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**COMMISSION STAFF WORKING DOCUMENT**

**Member State : Cyprus**

*Accompanying the document*

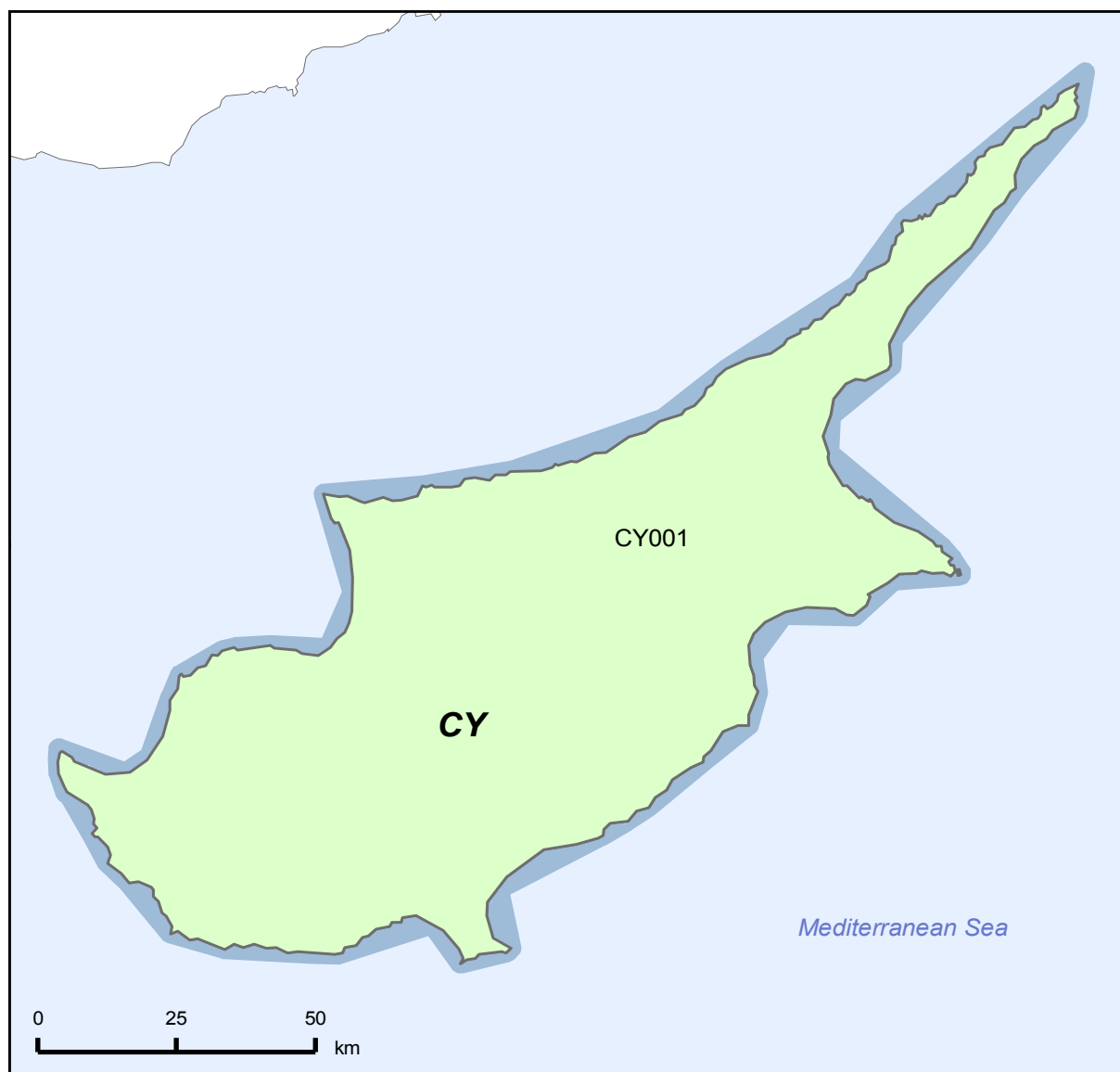
**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND  
THE COUNCIL**

**on the Implementation of the Water Framework Directive (2000/60/EC)**

**River Basin Management Plans**

{COM(2012) 670 final}

## 1. GENERAL INFORMATION



**Figure 1.1:** Map of River Basin District


**Source:** WISE, Eurostat (country borders)

Cyprus has a population of 0.8 million<sup>1</sup> and a total surface area of 9,250 km<sup>2</sup>. Cyprus is the largest island in the eastern Mediterranean and is situated south of Turkey. 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.

Cyprus has one river basin district that covers the country's whole territory.

The Cyprus 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.

## **2. STATUS OF RIVER BASIN MANAGEMENT PLAN REPORTING AND COMPLIANCE**

### **2.1 Adoption of the RBMPs**

The Cyprus RBMP was adopted on 9 June 2011.

### **2.2 Links with other water plans**

The RBMP was subject to a Strategic Environmental Assessment (SEA). The SEA was published and made available to the stakeholders for comments from May 2010 to November 2010. On December 2010 the SEA was submitted to the Environmental Authority Board and was approved on March 2011. However, it seems that policy options of the RBMP were not included in the SEA and, of the measures, only the supplementary measures were analysed.

### **2.3 Key strengths and weaknesses**

Cyprus' RBMP has a number of strengths. The consultation process was extensive and transparent, and included the active involvement of the relevant stakeholders. The measures are well targeted to improve water status in practice. Even though the monitoring programme does have large gaps, these are treated transparently which will help in finding solutions to the problems in the near future.

However, a range of weaknesses also exist. It is unclear how the objectives for the different water bodies are set. There are shortcomings in the classification of ecological status and potential, in the designation of heavily modified water bodies, and in the assessment of groundwater status. Further identified problems relate to the lack of justification of exemptions and the uncertainty on specific measures to tackle the over-exploitation of groundwater bodies.

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<sup>1</sup> European Commission - [http://europa.eu/about-eu/countries/member-countries/cyprus/index\\_en.htm](http://europa.eu/about-eu/countries/member-countries/cyprus/index_en.htm)

### 3. GOVERNANCE

#### 3.1 RBMP Timelines

Cyprus adopted and published its River Basin Management Plan on 9 June 2011 including a Drought Management Plan. The date of publication of the RBMP is later than the deadlines established in Article 14 of the WFD (December 2009), mainly as a result of the start of the consultation on the draft RBMP.

The final RBMP was reported to the EEA Central Data Repository (CDR) on 10 June 2011. Updates were submitted to WISE in 2012.

RBD	Timetable	Work programme	Statement on consultation	Significant water management issues	Draft RBMP	Final RBMP
Due dates	22/06/2006	22/06/2006	22/06/2006	22/12/2007	22/12/2008	22/12/2009
CY001	02/04/2007	02/04/2007		03/12/2007	28/05/2012	09/06/2011

*Table 3.1.1: Timeline of the different steps of the implementation process*

*Source: WISE*

#### 3.2 Administrative arrangements - river basin districts and competent authorities

There is one river basin district in Cyprus.

There is one competent authority in Cyprus, the Ministry of Agriculture, Natural Resources and Environment (MANRE).

#### 3.3 RBMPs - Structure, completeness, legal status

There is a national approach for RBM planning in Cyprus.

There is one RBMP with no sub-plans. The main RBMP is a short version, including a summary of the PoM. Annex 1 contains the full RBMP including a longer summary of the PoM. Various annexes specify the details of the PoM (annex 2: full PoM; annex 3: basic measures; annex 6: summary of measures). Annex 7 ("final study of water policy") and Annex 8 ("drought management plan) seem not to be completely integrated into the RBMP.

The RBMPs have been adopted by the Council of Ministers by means of a Governmental Decision. As regards the legal status of the RBMP, the RBMP is secondary legislation, falling under the laws issued by the Parliament. It has the same status as any other regulation approved by the Government, and any administrative decision should be in conformity with its provisions. There is no provision in the legislation regulating the relationship between the RBMP and individual decisions. Nevertheless, the RBMP constitutes in reality the actual implementation of the legislation on water resources and, therefore, any permit must comply

with this legislation, and with any other provision (for example limit values, prohibitions, etc.) directly or indirectly connected to water resources.<sup>2</sup>

### 3.4 Consultation of the public, engagement of interested parties

The consultation process was extensive and transparent including the active involvement of the relevant stakeholders, including water supply, energy, agriculture, NGOs, industry, fisheries, and local authorities. Navigation / ports and consumer groups were not involved. The public was involved via different publication means and consultation. The time period required by WFD for the consultation was respected.

Stakeholder comments brought new knowledge for the RBMP. After the consultation changes were made regarding some specific measures as well as new measures were included in the plan.

## 4. CHARACTERISATION OF RIVER BASIN DISTRICTS

### 4.1 Water categories in the RBD

The water categories that are present in Cyprus are rivers, lakes and coastal waters. The majority of water bodies are small water bodies.

No transitional water bodies were delineated. However in Cyprus there are specific water bodies, salt lakes which do not fall under the category 'transitional waters'. These salt lakes are unique ecosystems where water availability depends directly on rainfall, resulting in large salinity fluctuations, and in complete dryness of the lakes during long dry periods. The salt content of these water bodies is a result of the saline nature of the substratum, not of the inflow of seawater, since there is no connection to the sea. The reference to these water bodies as “coastal lagoons” in the RBMP has followed the Habitat’s Directive characterization, where they were assigned as “Habitat 1150 - Coastal Lagoons”.

### 4.2 Typology of surface waters

The 2011 RBMPs do not provide information on the validation of surface water types with biological data, the methodology described only refers to abiotic elements. At the time when the typology was devised (during the implementation of Article 5 WFD), no biological data were available for Cyprus’ freshwaters. Consequently no validation against such data was possible. According to recent information provided by Cyprus work is on-going on the validation.

RBD	Rivers	Lakes	Transitional	Coastal
CY001	3	4	0	3

**Table 4.2.1:** Surface water body types at RBD level

**Source:** WISE

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<sup>2</sup> Pressures & Measures Study "Governance".

Three types of rivers were differentiated in Cyprus, two of them are temporary river types and one is a perennial type. Due to the obvious large differences between perennial and temporal rivers, no dedicated attempt had been made at a national level to check if the two types can be discriminated using biological data. However, it was shown in the Intercalibration Exercise that the temporary type is distinctively different from the other perennial Mediterranean river types, both for benthic invertebrates and for phyto-benthos-diatoms. In addition, the relation of biological data to typology is being investigated, amongst others, on benthic invertebrates in Cyprus Rivers.

