EUROPEAN
COMMISSION

Brussels, 9.3.2015
SWD(2015) 54 final

COMMISSION STAFF WORKING DOCUMENT

Report on the implementation of the Water Framework Directive River Basin Management Plans
Member State: GREECE

Accompanying the document

COMMUNICATION FROM THE EUROPEAN COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

The Water Framework Directive and the Floods Directive: Actions towards the 'good status' of EU water and to reduce flood risks

{COM(2015) 120 final}
{SWD(2015) 50 final}
{SWD(2015) 51 final}
{SWD(2015) 52 final}
{SWD(2015) 53 final}
{SWD(2015) 55 final}
{SWD(2015) 56 final}

TABLE OF CONTENTS

1. GENERAL INFORMATION

Figure 1.1: Map of River Basin Districts

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

Source: WISE, Eurostat (country borders)

Greece has a population of 11 million[1] with a high concentration in the Athens metropolitan area, and a total surface area of 131,957 square km.[2] It is located in the southern extremity of the Balkan peninsula in south-east Europe. Its territory includes more than 2,000 islands in the Aegean and Ionian seas. Mount Olympus is the highest point in the country.

[1] Eurostat data for 2014.

[2] Greece country fiche (http://europa.eu/about-eu/countries/member-countries/greece/index_en.htm)

Greece has 14 River Basin Districts (RBDs) (see Table 1.1. below). The two largest ones are the Western Macedonia RBD (GR09) covering 13,585 km^2 and the Thessalia (GR08) covering 13,153 km^2. Two of the RBDs, namely Aegean Islands (GR14) and Crete (GR13) cover islands, while 6 more (Northern Peloponese-GR02, Western Sterea Ellada-GR04, Epirus-GR05, Attica-GR06, Eastern Sterea Ellada-GR07 and Thrace-GR12) cover both mainland and island areas.

The following overview is provided regarding the shared transboundary catchment with MS/third countries (see Table 1.2 below):

- With Albania: Lake Prespa Basin (Part of Drin/Drim sub-basin) (GR09), Aoos/Vjosa River Basin (GR05);
- With Bulgaria: Mesta-Nestos River Basin (GR12), Struma-Strymonas River Basin (GR11), Maritsa-Evros-Meric River Basin (GR12), Axios/Vardar River Basin (GR10);
- With the former Yugoslav Republic of Macedonia: Lake Prespa Basin (Part of Drin/Drim sub-basin) (GR09), Axios/Vardar River Basin including the Doirani Lake Basin (GR10), Struma-Strymonas River Basin (GR11); and,
- With Turkey: Maritsa-Evros-Meric River Basin (GR12).

RBD	Name	Size* (km^2)	Countries sharing borders
GR01	Western Peloponnese	7,235	-
GR02	Northern Peloponnese	7,418	-
GR03	Eastern Peloponnese	8,442	-
GR04	Western Sterea Ellada	10,432	-
GR05	Epirus	10,007	AL
GR06	Attica	3,139	-
GR07	Eastern Sterea Ellada	12,268	-
GR08	Thessalia	13,153	-
GR09	Western Macedonia	15,218	AL, FYROM
GR10	Central Macedonia	14,264	BG, FYROM
GR11	Eastern Macedonia	7,320	BG, FYROM
GR12	Thrace	11,242	BG, TR
GR13	Crete	8,301	-
GR14	Aegean Islands	9,118	-

Table 1.1: Overview of Greece's River Basin Districts
* Area in Greek territory
Source: River Basin Management Plans reported to WISE[3]: http://cdr.eionet.europa.eu/be/eu/wfdart13

[3] This report reflects the corrections submitted by EL in late 2014. There are some discrepancies between the information reported in the RBMPs and the information provided by EL/submitted to WISE.

Name international river basin	National RBD	Countries sharing borders	Co-ordination category					
			2		3		4	
			km²	%	km²	%	km²	%
Lake Prespa (Part of Drin/Drim Sub-basin)	GR09	AL, MK	347	25.1				
Aoos/Vjosa	GR05	AL	2,154	33.0				
Mesta-Nestos	GR12	BG	2,429	42.3%				
Struma-Strymonas	GR11	BG, FYROM	6,295	36.5%				
Maritsa-Evros_Meric	GR12	BG, TR	3,345	6.3%				
Axios/Vardar	GR09	FYROM, BG					863	3.9
Axios/Vardar	GR10	FYROM, BG					1,636	7.3

Table 1.2: Transboundary river basins by category (see CSWD section 8.1) and % share in Greece[4].
Category 1: Co-operation agreement, co-operation body, RBMP in place.
Category 2: Co-operation agreement, co-operation body in place.
Category 3: Co-operation agreement in place.
Category 4: No co-operation formalised.
Source: EC Comparative study of pressures and measures in the major river basin management plans in the EU.

Note: the area figures (km^2) refer to the actual hydrological catchment of the respective river (i.e. not the RBD area, nor the respective WFD river basin area which both contain additional small catchments grouped with the actual river catchment)

[4] Categorisation determined under the EC Comparative study of pressures and measures in the major river basin management plans in the EU (Task 1b: International co-ordination mechanisms).

2. STATUS OF RIVER BASIN MANAGEMENT PLAN REPORTING AND COMPLIANCE

At the time of drafting the current report, Greece had adopted 12 RBMPs (GR01, 02, 03, 04, 05, 06, 07, 08, 09, 10,11, 12), which have also been fully reported in WISE (along with the accompanying Annexes) and thus the current report only considers those (see Table 2.1 below). In late 2014, in the context of a bilateral meeting between Commission Services and Greek authorities, some additions and corrections to specific tables of this report were provided, which have been incorporated.

The drafting of the RBMPs was commissioned to different consultants and coordinated by the Ministry of Environment, Energy and Climate Change – Special Secretariat for Water (EGY) assisted by a "coordinator consultant". A general national approach has been followed, yet it is evident that RBMPs' implemented approaches and structures present commonalities within the plans assigned to the same consultant, and differences across the background documents (Annexes) of the plans assigned to different consultants. Thus, the following groups can be observed: GR01/02/03, GR04/05/08, GR06/07, GR09/10, GR11/12. The role of the "coordinator consultant" was to support the EGY and provide expertise and guidelines (also in the form of guidance documents, which were nevertheless not officially published) for the streamlining and harmonisation of the process.

One of the main shortcomings of the Greek RBMPs is that they have been delayed due to a number of factors which relate to technical issues, as well as legislative and administrative barriers and socio-economic constraints. Consequently, time to implement the suggested Programme of Measures (PoMs) by 2015 and revise the plans for the second WFD cycle (considering and embedding the effects of the measures) is very tight. Nevertheless EL has specified that implementation of a great number of measures included in the PoMs had started before the approval of the RBMPs (detailed information on this aspect is reported by EL to be available in the PoM-Implementation Progress Report – national level, due in December 2012 but submitted to the COM in late 2014, and uploaded on WISE on 22.01.2015; the contents of that Progress Report has not been assessed yet and therefore is not taken into account in this report).

Another significant problem with the RBMPs was the lack of WFD-compliant data. The information used for the various assessments was based on the old monitoring network which was obsolete (with regard to the WFD required data) and the time-series fragmented and incomplete. Thus, the embedded uncertainty in the characterisation is judged significant, and in some cases it is not transparent how water bodies have been classified as "good" status (given the lack of complete information), as opposed to "unknown" status, since the characterisation is based on limited data and assumptions.

The new National Monitoring Programme (NMP), according to the WFD requirements, has been established late in the process (in 2012) and it is mentioned that it will furnish the necessary data for the revision and update of the RBMPs in the second cycle. Yet, the RBMPs have proposed some modifications with regard to the sites and parameters of the NMP based on their current findings, which essentially resulted from the new typology using system B (as opposed to the original typology using system A back in 2011 when the NMP was designed, see section 5.1 below). These suggestions have not been taken up yet by the Special Secretariat for Water, and would in some cases require additional financial resources (i.e. when supplementary sites are proposed). It is stated by EL that the NMP will be updated for the planning period 2016-2021, taking into account all available data and information from

the RBMPs and of course the proposed modifications in each RBD. After the adoption of the RBMPs for all of the country's RBDs and a cost-effectiveness analysis in relation to the financial resources already allocated for the planning period 2016-2021, the Special Secretariat for Water will propose a new updated National Monitoring Network to be consulted on with all involved national and regional authorities, within 2015. The new updated National Monitoring Network will be defined in an amendment of the JMD 140384/9-9-2011.

With regard to harmonisation and common approaches across the RBMPs, a national coordination programme was in place, yet it is not clearly reflected that all RBMPs implemented exactly the same approaches (e.g. on issues with small water bodies, definition of "significance" of pressures, assessment of groundwater quantitative status) when reading the WISE summary reporting and the Annexes. The Annexes themselves are very different in structure and content (for the same topics) which confuses the reader. A common structure and content across the RBMPs' Annexes would have increased transparency and understanding.

Finally, a common approach to ensure adequate incentives for efficient use and an adequate contribution from different users was not in place (Art. 9). Moreover, economic analysis varied across the RBMPs, partly due to missing information. It is planned that the methodologies for the economic analysis will be increasingly harmonised in the second and future cycles of review of the RBMPs.

An important strength for the Greek RBMPs is that all underwent strategic environmental assessment (SEA). Another added value is the parallel development of a Drought & Water Scarcity Management Plan (DMP) for each RBD. In most cases the specific sub-units or specific river basins are looked at separately. Quantity issues are discussed in the RBMPs and some measures related to quantity management have been identified in the PoMs. The links between the RBMPs and the DMPs should be further strengthened and the DMPs should be further developed into fully operational plans complementing the RBMPs.

RBD	RBMP Date of Adoption	RBMP Date of Reporting*
GR01	08/04/2013	13/09/2013
GR02	08/04/2013	13/09/2013
GR03	08/04/2013	13/09/2013
GR04	18/09/2014	05/12/2014
GR05	04/09/2013	28/01/2014
GR06	08/04/2013	05/09/2013
GR07	08/04/2013	05/09/2013
GR08	18/09/2014	05/12/2014
GR09	30/01/2014	25/09/2014
GR10	30/01/2014	25/09/2014
GR11	04/09/2013	19/03/2014
GR12	04/09/2013	12/02/2014
GR13	Pending	
GR14	Pending	

Table 2.1: Adoption and reporting to the Commission of Greece's RBMPs.
Source: RBMPs and CDR. *Latest date of WISE reporting including all annexes and background documents.

3. GOVERNANCE

3.1 Timeline of implementation

The dates of publication of RBMP preparatory documents are provided in Table 3.1.1 below; these are behind the due dates set in Art. 14 of the WFD.

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**
GR01	05/04/2013	05/04/2013	05/04/2013	05/04/2013	05/04/2013	08/04/2013
GR02	05/04/2013	05/04/2013	05/04/2013	05/04/2013	05/04/2013	08/04/2013
GR03	05/04/2013	05/04/2013	05/04/2013	05/04/2013	05/04/2013	08/04/2013
GR04	01/11/2011	01/02/2012	05/04/2013	04/09/2013	30/10/2013	18/09/2014
GR05	01/11/2011	01/02/2012	05/04/2013	04/09/2013	04/09/2013	04/09/2013
GR06	30/08/2010	13/04/2011	03/05/2012	13/01/2012	03/05/2012	08/04/2013
GR07	30/08/2010	13/04/2011	03/05/2012	13/01/2012	03/05/2012	08/04/2013
GR08	01/11/2011	01/02/2012	05/04/2013	04/09/2013	30/10/2013	18/09/2014
GR09	15/06/2011	27/04/2012	30/07/2012	30/07/2012	01/02/2013	30/01/2014
GR10	15/06/2011	27/04/2012	30/07/2012	30/07/2012	01/02/2013	30/01/2014
GR11	30/08/2010	09/08/2010	15/10/2011	18/11/2011	07/05/2012	04/09/2013
GR12	30/08/2010	09/08/2010	15/10/2011	18/11/2011	07/05/2012	04/09/2013
GR13	-	-	-	-	-	Pending
GR14	-	-	-	-	-	Pending

Table 3.1.1: Timeline of the different steps of the implementation process
Source: WISE (for all columns except "Final RBMP") and DG Environment web page: http://ec.europa.eu/environment/water/participation/map_mc/countries/greece_en.htm (for "Final RBMP" column).

3.2 Administrative arrangements - river basin districts and competent authorities

At a decentralised level, Greece is managed by 7 Decentralised Administrations, 13 self-governed Regions, and 325 Municipalities. This restructuring of the decentralised state structure in Greece (called "Kallikratis") was implemented in 2010 and has created some confusion regarding the roles and functioning of various state institutions and difficulties on various topics including water management.

With regard to the development of the RBMPs, the national competent authority is the "Special Secretariat for Water" (under the Ministry of Environment, Energy and Climate Change), based on the Presidential Decree 24/2010 OJ A 56/15.04.2010 and Law 3199/2003, which has the following responsibilities: coordination of water management issues; implementation of the WFD; monitoring of water quality and quantity; management and reuse of wastewater; floods management. Furthermore, the main competencies of the Secretariat are described in WISE 1.1. The decentralised administrations (Regional Water Directorates) are responsible for the river basin districts. However, for the first round of the RBMPs they signed off their responsibility for the drafting of the plans to the EGY, but they were involved and contributed to the final formulation of the PoMs at the regional level; they are the ones responsible for implementing the plans. The RBMPs specifically state that "the RBMPs of Greece are developed under the responsibility of the competent authorities for each RBD. Based on a request by their Secretaries, the Special Secretariat for Water took over the development of the RBMPs, which then were commissioned to consultants". Nevertheless,

other authorities including regional, municipal, and local authorities from other sectors have contributed under topics of their expertise and interest.

Finally, in the relevant Annexes on those "responsible for specific aspects of water management", long lists of additional authorities are presented showing how complex the overall setup is. With regard to the main next steps and difficulties, the RBMPs mention that many of the "responsible authorities" at the regional level are not sufficiently staffed, so they are in danger of not fully covering their responsibilities. Additionally, the fact that the RBMPs were commissioned to consultants may have limited the Regional Water Directorates' opportunities to gain further insight into WFD issues and experience. Capacity building has nevertheless been undertaken through seminars organised by the EGY.

As mentioned above, the drafting of the RBMPs was commissioned to different consultants and coordinated by the EGY. A general national approach has been followed. There are some differences in terms of the methodologies and available data that were used among the different groups of the consultants e.g. the GR01/02/03 plans were compiled by one team, the GR04/05/08 plans by another, GR06/07 plans by a third team, GR09/10 plans by a fourth and GR11/12 plans by a fifth. However, as the Special Secretariat for Water coordinated all the teams there are several common specifications. There were no main changes announced or implemented after the submission of the RBMPs (corrections dealt with clarifications or typos).

