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Second River Basin Management Plans - Member State:Cyprus

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
QA/QC Directive	Quality Assurance / Quality Control Directive
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 (MS) 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.

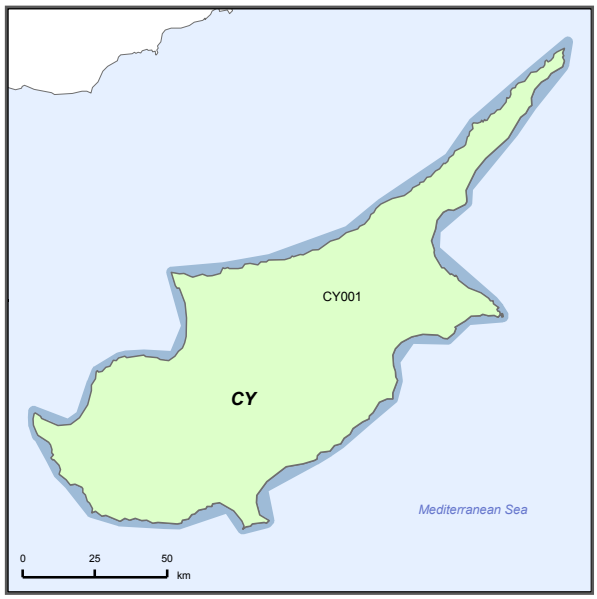
This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

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 River Basin Management Plans (RBMP) prepared earlier. The situation in the Member States may have changed since then.

General Information

Cyprus has a population of 0.8 million and a total surface area of 9,250 km^2. Cyprus is the largest island in the eastern Mediterranean (Map A). The two main mountain ranges are the Pentadactylos in the north and the Troodos in central and south-western part of the island. Between them is the fertile plain of Messaoria.

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

Cyprus has one River Basin District (RBD) that covers the country's whole territory (Table A). Cyprus being an island, the RBD does not share catchments with other Member States or with other countries. According to the provisions of Article 1 of Protocol No 10 on Cyprus, the application of the acquis is suspended in those areas of the Republic of Cyprus in which the Government of the Republic of Cyprus does not exercise effective control.

Table A Overview of Cyprus's River Basin Districts

RBD	Name	Size (km^2)
CY001	Cyprus	11023

Source: RBMPs reported to WISE

Status of second river basin management plan reporting

A total of one RBMP (Cyprus) was published on 7 October 2016. 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 Cyprus are as follows:

- **Governance and public consultation**

  - Cyprus used several mechanisms to involve stakeholders, including via advisory groups and their involvement in drafting of the RBMPs.

  - Open meetings were held in different cities to inform the public and stakeholders of the RBMP.

  - Cyprus did not adopt and publish the RBMP in accordance with the timetable in the Water Framework Directive.

- **Characterisation of the RBD**

  - A new and improved typology was developed for rivers and the national types are reported to fit with the intercalibration types.

  - For what concerns surface water bodies, there are significant gaps in the establishment of reference conditions for all water bodies. The second RBMP refers to a project that was underway for the establishment of reference conditions for lake water bodies in Cyprus, which will be used in the third RBMP. For groundwater, further characterisation work has been undertaken since the first RBMP, by describing the geological formations and whether they are layered or not. Cyprus has also done an assessment of linkages with surface water bodies and terrestrial ecosystems.

  - For surface waters and groundwater, significance of pressures was linked to failure of objectives and defined in terms of thresholds.

  - Cyprus has reported gaps that have to be filled for some (but not all) significant pressures on groundwater and surface water bodies. Some of the pressure types (e.g. diffuse sources) have been apportioned among sectors/activities.

  - An inventory of all Priority Substances has been reported in the second RBMP. Tiers 1 to 4 were implemented for substances deemed relevant at RBD level, and Tier 1 was implemented for substances identified as not relevant, as recommended by the CIS Guidance Document n°28. The data quality was assessed as good.

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

  - There was an increase in the number of monitoring sites used for the surveillance and operational monitoring of coastal waters since the first RBMP. Cyprus did not report any surveillance or operational monitoring sites in rivers and lakes. This was a reporting error, and the information subsequently provided by Cyprus shows also a significant increase in the number of monitoring sites in rivers, both surveillance and operational. There was, however, a decrease in monitoring sites in lakes, for which there were no operational sites for the second RBMP. It should be noted, however, that reservoirs, which had been reported as lakes in the first RBMP were now reported as rivers, so the number of delineated lake water bodies decreased significantly.

  - The proportion of surface water bodies in good or better status/potential was 58 % in the second RBMP, compared to 40 % in the first. The proportion with unknown status/potential significantly decreased, from 21 % in the first RBMP to 1 % in the second.

  - More biological quality element assessment methods have been developed since the first RBMP.

  - Fish in rivers have not been reported as having been monitored or classified, and no assessment methods have been developed. The justification given previously by Cyprus was that there are no indigenous fish in its freshwaters taking into account historical information on ecology, climate and pressures. A specific measure has been included in the Programme of Measures for the period 2016-2021 to further investigate the fish fauna in rivers in Cyprus. Cyprus subsequently clarified that investigative projects, which included monitoring of fish, have already been carried out since 2010.

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

  - Between the two RBMPs the proportion of surface water bodies in good chemical status increased from 74 % to 85 %. The proportion of water bodies in unknown status decreased from 21 % to 12 %.

  - Around a quarter of rivers and a third of lakes and coastal waters were monitored for chemical status. This means that a significant number of water bodies were classified in the absence of monitoring data for these water bodies, and it may at least partly

explain the significant proportion of water bodies classified with low confidence (58% of waterbodies).

- Territorial waters were neither monitored nor classified.

- Altogether 39 of the 41 Priority Substances were monitored in water and used for status assessment. This included all the Priority Substances identified as discharged. The monitoring frequencies met the recommended minimum frequency for surveillance monitoring but not for operational monitoring. No explanation could be found for the reduced frequencies.

- For status assessment, Cyprus clarified that mercury and hexachlorobenzene, and hexachlorobutadiene were monitored in biota in coastal waters at the recommended minimum frequency. No monitoring of biota was undertaken in surface freshwaters as Cyprus has yet to identify a suitable biota species for such monitoring.

- According to WISE, Cyprus did not perform any monitoring for long-term trend assessment. However, Cyprus subsequently clarified that since 2013, the 14 relevant Priority Substances are monitored in river sediment.

- **Monitoring, assessment and classification of quantitative status of groundwater bodies**

  - All groundwater bodies are now monitored and have a status.

  - The groundwater body area failing good status significantly decreased from 92 % of the total area to 57 %.

  - All associated ecosystems were considered although they are not considered to be presenting a risk.

- **Monitoring, assessment and classification of chemical status of groundwater bodies**

  - No surveillance monitoring and no operational monitoring has been reported, although 73 sites are listed for monitoring of chemical status. Cyprus subsequently noted reporting errors and clarified that the chemical monitoring has improved in the second RBMP and that chemical status is based on 92 operational monitoring stations. All stations are monitored twice a year.

- Contrary to the conclusion drawn from the electronic reporting, Cyprus clarified that all WFD core substances are monitored in all groundwater bodies.

- Despite the reported information, according to Cyprus, the confidence in status results is high and the assessment methodology is clearly described.

- Associated ecosystems have been considered in the status assessment although there is no related risk identified.

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

- The methodology for heavily modified water body designation explains the identification of substantial changes in character as well as provides information on the assessment of significant adverse effects on the use and the assessment of better environmental options.

- The focus of the methodology is on river water bodies linked to dams; the two lakes and the four coastal water bodies are assessed in less detail and less specific criteria are applied. For lakes, there is no available data about the status of the biological quality elements. For this reason, only the significance of the hydromorphological alterations is considered.

- Although good ecological potential is defined on the basis of mitigation measures, it has not been defined yet in terms of biology for rivers. For impounded rivers (reservoirs), GEP has been defined in terms of biology in the intercalibration for lakes and the assessment of the status of impounded rivers was carried out on that basis. Furthermore, the ecological changes expected from the mitigation measures in biological terms are not described in any quantitative terms.

- **Environmental objectives and exemptions**

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

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

- Commission recommendations regarding further detailed justifications for applying Article 4(4) exemptions have been followed.

- The application of Article 4(7) exemptions may be an issue of insufficient implementation of WFD requirements as it remains unclear if the reported process covers all steps of Article 4(7).

- **Programme of Measures**

  - Progress has been made with the targeting of measures.

  - Cyprus reported that some measures have been completed and clarified subsequently that in fact the majority of measures have been completed. A lack of finance is the main obstacle. More transparent information is needed on how measures have been selected and prioritised. Cyprus clarified that the measures included in the Programme of Measures are targeted to the significant pressures and formulated taking into consideration a number of factors including EU and national environmental policies, progress and experience of the first Programme of Measures, the status of water bodies and the results of the pressure and impact analysis, the financial resources and mechanisms available, the technical feasibility of the measures needed and the timescales in which good status should be achieved.

  - A significant amount of the funds required for the second Programme of Measures has been secured from European Union funding. Cyprus has reported that financing is in place from relevant sectors.

  - Not all significant pressures appear to have been addressed by KTMs, and KTMs have been reported for significant pressures which have not been reported as causing water bodies to fail objectives. Cyprus clarified that only the pressures with measurable indicators are mapped to KTMs. Additionally only one KTM is related to each significant pressure. As a result of this, some pressures for which measures are included in program of measures are not correlated to KTMs and some KTMs that could be relevant are not reported in WISE.

  - National basic and supplementary measures have been mapped against KTMs. Cyprus clarified that only the pressures with measurable indicators are mapped to KTMs. Additionally only one KTM is related to each significant pressure. As a result of this, some pressures for which measures are included in program of measures are not correlated to KTMs and some KTMs that could be relevant are not reported in WISE.

  - The range of KTMs against which national measures have been mapped is limited.

- Cyprus has reported indicators for those pressures where operational KTMs have been reported.
- The RBMP and Flood Risk Management Plan have not been fully integrated. However, the WFD and Floods Directive have been co-ordinated in terms of consultation, objectives and measures. Financial commitment has been obtained from the flood protection sector for the implementation of WFD measures.

- **Measures related to abstractions and water scarcity**
  - The Water Exploitation Index + (2009-2013) is 73.1 % for Cyprus, which is far beyond the preliminary European sustainability threshold.
  - Direct measurement/monitoring of urban water consumption is in place.
  - The current method for determining agricultural water consumption still presents weaknesses, and metering control needs improvements.
  - A permitting regime and a register of abstractions for surface water and groundwater is fixed by law.
  - Water efficiency and reuse measures are in place.
  - The control and sanction system can be described as rather weak; the illegal abstractions phenomenon appears to persist.
  - Water pricing for agriculture is not incentive-based, although a new water pricing law and system is being implemented.

- **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. A gap assessment, regarding nitrogen, phosphorus and biological oxygen demand, including an evaluation/prediction of how effective the measures are/would be at reducing the pressures to the level to achieve good status, was performed.

- Implementation of basic measures Article 11(3)(h) for the control of diffuse pollution from agriculture at source has been established across the whole RBD.

- Only one supplementary measure has been included as part of the Programme of Measures.

- Safeguard zones for drinking water protection have been established.

- Financing of measures is secured and the costs of the measures are reported.

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

- Cyprus has made progress on the recommendation to accelerate the implementation of the Urban Waste Water Treatment Directive.

- Cyprus did not include either 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), or KTM16 (Upgrades or improvements of industrial wastewater treatment plants (including farms)) in its list of KTMs addressing pollution from sectors other than agriculture, despite the fact that both Priority Substances and River Basin Specific Pollutants could cause non-compliance.

- The Programme of Measure does not explicitly link measures to individual Priority Substances or River Basin Specific Pollutants causing failure of objectives. Cyprus subsequently pointed out that 55 specific measures to tackle Priority Substances and River Basin Specific Pollutants are included in the Programme of Measures, in addition to some relevant horizontal measures. Especially, 10 out of 55 measures included in the Programme of Measures are specific to tackle Priority Substances.

- **Measures related to hydromorphology**

- According to information subsequently provided by Cyprus, a methodology for the assessment of hydromorphological pressures has been developed for the second RBMP. In addition, during the first cycle, authorities have registered all hydromorphological pressures and a regulation and licensing framework has been established for activities potentially leading to hydromorphological alterations. In the second RBMP, 43 % of the surface water bodies classified with ecological status less than good are facing significant hydromorphological pressures and relevant measures

are included in the program of measures to tackle them. Monitoring activities are still ongoing to verify measure effectiveness, e.g. on the ecological effectiveness of ecological flows and studies on fish fauna.

- Ecological flows have been derived and implemented for all relevant water bodies. For the preparation of the second RBMP, a specific analysis was conducted for the identification of the e-flows in heavily modified river water bodies downstream of dams with the aim of achieving good ecological potential. This is used to formulate three relevant measures for the determination of environmental flows in selected dams (release environmental flows downstream of dams, release environmental flows targeted in selected sites of significant ecological importance and release flood flows in selected dams), which define the standards for ecological flows in Cyprus.

- The specific KTM23 on Natural Water Retention Measures is not reported as operational to tackle any significant pressures in the second RBMP. However, the RBMP refers to synergies with measures taken under the Flood Risk Management Plan (FRMP). According to information provided by Cyprus during the assessment, Natural Water Retention Measures are included in the FRMP where appropriate.

- **Economic analysis and water pricing policies**

  - Environmental and resource costs have been calculated and attributed to the water users to a certain extent.

  - No information on the incentive function of the water pricing policies was reported in the RBMP but a new water pricing law/system has since been implemented to cover the water pricing requirements of the WFD.

  - No information on the application of the polluter pays principle was reported.

  - A rather broad definition of water services has been used.

- **Considerations specific to Protected Areas (identification, monitoring, objectives and measures)**

  - A detailed and comprehensive description of the regulation in safeguard zones is provided.

- The plan includes information about monitoring specifically for protected areas, which has been put in place in accordance with the requirements of the various Directives.

- **Adaptation to drought and climate change**

  - The Common Implementation Strategy guidance document on how to adapt to climate change was used for preparing the RBMP.

  - KTM 24 - Adaptation to climate change is not operational; but according to the information provided by Cyprus several measures are strongly linked to climate change effects.

  - A drought management plan including key measures exists and is aligned with the RBMP.

Recommendations

- The preparation of the third RBMPs should be carried out in accordance with the WFD timetable, to ensure that they are adopted on time.

- Cyprus should continue to improve the quality of monitoring by increasing the number of sites and by monitoring all relevant quality elements, finalising the measure aimed at investigating the fish fauna in rivers.

- Cyprus made significant progress in the characterisation of water bodies. However, further work is still needed on the apportionment of significant pressures on surface and groundwater bodies among different sectors. Further information should be provided on the methodologies used to define significant pressures and on the thresholds to define the significance of pressures.

- The assessment specifically of the lake and coastal water bodies needs to be improved in terms of biology. In case water bodies achieve good status they need to be designated as natural water bodies. Associating abstractions as "substantial changes in character" needs to be reconsidered in the context of relevant principles in the Common Implementation Strategy Guidance Document No. 4.

- The surveillance monitoring of lakes should be improved and lakes should also be included in operational monitoring.

- Cyprus should have a clear and transparent method for the selection of River Basin Specific Pollutants.

- Cyprus should continue improving the confidence in the assessment of surface water chemical status for all water categories (including territorial waters, whose status should be assessed), and further reduce the proportion of unknown status. In particular, monitoring should be performed in a way that provides sufficient temporal resolution and spatial coverage to classify all water bodies (in combination if necessary with robust grouping /extrapolation methods), all Priority Substances should be considered in the assessment of status, in the relevant matrix. If reduced frequencies or a different matrix are used, corresponding explanations should be provided, as required by the Directive.

- Cyprus should perform trend monitoring in sediment and/or biota, to ensure that all the relevant substances specified in Directive 2008/105/EC are monitored in a way that provides sufficient temporal resolution and spatial coverage.

- Cyprus should increase utilisation of metering (especially for agriculture) to better determine the quantitative status of water bodies and to secure their long-term protection considering that abstraction of groundwater is a significant pressure in Cyprus, mainly due to unregulated self-abstractions, and permits requiring alignment with environmental constraints.

- The increase of the application of Article 4(4) exemptions between the first and the second cycle is an issue of concern. Efforts need to be continued to ensure the implementation of an ambitious program of measures in order to ensure the timely achievement of the WFD objectives.

- Further progress is needed regarding the possible use of exemptions according to Article 4(7) in order to ensure thorough assessment of proposed new projects in line with the requirements of the WFD and as further specified by the Judgment of the Court in case C-461/13. An ex-ante assessment of the expected effects of a planned project at quality element level is required. In case deterioration / non-achievement of good status / potential is expected, all the conditions as outlined under Article 4(7) need to be fulfilled and thoroughly justified for the authorisation of a project.

- Cyprus should ensure that KTMs are reported for all significant pressures causing failure of objectives, and include KTM15 and KTM16 where relevant.

- Cyprus should ensure full implementation of measures and law enforcement to address over-exploitation of groundwater bodies, tackling water demand problems and illegal abstractions. It should promote more efficient irrigation networks, less water-intensive crops, and maximise water reuse.

- In the third RBMPs, it should be stated clearly to what extent, in terms of area covered and pollution risk mitigated, basic measures (minimum requirements to be complied with) or supplementary measures (designed to be implemented in addition to basic measures) will contribute to achieving the WFD objectives. Sources of funding should be identified (e.g. CAP Pillar 1, Rural Development Programmes-RDP), as appropriate, to facilitate successful implementation of these measures.

- Cyprus should continue to review and develop the strategy for the delivery of WFD objectives, in cooperation with the farming community and Cypriot CAP delivery authorities, to ensure the third RBMP is technically feasible and all relevant policies and instruments (e.g. RDP, CAP Pillar 1, Nitrates Directive) contribute significantly to RBMPs. Irrigation investments made through the RDP must be carried out to ensure water saved goes back to restore depleted aquifers.

- Cyprus should improve how it reports the links between KTMs and tackling individual chemical pollutants.

- All on-going and planned measures should be included in the next programme of measures.

- Cyprus should continue to 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. It should also continue to transparently present water-pricing policy results and provide a transparent overview of estimated investments and investment needs.

- Further work is needed in order to set additional objectives for all relevant Protected Areas. Cyprus should also plan a complete monitoring programme for all relevant Protected Areas.

Topic 1 Governance and public participation

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

1.1.1 Administrative arrangements – river basin districts

Cyprus has one RBD that covers the country's whole territory.

Cyprus did not adopt and publish the RBMP in accordance with the timetable in the Water Framework Directive: according to the information reported to WISE, the RBMP was published in October 2016.

1.1.2 Administrative arrangements – competent authorities

Cyprus has reported one Competent Authority, the Ministry of Agriculture, Rural Development and Environment. The Ministry holds all the main roles for the RBMP: monitoring and assessment of status for both groundwater and surface water, pressure and impact analysis, economic analysis, preparation of the RBMP and the Programme of Measures, public participation, implementation of measures, coordination of implementation and reporting to the European Commission.

1.1.3 River Basin Management plans – structure and Strategic Environmental Assessment

No sub-plans were prepared for the RBMP.

A Strategic Environmental Assessment was undertaken for the RBMP and Programme of Measures.

1.1.4 Public consultation

The public and interested parties were informed of the consultation of the RBMP via Internet, invitations to stakeholders, local authorities, media (papers, TV and/or radio), meetings and written consultation. Documents were available for download, and were available for the required 6 months. Cyprus informed that consultation on the draft RBMP was open to all stakeholders, and all documents were uploaded for consultation on the website of the WDD (Water Development Department).

Three types of stakeholder groups were actively involved in the development of the RBMP: local/regional authorities, NGOs/nature protection and water supply and sanitation. These

stakeholders were involved via advisory groups, involvement in drafting and a workshop. It can be noted that energy/hydropower, industry and fisheries/aquaculture stakeholders had been reported as being actively involved in the preparation of the first RBMP but were not reported in the second cycle.

Cyprus informed that seven open meetings were organized in different cities to inform the public. Invitations were open to all stakeholders covering all the main sectors of activities such as water supply, sanitation, agriculture, industry, NGOs, consumers and local authorities. The participants in these meetings were mainly from sectors such as water supply, agriculture, local municipal authorities and consumers. From sectors like energy, industry, and fisheries only representatives from the competent Authorities participated.

Public consultation led to the addition of new information, adjustment to specific measures, commitment to action in the next RBMP and the addition of new river water bodies.

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

Cyprus held a joint consultation of its RBMP and Flood Risk Management Plan under the Floods Directive[1] but did not co-ordinate consultation of the RBMP with the Marine Strategy Framework Directive[2].

Cyprus informed that during the preparation and the consultation of the second RBMP, the programme of measures for the implementation of the Marine Strategy Framework Directive was under formulation. For this reason, in the Programme of Measures of the second RBMP, it is clearly noted that the measures formulated for the implementation of the Marine Strategy Framework Directive are considered as supplementary to the second RBMP. This statement is also included in the second RBMP.

1.1.6 International coordination and co-operation

The Cyprus RBD does not share catchments with other Member States or with other countries.

1.2. Main changes in implementation and compliance since first cycle

No significant changes were observed.

[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

[2] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056

Although reporting to WISE suggests that public consultation appeared to be less broad in terms of involvement of stakeholders compared to the first cycle (energy, industry and fisheries stakeholders were actively involved in the first RBMP but were not reported as being actively involved in the second cycle), Cyprus informed that for the second cycle, only the main stakeholders that participated in the meetings or provided feedback for the preparation of the second RBMP were reported.

1.3 Progress with Commission recommendations

There were no recommendations based on the first RBMPs and first Programme of Measures.

Topic 2 Characterisation of the River Basin District

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

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

There have been significant reductions in the number of lake and river water bodies delineated between the two cycles (Table 2.1). Overall, Cyprus designated 216 river water bodies for the first cycle. For the second cycle, 174 were identified, similarly for lake water bodies the number decreased from 18 to 8. The reasons provided in the RBMP for these changes were that the typology was revised allowing merging of water bodies that previously were of different types and splitting of water bodies that previously were of the same type, as well as the availability of new monitoring data. The RBMP also reported that some lakes were re-delineated as rivers because they were river reservoirs[3].

Table 2.1 Number and area/length of delineated surface water bodies in Cyprus for the second and first cycles

Year	RBD	Lakes		Rivers		Coastal	
		Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total length of water body (km)	Number of water bodies	Total area (km^2) of water bodies
2016	CY001	8	20	174	1,777	22	869
2010	CY001	18	28	216	2,579	26	865

Source: WISE electronic reports

There was also a decrease in the number of coastal water bodies, though the total area of the coastal water bodies slightly increased in the second RBMP compared to the first RBMP indicating that the average size of the water bodies increased in the second RBMP. This was a result of studies which proposed the merging of neighbouring coastal water bodies, new monitoring data and to enable better targeting of measures.

[3] Cyrus subsequently noted that in the first RBMP, 11 impounded rivers were reported as lakes and for the second cycle these water bodies are reported as river water bodies according to CIS guidance. Cyprus stated that another four impounded rivers were added as river water bodies. Cyprus clarified that the changes in methodology are described in the RBMP and the changes derived were also presented to the public during the consultation carried out for the results derived after the revisions according to article 5 of the RBMP (Article 14(1) b of WFD) and during the consultation of the Draft RBMP (Article 14(1)(c) of the WFD).

Table 2.2 shows the differences in size distribution of surface water bodies in Cyprus between the first and second cycles. The RBMP also reported that the size threshold used for the delineation of water bodies has changed since the first cycle[4]. The minimum size criteria reported for rivers was 10 km^2 in terms of catchment area but the minimum size for lakes was not reported.

Table 2.2 Size distribution of surface water bodies in Cyprus in the second and first cycles

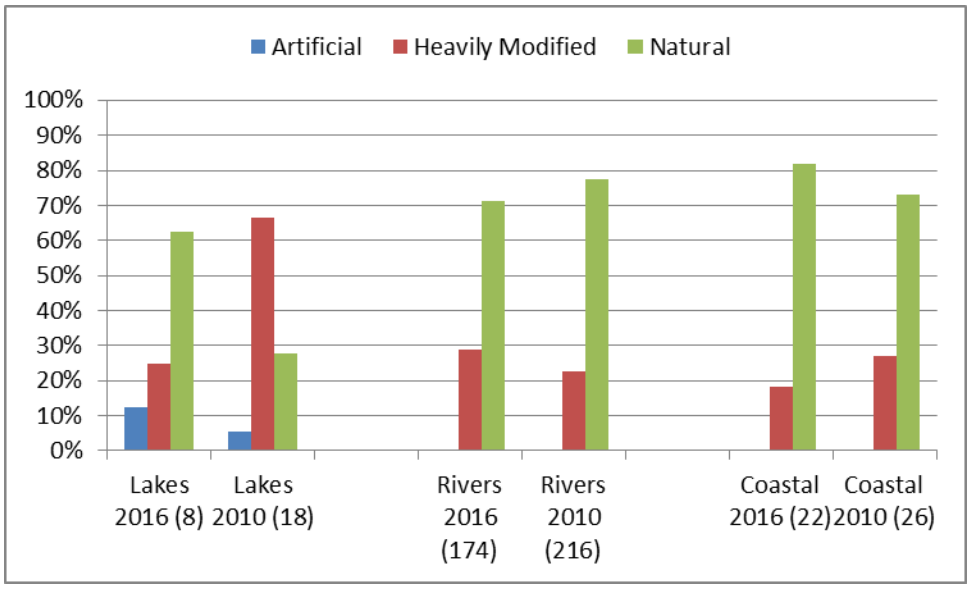
Year	RBD	Lake area (km^2)			River length (km)			Coastal (km^2)		
		Mini-mum	Maxi-mum	Aver-age	Mini-mum	Maxi-mum	Aver-age	Mini-mum	Maxi-mum	Aver-age
2016	CY001	0.06	10.06	2.52	0.03 (0.26)	3.33 (53.3)	0.79	4.02	87.13	39.5
2010	CY001	0.03	10.05	1.58	0.21	85.61	11.94	2.91	79.67	33.27

Source: WISE electronic reports. Values in parentheses were supplied by Cyprus as the values reported to WISE are areas rather than lengths.

There was an increase in the proportion of rivers that were designated as heavily modified in the second RBMP (29 %) compared to the first RBMP (23 %): this was also accompanied by a decrease in the number of natural rivers and an overall decrease in the total number of rivers identified (Figure 2.1). The number and proportion of heavily modified lake and coastal water bodies decreased significantly between the two cycles.

[4] Cyprus subsequently clarified that smaller lakes, which contribute to the biodiversity and are included in the Natura 2000 Network, were also delineated as water bodies: in the second RMBP one more lake smaller than 0.5 km2 (lake Oroklini) was added for the same reason.

Figure 2.1 ***Proportion of surface water bodies in Cyprus 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 also an increase of one in the number of groundwater bodies delineated in the second RBMP though the total area of groundwater bodies decreased, Table 2.3.

Table 2.3 ***Number and area of delineated groundwater bodies in Cyprus for the second and first cycle.***

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2016	CY001	21	1.9	2,396.95	284.97
2010	CY001	20	2	2,385.00	313.05

Source: WISE electronic reports.

Groundwater bodies were reported to be split because there were different pressures and to allow for the better targeting of measures, or because of their differing geological environment and better knowledge of groundwater since the first cycle, and more monitoring data.

Table 2.4 summarises the information provided by Cyprus on how water bodies have evolved between the two cycles.

Table 2.4 Type of change in delineation of groundwater and surface water bodies in Cyprus between the second and first cycles

Type of water body change for second cycle	Groundwater Body	Lake Water Body	River Water Body	Coastal Water Body
Aggregation			1	3
splitting	6		69	
Aggregation and splitting			8	
ExtendedArea		1		
Creation			14 (10 rivers line + 4 impounded rivers)	1
Deletion	2	6	105	2
Change in code		1	82 (71 rivers line and 11 impounded rivers)	11
No change	15			7
Total water bodies before deletion	23	8	279 (264 rivers line + 15 impounded rivers)	25
Delineated for second cycle (after deletion from first cycle)	21	8	174 (159 rivers line +15 impounded rivers)	22

Source: WISE electronic reports. Information in brackets was subsequently provided by Cyprus.

The water body type with the most changes was river water bodies, with water bodies defined (n = 14), and removed (n = 105). However, there may be some issues with the data in Table 2.4, as there do not appear to have been 105 river water bodies removed since the first cycle. No information on consequences of the changes in re-delineation were reported in the RBMP, but it is likely that the status assessments for surface water and groundwater bodies between the two cycles are not directly comparable.

2.1.2 Typology of surface water bodies

There have been changes in the typology of water bodies reported by Cyprus between the two cycles. One new type has been reported for coastal waters covering both natural and heavily modified water bodies. There has been a reduction of lake types from four in the first cycle

RBMP to three in the second RBMP, type code L4 was not reported in the second RBMP[5]. The RBMP mentions that no significant changes have taken place in the typology of lake and coastal water bodies.

Table 2.5 Number of surface water body types at RBD level in Cyprus for the first and second cycles

RBD	Rivers		Lakes		Coastal	
	2010	2016	2010	2016	2010	2016
CY001	3	4	4	3	3	4

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.

Four river types were reported in the second RBMP and only three in the first RBMP: the coding of all types was different for each cycle. In the second cycle the river water body typology has been revised and the following four types have been derived; P - Perennial mountain streams; I - Intermittent streams; Ih - Harsh intermittent streams; and E - Ephemeral / episodic streams. The RBMP reported that the river typology and the river water bodies used for the first cycle revealed significant disadvantages during the implementation of the WFD. There were issues with the lack of knowledge about the different types of rivers. It was therefore decided to develop new typologies for rivers.

The first RBMP did not provide information on the validation of surface water types with biological data, the methodology described only referred to abiotic elements. At the time when the typology was devised no biological data were available for Cyprus' freshwaters. Consequently, no validation against such data was possible. Work was on-going on the validation during the first cycle. For river water body types, the temporary stream regime (TSR)-Tool, was used, to relate the four types to biological communities for the WFD-monitoring. It was stated that type E cannot be made biologically relevant because appropriate methods do not yet exist. No specific information was provided for the other types.

All four national coastal water types have the same equivalent intercalibration type. The three lake types covering all eight lake water bodies do not have equivalent intercalibration types. Two common river intercalibration types have been used to intercalibrate the three national

[5] Cyprus subsequently clarified that the difference in the number of lake types is due to their change to river water bodies. L4 was a lake type for water reservoirs up to the first RBMP; in the second RBMP the water reservoirs were reported as rivers under the original river type of the river stretch where the reservoir is now located. Therefore, L4 does not appear any more in the second RBMP.

river types, each of which include both natural and heavily modified water bodies[6]. The forth river type has no equivalent intercalibration type equating to 6 % of total river water bodies[7].

2.1.3 Establishment of reference conditions for surface water bodies

Table 2.6 shows the percentage of surface water body types in Cyprus with reference conditions established for the first and second cycles. Reference conditions have not been set for any quality element for the lakes in Cyprus. The second RBMP referred to a project that was ongoing for the establishment of reference conditions for lake water bodies in Cyprus[8].

Table 2.6 ***Percentage of surface water body types in Cyprus with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements. Numbers in parenthesis are the number of types in each category***

Water category	Water types	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Lakes (3)	All			
	Some			
	None	100%	100%	100%
Rivers (4)	All			
	Some	100%	100%	100%
	None			
Coastal (4)	All			100%
	Some	100%		
	None		100%	

Source: WISE electronic reports

[6] Cyrpus subsequently clarified that the new river types fit with the results of the Intercalibration exercise for Cyprus and there are direct relationships between the old national types, the intercalibration types and the new national types as it is shown in the following table:

Old national type (1st RBMP)	IC type	New national type (2nd RBMP)
R2 (perennial)	R-M4	P
R1, R3 (temporary)	R-M5	I (Ih streams in years when flow period allows assessment of these streams)

[7] Cyprus subsequently clarified that for ephemeral/episodic streams (Type E) a special study was carried out in order to investigate the appropriate methods for the assessment of biological quality elements according to WFD requirements. Cyprus stated that the report concluded that Type E river water bodies are not biologically relevant and appropriate methods do not yet exist.

[8] Cyprus subsequently highlighted that the project has finished in December 2015 and reference conditions for lakes were established and a complementary (follow-up) project has finished in December 2016, where the definition of the reference conditions was further refined and updated. Cyprus stated that these reference conditions for lakes will be applied for the third RBMP.

For all four river types, reference conditions have been established for some but not all of the relevant biological, hydromorphological and physicochemical quality elements. In terms of coastal water types, reference conditions have been established for all physicochemical quality elements for all types, for some but not all biological quality elements in all types and for no hydromorphological quality elements in all types. There are, therefore, still significant gaps in the establishment of reference conditions for lake water bodies[9] in Cyprus. This casts doubt on the reliability and comparability of the assessment and classification of the ecological status/potential of all water bodies in Cyprus.

2.1.4 Characteristics of groundwater bodies

Cyprus reported details of the main geological formation of the aquifer type and whether or not the groundwater bodies are layered for all their groundwater bodies. 67 % and 5 % of groundwater bodies in Cyprus were reported to be linked to surface water bodies and to terrestrial ecosystems, respectively.

2.1.5 Significant pressures on water bodies

Nine significant pressure types affected river water bodies in the second RBMP; with diffuse other pressures affecting 48 % of river water bodies and diffuse agriculture 47 % (Figure 2.2). Four significant pressures affected lakes in the second RBMP with diffuse agricultural pressures affecting all eight water bodies. No significant pressures were reported to be affecting coastal waters.