Reference conditions are available for the applied biological quality elements.

Reference conditions are determined as follows:

- Rivers & lakes:
  - For benthic invertebrates in rivers, reference sites exist in Cyprus and reference conditions were determined following the REFCOND Guidance criteria based on pressure criteria. The absence of pressures was illustrated by using various methods and indices.
  - For phyto-benthos in rivers, reference sites exist in Cyprus. The diatom community structure and the IPS index values were the main criterion. Pressure data were also used and their intensity and impact was evaluated using expert judgement, following the guidelines of the Intercalibration Exercise.
  - For phytoplankton in reservoirs (water category: lakes), reference conditions were derived in the process of the Intercalibration Exercise using existing reference sites from all Member States that participated in the Mediterranean Lake Geographical Intercalibration Group.
- Coastal waters: reference conditions were determined based on the combination of expert knowledge/judgement, absence or minor anthropogenic activities (pristine, undisturbed areas, Natura 2000 sites) and historical data (where available, depending on the BQE)

### 4.3 Delineation of surface water and groundwater bodies

RBD	Surface Water								Groundwater	
	Rivers		Lakes		Transitional		Coastal			
	Number	Average Length (km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)
CY001	216	12	18	2	0	0	27	33	20	313

**Table 4.3.1:** Surface water bodies, groundwater bodies and their dimensions

**Source:** WISE and CY

Overall, Cyprus has designated 261<sup>3</sup> surface water bodies. In the first RBMP cycle smaller watercourses with only occasional surface flow were included as water bodies. However,

<sup>3</sup> There are 261WBs out of which the Republic of Cyprus exercises effective control over 259 (except over 2 coastal WBs)

during the first monitoring period, it became apparent that it would be impossible to include minor watercourses in the monitoring programme, and impractical to treat them as water bodies within the framework of the Directive. The reason behind this is that many smaller watercourses only experience episodic surface flows, in the form of events that may last some days or, in some cases, only hours after heavy rainfall. For numerous watercourses, such flow events occur, on average, less than once a year with no flows at all for one or more years in a row. Cyprus is therefore considering deleting 62 river water bodies in the 2<sup>nd</sup> RBMP cycle.

#### **4.4 Identification of significant pressures and impacts**

The identification of pressures was carried out for the implementation of Article 5 of the WFD. The plan does not include concrete thresholds to define significant pressures. An example of a criterion used in the determination of the significance of a pressure was whether IPPC facilities discharge their effluent to a suitable treatment plant or not. Expert judgement was used in other instances. Wide range of pressures was identified with expert judgement. The pressures identified under Article 5 WFD were updated in the framework of the development of the RBMP.

Diffuse source pollution is significant pressure in 43% of surface water bodies. 53% of surface water bodies are not subject to significant pressures.

RBD	No pressures		Point source		Diffuse source		Water abstraction		Water flow regulations and morphological alterations		River management		Transitional and coastal water management		Other morphological alterations		Other pressures	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
CY001	138	52.9	43	16.5	112	42.9	0	0	51	19.5	7	2.69	0	0	0		1	0.38

**Table 4.4.1:** Number and percentage of surface water bodies affected by significant pressures  
Source: WISE and CY

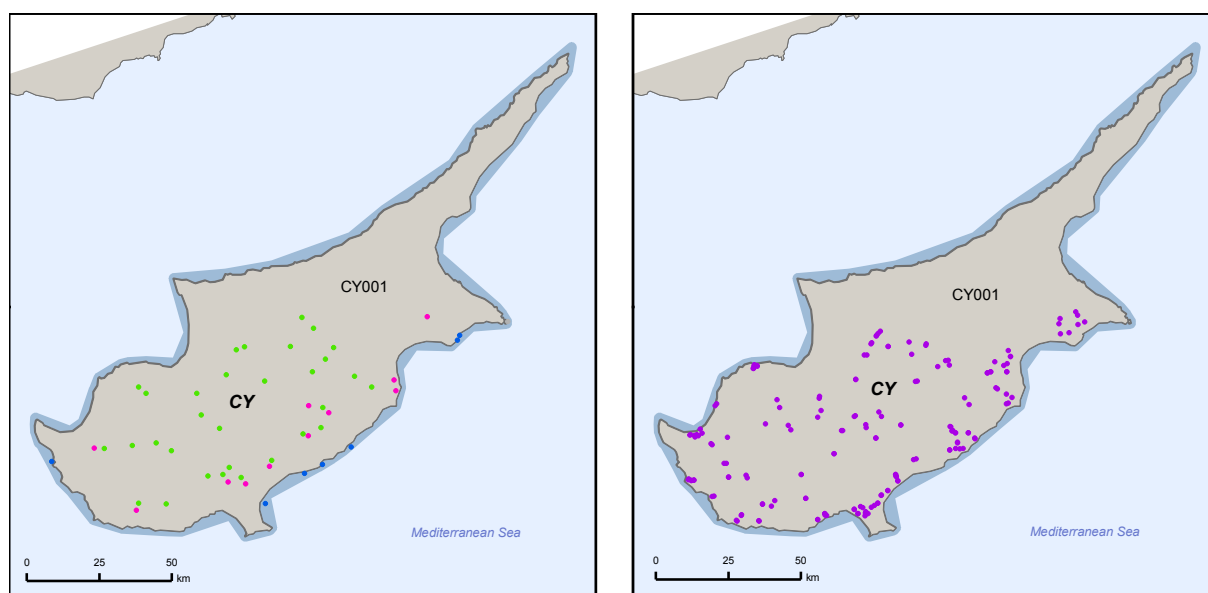
#### 4.5 Protected areas

In Cyprus 174 protected areas have been designated, according to information provided to WISE (see the table below). Most of these areas are related to bathing waters. 5 of those protected areas may be associated with SWBs and 13 of them with GWBs.

RBD	Number of PAs										
	Article 7 Abstraction for drinking water	Bathing	Birds	European Other	Fish	Habitats	Local	National	Nitrates	Shellfish	UWWT
CY001	18	113	-	-	-	36	-	-	5	-	2

**Table 4.5.1:** Number and percentage of surface water bodies affected by significant pressures  
Source: WISE

## 5. MONITORING



**Figure 5.1:** Maps of surface water (left) and groundwater (right) monitoring stations

- River monitoring stations
- Lake monitoring stations
- Transitional water monitoring stations
- Coastal water monitoring stations
- Unclassified surface water monitoring stations
- Groundwater monitoring stations
- River Basin Districts
- Countries outside EU

**Source:** WISE, Eurostat (country borders)

Cyprus has reported the number of monitoring sites for its RBD (see the table below). In total, 50 sites were reported for surface waters, and 170 sites for groundwater. The number of surface water monitoring sites is similar to those provided for the European Commission's 2009 report on monitoring in the EU.

RBD	Rivers		Lakes		Transitional		Coastal		Groundwater		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
CY001	19	12	10	1	0	0	7	1	86	68	84
Total by type of site	19	12	10	1	0	0	7	1	86	68	84
Total number of monitoring sites <sup>4</sup>	31		11		-		8		170		

**Table 5.1:** Number of monitoring sites by water category

Surv = Surveillance, Op = Operational, Quant = Quantitative

<sup>4</sup> The total number of monitoring sites may differ from the sum of monitoring sites by type because some sites are used for more than one purpose.

*Source: WISE*

## 5.1 Monitoring of surface waters

Not all biological quality elements are monitored in Cyprus.

Rivers:

<b>BQE</b>	<b>Cyprus situation</b>
Aquatic flora – phytobenthos	monitoring programme is ongoing
Aquatic flora – macrophytes	Was not considered for the 1st RBMP cycle. The BQE will be monitored and used for the next RBMP.
Benthic invertebrates	monitoring programme is ongoing
Fish	Was not considered for the 1st RBMP cycle. The BQE might be used in a supplementary way within biological assessment in certain types or limited stretches of rivers for the next RBMP.

**Table 5.1.1:** BQEs monitored in rivers

*Source: RBMP*

Reservoirs (water category: lakes):

<b>BQE</b>	<b>Cyprus situation</b>
Phytoplankton	Monitoring programme is ongoing
Other aquatic flora - phytobenthos	Not applicable in Mediterranean Reservoirs (seasonal fluctuations in water level do not allow their growth)
Other aquatic flora - macrophytes	Not applicable in Mediterranean Reservoirs (because of seasonal fluctuations in water level and the great reservoir depth)
Benthic invertebrates	Not applicable in Mediterranean Reservoirs (great seasonal water level fluctuation, high siltation rate and restrictive chemical conditions near the bottom)
Fish	Not applicable in Cyprus Reservoirs

**Table 5.1.2:** BQEs monitored in reservoirs

*Source: RBMP*

RBD	Rivers								Lakes													
	QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.3 Macrophytes	QE1.2.4 Phytobenthos	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 on priority specific pollutants	QE3.4 Other national pollutants	QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.3 Macrophytes	QE1.2.4 Phytobenthos	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 Non priority specific pollutants	QE3.4 Other national pollutants
CY001																						

CY001	RBD	Transitional										Coastal											
		QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.1 Microalgae	QE1.2.2 Angiosperms	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 Non priority specific pollutants	QE3.4 Other national pollutants	QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.1 Microalgae	QE1.2.2 Angiosperms	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 Non priority specific pollutants	QE3.4 Other national pollutants

**Table 5.1.3: Quality elements monitored**



QE Monitored

QE Not monitored

Not Relevant

Source: WISE

Coastal waters: In coastal waters (surveillance & operational monitoring programme) all BQEs are monitored, that is: Benthic Macrorinvertebrates, Phytoplankton (Chlorophyll-A), Macroalgae and Angiosperms (*Posidonia oceanica*).

In the framework of the operational monitoring, physico-chemical parameters and Chlorophyll-A are monitored on a monthly basis, whereas Angiosperms and Benthic Macroinvertebrates are monitored once a year. Moreover, heavy metals are monitored on a monthly basis in seawater, while heavy metals and synthetic compounds are monitored once a year in the fish striped mullet (*Mullus barbatus*).

For surface waters, no national method for the assessment of hydromorphological quality elements has yet been adopted by Cyprus. Nevertheless, during 2005-2012, hydromorphological quality elements were assessed for almost all river water bodies that are monitored for BQEs. However, based on the information received from the Cyprus authorities, there was no need to use this information in the status classification for the current RBMP, because all river WBs were assessed as having good or less than good status, based on either BQEs or physico-chemical elements.