3.3 RBMPs - Structure, completeness, legal status

In general the structure of the RBMPs follows the specifications of the WFD. In terms of clarity there are certain issues regarding the implementation of the methodology that is described in the relevant chapters of the RBMPs. In some cases it is not very clear whether and how a specific methodology, e.g. for assessing the water bodies, is applied. The different RBMPs have the same structure and content, but are accompanied by numerous Annexes, and harmonisation of structure and content is missing across them, thus confusing the assessment. In terms of completeness, it is explicitly mentioned on several occasions that there was insufficiency of available data and supporting studies/surveys for the assessment of water bodies. It is mentioned that in cases where no data were available, the assessment was done through expert judgment and/or through grouping of water bodies with similar types and levels of pressures, and thus the level of uncertainty was characterised as large. An improvement of the data quality and the water bodies' assessment can only be addressed through the implementation of the National Monitoring Program that was defined with the Common Ministerial Decree 140384/9-9-2011. It was originally foreseen that the new network programme would provide the first monitoring results at the end of 2013. This new data would be used to improve the knowledge of the water bodies' status and thus the completeness of the RBMPs in the next cycle. No links to any international plans are referenced within the RBMPs.

Out of the 14 RBMPs, 12 of them have been approved and embedded into the National Law, while the remaining 2 are in the process of compilation and consultation. For the approved RBMPs the relevant Strategic Environmental Assessments/Environmental Impact Assessments (SEA/EIAs) have been approved as well and are publicly available. The 12 officially approved RBMPs should implement the Programmes of Measures in the following very short period as the second round of revised Plans should be submitted by 2015, according to the WFD, taking into account the implementation of the first RBMPs.

3.4 Consultation of the public, engagement of interested parties

Regarding the RBMPs of GR01/02/03/09/10 there was a critical assessment expressed in a rather "positive" way about most consultation activities (in WISE 1.3.6), mentioning that: "Unprecedented for the Greek situation was the less than expected participation of the public". A "results of the participation" document was submitted along with the relevant RBMPs. Regarding the consultation procedures, in the RBMPs of GR04/05/06/07/08/11/12, the consultation document does not refer to the activities that took place, but is a "planning document" for the activities that should/would take place. According to WISE 1.3.6, the main activities include: (a) publication and commenting of the public participation plan, involved stakeholders, Significant Water Management Issues report; (b) publication and commenting of the RBMP; (c) publication and commenting of the SEA/EIA; (d) informational meetings and (e) 39 stakeholder conferences/workshops (attended by 3,500 participants in total as stated by the EGY). Moreover the EGY has set up an interactive internet site http://wfd.ypeka.gr where the full content of the RBMPs is available and which facilitated the submission of comments by interested stakeholders. The consultation can be assessed as adequate but "improvable" in terms of stakeholders' participation (almost 450 written comments/interventions were received through questionnaires and the consultation website) and input.

It is difficult to describe the impact of the consultation on the final plans, since the document "results of the participation" was not submitted (however it is reported by EL as available in the EGY). A "general list of comments was received" during the consultation workshops but it cannot be inferred from the RBMP itself whether these comments were actually taken under consideration and were incorporated in the newer RBMPs version. It is stated by the EGY that they have been considered and incorporated. Most of the comments originated either from the scientific community or from other institutions, organisations, etc.

There was no active continuous involvement of stakeholders and the general public but rather limited participation in certain consultation workshops. In general the consultation can be assessed as not very successful in terms of stakeholder participation and input.

3.5 Cooperation and coordination with third countries

For GR05 there has not been international coordination on public participation and active involvement of interested parties. In practice, in Albania (where the Aoos River Basin extends), the decisions of the National Water Council (NWC) and the respective local authorities have not been implemented; thus the competent national and local authorities do not fully operate. Both in WISE and in the RBMP there is no specific reference to existing or planned coordination on public participation[5].

For GR09, one part of the Prespa Basin and a sub-basin of Axios River extend geographically in the neighboring countries of FYROM and Albania; thus these basins are transboundary. However, there are no International RBMPs, as these countries are not EU MS; and thus not obligated to submit these Plans. Regarding the Axios River Basin, there is no border co-operation established for the integrated water resources management. Regarding the Prespa Basin there has been an international agreement between the three countries (Greece, Albania & FYROM) on the protection and sustainable development of the Prespa National Park.

[5] According to Greece, the Albanian authorities have been invited during the RBMP consultation process.

Additionally, a Coordination Commission was formed for the protection of the Park on 27/11/2009 and an International Agreement was signed on 02/02/2010 among the Ministers of Environment of the three countries and the EC Commissioner for the Environment. Furthermore, there has been recent mobility in international cooperation regarding the integrated water resources management in cross-border areas on 25/01/2012, followed by further meetings in June 2012 and May 2013 (both for Prespa and Axios Basin). Several actions and programmes have been implemented in the sub-basin of Prespa with the cooperation of Albania and FYROM. Also a working group has been established from 2006 for the monitoring and protection of the Prespa Basin. This group has organised four (4) meetings so far.

For GR10, one part of the Strimonas River Basin extends geographically in the neighboring country of Bulgaria, thus this basin is a transboundary one. However, there has not been an International RBMP, as Bulgaria had already submitted its RBMP to the EC before Greece. Thus, for the first round of the Plans, these are separate for the two countries. However, since 27th July 2010, there has been a common Announcement of the two responsible Ministries (i.e. the Hellenic Ministry of Environment, Energy and Climate Change and the Bulgarian Ministry of Environment and Water Resources). The Announcement confirmed the intention of the two countries to cooperate in the water resources management issues in the transboundary basins. For this purpose, the Joint Expert Working Group was established. The Group initially met in Drama on 16th May 2011, in Sofia on 12th October 2011 and in Thessaloniki on 23rd April 2013. Recently there has been a Joint Declaration of the competent Ministers of Greece and Bulgaria regarding the intention of cooperation between the two countries on issues of transboundary basin management.

For GR11 and GR12 there has been no international coordination on public participation and active involvement of interested parties, as Bulgaria submitted its RBMP to the EC before Greece, while Turkey is not a MS and thus not obligated to submit Plans. For GR05/11/12 there have not been any international RBDs designated and no international RBMPs adopted. For GR11, in spite of the fact that there has not been full international coordination between Greece and Bulgaria, from 27th July 2010, there has been a Joint Declaration between the Hellenic Ministry of Environment, Energy and Climate Change and the Bulgarian Ministry of Environment and Water Resources regarding the use of water resources in the territories of shared river basins. The Joint Declaration confirmed the intention of the two countries to cooperate in the water resources management issues in the transboundary basins. For this purpose, the Joint Expert Working Group was established; the Group initially met in Drama on 16th May 2011, then in Sofia on 12th October 2011, in Thessaloniki on 23rd April 2013 and in Athens on 8th May 2014. As regards the public participation there has been no international coordination between the two countries. For GR12, in spite of the fact that there has not been full international coordination between Greece, Bulgaria and Turkey, regarding the cooperation with Bulgaria, there has been a series of negotiations that started in 1965 and resulted in an Agreement between Greece and Bulgaria that was signed in 1995, certified with the Greek Law 2402/96, Government Gazette (GG/A/98) and has 8 Articles. As with GR11, the cooperation of the two countries was enhanced on 27th July 2010 with the Joint Declaration of the two responsible Ministries (see further details above). Additionally, regarding the cooperation with Turkey, an Ad Hoc Joint Committee has been established in November 2010 in respect to cooperation issues for the Evros River Basin. The Committee initially met on 30th May 2011. In this framework, the Joint Expert Working Group was established in order to exchange data and information for the Evros River and the relevant sub-basins in Greece and Turkey. The Joint Expert Working Group has met twice, in

Adrianoupolis on 24th June 2011 and in Alexandroupolis on 8th September 2011. It should also be mentioned that both the Greek and the Turkish sides give a great deal of emphasis on a common management response to the flood issues of Evros, a subject of Greek terms associated with the implementation of the corresponding Directive 2007/60/EC on flood risk management in the EU. As regards the public participation there has been no international coordination between the interested countries.

3.6 Integration with other sectors

The links with 10 national sectoral plans were analysed in the SEAs which accompanied the RBMPs (e.g. National Plan for Rural Development 2007-2013). The Directorate for Spatial Planning and the Ministry of Rural Development were among the stakeholders that have sent written comments on RBMPs and the respective SEAs. There are some cases, such as the regional development plans, which are in the process of compilation and might have been linked or used information from the approved RBMPs but this is not currently established, as these plans are not fully completed yet. No links with agricultural plans are apparent in the RBMPs.

4. CHARACTERISATION OF RIVER BASIN DISTRICTS

4.1 Water categories in the RBD

The RBDs reviewed in the current report include all water systems and their classification into four categories according to the requirements of the WFD (rivers, lakes, transitional and coastal waters, groundwater). According to Annex II of the WFD, categorisation of surface water bodies apart from the four above categories include the identification of Heavily Modified Water Bodies (HMWB) as well as artificial water bodies (AWB).

4.2 Typology of surface waters

The Presidential Decree 51/2007 "Establishment of measures and procedures for integrated protection and management of water in compliance with the provisions of the Water Framework Directive 2000/60/EC" defines in Annex II that both systems A and B could be used in the characterisation of surface water bodies. In the Greek RBMPs, system B has been applied for all the water categories. It is to be noticed that previously, in 2009, in response to the obligations of Art. 8 of the WFD, system A was used. In the current RBMPs there was a switch to system B (all obligatory descriptors for system B have been used), which resulted in the modification of the number, boundaries and characteristics of the surface water bodies.

Overall the surface water typology has been validated with biological data. For river water bodies it was based solely on benthic macroinvertebrates, for lakes on phytoplankton and for coastal and transitional water bodies on macroinvertebrates, phytoplankton and macroalgae. In general, reference conditions have been established for each of the surface water types with the exception of the transitional waters where the work on reference conditions is at an early stage and the information provided so far is indicative until intercalibration is finalised. The methodology used was based both on spatially based methods, as well as on expert judgement. It is unclear from the RBMPs and Annexes (provided as background documents) how much expert judgement was used. In terms of a national Guidance Document, guidelines were formulated by the coordinator consultant and the General Secretariat for Water to guide and harmonise the work and methodological approach of all other consultants who were commissioned with the drafting of the RBMPs, but these were not organised into a detailed guidance document.

The number of surface water types that have been defined in different water categories is summarised in Table 4.2.1.

RBD	Rivers	Lakes	Transitional	Coastal
GR01	6	1	2	1
GR02	6	4	2	1
GR03	5	1	2	1
GR04	8*	3*	2*	1*
GR05	8	3	2	1
GR06	1	1	0	1
GR07	5	1	1	1
GR08	8*	2*	0*	1*
GR09	10	4	2	1
GR10	7	4	2	1
GR11	6	2	1	1
GR12	7	2	2	1
GR13	No data reported in WISE			
GR14	No data reported in WISE			

Table 4.2.1: Surface water body types at RBD level
Source: WISE; * *corrections/additions provided by EL late 2014.*

4.3 Delineation of surface water bodies

The river delineation process excluded from the first step ephemeral streams, where 95% of the time there is no presence of water in them and neither is any aquatic environment present. After this exclusion the initial water bodies selection was performed on the basis of the Strahler stream classification index. Only streams of the 4th order and above are initially included in the set. This initial set is considered by definition to be comprised of "important and discrete" elements of surface water, but not including all such elements. Additional water bodies (which were initially excluded due to their ephemeral flow) were then added to this initial set if deemed important elements in terms of aquatic ecosystem and fish population. This assessment of importance of these small water bodies was made almost exclusively based on expert judgment of scientists from the Hellenic Centre for Marine Research (HCMR) taking into account biological data (fish and benthic invertebrates) where available. In the RBMPs it is mentioned that an investigation was undertaken into whether small water bodies can be aggregated with adjacent water bodies (aggregation was performed where feasible and essential). Finally, further additions were made during the consultation process where some additional streams to be included were indicated by local officials and scientists. For example, in the RBMP of GR11 it is stated that during the public consultation, objections were raised with regards to the inclusion of some small water bodies with ephemeral flow in the sub-catchment of the Aggitis River, and thus the necessary adjustments were then performed to exclude them.

The above clarifications were provided by EL since it does not clearly appear from the RBMPs' Annexes how the inclusion/exclusion of small water bodies has actually been implemented (i.e. the specific criteria for defining what is termed as an "important" element of water/ aquatic ecosystem are not clear in the RBMPs; the information on which small water bodies have been joined with adjacent ones, or not joined, and/or not considered is not obvious).

In the case of lakes, all lakes with a size greater than 0.5 km^2 have been considered as surface water 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)*
GR01	110	8	2	2	5	1	11	95	26	262
GR02	63	11	6	5	9	2	19	127	26	284
GR03	80	7	1	1	6	1	13	206	27	299*
GR04	102*	10*	5*	26*	4*	68*	8*	273*	25*	410*
GR05	85	13	1	19	7	59	13	81	26	349
GR06	14	9	1	3	0	-	14	288	24	129
GR07	81	13	3	12	1	18	19	339	46	268
GR08	74*	19*	1*	35*	0*	0*	7*	134*	32*	392*
GR09	150	10	14	39	2	20	2	564	62	275
GR10	104	11	6	28	3	23	11	350	39	348
GR11	91	9	2	24	1	7	4	183	15	456
GR12	188	10	6	4	5	56	12	61	18	578
GR13	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-
Total	*1142*	*11*	*48*	*17*	*43*	*23*	*133*	*225*	*366*	*338*

Table 4.3.1: Surface water bodies, groundwater bodies and their dimensions
Source: WISE; * corrections/additions provided by EL late 2014.

4.4 Identification of significant pressures and impacts

Even though in certain RBDs limited information on methods for defining significant pressures is available, the WISE summary report shows that determination of significant pressures has been made for all of the RBDs. Table 4.4.1 gives an overall picture of the significance of the different pressures within the country. These data indicate that diffuse pollution is assessed as the most significant pressure in Greece, affecting 63% of surface water bodies (802 SWBs) followed by point source pollution which affects 45% (520 SWBs). "Other pressures" affect 17% (228 SWBs), and surface water abstraction affects 6% (74 SWBs) of surface water bodies. Additionally, pressures such as water flow regulations and morphological alterations, other morphological alterations and river management are allocated smaller percentages, i.e. 3% (42 SWBs), 0.3% (4 SWBs), and 1% (14 SWBs) respectively.

An explicit identification of the criteria used to determine the significance of pressures is not apparent in all the RBMPs, yet EL clarified that criteria (and the related thresholds) for individual pressures (point and diffuse pollution, and water abstraction) were identified from the limits contained in other relevant Directives, studies and research results found in literature, and expert judgement as being likely to impact on water status.

Regarding point source pollution, some RBMPs (such as GR11/12) refer to the use of both numerical tools and expert judgement in pressure analysis; however, they do not provide details on the specific methods or criteria used. On the other hand, GR01/02/03/05/06/07/09/10 identify specific thresholds that define significant pressures from

point source pollution (e.g. in GR05 the significance of pressure from industrial units was based on the criterion of the type, size and number of units that relate to discharges of priority substances and were classified as follows: N≥5 (high), 1≤N<5 (medium), N=0 (low)).

Regarding diffuse source pollution most RBDs (e.g. GR01/02/03/04/05/06/07/08/09/10) give a summary table of criteria (related to type, size and pollution load) for all pressures, defining specific levels of N, P and BOD concentrations as thresholds connected to diffuse pollution (e.g. when BOD>10 mg/l, N>10mg/l and P >1mg/l the pressure is defined as significant).

Regarding abstraction pressures, generally in all RBDs a description of the pressures considered and the methodology followed is mentioned (a mixture of actual numbers and expert judgement). Criteria for assessing the significance of the pressure are available in GR01, GR02, GR03, GR04, GR06 (only relevant for groundwater abstractions), GR07, GR08 GR09 and GR10. These criteria relate to the assessment of water exploitation, abstraction volumes as percentage the natural annual and summer runoff volumes.