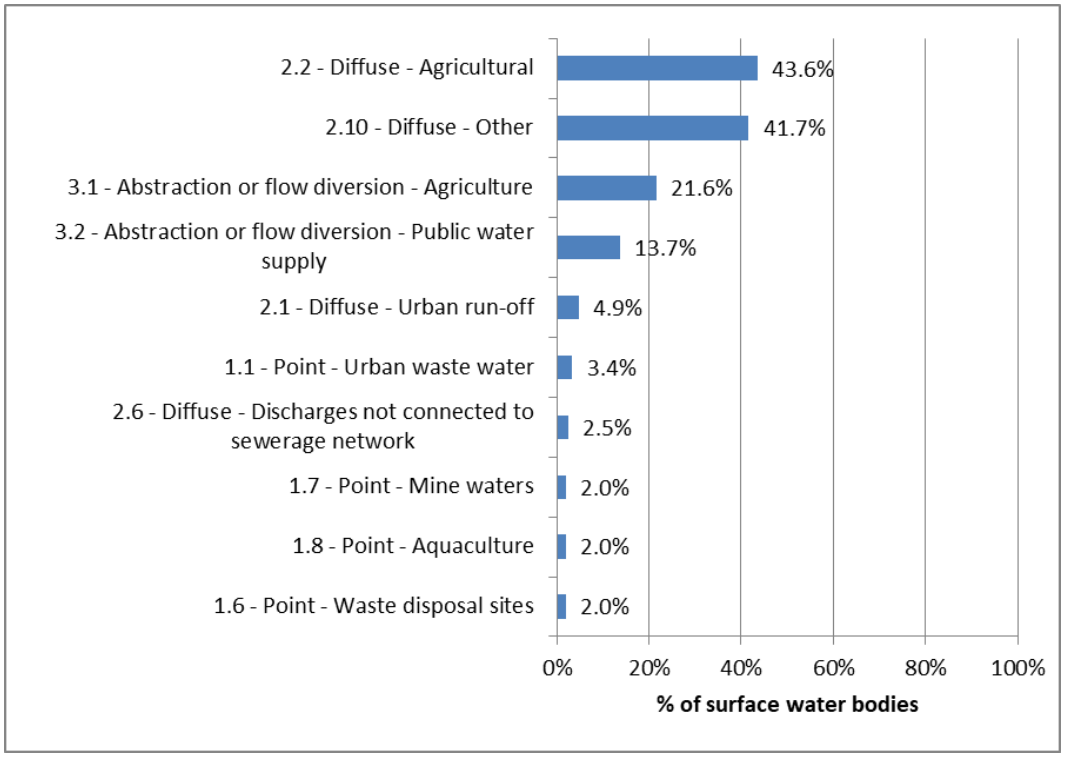
The RBMP reported that a revision of the pressures and impacts on the surface water and groundwater was completed. There have been significant changes in the numbers of water bodies delineated in Cyprus between the two cycles with changes in coding and there have been significant changes in the definition and reporting of pressure types. It is, therefore, difficult to make quantitative comparisons between the two cycles. At the aggregated pressures level, 43 (20 %) of river water bodies were affected by point source pollution in the first cycle RBMP; in the second RBMP it was 18 (10 %) of river water bodies affected. In the first RBMP, 104 (46 %) river and 8 (44 %) lake water bodies were affected by diffuse source pressures; in the second RBMP it was 116 (67 %) river and 8 (100 %) lake water bodies affected. Overall, there was an increase in the reporting of diffuse pressures and a decrease in hydromorphological pressures (Figure 2.3).

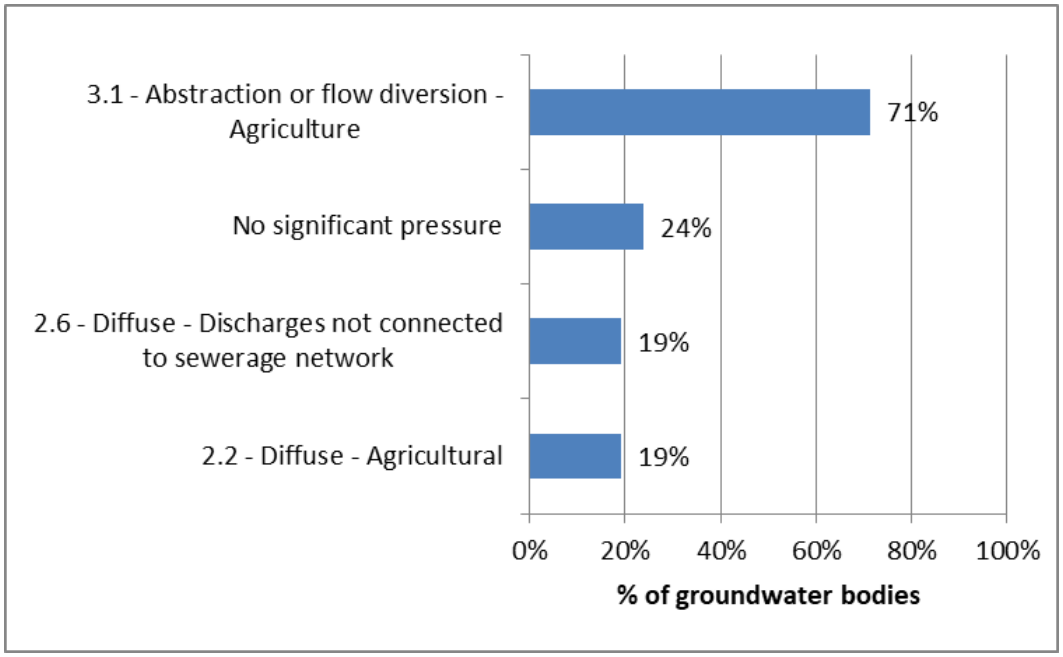
[9] Cyprus subsequently noted that all necessary actions were made to fill the gaps concerning the BQE methods and as a result for the assessment of the ecological status in river water bodies, three BQEs were defined: Benthic macroinvertebrates (Composition and abundance), Aquatic flora - phytobenthos (diatoms) and macrophytes (Composition and abundance), and Fish (Composition and abundance).

Three significant pressure types were reported to be affecting groundwater in the second RBMP (Figure 2.2). The most significant in terms of the proportion of water bodies affected was abstraction or flow diversion pressures (71 % of groundwater bodies), followed by diffuse agriculture and diffuse pollution from discharges not connected to sewerage network (both 19 %).

In the first RBMP Cyprus reported five significant (aggregated) pressure types affecting groundwater bodies. The largest proportion (95 %) was affected by diffuse sources followed by abstraction pressures (85 %) and saltwater intrusion (65 %). For the same reasons as for surface waters, it is difficult to compare pressures on groundwater between the two cycles. In the first RBMP 95 % of groundwater bodies were reported to be affected by diffuse pressures, in the second RBMP (at the aggregated pressure level) it was 33 %: it is unlikely that the two values are comparable.

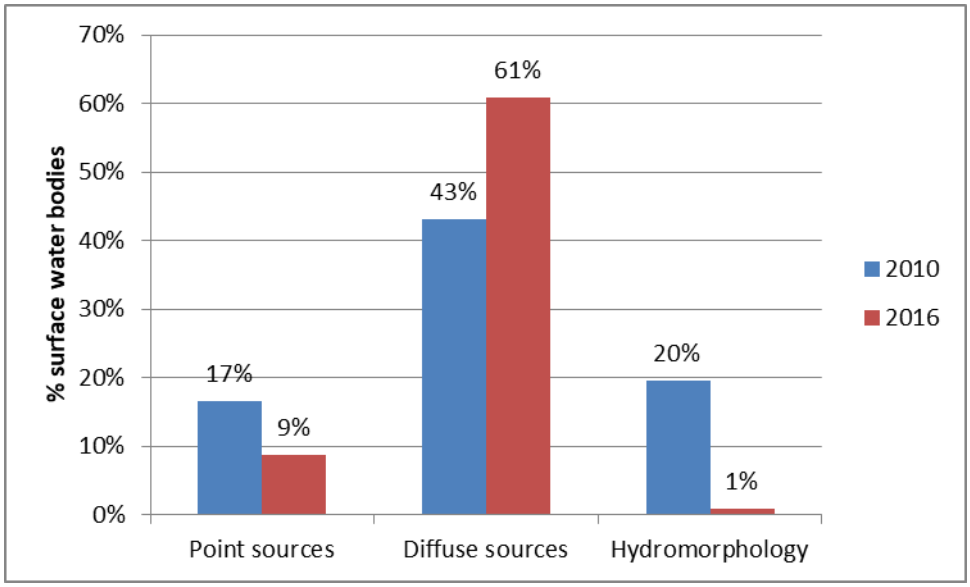
Figure 2.2 The most significant pressures on surface water bodies and groundwater bodies in Cyprus for the second cycle





Source: WISE electronic reports

Figure 2.3 ***Comparison of pressures on surface water bodies in Cyprus in the first and second cycles. Pressures presented at the aggregated level. Note there were 204 identified surface water bodies for the second cycle and 260 for the first cycle***



Source: WISE electronic reports

2.1.6 Definition and assessment of significant pressures on surface and groundwater

For the second RBMP a combination of both numerical tools and expert judgment were reported to have been used to assess point source, diffuse source and pressures on water flow on surface water bodies. Numerical tools were used to assess water abstraction pressures. A combination of both numerical tools and expert judgment were reported to be used to assess pressures on groundwater. The significance of pressures on surface water and on groundwater was defined in terms of thresholds and was linked to the potential failure of objectives.

No information was provided in the RBMP regarding any changes to the methodologies or criteria for defining significant pressures. No information on the threshold used to define significance was found in the RBMP either[10,11].

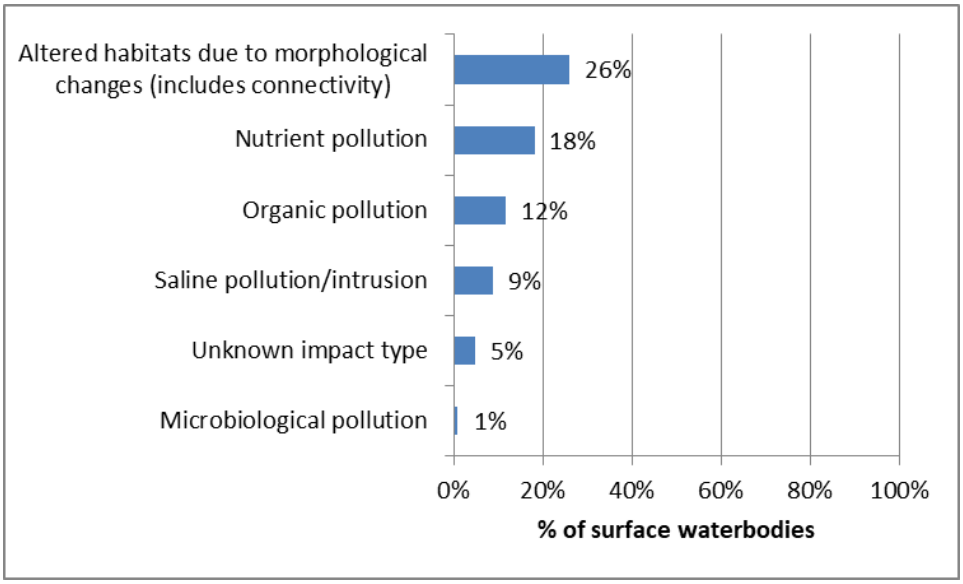
[10] Cyprus subsequently informed that a methodology for the evaluation of the significance of pressures in groundwater bodies and surface water bodies has been developed and explained in the RBMP. The methodologies are reported in detail in the report for the revision of pressure and impacts according to the provisions of article 5 - chapter 19 pp from 365 to 398 (document Pressures_CY_2014.pdf uploaded in WISE).

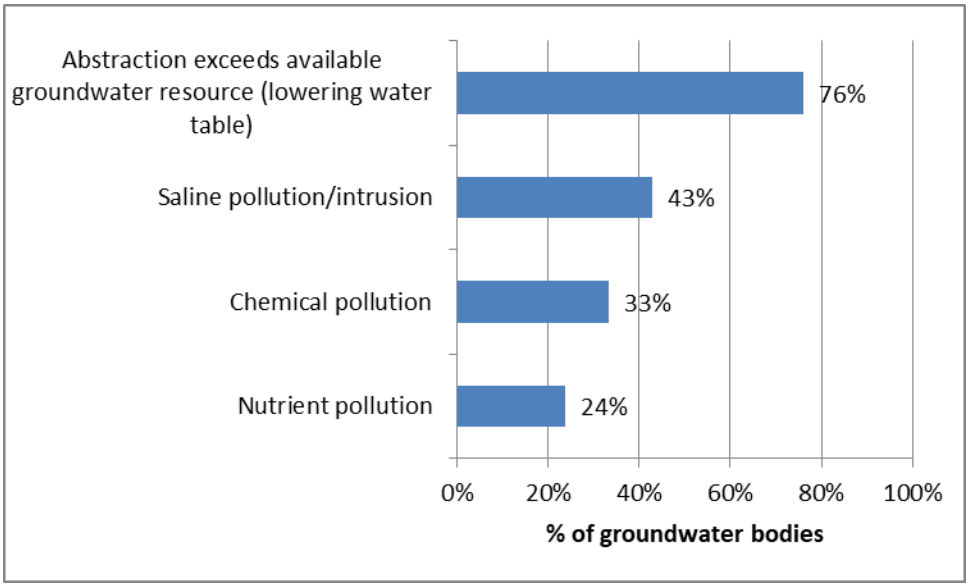
[11] Cyprus also informed that thresholds were used for nitrogen in groundwater: If the percentage of total nitrogen is >30% the pressure is classified as significant. Cyprus also gave examples for surface water whereby from the statistical analysis the following were extracted: nitrogen is used for uncontrolled landfills and agricultural activities, while the critical value for the BOD5 is used for the determination of the significance of pressures from livestock activities, municipal wastewaters and aquaculture.

2.1.7 Significant impacts on water bodies

Figure 2.4 shows the significant impacts on surface water and groundwater bodies in Cyprus for the second cycle. For surface waters “no significant impact” was reported 48 % of the time. The most common impact on surface waters was altered habitats due to morphological changes (includes connectivity) (26 %), followed by nutrient pollution (18 %). In 76 % of groundwater bodies abstraction exceeds available groundwater resource. 43 % of groundwater bodies are affected by saline intrusion and 33 % by chemical pollution.

Figure 2.4 ***Significant impacts on surface water and groundwater bodies in Cyprus for the second cycle. Percentages of numbers of water bodies***





Source: WISE electronic reports

2.1.8 Groundwater bodies at risk of not meeting good status

One third of groundwater bodies were reported to be at risk of failing to be in good chemical status because of seven different pollutants and one other determinant (electrical conductivity). The pollutant affecting most groundwater bodies was nitrate (33 %).

76 % of groundwater bodies were at risk of not being in good quantitative status with saline intrusion causing the risk in 43 % and water balance in 76 % of these groundwater bodies.

2.1.9 Quantification of gap and apportionment of pressures

The gap to the achievement of objectives in groundwater have been reported for one (Abstraction or flow diversion - Agriculture) of the three significant pressures on groundwater: the two pressures without a reported gap are diffuse source pressures from agriculture and from discharges not connected to the sewerage network.

A table is included in the RBMP for every surface water body that has a significant pressure identified that can affect its status and the sector the pressure related to. Gaps have been reported for one sector/activity causing diffuse pollution - agriculture. The other three responsible sectors had no gaps reported. Abstraction pressures and gaps have been apportioned between the two responsible sectors (agriculture and public water supply) and point sources between three of the four responsible sectors (urban waste water, waste disposal sites and mine waters) but not for aquaculture[12]. Gaps have also been reported for two pressure types arising from physical alteration of channel/bed/riparian area/shore and three arising from dams, barriers and locks even though these specific pressures were not reported at the water body level.

No gaps were reported for chemical substances causing failure of status objectives even though seven pollutants were reported to be causing failure of good chemical status in groundwater, one River Basin Specific Pollutant causing failing of good ecological status/potential and six Priority Substances causing failure of good chemical status in surface water bodies[13].

2.1.10 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (EQS Directive)[14] 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

[12] Cyprus subsequently clarified that pressures related to significant loads were prioritised, thus indicator gap for diffuse pressures from agriculture is selected to be reported instead of discharges not connected to the sewerage network, as the loads derived from agriculture are ten times greater (pp. 314-315 of the Pressures_CY_2014.pdf uploaded in WISE). Furthermore, Cyprus stated that a big effort was made in order to formulate indicators that are related to pressures concerning a significant number of water bodies failing to achieve good status.

[13] Cyprus subsequently clarified that for chemical substances causing failure of status only their presence and their concentration in affected water bodies are known and not the indicator gap.

[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

(respectively suppressing) emissions, discharges and losses for priority substances (respectively priority hazardous substances).

Cyprus reported that all Priority Substances had been included in an inventory of discharges, emissions and losses. The cyclodiene pesticides and polycyclic aromatic hydrocarbons were reported as grouped determinants rather than as individual component substances.

The two step approach from the Common Implementation Strategy Guidance Document n°28[15] has been followed for all substances considered in the inventories. For substances deemed not relevant at RBD level, Tier 1 of the methodology was implemented (consideration of point sources only). Tier 1 to 4 was implemented for all substances identified as relevant at RBD level, in accordance with the Guidance Document. The data quality was assessed as good.

2.2 Main changes in implementation and compliance since first cycle

The RBMP reported that the river typology and the river water bodies used for the first cycle revealed significant disadvantages during the implementation of the WFD. There were issues with the lack of knowledge about the different types of rivers. Another drawback was the fact that the characterization of river water bodies did not adequately respond to the pressures on water bodies. In the light of this it was decided to establish a new network of river bodies with a new typology for rivers.

There have been significant reductions in the number of lake and river water bodies delineated between the two cycles. Overall, Cyprus designated 216 river water bodies for the first cycle: for the second cycle 174 were identified. Similarly for lake water bodies the number decreased from 18 to 8 which was due to reservoirs being reclassified as river water bodies as per CIS guidance. There was also a decrease in the number of coastal water bodies though the total area of the coastal water bodies slightly increased in the second RBMP compared to the first RBMP indicating that the average size of the water bodies increased in the second RBMP. There was also an increase by one in the number of groundwater bodies delineated in the second RBMP though the total area of groundwater body decreased.

There was an increase in the proportion of rivers that were designated as heavily modified in the second RBMP (29 %) compared to the first RBMP (23 %): this was also accompanied by a decrease in the number of natural rivers and an overall decrease in the total number of rivers identified. The number and proportion of heavily modified lake and coastal water bodies decreased significantly between the two cycles.

[15] CIS Guidance N° 28 - Preparation of Priority Substances Emissions Inventory: http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm

There have been changes in the typology of water bodies reported by Cyprus between the two cycles. One new type has been reported for coastal waters covering both natural and heavily modified water bodies. There has been a reduction of lake types from four in the first RBMP to three in the second RBMP, type code L4 was not reported in the second RBMP. L4 was a lake type for water reservoirs up to the first RBMP and in the second RBMP the water reservoirs were reported as rivers. Four river types were reported in the second RBMP and only three in the first RBMP: the coding of all types was different for each cycle.

2.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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.*

  Assessment: It was reported that the assessment of significance of pressures was based on thresholds and linked to failure of objectives for the second RBMP. There has been progress on this aspect.

  A review of Cyprus' rivers has been undertaken for the second RBMP. The RBMP reported that the river typology and the river water bodies used for the first cycle revealed significant disadvantages during the implementation of the WFD. A new network of river bodies with a new typology for rivers was developed.

  Cyprus subsequently stated that a contract has been awarded, for the determination of reference conditions in the lake water bodies of Cyprus and the results from this report will be available to use in the next management cycle (third RBMP).

  Overall this recommendation has been partially fulfilled.

- Recommendation: *Present in the second RBMPs improved identification of pressures from chemical pollutants on the basis of the inventory of Priority Substances emissions (established since June 2013).*

  Assessment: An inventory of all Priority Substances has been reported for the second cycle. 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

to 4 was implemented for most substances and for a limited number Tier 1 of the methodology was implemented. The data quality was assessed as good. This recommendation has been fulfilled.

- Recommendation: *Provide a more detailed analysis of pressures and impacts, as well as an improved risk assessment based on the improvement of the monitoring network. The RBMPs should be explicit about the impacts related to each significant pressure and provide quantitative figures on the scale of the pressures that need to be reduced, to reach WFD objectives.*

  Assessment: Cyprus has reported gaps that have to be filled for some (but not all) significant pressures on groundwater and surface water bodies. Diffuse sources have been apportioned between the contributory sectors/activities[16].

  Numerical tools have been used to assess the significance of water abstraction pressures on surface waters and a combination of numerical tools and expert judgement for water abstraction pressures on groundwater bodies for the second RBMPs. Also the significance of pressures on surface water and on groundwater was defined in terms of thresholds and was linked to the potential failure of objectives. This indicates that there has been progress on this recommendation.

  Overall this recommendation has been fulfilled.

- Recommendation 5 (Topics 2 and 9): *Develop further the hydromorphological assessment methods so that improved biological monitoring results will allow for better risk assessment and more targeted measures concerning hydromorphological pressures.*

  Assessment: This recommendation relates to a number of Topics. In terms of characterisation, Cyprus reported that a combination of both numerical tools and expert judgment have been used to assess point sources, diffuse sources and pressures on water flow on surface water bodies and numerical tools were used to assess water abstraction pressures. The significance of pressures on surface water was defined in terms of thresholds and was linked to the potential failure of objectives. Cyprus subsequently noted that for the second RBMP, a methodology for the assessment of the hydromorphological pressures (the IPI index) was developed and was used for the review of the impacts and pressures carried out under Article 5 of the WFD and further developed. In terms of characterisation, this recommendation has been fulfilled.

[16] Cyprus subsequently clarified that pressures related to significant loads were prioritised, thus indicator gap for diffuse pressures from agriculture is selected to be reported instead of discharges not connected to the sewerage network, as the loads derived from agriculture are 10 times greater. Furthermore Cyprus stated that a big effort was made in order to formulate indicators that are related to pressures concerning a significant number of water bodies failing to achieve good status.

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

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

3.1.1. Monitoring of ecological status/potential

Monitoring programmes

Article 8.1 of the WFD requires Member States to establish monitoring programmes for the assessment of the status of surface water and of groundwater in order to provide a coherent and comprehensive overview of water status within each RBD.

Cyprus reported monitoring programmes for each of its surface water categories. Those for lakes and rivers cover monitoring of chemical status and ecological status separately. The programmes for coastal waters cover monitoring for surveillance purposes and operational purposes separately.

Monitoring sites and monitored water bodies used for surveillance and operational monitoring

Table 3.1 compares the number of monitoring sites used for surveillance and operational purposes between the cycles, and Table 3.2 gives the number of sites used for different purposes for the second cycle. Figure 3.1 shows the percentage of water bodies included in surveillance and operational monitoring in the first and second RBMPs. The zeros reported for rivers and lakes for the second cycle are considered to be a reporting error.

In the second RBMP Cyprus only reported monitoring sites in coastal waters for surveillance and operational purposes. No quality element was reported to be monitored and only chemical substances (River Basin Specific Pollutants and Priority Substances) were associated with monitoring sites. Monitoring sites in all water categories with details of the quality elements monitored were reported in the first RBMP. Therefore, this lack of data in the second RBMP is believed to be a reporting error.

There was an increase in the number of monitoring sites used for the surveillance and operational monitoring of coastal waters. For the second RBMP, 20 and four sites were used for surveillance and operational monitoring, respectively, compared to seven and one for the first RBMP.

Table 3.1 Number of sites used for surveillance and operational monitoring in Cyprus for the second and first cycles. Note that for reasons of comparability with data reported in the first cycle, the second cycle data does not take into account whether sites are used for ecological and/or chemical monitoring

	Rivers		Lakes		Coastal	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
Second RBMP						
CY_001	0 (52)	0 (34)	0 (6)	0	20	4
Total number of monitoring sites	*(86)*		*(6)*		*24*	
First RBMP						
CY_001	19	12	10	1	7	1
Total number of monitoring sites	*31*		*11*		*8*	

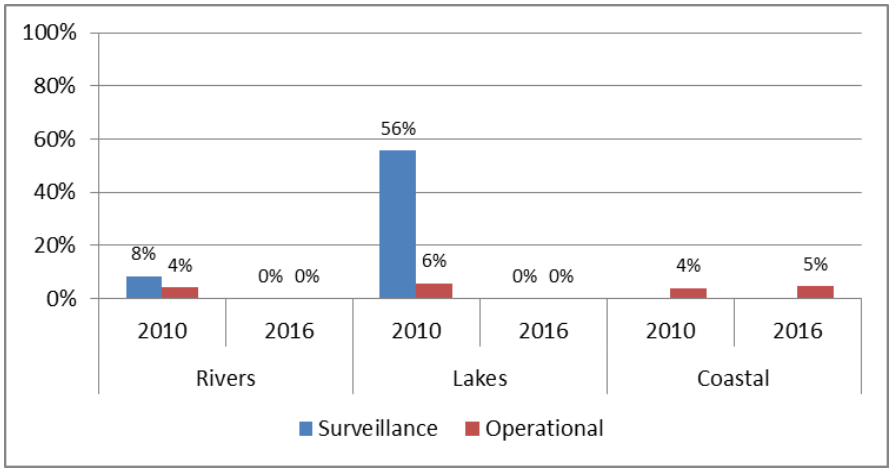
Source: Member States electronic reports to WISE. The values in brackets were not reported to WISE but were subsequently provided by Cyprus.

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes in Cyprus

Monitoring Purpose	**Lakes**	**Rivers**	**Coastal**
CHE - Chemical status	3	46	(3)
ECO - Ecological status	6	87	(24)
OPE - Operational monitoring	(0)	(32)	4
SUR - Surveillance monitoring	(6)	(52)	20
Total sites irrespective of purpose	**6**	**86**	**24**

Source: WISE electronic reports. The values in brackets were subsequently provided by Cyprus.

Figure 3.1 ***Percentage of water bodies included in surveillance and operational monitoring in Cyprus for the first RBMP and second RBMP.***



Source: WISE electronic reports. Note that no differentiation is made between water bodies included in ecological and/or chemical monitoring[17]

Monitoring sites and monitored water bodies used for ecological status/potential

Cyprus only reported monitoring sites in coastal waters for surveillance and operational purposes in the second RBMP. No quality element was reported to be monitored. The lack of data for other water categories in the second RBMP is believed to be a reporting error[18].

There was a reduction in the number of delineated water bodies in all three water categories in Cyprus for the second cycle compared to the first. Furthermore, 15 reservoirs which were reported as lakes in the first RBMP were reported as rivers in the second RBMP, thus making river and lakes water body numbers not directly comparable. This makes direct quantitative comparisons between the first and second RBMPs very difficult.

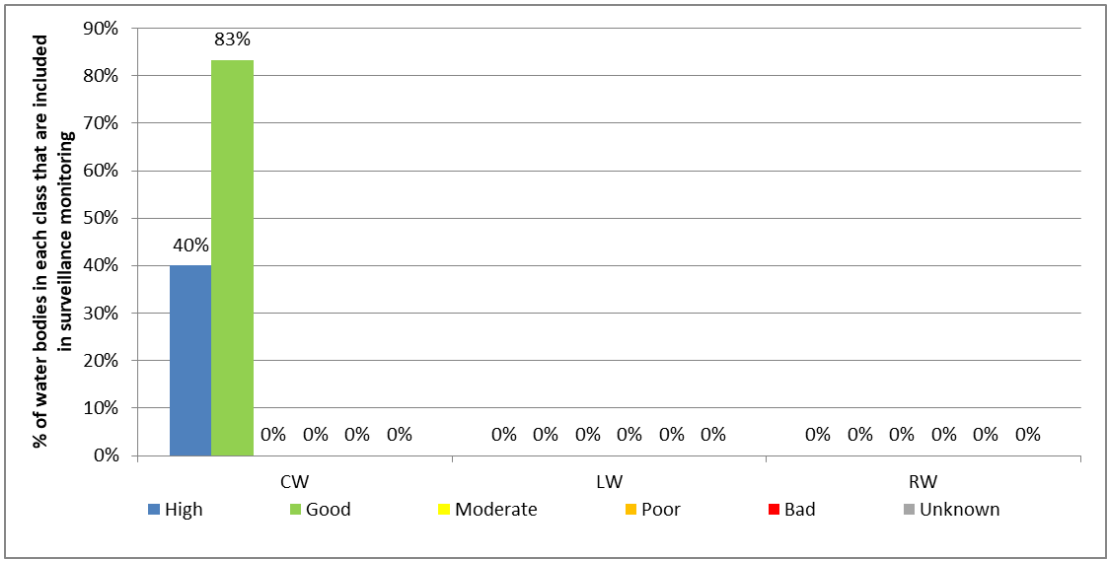
14 (64 %) coastal water bodies were included in surveillance monitoring for the second cycle compared to 7 (27 %) for the first. In terms of operational monitoring, one coastal water body was monitored for both cycles.

Figure 3.2 shows the proportion of water bodies in each ecological status/potential class that are included in surveillance monitoring. Note that surveillance monitoring has only been reported for coastal waters and all coastal waters are reported to be in good or better status.

[17] Cyprus subsequently informed the Commission that the reported information used for this figure was not correct.

[18] Cyprus subsequently indicated that quality elements are monitored in rivers and lakes, but the monitoring is continuous and not related to sites. The results of the monitoring program are presented in the report on the classification of rivers and lakes which has been reported, but this information is not reported in WISE.

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



Source: WISE electronic reports

Quality elements monitored (excluding River Basin Specific Pollutants)

No data were reported to WISE on the quality elements monitored. Cyprus subsequently stated that more quality elements were monitored for the second RBMP compared to the first[19].

River Basin Specific Pollutants and matrices monitored

Eight River Basin Specific Pollutants were reported to be monitored in in Cyprus: six in water and two in fish. All six that were monitored in water were monitored in rivers and lakes, and three of them also in coastal waters. Two pollutants (heptachlor and heptachlor oxide) were monitored in fish in coastal waters.

Boron was monitored in water at the most sites (71), followed by copper (47) and zinc (46).

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements: once every three months is recommended for river basin specific pollutants in water (every year for operational monitoring, and one year per cycle for surveillance monitoring).

As already described, Cyprus reported the purpose of monitoring (surveillance versus operational monitoring) only for sites in coastal waters and not in other water categories. The

[19] Cyprus indicated that the biological quality elements monitored in rivers are benthic invertebrates, phytobenthos and macrophytes. General physicochemical quality elements are also monitored in rivers. Biological quality elements are also monitored in lakes.

three River Basin Specific Pollutants which were monitored in water in coastal waters, both for surveillance and operational monitoring, were all sampled at a greater frequency than the recommended minimum frequency.

River Basin Specific Pollutants in rivers and lakes were reported to be monitored 12 times during one in every four years. This reported frequency meets the recommended minimum frequency for surveillance monitoring but not for operational monitoring.

Annex V, section 1.3.4 of the WFD does not explicitly define the matrices to which the minimum required frequency of monitoring of River Basin Specific Pollutants ("Other Pollutants") applies. Required monitoring frequencies are specified for Priority Substances in biota and sediment in Article 3(2)(c) of EQS Directive: this is once per year for operational and surveillance monitoring purposes. For consistency this required frequency of once per year has been applied to the monitoring of River Basin Specific Pollutants in biota/sediment. Heptachlor and heptachlor epoxide were monitored in fish at six sites in coastal waters 12 times every year in the six year RBMP cycle, which is greater than the minimum recommended monitoring frequency.

Table 3.3 shows the number of sites used to monitor River Basin Specific Pollutants in the second cycle and non-priority specific pollutants and/or other national pollutants in the first cycle.

Table 3.3 Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMP and non-priority specific pollutants and/or other national pollutants reported in the first RBMP in Cyprus. Note the data from both cycles may not be fully comparable as different definitions were used and also not all Member State reported information at the site level meaning that there were no equivalent data in the first RBMP

RBMP		Lakes	Rivers	Coastal
first	Sites used to monitor non-priority specific pollutants and/or other national pollutants	2	18	2
second	Sites used to monitor River Basin Specific Pollutants	1	70	7

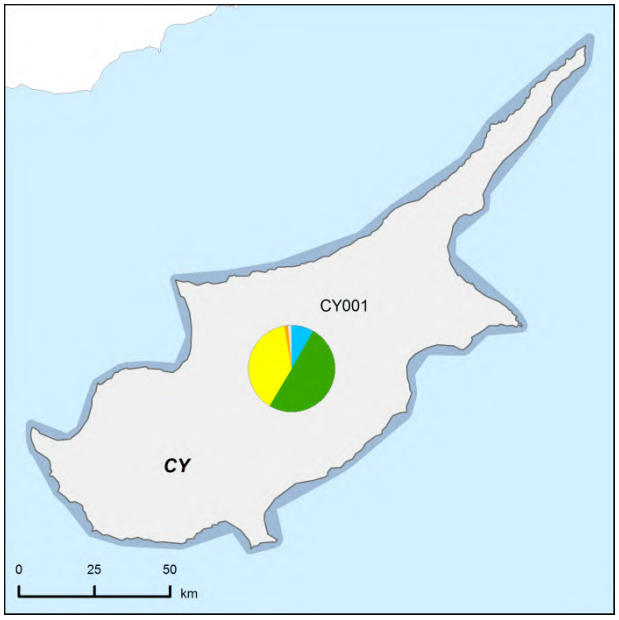
Sources: WISE electronic reports.

3.1.2. Ecological Status/potential of surface water

The ecological status/potential of surface water bodies in Cyprus in the second RBMP is illustrated in the Map 3.1.

Map 3.1 ***Most recently assessed ecological status or potential of surface water bodies in Cyprus.***

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



Source: WISE, Eurostat (country borders)

High
Good
Moderate
Poor
Bad
Unknown
River Basin Districts
Countries outside the European Union

Figure 3.3 shows the confidence in the classification of ecological status/potential. The confidence in classification of ecological status/potential has improved between the two RBMPs from medium/low to high for all coastal water bodies, but has decreased for rivers, in spite of using more quality elements in the second cycle. Lakes are classified with low confidence and classification is only based on phytoplankton.[20] [21]

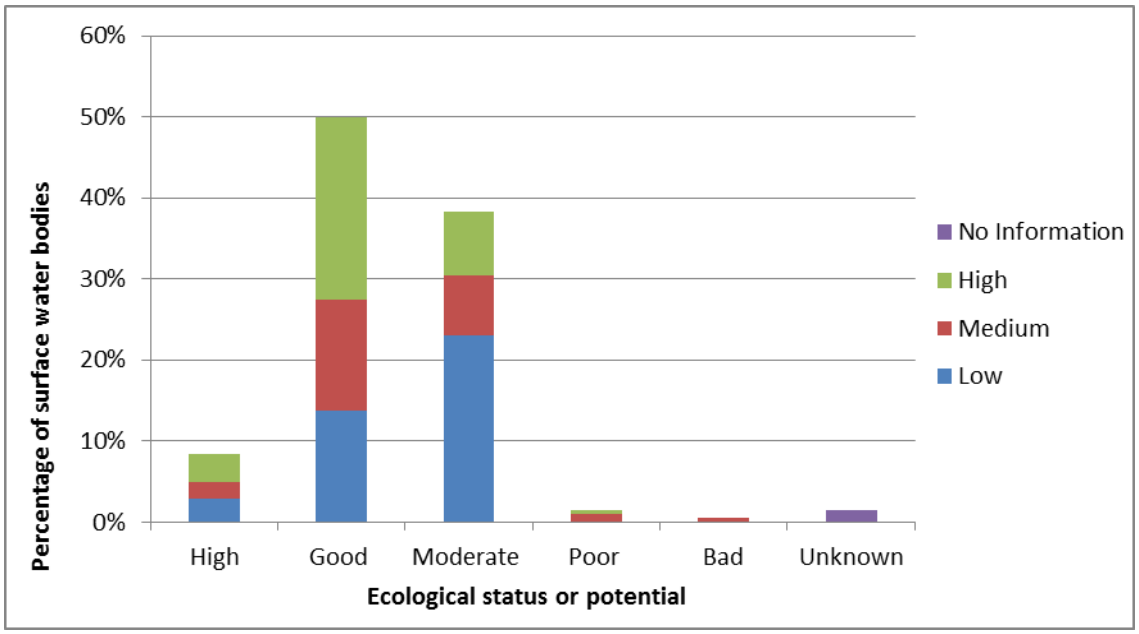
Figure 3.4 compares the ecological status of surface water bodies in Cyprus in the first RBMP with that in the second RBMP and that expected by 2015.