For coastal waters, no specific method for the assessment of hydromorphological quality elements has been developed by Cyprus so far. However, in the high status WBs (based on the biological and chemical status) and in the reference sites Hydromorphological QEs correspond in general with this status (e.g. there are no alterations that would result in changes of the undisturbed hydromorphological conditions).

Regarding surface waters, the BQE assessment methods applied by Cyprus were tested for their response to pressures during their development, and were shown to respond to pressures. The pressure response of the Cyprus methods was also tested and confirmed in the Intercalibration Exercise. For coastal waters, the BQE assessment methods applied by Cyprus were tested for their response to pressures (pressure index) during their development in the Intercalibration Exercise, and were shown to respond.

As regards priority substances, pesticides, metals and the majority of industrial pollutants included in Directive 2008/105/EC are monitored in surface freshwaters. The substances included in Directive 2008/105/EC that are not monitored are considered not to be discharged to Cyprus' waters. Efforts are currently made though to monitor more 2008/105/EC substances that are not currently monitored, in order to collect further data on the priority substances.

As regards priority substances in coastal waters, organo-chlorine pesticides and metals are monitored. All the substances included in Directive 2008/105/EC for monitoring in fish are monitored, as well as other organic pollutants and metals (also in fish).

A few specific pollutants (boron and some metals) have been identified for rivers and lakes, Polychlorinated biphenyls have been monitored in coastal waters.

For rivers, three specific pollutants were identified: Cu, Zn (based on Directive 2006/44/EC) and Boron (based on Directive 98/83/EC). For reservoirs the following specific pollutants were selected: Cr, As, B, Fe (based on Directive 75/440/EC), and Cu and Zn (based on Directive 2006/44/EC).

Grouping of water bodies was done based on similar typology, geography (altitude), hydrology, hydrogeology (permeability), pressures (point and diffuse sources, hydromorphological pressures) and risk status.

## 5.2 Monitoring of groundwater

The RBD has both surveillance and operational monitoring programmes for groundwater, and these cover both quantitative and chemical status.

The parameters for the groundwater operational monitoring include a core set of parameters comprising of dissolved oxygen, pH, conductivity, nitrate, ammonium, temperature. Since operational monitoring is required only for the groundwater at risk, nitrates and chloride are considered to be the fundamental indicators of the major pressures exerted on the groundwater bodies at risk; that is pollution of nitrates and seawater intrusion as a result of over-exploitation.

The monitoring is reported to be insufficient in relation to both time series and spatial coverage to investigate significant and sustained upward trends of pollution. As mentioned above, a specific measure was included in the Programme of Measures to address this problem.

## 5.3 Monitoring of protected areas

The number of monitoring sites associated with protected areas is 52 and more than half of them are related to the Habitats Directive and to drinking water abstraction.

The Cypriot authorities (Department of Fisheries and Marine Research) are implementing an on-going monitoring programme of salt lake water bodies. In the context of this programme, the salt lakes are monitored at a monthly basis during the wet season (that is, when the lakes have a sufficient volume of water) for many chemical (nutrients, priority substances: heavy metals and organic pollutants), biological (Chlorophyll-A), ecotoxicological and general abiotic (temperature, salinity, pH, water depth) parameters.

Also within the framework of the surveillance monitoring programme in the coastal waters, two marine Natura 2000 sites (Cape Greco & Akamas) are monitored for all the parameters and quality elements mentioned in the section of monitoring of surface waters.

RBD	Surface waters									Ground-water drinking water
	Surface drinking water abstraction	Quality of drinking water	Bathing water	Birds sites	Fish	Habitats sites	Nitrates	Shellfish	UWWT	
CY001	17	5	4	0	8 <sup>5</sup>	13	3	0	5	5

**Table 5.3.1:** Number of monitoring stations in protected areas<sup>6</sup>.

**Source:** WISE

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<sup>5</sup> Number of monitoring sites reported at programme level.

<sup>6</sup> Number of sites calculated from data reported at site level. If no data reported at site level, then table supplemented with data reported at programme level.

## 6. OVERVIEW OF STATUS (ECOLOGICAL, CHEMICAL, GROUNDWATER)

83 surface water bodies in Cyprus have been assessed as being at good or better ecological status; 4.7% of all the surface water bodies are in high status. For 45 surface water bodies the status has not been determined. The water bodies with unknown status are mainly small water bodies with episodic surface flows that occur on average less than once a year and which Cyprus is considering deleting as water bodies in the second RBMP cycle.

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
CY001	192	9	4.7	74	38.5	56	29.2	7	3.6	1	0.5	45	23.4

**Table 6.1:** Ecological status of natural surface water bodies

Source: WISE and CY

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
CY001	69	0	0	22	31.9	26	37.7	9	13.0	3	4.3	9	13.0

**Table 6.2:** Ecological potential of artificial and heavily modified water bodies

Source: WISE

Three quarters of the surface water bodies are reported to be in good chemical status in Cyprus and only less than 5% failing good status. For 56 surface water bodies, the chemical status is unknown for similar reasons to that mentioned above for ecological status.

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
CY001	192	141	73.4	5	2.6	46	24

**Table 6.3:** Chemical status of natural surface water bodies

Source: WISE

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
CY001	69	52	75.4	7	10.1	10	14.5

**Table 6.4:** Chemical status of artificial and heavily modified water bodies

Source: WISE

More than half of the groundwater bodies have good chemical status in Cyprus while 8 GWBs are in poor status. Only one groundwater body have not been assessed.

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
CY001	20	11	55	8	40	1	5

**Table 6.5:** Chemical status of groundwater bodies

Source: WISE

Only every fifth GWB is assessed at good quantitative status in Cyprus while three quarters of them are reported to be in poor quantitative status. The status of only one GWB is unknown.

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
CY001	20	4	20	15	75	1	5

**Table 6.6:** *Quantitative status of groundwater bodies*

**Source:** WISE

39% SWBs were assessed as being of good status in 2009. According to the information reported to WISE, the number of good status is expected to increase to 58% in 2015.

For groundwater bodies, only 20% were assessed as being of good status in 2009, and the proportion is not expected to increase in 2015. This shows a lack of ambition in improving the status of groundwater in Cyprus that is primarily related to a reluctance to tackle quantitative problems.

RBD	Total	Global status (ecological and chemical)					Good ecological status 2021		Good chemical status 2021		Good ecological status 2027		Good chemical status 2027		Global exemptions 2009 (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015									Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	No.	%	No.	%	%	%	%	%
CY001	261	102	39.2	169	65.0	25.8	189	63			195	95			17	0	0	0

**Table 6.7:** Surface water bodies: overview of status in 2009 and expected status in 2015, 2021 and 2027<sup>7</sup>

Water bodies with good status in 2009 fall into the following category:

1. Ecological status is high or good and the chemical status is good, exemptions are not considered

Water bodies expected to achieve good status in 2015 fall into the following categories:

1. Ecological status is high or good and the chemical status is good, exemptions are not considered

2. Chemical status is good, and the ecological status is moderate or below but no ecological exemptions

3. Ecological status is high or good, and the chemical status is failing to achieve good but there are no chemical exemptions

4. Ecological status is moderate or below, and chemical status is failing to achieve good but there are no ecological nor chemical exemptions

Note: Water bodies with unknown/unclassified/not applicable in either ecological or chemical status are not considered

**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

<sup>7</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total	Ecological status					Good ecological status 2021		Good ecological status 2027		Ecological exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	192	82	42.9	130	68.1	25.1					11.0	0	0	0

**Table 6.8:** Natural surface water bodies: ecological status in 2009 and expected status in 2015, 2021 and 2027<sup>8</sup>  
**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

RBD	Total	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	192	141	73.8	146	76.4	2.6					0	0	0	0

**Table 6.9:** Natural surface water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027<sup>9</sup>  
**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

<sup>8</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

<sup>9</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total	GW chemical status					Good chemical status 2021		Good chemical status 2027		GW chemical exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	20	11	55.0	11	55.0	0.0					40	5	0	0

**Table 6.10:** Groundwater bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027<sup>10</sup>

**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

RBD	Total	Groundwater quantitative status					Good quantitative status 2021		Good quantitative status 2027		GW quantitative exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	20	4	20.0	4	20.0	0.0					70	5	0	0

**Table 6.11:** Groundwater bodies: quantitative status in 2009 and expected status in 2015, 2021 and 2027<sup>11</sup>

**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

<sup>10</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

<sup>11</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total HMWB and AWB	Ecological potential					Good ecological potential 2021		Good ecological potential 2027		Ecological exemptions (% of all HMWB/AWB)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	69	22	31.9	39	56.5	24.6					30.4	0	0	0

**Table 6.12:** Heavily modified and artificial water bodies: ecological potential in 2009 and expected ecological potential in 2015, 2021 and 2027<sup>12</sup>

**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

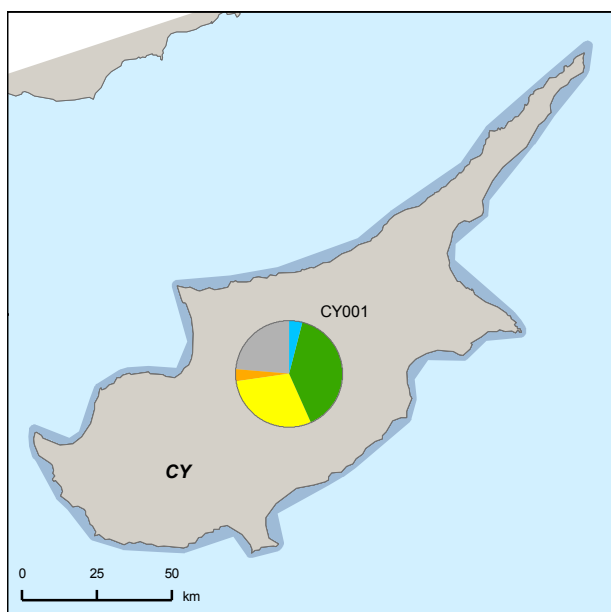
RBD	Total HMWB and AWB	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all HMWB/AWB)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
CY001	69	52	75.4	59	85.5	10.1					0	0	0	0

**Table 6.13:** Heavily modified and artificial water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027<sup>13</sup>

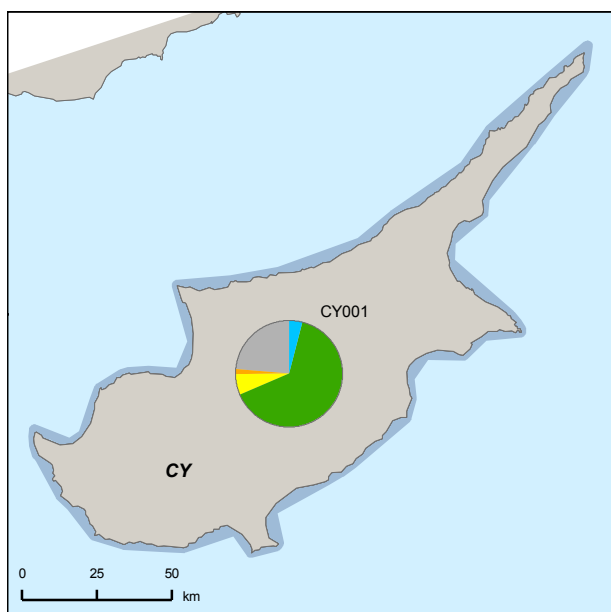
**Source:** WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)

<sup>12</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

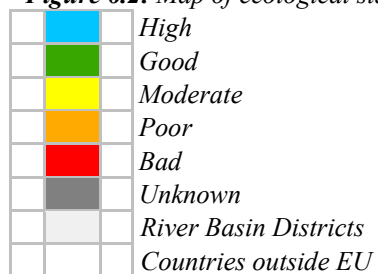
<sup>13</sup> Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.