Regarding water flow regulation and hydromorphological alterations, overall all RBMPs describe these pressures and a relevant analysis (a mixture of actual numbers and expert judgement), but specific criteria to judge significance were not found in the background documents. The most common hydromorphological pressures mentioned and analysed among RBDs are: flood defence structures/dams, water reservoirs, modifications and diversions, water transfers.

Further information provided by Greek authorities indicate that the criteria used are far from comprehensive because, to a large extent, only main dams (higher than 15 m and considering also the abstractions and the regulating capacity in relation to the river flow) have been considered as significant hydromorphological pressure. It appears also that the main impact that has been assessed is downstream of the dam, not necessarily considering the water bodies where the dams are located and the upstream effects. This approach potentially overlooks many smaller but significant hydromorphological pressures. This is likely the reason for the very low percentages of water bodies reported as affected by hydromorphological pressures.

As regards pollution loads, the main conclusions for each RBD are summarised below:

- GR01: the greatest individual point source pollution load comes from industrial units. Important pollution is also produced from urban waste water, and notable BOD load is produced by aquaculture.
- GR02/03: the greatest point source pollution burden comes from industrial units. Regarding diffuse pressures, livestock produces the largest amount of pollutants.
- GR04: it is evident from the available data collected for point source pollution that the increased pressure on water bodies comes from the Acheloos basin (GR15). Significant point source pollution loads are mainly generated by the industrial units and the stabled livestock. The greatest effect from non-point source pollution seems to be related to the intense livestock activity in the region, as the organic load, the nitrogen and phosphorus load is estimated to contribute over 90%, 80% and 50% respectively, of the total load.
- GR05: Significant point source pollution loads are mainly generated by industrial units and stabled livestock. One of the major sources of non-point source pollution in the area relates to livestock and agriculture. In particular, the greatest effect is associated with intense livestock activity in the region, as the organic load, the nitrogen and

phosphorus load is estimated to contribute more than 90%, 80% and 60% of the total load respectively.

- GR06: it was concluded that the main pollution load is generated by the intense industrial activity. Moreover, from the evaluation of quantitative estimates of diffuse sources of pollution it was concluded that surface runoff from cropland and livestock contribute significantly to pollution loads. The organic load due to untreated urban sewage contributes more than 60% of the total organic load (BOD t/year), while the effect of nitrogen and phosphorus load due to agricultural activity is greater (75% and 90% respectively).
- GR07: the main pressures on surface water bodies come from the sectors of agriculture, industry and livestock. From the assessment of quantitative estimates of diffuse sources of pollution it can be concluded that surface runoff from agriculture and livestock contributes significantly to pollution loads. The organic load due to livestock contributes more than 78% of the total organic load, while the effect of nitrogen and phosphorus load due to agricultural activity is greater (84% and 95% respectively).
- GR08: the increased pressure on the water bodies comes mainly from the river basin of Pinios from various activities (urban waste water treatment plants, livestock activity, industry, mining activities and uncontrolled dumpsites). Regarding the pollution load from diffuse sources (mainly from agriculture and stable livestock activity), the organic load and the nitrogen load resulting from livestock is over 90% and 60% respectively, while greater is the influence of phosphorus load due to agricultural activity (about 70%).
- GR09/GR10: industrial activity together with livestock and agriculture are the greater pressures within the water district. Quantitative estimates of diffuse sources show that the surface runoff from cropland and livestock contribute significantly to pollutant loads. The effect of nitrogen and phosphorus load due to agricultural activity is significant. It is worth mentioning that the concentration of organic load is generated mostly due to livestock activities, while nitrogen and phosphorus arise in farming and agriculture. The mining activity that relates to water pollution is located mainly in the region of Jerrissou, in the southeast of the water districts.
- GR11/12: most of the pollution loads come from agriculture, livestock and urban waste.

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.	%
GR01	-	0	88	69	128	100	10	8	0	0	0	0	0	0	0	0	32	25
GR02	-	0	48	49	97	100	18	19	0	0	0	0	0	0	0	0	39	40
GR03	2	2	63	63	98	98	4	4	0	0	0	0	0	0	0	0	37	37
GR04	53*	44*	54*	45*	41*	34*	11*	9*	17*	14*	5*	4*	4*	3*	0*	0	53	44
GR05	44	42	46*	42	44*	41	11*	9	8	8	0	0	5*	5*	0*	0*	44*	42*
GR06	5	17	23	79	19	66	0	0	0	0	0	0	0	0	0	0	0	0
GR07	20	19	67	64	74	71	5	5	0	0	0	0	0	0	4	4	0	0
GR08	13*	16*	55*	67*	62*	76*	2*	2*	2*	2*	7*	9*	0*	0*	0*	0*	13*	16*
GR09	115	68	28	17	25	15	0	0	0	0	0	0	0	0	0	0	0	0
GR10	51	41	26	21	67	54	1	1	0	0	0	0	0	0	0	0	0	0
GR11	40	41	17	17	52	53	10	10	6	6	0	0	0	0	0	0	0	0
GR12	114	54	5	2	95	45	2	1	9	4.27	2	1	0	0	0	0	10	5
GR13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	*457*	*29*	*520*	*45*	*802*	*63*	*74*	*6*	*42*	*3*	*14*	*1*	*9*	*1*	*4*	*0,3*	*228*	*17*

Table 4.4.1: Number and percentage of surface water bodies affected by significant pressures
Source: WISE; * corrections/additions provided by EL late 2014.

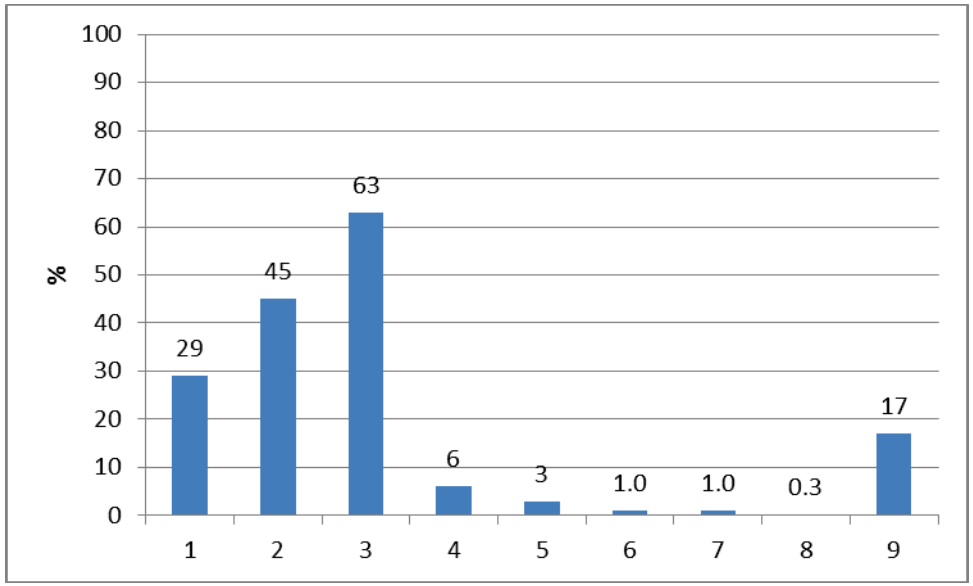

Figure 4.4.1: Graph of percentage of surface water bodies affected by significant pressures
1 = No pressures
2 = Point source
3 = Diffuse source
4 = Water abstraction
5 = Water flow regulations and morphological alterations
6 = River management
7 = Transitional and coastal water management
8 = Other morphological alterations
9 = Other pressures
Source: WISE

4.5 Protected areas

In Greece 1,615 protected areas have been designated, according to information provided to WISE (see Table 4.5.1). Just over half of these areas (57%) are for bathing water, while 8% are for drinking water abstraction under Art. 7 of the WFD. Another 10% are for habitats, birds and fish altogether, 6.5% are for UWWTPs. With regard to the protected areas under Art. 7 abstraction for drinking water, out of the total 131 protected areas 85 are for groundwater (i.e. 65%) and the remaining 35% are for surface water.

RBD	Number of PAs										
	Article 7 Abstraction for drinking water	Bathing	Birds	European Other	Fish	Habitats	Local	National	Nitrates	Shellfish	UWWT
GR01	5	50	2		4	8		8			
GR02	9	114	4		6	15		5	1		
GR03	3	88	3		4	7		8	1		
GR04	21*	60*	15*			22*	9*	25*	2*		12*
GR05	10	87	21			23	33	23	2		6
GR06	4	125	4			5			3		4
GR07	16	170	14			16			4		11
GR08	7*	67*	16*			13*		5*	1*		2*
GR09	17	11	11		6	22			2	2	23
GR10	4	84	9			15			1	4	6
GR11	15	23*	5		2	7			1	4	14
GR12	20	36	14		5	12			3	7	27
GR13	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-
Total	*131*	*915*	*118*	*0*	*27*	*165*	*42*	*74*	*21*	*17*	*105*

Table 4.5.1: Number of protected areas of all types in each RBD and for the whole country, for surface and groundwater[6]
Source: WISE; * corrections/additions provided by EL late 2014.

5. MONITORING

5.1 General description of the monitoring network

The monitoring programme for Greece has been defined in the Common Ministerial Decree KYA 140384/9-9-2011 while the standards and minimum performance criteria of the analytical methods for the chemical analysis and monitoring have been defined in the Common Ministerial Decree 38317/1621/E103/2011. According to the Ministerial Decree

[6] This information corresponds to the reporting of protected areas under the WFD. More/other information may have been reported under the obligations of other Directives.

140384/9-9-2011, the EGY is responsible for: i) the submission of the annual budget for the operation of the NMP to the Ministry, ii) the monitoring at national level of the quantity and quality of surface and groundwaters in cooperation with the Regional Water Directorates of the Decentralised Administrations, iii) the development and operation of the national network/ grid. At the time that the RBMPs were being drafted, the new WFD monitoring programme was not operational. Thus, the monitoring data used for the characterisation of the water bodies in the RBMPs were based on the old fragmented monitoring network which had significant data gaps with regard to the WFD-required assessment parameters.

The new National Monitoring Programme - NMP (established with the above mentioned Ministerial Decree in 2011 and currently implemented from 2012 onwards) follows a common national approach in terms of objectives, standards, definition of monitoring points, responsible authorities, etc. The number, type and location of monitoring stations per water body and the number, type and frequency of the sampling parameters are listed in the Ministerial Decree. All these were originally defined in 2009 in response to the obligations of Article 8 of the WFD, considering the state-of-the-art knowledge at that time and the results of a relevant study commissioned by the General Secretariat for Water (which also defined the water bodies, pressures and impacts) and were updated and finalised in 2010 in the framework of the national project "Development and application of methods and software for the assessment of the water quality related data of the Greek water bodies". A total of 616 monitoring stations for surface water bodies are defined in the new programme for the whole territory, and 1,387 for groundwater bodies. It is foreseen that the new network programme will be updated periodically in order to better meet the systems' needs based on the first monitoring results (originally expected at the end of 2013) and the findings of the current RBMPs.

In the RBMPs the typology used for the characterisation of the water bodies changed with regard to the system that was used back in 2008-2009 (shifting from system A to system B). This resulted in the modification of the number, boundaries and characteristics of the water bodies, and the subsequent need to perform a new matching between the established monitoring points of the Ministerial Decree and the latest defined water bodies (in the RBMPs). The matching has been performed, but also additional information from the neighbouring RBDs, the water bodies' grouping and the identified pressures and impacts has been integrated and led to suggestions on modification of the new monitoring programme to better serve its purpose. These suggestions are presented in all the RBMPs and are basically grouped under three main categories: (i) reallocation of the monitoring stations to neighbouring sites (e.g. upstream or downstream in rivers); (ii) switching of monitoring stations from the surveillance to the operational programme and vice-versa; (iii) inclusion/exclusion of the sampling elements and/or changes in the frequency of sampling. It is acknowledged in some RBMPs that these modifications (especially category ii - additional sites) may be difficult to implement since they would require additional funding, but categories i and iii are deemed feasible.

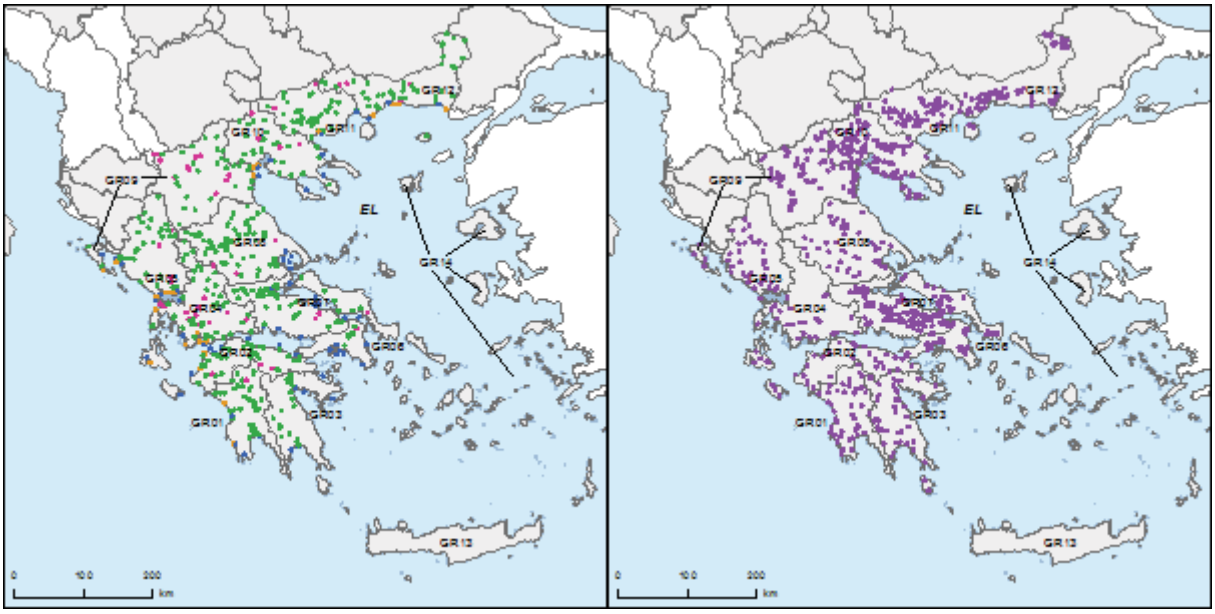

Figure 5.1: Maps of surface water (left) and groundwater (right) monitoring stations

- 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)

5.2 Monitoring of surface waters

As explained above, the data used in the RBMPs originated from the old monitoring network, which was not compliant with WFD requirements. The available data were fragmented, with many gaps in parameters and time-series which restricted the corresponding assessments in the RBMPs. The data of the old monitoring network were provided by different agencies, mainly the Ministry for the Environment, Energy and Climate Change, the Ministry of Rural Development and Food and the General Chemical State Laboratory. Data from regional authorities and sample monitoring from various existing surveys were also available in some cases. As a result, based on quality assurance, completeness, accuracy, etc. the following quality elements of the old monitoring system have been considered overall for the classification of surface water bodies (yet not in all cases, and not with continuous long time-series) in the current RBMPs:

- BQEs: benthic macroinvertebrates (for rivers); phytoplankton (lakes); macroinvertebrates, phytoplankton and macroalgae (coastal and transitional) *–more details in section 7.*
- Physico-chemical elements: transparency, thermal conditions, oxygen conditions, salinity, acidification conditions and nutrient conditions *–more details in section 7.*
- Hydromorphological elements: not clear if they have been considered *–more details in section 7.*

- Priority substances and other specific pollutants: Ni, Pb, Hg, Cd, Brominated diphenylether, Di(2-ethylhexyl)phthalate (DEHP), Endosulfan, Hexachlorocyclohexane, Chlorfenvinphos, Anthracene, Hexachlorobenzene, considered on a case-by-case basis –*more details in section 9.*

In assessing the river water bodies (in the current RBMPs), grouping was performed when there was no monitoring station within a certain river water body (of the old network). Groups have been formulated so that each group contains at least one river water body which is being monitored. The grouping was based on the hydromorphological characteristics of the rivers (biogeographical regions, annual discharge, slope, altitude) as reflected in the water bodies' typology, as well as on the type and intensity of pressures that are identified in the sub-catchment of the water body. The heavily modified and artificial water bodies have been excluded from grouping and are considered individually even when monitoring stations are not present in them.