[20] Cyprus subsequently stated that the classification was based on phytoplankton only in one lake (with unknown status), while in the other lake water bodies it was based on expert judgment. This is different from the information reported to WISE.

[21] Cyprus subsequently clarified that there are many differences between first and the second RMBP in the methodology and the assumptions applied for the evaluation of uncertainties. This explains why the confidence of the assessment is reduced in the second RMBP.

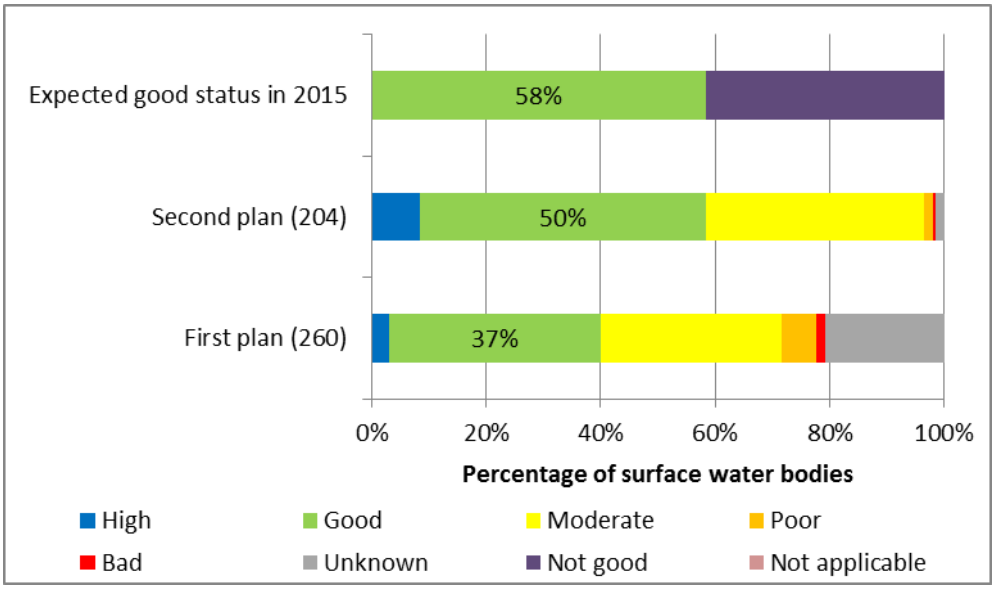
The proportion of surface water bodies in good or better status/potential in the second RBMP was 58 %, compared to 40 % in the first RBMP. The proportion with unknown status/potential significantly decreased from 21 % in the first RBMP to 1 % in the second.

Figure 3.3 Confidence in the classification of ecological status or potential of surface water bodies in Cyprus based on the most recently assessed status/potential



Source: WISE electronic reports

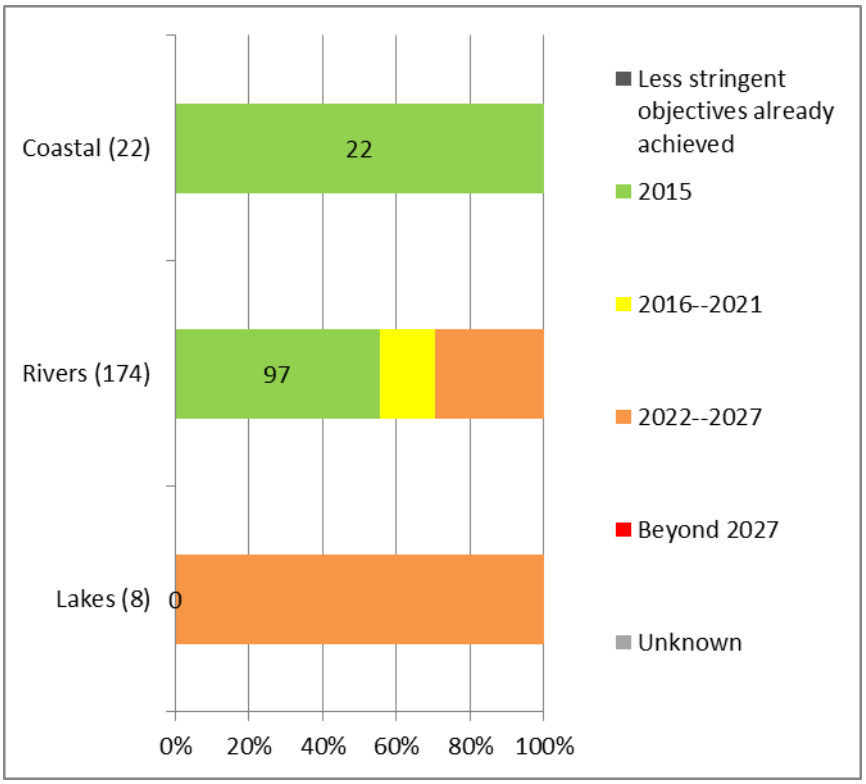
Figure 3.4 ***Ecological status or potential of surface water bodies in Cyprus for the second RBMP, for the first RBMP and expected in 2015. The number in parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2009 to 2013. The year of the assessment of status for first RBMP was 2005 to 2009.***



Source: WISE electronic reports

Member States were asked to report the expected date for the achievement of good ecological status/potential. The information for Cyprus is shown in Figure 3.5.

Figure 3.5 ***Expected date of achievement of good ecological status/potential of surface water bodies in Cyprus. The number in parenthesis is the number of water bodies in each category***



Source: WISE electronic reports

All water bodies have been classified for the second RBMP, except three artificial or heavily modified lakes. All the coastal waters bodies are in good or better status/potential, while all the natural lakes are in moderate status. For natural rivers, more than 60 % are in good or better status, while only 40 % of the heavily modified rivers are in good or better potential. According to the reporting to WISE, three of five natural lakes are classified based on phytoplankton. For the two remaining natural lakes, the basis for classification is unclear (grouping has only been used for rivers).[22]

There was a significant decrease in the number of surface water bodies delineated between the two cycles, from 260 in the first RBMP to 204 in the second.

The proportion of surface water bodies in good or better status/potential in the second RBMP was 58 % compared to 40 % in the first. The proportion with unknown status/potential significantly decreased from 21 % in the first RBMP to 1 % in the second. This decrease mirrored the increase in the proportion of good or better status/potential while the proportion at

[22] Cyprus subsequently stated that of the total of eight lake water bodies, five are in moderate status and three have unknown status. Classification was generally based on expert judgment and phytoplankton monitoring was used in one lake.

less than good remained nearly the same. Because of the significant change in the delineation of water bodies the comparison between the cycles should be treated with caution.

In the Cyprus RBMP there is a comparison of the ecological status/potential of river water bodies (with the exclusion of reservoirs) between the two cycles. The classification is based on length of rivers and indicates that 41 % of the length of river water bodies was good or better in the first RBMP and 54 % in the second. 9 % of river length was of unknown status/potential in the first RBMP and this decreased to zero for the second. No equivalent information was found for lakes and coastal waters.

Classification of ecological status in terms of each classified quality element

The majority of river water bodies are in good or better status/potential for phytobenthos and benthic invertebrates, as well as morphological conditions, oxygenation conditions, salinity and nutrient conditions (but the nutrient standards are very high, so it is relatively easy to obtain good status[23]). In coastal waters, the majority of water bodies are in good or better status for all the biological quality elements.

The classification of many quality elements is reported with "unknown status", "not applicable" or "monitored, but not used" in a large number of water bodies especially in lakes and coastal waters.

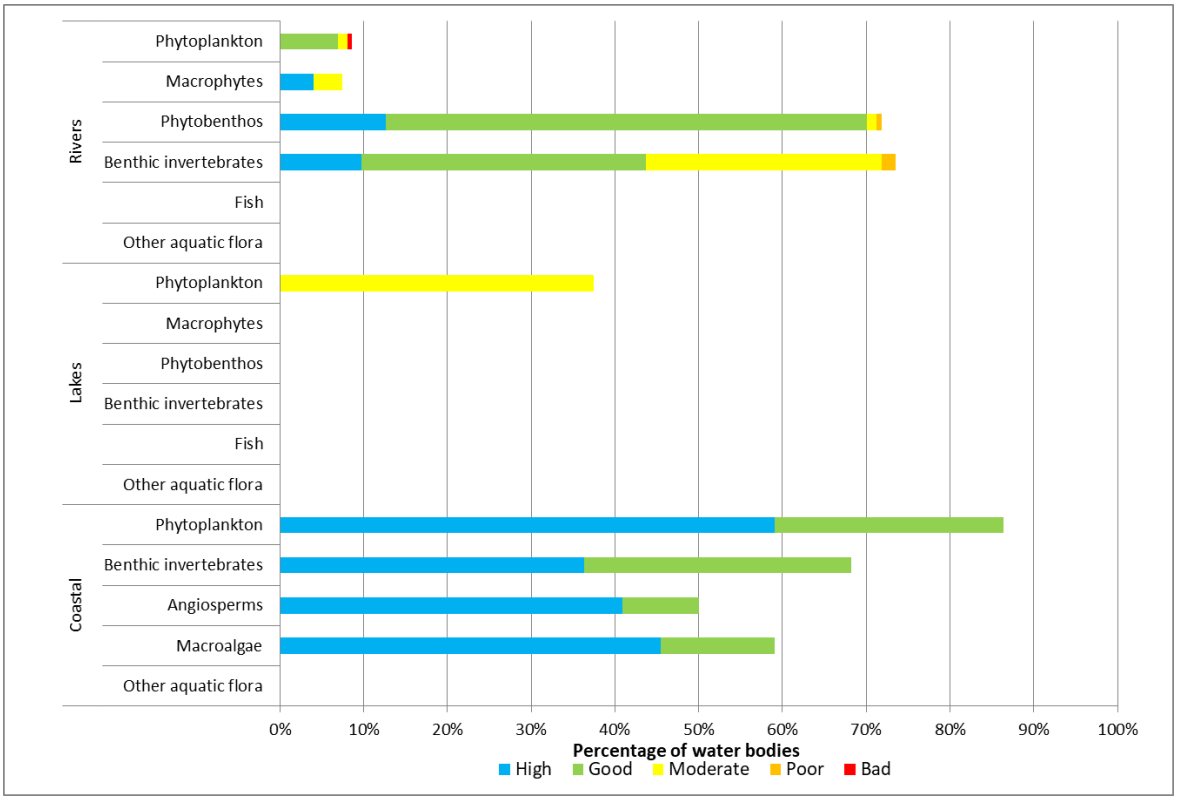
For the second RBMP Cyprus reported to WISE that no information was available and/or it was impossible to compare current status or potential at the quality element level with status or potential in the first RBMP.

Figure 3.6 shows the ecological status/potential of the biological quality elements used in the classification of lakes and rivers.

[23] Cyprus subsequently informed that the assessment method used for the general physicochemical quality elements in the first RBMP was reviewed in order to examine if an adjustment /improvement could be made. The assessment system that was applied for the first RBMP was not based on Cypriot data because in 2009 not enough data was available to adjust it to local conditions. As a significant amount of data became available since 2009, the review and possible adjustment was considered feasible for the purpose of the second RBMP. To this end, the monitoring results for physicochemical parameters were analysed in relation to the corresponding results of the biological quality elements, in order to determine whether the limit values of the physicochemical parameters correspond to the status of the biological quality elements. According to those analyses, it was concluded that the assessment system as applied in the first RBMP seems to be in line with the Cypriot physicochemical data. Therefore, it was decided to continue with the same assessment system for the physicochemical data in the second RBMP. For the third RBMP it is planned to review again the nutrient boundaries using the tools that have been developed within the Common Implementation Strategy Working Group on Ecological Status.

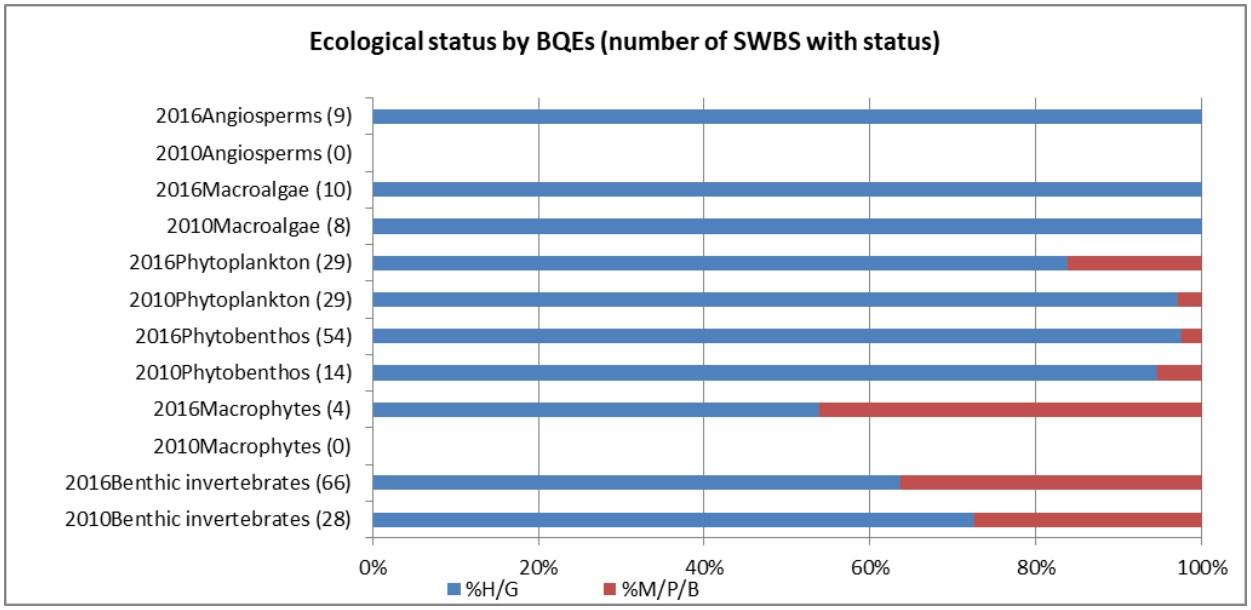
Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the two cycles. It should be noted that this comparison should be treated with some caution as there are differences between the numbers of surface water bodies classified for individual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

Figure 3.6 Ecological status/potential of the biological quality elements used in the classification of surface waters in Cyprus. 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. Cyprus subsequently stated that phytoplankton in rivers refers exclusively to impounded rivers (reservoirs) and not to "normal" Cyprus rivers.

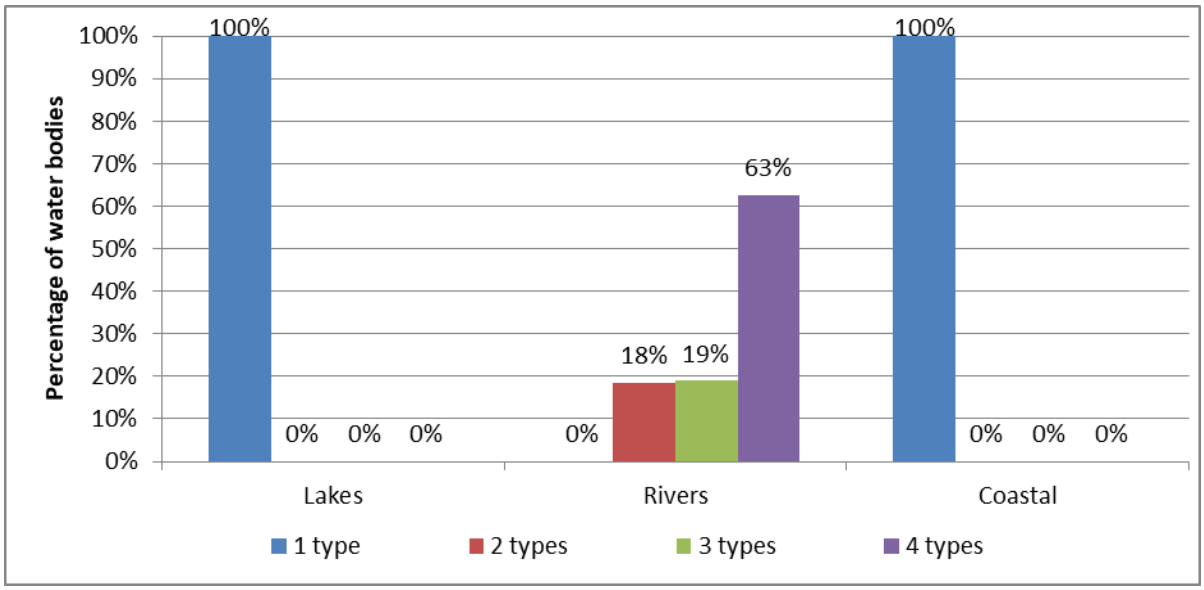
Figure 3.7 Comparison of ecological status/potential in Cyprus according to classified biological quality elements in rivers and lakes between the two cycles



Source: WISE electronic reports

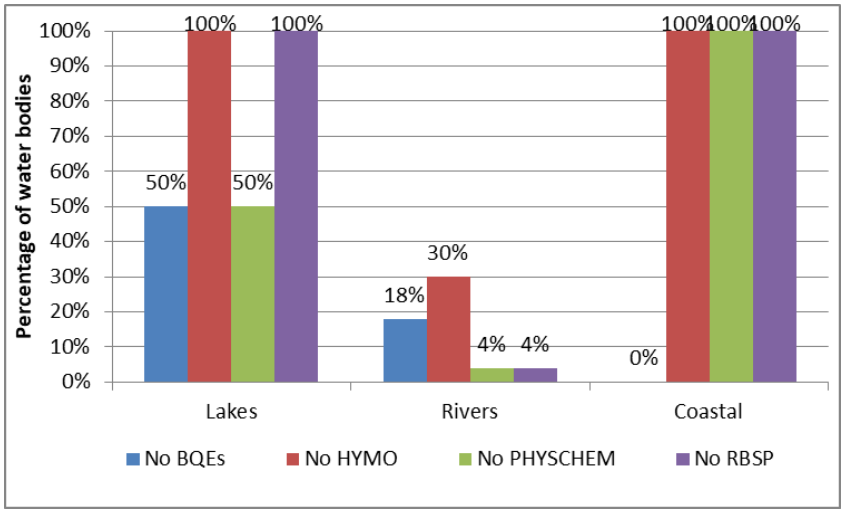
3.8 and Figure 3.9 illustrate the basis of the classification of ecological status/potential of rivers and lakes in Cyprus for the second RBMP.

Figure 3.8 The classification of the ecological status or potential of rivers and lakes in Cyprus using one, two, three or four types of quality element. Note: The four types are: biological; hydromorphological, general physicochemical and River Basin Specific Pollutants



Source: WISE electronic reports

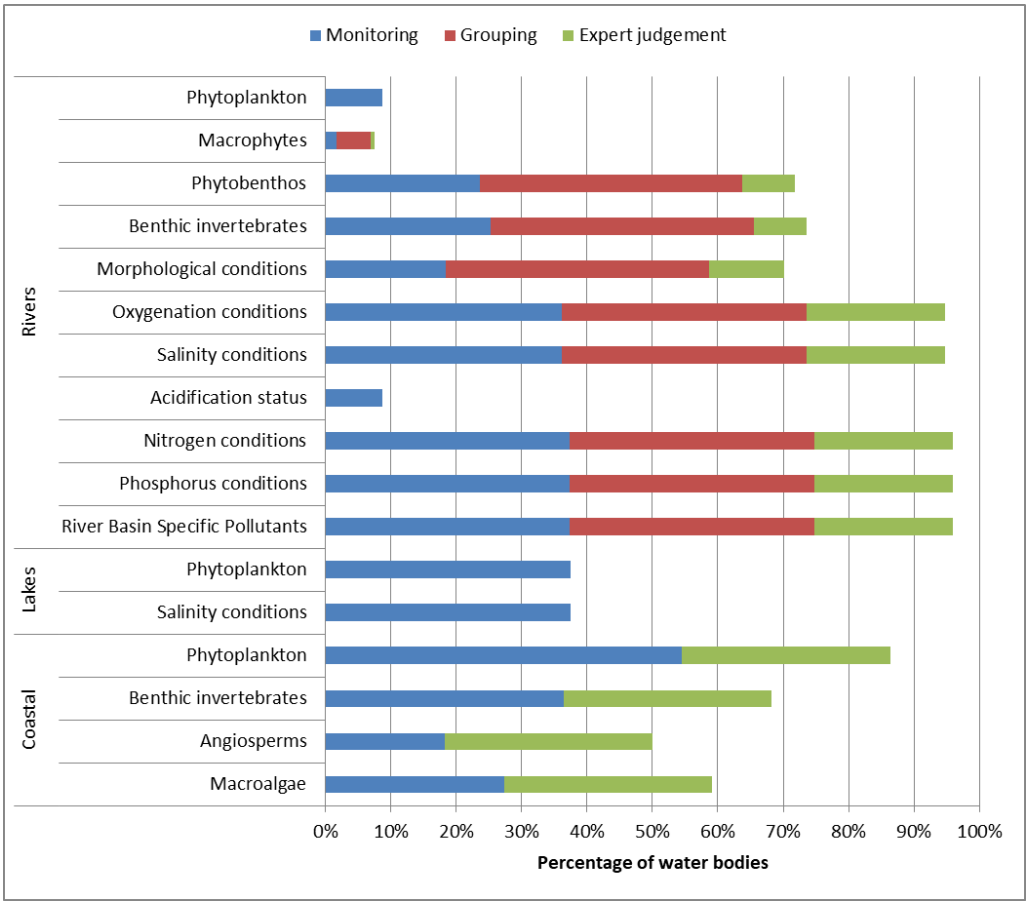
Figure 3.9 ***The percentage of river and lake water bodies in Cyprus where no biological quality element or no hydromorphological (HYMO) or no general physicochemical (PHYSCHEM) or no river basin specific pollutant (RBSP) has been used in the classification of ecological status or potential***



Source: WISE electronic reports

The classification of the individual quality elements is illustrated in Figure 3.10.

Figure 3.10 ***Basis of the classification of ecological status/potential in Cyprus. The percentages are in terms of the number of waterbodies in each category.***



Source: WISE electronic reports

Assessment methods and classification of biological quality elements

More methods for the assessment of biological quality elements have been developed since the first cycle, and now include phytobenthos, macrophytes and phytoplankton[24] in rivers.

No assessment methods for fish in rivers, macrophytes, phytobenthos, benthic invertebrates and fish in lakes, and macroalgae and angiosperms in coastal waters were reported to WISE. However, macroalgae and angiosperms are used for classification: the basis of the classification of these elements that have no assessment method is not clear[25].

Reference conditions were reported not to be available for any biological quality elements in any of the lake types. Previously the Cyprus authorities had indicated that reference conditions

[24] Cyprus subsequently clarified that the assessment method for phytoplankton in rivers refers exclusively to reservoirs that were formed by damming rivers.

[25] Cyprus subsequently clarified that there are assessment methods for macroalgae and angiosperms in coastal waters, which are included in the Intercalibration Decision 2013/480/EU.

for lakes types L1, L2 and L5 would be set. Even though this work would possibly not be finished in time for the second RBMP, it would be used as much as possible. Macrophytes, benthic invertebrates and fish are missing in terms of monitoring, classification and methods. The justification is that many lakes are reservoirs where macrophytes and benthic invertebrates are not applicable due to the large water level fluctuations. However, there are also five natural lakes, where these biological quality elements could potentially be applied[26].

Fish in rivers have not been monitored or classified and there are no assessment methods developed. The justification given previously by Cyprus was that there are no indigenous fish in its freshwaters taking into account historical information on ecology, climate and pressures[27].

The methods are reported to be sensitive to all impacts reported for Cyprus except for saline pollution in lakes and rivers.

Intercalibration of biological assessment methods and national classification systems

All the four coastal water body types and three river water body types are reported to be linked to an intercalibration type.

None of the lake water body types are reported to be linked to an intercalibration type. It is not clear which of the biological quality element methods have been intercalibrated[28].

Assessment methods for hydromorphological quality elements

Assessment methods for hydromorphological quality elements are reported to be only developed for morphological conditions in rivers: the classification boundaries for this element are reported to be related to the class boundaries for the sensitive biological quality elements.

[26] Cyprus subsequently informed that in a project on the establishment of reference conditions in natural lakes all biological quality elements prescribed by the WFD were investigated. During sampling in all three survey periods of the project, fish and macrophytes were absent from these water bodies. There is no suitable substrate for phytobenthos in these lakes, therefore it was not proposed as a biological quality element to be monitored. Macrophytes, although recorded occasionally in the past (their presence seems to depend on specific conditions of salinity, depth and transparency of the water column that occur only rarely) are not proposed as a biological quality element to be monitored because of their sporadic appearance. Benthic macroinvertebrates were recorded in very low abundances (1-2 individuals in each sample) and they are consequently not proposed as a biological quality element to be monitored. The project proposed that phytoplankton and zooplankton be monitored in natural lakes.

[27] Cyprus subsequently noted that there are still scientific uncertainties about the use of fish in rivers in Cyprus. For this reason a specific measure is included in the Programme of Measures for the period 2016 -2021 to further investigate the fish fauna in rivers in Cyprus.

[28] Cyprus subsequently indicated that the lake water bodies of Cyprus are highly diverse in terms of ecological and hydrological characteristics and that this type of lakes is not common in other countries. Efforts were made twice to identify common types amongst Mediterranean countries in the intercalibration exercise, without success, except for reservoirs.

In lakes and coastal waters, no hydromorphological quality elements methods are developed[29].

Assessment methods for general physicochemical quality elements

A number of assessment methods for the physicochemical quality element methods in rivers and lakes have been developed: oxygenation, salinity, acidification, nutrient conditions. The classification boundaries for these elements are reported to be related to the class boundaries for the sensitive biological quality elements.

The quality element methods missing for rivers and lakes are for transparency and thermal conditions. No methods are reported for coastal waters, for which these elements were not used in the classification. Salinity conditions (expressed by electrical conductivity) is the only physicochemical quality element used for classification in lakes.

Standards have been set for nutrients, oxygenation conditions, electrical conductivity and acidification in rivers and lakes. Standards are also reported for coastal waters for all relevant physicochemical quality elements except for transparency, this is in spite of no assessment methods being reported for these elements in coastal waters. All standards in all water categories are said to be related to the good-moderate classification boundary of the relevant sensitive biological quality element except for thermal conditions in coastal waters.

Standards for physicochemical quality elements have the same range of values for all water categories and all types. It is not clear how these have been. The nutrient standards for total phosphorus are higher than the saturation level for nutrient sensitive biological quality elements (0.1 mg/l), but they are still indicated to support good status for these biological quality elements.

Subsequently Cyprus indicated that in both rivers and lakes, transparency and thermal conditions are monitored as complementary quality elements only and they are not used for classification. In most of the natural lakes of Cyprus the thermal conditions have been monitored since 1988 on a monthly basis. This monitoring is continuing and was improved, especially in the last few years by increasing the frequency to weekly. Transparency is not monitored due to technical difficulties. It was found practically impossible to take accurate turbidity measurements in the shallow lakes (usual water depth up to 30-50cm) with muddy bottom. Acidification is not assessed as there is no standard (but pH is regularly monitored as a complementary parameter). In rivers, thermal conditions and transparency (turbidity) are

[29] Cyprus subsequently indicated that in most of the natural lakes of Cyprus hydrological regime has been monitored since 1988 on a monthly basis. This monitoring continued and was improved, especially in the last few years, by increasing frequency to weekly. Morphological conditions have not been described yet, but it is a task that is planned to be done in the future.

monitored on a monthly basis since the first WFD monitoring cycle. Data reported to WISE, including the standards for nutrient conditions, was found to be incorrect.

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

There is no information on how the River Basin Specific Pollutants were selected and how they are used in the overall classification of ecological status (although the one-out, all-out principle was reported to be applied)[30].

River Basin Specific Pollutants are monitored in less than 40% of the river water bodies, and only in one of eight lake water bodies and five of 22 coastal water bodies, but are classified in almost all the rivers using also grouping and expert judgement. River Basin Specific Pollutants are not classified in any lake or coastal water body.

Environmental Quality Standards for six different metals are reported for water. All six were reported to be used in lakes and rivers (although Cyprus subsequently stated only three were applicable in rivers and six in impounded rivers), and four in coastal waters. Only annual average Environmental Quality Standards are listed. The standards have been derived in accordance with the 2011 Technical Guidance Document No 27. The analytical methods are in line with Article 4(1) of Directive 2009/90/EC[31] for all substances.

No environmental quality standards were reported for Heptachlor and Heptachlor epoxide, although they are reported to be monitored as River Basin Specific Pollutants. It is not clear how exceedances are identified for these substances.

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

The one-out-all-out principle is reported to have been used.

3.2. Main changes in implementation and compliance since first RBMP

There was an increase in the number of monitoring sites used for the surveillance and operational monitoring of coastal waters between the two cycles. There has also been an increase in the number of coastal water bodies included in surveillance monitoring between the two cycles: one water body was operationally monitored in both cycles.

[30] Cyprus subsequently informed that the list of River Basin Specific Pollutants has been revised and will be monitored in preparation for the third RBMP. The revision of the list was based on the results of the monitoring programmes and on the type of pressures identified as a result of the pressure and impact assessment for the second RBMP. The new list includes 17 substances (metals, pesticides, and two industrial chemicals).

[31] 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

More biological quality element assessment methods have been developed since the first RBMP and now include river phytobenthos, macrophytes and phytoplankton. Also supporting quality element methods have been developed for morphological conditions in rivers, and a number of physicochemical quality element methods in rivers and lakes: oxygenation, salinity, acidification, nitrogen and phosphorus conditions.

The proportion of surface water bodies in good or better status/potential in the second RBMP was 58 %, compared to 40 % for the first RBMP. The proportion with unknown status/potential significantly decreased, from 21 % in the first RBMP to 1 % in the second.

The confidence in classification changed between the two cycles: For coastal waters, the confidence has improved from medium/low to high for all water bodies, while for rivers the confidence has been reduced from 85 % to 60 % in high/medium. For lakes, the confidence has also been reduced to low for 100 % of the natural lakes (all the classified lakes)[32].

3.3. Progress with Commission recommendations

The Commission recommendations based on the firstRBMP and firstProgramme of Measures requested action on the following:

- Recommendation: *Present in the second RBMPs improved identification of pressures from chemical pollutants on the basis of the inventory of Priority Substances emissions (established since June 2013).*

  Assessment: There is no information on how the River Basin Specific Pollutants were selected. six River Basin Specific Pollutants were reported to be monitored in water in Cyprus: all six were monitored in rivers and lakes, and three in coastal waters. Environmental Quality Standards for six different metals are reported for water. All six are used in lakes and rivers (the Cyprus Authorities subsequently stated that only three were applied in rivers), and four in coastal waters. Only Annual Average Environmental Quality Standards are listed. The technical guidance has been used to set the Environmental Quality Standard values. The analytical methods are in line with Article 4(1) of Directive 2009/90/EC[33] for all substances.

  The recommendation has been partially fulfilled.

[32] Cyprus subsequently clarified that there are many differences between first and the second RMBP in the methodology and the assumptions applied for the evaluation of uncertainties. This explains why the confidence of the assessment is reduced in the second RMBP.

[33] 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

Cyprus subsequently indicated that for the preparation of the second RBMP a special investigation was carried out to identify additional River Basin Specific Pollutants. The investigation was based on the type of pressures identified as result of the review of the pressures and impact conducted for the preparation of the second RBMP and the results of the monitoring programme. An additional 11 River Basin Specific Pollutants (all non-metals) will be used for the classification of the status for the preparation of the third RBMP.

- 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.*

- Recommendation: *Provide a more detailed analysis of pressures and impacts, as well as an improved risk assessment based on the improvement of the monitoring network. The RBMPs should be explicit about the impacts related to each significant pressure and provide quantitative figures on the scale of the pressures that need to be reduced, to reach WFD objectives.*

  Assessment: For coastal waters, the confidence has improved from medium/low to high for all water bodies, while for rivers the confidence has been reduced from 85% to 60% in high/medium. For lakes, the confidence has also been reduced to low for 100% of the natural lakes (all the classified lakes).

  The recommendation has been partially fulfilled (for coastal water bodies).

- Recommendation: *The classification of ecological status and potential should be further developed and completed.*

  Assessment: More biological quality element methods have been developed, in line with this recommendation, in terms of now including river phytobenthos, macrophytes and phytoplankton. Also supporting quality element methods have been developed for morphological conditions in rivers, and a number of physicochemical quality element methods in rivers and lakes: oxygenation, salinity, acidification, nitrogen and phosphorus conditions. All the four coastal water types and three river types are linked to an intercalibration type. The majority of river water bodies are in good or better status for phytobenthos and benthic invertebrates, as well as morphological conditions, oxygenation conditions, salinity and nutrient conditions (but the nutrient standards are very high, so it is relatively easy to obtain good status).

For coastal waters, the confidence in classification improved from medium/low to high for all water bodies. The number of water bodies with unknown ecological status/potential was reduced from 51 to three.

The recommendation has been mostly fulfilled.

- Recommendation: *Efforts should be made to improve the quality of monitoring.*

  Assessment: Cyprus only reported monitoring sites in coastal waters for surveillance and operational purposes in the second RBMP. No quality element was reported to be monitored and only chemical substances (River Basin Specific Pollutants and Priority Substances) were associated with monitoring sites. This lack of data in the second RBMP is believed to be a reporting error.[34]

  Therefore there is not enough information on progress regarding this recommendation.

[34] Cyprus subsequently indicated that quality elements are monitored in rivers and lakes, the monitoring is continuous and not related to sites. The results of the monitoring program are presented in the report on the classification of rivers and lakes which has been reported, but this information is not reported in WISE.