**Figure 6.1:** Map of ecological status of natural surface water bodies 2009

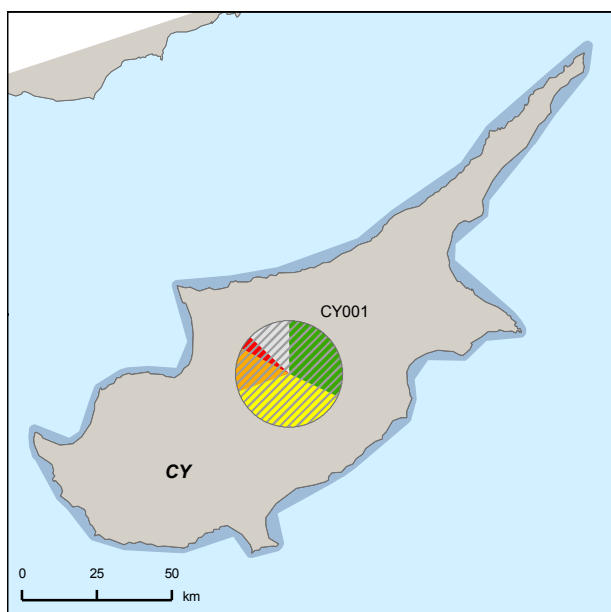


**Figure 6.2:** Map of ecological status of natural surface water bodies 2015

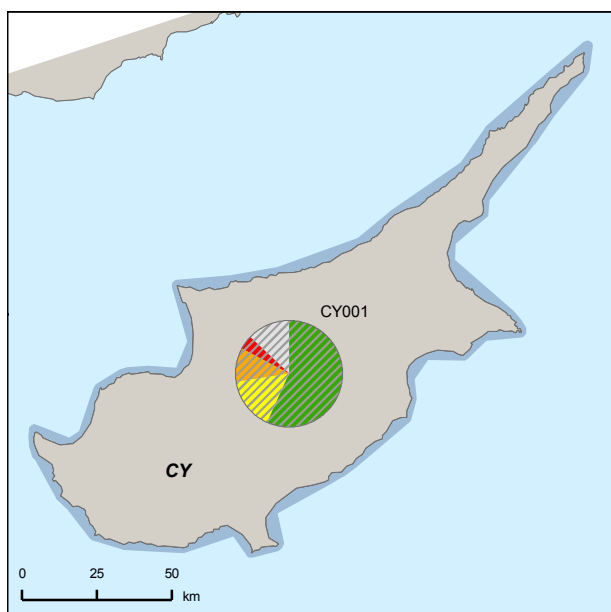


Note: Standard colours based on WFD Annex V, Article 1.4.2(i).

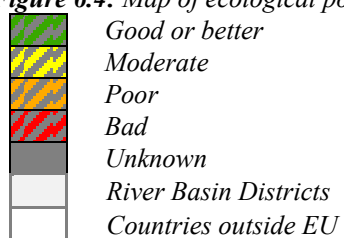
Source: WISE, Eurostat (country borders)



**Figure 6.3:** Map of ecological potential of artificial and heavily modified water bodies 2009

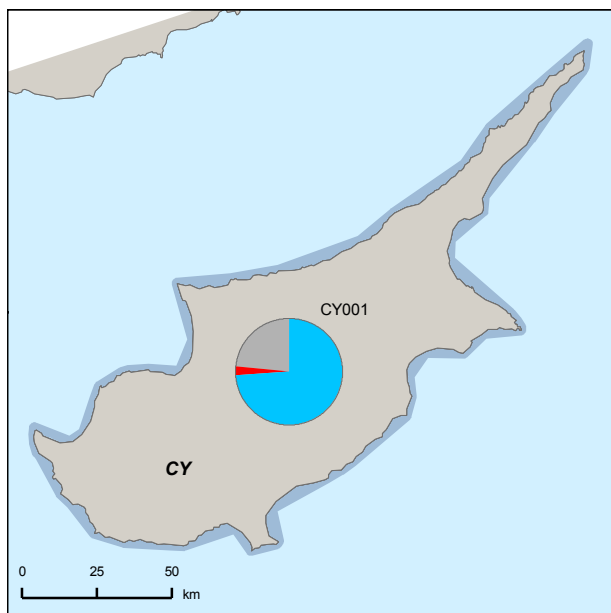


**Figure 6.4:** Map of ecological potential of artificial and heavily modified water bodies 2015

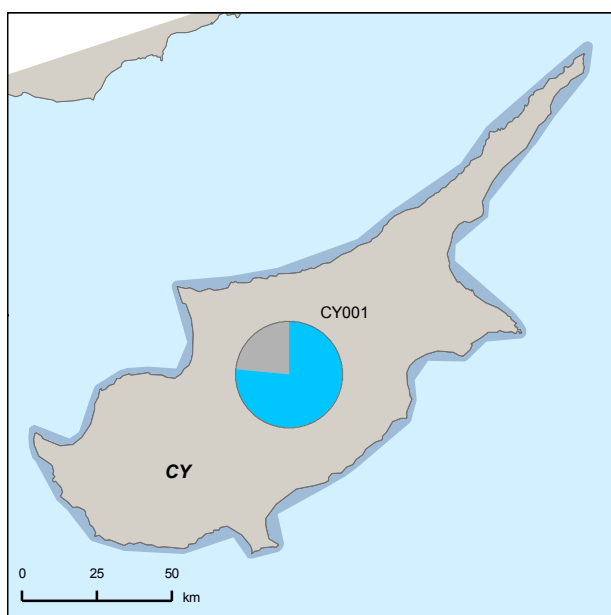


Note: Standard colours based on WFD Annex V, Article 1.4.2(ii).

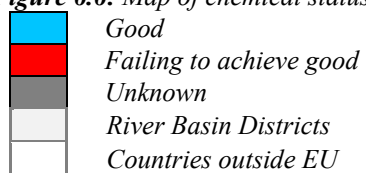
Source: WISE, Eurostat (country borders)



**Figure 6.5:** Map of chemical status of natural surface water bodies 2009

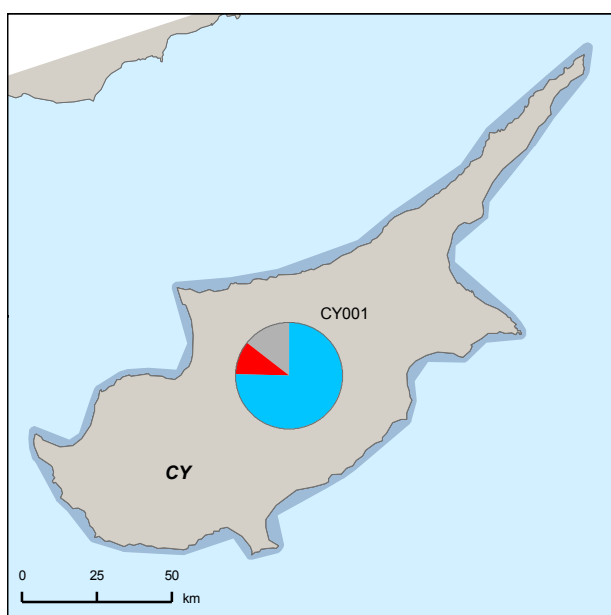


**Figure 6.6:** Map of chemical status of natural surface water bodies 2015

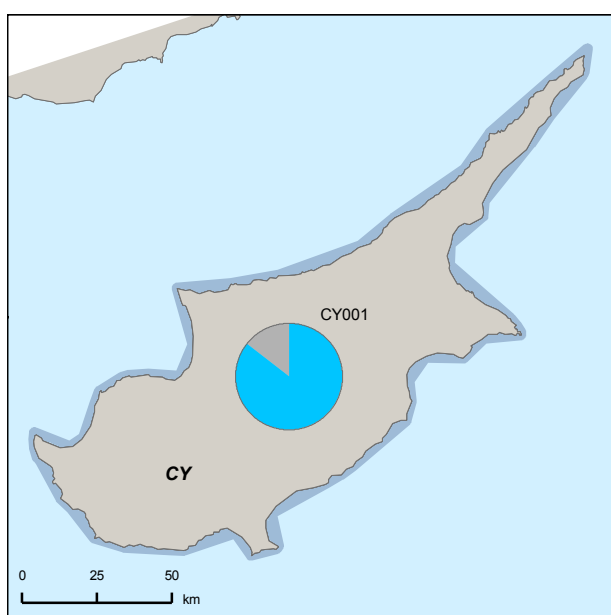


Note: Standard colours based on WFD Annex V, Article 1.4.3.