With regard to the New Monitoring Programme (established by the Ministerial Decree in 2011) it includes both surveillance and operational monitoring programmes including all relevant quality elements. A total of 616 monitoring stations for surface water bodies are defined in the NMP for the whole territory, of which 377 are for surveillance and 239 for operational monitoring. Biological, physico-chemical and hydromorphological QEs are defined to be monitored in all of them, priority substances in 326, specific pollutants in 282 and other substances in 29 of them. The relevant elements that are monitored per RBD are shown in Table 5.1 below as reported in the WISE Summary Reports 4.1.7 and 4.1.8 and further corrected by EL in late 2014.

Few of the monitoring stations are part of the International Network Barcelona Convention/Mediterranean Action Plan (MEDPOL). A detailed view of the programmes (surveillance & operational), station locations, elements and frequencies foreseen to be monitored at each water body is provided in the Annexes of the Ministerial Decree, and also on WISE - CDR under the Art. 8 reporting (submitted 26.08.2009), and have been defined in the document "Updated Report of Article 8 of the WFD including the catalogue of elements and parameters to be monitored in each station of the NMP". The sampling and frequency methodologies are also mentioned there. With regard to the methodologies for selecting the BQEs of the operational programme, the priority substances and other pollutants, it is mentioned that these are developed within the guidance documents of the research project "Development of network and monitoring of the internal, transitional and coastal water bodies of the country – Assessment/Classification of their ecological status" undertaken by the HCMR-EKBY, 2008 (Hellenic Centre for the Marine Research – Greek Biotope/Wetland Centre). As mentioned above, upon the establishment of the RBMPs and their findings additional suggestions were made in the RBMPs regarding modifications to the NMP (inclusion/exclusion of monitoring stations and/or elements) to better accommodate the identified needs.

5.3 Monitoring of groundwater

As explained above, the data used in the RBMPs originated from the old monitoring network, which was not compliant with the WFD requirements. The available data was fragmented, with gaps in parameters and time-series which restricted the corresponding assessments in the RBMPs. The data of the old monitoring network were provided by different agencies, mainly the Institute of Geology and Mineral Exploration, the Ministry for the Environment, Energy and Climate Change, the Ministry of Development. Data from regional authorities and sample monitoring from various existing surveys were also available in some cases. As a result, based

on quality assurance, completeness, accuracy, etc. the following elements and parameters of the old monitoring programme have been considered overall for the assessment of groundwater bodies (yet not in all cases, and not with continuous long time-series) in the current RBMPs:

- Quantitative status: abstraction per sector (mostly estimated from water demands); water balance (comparison between available groundwater resource by the long-term annual average rate of abstraction), groundwater levels, spring discharges –*more details in section 10.*
- Chemical status: pH, conductivity, chloride, nitrates, nitrogen dioxide, ammonium, sulphate. Pb, Cr, Ni, Al, Fe, Mg, Mn, B were assessed in a subset of the groundwater bodies. The data series of heavy metals (Pb, Cd, As, Hg) were not systematic – *more details in section 10.*
- No data were available for trichloroethylene and tetrachloroethylene. Thus, these parameters have not been considered in the assessments – *more details in section 10.*

Quantitative, surveillance and operational monitoring programmes are included in the new monitoring network (established with the Ministerial Decree in 2011). It includes monitoring of quantitative status and the all chemical elements considered relevant by the Greek authorities. A total of 1,387 monitoring stations for groundwater bodies are defined in the NMP for the whole territory, of which 294 are for surveillance and 1093 for operational monitoring. Quantity and physico-chemical parameters are defined to be monitored in all stations, nitrates in 867, heavy metals in 844, pesticides in 502, and composite compounds in 284 of them. A detailed view of the programmes (quantitative, surveillance & operational), station locations, elements and frequencies foreseen to be monitored at each groundwater body are provided in the Annexes of the Ministerial Decree, and have been defined in the document "Updated Report of Article 8 of the WFD including the catalogue of elements and parameters to be monitored in each station of the NMP". The sampling and frequency methodologies are also mentioned there.

With regard to the criteria for defining the monitoring stations of the operational programme the following are listed:

(i) Availability of existing monitoring stations (of the old networks) for which representative samples can be retrieved;

(ii) Possibility to support different programmes and requirements of the Water Framework, Groundwater and Nitrates Directives (e.g. monitoring of both quantitative and chemical elements, monitoring of nitrates pollution, monitoring of drinking water areas);

(iii) Accessibility and capacity to achieve/support the measurement of parameters on a long-term basis.

With regard to the methodologies for selecting the parameters or elements of the operational programme, it is mentioned that these are developed within the guidance documents of the research project "Development of network and monitoring of the internal, transitional and coastal water bodies of the country – Assessment/Classification of their ecological status" undertaken by the HCMR-EKBY, 2008 (Hellenic Centre for Marine Research – Greek Biotope/Wetland Centre). As mentioned above, upon the establishment of the RBMPs and their findings, additional suggestions were made in the RBMPs regarding modifications to the NMP (inclusion/exclusion of monitoring stations and/or elements) to better accommodate the identified need.

BD	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 Non 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
GR01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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
GR01																						
GR02																						
GR03																						
GR04																						
GR05																						
GR06	-	-	-	-	-	-	-	-	-	-	-											
GR07																						
GR08	-	-	-	-	-	-	-	-	-	-	-											
GR09																						
GR10																						
GR11																						
GR12																						
GR13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 5.1: Quality elements monitored[7]

[7] This table refers to the New National Monitoring Programme, which was established with the Common Ministerial Decree KYA 140384/9-9-2011, but was not used during the 1st cycle of the RBMPs.

QE Monitored
QE Not monitored
Not Relevant

Source: WISE Summary Reports: 4.1.7 and 4.1.8. Note: EL provided an alternative formulation of this Table, but the output from the Annexes and WISE have been used here.

D	Rivers		Lakes		Transitional		Coastal		Groundwater		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
GR01	17	19	1	0	0	2	4	0	27*	59*	86*
GR02	25	11	2	1	0	4	4	5	10	95*	105*
GR03	12	10	0*	0*	0*	0*	3	2	13	113*	126*
GR04	15*	26*	10*	2*	0*	5*	1*	1*	23*	42*	65*
GR05	32	5*	3	1*	0*	6	2	5*	19*	71*	90*
GR06	4	4	0	1	0*	0*	3	6	6	74	80
GR07	37	6	2	1	0	1	3	6	11	154*	165*
GR08	24*	33*	2*	0*	0*	0*	4*	1*	33*	61*	94*
GR09	19	11	2	10	0	2	1	0	45*	44	89*
GR10	22	4	1	4	0	2	3	2	5	108	113
GR11	26	10	1	1	0	1	1	0	16	35	51
GR12	36	4	2	3	0	8	3	1	26	53	79
GR13	21*	5*	1*	2*	0*	0*	5*	1*	36*	76*	112*
GR14	10*	0*	0*	0*	0*	4*	13*	0*	24*	108*	132*
Total by type of site	*300*	*148*	*27*	*26*	*0*	*35*	*50*	*30*	*294*	*1093*	*1387*
Total number of monitoring sites	*448**		*53**		*35**		*80**		*1387**		

Table 5.2: Number of monitoring sites by water category, in accordance with JMD 140384/09-09-2011
Surv = Surveillance, Op = Operational, Quant = Quantitative
Source: WISE
*corrections/additions provided by EL in late 2014. Some discrepancies between this information and the RBMPs/their Annexes are observed.

5.4 Monitoring of protected areas

Figure 5.2: Map of monitoring stations for protected areas
Source: WISE

In the NMP there are monitoring stations located within protected areas and drinking water protected areas (of the Birds, Habitats and Drinking Water Directives). Upon the establishment of the RBMPs and their findings, suggestions were made to place additional stations in more protected areas which are explicitly mentioned. There is no detailed information in the RBMPs on specific monitoring programmes (e.g. drinking water, bathing water) for the protected areas (i.e. name and code of protected area, number and location of monitoring sites, specific monitored parameters, etc.).

RBD	Surface waters									Ground-water drinking water
	Surface drinking water abstraction	Quality of drinking water	Bathing water	Birds sites	Fish	Habitats sites	Nitrates	Shell-Fish	UWWT	
GR01	1*	0	6*	1*	4*	13*	0	0	0	9*
GR02	3*	0	5*	10*	4*	13*	0	0	0	12*
GR03	0	0	4*	4*	3*	6*	0	0	0	17*
GR04	7*	0*	3*	28*	6*	25*	0*	0*	61*	4*
GR05	0	0	0	0	0	0	0	0	0	20
GR06	1	0	8	3	0	6	0	0	2	13*
GR07	3	0	8	23	0	34	15	0	5	69*
GR08	0*	0*	5*	35*	0*	12*	58*	0*	64*	12*
GR09	1*	1*	0	14	2*	15*	16*	0	5*	9*
GR10	0	0	0	16*	0	11*	27*	4	4*	3*
GR11	0	0	1*	4*	1*	6*	26*	1	6*	51*
GR12	1*	0	3*	26*	1*	17*	21*	3	12*	79*
GR13	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-
Total	*17*	*1*	*43*	*164*	*21*	*158*	*163*	*8*	*159*	*298*

Table 5.3.1: Number of monitoring stations in protected areas[8].
Source: WISE
*corrections/additions provided by EL in late 2014

[8] 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. The reported information refers to the new National Monitoring Programme

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

The ecological status of natural surface water bodies presented in the RBMPs shows that 49 % are in high or good status (7% and 42% respectively). Another 18% are in moderate status, 11% in poor and bad status (10% and 1% respectively) while 21% remain unknown. GR04 presents the lowest percentage of water bodies with unknown status (2%) while GR02 the highest (40%). Variations are observed across the RBDs (see Table 6.1): GR04 and GR05 have the highest percentage of water bodies in high and good status (84% of their surface water bodies), while GR08 and GR09 has the highest percentage of water bodies in poor and bad status (40% and 25% respectively). With regard to the ecological potential of artificial and heavily modified water bodies (see Table 6.2), 6% across the RBDs are in good status, 24% in moderate, 25% in poor, 2% in bad and 43% in unknown status. In GR01/02/03/10 more than 60% are in unknown status. It should be taken into consideration that in these classifications, not all relevant quality elements have necessarily been evaluated or considered, and that the available data were limited in many cases. As such the confidence in the classification is not high.

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
GR01	109	9	8%	51	47%	10	9%	4	4%	0	0%	35	32%
GR02	88	13	15%	27	31%	8	9%	5	6%	0	0%	35	40%
GR03	89	10	11%	20	22%	23	26%	6	7%	0	0%	30	34%
GR04	101*	3*	3%*	82*	81%*	13*	13%*	1*	1%*	0*	0%*	2*	2%*
GR05	90	10	11%	66*	73%*	10	11%	0	0%	0	0%	4*	5%*
GR06	25	2	8%	6	24%	7	28%	4	16%	1	4%	5	20%
GR07	96	12	13%	38	40%	17	18%	7	7%	3	3%	19	20%
GR08	70*	5*	7%*	11*	16%*	19*	27%*	28*	40%*	0*	0%*	7*	10%*
GR09	128*	3	2%	47	37%*	20	16%	27*	21%*	5	4%	26	20%*
GR10	108	7	6%	38	35%	7	6%	20	19%	1	1%	35	32%
GR11	66	0	0%	13	20%	31	47%	3	5%	0	0%	19	29%
GR12	166	4	2%	81	49%	45	27%	11	7%	0	0%	25	15%
GR13	-	-	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1136	78	7%	480	42%	210	18%	116	10%	10	1%	242	21%

Table 6.1: Ecological status of natural surface water bodies.
Source: WISE; *corrections/additions provided by EL in late 2014

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
GR01	19	0	0%	1	5%	3	16%	3	16%	0	0%	12	63%
GR02	9	0	0%	0	0%	2	22%	0	0%	0	0%	7	78%
GR03	11	0	0%	0	0%	4	36%	0	0%	0	0%	7	64%
GR04	19*	0*	0%*	7*	37%*	2*	11%*	0*	0%*	0*	0%*	10*	52%*
GR05	16	0	0%	3	19%	4	25%	1	6%	0	0%	8	50%
GR06	4	0	0%	0	0%	1	25%	2	50%	0	0%	1	25%
GR07	8	0	0%	0	0%	4	50%	2	25%	2	25%	0	0%
GR08	12*	0*	0%*	2*	17%*	2*	17%*	3*	25%*	0*	0%*	5*	41%*
GR09	40*	0	0%	0	0%	1	2%	13*	33%*	3	7%	23	52%
GR10	16	0	0%	0	0%	1	6%	4	25%	0	0%	11	69%
GR11	32	0	0%	0	0%	12	38%	12	38%	0	0%	8	25%
GR12	45	0	0%	1	2%	19	42%	18	40%	0	0%	7	16%
GR13	-	-	-	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	*231*	*0*	*0%*	*14*	*6%*	*55*	*24%*	*58*	*25%*	*5*	*2%*	*99*	*43%*

Table 6.2: Ecological potential of artificial and heavily modified water bodies.
Source: WISE; *corrections/additions provided by EL in late 2014

The chemical status of natural surface water bodies presented in the RBMPs shows that 44% are good status, 6% in poor status, while 51% remain unknown. GR04 presents the lowest percentage of water bodies with unknown status (yet it reached 29%) while GR02 the highest (91%). Variations are observed across the RBDs (see Table 6.3): among the classified surface water bodies GR04 has the highest percentage of water bodies in good status (72% of its surface water bodies). With regard to the chemical status of artificial and heavily modified water bodies (see Table 6.4), 13% across the RBDs are in good status, 27% in poor, and 60% in unknown status. It should be taken into consideration that in these classifications not all relevant quality elements have necessarily been evaluated or considered (refer to section 9), and that the available data were limited in many cases.