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

4.1. Assessment of implementation and compliance with WFD requirements in 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 EQS Directive, 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 waterbodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such waterbodies resulting from the programme of measures.

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

Figure 4.1 summarises the proportion of sites used for the monitoring of chemical status in lakes, rivers and coastal waters (territorial waters are not delineated or monitored for chemical status in Cyprus) as reported in 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[35].

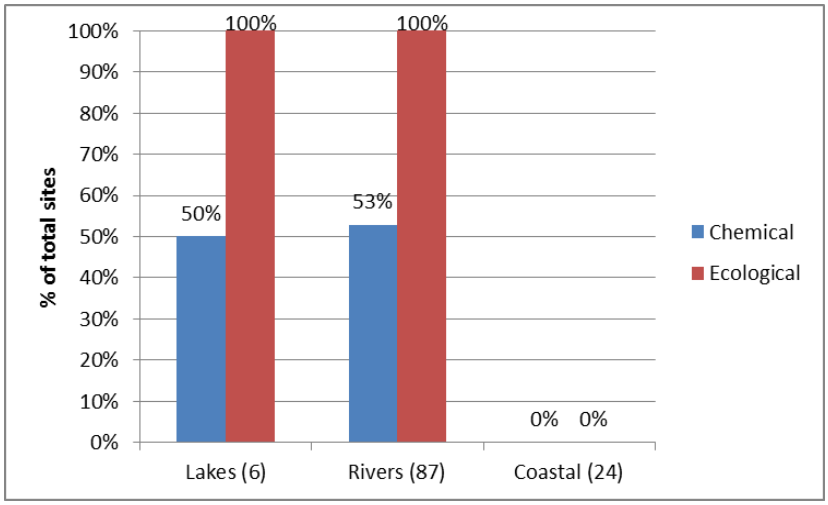
For rivers and lakes, around half of all monitoring sites are used for monitoring chemical status (all sites are used for monitoring ecological status). Cyprus subsequently informed that eight monitoring sites (33 %) are monitored for chemical status in coastal waters (no information for coastal waters could be found in WISE).

Figure 4.2 summarises the proportion of water bodies monitored for chemical status in lakes, rivers and coastal waters as reported in the second RBMP. In this figure no distinction is made

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

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 174 river water bodies and 38 % of eight lakes are monitored for chemical status. No information was available in WISE for coastal waters. Cyrus subsequently informed that seven coastal water bodies (about 29 %) are monitored for chemical status.

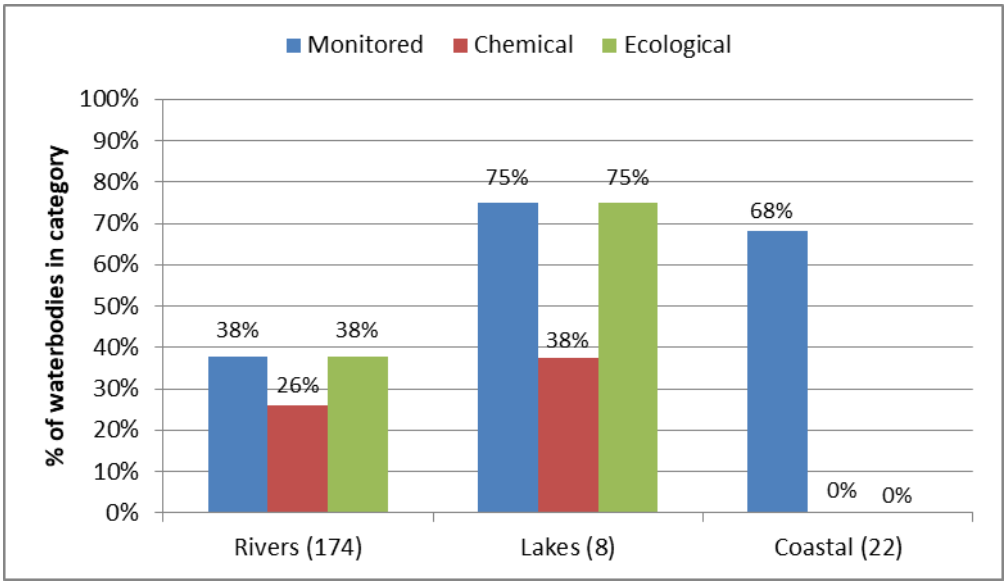
Figure 4.1 ***Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Cyprus. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose. The figure is based on the information found in WISE.***



Source: WISE electronic reporting

Cyprus informed that eight (33 %) monitoring sites are monitored for chemical status and 22 (98%) for ecological status in coastal waters

Figure 4.2 ***Proportion of total water bodies in each category monitored, monitored for chemical status and, for comparison, monitored for ecological status, in Cyprus. The number in parenthesis next to the category is the total number of water bodies in that category. The figure is based on the information found in WISE***



Source: WISE electronic reporting

Cyrus informed that seven (32 %) coastal water bodies are monitored for chemical status and 15 (68 %) for ecological status

86 % of river water bodies that are failing to achieve good chemical status are subject to operational monitoring in Cyprus. No lakes or coastal water bodies are classified as failing to achieve good status.

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

39 Priority Substances and groups of Priority Substances are monitored in water for status assessment at 26, 38 and 32 % of river, lake and coastal water bodies represented by a total of 46, three and eight chemical monitoring sites respectively.

The RBMP states that for rivers, the Priority Substances monitored have been selected on the basis of a specific 2012 study regarding the preparation of an inventory of emissions, discharge and losses of priority and priority hazardous substances.

According to WISE, mercury and hexachlorobenzene, but not hexachlorobutadiene, were monitored in biota in coastal waters for status assessment. Cyprus subsequently clarified that hexachlorobutadiene was actually also monitored in biota in coastal waters for status assessment. The following substances were also monitored in biota: DDT-p,p', hexachlorocyclohexane, lead, mercury and cadmium. The number of sites monitored for biota in Cyprus as a whole was two for each of the Priority Substances monitored. Cyprus informed that there was no monitoring of biota in surface freshwaters as no suitable biota species has yet been identified. Mercury, hexachlorobenzene and hexachlorobutadiene are reported to be monitored in water in freshwaters (although there is no further information available as to whether the standards used are as least as protective as the biota standard).

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.

Intra-annual monitoring frequencies of twelve times per year are reported in WISE for 39 Priority Substances and groups of Priority Substances in water. According to this source of information, monitoring is undertaken every year in coastal waters and once every four years in river and lake water bodies. The monitoring frequencies are therefore consistent with the recommended minimum frequencies for surveillance monitoring but not for operational monitoring in rivers and lakes. Monitoring of biota for status assessment in coastal water

bodies was also reported as being 12 times every year which meets the recommended minimum frequencies of the Directive.

Cyprus however subsequently clarified that water monitoring for rivers is carried out five or six times per year over a minimum of two years in the six- year cycle, to reach a number of 10 to 12 samples per cycle. Water monitoring for impounded rivers (water reservoirs) is performed four to six times per year over a minimum of two years in the six-year cycle. However for reservoirs used for domestic water supply (i.e. the majority of reservoirs), the water monitoring frequency is four to six times per year each year in the six- year cycle. Cyprus mentioned that monitoring five or six times during a given year allows to have a monthly monitoring frequency during the period when temporary rivers flow, and during the period of high river flows for perennial rivers. It is not entirely clear whether these monitoring frequencies apply to both operational and surveillance monitoring, or only to surveillance monitoring.

Cyprus also clarified that the monitoring frequency in biota is once per year every year.

Monitoring for long-term trend assessment

Requirements

Article 3.6 of Directive 2013/39/EU (amending Article 3.3 of Directive 2008/105/EC) states that "Member States shall arrange for the long-term trend analysis of concentrations of those priority substances listed in Part A of Annex I that tend to accumulate in sediment and/or biota, giving particular consideration to the substances numbered 2, 5, 6, 7, 12, 15, 16, 17, 18, 20, 21, 26, 28, 30, 34, 35, 36, 37, 43 and 44[36] listed in Part A of Annex I, on the basis of the monitoring of surface water status carried out in accordance with Article 8 of Directive 2000/60/EC. Substances numbered 34, 35, 36, 37, 43 and 44 are new Priority Substances and as such information on trends for them would not be expected to be reported in the second RBMPs. There are therefore 14 Priority Substances for which monitoring for long-term trends is expected.

Spatial coverage and frequencies

No monitoring for long-term trend assessment was reported.

[36] (2) Anthracene, (5) Brominated diphenylether, (6) cadmium, (7) C10-13 chloroalkanes, (12) DEHP, (15) fluoranthene, (16) hexachlorobenzene, (17) hexabutadiene, (18) hexachlorocyclohexane, (20) lead, (21) mercury, (26) pentachlorobenzene, (28) PAH, (30) Tributyltin, (34) Difocol, (35) PFOS, (36) quinoxyfen, (37) dioxins, (43) hexabromocyclodecane and (44) heptachlor.

Cyprus subsequently clarified that no Priority Substance was monitored in sediment until 2013. However, since 2013, the 14 substances mentioned above are monitored in river sediments (mainly in impounded rivers/water reservoirs, but also in few natural rivers), and this monitoring will be reported in the third RBMP[37].

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 Cyprus, all 41 Priority Substances and groups of Priority Substances were included in an inventory and 7 are reported to be discharged (trifluralin, chlorpyrifos, lead, mercury, nickel, cadmium and alachlor). 39 of these 41 Priority Substances, including all of those discharged, are monitored; octylphenol and brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154) were not monitored. Cyprus have since clarified that both Octylphenol and brominated diphenylethers have been monitored since 2016 and that data will be available in the next round of reporting for the third RBMP. Lack of monitoring prior to 2016 was a result of technical problems.

Performance of analytical methods used

In Cyprus, reporting to WISE indicates that for all 41 Priority Substances the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of Directive

[37] Cyrpus also mentioned that since 2015, these substances are monitored in sediment in natural lake, for trend assessment purposes.

2009/90/EC[38] for the strictest standard applied. However, two Priority Substances have not been reported as monitored in WISE. Based on Cyprus' clarification above, it might be that the performances reported here refer to the analytical methods used in 2016 for these two substances.

The method for dealing with measurements of Priority Substances lower than the limit of quantification was as required in Article 5 of Directive 2009/90/EC about the 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. In Cyprus the chemical assessments were carried out based on data from 2009 to 2013[39].

The chemical status of surface water bodies in Cyprus for the second RBMP is illustrated in Map 4.1. This is based on the most recent assessment of status. Overall between the two cycles there was an increase in the proportion of surface water bodies with good chemical status from 74 to 85% and a small decrease in the proportion that fail to achieve good chemical status from 5 to 3%. The proportion with unknown status has reduced from 21 % to 12 %. Classification of water bodies that were not monitored was carried out by grouping and the use of expert judgement. The RBMP provided a detailed approach to grouping comprising:

- Water bodies that are upstream a water body with "Good chemical status", then their status is set as well as "Good" on the assumption that if there was a source of Priority Substances upstream of the monitoring station, this would have shown in the monitoring results.

- Water bodies that are downstream of a water body with "Failing to achieve good status" status, are also set to "Failing to achieve good status". This rule was applied downstream up to:

[38] 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

[39] Cyprus mentioned that more details are available in the document entitled Classification_Rivers_lakes_CY_2014.pdf, which has been reported to WISE.

- a dam that overflows only very rarely; and,
- a water body with a monitoring station with good chemical status.

- Water bodies in assessment groups of negligible or minor pressures (resulting from the grouping applied) were assigned Good Chemical Status only after evaluating point pressures such as mines, industrial facilities and industrial areas.

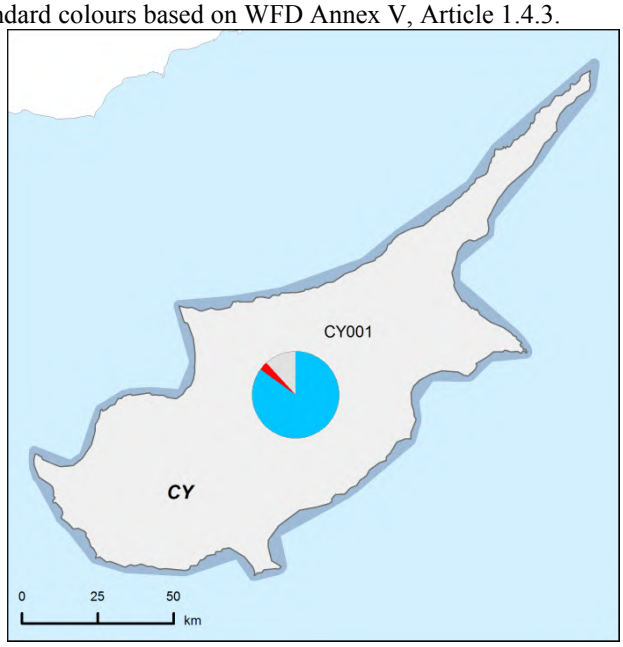
- On a case by case basis, water bodies that belong in groups with important pressures, were assigned Good Chemical Status only after evaluating pressures such as mines, industrial facilities and industrial areas and significant urban areas.

- Water bodies that could not be assigned a status according to the above criteria were assigned Unknown Chemical Status.

Cyprus confirmed that the one-out-all-out principle is applied in the assessment of chemical status.

Map 4.1 ***Chemical status of surface water bodies in Cyprus 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

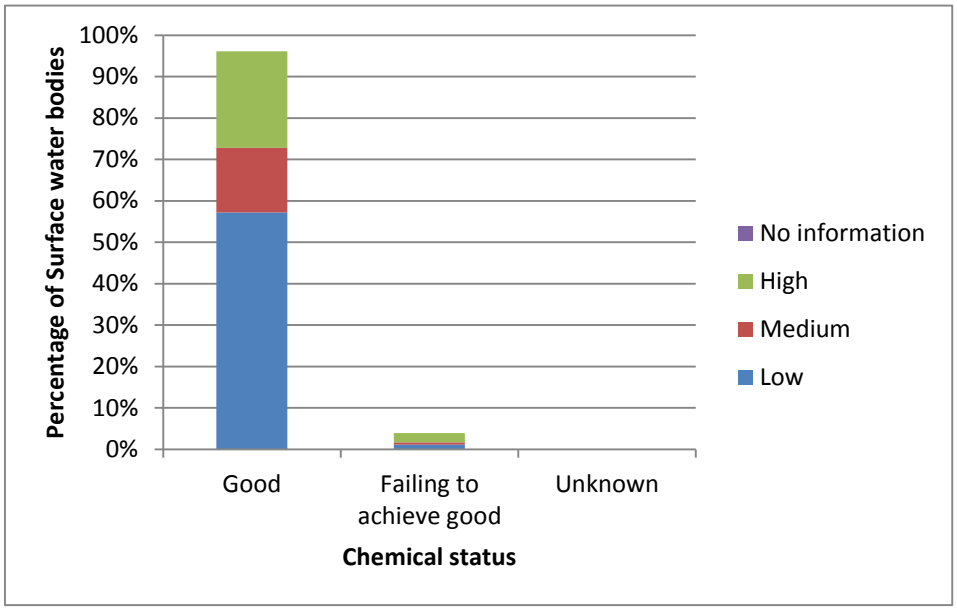
The chemical status of lakes, rivers and coastal waters in Cyprus for the first and second RBMPs is given in Table 4.1.

Table 4.1 ***Chemical status of surface water bodies in Cyprus 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						
Lakes (8)	1	13%			7	88%
Rivers (174)	150	86%	7	4%	17	10%
Coastal (22)	22	100				
Total (204)	173	85%	7	3%	24	12%
First RBMP						
Lakes (18)	13	72%	3	17%	2	11%
Rivers (216)	154	71.00%	9	4.00%	53	24%
Coastal (26)	26	100.00%				
Total (260)	193	74%	12	5%	55	21%

Figure 4.3 shows the confidence in the classification of chemical status for the second RBMP. Overall, 26 % of surface water bodies in Cyprus were classified for chemical status with high confidence, 16 % with medium confidence and 58 % with low confidence. Confidence in the classification of chemical status for the first RBMP was not reported.

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



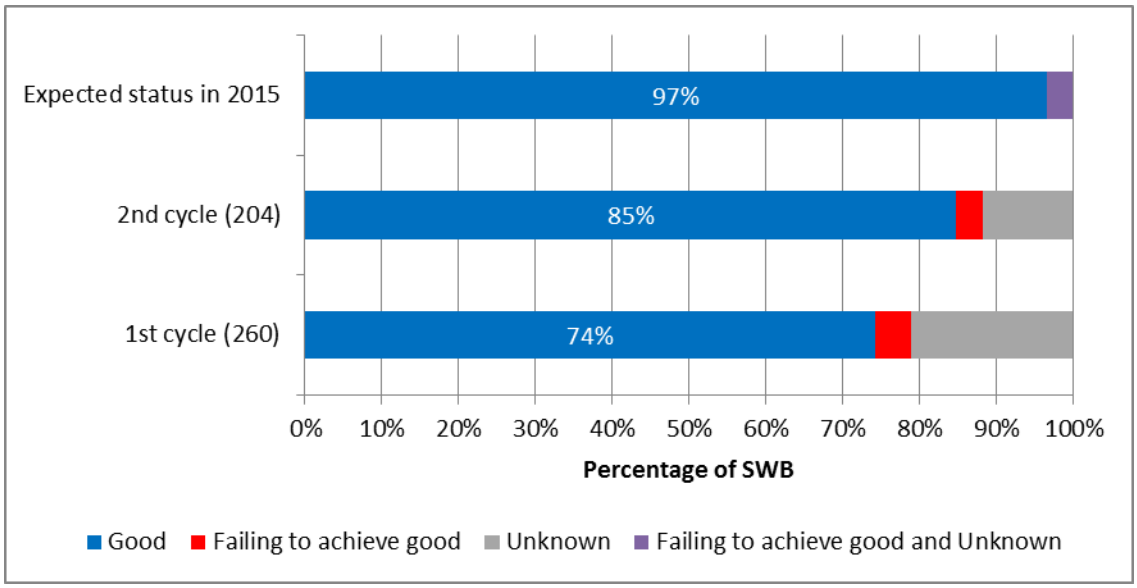
Source: WISE electronic reporting

Figure 4.4 compares the chemical status of surface water bodies in Cyprus for the first RBMP with that for the second RBMP (based on the most recent assessment of status) and that expected by 2015. Figure 4.4 illustrates that the level of good chemical status reported in the second RBMP is lower than the one expected in 2015 (85 % compared to 97 %).

The assessment of chemical status for the second RBMP was expected to be based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009[40]). 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.

[40] It is to be noted that following Directive 2013/39/EU, which amended the Environmental Quality Standards Directive, introduced a less stringent annual average environmental quality standard for naphthalene in transitional 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 Cyprus 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 RBMP was 2009 to 2013. The year of the assessment of status for 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[41].

Directive 2013/39/EU amended the EQS Directive. In particular, it sets more stringent environmental quality standards for seven substances[42]. Member States were required to indicate if the new standard caused the status of the surface water body to appear to deteriorate. Cyprus reported that no surface water bodies appeared to deteriorate as a result of this change.

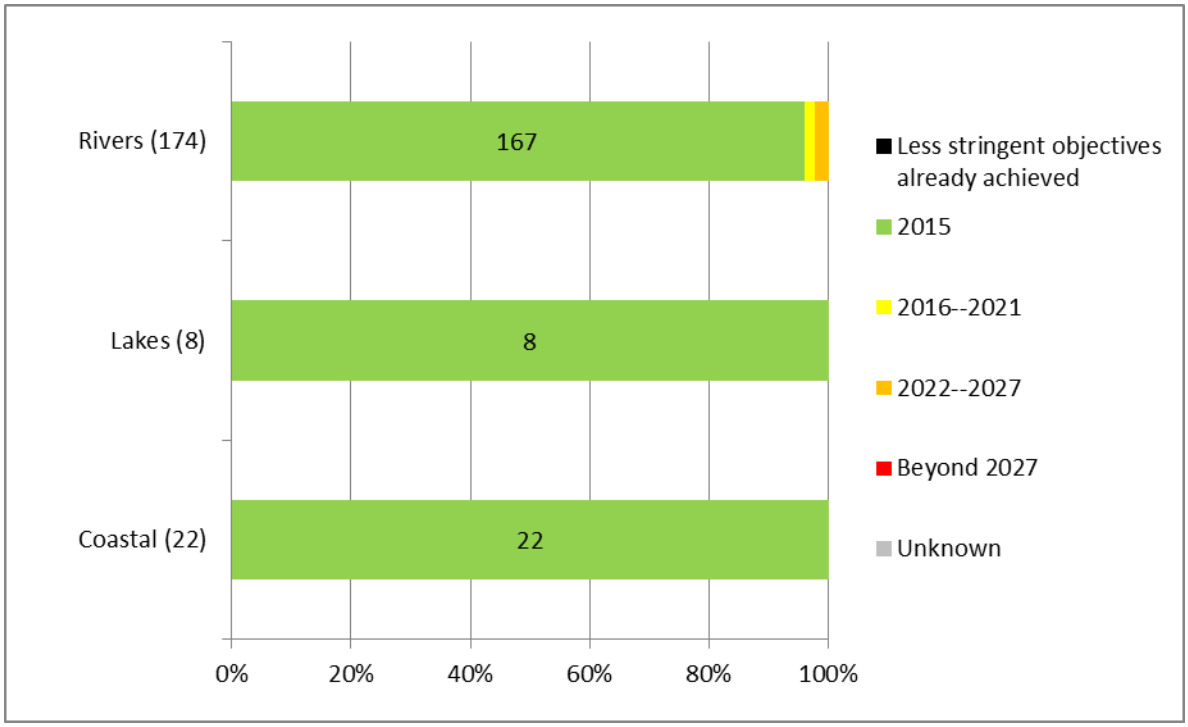
Good chemical status should be reached by 2021 in relation to the revised environmental quality standards, unless Member States apply exemptions under WFD Article 4(4) or less stringent objectives under WFD Article 4(5).

Member States were asked to report the expected date for the achievement of good chemical status. The information for Cyprus is shown in Figure 4.5; good chemical status is expected to be achieved by the end of the third planning cycle in all water bodies in Cyprus. No data was available on the expected achievement date of good status in first RBMPs.

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

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

Figure 4.5 ***Expected date of achievement of good chemical of surface water bodies in Cyprus. 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

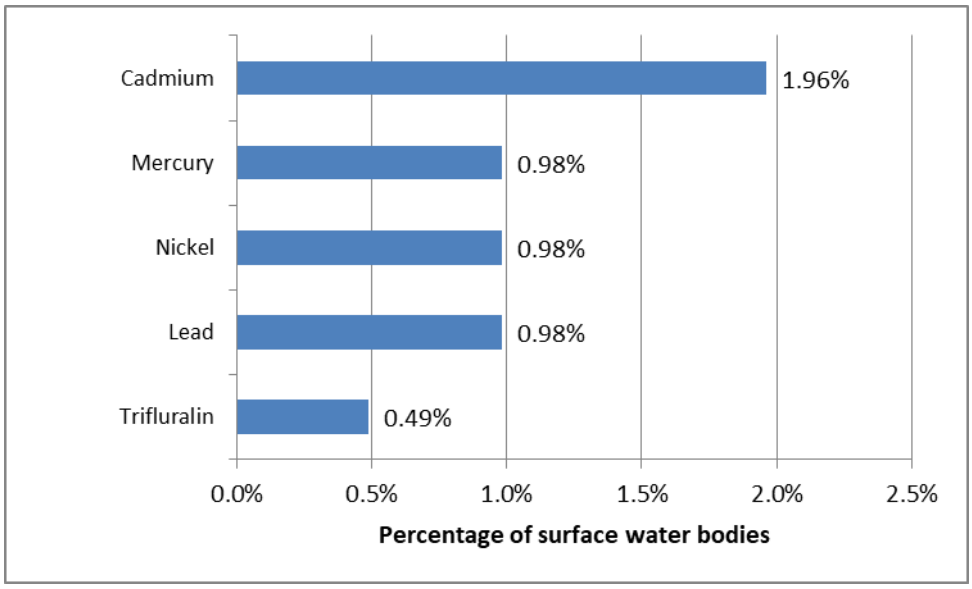
Member States were expected to report exceedances based on the revised, more stringent Environmental Quality Standards from Directive 2013/39/EU. For Cyprus, no change in status is expected because of these standards, compared to the initial standards.

The substances causing the greatest proportion of water bodies to fail good chemical status in surface water bodies were cadmium, lead, mercury, nickel and trifluralin (Figure 4.6).

The largest proportion of exceedances were for the annual average environmental quality standard for cadmium (2.3 % of water bodies failing), nickel (1.15 %) and lead (1.15 %). In terms of exceedance of both the annual average-environmental quality standard and the maximum allowable concentration-environmental quality standard standards, the largest proportion was for mercury (1.15 %).

Six Priority Substances were reported to have resulted in the improvement of the status of water bodies from failing to achieve good chemical status to good chemical status since the first RBMP; including cadmium (2.3 %), lead (2.3 %) and nickel (1.7 %).

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



Source: WISE electronic reporting

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to Article 8(a) of the EQS Directive[43], eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulative and toxic substances[44]. 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. There were two river water bodies in Cyprus where one ubiquitous persistent, bioaccumulative and toxic Priority Substance (mercury) exceeded its Environmental Quality Standard in water bodies. Other Priority Substance also exceeded their environmental quality standards in these water bodies.

[43] Amended by Directive 2013/39/EU.
[44] Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, dioxins, hexabromocyclodecane and heptachlor

However, the full extent of the influence of these substances is not known because about a quarter of surface water bodies are monitored for chemical status in each water category (26, 38 and 32 % for rivers, lakes and coastal waters respectively) with the remainder classified on the basis of expert judgement. Furthermore, 12 % of surface water bodies have unknown status and monitoring of biota for status assessment appears to be very limited.

Related information is also available in the 2018 State of Water report of the European Environment Agency[45].

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

Cyprus reported in WISE that 39 of 41 Priority Substances are both monitored and used in the assessment of chemical status. Octylphenol and brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154) are not monitored and not used in the assessment.

The RBMP indicates that seven Priority Substances (brominated diphenylether, octylphenol, C10-13 chloroalkanes, pentachlorobenzene, pentachlorophenol, nonylphenol, tributyltin compounds have not been monitored in surface freshwaters. Cyprus subsequently clarified that all of these, with the exception of tributyltin, have been monitored from 2016 and the results will be reported in the next RBMP.

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.

Cyprus reported that all of the environmental quality standards laid down in Part A of Annex I of the Directive 2008/105/EC had been applied for the 41 Priority Substances and that alternative and/or additional standards for particular Priority Substances had not been applied. However, two Priority Substances (octylphenols and brominated diphenylethers) have not been monitored or used in the assessment of chemical status.

Use of mixing zones

Article 4 of Directive 2008/105/EC[13] provides Member States with the option of designating mixing zones adjacent to points of discharge. Concentrations of substances may exceed the

[45] https://www.eea.europa.eu/publications/state-of-water (p40-41 of the report).

relevant EQS within such mixing zones if they do not affect the compliance 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 in Cyprus.

Background Concentrations and Bioavailability

EC Directives 2008/105/EU and 2013/39/EU stipulate that Member States may (i.e. treat as optional), when assessing the monitoring results against the environmental quality standards, take into account:

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

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

No information was provided as to whether natural background concentrations for metals and their compounds were taken into consideration where such concentrations prevent compliance with the relevant environmental quality standards. Cyprus subsequently informed that natural background conditions are not relevant for their river water bodies. Those failing to achieve good chemical status are affected by historic mining operations.

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

4.2. Main changes in implementation and compliance since first cycle

The monitoring programme has been modified and updated since the first RBMP. This has been informed by further studies and investigations including a specific contract referenced within the RBMP (a Department of Environment project entitled: *Preparation of an Inventory of Emissions, Discharges and Losses of Priority and Priority Hazardous Substances*). Informed by the results of this contract, updates of the monitoring program for Priority Substances have been made, to make it more targeted and informative. Data now available through previous years' monitoring, allow more focused monitoring for the assessment of chemical status. Furthermore, some substances that are not considered to be relevant in Cyprus RBD (according to the above mentioned project) have been taken out the monitoring program, with increased focus on those Priority Substances found to be more relevant. Additional water

bodies are being assessed for their chemical status to reduce the percentage of water bodies with unknown chemical status.

There has been a re-delineation of water bodies between the two RBMPs and therefore a strict comparison of status between the two RBMPs should be treated with some caution. Overall the number of surface water bodies has decreased from 260 in the first RBMP to 204 in the second RBMP. Between the two RBMPs there was an increase in the proportion of surface water bodies with good chemical status from 74 % to 85 % and a small decrease in the proportion that fail to achieve good chemical status from 5 % to 3 %. The proportion of surface water bodies with unknown status has reduced from 21 % to 12 %.

Six Priority Substances are reported to have improved from failing to achieve good chemical status to good chemical status since the first RBMP with water bodies showing improvements in particular in terms cadmium, lead and nickel; each in approximately 2 % of water bodies.

4.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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.*

  Assessment: This recommendation applies to a number of topics. In terms of uncertainties in the assessment of status, 68 % of coastal water bodies and 64 % of river water bodies were classified by expert judgement and a high number of water bodies being classified with low confidence; 58 % overall. 12 % of surface water bodies have been assigned unknown status. Also two substances are neither monitored nor used in the status assessment. This implies that there is still likely to be a high level of uncertainty in the classification of status.

  Also, territorial waters are not monitored, and consequently their status is not assessed.

  In terms of the assessment of pressures on surface water bodies failing to achieve good status affected only river water bodies in Cyprus, with the pressures reported most frequently being “Diffuse – Agricultural” and “Diffuse – Other”. Significant pressures are considered as part of the application of the expert judgement approach adopted in

Cyprus; good chemical status is assigned to unmonitored water bodies in either the absence, or presence of minor, point and diffuse source pressures.

As stated in Section 4.2, the monitoring programme has been modified and updated since the first RBMP. This has been informed by further studies and investigations including a specific contract referenced within the RBMP (a Department of Environment project entitled: Preparation of an Inventory of Emissions, Discharges and Losses of Priority and Priority Hazardous Substances). Informed by the results of this contract, updates of the monitoring program for Priority Substances have been made, to make it more targeted and informative and to reduce uncertainty.

Some progress has therefore been made towards addressing this recommendation. However it is partially fulfilled.

- Recommendation: *Where it helps to achieve the necessary analytical sensitivity, Priority Substances whose concentrations are difficult to measure in water should where possible be monitored in sediment or biota so that they can be included in the chemical status assessment. The trend monitoring already being carried out in one or other of these matrices needs to cover at least the substances in Directive 2008/105/EC Article 3(3).*

  Assessment: With regards to status assessment, Cyprus clarified that mercury hexachlorobenzene (and hexachlorobutadiene) have been monitored in biota in coastal waters. In general, in Cyprus' inland waters no suitable biota species for monitoring of Priority Substances have been identified to date. DDT p,p', hexachlorocyclohexane, lead, and cadmium have also been monitored in biota. Biota monitoring was performed at two monitoring sites. Cyprus clarified that monitoring was performed once every year, which is in accordance with the minimum recommended frequency from the Directive.

  With regards to long-term trend assessment, arrangements are not in place for the long-term trend analysis of concentrations of the required Priority substances in sediment and/or biota. Further information was provided by Cyprus stating that no Priority Substances were monitored in sediment for any water body until 2013 and the results were not used for the second RBMP. Cyprus state that since 2013 the substances referred in Directive 2008/105/EC for long term trend analysis have been monitored in river sediments (mainly in impounded rivers/water reservoirs, but also in few natural rivers).

Some progress in implementing this recommendation has therefore been demonstrated, and it is partially fulfilled.

- Recommendation: *Efforts should be made to improve the quality of monitoring.*

  Assessment: Around a quarter of all rivers and a third of lakes and coastal waters are monitored for chemical status. All Priority Substances have been included in the monitoring programme with the exception of octylphenol and brominated diphenylethers. In surface freshwaters, C10-13 chloroalkanes, pentachlorobenzene, pentachlorophenol, nonylphenol and tributyltin compounds have also not been monitored.

  The water monitoring frequencies applied by Cyprus are described in details in the corresponding section above. There is some unclarity on whether these frequencies apply for both operational and surveillance monitoring. These frequencies are below the minimum recommended frequency for operational monitoring and no explanation could be found for these reduced frequencies. Cyprus also stated that 5 monitoring results over the six year cycle gives a sufficient view of the situation for surveillance monitoring, but no detail was provided as to why this was sufficient (compared to the monthly frequency one year per cycle for surveillance monitoring).

  For coastal water bodies, monitoring frequencies of twelve times per year every year are reported for 39 Priority Substances at the site level. This is undertaken every year in coastal waters and one year every four years in river and lake water bodies. The monitoring frequencies are therefore consistent with the recommended minimum frequency for surveillance monitoring but not for operational monitoring in rivers and lakes.

  Monitoring of biota for status assessment in coastal water bodies was also reported at a low number of sites, at the recommended minimum frequency. Cyprus indicates that octylphenol and brominated diphenylethers are being monitored since 2016 and will be included in the assessment of chemical status for the third RBMP. The analytical methods were also reported to comply with article 4(1) of the Directive 90/2009/EC.

  Progress in implementing this recommendation has therefore been shown. It is partially fulfilled.

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

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

5.1.1. Monitoring of quantitative status in groundwater

The total number of groundwater bodies in Cyprus is 22. One GWB is in the areas of Cyprus in which the Government of the Republic of Cyprus does not have effective control. This GWB is not included in the RBMP and therefore is not covered by the following assessment[46]. All 21 groundwater bodies (Table 5.2) that are in areas in which the Government of the Republic of Cyprus does exercise effective control are subject to monitoring for quantitative status (Table 5.1).

The number of groundwater bodies in areas in which the Government of the Republic of Cyprus has effective control increased from 20 in the first RBMP to 21 in the second RBMP but the total groundwater body area declined by 5 %. 15 groundwater bodies remained unchanged since the first RBMP.

The number of monitored groundwater bodies in areas in which the Government of the Republic of Cyprus exercises effective control increased from 19 of 20 in the first RBMP to all 21 in the second RBMP. The number of monitoring sites for quantitative status is listed in Table 5.3 and shows a slight decrease from 85 in the first RBMP to 82 in the second RBMP. 13 of 21 groundwater bodies are identified as drinking water protected areas.