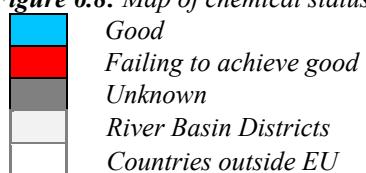
Source: WISE, Eurostat (country borders)



**Figure 6.7:** Map of chemical status of artificial and heavily modified water bodies 2009

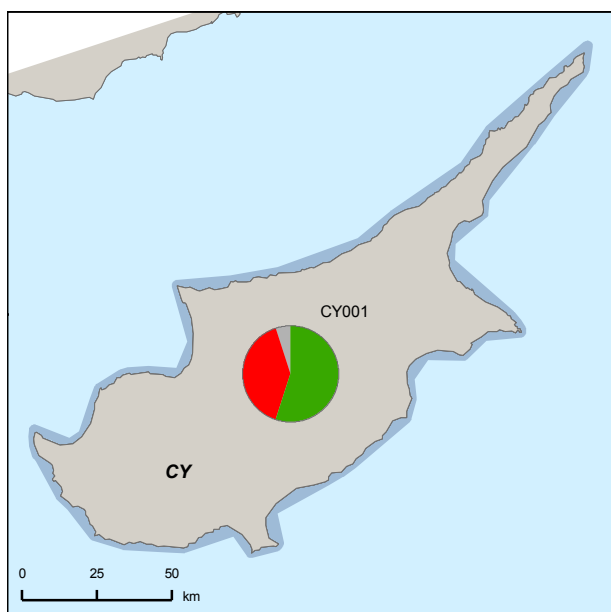


**Figure 6.8:** Map of chemical status of artificial and heavily modified water bodies 2015

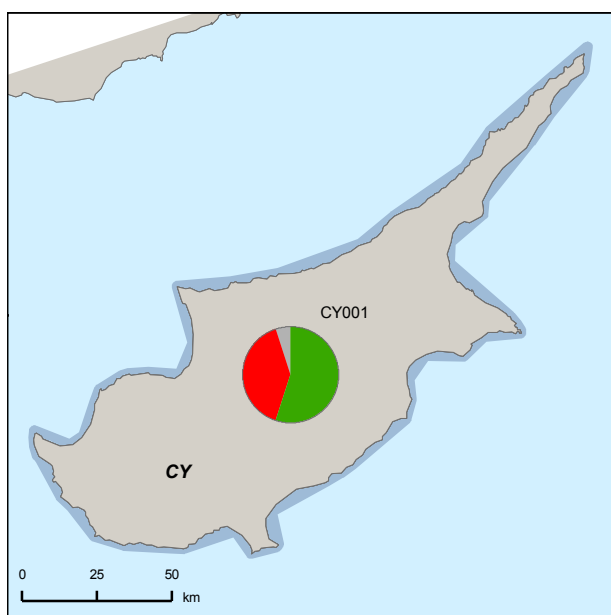


Note: Standard colours based on WFD Annex V, Article 1.4.3.

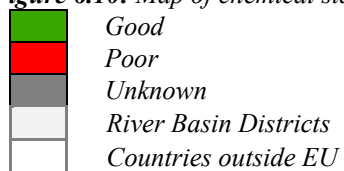
Source: WISE, Eurostat (country borders)



**Figure 6.9:** Map of chemical status of groundwater bodies 2009

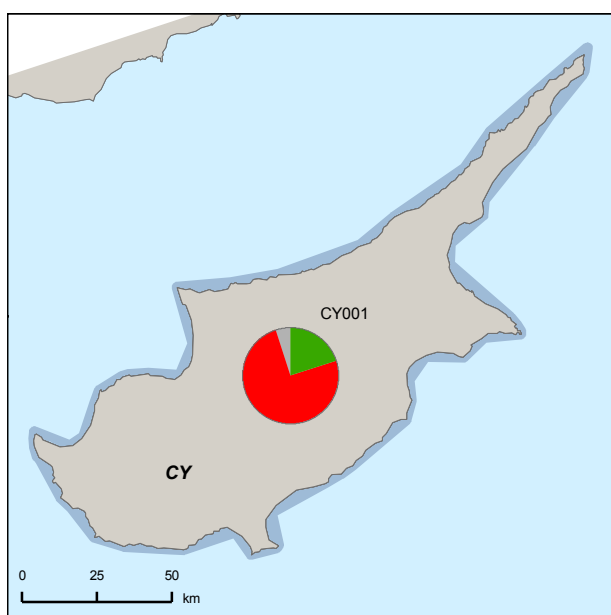


**Figure 6.10:** Map of chemical status of groundwater bodies 2015

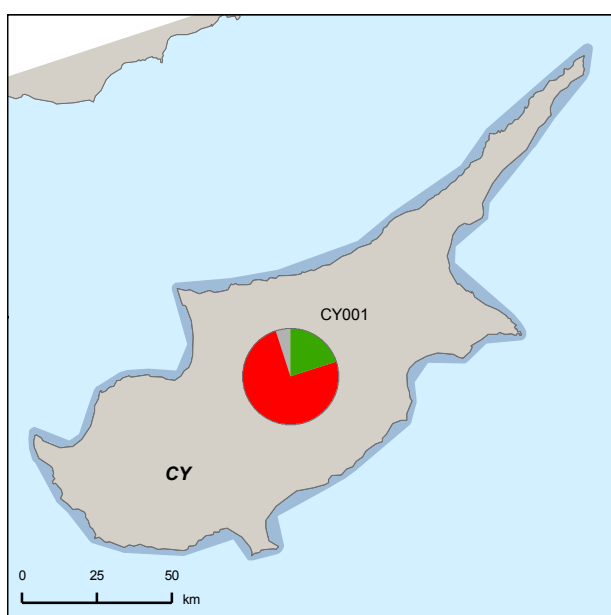


*Note: Standard colours based on WFD Annex V, Article 2.4.5.*

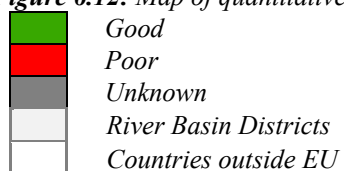
**Source:** WISE, Eurostat (country borders)



**Figure 6.11:** Map of quantitative status of groundwater bodies 2009



**Figure 6.12:** Map of quantitative status of groundwater bodies 2015



Note: Standard colours based on WFD Annex V, Article 2.2.4.

Source: WISE, Eurostat (country borders)

## **7. ASSESSMENT OF ECOLOGICAL STATUS OF SURFACE WATERS**

### **7.1 Ecological status assessment methods and application of methods and ecological status results**

The first RBMPs indicated significant gaps in the establishment of assessment methodologies but Cyprus authorities updated the information in 2012.

#### Rivers:

In Cyprus there are no completed baseline studies on fish, or their distribution through the island. At the same time, the island has a species-poor native fish fauna and therefore Cyprus considers that it is not possible to base any type of ecological quality assessment solely on fish species.

Consequently, 'fish' are not monitored as a WFD biological quality element, and Cyprus does not participate in the River-Fish Intercalibration Exercise. However, in order to provide an initial understanding of the potential use of this BQE, an investigation is being undertaken in an on-going research project. In this project, the most significant Cyprus rivers are being investigated. Depending on the results of this research project, the potential to use fish in a supplementary way within biological assessment and water management exists, especially through the localized Eel and naturalized Brown Trout populations. Cyprus might, in the future, start fish-based assessment and monitoring in certain types or limited stretches of rivers.

Regarding phytobenthos, the BQE is being monitored using the IPS index as a national method. The method has been successfully intercalibrated in the 2nd phase of the Intercalibration Exercise. The monitoring results have been used for classification in the RBMP.

Methodology for macrophytes has recently been developed but not yet considered in the 1<sup>st</sup> RBMP cycle. Cyprus participated in the related Intercalibration Exercise phase 2. The BQE will be monitored and used for the next RBMP.

A Nutrient Classification System (NCS) is applied in rivers. It is principally based on the average values found in five quality classes of a biological classification system, which has been developed using benthic macroinvertebrates.

#### Lakes:

A classification system has been developed for one lake type, but not for the others due to the absence of reference conditions and of similar water bodies elsewhere. The value of ecological status / ecological potential was based on expert judgement.

#### Reservoirs:

Macrophytes are not used because the seasonal fluctuations in water level do not allow their growth. For the same reason, and also because of the depth of the reservoirs, the index of phytobenthos cannot be applied. Similarly, benthic macroinvertebrates are also not applicable in Mediterranean reservoirs generally, and specifically not in Cyprus. Fish is a non-expedient, not applicable BQE in Cyprus' lakes and reservoirs as there are no indigenous fish populations in Cyprus rivers (except eel) and all fish in the reservoirs have been introduced by stocking. The composition of introduced fish species is different from one reservoir to the other. Because of these reasons, fish is considered as a BQE that is not relevant in this situation, therefore it is not monitored and no assessment methods are developed.

The class boundaries for Total P were set based on real monitoring results. The class boundary for Ammonium (NH<sub>4</sub>) was based on Directive 2006/44/EC, for cyprinid waters.

#### Coastal waters:

Cyprus finalised the assessment method for angiosperms in 2011, during the 2<sup>nd</sup> phase of the Intercalibration Exercise. Cyprus uses the already developed and approved PREI Index for *Posidonia oceanica* as the national assessment method. Moreover, the assessment methods for Phytoplankton (Chlorophyll-A), Macroalgae and Benthic Macroinvertebrates have been finalized in the 1st phase of the IC Exercise and included in the Commission Decision 2008/915/EC, and were also revised in the 2<sup>nd</sup> phase.

Physico-chemical parameters are monitored in the coastal waters of Cyprus (salinity, temperature, conductivity, dissolved oxygen and nutrients). The measured values of all the aforementioned parameters show no significant differences between sites (sampling stations and WBs), rather they exhibit a remarkable stability and reflect the ultra-oligotrophic character of the whole area. For this reason, the ecological status of coastal waters of Cyprus is determined by the status of the BQEs in each WB.

No methods have been developed to address specifically hydromorphological pressures in the coastal waters.

#### Methodologies for the assessment of hydromorphological quality elements

There are no methods for the assessment of hydromorphological quality elements adopted yet by Cyprus, nevertheless hydromorphological quality elements were assessed for almost all river water bodies that are monitored for BQEs. However, this information was not used in the status classification for the current RBMP. According to recent information, a project for the consolidation of the available data and official establishment of a national method for the assessment of hydromorphological quality elements is envisaged in Cyprus.