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GR01	109	10	9%	5	5%	94	86%
GR02	88	5	6%	3	3%	80	91%
GR03	89	6	7%	18	20%	65	73%
GR04	101*	72*	71%*	0*	0%*	29*	29%*
GR05	90	54	60%	0	0%	36	40%
GR06	25	6	24%	0	0%	19	76%
GR07	96	34	35%	2	2%	60	63%
GR08	70*	25*	36%*	5*	7%*	40*	57%*
GR09	128*	50*	39%*	9	7%	69*	54%*
GR10	108	43	40%	12	11%	53	49%
GR11	66	8	12%	9	14%	49	74%
GR12	166	4	2%	22	13%	140	84%
GR13	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-
Total	*1453*	*634*	*44%*	*85*	*6%*	*734*	*51%*

Table 6.3: Chemical status of natural surface water bodies.
Source: WISE
*corrections/additions provided by EL in late 2014

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GR01	19	5	26%	2	11%	12	63%
GR02	9	1	11%	0	0%	8	89%
GR03	11	0	0%	4	36%	7	64%
GR04	19*	9*	47%*	4*	21%*	6*	32%*
GR05	16	8	50%	1	6%	7	44%
GR06	4	1	25%	0	0%	3	75%
GR07	8	1	13%	1	13%	6	75%
GR08	12*	3*	25%*	2*	17%*	7*	58%*
GR09	40*	0*	0%*	12	30%*	28*	70%
GR10	16	0	0%	4	25%	12	75%
GR11	32	2	6%	12	38%	18	56%
GR12	45	0	0%	20	44%	25	56%
GR13							
GR14	-	-	-	-	-	-	-
Total	*231*	*30*	*13%*	*62*	*27%*	*139*	*60%*

Table 6.4: Chemical status of artificial and heavily modified surface water bodies.
Source: WISE,
*corrections/additions provided by EL in late 2014

The chemical status of groundwater bodies presented in the RBMPs shows that 83.8 % are in good status, 16.2% in poor, while none remain unknown. Variations are observed across the RBDs (see Table 6.5): GR05 has the highest percentage of water bodies in good status (96.2% of its groundwater bodies), while GR06 has the highest percentage of water bodies in poor status (45.8% of its groundwater bodies).

With regard to the quantitative status of the groundwater bodies, 83.1 % are in good status, 16.9% in poor, while none remain unknown. Variations are observed across the RBDs (see Table 6.6): GR05 has the highest percentage of water bodies in good status (96.2% of its groundwater bodies), while GR06 has the highest percentage of water bodies in poor status (37.5% of its groundwater bodies). It should be taken into consideration that in these classifications the available data were limited in many cases.

RBD	Good		Poor		Unknown	
	No.	%	No.	%	No.	%
GR01	24	92.3%	2	7.7%	0	0%
GR02	22	84.6%	4	15.4%	0	0%
GR03	17*	63%*	10*	37%*	0	0%
GR04	24*	96%*	1*	4%*	0**	0%
GR05	25	96.2%	1	3.8%	0	0%
GR06	13	54.2%	11	45.8%	0	0%
GR07	40	87%	6	13%	0	0%
GR08	28*	87,5%*	4*	12,5%*	0*	0%*
GR09	58	93.5%	4	6.5%	0	0%
GR10	31	79.5%	8	20.5%	0	0%
GR11	14	93.3%	1	6.7%	0	0%
GR12	14	77.8%	4	22.2%	0	0%
GR13	-	-	-	-	-	-
GR14	-	-	-	-	-	-
Total	*311*	*85%*	*55*	*15%*	*0*	*0%*

Table 6.5: Chemical status of groundwater bodies.
Source: WISE
*corrections/additions provided by EL in late 2014

RBD	Good		Poor		Unknown	
	No.	%	No.	%	No.	%
GR01	24	92.3%	2	7.7%	0	0%
GR02	24	92.3%	2	7.7%	0	0%
GR03	22	81.5%	5	18.5%	0	0%
GR04	23*	92%*	2*	8%*	0*	0%*
GR05	25	96.2%	1	3.8%	0	0%
GR06	15	62.5%	9	37.5%	0	0%
GR07	41	89.1%	5	10.9%	0	0%
GR08	22*	68.8%*	10*	31.2%*	0*	0%*
GR09	48	77.4%	14	22.6%	0	0%
GR10	28	71.8%	11	28.2%	0	0%
GR11	14	93.3%	1	6.7%	0	0%
GR12	18	100%	0	0	0	0%
GR13	-	-	-	-	-	-
GR14	-	-	-	-	-	-
Total	*304*	*83.1%*	*62*	*16.9%*		

Table 6.6: Quantitative status of groundwater bodies.
Source: WISE
*corrections/additions provided by EL in late 2014

A total of 330 surface water bodies (i.e. 24%) are expected to achieve good or better global status by 2015. The most significant increase is observed in GR03 (25% increase between 2009 and 2015). 25% of the surface water bodies are applying exemptions according to Article 4.4. No exemptions according to Art. 4.5 are applied, based on the information provided by EL in late 2014.

RBD	Total	Global status (ecological and chemical)					Good Global status 2021		Good Global 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.	%	%	%	%	%
GR01	128	4	3.1	20	15.6	12.5	128	100	128	100	4*	0	0*	0*
GR02	97	2	2.1	5	5.2	3.1	95	98	96	99	4*	0	0*	0*
GR03	100	2	2	27	27	25	100	100	100	100	33*	0	0*	0*
GR04	120*	71*	59*	71*	59*	0*	88*	73*	116*	97*	15*	0*	0*	4*
GR05	106	52	49.1	52	49.1	0	67*	63*	105*	99*	14*	0*	0*	0.9*
GR06	29	2	6.9	3	10.3	3.4	10*	34*	17*	58*	48	0		
GR07	104	27	26	27	26	0	48*	46*	62*	59*	33	0		
GR08	82*	5*	6*	5*	6*	0*	56*	68*	80*	98*	62*	0*	0*	2*
GR09	168	45	26.8	50	29.8	3					14	0		2*
GR10	124	36	29	58*	47*	18*					10	0		
GR11	98	5	5.1	8*	8.2*	0	-		-		52*	0		1
GR12	211	4	1.9	4	1.9	0	-		-		40*	0		4.3*
GR13	-	-	-	-	-	-					-	-		
GR14	-	-	-	-	-	-					-	-		
Total	*1367*	*255*	*19%*	*330*	*24%*	*5%*								

Table 6.7: *Surface water bodies: overview of status in 2009 and expected status in 2015, 2021and 2027;*

Waterbodies 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

Waterbodies 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: Waterbodies with unknown/unclassified/Not applicable in either ecological or chemical status are not considered

Source: WISE, corrections provided by EL in late 2014. For this and the following tables of this chapter, there are some discrepancies between this information and the RBMPs/their Annexes.

*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	109	60	55%	74	68%	13%	109*	100%*	109*	100%*	0%*	0%*	0%*	0%*
GR02	88	40	45%	53	60%	15%	88*	100%*	88*	100%*	2%*	0%*	0%*	0%*
GR03	89	30	34%	59	66%	32%	89*	100%*	89*	100%*	17%*	0%*	0%*	0% *
GR04	101*	85*	84%*	85*	84%*	0%*	92*	91%*	96*	95%*	7%*			5% *
GR05	90	76*	84%*	76*	84%*	0%	86*	96%*	89*	99%*	11%			1%*
GR06	25	8	32%	8	32%	0%					48%			
GR07	96	50	52%	50*	52%*	0%*					28%*			
GR08	70*	16*	23%*	16*	23%*	0%*	61*	87%*	69*	99%*	64%*			1%*
GR09	128*	50	39%*	92*	72%*	33%*					6%*			2%
GR10	108	45	42%	65*	60%*	18%*					10%			0.02%*
GR11	66	13	20%	19*	29%*	9%*					41%*			2%
GR12	166	85	51%	90*	54%*	3%*					27%*			4%*
GR13	-	-	-	-	-	-					-			-
GR14	-	-	-	-	-	-					-			-
Total	*1136*	*558*	*49%*	*687*	*60%*	*11%*								

Table 6.8: Natural surface water bodies: ecological status in 2009 and expected status in 2015, 2021 and 2027
Source: WISE
*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	109	10	9%	15	14%	5%	109*	100%*	109*	100%*	0%*	0%*	0%*	0%*
GR02	88	5	6%	8	9%	3%	88*	100%*	88*	100%*	2%*	0%*	0%*	0%*
GR03	89	6	7%	24	27%	20%	89*	100%*	89*	100%*	17%*	0%*	0%*	0% *
GR04	101*	72*	71%*	72*	71%*	0%*	79*	78%*	97*	96%*	5%*			4% *
GR05	90	54	60%	54	60%	0%	54*	60%*	89*	99% *	0%*			1%*
GR06	25	6	24%	6	24%	0%								
GR07	96	34	35%	34	35%	0%					2%			
GR08	70*	25*	36%*	25*	36%*	0%*	30*	43%*	68*	97%*	7%*			3% *
GR09	128*	50*	40%	51*	40%	0%					5%*			
GR10	108	43	40%	48	44%	4%					9%*			
GR11	66	8	12%	8	12%	0%					14%			
GR12	166	4	2%	4	2%	0%					13%			
GR13	-	-	-	-	-	-					-			
GR14	-	-	-	-	-	-					-			
Total	*1136*	*317*	*28%*	*349*	*31%*	*3%*								

Table 6.9: Natural surface water bodies: chemical status in 2009 and expected status in 2015, 2012 and 2027
Source: WISE

*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	26	24	92.3	24	92.3	0	24*	92.3*	26	100%	7.7%*	0%*		
GR02	26	22	84.6	22	84.6	0	22*	84.6*	26	100%	15.4%*	0%*		
GR03	27	17*	63*	17*	63*	0	17*	63*	27	100%	37%*	0%*		
GR04	25*	24*	96*	24*	96*	0*	24*	96*			4%*	0%*	0%*	0%*
GR05	26	25	96.2	26	100	3.8	25	96			4%	0%	0%*	0%*
GR06	24	13	54.2	13	54.2	0			24	100%	46%	0%		
GR07	46	40	87	40	87	0			46	100%	13%	0%		
GR08	32*	28*	87.5*	28*	87.5*	0*	28*	87.5*	28*	87.5*	12.5*	-	0%*	0% *
GR09	62	58	93.5	58	93.5	0					6%	0%		
GR10	39	31	79.5	31	79.5	0					18%	0%		3%
GR11	15	14	93.3	14	93.3	0	14	93	15	100	7%	0%		
GR12	18	14	77.8	14	77.8	0	14	78	17	94	28%	0%		
GR13	-	-	-	-	-	-					-	-		
GR14	-	-	-	-	-	-					-	-		
Total	366	310	85%	311	85%	0.3%								

Table 6.10: Groundwater bodies: chemical status in 2009 and expected status in 2015, 2012 and 2027
Source: WISE
*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	26	24	92.3	24	92.3	0	24*	92.3*	26	100%	7.7%*	0%		
GR02	26	24	92.3	24	92.3	0	24*	92.3*	26	100%	11.5%*	0%*		
GR03	27	22	81.5	22	81.5	0	22*	81.5*	27	100%	33.3%*	0%		
GR04	25*	23*	92*	23*	92*	0*			25*	100%*	8%*	0%*	0%*	0%*
GR05	26	25	96.2	25	96.2	0	25		26*	100%*	4%	0%	0%*	0%*
GR06	24	15	62.5	15	62.5	0	19*	79*	24	100%	38%	0%		
GR07	46	41	89.1	41	89.1	0			46	100%	11%	0%		
GR08	32*	22*	68.87 *	22*	68.87*	0*			32*	100%*	31%*	0%*	0%*	0%*
GR09	62	48	77.4	48	77.4	0					23%	0%		
GR10	39	28	71.8	28	71.8	0					28%	0%		5%
GR11	15	14	93.3	14	93.3	0	14	93	15	100	7%	0%		
GR12	18	18	100	18	100	0					0%	0%		
GR13	-	-	-	-	-	-	-	-	-	-	-	-		
GR14	-	-	-	-	-	-	-	-	-	-	-	-		
Total	*366*	*304*	*83.1*	*304*	*83.1*	*0*								

Table 6.11: Groundwater bodies: quantitative status in 2009 and expected status in 2015, 2012 and 2027
Source: WISE

*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	19	1	5%	7	37%	32%	19*	100%*	19*	100%*	16%*	0%*	0% *	0% *
GR02	9	0	0%	2	22%	22%	7*	78%*	8*	89%*	22%*	0%*	0% *	0% *
GR03	11	0	0%	4	36%	36%	11*	100%*	11*	100%*	55%*	0%*	0% *	0% *
GR04	19*	7*	37%*	7*	37%*	0%*	9*	47%*	19*	100%*	10%*	-		-
GR05	16	3	19%	3	19%	0%	8*	50%*	16*	100%*	31%*			
GR06	4	0	0%	1	25%	25%					50%			
GR07	8	0	0%	0	0%	0%					100%			
GR08	12*	2*	17%*	2*	17%*	0%*	7*	58%*	12*	100*	42%*	-		-
GR09	40*	0*	0%*	5*	12%*	12%*					30%*			
GR10	16	0	0%	0	0%	0%					31%*			
GR11	32	0	0%	0	0%	0%					75%			
GR12	45	1	2%	1	2%	0%					80%			2%
GR13	-	-	-	-	-	-					-	-		-
GR14	-	-	-	-	-	-					-	-		-
Total	231	14	6%	32	14%	8%								

Table 6.12: Heavily modified and artificial water bodies: ecological potential in 2009 and expected ecological potential in 2015, 2021 and 2027
Source: WISE
*corrections/additions provided by EL in late 2014

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.	%	%	%	%	%
GR01	19	5	26%	7	37%	11%	19*	100%*	19*	100%*	16%*	0%*	0%*	0%*
GR02	9	1	11%	1	11%	0%	7*	78%*	8*	89%*	22%*	0%*	0%*	0%*
GR03	11		0%	4	36%	36%	11*	100%*	11*	100%*	55%*	0%*	0%*	0%*
GR04	19*	9*	47%*	9*	47%*	0%*					21%*	0%*	0%*	0%*
GR05	16	8	50%	8	50%	0%					6%	0%*	0%*	0%*
GR06	4	1	25%	1	25%	0%								
GR07	8	1	13%	1	13%	0%					13%			
GR08	12*	3*	25%*	3*	25%*	0%*					17%*	0%*	0%*	0%*
GR09	40*	0*	0%*	1*	3%*	3%*					27%*			
GR10	16		0%	0	0%	0%					25%			
GR11	32	2	6%	2	6%	0%					38%			
GR12	45		0%	0	0%	0%					44%			
GR13	-	-	-	-	-	-					-			
GR14	-	-	-	-	-	-					-			
Total	*231*	*30*	*13%*	*37*	*16%*	*3%*								

Table 6.13: Heavily modified and artificial water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027
Source: WISE
*corrections/additions provided by EL in late 2014