Table 5.1 Number of water bodies in Cyprus directly monitored and the purpose of monitoring

RBD	Total groundwater bodies directly monitored	Monitoring Purpose	
		CHE - Chemical status	QUA – Quantitative status
CY001	21	19 (21)	21

Source: WISE electronic reporting. The numbers in brackets were subsequently provided by Cyprus and do not match the data reported to WISE.

Table 5.2 Proportion of groundwater bodies in Cyprus monitored for quantitative status

European Union RBD Code	No of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
CY001	21	21	100%

Source: WISE electronic reporting

[46] The Republic of Cyprus subsequently clarified the precise total number of groundwater bodies and the specific situation of one groundwater body.

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

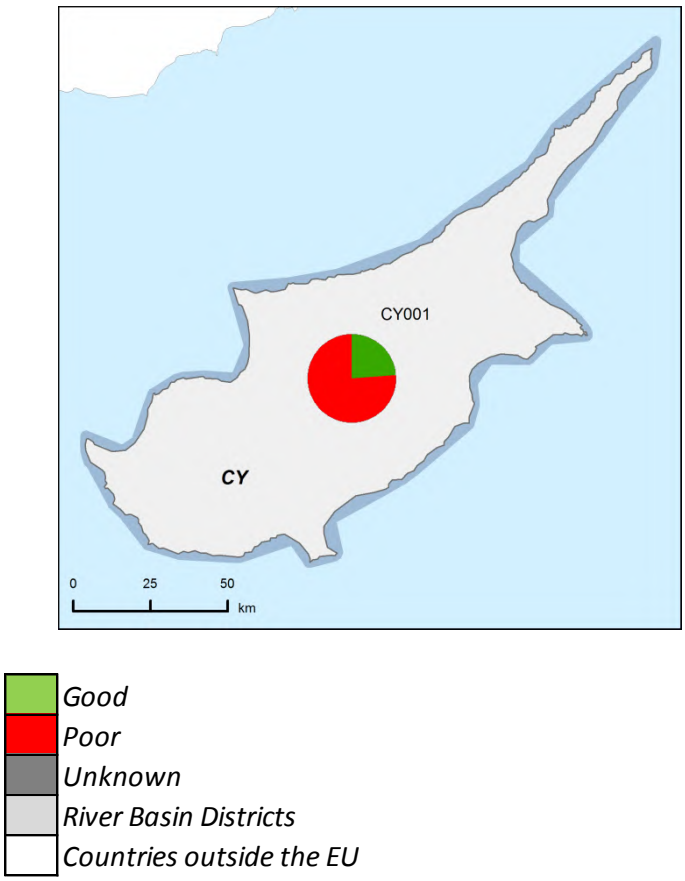
RBD	Total groundwater monitoring sites	Monitoring Purpose	
		CHE - Chemical status	QUA - Quantitative status
CY001	141 (159)	73 (92)	81 (82)

Source: WISE electronic reporting. The numbers in brackets were subsequently provided by Cyprus and do not match the data reported to WISE.

5.1.2. Assessment and classification of quantitative status for groundwater

Map 5.1 displays the most recently assessed quantitative status of the 21 groundwater bodies in areas in which the Government of the Republic of Cyprus has effective control. It shows that five out of 21 groundwater bodies (24 %) were of good quantitative status and 16 (76 %) are below good status. The status of the GWB in the area in which the Government of the Republic of Cyprus does not have effective control is unknown.

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

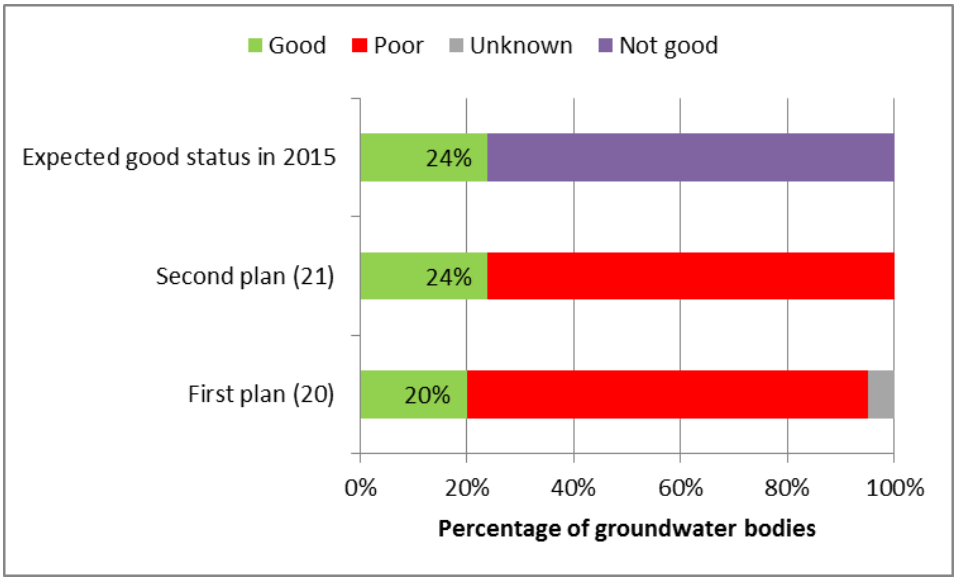


Note: Standard colours based on WFD Annex V, Article 2(2)(4).
Source: WISE, Eurostat (country borders)

In terms of area, this means that in areas in which the Government of the Republic of Cyprus has effective control about 57 % are failing good quantitative status. Figure 5.2 shows the

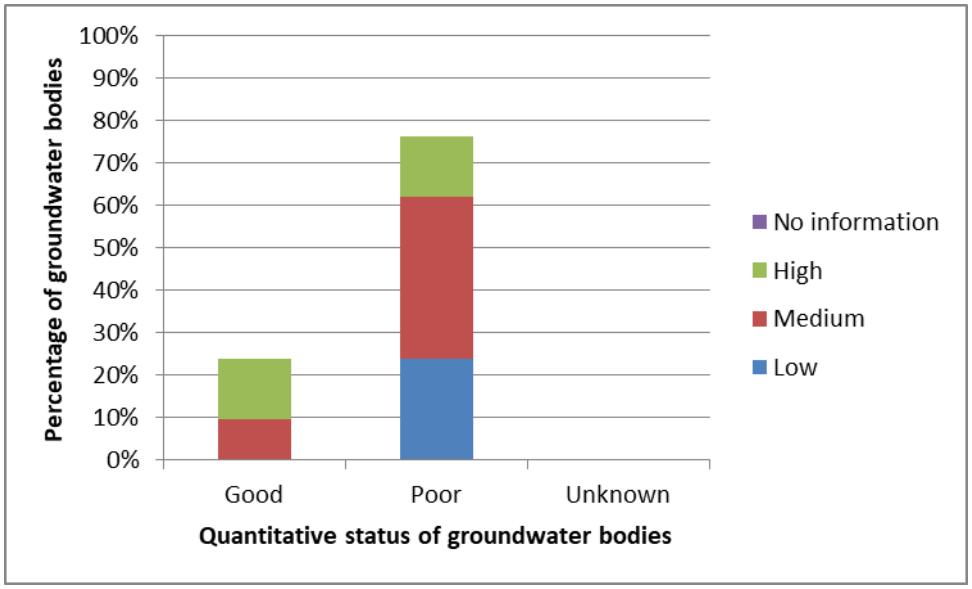
confidence in status classification. All groundwater bodies in areas in which the Government of the Republic of Cyprus exercise effective control now have a clear status, in the second RBMP. This represents an improvement since the first RBMP, in which one groundwater body was of unknown status. The status of the GWB in the area in which the Government of the Republic of Cyprus does not exercise effective control is unknown.

Figure 5.1 ***Quantitative status of groundwater bodies in Cyprus 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 2008 to 2014. 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 Cyprus based on the most recent assessment of status



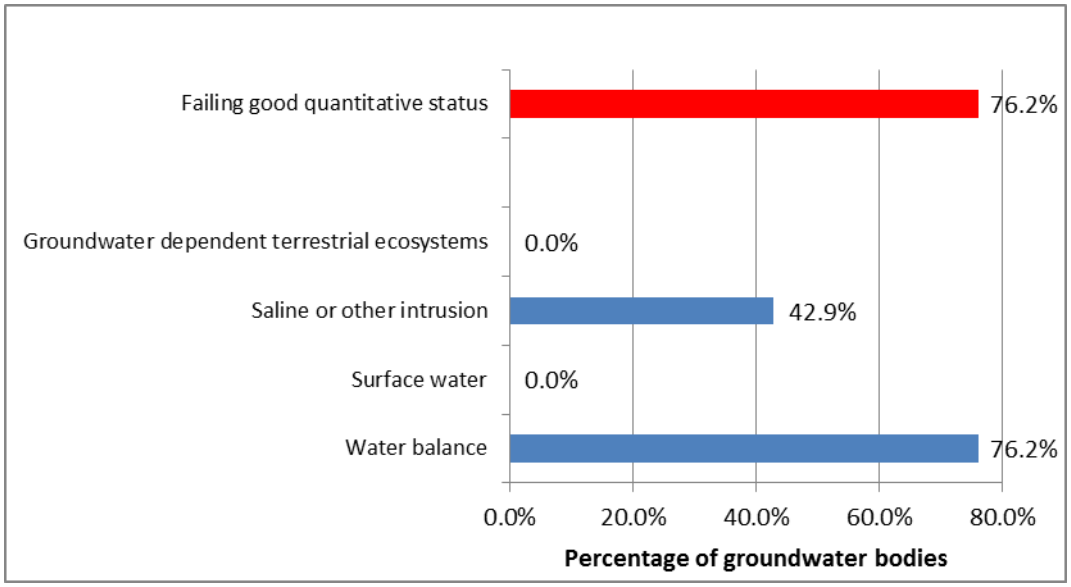
Source: WISE electronic reporting

The total number of groundwater bodies failing good quantitative status increased from 15 groundwater bodies in the first RBMP to 16 in the second RBMP but in terms of groundwater body area failing good quantitative status, the situation has improved significantly from 92 % of the total groundwater body area in the first RBMP to 57 % in the second RBMP.

For the one River Basin District in Cyprus 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. 16 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 and nine groundwater bodies are failing due to saline intrusion. The expected date of achievement of good quantitative status in Cyprus is shown in Figure 5.4 and it is beyond 2027.

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



Source: WISE electronic reporting

Notes:

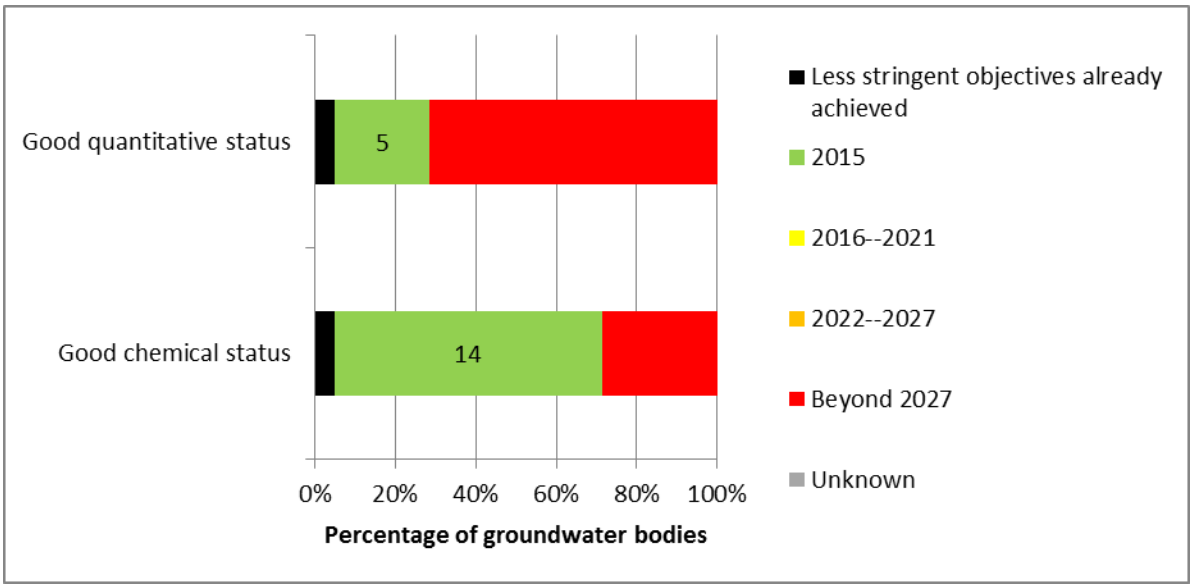
'Water balance' = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.

'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) for associated surface water bodies resulting from anthropogenic water level alteration or change in flow conditions; significant diminution of the status of surface waters resulting from anthropogenic water level alteration or change in flow conditions.

'Groundwater dependent terrestrial ecosystems' = Significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration.

'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenic induced sustained changes in flow direction.

Figure 5.4 Expected date of achievement of good quantitative and good chemical status of groundwater bodies in Cyprus. 21 groundwater bodies delineated for second RBMP



Source: WISE electronic reporting

The criterion of 'available groundwater resource' has been fully applied in accordance with Article 2(27). All environmental objectives have been considered in the status assessment.

In total 16 groundwater bodies (76 %) are at risk of failing good quantitative status due to harm to actual or potential legitimate uses or functions of groundwater.

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

Groundwater associated surface waters have been reported. They are not related to risk and they have been considered in status assessment.

Groundwater bodies are linked with groundwater dependent terrestrial ecosystems. They are also not related to risk and they have been considered in status assessment. The needs of terrestrial ecosystems have not been considered in status assessment.

5.2. Main changes in implementation and compliance since first cycle

15 of 21 groundwater bodies remained unchanged since the first RBMP.

The RBMP and background documents assessed did not include a separate document or chapter indicating changes as compared to the first RBMPs. Yet, it appears that the applied methodologies have not been modified[47].

The number of groundwater bodies slightly increased and the groundwater body area decreased by 5 %. The changes in the number of groundwater bodies occurred because one groundwater body was deleted and three others were "split" into two, so the overall resulting number of groundwater bodies became 21.

The monitoring situation has improved, since all groundwater bodies are now subject to monitoring.

The status changes show significant improvement as well. The number of groundwater bodies failing good quantitative status increased slightly but in terms of groundwater body area failing good quantitative status, the situation improved significantly from 92 % of the total groundwater body area in the first RBMP to 57 % in the second RBMP. RBMP and background document investigations identified that there was a change from poor to good status in groundwater body CY19 because the pressure levels in the boreholes showed an upward trend. No further explanation is found on why this is the case.

5.3.Progress with Commission recommendations

- Recommendation: *Provide a more detailed analysis of pressures and impacts, as well as an improved risk assessment based on the improvement of the monitoring network. The RBMPs should be explicit about the impacts related to each significant pressure and provide quantitative figures on the scale of the pressures that need to be reduced, to reach WFD objectives.*

  Assessment: From the reported information progress in monitoring has taken place, but the information on impacts and significant pressures could be improved. This recommendation is considered partially fulfilled.

- Recommendation: *Utilise metering (especially for agriculture) to better determine quantitative status of WBs and to secure their long-term protection because abstraction of groundwater is a significant pressure in Cyprus, mainly due to unregulated self-abstractions and permits not consistent with environmental needs.*

[47] While this information was not assessed, Cyprus subsequently clarified that in Chapter 7.2.2 pp 7-87 7-89 of the RBMP the changes in GWBs as compared to first RBMP and their justifications are presented. More detailed information is provided in Chapter 4 of the document Classification_suppl_CY_2015.pdf which has been reported.

This recommendation is addressed in Topic 10. It has been assessed as partially fulfilled.

- 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.*

  Assessment: The confidence in the status assessment of three quarters of the groundwater bodies is medium or low. Relatively little progress has been made. Cyprus subsequently clarified that there has been a reporting error and that the assessment of the status for the second RBMP is based on a solid dataset and presents high confidence.

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

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

6.1.1. Monitoring of chemical status in groundwater

The total number of groundwater bodies in Cyprus is 21 (Table 2.3) of which 33 % are at risk. Neither surveillance monitoring nor operational monitoring sites were reported, however, there were 73 chemical status monitoring sites in 19 groundwater bodies reported (Table 5.2).

The number of groundwater bodies increased from 20 in the first RBMP to 21 in the second RBMP but the total groundwater body area declined by 5 %. 15 groundwater bodies remained unchanged since the first RBMP.

In the first RBMP 84 surveillance and 68 operational monitoring sites have been reported, in the second RBMP 73 chemical status monitoring sites are available. There is no indication in the WISE electronic reports whether these sites are surveillance and/or operational monitoring sites, thus a comparison between first and second RBMP was not possible. The number of monitoring sites is listed in Table 3[48].

Several substances causing risk of deterioration in chemical status were reported, but there is no monitoring established for these substances. From the WFD core parameters of nitrate, ammonium, electrical conductivity, dissolved oxygen and pH, only nitrate and conductivity are monitored.[49]

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 14 of 21[50] groundwater bodies (67 %) were of good chemical status, and the remaining seven groundwater bodies (33 %) are failing good status. In terms of area this means that about 12 % are failing good chemical status. Figure 6.2 shows the confidence in status classifications. All groundwater bodies now have a clear status, in the

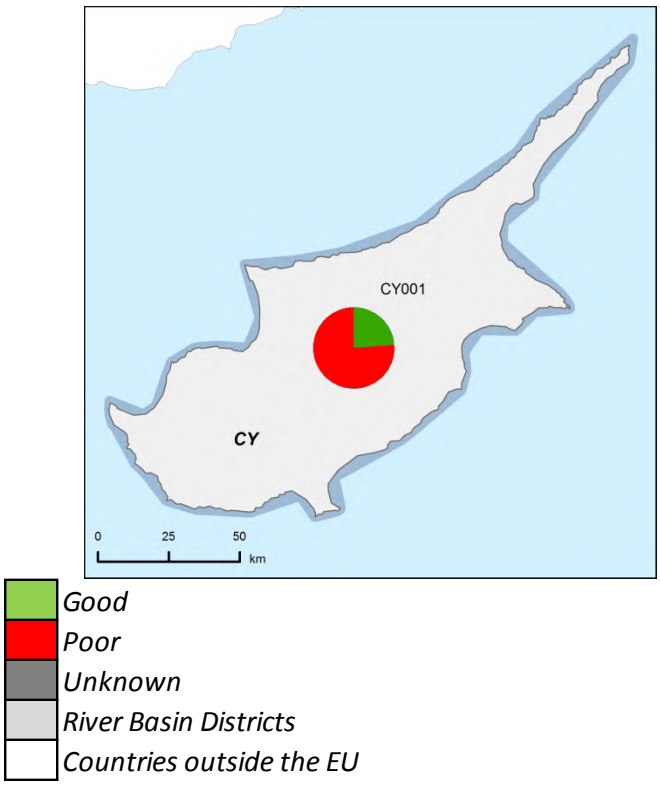
[48] Cyprus subsequently clarified, that the chemical monitoring has improved in the 2nd cycle RBMP and the chemical status is based on 92 operational monitoring stations. All stations are monitored twice a year.

[49] Cyprus subsequently clarified that all WFD core substances are monitored in all groundwater bodies.

[50] Cyprus subsequently clarified that the total number of groundwater bodies in Cyprus is 22. One GWB is in those areas in which the Government does not exercise effective control. In the second RBMP all groundwater bodies (21) that are in areas in which the Government exercises effective control are included. The status of the GWB in the area in which the Government does not exercise effective control is unknown.

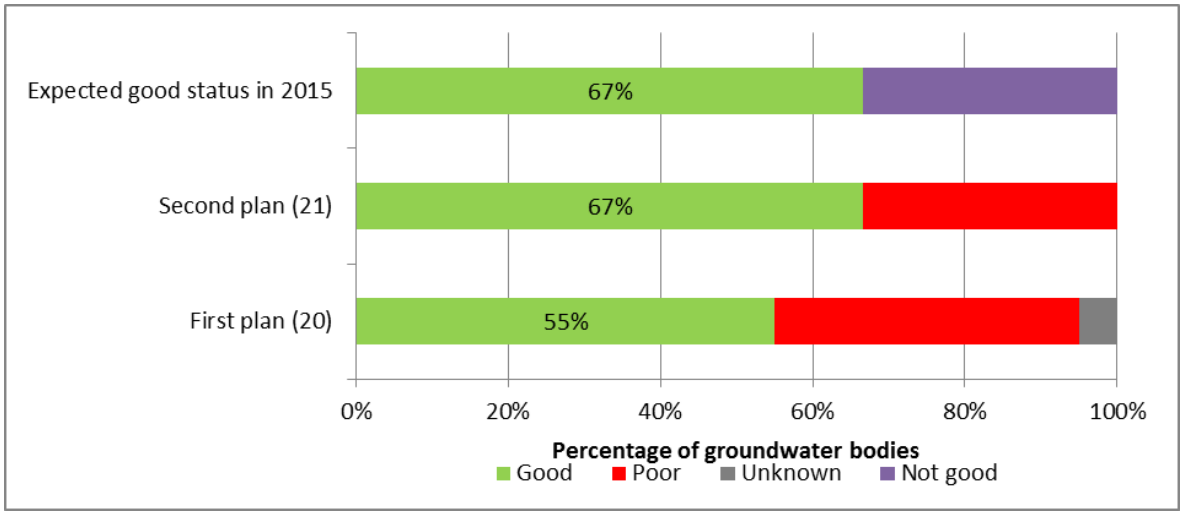
second RBMP. This situation improved as for the first RBMP one groundwater body was of unknown status.

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



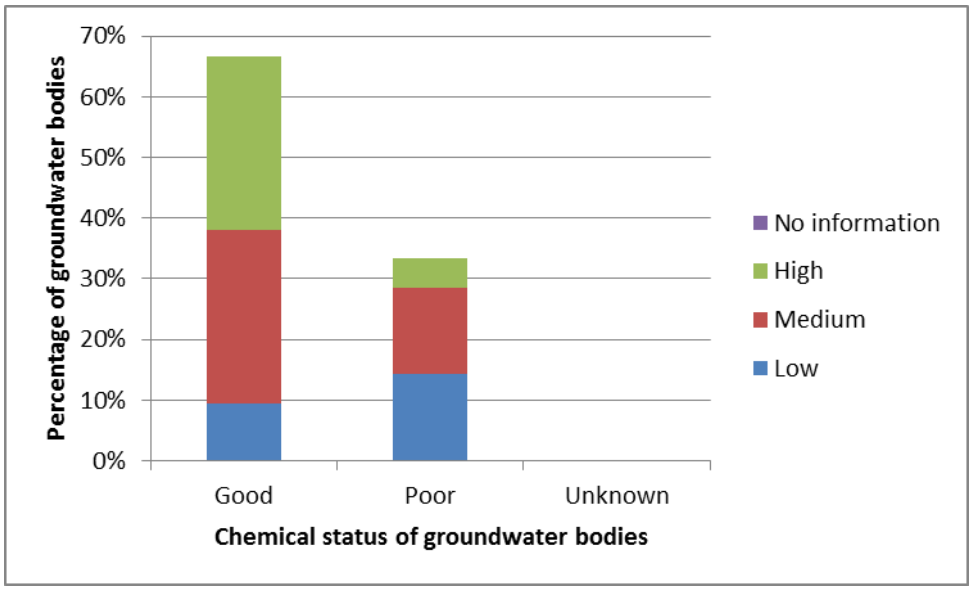
Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders)

Figure 6.1 Chemical status of groundwater bodies in Cyprus 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 2008 to 2014. The year of the assessment of status for first RBMP is not known



Source: WISE electronic reporting

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



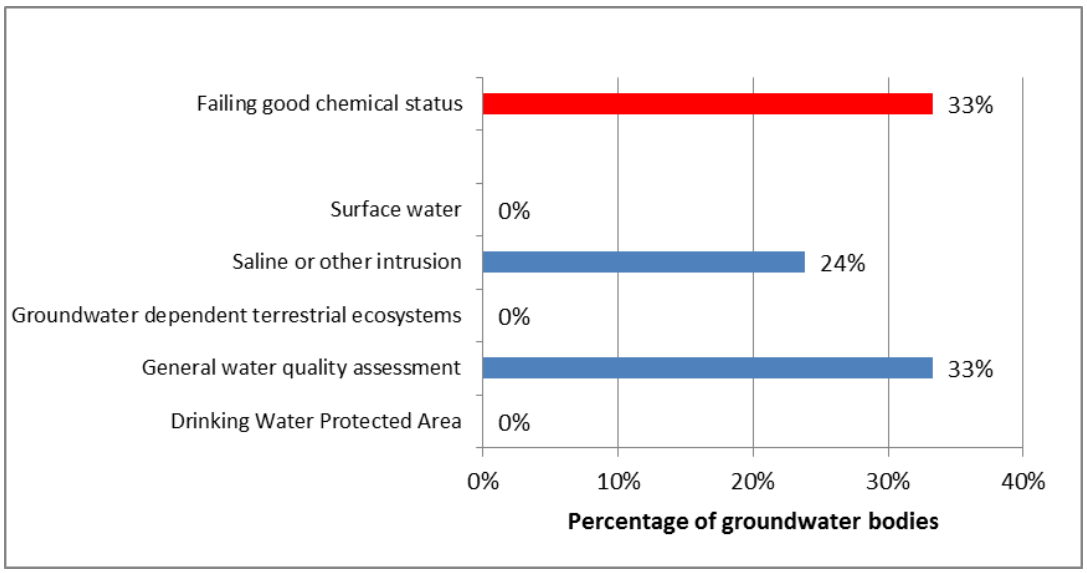
Source: WISE electronic reporting

The total number of groundwater bodies failing good chemical status decreased since the first RBMP from eight (40 %) to seven (33 %) groundwater bodies (see Figure 6.1). The total area of groundwater bodies failing good chemical status remained nearly the same (slight increase from 11.7 % to 11.9 % of the total groundwater body area). The expected date of achievement of good chemical status in Cyprus is shown in Figure 5.4.

The reasons for the failure of good chemical status of groundwater bodies are shown in Figure 6.3. For seven 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. Five groundwater bodies are failing good chemical status due to saline or other intrusion. Figure 6.4 shows the pollutants causing failure of status and a sustained upward trend.

The classification of the chemical status of the groundwater body as a whole was reported in an additional classification-document. There was no systematic overall approach described on how the calculation of the extent of exceedance of a groundwater quality standard or a groundwater threshold value was assessed and what an acceptable extent of exceedance was. Cyprus subsequently clarified that an overall approach is described in the RBMPs, e.g. for each parameter the mean value of all the measurements is compared to the determined threshold value. In case of exceedance of the threshold value the chemical status of the groundwater body is assessed as poor.

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



Source: WISE electronic reporting

Notes:

'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) in associated surface water bodies or significant diminution of the ecological or chemical status of such surface water bodies.

'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.

'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.

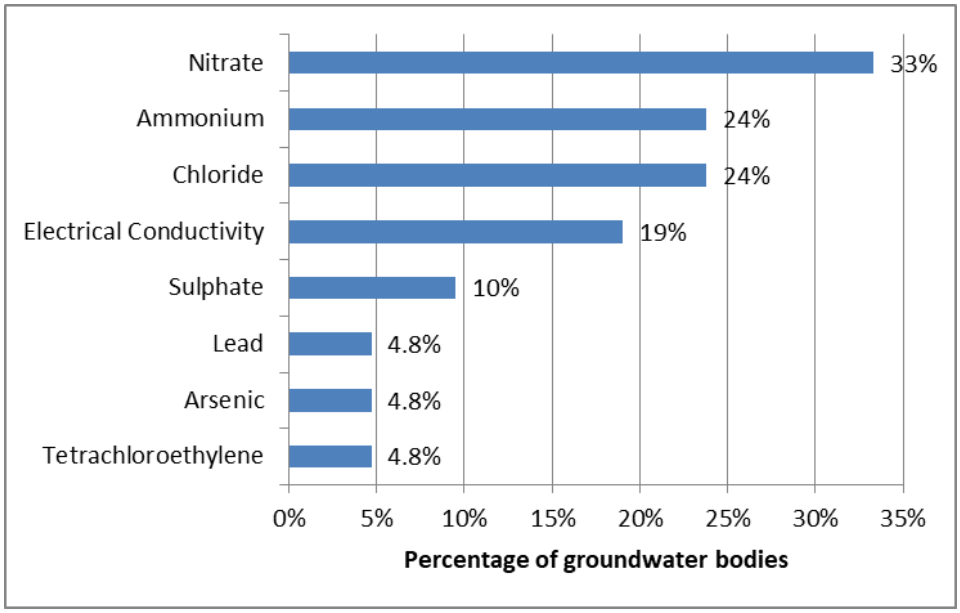
'Drinking Water Protected Area' = Deterioration in quality of waters for human consumption.

'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.

Groundwater threshold values have been established for all pollutants or indicators of pollution causing a risk of failure of good chemical status. The RBMP and background document assessment found an indication that all Groundwater Directive[51] Annex II substances had been considered for establishing threshold values.

Threshold values have been established separately for each groundwater body. These values were based on measurements of the WFD groundwater monitoring network until 2008 and other measurements from an expanded groundwater monitoring network. The data from 2008–2013 do not differentiate from the data which were used to establish the threshold values. The threshold values considered the natural concentration of pollutants in groundwater, the current and future use of water and the hydrogeological conditions prevailing in each water body. In groundwater bodies which were used for water supply but also for irrigation or other uses, the threshold values were the drinking water standards. In groundwater bodies used only for irrigation threshold values were derived from the upper acceptable limits for irrigation water.

Figure 6.4 Top groundwater pollutants causing failure of good chemical status in Cyprus



Source: WISE electronic reporting.

Note: 8 pollutants reported causing failure.

Natural background levels were considered in the development of groundwater threshold values. In groundwater bodies influenced by natural background levels, threshold values were determined on a case-by-case basis using an empirical methodology based on the range of

[51] 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

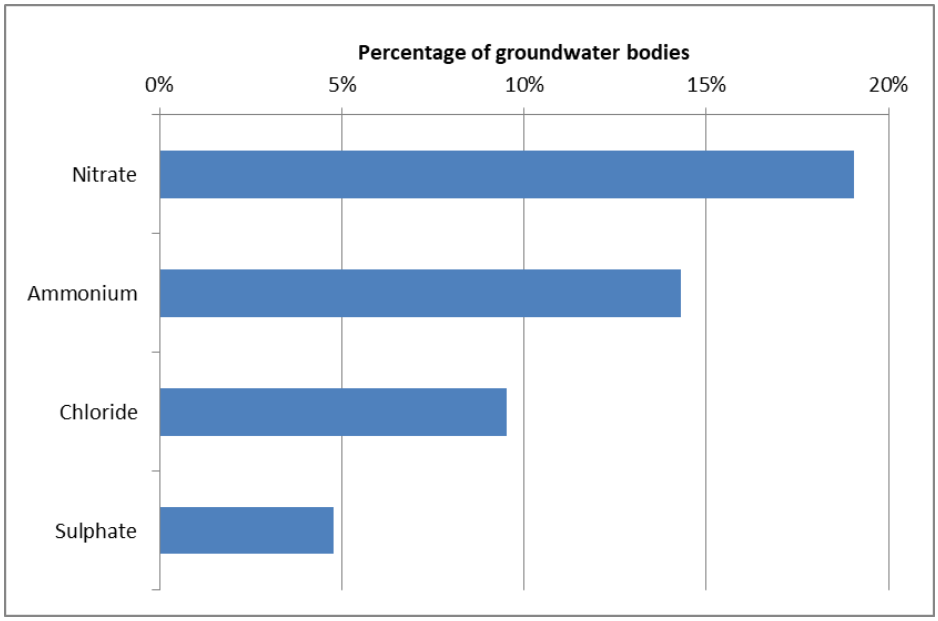
concentrations found in the monitoring data, for which the indicators showed no human intervention.

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

Groundwater associated surface waters have been reported, they are not related to risk. Diminution damage was considered when assessing groundwater qualitative status.

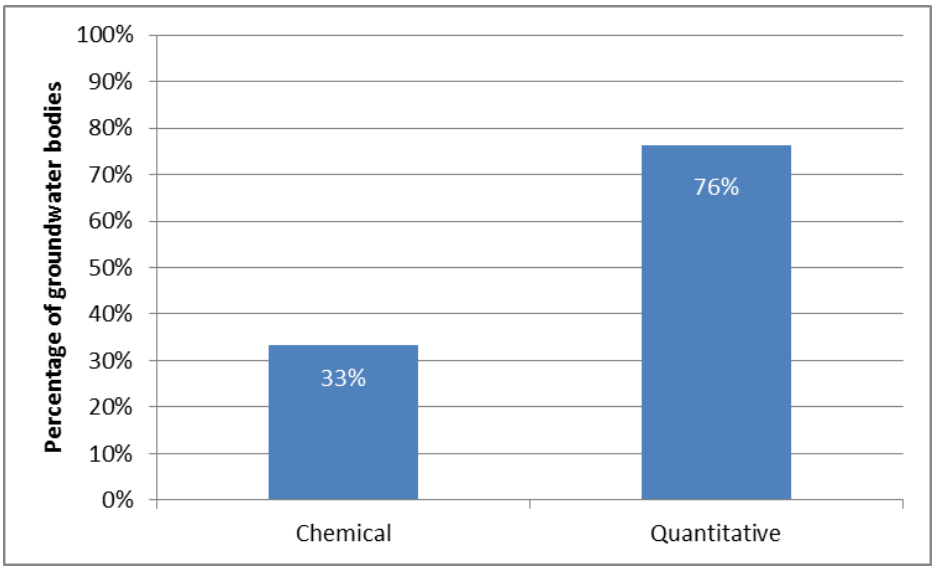
Groundwater bodies are linked with groundwater dependent terrestrial ecosystems, they are not related to risk and they have not been considered in status assessment. Groundwater associated aquatic ecosystems and groundwater dependent terrestrial ecosystems have both been considered in the establishment of groundwater threshold values. Figure 6.5 shows the top 10 pollutants with upward trends in groundwater bodies. Figure 6.6 shows the percentage of groundwater bodies at risk of failing good chemical status and good quantitative status.

Figure 6.5 Top pollutants with upward trends in groundwater bodies in Cyprus



Source: WISE electronic reporting

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



Source: WISE electronic reporting

6.2. Main changes in implementation and compliance since first cycle

In the first RBMP 84 surveillance and 68 operational monitoring sites were reported, in the second RBMP 73 chemical status monitoring sites were reported. Cyprus subsequently clarified that there are incorrect data in the WISE electronic reports. In fact the chemical monitoring program has been upgraded and considerable improvement of the quality of monitoring in groundwater bodies is achieved. The chemical monitoring of groundwater bodies now consists of 92 operational stations. Sampling takes place twice a year.