RBD	Rivers							Lakes							Transitional							Coastal						
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Physico-Chemical	Hydromorphological	
CY001	-											-			-	-	-	-	-	-	-							

**Table 7.1.1:** Availability of biological assessment methods

-

Assessment methods fully developed for all BQEs

Assessment methods partially developed or under development for all or some BQEs

Assessment methods not developed for BQEs, no information provided on the assessment methods, unclear information provided

- Water category not relevant or BQE not applicable

**Source:** RBMPs and CY

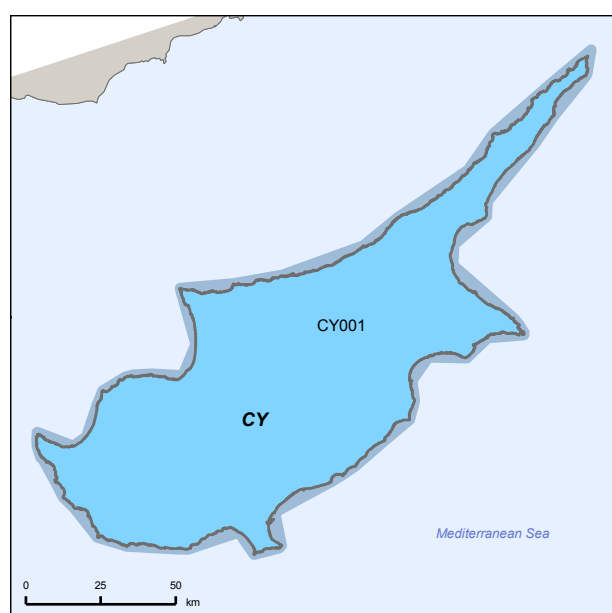
## 7.2 River basin specific pollutants

A few specific pollutants (boron and some metals) have been identified for rivers and lakes, polychlorinated biphenyls for coastal waters.

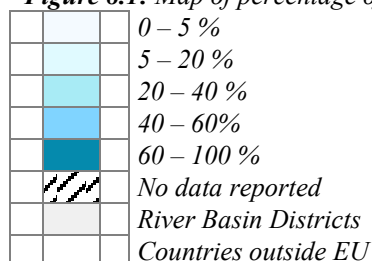
For rivers three pollutants were identified: Cu, Zn (based on Directive 2006/44/EC) and Boron (based on Directive 98/83/EC). For reservoirs the following pollutants were selected: Cr, As, B, Fe based on Directive 75/440/EC, and Cu and Zn (based on Directive 2006/44/EC).

There were no cases causing failure to ecological status due to specific pollutants.

## 8. DESIGNATION OF HEAVILY MODIFIED WATER BODIES (HMWB) AND ASSESSMENT OF GOOD ECOLOGICAL POTENTIAL



**Figure 8.1:** Map of percentage of Heavily Modified and Artificial water bodies by River Basin District



**Source:** WISE, Eurostat (country borders)

## **8.1 Designation of HMWBs**

In total 67 HMWBs and 1 artificial water body (AWB – a lake water body) have been designated. 49 of them are river WBs (22.69% of total river WBs), 12 lake WBs (72.22%) and 7 coastal WB (26.92%).

There is no systematic designation of HMWBs. The designation process of CIS guidance document No. 4<sup>14</sup> is mentioned and described, but the steps are not always followed. There is no clear definition of what 'substantial changes' are, there is only a very general reference to 'adverse effect on the water use', and significance is not defined. Although it is stated that there are no better environmental options, there is no justification but are statements that apply in general to all physical modifications for particular uses.

The water uses in the sense of Article 4(3)(a) are mentioned in general and for each HMWB designated. The physical modifications are not described in detail, but generally.

For river bodies, the most frequent reason is the existence of a dam upstream (for water storage and there is one diversion weir). The only other reason for HMWB designation is canalisation within urban areas.

Lake water bodies are designated as HMWB as a result of being artificial reservoirs (impounded rivers) with the primary objective of the storage and abstraction for water use.

Coastal water bodies are designated as HMWB only within seaport areas.

Reservoirs have been reported as heavily modified lakes, not as heavily modified rivers, as recommended. This limits the comparability with information from other Member States.

Some types of the WB have been designated as HMWB during the first RBMP cycle due to uncertainties and insufficient data (downstream dams, reservoirs, urban areas). It is mentioned that the data available should be improved in the 2nd cycle and may change designation of some current HMWBs.

## **8.2 Methodology for setting good ecological potential (GEP)**

Good ecological potential has not been defined for most of the water types.

In river HMWBs, the same methods are applied that for non-heavily modified rivers.

For reservoirs, the method developed for phytoplankton does yield GEP.

## **9. ASSESSMENT OF CHEMICAL STATUS OF SURFACE WATERS**

The overall proportion of WBs failing good status due to chemical pollution is 4.2% for river WBs and 16.7 % for lake WBs. All coastal WBs are considered to be in good chemical status.

Cyprus provided information on the specific substances causing failure to achieve good chemical status.

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<sup>14</sup>[http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework\\_directive/guidance\\_documents/gds04shmwbspolicyssummar/\\_EN\\_1.0\\_&a=d](http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/gds04shmwbspolicyssummar/_EN_1.0_&a=d)

CAS Number	Name of substances	Number of water bodies failing good chemical status
7440-43-9	Cadmium	2
7439-92-1	Lead	7
7439-97-6	Mercury	4
7440-02-0	Nickel	5
15972-60-8	Alachlor	3
1582-09-8	Trifluralin	4

**Table 9.1:** Substances causing failure to achieve good chemical status  
**Source:** RBMP

The assessment of chemical status is based on monitoring data. Not all pollutants/measurements are used for the assessment of chemical status.

Some priority substances are discarded from the assessment of chemical status on the basis of the sensitivity of the analytical methods used.

In the framework of the Cyprus coastal waters monitoring programme for the WFD and other programmes (e.g. MEDPOL), several priority substances (chemical pollutants and metals: Pb, Cd and Hg) in water and biota (*Mullus barbatus*) are being monitored at a regular basis. A number of synthetic compounds are being monitored in biota samples from coastal sites. Up to now, the results of the analyses show that organo-chlorine pesticides and polychlorinated biphenyls are present only in trace levels in biota samples taken from the coastal areas.

Regarding heavy metals in seawater (Cu, Zn, Pb, Ni, Cr, Cd, Fe and Hg), monthly water sampling has been carried out since 2007 in 4 selected coastal water stations which belong to 2 WBs. In addition, sediment samples were taken at two of the above sampling stations in the years 2007 and 2008. Water sample analyses show that metal concentrations are at low levels without any significant site and seasonal differences. Sediment concentrations are also low and show no significant differences during the whole sampling period.

## 10. ASSESSMENT OF GROUNDWATER STATUS

### 10.1 Groundwater quantitative status

15 GWBs are reported to be in poor quantitative status.

Abstractions and saline intrusion are considered in the assessment.

It is not clear whether the concept of "available groundwater resource" is applied as described in Article 2.27 of the WFD.

Significant diminution of surface water status is a reason for poor groundwater status at one GWB. A list of surface/groundwater body interactions is given and the connection and feedback of surface water bodies to and from groundwater was taken into account in order to draw conclusions on quantitative status, although the minimum flow requirement for surface waters was not available for all surface waters. A water balance was established.

In addition, at least one groundwater dependent terrestrial ecosystem was reported to exist. However, groundwater dependent terrestrial ecosystems were not considered in the groundwater quantitative status assessment.

## 10.2 Groundwater chemical status

8 GWBs are in poor chemical status in Cyprus.

Most of the coastal aquifers in Cyprus are suffering from seawater intrusion (caused by over-pumping) and therefore these groundwater bodies are at risk not achieving good status.

Surface waters associated to groundwater appear not to be considered in the groundwater status assessment. The transfer of chemicals between the only groundwater dependent terrestrial ecosystem and the related groundwater body warrants investigation and monitoring.

Threshold values (TVs) are based on drinking water standards taking into account natural background levels of substances, existing and future water uses and hydrogeological conditions. A groundwater body was declared of poor chemical status if one (or more) representative monitoring station(s) exceeded the TV. Expert judgment was only used in deciding whether a monitoring station was representative of the status of the whole groundwater body.

Trend assessments were carried out using the methodology given in the CIS Guidance document although monitoring is reported to be insufficient in time series and spatial coverage to investigate trends. The aim was to identify areas where further attention is required and appropriately modify monitoring practices. The methods used apply the trend reversal identification practices, with the caveat that they are indicative and lack adequate record lengths and spatial coverage. All available data was used in the first RBMP cycle, but now the monitoring network may need to be revised, therefore a specific measure was included in the Program of Measures to re-evaluate the monitoring network.

Trend reversals are planned for the 2nd RBMP cycle.

## 10.3 Protected areas

Information reported in WISE on the status of groundwater drinking protected areas is fragmented. Only 13 such areas are reported, 4 of them are in poor chemical status.

RBD	Good	Failing to achieve good	Unknown
CY001	8	4	1

**Table 10.3.1:** Status of groundwater drinking water protected areas

**Source:** WISE and CY

## 11. ENVIRONMENTAL OBJECTIVES AND EXEMPTIONS

The information found in the RBMPs on the environmental objectives and exemptions for water bodies is fragmented.

An overview of the information for SWBs is provided in the table below.

RBD	Total no. of SWBs	Percent of SWBs at good status				SWB exemptions (% of all SWBs)			
		Now	2015	2021	2027	Art. 4.4	Art. 4.5	Art. 4.6	Art. 4.7
CY001	261	38.7	58.2	73.2	100 <sup>15</sup>	17.2			

*Table 11.1: Objectives and exemptions for surface water bodies*

*Source: WISE*

### 11.1 Additional objectives in protected areas

Protected areas have been defined (for drinking water, bathing water and Natura 2000) and there are references to the relevant legislation, although there are no specific additional objectives are defined in the RBMP.

No additional objectives, on top of the WFD general objectives, have been set in nature protected areas to achieve the objectives of the Habitats and Birds Directives (although there is a clear inventory of water dependent Natura 2000 areas). A detailed assessment of the needs for these additional objectives has not been carried out. The specific management plans for the Natura 2000 areas in Cyprus have not been completed and the necessary conservation measures have not yet been established. It is planned that these additional objectives will be set in the next programming cycle.

No shellfish areas exist in Cyprus.

### 11.2 Exemptions according to Article 4(4) and 4(5)

In total, exemptions of all types have been reported for 45 water bodies in Cyprus, about 17% of the total. All the exemptions related to surface water are under Art. 4.4 (extension of the deadline for meeting good status) and are related to ecological status. The groundwater exemptions are related to quantitative status.

Technical infeasibility is cited for 33 exemptions, natural conditions are cited for 12 exemptions and all exemptions for groundwater.