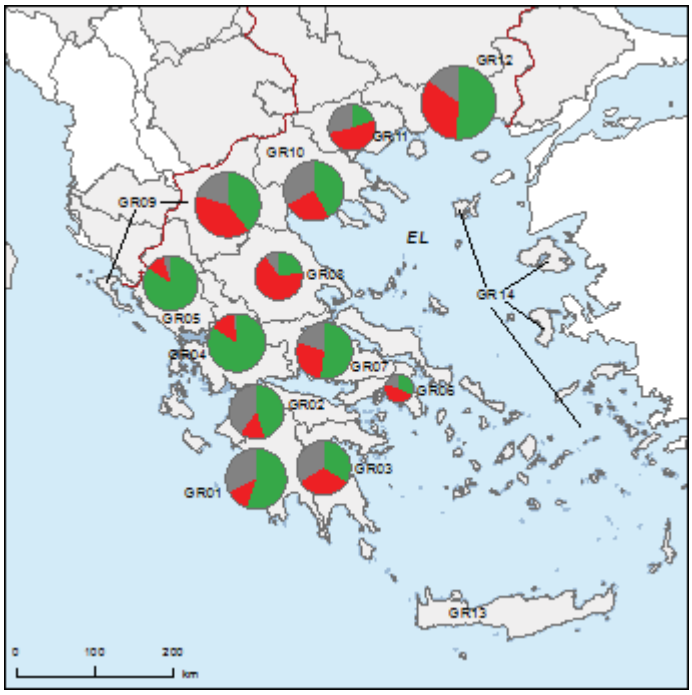

Figure 6.1: Map of ecological status of natural surface water bodies 2009

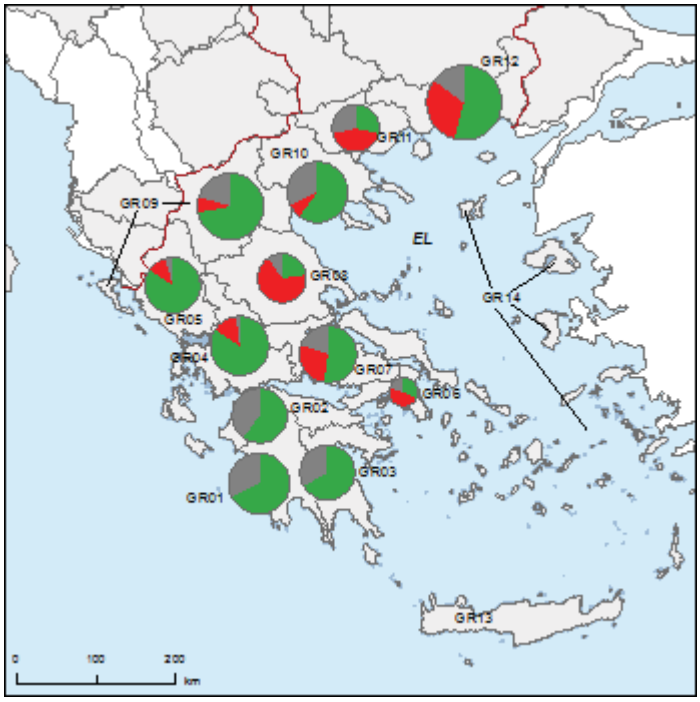

Figure 6.2: Map of ecological status of natural surface water bodies 2015

Good or better
Less than good
Unknown
River Basin Districts
Countries outside EU

Source: WISE, Eurostat and corrections/additions provided by EL in late 2014

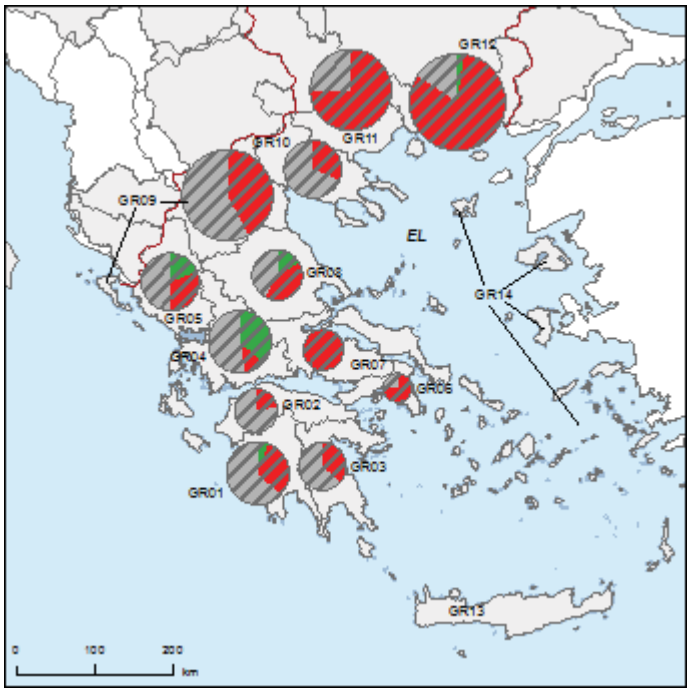

Figure 6.3: Map of ecological potential of artificial and heavily modified water bodies 2009

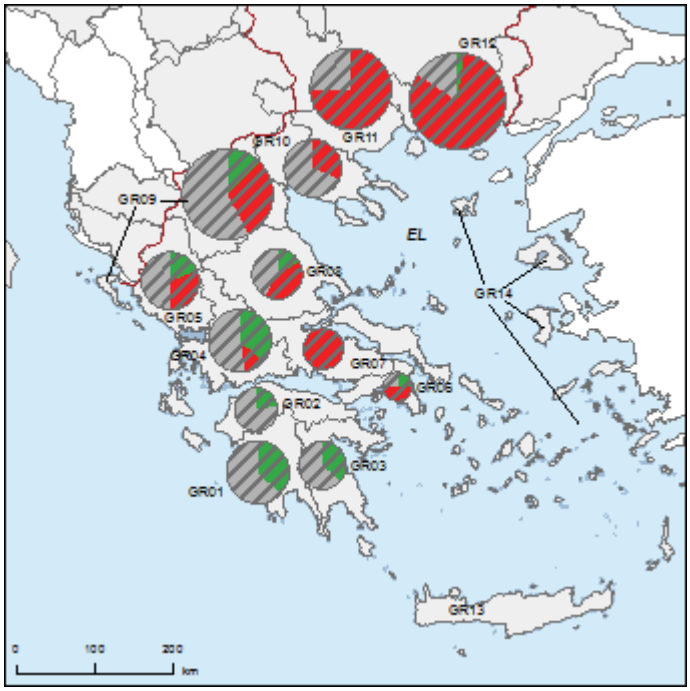

Figure 6.4: Map of ecological potential of artificial and heavily modified water bodies 2015

Good or better
Less than good
Unknown
River Basin Districts
Countries outside EU

Source: WISE, Eurostat and corrections/additions provided by EL in late 2014

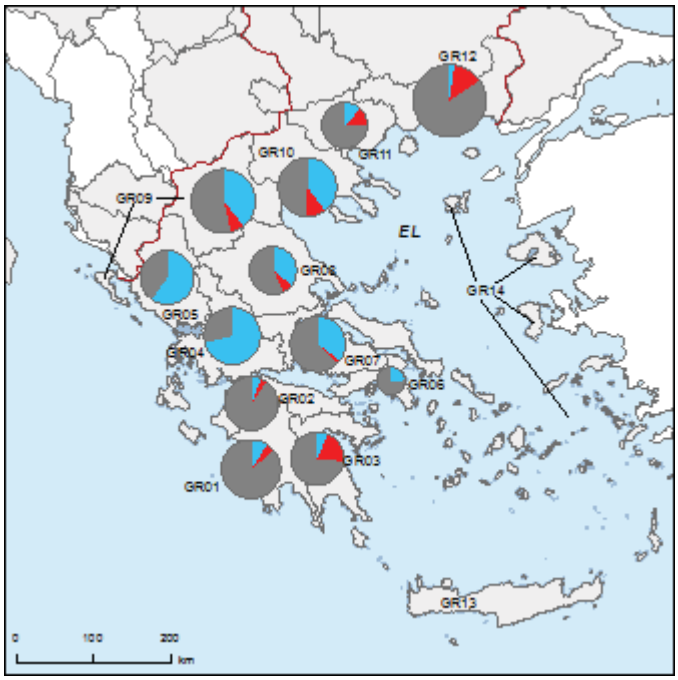

Figure 6.5: Map of chemical status of natural surface water bodies 2009

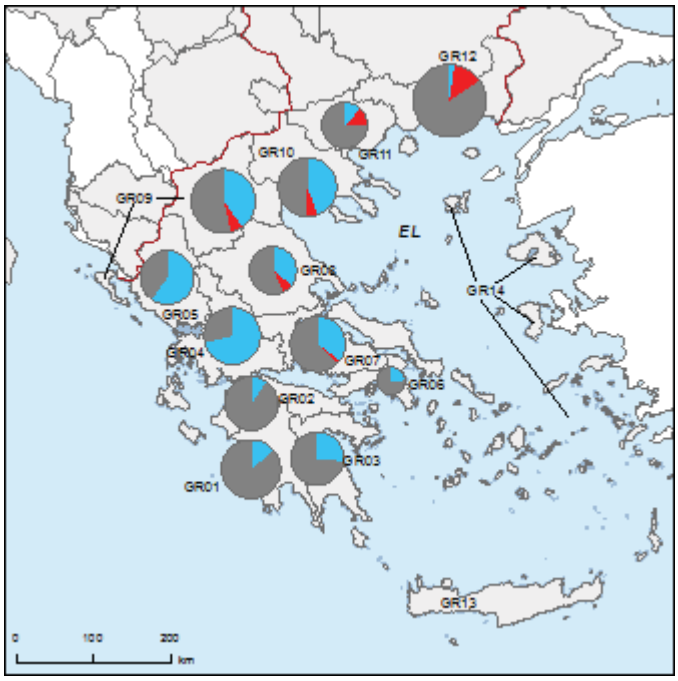

Figure 6.6: Map of chemical status of natural surface water bodies 2015

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

Note: Standard colours based on WFD Annex V, Article 1.4.3.
Source: WISE, Eurostat and corrections/additions provided by EL in late 2014

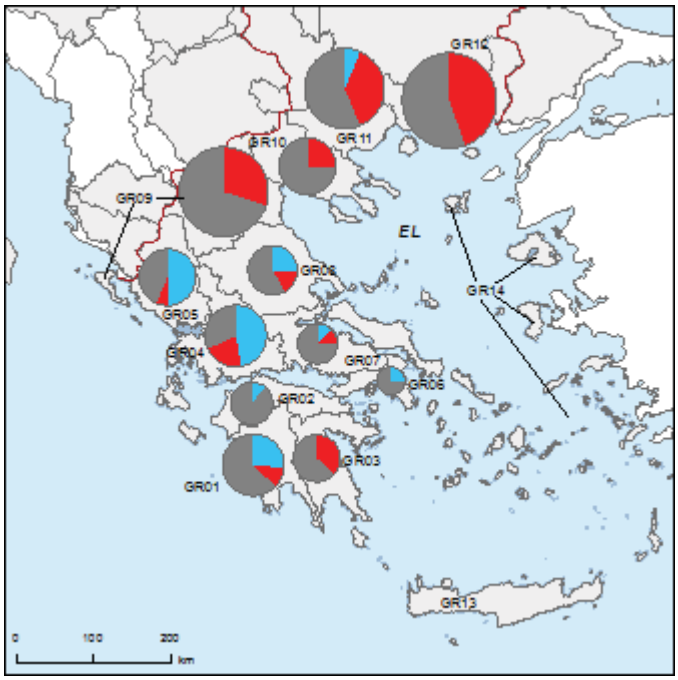

Figure 6.7: Map of chemical status of artificial and heavily modified water bodies 2009

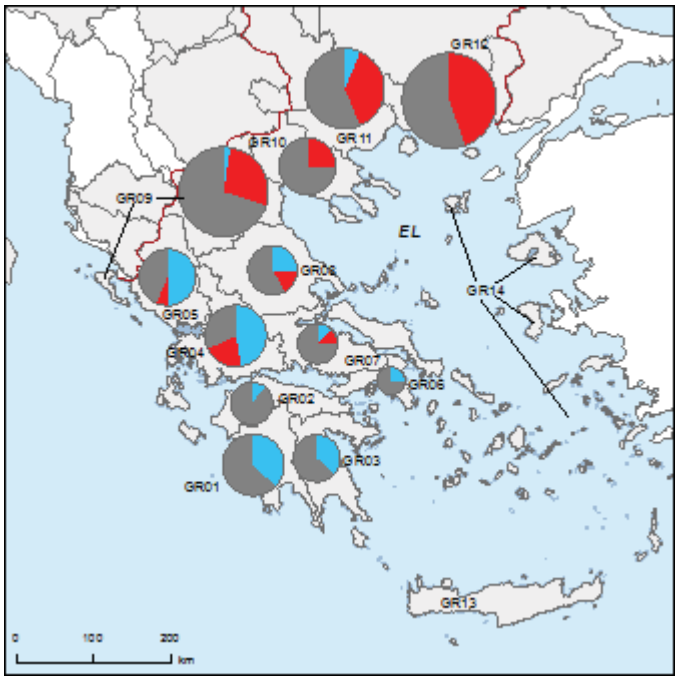

Figure 6.8: Map of chemical status of artificial and heavily modified water bodies 2015

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

Note: Standard colours based on WFD Annex V, Article 1.4.3.
Source: WISE, Eurostat (country borders) and corrections/additions provided by EL in late 2014

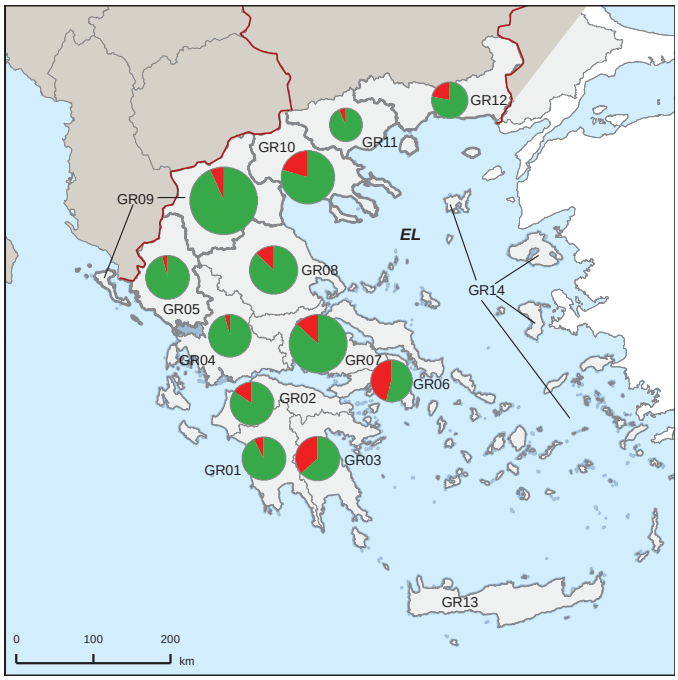

Figure 6.9: Map of chemical status of groundwater bodies 2009

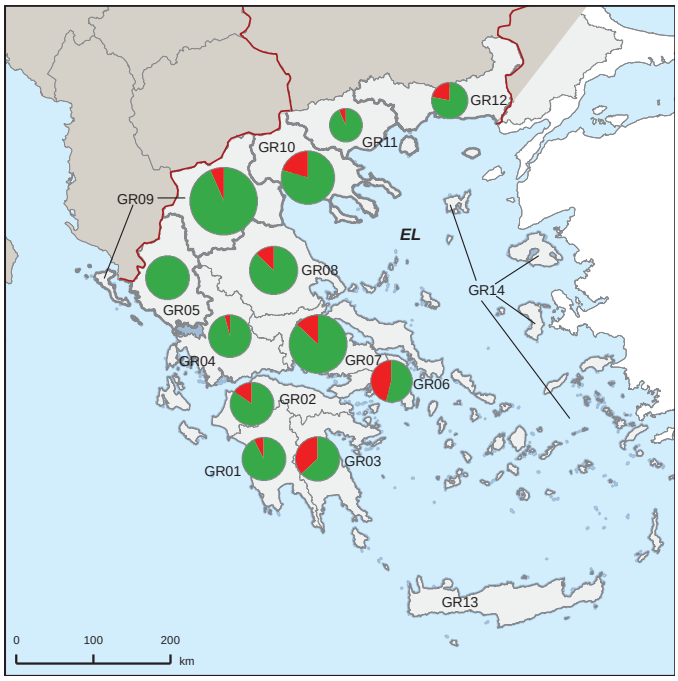

Figure 6.10: Map of chemical status of groundwater bodies 2015

Good
Poor
Unknown
River Basin Districts
Countries outside EU

Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders) and corrections/additions provided by EL in late 2014