The RBMP and background document assessment did not find a specific chapter summarising the changes since the first Plan. Also from screening the relevant chapter, no changes regarding methodologies were noticed, just the use of updated monitoring data (2008–2014).

The number of groundwater bodies increased from 20 in the first RBMP to 21 in the second RBMP but the total groundwater body area declined by 5 %. 15 groundwater bodies remained unchanged since the first RBMP.[52]

The status situation mainly remains unchanged. The number of groundwater bodies failing good status slightly declined from eight to seven but the groundwater body area failing good status increased slightly from 11.7 % to 11.9 % of the total groundwater body area. The changes in status are mainly due to the re-delineation of groundwater bodies. In addition, one groundwater body with unknown status has now a clear status. All three new groundwater

[52] As mentioned earlier, deletion/merging of one groundwater body and three were split.

bodies are of good chemical status, one improved from poor to good status. An initial examination of the supplementary "classification" document and the specific analysis did not find any explanation as to why the status improved.

6.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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.*

  Assessment: The confidence in status assessment of two thirds of the groundwater bodies is medium or low. In addition, there is apparently no monitoring performed.

  Cyprus subsequently clarified that there are incorrect data in the WISE electronic reports. The chemical status is in fact based on 92 operational monitoring stations. All stations are monitored twice a year. Thus the assessment of the status in the second RBMP appears to be based on a solid dataset and is characterised with high confidence. The additional information provided by Cyprus indicates that for the groundwater bodies the recommendation can be considered as fulfilled.

- Recommendation: *Efforts should be made to improve the quality of monitoring.*

  Assessment: Neither surveillance nor operational monitoring was reported although it seems clear that monitoring took place. Cyprus subsequently clarified, that there is incorrect data in the WISE electronic reports. In fact, the chemical monitoring program has been upgraded and considerable improvement of the quality of monitoring in groundwater bodies is achieved. Therefore, with the additional information provided by Cyprus, for groundwater bodies the recommendation can be largely considered as fulfilled.

- Recommendation: *Groundwater trend assessments and trend reversal should be improved in the second RBMP cycle.*

  Assessment: A trend assessment methodology is available and trend assessment has been performed but neither a methodology for trend reversal nor any monitoring of trend was found. Cyprus subsequently clarified, that the trend and trend reversal assessment methodology is described in a background document and applied to all groundwater bodies. Therefore the additional information provided by Cyprus indicates that this recommendation is largely fulfilled.

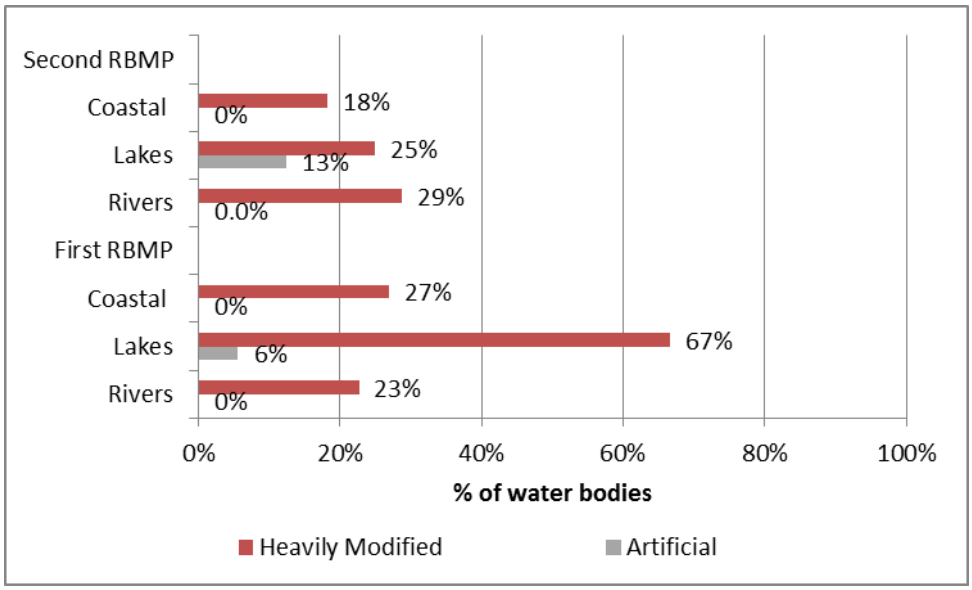
Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

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

7.1.1. Designation of Heavily Modified and Artificial Water Bodies

In total 56 surface water bodies were designated as heavily modified water bodies and one surface water body was defined as an artificial water body. The proportion of total water bodies in each category is given in Figure 7.1. The WFD requires a review of designation every six years. As mentioned further below, only minor changes have been noted in the designation of river heavily modified water bodies since the first cycle RBMP, while more significant changes took place for lake and coastal heavily modified water bodies. The review of the designation of HMWB has been based on CIS Guidance Document No 4. Out of the 50 designated river heavily modified water bodies, there were 15 reservoirs that where originally rivers. This represented a change in the approach used in the first RBMP, where reservoirs were reported as heavily modified lakes and not as heavily modified rivers.

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



Source: WISE electronic reports

The main water uses for which river water bodies were designated as heavily modified water bodies were irrigation for agriculture and drinking water supply for urban use. Lake heavily

modified water bodies were designated mainly due to urban development and coastal heavily modified water bodies due to navigation/ports and urban development.

The main physical alterations of river heavily modified water bodies were weirs/dams/reservoirs. The main alterations of coastal heavily modified water bodies were land reclamation / coastal modifications / ports, while the alterations of lake heavily modified water bodies were other alterations not specified in WISE.

The methodology for heavily modified water body designation explains the identification of substantial changes in character as well as information on the assessment of significant adverse effect on the use and the assessment of better environmental options. While some criteria are mentioned, it also is evident that expert judgement was used in some of the steps. The focus of the methodology was on river water bodies linked to dams; the two lakes and the four coastal water bodies were assessed in less detail and less specific criteria were applied.

For identifying and describing significant changes in hydromorphology, the criteria applied include:

- The total length of each water body that is altered from roads or other human interventions. In case that the length affected is greater than 30 % of the total length of the water body the hydromorphological pressure is considered as significant.

- The total number of small abstractions in each surface water body. When the total number of abstractions is greater than five, the hydromorphological pressure is considered as significant. It should be noted that small abstractions are related to small works (weirs) or other interventions in the river banks.

- The presence of a dam; the hydromorphologic alterations in impounded rivers are considered as significant. Additionally for the streams downstream a dam, a hydromorphological pressure is considered as significant in cases that the area of the river basin of the dam is greater than 20 % of the total area of the river basin of the downstream river.

- Hydromorphological pressures are also considered significant in water bodies that are related to urban areas or affected by flood protection constructions.

- For the coastal water bodies the presence of port facilities is considered as well as the presence of urban areas.

A registry for small abstractions has also been completed (as part of the first Programme of Measures) and used as an information base for establishing the significant hydromorphological alterations. It is also mentioned that in the context of the revision of the Article 5 analysis on pressures and impacts and the significant water management issues, "the effects on morphology and hydrology of rivers of artificial surfaces and small abstractions have been identified and assessed".

The substantial changes in character due to physical alterations of water bodies are assessed as follows:

- Water bodies with substantial and permanent morphological alterations without necessarily presenting permanent hydrological changes
- Water bodies downstream of dams with substantial hydrological changes. For the evaluation of the hydrological changes in water bodies downstream of dams, the changes in their types is considered (Intermittent streams that are changed to harsh intermittent streams and harsh intermittent streams that are changed to ephemeral streams).

The assessment of significant adverse effects was explicitly mentioned only for river heavily modified water bodies downstream of dams (used for urban water supply/irrigation) and river heavily modified water bodies facing pressures due to abstractions (but not for lakes and coastal water bodies). The supply systems related to the dams of the river heavily modified water bodies are interconnected to cover the supply of wider areas. For these reasons the designation tests of significant adverse effects on the use and better environmental options are applied for the group of all the related water bodies.

The main restoration measure considered was the provision of environmental flows. According to the assessment, given the dependency of urban water supply and agriculture on dams, the provision of environmental flows would mean a reduction of water availability for urban and agricultural use. Concerning effects on the wider environment, it was noted that the provision of environmental flows would not adversely affect lake environments/wetlands linked to reservoirs.

Furthermore, an assessment of other means was carried out. For urban water supply, the other means considered were water savings, expanding desalination and increasing groundwater abstractions. For irrigation, the other means considered were water savings (through various means, including water pricing), increasing the use of recycled water and increasing groundwater abstractions. The assessment concluded that other means (such as water savings,

expanding desalination and use of recycled water) are already in place or planned but these are not reliable to cover the needs for the water uses supplied by the current dams. The possibility of using further other means to cover the needs is practically negligible, due to disproportionate costs.

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

Good ecological potential was reported as defined at water body level using the Prague approach (based on the identification of mitigation measures).

Good ecological potential has not been defined in terms of biology, but the information reported in WISE indicates biological quality elements for which biological values have been derived to define maximum ecological potential and good ecological potential (namely benthic invertebrates, phytoplankton, macrophytes and phytobenthos). A comparison between good ecological potential and good ecological status has not been done.

According to information in the RBMP, the good ecological potential for river heavily modified water bodies is defined through application of all mitigation measures. Based on the efforts made in terms of the mitigation measures, the potential is estimated, e.g. if more than 70% of measures relevant to a specific heavily modified water body are taken, then the potential is reported as good. For some heavily modified water bodies, it is stated that the current status can be assumed as good potential.

The good ecological potential for reservoirs (impounded rivers) is defined based on the high and good ecological status of the same type of lake water bodies (which was the approach previously used in the first RBMP).[53] Good ecological potential for coastal heavily modified water bodies was also defined using the values for natural coastal water bodies. However, the coastal heavily modified water bodies will be re-assessed for the next cycle on the basis of scientific developments and new data/information that will result from the activities/measures planned under the Marine Strategy Framework Directive (MSFD).

Good ecological potential definition has not been established for lake heavily modified water bodies as more information is needed on the two lake heavily modified water bodies regarding their natural characteristics and the results of the pressure analysis.

[53] Cypriot authorities subsequently informed that GEP for impounded rivers was directly established in the intercalibration exercise of the Med Lakes GIG, by treating the reservoir HMWB as natural lakes. Therefore, MEP and GEP were directly determined based on actual data.

Biological quality element assessment methods sensitive to hydrological and morphological changes were reported for rivers and coastal waters, but not for lakes.[54] One method to assess macrophytes in rivers and one method to assess benthic invertebrates in coastal waters were reported as sensitive to hydromorphological changes.

Mitigation measures for defining good ecological potential have been reported. A library of mitigation measures was established and for each measure, a link of the measure to the hydromorphological elements of the WFD was provided. The ecological changes expected from the mitigation measures in biological terms are not described.

7.2. Main changes in implementation and compliance since first cycle

There were only minor changes in the designation of river water bodies as heavily modified, namely their number increased by one heavily modified water body since the first RBMP. In the case of lake and coastal heavily modified water body, more significant changes took place since the first RBMP. The number of designated lake heavily modified water body decreased from twelve to two and of designated coastal heavily modified water bodies from seven to four. No changes were noted in the number of Artificial Water Bodies; only one lake was designated as an artificial Water Body, similar to the first RBMP.

In the first RBMP, existing reservoirs were reported as heavily modified lakes. In the second RBMP, reservoirs have been designated as river heavily modified water bodies, following Common Implementation Strategy guidance on this issue. Furthermore, four river heavily modified water bodies were added (reservoirs of the Kannaviou dam, which was constructed during the elaboration of the first RBMP as well as for the Arminou, Tamassos and Akaki-Malounda dams that are smaller than 0.5 km^2 and were therefore not regarded as distinct water bodies in the first RBMP). Any further modifications to the number of river heavily modified water bodies were due to new information from investigations and monitoring.

The number of lake heavily modified water bodies has decreased due to the change of reservoirs into river heavily modified water bodies (see above); in addition, one more lake is designated as heavily modified water body due to significant hydromorphological pressures.

The number of coastal heavily modified water bodies has been reduced due to combining three water bodies into one (based on new information from monitoring "and other investigations") and due to excluding two coastal water bodies over which the Cyprus does not have effective control (and had been included in the first RBMP).

[54] Cyprus subsequently informed that BQEs sensitive to hydromorphology, e.g. macrophytes or fish, are not proposed to be monitored in natural lakes because they are not applicable.

In general, no changes are described on the methodology for designating heavily modified water bodies; at the same time, additional information and modifications e.g. regarding the status assessments have occurred.

According to WISE, good ecological potential was reported in the second RBMP as defined. In the first RBMP, good ecological potential had not been defined for most of the water types. Explicit changes to the methodology since the first RBMPs have not been described.

7.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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 designation of heavily modified water bodies has been reviewed for the second RBMP considering also water bodies downstream of dams. Impounded rivers have been designated as heavily modified water body rivers (and not lakes which was the case in the first RBMPs). The methodology for heavily modified water body designation explains the identification of substantial changes in character as well as information on the assessment of significant adverse effect on the use and the assessment of better environmental options. Also, a registry for small abstractions has been completed (as part of the first Programme of Measures) and used as an information base for establishing the significant hydromorphological alterations. While some criteria are mentioned, it seems that also expert judgement is used in some of the steps.

  Details of the outcome of the designation tests of significant adverse effects on the use and better environmental options are not reported for individual water bodies. The supply systems related to the dams of the river heavily modified water bodies are interconnected to cover the supply of wider areas. For these reasons the designation tests of significant adverse effects on the use and better environmental options are applied for the group of all the related water bodies. The focus of the methodology is on river water bodies linked to dams. The two lakes and the four coastal water bodies are assessed in less detail and less specific criteria are applied. For lakes there is no

available data about the status of the biological quality elements. For this reason, only the significance of the hydromorphological alterations is considered. The coastal water bodies that are designated as HMWBs from the first cycle RBMP are classified at good ecological status. In the second cycle RBMP, they are maintained as HMWB but it is expected that in the next RBMP they will be considered as natural.

It is also noted that abstractions are associated to "substantial changes in character", which needs to be reconsidered in the context of relevant principles in the Common Implementation Strategy Guidance No. 4. Overall, progress has been made on the issues outlined in this recommendation; the recommendation is considered as partially fulfilled as the methodological details are mainly given on river water bodies.

Topic 8 Environmental objectives and exemptions

8.1. Assessment of implementation and compliance with WFD requirements in 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[55)], 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 have been reported for the single Cypriot RBD as well as for good quantitative and chemical status. The Commission recommendation to set environmental objectives for all water bodies for the second RBMP has been considered and objectives are reported.

Member States are also required to specify additional environmental objectives and standards in Protected Areas where these are required to ensure the requirements of the associated Directive are met. An assessment of such additional objectives for Cyprus is provided in Chapter 15 of this report.

Assessments of the current status of surface and groundwater bodies in Cyprus 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 were required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Cyprus elsewhere in this report: for ecological status/potential of surface

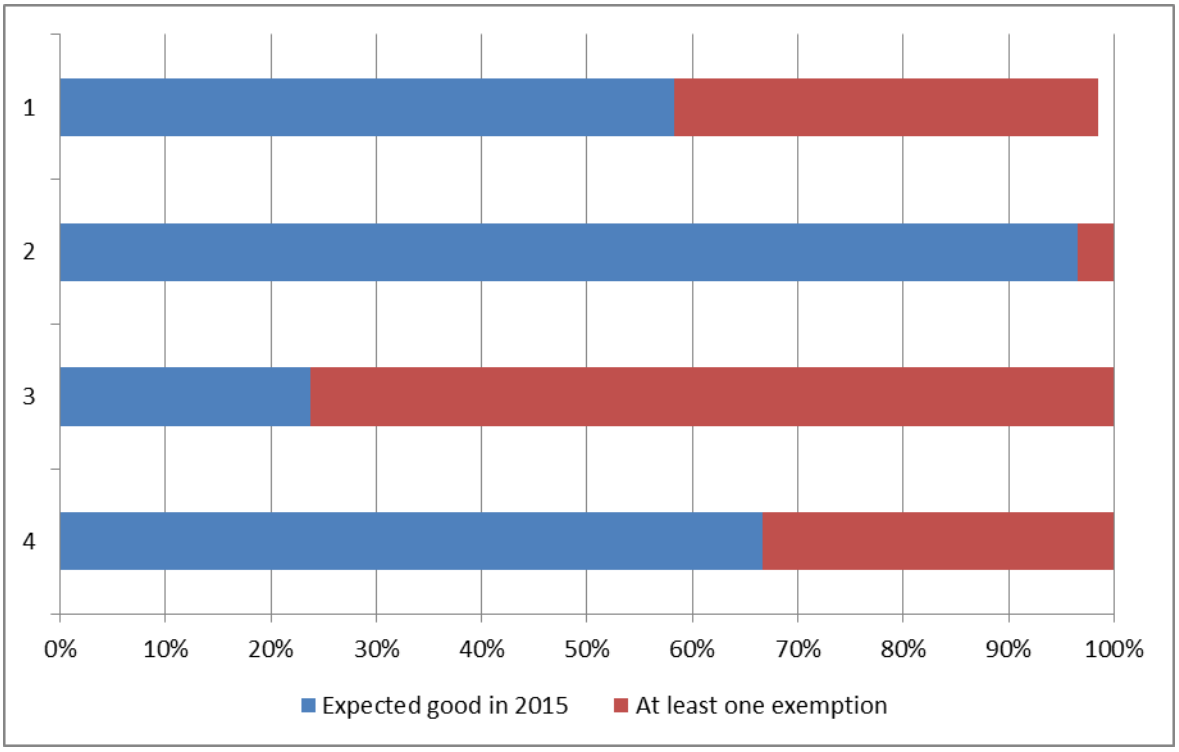
[55] For priority substances newly introduced by Directive 2013/39/EU, good status should be reached by 2027, and for the 2008 priority substances, for which the Environmental Quality Standards were revised by Directive 2013/39/EU, good status should be reached in 2021.

waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6).

8.1.2. Exemptions

Where environmental objectives are not yet achieved exemptions can be applied in case the respective conditions are met and the required justifications are explained in the RBMP. 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 Cyprus for the four main sets of environmental objectives.

Figure 8.1 ***Water bodies in Cyprus 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***



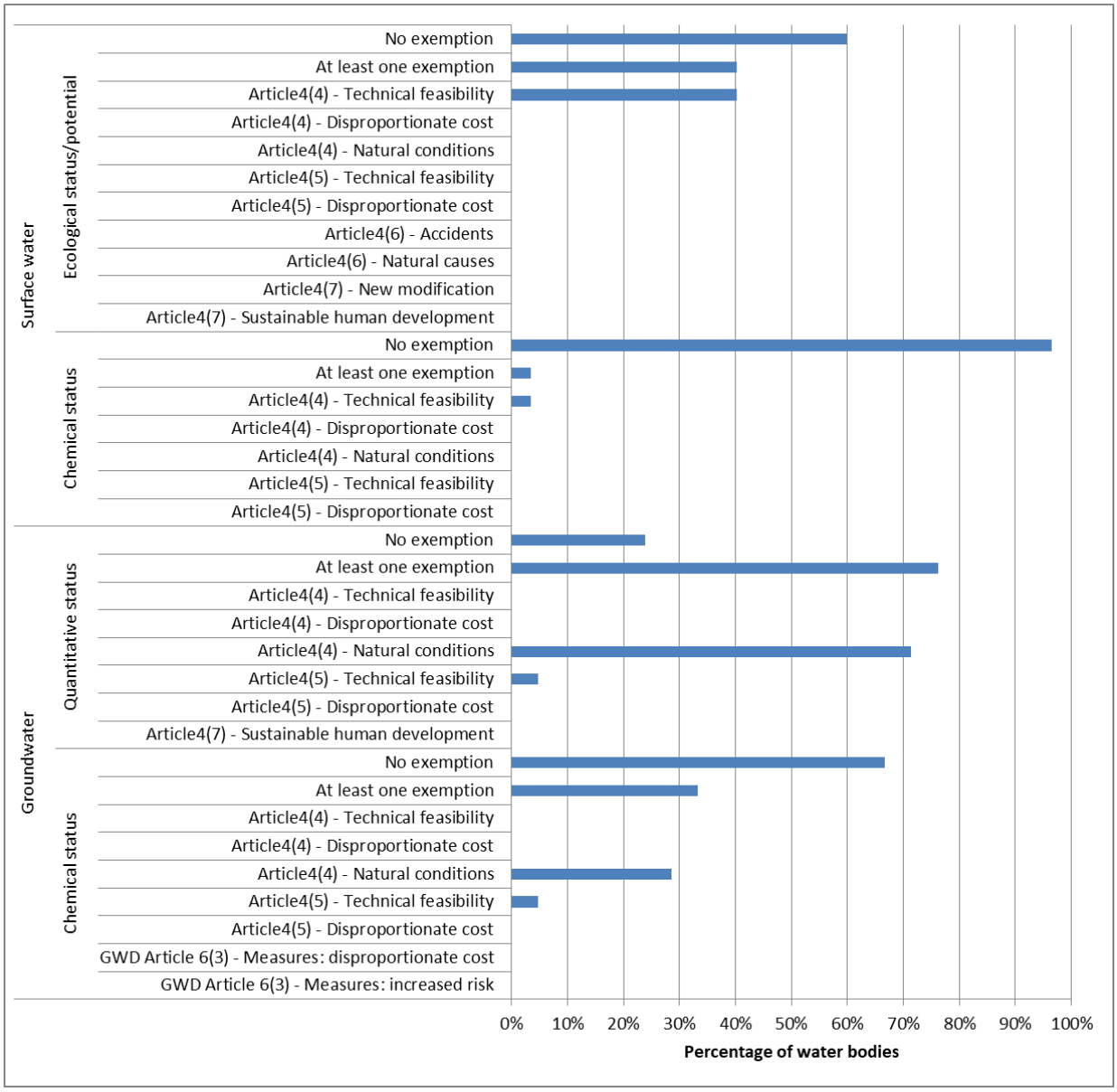
Source: WISE electronic reports

Article 4 of the WFD allows under certain conditions for different exemptions to the objectives: extension of deadlines beyond 2015, less stringent objectives, a temporary deterioration, or deterioration / non-achievement of good status / good 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, Article 4(5) - lower objectives, Article 4(6) - temporary deterioration, and Article 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 objectives in Cyprus.

Figure 8.2 ***Type of exemptions reported to be applied to surface water and groundwater bodies for the second RBMP in Cyprus. 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)

The use of Article 4(4) which was applied for groundwater and surface water bodies increased between the first RBMP and the second RBMP. In the second RBMP the justification for Article 4(4) for surface waters refer to technical feasibility.

With regard to technical feasibility, an elaborate process was followed (especially for surface water bodies) in order to determine Article 4(4) exemptions. Justifications at water body level are given including various "arguments" that are then summarized as the "technical feasibility" argument. The tests for the application of Article 4(4) to surface water bodies were carried out for all water bodies classified with ecological and chemical status less than good. The analysis included:

- The determination of the pressures for each water body,
- The estimation of the loads of Nitrate, Phosphate and biological oxygen demand for each water body and the definition of chemical parameters exceeding the threshold values referred to the national and European legislation,
- The comparison of the estimated loads of nitrate, phosphate and biological oxygen demand with the threshold loads e.g. loads that trigger the transition from good status to less than good, for each type of river water body, as they estimated in a specific analysis of the significance of pressures in Cyprus' river water bodies carried out by the Water Development Department.

The analysis also considered other critical parameters such as the level of uncertainty of the classification of the status of water bodies, the progress of ongoing projects aimed to improve the water status (e.g. the Vati Project, Wastewater Treatment Facilities) and the estimated reduction of the loads and impacts expected from the implementation of the proposed program of measures.

In this context, for natural river water bodies classified with low uncertainty, which were affected by significant pressures from agricultural activities, and for which a reduction of less than 25 % of the loads of N, P and biological oxygen demand would be necessary in order to achieve the estimated values of the threshold loads, it was assumed that good status could be achieved by 2021, after the implementation of the proposed program of measures. For the remainder water bodies, Article 4(4) was applied for 2021.

Additionally, Article 4(4) for 2021 was indicated to be applied for natural surface water bodies:

- With chemical status of good or below good;
- For which the ecological status classification presents high level of uncertainty;
- Which are affected only by pressures from agricultural activities, and
- For which the correlation of their status with the estimated loads is not evident from the available data.

For these water bodies, further investigation would be necessary, including a special monitoring program and a detailed registration and controls of the activities and practices applied in their sub basin, in order to formulate the appropriate actions needed in the next management cycle, for the achievement of the good status.

Although disproportionate costs were not reported as a type of exemption for 4(4) in the plans, in WISE, the reported information indicates that disproportionate costs were also put forward in relation to affordability for surface waters and cost-benefit ratios for groundwater[56].

Article 4(4) was applied for 14 out of 21 groundwater bodies, which were identified in Cyprus as result of the revision made during the preparation of the second RBMP, because of natural conditions[57]. These water bodies were identified as follows: CY-3A KoitiTremithios, CY-3B Kiti-Pervolia, CY-4 Softades-Vasilikos, CY-5 Maroni, CY-6 Mari-KaloChorio, CY-8 Lemesos, CY-9 Akrotiri, CY-10 Paramali-Avdimou, CY- 12 Letymbou-Giolou, CY-13 Pegia, CY-15A Chrysochou-Gialia, CY-15B Kiti-Chrysochou, CY-17 Central & Western Mesaoria and CY-18-Pachna Lefkara. For them the achievement of good status by 2021 was not considered feasible due to the time lag necessary for recovery of groundwater; it was also assumed that these water bodies may not achieve good status even up to 2027.

The pressures responsible for exemptions in surface water came from a broad range of activities including urbanism, agriculture, mining, abstraction and aquaculture. For groundwater the main pressures were pollution and abstraction from agriculture and discharges not connected to sewerage network. The main driver causing the pressures to ground and surface waters is agriculture. For surface water the impacts were saline pollution/intrusion, microbiological, organic and nutrient pollution, altered habitats due to morphological changes (includes connectivity) and other significant impacts. The main impacts causing Article 4(4)

[56] Cyprus subsequently clarified that there are reporting errors in WISE.
[57] Cyprus subsequently clarified that there are reporting errors in WISE.

exemptions to groundwater were saline pollution/intrusion, chemical and nutrient pollution and lowered water tables.

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

Significant pressure on surface water bodies	Failing Priority Substances	Article4(4) - Technical feasibility exemptions	Article4(5) - Technical feasibility exemptions
	Number	Number	Number
1.1 - Point - Urban waste water	4	4	0
1.6 - Point - Waste disposal sites	4	4	0
2.2 - Diffuse - Agricultural	2	4	0

Source: WISE electronic reports

Table 8.2 Pressures responsible for pollutants in Cyprus 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) - Natural conditions	Article 4(5) - Technical feasibility
2.2 - Diffuse - Agricultural	4	7	2
2.6 - Diffuse - Discharges not connected to sewerage network	5	8	2
3.1 - Abstraction or flow diversion - Agriculture	2	7	2

Source: WISE electronic reports

Application of Article 4(5)

Article 4(5) was also used in the second cycle. For one groundwater body, an extended analysis was provided, leading to the result of "technical infeasibility" to justify the Article 4(5) exemption. For this groundwater system the achievement of the objectives of good quantitative and chemical status by the year 2021 and by the year 2027, even with application of “drastic” measures was not considered possible. Therefore, Article 4(5) was applied and less stringent objectives for quantitative and chemical status were formulated.

Application of Article 4(6)

Exemptions under Article 4(6) have not been applied.

Application of Article 4(7)

Exemptions under Article 4(7) were not applied, but there was a list of future projects given in the "objectives" document regarding Article 4(7), divided into following categories: 1. Sewage works 2. Water supply works 3. Reused water works 4. Dams 5. Desalinization works/groundwater recharge.

For the four dam projects (two of them consisting of multiple dams) and since a degradation of ecological status would be possible, the assessment steps under Article 7 should be taken into consideration. For this, the following information was analysed: 1. how mature the project was, i.e. if the project can start within the second management period 2. the objectives of the project (in order to assess "alternatives") 3. the technical specifications, and 4. the effects of the project on the environment. The specific water bodies affected by the dam project are also provided.

As a result:

- The project on flood protection dams was outlined to not affect water bodies according to the WFD requirements, so no further justification under Article 4(7) was indicated to be needed.

- The Souskous dam: An Article 4(7) check was done in the context of the environmental permitting, with a result that no deterioration would take place affecting the WFD objectives. For these dams, there was not enough information to conduct the further assessment steps of Article 4(7) (since the project was not considered to be mature enough).

Therefore, a measure was included in the Programme of Measures: "checking the application of Article 4(7)". These projects are planned to undergo an Article 4(7) test during their environmental permitting procedure (and will be included in the public consultation process). The competent authority is planning to assess and in case approve this Article 4(7) check and include it in the following RBMP.

The application of Article 4(7) exemptions may not comply with WFD requirements as it remains unclear if the reported process covers all steps of Article 4(7), in particular how overriding public interest is assessed[58].

[58] Cyprus subsequently clarified that after the publication of the CIS Guidance Document for the Application of exemptions under article 4.7 (GD No 36), it is preparing a new special guidance document for the requirements for the application of Article 4(7).

Application of Article 6(3) of the Groundwater Directive

Exemptions under Article 6(3) of the Groundwater Directive[59] have not been applied.

8.2. Main changes in implementation and compliance since first cycle

The number of exemptions under Article 4(4) has increased. New Article 4(5) exemptions have been reported for one groundwater body (due to technical feasibility). Overall, it is mentioned in various parts of the RBMP that additional monitoring information has been used for applying exemptions. No exemptions under Article 4(6) or Article 4(7) were reported in the first RBMP and the second RBMP.

8.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures reports requested action on the following:

- Recommendation: *It is unclear whether there are new physical modifications planned in RBMPs. If this is the case, the use of exemptions under Article 4(7) should 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 regarding the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water. All conditions for the application of Article 4(7) in individual projects must be included and justified in the RBMPs as early in the project planning as possible.*

  Assessment: This recommendation has been partly implemented. It is clearly stated that Article 4(7) has not been applied in the second RBMP. However, for potential future projects a procedure is in place that follows the Article 4(7) requirements. It is stated that this procedure will be applied to all infrastructure projects.

- Recommendation: *Objectives for water bodies should be clearly indicated in order to be able to reach good status of waters in a reasonable timeframe.*

[59] 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

Assessment: This recommendation has been implemented and progress has been made and objectives for each water body are provided.

- Recommendation: *While the WFD does provide for exemptions, there are specific criteria that 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.*

  Assessment: This recommendation has been implemented as a detailed procedure with clear criteria has been developed.

Topic 9 Programme of measures

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

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

9.1.1. General issues

An indication as to whether or not measures have been fully implemented and made operational is when they have been reported as being planned to tackle significant pressures (at the Key Types of Measure level). Significant pressures are also reported at the water body level. It would therefore be expected that there would be measures planned in the RBMP to tackle all significant pressures, but in Cyprus, not all significant pressures have operational KTMs in place to reduce the pressures in both surface waters and groundwater. For groundwater the only significant pressure reported that has operational KTMs in place is Abstraction or flow diversion – Agriculture. KTMs have not been reported to tackle the significant pressures Diffuse – Agricultural, and Diffuse - Discharges not connected to sewerage network, despite them being reported as causing water bodies to fail to be of good status. Similarly, for surface water bodies, operational KTMs have been reported as being in place to address 6 significant pressures, but no measures are in place to address Point - Aquaculture, Diffuse - Urban run-off, Diffuse - Discharges not connected to sewerage network, Diffuse - Other, and Physical alteration of channel/bed/riparian area/shore – Other, despite these pressures being reported as causing water bodies to fail to be of good status. Cyprus did not provide information on the percentage of water bodies failing to be of good status as a result of these significant pressures, and therefore it is not possible to assess the relative importance of these pressures[60]. Conversely, for surface water bodies, a number of KTMs have been reported as addressing significant pressures which have not been reported as causing water bodies to be of good status, specifically, Physical alteration of channel/bed/riparian area/shore - Flood protection; Physical alteration of channel/bed/riparian area/shore - Agriculture; Dams, barriers and locks - Flood protection; Dams, barriers and locks

[60] Cyprus subsequently clarified that from the review of the significant pressures and impacts according to the provisions of article 5 of WFD that was carried out for the preparation of the second RBMP it was shown that the status of surface water bodies is affected mainly from agriculture and hydromorphological alterations. The main pressures affecting groundwater bodies are abstraction and agriculture (diffuse) followed by discharges from agglomerations not connected to sewerage network (diffuse).

- Drinking water; Dams, barriers and locks - Irrigation; Hydromorphological alteration - Other[61].

Cyprus has mapped 30 national basic measures against four pre-defined KTMs, and one national basic measure against the nationally derived KTM "Administrative and technical water pollution control measures from abandoned industrial facilities". 43 % of the national basic measures have been mapped against KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households and another 43% against KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure. 24 national supplementary measures have been mapped against five pre-defined KTMs. 29 % of these have also been mapped against KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households and 38% have been mapped against KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity. None of the basic measures are reported to cover the requirements of Article 11(3)(b) - measures for the recovery of cost of water services (Article 9), 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, Article 11(3)(f) - controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies, Article 11(3)(i) - measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts, or Article 11(3)(l) - any measures required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents. An inventory of national measures has been reported with links to where further information can be found.[62]

There is a correlation between the operational KTMs reported to be addressing significant pressures, and the KTMs against which national measures have been mapped, with the exception of the nationally defined KTM "Administrative and technical water pollution control

[61] Cyprus subsequently clarified that only the pressures with measurable indicators are mapped to KTMs. Additionally only one KTM is related to each significant pressure. As a result of this, some pressures for which measures are included in program of measures are not correlated to KTMs and some KTMs that could be relevant are not reported in WISE.