There is no justification for the argument of technical infeasibility to justify the exemptions. The information given is minimal: for 3 exemptions no technical solution is available; for the rest the reason is either uncertainty in the identification of the causes of inferior status or

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<sup>15</sup> 100% refers to water bodies which are under effective control of the Government of Cyprus only.

because a longer recovery time is needed. For groundwater bodies, a longer recovery time is the only reason.

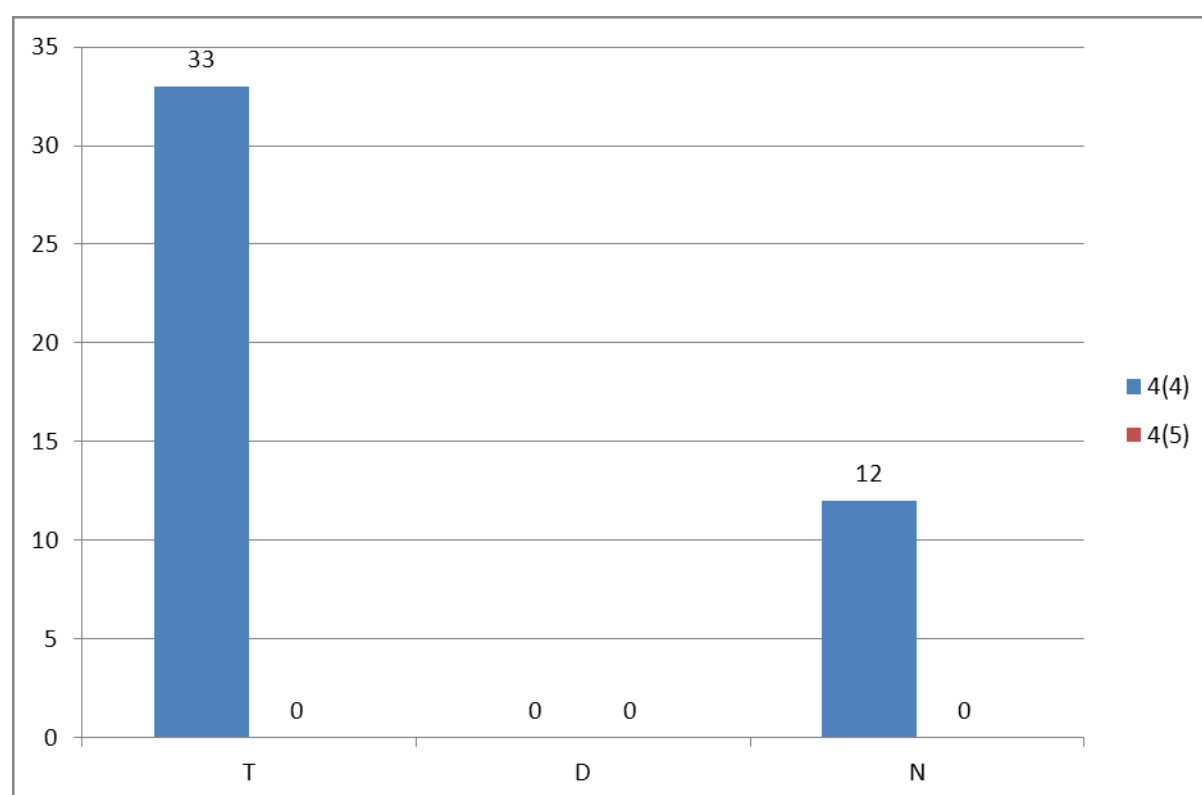
The natural conditions argument is used with no further justification. Disproportionate costs are not used as argument for exemptions.

No exemptions under Art. 4.5, 4.6 or 4.7 were reported. Regarding Art. 4.7, there are no planned projects liable to cause deterioration of status of water bodies. For all planned projects it was either concluded that they are not liable to cause deterioration of the status of water bodies or, in the case of the planned Souskious dam, conclusions will be drawn at a future stage, following the execution of an Environmental Impact Assessment.

RBD	Global <sup>16</sup>					
	Technical feasibility		Disproportionate costs		Natural conditions	
	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)
CY001	33	0	0	0	12	0

**Table 11.2.1:** Numbers of Article 4(4) and 4(5) exemptions

Source: WISE



**Figure 11.2.1:** Numbers of Article 4(4) and 4(5) exemptions

T = Technical feasibility

D = Disproportionate costs

N = Natural conditions

<sup>16</sup> Exemptions are combined for ecological and chemical status

*Blue = Article 4(4) exemptions*

*Red = Article 4(5) exemptions*

**Source:** WISE

## **12. PROGRAMMES OF MEASURES**

According to Annex VII of the WFD, the RBMPs should contain a summary of the programmes of measures (PoM), including the ways in which Member States expect to achieve the objectives of Article 4 WFD. The programmes should have been established by 2009, but are required to become operational only by December 2012. The assessment in this section is based on the PoM as summarised by the Member State in its RBMP, and the compliance of this with the requirements of Article 11 and Annex VII of the WFD.

It therefore does not include a comprehensive assessment of compliance with the requirements of Article 11(3)<sup>17</sup> on basic measures. It focuses in particular on key sets of measures. Member States will report to the Commission by December 2012 on the full implementation of their PoMs, including on the progress on the implementation of basic measures as required by Article 11(3). The Commission will assess what Member States report and will publish its assessment in accordance with Article 18 WFD.

### **12.1 Programme of measures – general**

The RBMP contains a Programme of Measures. The measures are well targeted to improve the water status in practice.

The geographical scale for all measures is indicated – for most of them it is RBD level (national), for some other it is sub-basin or WB level.

The total cost of measures is €340.35 million, but there is no further explanation or breakdown by sector, pressure or water category. €10.2 million is dedicated for supplementary measures up to 2015 (mainly legislative/administrative, awareness raising/communication, research etc.).

On the cost effectiveness analysis, the measures which are effective in all water bodies are measures that promote the ecological restoration of degraded water bodies and wetlands; measures related with the monitoring of WBs; measures promoting research, development and better control of the quality characteristics of water bodies; administrative measures; and, measures of efficiency and reuse such as promoting environmental responsibility, training and awareness campaigns held an important position. 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.

Uncertainties on effectiveness on the measures are considered in the context of designation of HMWBs.

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<sup>17</sup> These are the minimum requirements to be complied with and include the measures required under other Community legislation as well as measures to achieve the requirements of other WFD Articles and to ensure appropriate controls on different activities affecting water management

The majority of the measures are funded through the national budget, a few are financed through private funds and some others are co-financed through EU funds.

For Government financed measures the capital expenditure for their implementation is included in the proposals of the Government Budget. In the case of co-financed projects/measures the total cost of these projects is included in the Government Budget and the contribution of the other parties will be endorsed following the progress of the project.

The majority of measures are planned to become operational by 2012, however, certain measures linked to a significant financial expense will be delayed up to year 2015. The co-financed projects are planned to be completed and operational by the end of 2015.

## **12.2 Measures related to agriculture**

The farming sector represents a significant pressure on the water resources in Cyprus. Diffuse pollution and over abstraction are the two main problems.

The main point source pollution from agriculture is related to livestock wastes from regulated unit farms, such as poultry, pig and cow farms. 67 such farms were identified since they fall under the provisions of the Directive on Integrated Prevention and Pollution Control (IPPC). Reference is also made to nitrates and recycled water.

Substantial information on the agricultural measures is lacking in the RBMP. This puts into question the level of ambition on this issue.

The overall water demands of the sector seem not to be tackled as a whole, although measures exist.

Farmers seem to have had a significant involvement in the selection of the WFD measures for the agricultural sector.

A new water pricing policy towards agriculture has been established, taking into account the ability of farmers to pay for water.

Problems with over-abstraction and self-abstraction are highlighted. The RBMP and the annexed Report on Water Policy address quantitative water management issues. It prescribes specific and comprehensive quantitative abstraction rules for each surface water source and groundwater body. It also defines specific minimum flow requirements and dam releases for each body. In addition, it includes a policy for increased recycled use and policy rules that aim to optimize the production of desalinated water.

Other measures addressing abstractions are also included in the Programme of Measures such as those related to reuse, relicensing and metering of boreholes, reducing the mandatory value for network losses for the water councils, mandating the preparation of a losses report for each irrigation scheme, and extending the existing cultivation plot database of the Cyprus Organization for Agriculture Payments to include water use data etc. Reuse of treated waste water and recycled water in existing irrigation networks in particular, are deemed to bring a significant potential to increase water efficiency.

No measures to address pesticide diffuse pollution are foreseen, based on the monitoring data pesticides do not seem to be a significant issue for groundwater.

The timing of implementation of the WFD measures in agriculture is not precise.

Moreover there is no clear information on how the measures will be funded. In particular the link with the Rural Development programme (RDR) is not clear in the PoM. However the

Cypriot Authorities have submitted additional information specifying that the Rural Development programme will support investment measures consisting of improving irrigation systems for more efficient use of irrigation water, and the construction of storage reservoirs of rain water, etc. Moreover although Cyprus does not currently use the RDR Article 38, it plans to implement the similar RDR Article 31 under the next Rural Development cycle (period 2014-2020).

Beyond the usual controls linked to the enforcement of the Common Agricultural Policy, information is missing on how the WFD measures will be practically controlled and how the implementation in the agricultural sector will be followed up.

Measures	CY001
<b>Technical measures</b>	
Reduction/modification of fertiliser application	✓
Reduction/modification of pesticide application	
Change to low-input farming (e.g. organic farming practices)	
Hydromorphological measures leading to changes in farming practices	✓
Measures against soil erosion	
Multi-objective measures (e.g. crop rotation, creation of enhanced buffer zones/wetlands or floodplain management)	✓
Technical measures for water saving	
<b>Economic instruments</b>	
Compensation for land cover	
Co-operative agreements	
Water pricing specifications for irrigators	✓
Nutrient trading	
Fertiliser taxation	
<b>Non-technical measures</b>	
Additions regarding the implementation and enforcement of existing EU legislation	✓
Institutional changes	✓
Codes of agricultural practice	✓
Farm advice and training	✓
Raising awareness of farmers	✓
Measures to increase knowledge for improved decision-making	✓
Certification schemes	
Zoning (e.g. designating land use based on GIS maps)	
Specific action plans/programmes	✓
Land use planning	
Technical standards	
Specific projects related to agriculture	
Environmental permitting and licensing	

**Table 12.2.1:** Types of WFD measures addressing agricultural pressures, as described in the PoM  
**Source:** RBMPs

### 12.3 Measures related to hydromorphology

The Cyprus RBMP includes measures related to hydromorphology. There are general explanations on the link between water uses and pressures, and pressures, impacts and measures.