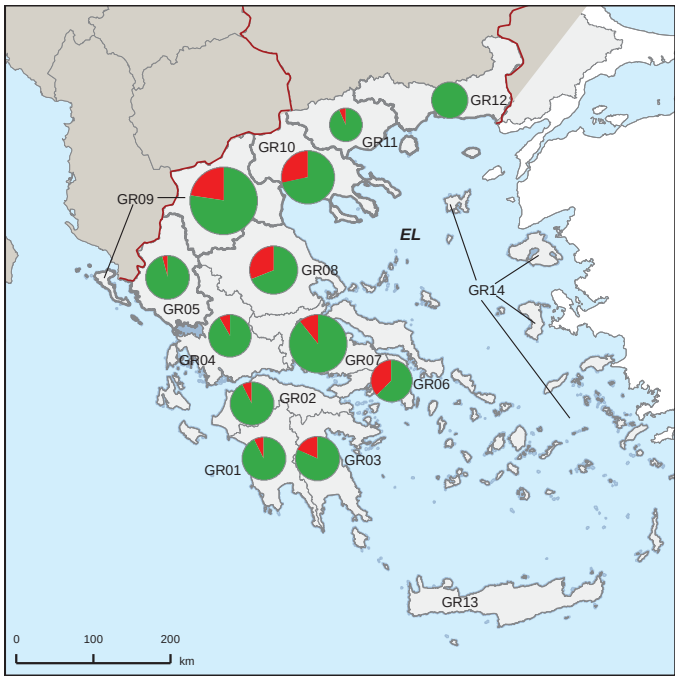

Figure 6.11: Map of quantitative status of groundwater bodies 2009

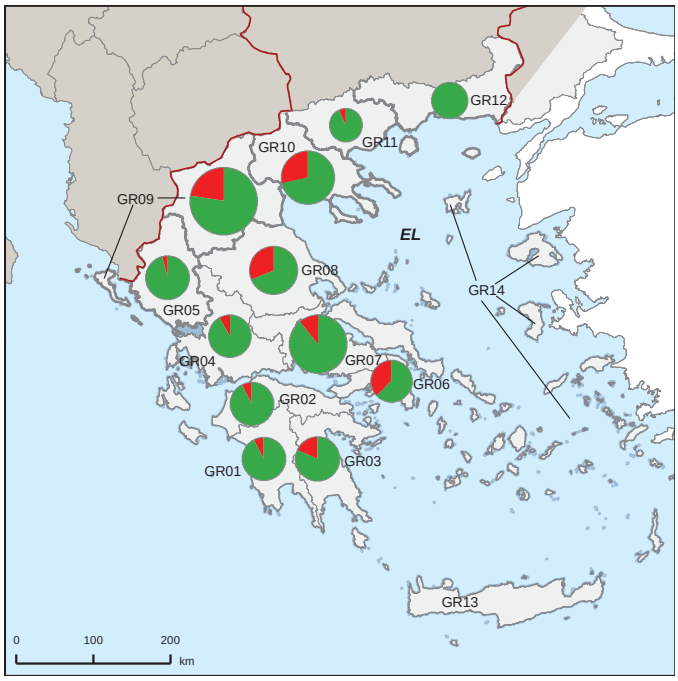

Figure 6.12: Map of quantitative status of groundwater bodies 2015

Good
Poor
Unknown
River Basin Districts
Countries outside EU

Note: Standard colours based on WFD Annex V, Article 2.2.4.
Source: WISE, Eurostat (country borders) and corrections/additions provided by EL in late 2014

7. ASSESSMENT OF ECOLOGICAL STATUS OF SURFACE WATERS

It seems that the different projects commissioned for the development of the different RBMPs were centrally coordinated by the Special Secretarial for Water; thus, generally a national approach is followed. At the same time, for GR01/02/03 the actual classification was done (partly) based on a specific sampling study. For the different RBMPs the information is provided in a very different way, so it remains unclear if a national approach is transparently used for all RBDs (it is also unclear due to the lack of national published guidance on different issues, although EL has stated that internal guidelines have been provided to the different consultants). Out of the 14 RBMPs that should have been approved by 2009, only 12 RBMPs have been approved so far. The 12 RBMPs that have recently become official should implement the Programmes of Measures in the following very short period as the second round of revised Plans should be submitted by 2015, according to the WFD, taking into account the implementation of the first RBMPs. A PoM-Implementation Progress Report (national level) has been submitted by EL to the Commission as a reply to an EU enquiry in December 2014, and was uploaded on WISE on 22.01.2015. It has not been assessed by the Commission to date.

7.1 Ecological status assessment methods

The assessment methods for the classification of ecological status are only partly developed for some BQEs and are explicitly described in the Annexes A/6 (Reference conditions of SWBs). For rivers only the benthic fauna was used; it is stated that "in agreement with the managing authority, for the classification of rivers in the current RBMPs cycle it was decided to rely only on the biological quality element (BQE) of benthic macroinvertebrates". Accordingly, phytoplankton is the only BQE that is able to produce reliable assessment methods of the ecological status in lakes. For most of the BQEs specified in the WFD, national methods for assessing ecological status have not been developed. This is due to the insufficiency of available data to describe reference conditions, due to the lack of development of indicators for the parameters estimation for each BQE, or due to inadequate experience and knowledge on the biology of specific BQEs to link the status of the habitats with the condition of the water bodies. There are therefore important gaps in the assessment system.

The overall approach of classification according to the WFD is described, and was principally based on the One-Out-All-Out principle. It is clearly mentioned that "for water bodies where there are measurements of priority substances, the One-Out-All-Out principle was followed among the qualitative data, regardless of the number of parameters for which data have been available; that is, if a priority substance exceeded the boundaries set, the water body was classified in a lower than good status". Similarly, in cases where, based on the available data, the BQEs resulted a good status but physicochemical parameters failed, the ecological status has been classified as moderate. In cases where correlation in the monitoring data was not evident, at the time and the position of the sampling for physicochemical parameters, and the BQEs exhibited discrepancies, the physicochemical data were not used for the classification of the water bodies (mainly in the RBDs GR06 and GR07). At the same time, and based on the way the classification was done, it is not possible to say if this principle was followed in practice.

It is highly questionable whether the classification system is responsive to all pressures as relevant information is insufficient. In some RBMPs there is a brief mention of the different pressures addressed by the classification system (e.g. the phytoplankton increases eutrophication in a lake system), but not sufficient information on which BQEs are detecting

which pressures. For GR09 the same applies for the information from the Prespa plan as well. In the case of GR11/12, it is explicitly mentioned that at this stage the system is not using calibrated measurements of the BQE to determine whether there is a correlation between the abstraction levels from rivers and their ecological status assessed by the measurements of the BQE. In the case of river water bodies for which no data are available from monitoring programmes, a process of grouping of the water bodies was followed for GR04/05/08/09/10 in relation to the different pressures. The main idea of grouping is that water bodies of the same type which are subject to similar levels of anthropogenic pressures are likely to have the same ecological quality. The purpose was to minimise the number of water bodies that would be characterised as of unknown ecological status. As this approach is indirect, this type of assessment has a low level of confidence.

In general, it is mentioned that the classification of water bodies in terms of physico-chemical QEs was supplementary to the assessment of the BQEs (respecting the One-Out-All-Out (OOAO) principle); that is these QEs are used to assist in determining the ecological status of surface water bodies. The elements that are assessed include the transparency, thermal conditions, oxygen conditions, salinity, acidification conditions and nutrient conditions. For the RBMPs of GR01/02/03, regarding the classification, there was very limited monitoring information available. One specification regarding the way the physico-chemical QEs were dealt with in practice is the sampling study used for some water bodies. The study collected samples and measurements concerning the biodiversity and carrying capacity of rivers such as for macroinvertebrates. In this case, the physico-chemical parameters were determined in situ with a portable multi-parameter instrument. For the RBMPs of GR06/07 it is clearly stated that physico-chemcial QEs were not used for the classification of the ecological status for surface water bodies. For the RBMPs of GR04/05/08/09/10/11/12, the assessment is conducted through measured data (limited years) of the General Chemical State Laboratory, the Ministry of Rural Development and Food, Universities, and the Decentralised Administrations, Water Directorates. These are then compared to the relevant environmental quality standards (EQS) for each water body category. When the value of the parameters complies with standards, the water body is classified as in good status; in the opposite case the water body is classified as in a less than good status. The values refer to the boundary between good and moderate status, which according to the general classification scheme, determines the possibility of relegation measured by the BQEs of ecological status of a water body from good to moderate.

Theoretically, EQSs have been established. The relevant Ministerial Decision (51354/2641/E103/2010) establishes Environmental Quality Standards for 101 chemical compounds or groups of compounds, of which 41 are priority substances and other pollutants, which have been agreed within the European Union (Directive 2008/105/EC) and 60 relating to specific pollutants, which either have been detected in water bodies of the country or identified in previous legislation. Note that the priority substances characterise the chemical status of water, as defined in the WFD and the specific pollutants are used to assist in determining ecological status. In the Annexes it is mentioned that “the specific pollutants are supporting parameters which are also considered for the classification of ecological status; the classification of a water body is not good if a specific pollutant does not meet the specified environmental quality standards”. Consequently, it seems that all pollutants referred to in the WFD-Annexes VIII and X are covered by the Ministerial Decision. No reference is provided on how the EQSs were established. Additionally, it is noted that only very limited monitoring information is available regarding these pollutants in the RBDs.

The overall approach of classification according to the WFD is described, including the One-Out-All-Out principle. It is implied on several occasions that the total ecological status of the

water system is determined by the results of the biological, physico-chemical and hydromorphological quality elements taking into account the worst category (i.e. the part of the quality most affected by human activity); that is the One-Out-All-Out principle. The hydromorphological data were taken into account only to rank the "high" status. At the same time, and based on the way the classification was done, it is not possible to say if this principle was followed in practice.

Based on the very limited information available for the classification of the surface water bodies and the common use of expert judgement, etc., the uncertainty is classified in three categories as follows:

- Large Uncertainty: concerns water bodies in which there was no monitoring station;
- Medium Uncertainty : where there is one monitoring station (either from the sampling study, or from the existing monitoring network);
- Small Uncertainty: where there is more than one monitoring station. If in a water body several monitoring results exist and the assessments do not agree, then the uncertainty is characterised as medium.
- Not defined uncertainty: where the situation remains unknown.

Specifically, in the GR04/05/08/11/12, regardless of the parameter for which the analysis was conducted the level of uncertainty was considered:

- Limited Uncertainty for the types with more than 7 samples;
- Medium Uncertainty for the types that did not comply with the above condition;
- High Uncertainty for the types with less than 4 samples or 4 stations;
- Large Uncertainty in cases where no data were available and the determination of the values was done through the expert judgment.

It has to be noted that regarding the main data gaps and uncertainties relating to surface waters there are delays in determining the physico-chemical and hydromorphological standards so it is not possible to set reference conditions and class boundaries between high, good condition, etc.

All water body types are covered by a classification system. For most of the BQEs specified in the WFD, national methods for assessing ecological status for the case of Greece have not been developed. This is due to the insufficiency of available data to describe reference conditions, due to the lack of development of indicators for the parameters estimation for each BQE, or due to inadequate experience and knowledge on the biology of specific BQEs to link the status of the habitats with the condition of the water bodies. For GR05/09/10/11/12 the transitional waters are assessed based on the criteria that are used for the coastal waters and for the coastal waters there is only one water body type for the whole country in order to avoid increased fragmentation.

The intercalibration work is mentioned only in general. The class boundaries are in almost all cases not used for the actual classification of water bodies due to the lack of data. No data is available to cross-check the intercalibration decision with what is mentioned in the relevant Annexes. The boundaries used for the case of Greece for the respective types (R-M1, R-M2 and RM-4), referred only to the biological quality element of benthic macroinvertebrates; the purpose was to evaluate which is the common Intercalibration Common Metrics index (ICMi), as a national assessment method for the ecological status to be involved in the exercise was not fully developed. Additionally, Greece's involvement in the intercalibration

exercise of the countries of the Mediterranean eco-region was fragmented. As a result any national methods that were developed in the context of individual pilot projects implementing the WFD cannot be matched with the methods developed by other countries. Consequently, there is a lack of commonly accepted values of reference conditions and class boundaries of the ecological status classification including national methods that have been used at times in other Mediterranean countries.

The background documents that have been reported as Annexes to the RBMPs are Annexes A/6 (Reference conditions for SWBs) and A/9 (Classification of SWBs). In terms of a national Guidance Document, guidelines were formulated by the coordinator consultant and the General Secretariat for Water to guide/harmonise the work and methodological approach of all other consultants who were commissioned with the drafting of the RBMPs, but these were not organised into a detailed guidance document.

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
GR01																											
GR02																											
GR03																											
GR04																											
GR05																											
GR06																											
GR07																											
GR08															-	-	-	-	-	-	-						
GR09																											
GR10																											
GR11																											
GR12																											
GR13																											
GR14																											

Table 7.1.1: Availability of biological assessment methods as reflected in the RBMPs. Some of the methods marked in red may be under development but the information available is unclear.

Assessment methods fully developed

Assessment methods partially developed or under development

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

\- Water category not relevant

Source: RBMPs (Annex A/6 Reference Conditions of SWBs). Note: EL provided alternative formulation of this Table, reflecting on-going development of methods).

7.2 Application of methods and ecological status results

The national monitoring network (defined by the Common Ministerial Decree 140384/2011) was not operational by the time of data collection for the purposes of the RBMPs in order to assess the current status of SWR. Thus, the data for the compilation of the RBMPs were collected by the Ministry of Environment, Energy and Climate Change, the Ministry of Rural Development and Food, the Water Directorates of the Regions, etc. as well as through relevant studies and surveys and were fragmented. The difficulty of the issue to assess the ecological status, due to lack of data, can only be addressed through the implementation of the national monitoring program. It is explicitly stated that once this new monitoring programme is operational and in the revision of the RBMPs, the Special Secretariat for Water, the competent agencies and the scientific community will undertake further investigation of the appropriate indicators for the next management period.