[62] Cyprus subsequently clarified that measures implemented in the first programme of measures (including those that have been added to the operational function of the relevant competent authorities) have not been included in the second programme of measures. They also noted that some of the actions taken to address some water management issues are not included in the programme of measures. The measures that have not been included in the programme of measures for the reasons cited include some of those required to be included by Article 11(3) of the Water Framework Directive. Cyprus further clarified that 5 measures have been included in the PoM that implement Article 11(3)(i) but that they have not been indicated as such in the electronic reporting to WISE.

measures from abandoned industrial facilities" which is not reported to be addressing any significant pressures.[63]

No information was reported on the River Basin Specific Pollutants (RBSPs) causing surface water bodies in Cyprus to fail to be of good status, nor was any information provided on the KTMs in place to address River Basin Specific Pollutants in surface water bodies. Eight substances were reported to be causing groundwater bodies to fail to be of good status (tetrachloroethylene, nitrate, ammonium, chloride, sulphate, lead and its compounds, arsenic and its compounds, electrical conductivity) in 1-7 groundwater bodies. However, no information was reported on the KTMs being used in the second cycle to address these failures. Similarly for Priority Substances, six substances (trifluralin, chlorpyrifos, lead and its compounds, mercury and its compounds, nickel and its compounds, cadmium and its compounds) were reported to be causing 1-4 surface water bodies to fail to be of good chemical status, but no information was provided on the KTMs in place to address these failures.[64]

Cyprus has provided an analysis of the gap to good status for those significant pressures for which operational KTMs have been reported. For groundwater bodies, in order to address the significant pressure Abstraction or flow diversion – Agriculture, it was reported that the volume of water abstracted/diverted for agriculture would need to be reduced by 19 million m^3 in order to achieve good status. In order to achieve this 960 km^2 of irrigated land would need to be covered by measures under KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households. Cyprus reported that no further reduction in the volume of water abstracted would be required in 2021, but the area of land covered by measures would continue to be 960 km^2. No indication of what would be required in 2027 was provided. For surface waters, indicators of the gap to good status, and the level of implementation of measures required were also provided for 2015 and 2021. All the significant pressures with operational measures are expected to be fully addressed by 2021 with the exception of Diffuse – Agricultural. In 2015 the load of nitrogen was expected to be reduced by 14 t/y, with further reductions of 10 t/y expected in 2021. 1400 km^2 of land would need to be covered by measures under KTM2 - Reduce nutrient pollution from agriculture, in both the 2015 and 2021 Programme of Measures to achieve this reduction. No projections were given for 2027, so it is

[63] Cyprus subsequently clarified that this was an error in the electronic reporting to WISE.
[64] Cyprus subsequently clarified that measures are in place to control RBSPs and Priority Substances but theyhave not been clearly reported to WISE.

not known whether the 2021 Programme of Measures would be anticipated to be sufficient to achieve good status[65].

Cyprus informed that targeted measures for agriculture are already in place. For example, most of the cow farms have already built a watertight platform in order to store their manure. All the farms are frequently inspected in order to ensure sound waste management. Many aerobic and anaerobic digesters are in operation for the management of the livestock waste.

Cost-effectiveness analysis (cost-effective 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 is given the highest ranking. In the first Programme of Measures it was not clear whether cost-effective analysis had been used in the selection of measures in Cyprus. In the second Programme of Measures, it has been reported that a combination of both, quantitative and qualitative cost-effectiveness analysis has been carried out for supporting the selection of measures proposed under the 2015-2021 Programme of Measures. The selection and prioritisation of measures was further investigated in the RBMP and background documents of the assessment and it was found that the Programme of Measures did not provide much information. From the limited information available it can be concluded that the KTMs have been selected overall based on addressing pressures, but the exact methodology used has not been specified.[66]

A critical factor in the success of the implementation of the Programme of Measures is the availability of funding to support the investments required. Cyprus reported that €445 000 was invested in Article 11(3)(a) requirements (measures required to implement Community legislation for the protection of water) and €18.52m on measures under Articles 11(3)(b-l), 11(4) and 11(5) (all other measures) in the first Programme of Measures. Cyprus plans capital investment of €56.14m in Article 11(3)(a) requirements (measures required to implement Community legislation for the protection of water) and €190.585m in measures under Articles

[65] Cyprus subsequently clarified that quantitative indicators are presented where this information was available and could be derived on the basis of a reasonable effort. For the formulation of the indicators pressures related to significant loads were prioritized. Thus indicator gap from diffuse pressures from agriculture is reported instead of discharges not connected to the sewerage network as the loads derived from agriculture are ten times larger. The Indicators reported are based on the predefined indicators suggested in the guidance for reporting. From the proposed set of the predefined indicators, Cyprus selected quantitative indicators that can be calculated and monitored with relatively low uncertainty. For some of these indicators the value calculated concerns both groundwater and surface water as derived from the calculated loads (such as Load of nitrogen to be reduced to achieve objectives). As a result of the above mentioned reasoning only few measurable indicators for some of the pressures are identified and reported to WISE. For the other pressures was decided not to use general indicators which are not included in the predefined list.

[66] Cyprus clarified that the measures included in the program of measures are targeted to the significant pressures and formulated taking into consideration a number of factors including EU and national environmental policies, progress and experience of the first PoM, the status of water bodies and the results of the pressure and impact analysis, the financial resources and mechanisms available, the technical feasibility of the measures needed and the timescales in which good status should be achieved.

11(3)(b-l), 11(4) and 11(5) (all other measures) in the second Programme of Measures. No operation and maintenance costs have been reported, and depreciation has not been included in either capital investment estimate. Cyprus has reported that no European Union funding was received to support the first Programme of Measures, but that €213.79m of European Union funding is expected for the second Programme of Measures.

It has been reported that clear financial commitments have been secured for the second Programme of Measure in Cyprus from the agriculture, urban and flood protection sectors. The industry, transport, hydropower, energy, aquaculture and recreation sectors have been reported to be not relevant in Cyprus.

There was no joint consultation carried out on the RBMPs and Marine Strategy in Cyprus. The preparation of the RBMP and Programme of Measures has been reported to be coordinated with the implementation of the Marine Strategy Framework. It has been reported that there is no need for additional measures or more stringent measures beyond those required by WFD in order to contribute to the achievement of the relevant Marine Strategy Framework Directive[67] objectives in costal and marine environments[68].

The RBMPs and the Floods Directive's[69] Flood Risk Management Plans have not been integrated into a single plan in Cyprus. However, joint consultation was carried out on the RBMPs and Flood Risk Management Plans, and the objectives and requirements of the Floods Directive have been considered in the second RBMP and Programme of Measures. Cyprus indicated that specific win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures have been included in the Programme of Measures. The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, have been adapted to take into account WFD environmental objectives and clear financial commitment has been secured for the implementation of the Programme of Measures in the flood protection sector. Article 9(4) has not been applied to impoundments for flood protection in Cyprus[70].

[67] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056

[68] Cyprus subsequently clarified that during the preparation and the consultation of the second RBMP, the program of measures for the implementation of the marine strategy Framework Directive was under formulation. For this reason in the Program of Measures of the second RBMP, is clearly noted that the measures formulated for the implementation of the Marine Strategy Framework Directive, are considered as supplementary to the second RBMP

[69] 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

[70] Cyprus subsequently clarified that the integration of the RBMP and FRMP in one document is considered not feasible as the information covered by the two management plans is very different.

9.1.2. Measures related to other significant pressures

No other significant pressures have been identified in Cyprus.

9.1.3. Mapping of national measures to Key Types of Measure

It was expected that Member States would be able to report their Programme of Measures by associating their national measures with predefined Key Types of Measure. Key Types of Measure are expected to deliver the bulk of the improvements through reduction in pressures required to achieve WFD Environmental Objectives. A Key Types 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 Measure, 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 Measure in Cyprus. Also shown is the number of River Basin Districts for which the Key Types of Measure has been reported.

Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the Key Types of Measure.

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

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	3		1
KTM14 - Research, improvement of knowledge base reducing uncertainty		3	1
KTM2 - Reduce nutrient pollution from agriculture	1		1
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	13		1
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)		1	1
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity		9	1
KTM7 - Improvements in flow regime and/or establishment of ecological flows		4	1
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	13	7	1
KTM99 - Other key type measure reported under Programme of Measures - Administrative and technical water pollution control measures from abandoned industrial	1		1

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
facilities			
Total number of Mapped Measures	**31**	**24**	**1**

Source: Member States reports to WISE

Table 9.2 Type of basic measure mapped to Key Types of Measure in Cyprus

Key Type of Measure	Basic Measure Type							
	Controls water abstraction	Efficient water use	Habitats or Birds	Nitrates	Point source discharges	Pollutants diffuse	Surface Priority Substances	Urban Waste Water
KTM1 - Construction or upgrades of wastewater treatment plants								3
KTM2 - Reduce nutrient pollution from agriculture				1				
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure					5	8		
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	3	4	1				5	
KTM99 - Other key type measure reported under PoM						1		

Source: Member States reports to WISE

Key

'Controls water abstraction' = Article 11(3)(e): Controls over the abstraction of fresh surface water and groundwater and impoundment of fresh surface waters including a register or registers of water abstractions and a requirement for prior authorisation of abstraction and impoundment.
'Efficient water use' = Article 11(3)(c): Measures to promote efficient and sustainable water use.
'Habitats or Birds' = Habitats Directive (92/43/EEC) or Birds Directive (2009/147/EC)
'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.
'Surface Priority Substances' = Article 11(3)(k): Measures to eliminate pollution of surface waters by Priority Substances and to reduce pollution from other substances that would otherwise prevent the achievement of the objectives laid down in Article 4.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC) .

9.1.4. Pressures for which gaps to be filled to achieve WFD objectives have been reported and the Key Types of Measure 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 first cycle

Often there is no equivalent information for the first cycle and it is difficult, therefore, to make direct comparisons because the two cycles on what has changed significantly, and Cyprus did not provide a specific summary of changes for this topic. However, it is mentioned in various places that, based on additional information through better monitoring, various aspects of the RBMP and the Programme of Measures have been updated. Cyprus has reported that some measures have been completed from the first Programme of Measures, with the only obstacle being a lack of finance. In the RBMP and background documents assessment it was found that some measures will not be implemented because they are no longer needed, or are not possible. In the first Programme of Measures it wasn’t clear how measures were selected and cost effectiveness assessment was carried out only for measures which were already selected in the Programme of Measures so it had no effect on the selection of measures. It has been reported

that the combination of both, quantitative and qualitative costs effectiveness analysis has been carried now to support the selection of measures in the second cycle, but it is not clear how this information has actually been used.

9.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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.*

  Assessment: It was unclear how measures were selected in the first cycle. It has been reported that the combination of both, quantitative and qualitative costs effectiveness analysis has been carried now to support the selection of measures in the second cycle. However not all significant pressures have operational KTMs in place to reduce the pressures in both surface water and groundwater bodies. KTMs have not been reported to tackle some of the significant pressures reported as causing water bodies to fail to be of good status, and measures have been reported as being in place to address pressures that have not been reported to be causing failures. No measures have been reported to address the specific pollutants reported as causing groundwater bodies to fail to be of good status, or the Priority Substances causing surface water bodies to be of good status. No information on the River Basin Specific Pollutants causing surface water bodies to fail to be off good status has been provided. More information will be available from Topic 2, but from a Topic 9 perspective, this recommendation has been partially addressed. Cyprus has meanwhile provided a clarification on a number of the issues raised here (see footnotes in section above). From this it is clear that significant progress has been made to address this recommendation. However, whilst it is clear that the main focus of measures is on addressing those pressures affecting most water bodies, other pressures should also be addressed. Similarly all on-going and planned measures should be included in the second Programme of Measures.

- Recommendation: *Provide a more detailed analysis of pressures and impacts, as well as an improved risk assessment based on the improvement of the monitoring network. The RBMPs should be explicit about the impacts related to each significant pressure and provide quantitative figures on the scale of the pressures that need to be reduced, to reach WFD objectives.*

Assessment: The first part of the recommendation will be addressed by Topics 2, 3 and 4. In respect of the second part of the recommendation, Cyprus has reported quantitative indicators on the scale of reduction of those significant pressures for which operational measures are in place, and the level of implementation of the measures that is required to enable that reduction to be achieved to WISE. For all but one significant pressure, a full reduction is expected by 2021. However, no measures have been reported to address pollution from River Basin Specific Pollutants and Priority Substances, and measures have been reported as being in place to address significant pressures that have not been reported to be causing water bodies to fail to be of good status. This recommendation was further examined in the RBMP and background documents and it was found that there is no clear allocation of gap per pressure in the Programme of Measures. However, it was clear that work has been done on the quantification of (some) pressures and the allocation to pressures/KTMs. Chapter 5 of the Programme of Measures relates the significant pressures with Key Types of Measure (KTMs). This was done by establishing the biological oxygen demand, N, P contributions (as % of the overall load) to the different pressures/sectors, both for diffuse pollution (divided again into surface and groundwater) and point source pollution. The pressures overall were then allocated to their importance to surface water and groundwater status based on monitoring results, although the detailed methodology of how this was achieved was not provided. The results of this for surface water bodies are that the two main pressures are diffuse pollution from agriculture (affecting 71 % of water bodies with status below good) and hydromorphological pressures that affect 43% of the water bodies below good. Regarding groundwater bodies, the significance of pressures on chemical status was established based on N (significant pressure source if the N contribution from this pressure was more than 30% of the overall load). Finally (based on various sources), a table is provided, indicating for all pressures (including hydromorphology, combining pressures 4.1.1, 4.1.2 and 4.5 in one category as well as 4.2.2, 2.3 and 4.2.4 in another) the number (and length) of water bodies affected, pressure indicators (e.g. N, qm abstracted, length of water bodies affected by hydromorphological alterations etc.) and the KTM of relevance/a "rough" specification (e.g. "length of river bed that needs to be restored". Overall, the specific measures of the Programme of Measures then do not relate to the specific gap that will be closed through the measures per pressure - various criteria are used for the selection of measures but how these are used is not clear. In conclusion, from a topic 9 perspective, significant steps have clearly been made to address this recommendation but there is still some work to be done and therefore this recommendation has been partially addressed.

- Recommendation: *The targeting of the measures should be explicit in terms of their type and extent, to ensure that pressures are addressed adequately.*

  Assessment: As stated above, Cyprus has provided quantitative indicators on the scale of reduction of those significant pressures for which operational measures are in place, and the level of implementation of the measures that is required to enable that reduction to be achieved. For all but one significant pressure, a full reduction is expected by 2021. However, no measures have been reported to address pollution from River Basin Specific Pollutants and Priority Substances, and measures have been reported as being in place to address significant pressures that have not been reported to be causing water bodies to fail to be of good status. The recommendation was further examined in the RBMP and background documents where it was found that, as described above, the KTMs have been selected overall based on addressing pressures, but this is not then clearly specified how the specific measures have been selected. It is therefore concluded that this recommendation has been partially addressed. Cyprus has in the meantime provided clarification of a number of the issues raised here (see footnotes in section above), including the fact that measures are in place to address pollution from River Basin Specific Pollutants and Priority Substances, although this information was not reported electronically to WISE. Clarification was also provided on the prioritisation of measures, however the information provided is still not sufficiently detailed to change the conclusion of this recommendation.

- Recommendation: *Develop further the hydromorphological assessment methods so that improved biological monitoring results will allow for better risk assessment and more targeted measures concerning hydromorphological pressures.*

  Assessment: The first part of this recommendation is addressed by Topics 2 and 3. Cyprus has provided quantitative indicators on the scale of reduction of those significant pressures for which operational measures are in place, and the level of implementation of the measures that is required to enable that reduction to be achieved, this includes for the hydromorphological pressures Physical alteration of channel/bed/riparian area/shore - Flood protection, Physical alteration of channel/bed/riparian area/shore – Agriculture, Dams, barriers and locks - Flood protection, Dams, barriers and locks - Drinking water, Dams, barriers and locks – Irrigation and Hydromorphological alteration – Other. This recommendation was also examined further by a review of the RBMP and background documents where it was found that there is no specification/clear information then on which specific measure taken targets which specific hydromorphological pressure and what "gap" will be

closed.. Cyprus has in the meantime provided further information regarding the measures adopted to address hydromorphological pressures. On the basis of this information it can be concluded that this recommendation has largely been fulfilled.

- Recommendation: *Develop fully the economic analysis of water use, including the calculation of environmental and resource costs, and how the cost effectiveness analysis influenced the selection of measures.*

  Assessment: It was unclear how measures were selected in the first cycle and the cost effectiveness assessment has been carried out only for measures which were already selected in the Programme of Measures so it had no effect on the selection of measures. Cyprus has reported that a combination of both, quantitative and qualitative cost-effectiveness analysis has been carried in the second cycle to support the selection of measures. This recommendation was examined further through a review of the RBMP and background documents where it was not clear how the results of the cost-effective analysis had been used in the selection of measures. Therefore, this recommendation has not been addressed.

Topic 10 Measures related to abstractions and water scarcity

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

10.1.1. Water exploitation and trends

Water abstraction pressure is highly relevant for Cyprus. The Water Exploitation Index + (2009-2013) is 73.1 % for Cyprus, which is far beyond the preliminary European sustainability thresholds (20-40 %). The RBMP acts also as a water resource allocation and management plan.

10.1.2. Main uses for water consumption

The major use for water consumption is agriculture with 55.27 % on groundwater and 19.43 % on surface water, based on process-based deterministic hydrological and water balance modelling. Given the determination method, these figures can however be different from practice. Urban use (from groundwater 5.01 %, and from surface water 17.83 %), is the second most important water use, based on direct measurement/monitoring.

10.1.3. Measures related to abstractions and water scarcity

Regarding basic measures (Article 11(3)(e)), in Cyprus 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 not exempted from these controls.

The permitting/control system regarding water abstractions is not described in the RBMP in detail. For Article 11(3)(e), various basic measures are included in the RBMP regarding a better information base/database of abstractions (leading to a better understanding of the abstraction situation) as well as (generally) regarding better abstraction control.

In principle all water abstractions from groundwater and surface water bodies since the first RBMP require a permit including self-abstractions (Article 14 and Article 82(1), by law, for the integrated management of water resources (79(I)/2010, modification of Article 82: (121(I)/2012)), Article 82(2) defines exceptions. These are for water abstractions:

(a) not exceeding $5m^3$ at a rate not exceeding $2m^3$ per hour, provided that such an abstraction is occasional and is not part of a continuous operation or series of operations by which the abstraction is in excess of 5 m^3;

(b) for firefighting purposes or any other such emergency;

(c) from the sea, except for desalination purposes;

(d) based on a water right or from any source of privately owned water, or

(e) for research purposes by the Geological Survey Department.

Regarding the abstractions "based on a water right" and "privately owned water", Article 13(2) stipulates that existing water rights refer to rights on inland waters existing before the entry into force of this law (2010) based on the real estate law. In addition, abstractions in place before the first RBMP need to get "new" water permits, the deadline for which has been postponed a number of times.

It cannot be assessed for how many of the current water abstractions a permit is in place.

The law for the integrated management of water resources (79(I)/2010, various modifications in the subsequent years) stipulates in Article 103(5) that the water permit can be cancelled/modified if its specifications have been severely (or repeatedly) breached. The fines for not complying with the water permit content (including volumes used) are defined in Articles 112 and 134. Articles 120, 121 and 123 of the 2010 law define the rights for inspections, but do not specify the details of the inspection system (frequency, number of staff, etc.).

In practice, there are indications that the inspection system checks only a fraction of the water abstractions: in the 2014 annual report of the Water Development Department (the most recent available annual report) it is stated that "Due to the high workload in examining applications for legalising unlicensed boreholes, during 2014 the monitoring of the water meter readings was carried out on about 300 boreholes only" out of 31 500 legal boreholes. In addition, the 2014 report on water management by the Audit Office of the Republic of Cyprus criticises the almost non-existent inspection of the allowed maximum volumes of boreholes and recommends a significant increase in inspections. In addition, it states that for a large number of older boreholes (before the 2010 law) no maximum volumes are set. Even in inspection cases were the maximum volumes were exceeded (38 out of 353 of the inspected boreholes), no fine was imposed[71].

[71] Cyprus subsequently clarified that the actions required for this issue are included in the roadmap that has been prepared to tackle groundwater over-abstraction, which includes updating the database with issued licenses, verification through onsite visits, sealing of boreholes if necessary, updating license terms, installation of water meters in all boreholes.

Regarding the obligation to review abstractions within a fixed period – e.g. to adapt abstraction volumes to WFD objectives – there is no (clear) information provided in the RBMP[72].

Measures under Article 11(3)(c) have been implemented in the previous cycle but new measures and/or significant changes are also planned for the 2016-2021 period.

Measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies (Article 11(3)(f)) have been implemented in the previous cycle, and new measures or significant changes are planned for the next period.

Complementary measures are planned to be implemented in Cyprus associated to KTM7 - Improvements in flow regime and/or establishment of ecological flows and KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households, in both surface and groundwater bodies. KTM7 - Improvements in flow regime and/or establishment of ecological flows aims for 10.2m m^3 per year of water abstracted/diverted for agriculture (and public supply, which in principle is not considered within this KTM) to be reduced to achieve objectives for 18 surface water bodies. KTM8 - water efficiency, technical measures for irrigation, industry, energy and households aims for 19m m^3 per year of water abstracted/diverted for agriculture to be reduced to achieve objectives of groundwater bodies related to 960 km^2 of irrigated land, eliminating the gap for all concerned water bodies by 2021.

10.2.Main changes in implementation and compliance since first cycle

The new relevant developments regarding laws/regulations are: The regulation "regarding water pricing and cost recovery mechanisms for water services" (ΚΔΠ128/2014) set the framework for harmonious water pricing for the whole of Cyprus, covering urban water supply (households and other uses) and irrigation (from state water works, distribution of recycled water and self-abstraction). In December 2016, the Council of Ministers adopted the regulation ΚΔΠ 48/2017 which sets new specific water tariffs for urban water supply (Annex I), irrigation (Annex II-A-1)/other uses (Annex II-A-2) with water provided from state water works, irrigation/other uses with water from boreholes and surface waters (Annex II-B) and for

[72] Cyprus subsequently clarified that in chapters 13.4.1.5 and 13.4.1.6. of the RBMP a presentation of the main actions taken to tackle pressures from water abstractions for groundwater and surface waters is included. Furthermore, Cyprus has prepared two road maps for the actions that need to be implemented to this end. The main actions that are included in these two road maps are also presented in sections 13.4.1.5 and 13.4.1.6. of the RBMP. Additionally, in chapter 15 of the RBMP the schedule of the actions planned is presented. As it concerns surface waters, the adaptation of the abstraction volumes to WFD objectives has been completed for selected water bodies that are affected by significant hydromorphological pressures. To this end, relevant measures have been included in the program of measures (Ecological flows and maximum abstracted water quantity allowed in specific water bodies). However, it should be noted that Cyprus did not provide the exact number or name of water bodies for which such review had been carried out.

recycled water (Annex III)[73]. Competent authorities must take into account the status of the affected water body in the permitting procedure and authorise abstractions that allow for reaching of the WFD objectives. Over-abstractions justified by the "needs for irrigation" should not be allowed if they are not in line with the WFD obligations. According to the Intergraded Water Management Law (N79(I)/2010) all abstractions need authorisation. The fact that there are approximately 10 000 unauthorised abstractions falling in this category, mainly used for gardening, and affecting the overall water balance is a reason for concern, despite their relatively low individual consumptions.

Regarding basic measures (Article 11(3)(e)), the Law for the integrated management of water resources (79(I)/2010, various modifications in the subsequent years) is in place since the first RBMP; however, implementation (control and sanctions) of water abstractions and their exceedance remains a challenge, which is not properly dealt with to achieve the WFD objectives.

10.3.Progress with Commission recommendations

Regarding basic measures (Article 11(3)(e)), in Cyprus there is a concession, authorisation and/or permitting regime to control water impoundment and a register of impoundments; and small abstractions are not exempted from these controls. Measures on this topic have been implemented in the previous cycle but new measures and/or significant changes are also planned for the 2016-2021 period.

The Commission recommendations based on the first RBMPs and first Programme of Measures requested action on the following:

- Recommendation: *Utilise metering (especially for agriculture) to better determine quantitative status of water bodies and to secure their long-term protection because abstraction of groundwater is a significant pressure in Cyprus, mainly due to unregulated self-abstractions and permits not set consistent with environmental needs.*

  Assessment: Although in principle all water abstractions, including self-abstractions, from groundwater and surface waterbodies require a permit since the first RBMP, the law for the integrated management of water resources defines exceptions. Regarding the exemption for abstractions “based on a water right” and “privately owned water”,

[73] Cyprus subsequently clarified that pricing according to ΚΔΠ48/2017, foresees that abstractions less than 500 m3/year used for gardens are not charged. Environmental and resource costs (ERC) have been attributed to the water users who abstract water from private sources (boreholes) taking into consideration the cost of the measure, the expected environmental benefit from its application as well as the administrative constraints. All abstractions for any consumption and for any other uses will be charged with ERC, as well as all abstractions for garden irrigation above 500 m3/yr.

the law stipulates that existing water rights refer to rights on inland waters existing before the entry into force of this law (2010) based on the real estate law. In addition, abstractions in place before the first RBMP need to get "new" water permits, the deadline for which has been postponed a number of times. It cannot be assessed for how many of the current water abstractions a permit is in place. Cyprus estimates that there is around 10 000 of unauthorised (active) wells most of which are used for gardening with a permit to pump water less than 250 cubic meters per year; whilst other sources consider the number even higher[74].

In general, metering is required for new water permits (after 2010): the law for the integrated management of water resources (79(I)/2010, various modifications in the subsequent years) stipulates that every owner of a water permit has to install a water meter or another measurement system, when this is required by the conditions of the water permit. At the same time, the water abstractions (old water rights) in place before the 2010 law do not have such a strict requirement in place. For water provided by government irrigation works, the water pricing law (ΚΔΠ128/2014) states that "in cases where the metering of irrigation water is not possible (preventing pricing based on water volume used), the Director of the Water Development Department or the council of the government irrigation project on a case-by-case basis defines the way for estimating the used irrigation water volumes, either per area irrigated, crops irrigated or the length of time water was used." The same law further mentions the same exemption for non-government irrigation networks, self-supply and for irrigation with recycled water. Regulation ΚΔΠ 48/2017 which set new specific water tariffs (inter alia) also for irrigation water indicate the same restriction (charging not based on volumes but on estimations based on area, crops, time) for "irrigation/other uses with water from boreholes and surface waters", so self-abstractions (Annex II-B) for consumption less than 30 000 cubic meters per year. It cannot be assessed how many authorised water abstractions from agriculture are actually metered. In addition, there are indications that many non-authorised abstractions still exist. There is no known government action plan or commitment to apply a "strict" volumetric pricing policy (thus, requiring irrigation water to be charged only based on metered volumes). Even the recent 2017 law allows for "other estimations" (based on area, crops) and does not provide a clear action plan

[74] E.g. Anastasia Sofroniou & Steven Bishop (2014) "Water Scarcity in Cyprus: A Review and Call for Integrated Policy" refer to a considerable number of the 100,000 existing wells as illegal.

on how to change this situation[75]. In light of some of these limitations it can be concluded that this recommendation has been partially fulfilled.

- Recommendation*: 'The Programme of Measures includes some planned actions to be taken to tackle the serious problem of over-exploitation of groundwater, but they are not yet implemented and it is questionable whether they are sufficiently robust to solve the serious problem. There is a need for ambitious measures to tackle water demand and illegal abstractions.' 'Enforce 'the Law for groundwater status improvement (the application deadline for non-licensed boreholes was extended until June 2014 for farmers)'.*

  Assessment: There is no reference to illegal abstractions/boreholes in the RBMP. Only, the Economic analysis annex to the RBMP states: *"In many cases, there is no full control yet if the limits set for the use of boreholes are complied with. In combination with the existence of illegal boreholes, this has led to significant overuse of groundwater and a worsening of the status of most of the groundwater bodies of Cyprus"*.

  The Law for the integrated management of water resources (79(I)/2010, various modifications in the subsequent years) stipulates in Article 103(5) that the water permit can be cancelled/modified if its specifications have been severely (or repeatedly) breached. The fines for not complying with the water permit content (including volumes used) are defined in Article 112 and 134. Article 120, 121 and 123 of the Law define the rights for inspections, but do not specify the details of the inspection system (frequency, number of staff etc.).

  In practice, there are indications that the inspection system checks only a fraction of the water abstractions: in the 2014 annual report of the Water Development Department (the most recent available annual report) it is stated that. "Due to the high workload in examining applications for legalizing unlicensed boreholes, during 2014 the monitoring of the water meter readings was carried out on about 300 boreholes only" out of 31 500 legal boreholes. In addition, the 2014-report on water management by the Audit Office of the Republic of Cyprus criticises the almost non-existent inspection of the allowed maximum volumes of boreholes and recommends a significant increase in inspections.

[75] Cyprus subsequently clarified that the ΚΔΠ48/2017 does not withdraw the obligation to install water meters on boreholes, neither the abstraction control permit (which is always applied). All water prices are based on a volumetric basis. However, because of the unfeasibility to have access to all metering, the charging for abstraction permits below 30.000 will be calculated based on the permit, or other parameter (e.g. crop, area) if necessary. As regards the pricing within GWW, the regulations 128/2014 and 48/2017 allow for the estimation of the consumption, pricing and subsequent invoicing according to area, crop etc.

In addition, it states that for a big number of older boreholes (before the 2010-law) no maximum volumes are set. Even in inspection cases were the maximum volumes were exceeded (38 out of 353 of the inspected boreholes), no fine was imposed. In light of some of these limitations it can be concluded that this recommendation has been partially fulfilled[76].

- Recommendation: *'Promote more efficient irrigation networks and maximization of water reuse'*

  Assessment: Complementary measures are planned to be implemented in Cyprus associated to KTM7 - Improvements in flow regime and/or establishment of ecological flows and KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households, in both surface and groundwater bodies. KTM7 - Improvements in flow regime and/or establishment of ecological flows aims for 10.2 m m^3 per year of water abstracted/diverted for agriculture (and public supply, which in principle is not considered within this KTM) to be reduced to achieve objectives for 18 surface water bodies. KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households aims for 19m m^3 per year of water abstracted/diverted for agriculture to be reduced to achieve objectives of groundwater bodies related to 960 km^2 of irrigated land, eliminating the gap for all concerned water bodies by 2021. This recommendation has been implemented by Cyprus.

- Recommendation: *'Consider switching to less water-intensive agricultural products, which can often provide a better economic return.'*

  Assessment: Looking at the basic measures, no "behavioural" measures regarding agriculture and irrigation are included in the RBMP. There is only a supplementary measure regarding the provision of information/know-how to farmers regarding the sustainable use of water (ΣM-xv-01).

[76] Cyprus subsequently clarified that a Road Map has been prepared with the aim to tackle groundwater over-abstractions from agriculture. This road map is presented in the Report on Program of Measures and in the RBMP. The actions included in the road map are described in chapter 6.6 of the report on Program of Measures and in chapter 13.4.1.6 of the RBMP. Part of the actions are included in the program of measures for the period 2016-2021. The rest are considered as the main priorities of Cyprus and they will be implemented gradually according to the available resources. The Road Map is structured around the following four basic objectives: Identification and recording of all abstraction points (boreholes) and water quantity abstracted; Determination of the available water quantity for abstraction from each GWB; Promotion of water savings in agriculture; Implementation – enforcement and inspection of the actions of the road map. In chapter 15 of the RBMP the main actions that are planned and/or are have already been implemented and the timetable for their implementation are presented. For the implementation of the actions included in the Road Map and/or the obligations derived from them, a mechanism for enforcement and inspection has to be set up.

Yet, the most important measure seems to be the new water pricing regime/law (now in place, see above) which also includes environmental and resource costs and should in theory provide incentives for a more sustainable water use/change in behaviour, especially in agriculture. The incentive effects of the new 2017 water prices are not discussed/described. While the overall water pricing policy has as an aim to provide incentives, the limited/no existent increase in irrigation water prices in 2017 will likely not provide better incentives for rational water use, something that would probably be needed since many cases of not reaching the environmental objectives of the WFD are related to water use from agriculture.

The specific water prices (for all agricultural uses, including self-abstractions and use of recycled water) have been defined through the regulations ΚΔΠ 48/2017. Yet, the rates of environmental and resource costs included in the new water prices (ΚΔΠ 48/2017) are systematically lower than the ones estimated in the RBMP/the relevant economic analysis annex. In addition (and this is valid not only for the environmental and resource costs estimation, but also to a large extent also for the financial costs calculation and the resulting degree of cost recovery for the different water services): The estimations are directly taken over from a 2009-report (an update of the 2004-economic analysis report), using information for the period 2005-2007. The economic analysis annex of the second RBMP has only been partly updated (e.g. including the overall regulations regarding water pricing (ΚΔΠ128/2014)) yet the important cost recovery rates remain the same as in the 2009-report. In addition, since the estimations are based on numbers available in 2009, also the new information on monitoring/status of water bodies made available since 2009 has not been used. This information might affect the calculated environmental and resource costs (status of water bodies might be different than in the first RBMP due to new monitoring information). This is something that also the 2014 report on water management by the Audit Office of the Republic of Cyprus criticises. The water pricing for irrigation water overall for Cyprus (up to 2013) are reported in the RBMP as 0,05 €/m^3 to 0,56 €/m^3. The new water prices (since 2017) are in the range of 0,12-0,17 €/m^3 (plus a yearly connection fee) for irrigation water provided by government irrigation works. No real increase can be found as compared to the previous prices (for 2005-2007, but valid until 2016): the economic analysis report shows 0,15 to 0,17€ /m^3 for irrigation water provided by government irrigation works (but without a connection fee). These price changes cannot be assessed in more detail, yet it cannot be expected that a higher cost recovery rate for irrigation can be reached through these new water prices. It is important to note here the economic analysis report itself states on pp. 8-102 that "an increase of irrigation water price between 0,21 to 0,25€/m^3 would not disrupt the agricultural production system in Cyprus in the short-

to medium term". The calculated environmental and resource costs related to agriculture (in the economic analysis annex to the RBMP) are approx. Five to ten times higher than the ones included in the 2017 pricing regulation: the calculated environmental and resource costs are approximately 0,1€ /m^3 for government works, 0,194€ /m^3 for self-abstractions and 0,056€ /m^3 for recycled water. In the RBMP there is no discussion of "adequateness" of these contributions, since the RBMP was adopted before the water price stetting regulation came into force. So, an analysis by Cyprus on if the new water prices for agriculture are "adequate" does not exist[77]. Limited directly applicable progress has been made in meeting this recommendation.

[77] Cyprus subsequently clarified that the water tariff for irrigation of 0.56 €/m3 mentioned above was the overconsumption charge from GWW until 2016. With the ΚΔΠ48/2017, this price was revised to €0.45/m3, i.e. equal to the full cost of irrigation water from GWW, including ERC. The new water prices (since 2017) for irrigation water provided by government irrigation works are in the range of €0.12 to 0.45 €/m3 € (plus a yearly connection fee). The ERC applied for agricultural irrigation is well below the estimated cost, as stated above, due to social and economic reasons and after a public consultation process.