There is no specific definition or guidance for ecologically based flow regime, but it was calculated for each WB with a dam (all are HMWBs), and included in the PoM.

Minimum flows are set, but they are not related to the objective of good ecological status because of a lack of adequate knowledge regarding reference conditions related to good ecological status and, more importantly, good potential.

Cyprus also established a priority in water use: as water is very scarce in Cyprus, drinking water supply from reservoirs has priority over the preservation of the fish populations in the reservoirs.

There is a reference in the plan of hydromorphology and the management plans of Natura 2000 sites.

Measures	CY001
Fish ladders	
Bypass channels	
Habitat restoration, building spawning and breeding areas	
Sediment/debris management	
Removal of structures: weirs, barriers, bank reinforcement	
Reconnection of meander bends or side arms	
Lowering of river banks	
Restoration of bank structure	✓
Setting minimum ecological flow requirements	✓
Operational modifications for hydropeaking	
Inundation of flood plains	
Construction of retention basins	
Reduction or modification of dredging	
Restoration of degraded bed structure	
Remeandering of formerly straightened water courses	

**Table 12.3.1:** Types of WFD measures addressing hydromorphological pressures, as described in the PoM  
**Source:** RBMPs

### 12.4 Measures related to groundwater

The RBMP includes groundwater general measures relating to the chemical states of groundwater, which are implemented in the fields of agriculture, mining and WWTPs.

There are targeted supplementary measures in groundwater bodies in poor status covering nitrates pollution and good agricultural practice. No measure to address pesticide diffuse pollution is foreseen, based on the monitoring data pesticides do not seem an issue in

groundwater; this is due to the island's semi-arid conditions and the generally thick unsaturated zone.

Basic groundwater quantitative measures have also been implemented; they include the establishment and improvement of legislation (like licensing of abstractions) and strengthening of the infrastructure for the evaluation of monitoring results.

Supplementary measures are included in the field of agriculture, desalination and artificial recharge covering trainings, studies and consultations with stakeholders.

The programme of measures includes some planned actions to be taken 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 are improvements in the legislative framework for the licensing process. The Law 79(I)/2010 "Integrated Water Management Law" gives the right to the Director of the Water Development Department (WDD) to set and change the groundwater extraction limit. This applies to all existing and new permits. Targets on annual abstraction volumes per groundwater body have been set, and these are to be taken into account as the borehole extraction limit is reviewed on an annual basis and as the installation of water meters measure is implemented. The monitoring of the extraction limits for each permit is planned to be carried out by the WDD.

However, over-exploitation is a result of pumping through both registered and non-registered boreholes and the Law provides for a period for compliance for non-registered boreholes until May 2013.

In addition, supplementary measures are mostly "soft" measures (studies, training) and it is not clear whether they will be able to tackle the over-exploitation that affects 80% of groundwater bodies.

There are only a couple of other measures that appear effective to reduce groundwater consumption: the gradual prohibition of water provision through private boreholes, the policy of reduced abstraction (but it is not clear through which tools these measures are going to be implemented), and to some extent water reuse.

## **12.5 Measures related to chemical pollution**

A range of measures to address chemical pollution are proposed, some of them to tackle concrete sources. However, the measures are not clearly linked to status failures or specific substances.

Due to the specific characteristics of WBs in Cyprus (dry for most of the year) the classification involves considerable uncertainty. Thus, two specific monitoring programmes were included as supplementary measures in the PoM (ad hoc monitoring of water bodies and exploration of river basins with uncertain sources of pollutants). In one case, where the presence of priority substances was confirmed, a specific action programme was proposed.

## **12.6 Measures related to Article 9 (water pricing policies)**

The following water uses were identified in Cyprus: agriculture, industry, households, tourism and farming livestock. They were identified with reference to the impact of water uses on water status (quantitative and qualitative).

There is a narrow approach to water services: only drinking water supply, irrigation, wastewater collection and treatment, and recycled water supply are identified as water services. Each water service is divided in several sub-services for the purpose of economic analysis and calculation of total cost, so as to link the water services to the uses. Water services such as self-abstraction, storage, and impoundment are not identified. The narrow definition of water services is related to the fact that they were identified through the financial cost of water services instead of the economic costs which includes those related to the environmental impacts.

The collection and utilisation of rain water was not considered as a water service in Cyprus, because there is not an institutional structure for managing this area yet. Therefore, it was not possible to carry out an economic analysis of this service. The issue will be re-examined in the next management cycle, in conjunction with the implementation of the Floods Directive 2007/60/EC in Cyprus.

Regarding incentive pricing policy, Cyprus is in the process of applying the provisions of Article 9 of the WFD. Thus, the aim is to maintain the advantages of the pricing established so far (metering, volumetric pricing, overconsumption charge, rising block tariffs etc) whilst adding and promoting the use of new concepts, such as pricing the environmental and the resource values of water.

A special study was implemented regarding existing costing and pricing policies and the results have undergone a public participation process. They have also been discussed by the competent authority and the interested parties, at administrative level, within the process to establish a framework that will legally bind all water sectors and water uses to a common practice.

The calculation of cost recovery takes into account financial costs (capital costs, M&O costs, administrative costs, other direct costs) and environmental and resource costs, but not for all water services. Subsidies and cross-subsidies are not included into the cost recovery calculation.

Cost recovery rates are not calculated as a contribution of different (at least agriculture, industry, households) water uses to cost recovery, but as recovery rates for some water services.

The basic principle is to fully recover the cost of drinking water supply and partially recover the cost of irrigation water (irrigation networks were part of the rural development policy applied). The price of tertiary treated water is set at considerably lower levels than the price of fresh water, considering the environmental benefit of the use, and to encourage the use when appropriate. The lower recovery rate for irrigation should be justified by flexibility provisions (having regard to the social, environmental and economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected). It hasn't been done so far.

The new water pricing legislation proposal have been adopted and promoted to the Parliament in July 2011, but no vote has yet taken place. Elasticity and affordability based pricing was examined and considered in the proposal.

## **12.7 Additional measures in protected areas**

Protected areas under other Directives are clearly identified, but no specific additional measures to reach the more stringent objectives have been described for some of those protected areas.

Measures are taken by the WDD for the construction of new WWTP to replace the existing lagoon system for septic waste discharge.

Additional measures have been taken within the Management Plans for Natura 2000 sites. The protection of salt lakes is ensured by their designation in the Cyprus Natura 2000 network and by the subsequent management plan and measures that have been developed aiming in the protection and conservation of the lakes.

According to the provisions of the Bathing Water Directive 2006/7/EC the establishment of Bathing Water profiles took place for all bathing waters before March 2011 and also management measures were identified.

Regarding Nitrate Vulnerable Zones, a revision of the Action Plan under the Nitrates Directive is expected to be issued soon which includes a) the rational use and storing of fertilizers and manure, b) closed time periods for fertilizer and manure soil application.

## **13. CLIMATE CHANGE ADAPTATION, WATER SCARCITY AND DROUGHTS AND FLOOD RISK MANAGEMENT**

### **13.1 Water Scarcity and Droughts**

Water scarcity and droughts (WS&D) are stated as very relevant concerns in Cyprus but they are not systematically treated in the RBMP. Some measures to tackle WS&D are in place.

Water scarcity is a normal condition for Cyprus and is dealt with in the Report annexed to the RBMP on Water Policy. This report is a result of a study, and deals with all water sources and types of demand, including future trends.

Sources of water are surface water (exclusively dams), groundwater, recycled water and desalination. Future water availability trend scenarios are presented for water resources available in dams.

Drought is dealt with both in the Report on Water Policy and in the Drought Management Plan, both of which are annexed to the RBMP.

Demand reduction is dealt with in the Report on Water Policy, and Measures for demand management form a significant part of the Programme of Measures. The Drought Management Plan deals with the identification of measures to deal with high intensity / prolonged drought conditions, and mainly develops indicators for the definition of a "drought situation" and how to then manage the existing dams.

In the reply to the questionnaire sent by the European Commission to follow-up the implementation of the Communication on Water Scarcity and Droughts (COM (2007) 414 final), Cyprus reported to have undertaken activities to integrate water scarcity and droughts into sectoral policies and that these would be included in the RBMP. Although agricultural measures (authorisation and contracts for irrigation, approval of maximum quantities of

water, over-consumption fees, the possibility to suspend the supply of water in cases of over-consumption) exist, no concrete measures relating to the integration of water scarcity and droughts into sectoral policies could be clearly identified in the RBMP. However, it is stated that water concerns have to be taken into consideration in land use planning and civil protection mechanism must intervene in drought situations.

### 13.2 Flood Risk Management

The implementation of the Floods Directive 2007/60/EC is mentioned in the context of rainwater harvesting in the Cyprus RBMP relating to the next RBMP cycle.

### 13.3 Adaptation to Climate Change

Climate change is only mentioned in a very general way on a few occasions in two of the annexes of the RBMP. No further information provided.

Climate change is not even mentioned in the Drought Management Plan that is annexed to the RBMP.

## 14. RECOMMENDATIONS

Following the steps of river basin planning as set out in the WFD should ensure that water management is based on a better understanding of the main risks and pressures in a river basin and as a result, interventions are cost effective and ensure the long term sustainable supply of water for people, business and nature.

To deliver successful water management requires linking these different steps. Information on **pressures** and risks should feed into the development of **monitoring programmes**, information from the monitoring programmes and the **economic analysis** should lead to the identification of **cost effective programmes of measures** and justifications for exemptions. **Transparency** on this whole process within a clear governance structure will encourage **public participation** in both the development and delivery of necessary measures to deliver sustainable water management.

To complete the 1<sup>st</sup> river basin management cycle, and in preparing for the second cycle of the WFD, it is recommended that:

- Objectives for water bodies should be clearly indicated in order to be able to reach good status of waters in a reasonable timeframe.
- The classification of ecological status and potential should be further developed and completed.
- 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.
- Efforts should be made to improve the quality of monitoring.

- The designation of HMWBs 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.
- 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).
- Groundwater trend assessments and trend reversal should be improved in the 2<sup>nd</sup> RBMP cycle.
- 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.
- Water efficiency could be improved by increasing the reuse of treated waste water in existing irrigation networks.
- 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.
- 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.
- 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 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.