Topic 11 Measures related to pollution from agriculture

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

In the first cycle diffuse pollution from nutrients and over abstraction were the two main pressures but in the second cycle only diffuse pollution is mentioned and measures are proposed. An overall gap assessment was carried out for nitrogen, phosphorus and biological oxygen demand through an evaluation/prediction of how effective the measures would be at reducing the pressures to the level to achieve good status, including measures for controlling diffuse pollution. The summary of the "objectives" provides information on what was carried out regarding surface water bodies and involved a comparison of the estimated loads of Nitrate, Phosphorus and biological oxygen demand with the transition loads e.g. loads that trigger the transition form good status to status less than good, for each type of river water body, as part of an analysis of the significance of pressures in Cyprus' river water bodies carried out by the Water Development Department. The analysis also considered other critical parameters such as the level of uncertainty of the classification of the status of the water bodies, the progress of ongoing projects aimed to tackle the impacts of activities in the waters (e.g. the Vati Project, Wastewater Treatment Facilities) and the estimated reduction of the loads and impacts expected from the implementation of the proposed program of measures. The area of agricultural land required to be covered by agricultural measures to achieve objectives would be 1.400 km^2 and is not going to change between 2015 and 2021.

The Programme of Measures summarizes what has been implemented with regard to reducing agricultural pressures. Therein, various activities "over the last years" were mentioned, including six new Nitrate Vulnerable Zones, a new mandatory action programme for vulnerable zones (from 2014), the good agricultural practice code (from 2007) as well as various actions in the Rural Development Programme (2007-2013). Further, the Programme of Measures with regard to Nitrate Vulnerable Zones, states that the provisions of the Nitrate Directive have been implemented; in addition, a revised action programme had been agreed in 2014 (with the specific activities described). For controlling its implementation, controllers for each province have been assigned. There is no specific mention of how much the Nitrate Action Programme will contribute to closing the nutrient gap.

Mandatory measures (KTM2 - Reduce nutrient pollution from agriculture) under Article 1(3)(h) for the control of diffuse pollution from agriculture at source are the only measures reported to have been taken to tackle the pressure. There are various basic measures (the minimum requirement to be complied with) related to Article 11(3)(h), many of them related to

agriculture, but how much each measure will contribute to good ecological status/closing the gap has not been assessed in detail. Controls or general binding rules (Article 11(3)(h) WFD) for addressing diffuse pollution from agriculture at source are applied and implemented, under differentiated rules for different parts of the RBDs.

Regarding Article 11(3)(d), the Programme of Measures mentions that no additional measures/activities are needed beyond what is already implemented and refers to "activities for protection of protection zones" (including for the drinking water protection zones and nitrate vulnerable zones). The regulations regarding drinking water protection zones are extensive and include safeguard zones (for a description, see T15, Q 4.1 and 4.2) and have been implemented since the first RBMPs. These refer also to prohibitions regarding agricultural activities.

Measures to reduce hydromorphological pressures from agriculture are also part of the Programme of Measures. Legally binding measures under Article 11(3)(g) measures seem not to be needed to reduce point sources of agricultural contaminants as no point pressures from agriculture are reported.

No information is provided as regards whether or not farmers/farmers' Unions have been consulted under the Public Consultation process.

In the first cycle no clear information on how the measures would be funded was provided. This information has now been provided for the first cycle and financing in the second cycle of agriculture measures is now reported to be secured. Water pricing is mentioned as a measure in the first cycle but this is not reported for the second cycle.

Advisory services and measures to tackle the issue of pesticides have been applied in Cyprus as a result of the implementation of other policies concerning agriculture. According to Directive 2009/128[78] and the National Action Plan, all professional users should hold a Professional User of Plant Protection Products (PPP) Training Certificate.

11.2.Main changes in implementation and compliance since first cycle

In the first cycle diffuse pollution and over abstraction were reported as being the two main pressures. This has changed and in the second cycle only diffuse pollution is mentioned as the significant pressure from agriculture. Water pricing was reported as a measure in the first cycle, but this is no longer the case for the second. In the first cycle no clear information on how the measures will be funded has been provided. This information is now provided for the first cycle. Financing of agriculture measures is secured now for the second cycle.

[78] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides.

11.3.Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures requested action on the following:

- Recommendation: (from first RBMP assessment) *Agriculture is indicated as exerting a significant pressure on the water resource in Cyprus. 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 CAP funds can adequately set up Rural Development programmes and cross compliance water requirements.*

  The information provided is not fully sufficient to check whether the recommendation has been fully implemented although parts of the recommendation have been addressed according to the information provided.

- Recommendation: (from PoM assessment) *Review the degree to which the existing measures to implement the Nitrates Directive (ND) are sufficient to address agricultural pressures and concentrate efforts on ensuring farmers understand their obligations in this regard and can finance the necessary investments. Additionally Cyprus should ensure basic measures as per article 11.3.h of the WFD are put in place to control other diffuse pollutants – e.g. phosphate, pesticides, particulate matter. These measures should be specific, have a clear legal basis, and include appropriate advice, monitoring and inspection regimes to ensure their effective implementation. In addition to the basic measures, it should be set out clearly what supplementary measures will be needed to bridge the gap to good status and which of these measures will be included in the second POM and what funding sources will be used to deliver these. Clear references to expectations for the Rural Development Programs (RDPs) in this regard (and to other funding sources) are expected. Irrigation investments made in the Rural Development Programmes must be carried out to ensure water saved goes back to restore depleted aquifers.*

  Assessment: It can be deduced that good progress has been made towards fulfilling the requirements of this recommendation. A gap assessment regarding nitrogen, phosphorus and biological oxygen demand was performed including an

evaluation/prediction of how effective the measures are/would be at reducing the pressures to the level to achieve good status.

The Action Program for protecting Nitrate Vulnerable Zones from agricultural sources was revised, after communication between the Cypriot authorities and the European Commission/DG Environment. The amendments of the Action Program include the following:

- Inclusion of definitions of various terms used in the program;
- The prohibition of using nitrogen fertilizers from the 1st of November of each year until the 31st of January of the following year;
- Additional information on the calculation of the required capacity of the evaporation lagoons, considering rainfall and evaporation;
- A set of clear requirements for temporary storage of solid manure;
- Additional provisions for monitoring the implementation of Action Program by a Committee;
- Additional provision for soil analysis every two years for trees and cereals and every year for vegetables and water analysis every three years;
- Additional information and examples for easier calculation of the maximum quantity of manure which farmers can use in order to comply with the limit of 170Kg of nitrogen per hectare per year;

Furthermore, it is noted that Cyprus authorities are in the process for a new revision of the Action Program. The purpose of the new revision is to include:

- A new table for the crop nitrogen needs in relation to the yield and irrigation needs, and;
- A new analytical table containing the manure and annual nitrogen excretion by several categories and subcategories of animals.

The issue of Nitrate Vulnerable Zone is planned to be re-examined in the next management cycle, in conjunction with the implementation of the Floods Directive 2007/60/EC[79] in Cyprus.

Basic measures under Article 1(3)(h) are taken and address microbiological and bacteriological issues, nitrates, organic pollution, pesticides and phosphorus. Also measures to reduce hydromorphological pressures from agriculture are reported. Legally binding measures under Article 11(3)(g) measures seem not to be needed to reduce point sources of agricultural contaminants as no point pressures from agriculture are reported.

Funding information in relation to measures is provided. It remains unclear from the RBMP if irrigation investments made in the Rural Development Programmes are carried out and if it is ensured that water saved goes back to restore depleted aquifers.

[79] 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

Topic 12 Measures related to pollution from sectors other than agriculture

12.1. Assessment of implementation and compliance with WFD requirements in 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. Key types of measures (KTM) are groups of measures identified by Member States in their Programmes of Measures which target the same pressure or purpose. A KTM could be limited to 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.

The following KTMs relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for the Cyprus RBD:

KTM1 - "Construction or upgrades of wastewater treatment plants"

KTM14 - "Research, improvement of knowledge base reducing uncertainty" and

KTM21 - "Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure".

These KTMs do not include 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", nor KTM16 – "Upgrades or improvements of industrial wastewater treatment plants (including farms)", despite the fact that the Topic 3 and Topic 4 assessments have indicated that both Priority Substances and River Basin Specific Pollutants could cause non-compliance.

The WFD specifies that Programme of Measures shall include, as a minimum, “basic measures” and, where necessary to achieve objectives, “supplementary measures” when basic measures are not enough to address specific significant pressures (see chapter 9 in this report). Quantitative information on basic measures used to tackle pollution from non-agricultural sources (number of measures per KTM) has been provided for KTM1 and KTM21. No supplementary measures are mentioned.

Three KTM1 measures (designated BM-a-01 to 03) have been applied:

- Completion of the sewage systems (networks and treatment) for;
- Continuation of monitoring on compliance of the wastewater treatment plants in vulnerable zones, and;
- For the vulnerable zones: constructing the sewage network and appropriate treatment for the remaining part of one settlement.

Under KTM21, 13 basic measures are indicated, of which five are tackling point sources and eight diffuse sources (however, all these 8 measures are related to agriculture). The five non-agricultural measures tackling point sources (designated BM-g-01 to 05) are as follows:

- Increasing coherence of monitoring and establishing a remediation plan for old mine material disposal sites in order to improve chemical status to good;
- Implementation of a specific intensive investigative monitoring programme for Nickel in the Kouris river;
- Immediate remediation of the waste disposal site of Lemessos;
- Priority specification and implementation of the following projects: Wastewater treatment plants for Apakapa and Apilikio municipalities, construction of sewage network and wastewater treatment plant in the Ag. Ioannis Agros municipality, and;
- Immediate remediation of the waste disposal site of Lemessos.

No systematic information is provided on what effects these KTM21 measures will have on reaching the objectives. They focus on waste disposal sites, old mining sites, a specific monitoring programme for one substance in one surface water body, and urgent wastewater treatment projects.

Cyprus provided more targeted information on basic measures required under Article 11 (3)(c to k). Use of an authorisation and/or permitting regime to control waste water point source discharges (Basic measures Article 11(3)(g)) was reported for the Cyprus RBD for surface and groundwater. A register of waste water discharges (Basic measures Article 11(3)(g)) is available in the Cyprus RBD for surface and groundwater. Small waste water discharges are exempted from controls in Cyprus and some direct discharges to groundwater are authorised in accordance with Article 11(3)(j).

Measures explicitly to eliminate/reduce pollution from Priority Substances and other substances are not in place in Cyprus despite the fact that both Priority Substances and River Basin Specific Pollutants could cause non-compliance (see Topics 3 and 4).

Cyprus subsequently clarified that the review of the significant pressures and impacts (Article 5, WFD) carried out for the preparation of the second RBMP showed that waterbody status is affected mainly by:

- Agriculture
- Hydromorphological alterations
- Discharges from agglomerations not connected to sewerage network
- Waste disposal facilities
- Vati (Wastewater facility)
- Mines

As a result the Programme of Measures was formulated to tackle those pressures, in particular, out of a total of 55 measures:

- 17 measures targeted to hydromorphological alterations (14 supplementary)
- two measures targeted to wastewater (all basic)
- two measures targeted to waste disposal (all basic)
- nine measures targeted to agriculture (two supplementary)
- 10 measures targeted to abstraction (six supplementary)
- three measures targeted to mining activities (onesupplementary)

Additionally six measures for protected areas and six horizontal measures concerning actions related to more than one of the abovementioned activities are included.

Details of the above mentioned measures as well as of the waterbodies concerned are given in the report on the Programme of Measures in Chapter 9.

12.2. Main changes in implementation and compliance since first cycle

Measures in the first RBMP were not clearly linked to status failures or specific substances. This information is missing in the second RBMP as well. No information on or explanation of

measures planned for the Priority Substances and River Basin Specific Pollutants causing failure was found in the RBMP/Programme of Measures.

Cyprus subsequently provided additional information, as indicated above, stating that measures to tackle River Basin Specific Pollutants and Priority Substances are included in the Programme of Measures. The main sources of these substances are agriculture, waste water discharges, mining, and waste disposal sites, which are addressed by the measures listed above, and by some horizontal measures (mainly administrative measures or measures concerning monitoring) that are relevant to these substances. The main measures that address pollution from River Basin Specific Pollutants and Priority Substances are the following

- BM-h-03: Inclusion in cross compliance rules of specific arrangements – obligations related to water body protection in targeted areas
- BM -h-04: Pasture land management
- BM -h-05: Restrictions on use of chemical herbicides in specific crops
- BM -h-06: Application of crop rotation to potato and cereal crops
- BM -h-07: Organic farming
- BM -h-09:Targeted agro-environmental actions for potato and citrus tree crops
- BM-g-04: Prioritization of the construction of the following works: Construction of the WWTP of Arakapia, Construction of the WWTP of Apliki, Construction of sewage pipeline and WWTP in Ag. Ioannis Agros.
- BM-g-03: Immediate rehabilitation of existed Waste Disposal Site of Lefkosia
- BM-g-05: Immediate rehabilitation of existed Waste Disposal Site of Lemessos
- ΣM-xvi-01: Special monitoring programme of the trends in the chemical status in Argaki Limnis WB to draw conclusions on the effectiveness of the rehabilitation works in Limni Mine on the water status, with the aim of applying them to rehabilitation works planned in other regions.

Details of the above mentioned measures as well as of the waterbodies concerned are given in the report on the Program of Measures in Chapter 7.3.6 (pp. 7-127 – 7- 147), chapter 7.3.5 (pp. 7-117 – 7- 127) and chapter 7.4.7 (pp. 7 – 210)

For these measures only a limited number of KTMs is reported.

12.3. Progress with Commission recommendations

The Commission made one recommendation based on the first RBMPs and first Programme of Measures:

- Recommendation: "*Accelerate implementation of the Urban Waste Water Treatment Directive measures, availing of European Union funds as collecting systems and treatment plants are not fully operational (62,0% of the population equivalent according to 2010 data).*"

  Assessment: Measures to tackle urban point sources are reported in WISE. Regarding the implementation of the Urban Waste Water Treatment Directive, in the Programme of Measures (pp. 6-60) it is stated that at this point, 17 urban wastewater treatment plants are operational with a capacity of 1141350 population equivalents (p.e.) that cover 57 settlements. Four additional ones (those from BM-a-01) are under construction and are co-financed with cohesion funds of €139 million. Beyond that, an additional wastewater treatment plant is being constructed with the support of Switzerland. According to the revised Urban Waste Water Treatment Directive implementation plan, for 2016-2021 an increase in capacity of 312150 p.e. is planned, with a budget of €480 million, leading to 23 urban wastewater treatment plants being operational.

  Regarding the relevant (Article 11(3)(a)) measures, a summary is given in the RBMP of the legal transposition of the Urban Waste Water Treatment Directive, the current implementation status (also regarding the use of sludge, relevant monitoring etc.) as well as the targets of the revised 2011 implementation plan. It is stated that a significant reduction of diffuse pollution is expected through the implementation of the Urban Waste Water Treatment Directive.

  The recommendation therefore appears to have been acted upon.

Topic 13 Measures related to hydromorphology

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

The only significant hydromorphological pressures for which the number and size of affected surface water bodies are reported in WISE relate to physical alterations of the channel/bed/riparian area/shore (due to other uses) of two lake water bodies. For river water bodies, even though significant hydromorphological pressures are not reported, there are significant abstraction pressures due to agriculture and public water supply. Overall, it remains unclear why several hydromorphological pressures are reported as not significant, since the Programme of Measures mentions that 43% of all surface water bodies are facing significant hydromorphological pressures. The Cypriot authorities subsequently informed that for the second RBMP a methodology for the assessment of hydromorphological pressures has been developed. This methodology is used for the review of the impacts and pressures carried out under Article 5 and further developed and applied in the first steps of the methodology for the designation of HMWBs. As a result, 43% of the surface water bodies classified with ecological status less than good are facing significant hydromorphological pressures and relevant measures are included in the program of measures to tackle them.

At the same time, operational KTM to tackle significant pressures are not reported for the physical alterations of lakes due to other uses but are reported for other types of hydromorphological pressures, namely physical alterations due to flood protection and agriculture, dams/barriers/locks due to flood protection, drinking water and irrigation as well as hydromorphological alterations due to other use. The relevant KTM reported are KTM5-Improving longitudinal continuity and KTM6 - Improving hydromorphological conditions. Quantitative management objectives in terms of restoring river continuity have been set.

To tackle the significant abstractions on river water bodies, KTM7-Improvements in flow regime and/or establishment of ecological flows was reported to be made operational.

Supplementary measures of relevance to hydromorphology include following activities as options: fish ladders, habitat restoration, removal of structures, restoration of modified bed and bank structures, setting of ecological flows. Some additional activities are mentioned such as pilot measures to support protected species in selected natural rivers, tree planting to support hydromorphological improvements; monitoring of ecological effectiveness of ecological flows and studies to improve knowledge on inland fish in rivers and lakes of Cyprus.

In terms of basic measures planned to tackle hydromorphological pressures, there is an authorisation and/or permitting regime in place to control physical modifications, 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 RBMP also indicates that the relevant authorities have set a regulation and permitting system for projects/activities which can potentially cause hydromorphological alterations. This consists of:

- A registry of all dams and an assessment of their impacts on the river water bodies;
- A specific regulation framework has been set up for the permitting and approval of new developments adjacent to water bodies in order to fulfil both the WFD and Flood Directive requirements, and;
- Public and private work/projects and activities with significant impact on the environment including the morphological condition of the water bodies undergo an environmental permitting process.

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 reported to be included in the Programme of Measures. The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, is also reported to have been adapted to take into account WFD objectives.

Ecological flows have been derived and implemented for all relevant water bodies. KTM7 (on improvements in flow regime and/or establishment of ecological flows) was reported as an operational KTM to tackle significant abstractions or flow diversions for agriculture and public water supply.

For the preparation of the second cycle RBMP, a specific analysis was conducted for the identification of the e-flows in heavily modified river water bodies downstream of dams with the aim of achieving Good Ecological Potential. For this analysis, CIS Guidance Document number 31 was taken into consideration and the IHA method is applied in 21 river basins aiming to determine the adequate environmental profile of the flows. The results of this analysis are used to formulate the three relevant measures for the determination of environmental flows in selected dams; release environmental flows downstream of dams, release environmental flows targeted in selected sites of significant ecological importance and release flood flows in selected dams. The above mentioned measures define the standards for ecological flows in Cyprus. Furthermore a special measure has been included with a view to

monitor the results of the proposed flows in aim to revise them if necessary in the next management cycle.

No reference to an additional administrative law/regulation regarding ecological flows was found in the RBMP. It is mentioned though that, in the context of the development of the second RBMP, the needs for water in rivers and important ecosystems/protected species below dams have been "reassessed", so that specific regulations of the hydrological regime can be developed to protect the important ecological characteristics that are supported by the rivers. In addition, according to national legislation, the programme of measures included in the RBMP is approved by the ministerial Council. Thus the implementation of the programme of measures is mandatory, and the application of the environmental flows included in the RBMP is binding for the relevant administrative bodies.

Indicators on the gap to be filled for significant hydromorphological pressures and significant abstraction pressures and KTM indicator values were reported for 2015 and 2021. From the information available, it can be concluded that there is ambition to close the gap for hydromorphological pressures and abstraction pressures by 2021 with measures taken in the second planning cycle. Gap indicators and KTM indicators were zero in 2021, implying that no further measures would be needed after 2021.

13.2. Main changes in implementation and compliance since first cycle

The links between water uses and pressures, and pressures and measures are clearer in the second RBMP reporting, also due to the improved reporting in WISE.

The RBMP presents the main actions that are completed as a result of the objectives set in the first cycle RMBP. During the first cycle, authorities have registered all these hydromorphological pressures and a regulation and licensing framework has been established for activities potentially leading to hydromorphological alterations. The main actions completed were: creation of a register of all dams / and weirs in Cyprus and evaluation of their impacts on river water bodies, establishment of a specific regulatory framework for the authorization and approval of new developments adjacent to rivers, and requirement for public and private projects and activities with significant impacts on the environment including on the morphological status of the water bodies to be subject to environmental licensing. The actions taken were therefore mainly of administrative and regulatory character. It is stated that in the first RBMPs, specific topics were not considered appropriately due to a lack of knowledge of the situation, e.g. on the morphological alterations of river water bodies.

13.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures requested action on the following:

- Recommendation: (report 2015) *Develop further the hydromorphological assessment methods so that improved biological monitoring results will allow for better risk assessment and more targeted measures concerning hydromorphological pressures. Cyprus should be more ambitious in second RBMPs in relation to hydromorphological measures.*

  Assessment: The assessment of the first part of the recommendation with regard to hydromorphological assessment is provided in chapter 2 on the characterisation of the RBD. Concerning the second part of the recommendation on measures, the actions taken on the basis of measures planned in the first cycle RBMP were mainly of administrative and regulatory character. During the first cycle, authorities have registered all hydromorphological pressures and a regulation and licensing framework has been established for activities potentially leading to hydromorphological alterations. In addition, a methodology for the assessment of hydromorphological pressures has been developed to improve knowledge on hydromorphological alterations. In the second cycle RBMP, operational KTM to tackle significant hydromorphological pressures are reported. 43 % of the surface water bodies classified with ecological status less than good are facing significant hydromorphological pressures and relevant measures are included in the programme of measures to tackle them. Monitoring activities are still ongoing to verify measure effectiveness, e.g. on the ecological effectiveness of ecological flows and studies on fish fauna.

  Overall, progress is noted in the planning of hydromorphological measures for the second RBMPs and the recommendation is considered as 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 of water infiltration and thus aquifer recharge, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure."*

  Assessment: The specific KTM23 on Natural Water Retention Measures is not reported as operational to tackle any significant pressures in the second cycle RBMP. However, the RBMP refers to synergies with measures taken under the Flood Risk Management

Plan (FRMP). The management of water resources in Cyprus for the period 2016 -2021 is formulated by jointly in the two management plans RBMP and FRMP. The Cypriot authorities have informed that Natural Water Retention Measures are included in the FRMP where appropriate (however apparently at a limited extent), for example projects for groundwater enrichment and reduction of water flow in river beds upstream, use of absorption pits for rainwater retention, promotion of runoff reduction practices, promotion of private rainwater harvesting systems, stream restoration, upstream flood retention.

On the basis of this information, this recommendation is considered as partly fulfilled, with the use of natural water retention requiring revisiting in the next Plan.

Topic 14 Economic analysis and water pricing policies

14.1. Assessment of implementation and compliance with WFD requirements in second cycle

A rather broad definition of water services has been used. Water services according to the RBMP are classified as urban water supply, irrigation water supply, sewage collection/wastewater treatment and recycled water for irrigation. Self-services are referred to (such as private abstractions for water supply) in the description of the provision of drinking water and of irrigation water.

No justification/explanation for the use of Article 9(4) can be found in the RBMP and Annexes[80].

Environmental and resource costs are reported in WISE as calculated, significant and considered as internalised.

There is no information on the incentive function of water pricing for all water services provided[81].

Volumetric charging was reported in WISE as applied for drinking water abstraction (surface and/or groundwater), treatment and distribution, self-abstraction and recycled water for irrigation. It was reported as partly applied for sewage collection and wastewater treatment and irrigation water abstraction, treatment and distribution. The issue of illegal abstractions is not discussed in the economic analysis.

It needs to be noted that after the adoption of the RBMP, a new water pricing law/regulation has been put into place: In December 2016, the Council of Ministers adopted the regulation 48/2017 which set new specific water tariffs for urban water supply, irrigation and other uses with water provided from state water works, irrigation and other uses with water from boreholes and surface waters and for recycled water. This new legal framework adopted on water pricing to give effect to Article 9 of the WFD is now being implemented.

The economic analysis was reported as updated.

[80] Cyprus notified the Commission that the data reported in WISE will be corrected.

[81] Cyprus notified the Commission that this issue has been addressed in the meanwhile by Regulation KDP45/2017.

14.2.Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures 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.*

- Recommendation: *Develop fully the economic analysis of water use, including the calculation of environmental and resource costs.*

  Assessment: As stated above, “Water services” according to the RBMP are classified as urban water supply, irrigation water supply, sewage collection/wastewater treatment and recycled water for irrigation. Self-services are referred to in the description of the provision of drinking water and of irrigation water. Self-supply now is also charged a contribution for covering environmental and resource costs.

  In the RBMPs there are no cost recovery contributions calculated for the different water uses[82].

  The RBMP provides an economic analysis of the significant water uses and the level of cost recovery for different water services. The financial cost recovery rates reported are: 95 % for drinking water abstraction (surface and/or groundwater), treatment and distribution; 100 % for sewage collection and wastewater treatment; 56 % for irrigation water abstraction, treatment and distribution; 100 % for self-abstractions and 18,5 % for recycled water for irrigation.

  The calculated environmental and resource costs related to agriculture (in the economic analysis annex to the RBMP) are significantly higher than the ones included in the 2017 pricing regulation. Both environmental and resource costs are calculated based on the restoration cost method.

[82] Cyprus notified the Commission that this issue has been addressed in the meanwhile by Regulation KDP45/2017.

There is no reference to the Polluter Pays Principle in the RBMP or the economic analysis report[83].

There is no information on the incentive function of water pricing for all water services provided. Instead, the economic analysis report presents the water pricing provisions for the different water services, but without discussion of their incentive effects. This is based on the 2014 law; the incentive effects of the new 2017-water prices are not discussed/described in the RBMP, since they were agreed after the RBMP was adopted.

Overall, Cyprus has made progress regarding the implementation of the European Commission´s recommendation (definition of water services, calculation of environmental and resource costs), including through the new water pricing put in place after the preparation of the RBMP, which is therefore partially fulfilled.

[83] Cyprus notified the Commission that this issue has been addressed in the meanwhile by Regulation KDP45/2017.

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

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

The identification of Protected Areas includes areas related to Article 7 (Drinking Water Directive), Bathing Waters, Habitats, Nitrates and the Urban Waste Water Directives.

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

Protected Area type	Number of sub-units			
	Rivers	Lakes	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7[84]	12			13
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[85]			113	
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)[86]				
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)[87]	29	4	8	
Nutrient-sensitive areas, including	6	1	5	6

[84] Cyprus subsequently highlighted that in areas designated for the abstraction of water intended for human consumption a monitoring programme is implemented in accordance with the provisions of Directive 80/778/EEC as amended by 98/83/EC. Additionally 12 impounded rivers (reservoirs) fall into drinking (surface) water protected areas (Drinking Water Protection Area). Cyprus stated that these designated protected areas include the entire catchments, so the existing monitoring of these surface waters within the protected catchments could be considered as monitoring in protected areas.

[85] 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
Cyprus subsequently noted that for bathing waters included in the Register of protected areas 113 sites are monitored in accordance with the provisions of Directive 2006/7/EC and two basic parameters are monitored monthly; Intestinal enterococci and Escherichia coli.

[86] 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

[87] 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

Protected Area type	Number of sub-units			
	Rivers	Lakes	Coastal	Groundwater
areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive[88]) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive[89])				
Areas designated for the protection of economically significant aquatic species				
Other				

Source: Member States reports to WISE

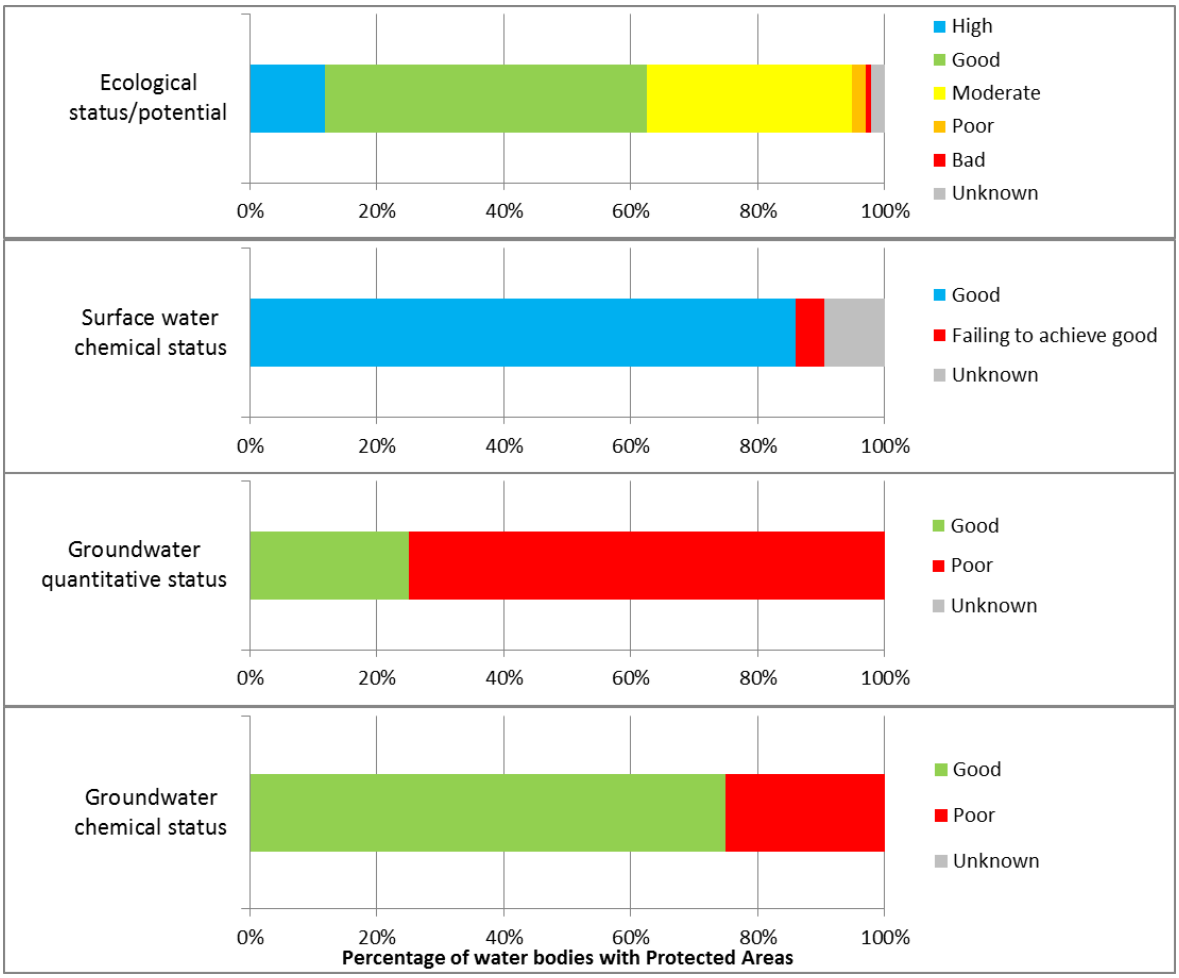
Overall, the status assessment for Protected Areas is considered to be adequate. However, a substantial number of the assessments have been made on the basis of information with low associated confidence, indicating a significant need for additional monitoring[90]. This corresponds with the fact that no specific monitoring activities for the different types of Protected Area have been reported. Figure 15.1 shows that quantitative status is the main issue associated with protected areas. For groundwater, Protected Areas related to Drinking Water and Nutrient-sensitive areas have been identified (Table 15.1).

[88] 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
Cyprus subsequently clarified that the monitoring network in vulnerable zones consists of 222 monitoring stations and highlighted that a major part of the WFD monitoring network is part of the monitoring network for nitrate pollution in accordance with the provisions of Directive 91/676 / EEC.

[89] 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
Cyprus subsequently notedthat in sensitive areas controls for the compliance of Urban Waste Water Treatment Plants are carried out in accordance with the provisions of the Article 15 of Directive 91/271/EEC. The quality monitoring program of urban waste water treatment plant started in 2007.

[90] Cyprus clarified subsequently that the monitoring programmes for protected areas are presented in the RBMP. These are in place in accordance to other Directives and their results are reported and/or published as required. These monitoring programmes are supplementary to the monitoring programmes under Article 8. Cyprus also informed that the data reported on protected areas to WISE will be corrected.

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



Source: WISE electronic reporting

The number of Protected Areas of the different categories and types has not changed significantly between the first and second cycle plans, except for Protected Areas related to the Nitrates Directive[91] where the number has increased from five in the first cycle to 17 in the second cycle.

No additional objectives have been set for Protected Areas, including Drinking Water and Habitat areas where it is thought that good ecological status is sufficient to reach the objectives of the Habitats Directive.

No monitoring sites are reported to be associated with Protected Areas in Cyprus which reiterated the point that a substantial part of the status assessments have been made on the basis

[91] 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

of information of low confidence[92], indicating a significant need for additional monitoring. No additional measures are reported, but as no additional objectives have been set, additional measures are not to be expected. However, the assessment of the RBMPs and background documents did identify the very differentiated regulation of safeguard zones for the protection of drinking water from both surface water reservoirs and ground water boreholes.

15.2.Main changes in implementation and compliance since first cycle

The number of Protected Areas of the different categories and types has not changed significantly between the two cycles, except for Protected Areas related to the Nitrates Directive[93] where the number has increased from five in the first cycle to 17 in the second cycle.

No information about specific monitoring of Protected Areas was reported in the second cycle RBMP, compared to a program in the first cycle with monitoring sites for all relevant types of Protected Areas[94].

15.3.Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and first Programme of Measures for this topic.

[92] Cyprus subsequently referred to comments in Topics 3, 4 5 and 6 where it is clarified that the characterisation of the status is considered reliable and comparable to other Member States.

[93] 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

[94] Cyprus informed subsequently that the data reported to WISE on protected areas will be corrected.

Topic 16 Adaptation to drought and climate change

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

Climate change was considered in the RBMP and it is stated that the guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24[95]) was used. Climate change was considered for drought management and flood management as well as for detecting climate signals. However, KTM24 - Adaptation to climate change is not reported to have been made operational to address any of the significant pressures[96].

According to the 2012 Topic Report on Water Scarcity and Drought in RBMPs[97], droughts and water scarcity (abstractions) were not clearly distinguished. No exemptions have been applied for Cyprus 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. The second RBMP of Cyprus explicitly refers to and includes the Drought Management Plan of 2011 which was modified in 2013. The RBMP states that the Drought Management Plan measures are an integral part of the RBMP. Certain RBMP measures are reported (and described) which have direct synergies with the management of drought events. Additional measures/actions can be found in the Drought Management Plan for different drought severity levels e.g. Temporary restrictions to water use and other uses (environmental flows from reservoirs restricted to "absolute minimum"), and increased controls.

16.2 Main changes in implementation and compliance since first cycle

In the first RBMP Climate change was only mentioned in a very general way on a few occasions in two of the annexes of the RBMP. In the second RBMP climate change has been addressed more widely and a climate proofing of measures has been undertaken.

16.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and first Programme of Measures for this topic.

[95] 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

[96] Cyprus subsequently clarified that 18 measures out of 55 are strongly related to climate change. Due to some misunderstandings, only a limited number of KTM was reported in WISE.

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