Although there is information on which specific pollutants are responsible for failure of ecological status of the water bodies, uncertainty does remain since data limitation has in many cases hindered a full scale assessment of all pollutants. It is quite unclear whether the most sensitive biological quality elements have been selected for ecological status assessment for operational monitoring sites. The national monitoring network was not operational by the time of data collection for the purposes of RBMPs. It is highly questionable whether the classification system is responsive to all pressures as relevant information is insufficient. In some RBMPs there is a brief mention of the different pressures addressed by the classification system, but not sufficient information on which BQEs are addressing which pressures.

There is very limited information regarding the confidence and precision of the different parts of the classification system for the ecological status. For example in GR05/11/12, in the calculation of the Bentix indicator, the level of confidence is considered low when the number of species is 3 or less, the number of items is 6 or less, the percentage of disregarded species is 7% or more, or the percentage of species that are not calibrated is 20% or more. This is very fragmented information.

For GR09/10, the water bodies are characterised with low confidence when the classification is based only on biological elements with a parallel assessment of the nutrient. Water bodies are also characterised of low confidence when the classification has only been based on physico-chemical characteristics and specific pollutants. They are characterised as of medium confidence when their classification is based on biological characteristics, physicochemical and specific pollutants (from systematic measurements of the General Chemical State Laboratory and the Region of Central Macedonia.

RBD	CAS Number	Substance	Percentage Water Bodies Failing Status (%)
GR01		Zinc (3 failing out of 128 SWBs)	2.3
		Molybdenum (3 failing out of 128 SWBs)	2.3
		Sulfonic acid/LAS (4 failing out of 128 SWBs)	3.1
GR02		Zinc (1 failing out of 97 SWBs)	1
		Copper (1 failing out of 97 SWBs)	1
		Sulfonic acid/LAS (2 failing out of 97 SWBs)	2.1
		Cyanide (2 failing out of 97 SWBs)	2.1
GR03		Zinc (2 failing out of 100 SWBs)	2
		Sulfonic acid/LAS (1 failing out of 100 SWBs)	1
GR04*		Methamidofhos(iso) (3 WBs out of 120) Monolinuron (ISO) (3 WBs out of 120) LAS (2 WB out of 120) Zinc (1 WB out of 120)	5
GR05*		Molybdenum (16 WBs out of 106) Monolinuron (ISO) (1WBs out of 106) Tin (1WBs out of 106)	15
GR08*		Monolinuron (ISO) (6WBs out of 86) Methamidofhos(iso) (6WBs out of 86) Copper (1WBs out of 86) Zinc (1WBs out of 86)	14
GR09*		LAS (19 failing out of 150 SWBS)	12,6
GR10*		Selinum -Sn (2 failing out of 104 SWBS)	1,9
GR11		Molybdenum (1 WB out of 98)	1
		Zinc (1 WB out of 98)	1
GR12		Sn (Tin) (16 WBS out of 211)	7.6
		Cu (Copper) (1 WB out of 211)	0.5
		Molybdenum (9 WB out of 211)	4.3
		As (Arsenic) (3 WBs out of 211)	1.4

Table 7.3.1: River basin specific pollutants causing failure of status
Source: RBMPs (Template 12 (Chemical Measures), question 3)
* corrections/additions provided by EL in late 2014

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

Figure 8.1: Map of percentage Heavily Modified and Artificial waterbodies by River Basin District

- 0 – 5 %
- 5 – 20 %
- 20 – 40 %
- 40 – 60%
- 60 – 100 %
- No data reported
- River Basin Districts
- Countries outside EU

Source: WISE, Eurostat (country borders)

8.1 Designation of HMWBs

Based on the information submitted by EL in late 2014, 235 water bodies are designated as HMWB/AWB in the 12 RBDs for which the RBMPs are available (189 HMWBs and 46 AWBs). These represent approximately 17.2% of the reported 1366 surface water bodies. There are some differences between the information submitted by EL in late 2014, the information reported in WISE and the numbers found in the RBMPs.

The water uses that are linked to the water bodies designated as HMWB as well as the types of physical modifications leading to the designation are mentioned briefly in most but not all RBDs, with differences regarding the way relevant information is presented in each group of RBMPs: GR1/2/3, 4/5/8, 6/7, 9/10 and 11/12.

In most cases, the starting point for the designation is the list of water bodies "preliminarily identified" as HMWB/AWB – mostly at the end confirming their final designation. Exceptions are e.g. GR11/12 where a significantly different list of water bodies is "tested" regarding the HMWB/AWB-designation as the ones provisionally identified in the past, but also confirming that all tested water bodies are HMWB/AWB. In GR9/10, there is no reference to the "preliminarily identified" HMWB/AWB as a starting point for the designation.

Information on methodologies and the approach to designate HMWB/AWB varies across RBMPs. It seems that no national legislation or guidance exists on the issue. All plans refer to the use of the CIS Guidance document N°4. For Greece, the practical approach for designation is described with varying detail for each RBD, mostly covering the steps as described in the guidance.

The level of detail for answering each "designation step" is different and generally can be considered as very brief or not sufficient. In addition, the way to present the designation process differs significantly: the step-wise approach in some cases is followed more "strictly" and with the specific results of each step summarised per water body; in others the required steps are not followed that clearly and the assessment is done in a summary way (e.g. in GR4/5/8/11/12).

In more detail, criteria (or thresholds) for defining substantial changes in character and significant adverse effects of restoration measures on the use are not clearly stated and expert judgment has been used extensively, with only brief information provided on this. Similarly, the identification of "better environmental options" is very brief and the analytical criteria for this step are mostly not clear. There is no real consideration of e.g. water demand measures or reduction of irrigation water demands as an alternative to increasing water supply e.g. through a dam.

HWMB/AWBs are also designated in relation to new construction works or dams currently being built. Some RBMPs classify water bodies to be affected by dams currently under construction as HMWBs, instead of applying Article 4.7 of the WFD.

Uncertainties are mentioned in general in most RBDs concerning the HMWB/AWB designation process, due to the lack of relevant monitoring data.

Regarding future re-assessment of the HMWB/AWB-designation, GR1/2/3 (but not the other RBMPs assessed) mention that "during the first revision of management plans the designation of HMWB/AWB has to be reconsidered, taking into account additional information and measurements which will then be available as well as developments regarding the setting of GEP through the intercalibration activities for the whole area of the RBD and for all types of surface water bodies. All this will then be taken into account in the PoM that will be proposed in the RBMP of the particular RBD." GR4/5/8 mention more specifically that "for water bodies below dams, further analysis is needed (based on better monitoring results, etc.) regarding the "significance of alteration" and thus if GES can be reached in these water bodies - giving the final answer if these water bodies are HMWB or not." In all RBDs, there is no specific mention of planned improvements to the methodology applied.

HMWB or AWB	RBD	Water category									
		Rivers		Lakes		Transitional water		Coastal water		All water bodies	
		Number	% of category	Number	% of category	Number	% of category	Number	% of category	Number	%
HMWB	GR01	15	14	2	100	0	0	0	0	17	13%
	GR02	4	6	3	50	0	0	1	5	8	8%
	GR03	9	11	1	100	0	0	0	0	10	10%
	GR04	18*	12*	0*	0*	0*	0*	1*	11*	19*	16%
	GR05	10*	13*	1*	100	0	0	2	15	13	12%
	GR06	1	7	1	100	0	0	2	14	4	14%
	GR07	3	4		0	0	0	0	0	3	3%
	GR08	6*	8*	1*	100*	0*	0*	1*	14*	8*	10%
	GR09	26	17	8	57	0	0	0	0	34	20%
	GR10	2	2	1	17	0	0	1	9	4	3%
	GR11	27	30	2	100	0	0	0	0	29	30%
	GR12	34	18	5	83	0	0	1	8	40	19%
	GR13	-	-	-	-	-	-	-	-	-	-
	GR14	-	-	-	-	-	-	-	-	-	-
	Total	*155*	*14*	*25*	*52*	*0*	*0*	*9*	*7*	*189*	*14*
AWB	GR01	2	2	0	0	0	0	0	0	2	2%
	GR02	0	0	1	17	0	0	0	0	1	1%
	GR03	1	1	0	0	0	0	0	0	1	1%
	GR04	0*	0*	0*	0*	0*	0*	0*	0*	0*	0
	GR05	3	3	0	0	0	0	0	0	3	3%
	GR06	0	0	0	0	0	0	0	0	0	0%
	GR07	5	6	0	0	0	0	0	0	5	5%
	GR08	4*	5*	0*	0*	0*	0*	0*	0*	4*	5
	GR09	10	7	0	0	0	0	0	0	10	6%
	GR10	10	10	1	17	0	0	1	9	12	10%
	GR11	3	3	0	0	0	0	0	0	3	3%
	GR12	5	3	0	0	0	0	0	0	5	2%
	GR13	-	-	-	-	-	-	-	-	-	-

HMWB or AWB	RBD	Water category									
		Rivers		Lakes		Transitional water		Coastal water		All water bodies	
		Number	% of category	Number	% of category	Number	% of category	Number	% of category	Number	%
	GR14	-	-	-	-	-	-	-	-	-	-
	Total	*43*	*4*	*2*	*4*	*0*	*0*	*1*	*1*	*46*	*3*

Table 8.1.1: Number and percentage of HMWBs and AWBs.
Source: WISE, corrections/additions provided by EL in late 2014 (marked with *). Some discrepancies between this information and the RBMPs/their Annexes.

8.2 Methodology for setting good ecological potential (GEP)

While HMWBs/AWBs have been designated, the RBMPs do not define GEP, so the relevant steps for setting GEP have not been applied, which is not in line with the WFD requirements.

No national guidance exists on the issue, while no specific plans are mentioned in the RBMPs for setting GEP. According to the Greek authorities a national guidance will be developed in the future.

According to Greek authorities, given the lack of methodologies, for the first RBMP GEP was defined as equal to Good Ecological Status (GES). This statement is implausible from the point of view of the WFD. If the water body is designated as HMWB is because the physical modification that is necessary to enable the water use does not allow the water body to achieve GES. The underlying problem is the lack of assessment methods which are sensitive to hydromorphological modifications. This lack of sensitive methods makes it impossible to effectively derive and implement GEP and to measure the improvements achieved to the associated mitigation measures.

8.3 Results of ecological potential assessment in HMWB and AWB

As stated above, no GEP has been defined. At the same time, GR4/5/6/7/8/9/10/11/12 mention that for this implementation cycle, the GEP is defined as the usual “good ecological status”; at the same time, GR1/2/3 just mention GEP as the objective for HMWB/AWB, without any further specification.

9. ASSESSMENT OF CHEMICAL STATUS OF SURFACE WATERS

9.1 Methodological approach to the assessment

The relevant Ministerial Decree 51354/E103/2010 (FEK 1909B/8-12-2010) includes the substances listed in Annex I of the Environmental Quality Standards Directive (EQSD). The Decree calls for the consideration of background concentrations as well as bioavailability factors of metals, and for the monitoring of biota and sediments. It also presents an approach for monitoring in mixing zones (Article 4).

It is recognised that only a few priority substances (e.g. in GR05: Cadmium, Nickel, Lead and Mercury) were measured in most water bodies of the RBDs with an exception of certain water bodies (e.g. in GR05, Lake Pamvotida) where additional priority substances were measured. It is not clear whether only specific substances have been assessed (as opposed to all of them) because expert judgment and/or existing studies ruled out the relevance of others for the specific surface water body. It appears also that the substances used in the assessment were not common across the water bodies, i.e. different substances have been used in different water bodies. The standards used for the all substances follow Annex I of the EQSD.

Neither the standards in biota or sediment nor the background concentrations that are set in the relevant decree 51354/E103/2010 (FEK 1909B/8-12-2010) were implemented in the assessed RBMPs. Bioavailability was also not applied. The same applies for the issue of mixing zones (Article 4).

Table 9.1.1 lists the substances reported as responsible for exceedances per RBD, mentioning also the number of water bodies per substance. According to the table, heavy metals (present in 88 water bodies across the RBDs), other pollutants (present in 40 water bodies across the RBDs) and pesticides (present in 39 water bodies across the RBDs) are mainly responsible for those exceedances. It can also be noted that GR12 (96 WBs), GR11 (38 WBs) and GR03 (32 WBs) are the RBDs with the highest number of water bodies with exceedances.

Substance causing exceedance	Exceedances per RBD													
	GR01	GR02	GR03	GR04	GR05	GR06	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
1 Heavy Metals - aggregated	4		6						16	11	9	42		
1.1 Cadmium		1	5	1*				5*		2				
1.2 Lead										3				
1.3 Mercury			10				1*							
1.4 Nickel										2				
2 Pesticides – aggregated											14	25		
2.5 Diuron				3*	1		3	4*						
2.5 Isopruton								2*						
3 Industrial Pollutants - aggregated									1		13	10		
3.3 Brominated Diphenylether					1			1*						
3.8 Di(2-ethylhexyl)phthalate (DEHP)									1					
4 Other pollutants -	7	3	11						2		2	15		

Substance causing exceedance	Exceedances per RBD													
	GR01	GR02	GR03	GR04	GR05	GR06	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
aggregated														
4.9 Hexachlorobutadiene							3		1					
4.11 Polyaromatic hydrocarbons												4		
4.17 Tributyltin compounds				3*	1		3	4*						

Table 9.1.1: Substances responsible for exceedances
Source: WISE
*corrections/additions provided by EL in late 2014.

10. ASSESSMENT OF GROUNDWATER STATUS

The Common Ministerial Decree 39626/2208/ E130/2009 sets the measures for the protection of groundwater against pollution and deterioration, in compliance with the provisions of the EU Directive 2006/118/EC.

All groundwater bodies (GWBs) (366 in total) have been assessed for both chemical and quantitative status. There are 15% of GWBs in poor chemical status and 17% are in poor quantitative status, while 78% are in good status for both chemical and quantitative aspects.

Status	Poor chemical status	Poor quantitative status	Good status
GR01	2	2	24
GR02	4	2	22*
GR03	10*	5	17*
GR04	1*	3*	23*
GR05	1	1	25
GR06	11	9	12
GR07	6	5	38
GR08	4*	10*	21*
GR09	4	14	48
GR10	8	11	26
GR11	1	1	14
GR12	4	0	14
GR13	-	-	-
GR14	-	-	-
Total	*56*	*63*	*284*

Table 10.1: Number and percentage of groundwater bodies and their status.
Source: WISE
*corrections/additions provided by EL in late 2014

10.1 Quantitative status

In the 12 RBDs reviewed so far in this report, approximately 83% of groundwater bodies are in good quantitative status and 17% in poor. The main reason for failure to achieve good quantitative status was reported to be the exceedance of the available groundwater resource by the long-term annual average rate of abstraction, which may result in a decrease of groundwater levels and saline intrusion. The significant diminution of the status of surface waters was reported as an additional reason in one GWB of GR11.

For the assessment of the GW quantitative status the following criteria are mentioned to be considered in principle:

1) Checking the water balance.

2) Checking the impact on surface water flow conditions: the influence of a GWB on SWBs is considered significant and further investigated when the groundwater abstractions are more than 50% of the total freshwater abstractions of the River Basin of the respective SWB.

3) Checking the impact on terrestrial ecosystems.

4) Checking saline intrusion: definition of mean annual abstractions in combination with the long-term annual average change of groundwater levels in order to locate the saline water front.

The above mentioned Water Framework and Groundwater Directives' criteria have been adjusted in practice to the limitations or constraints imposed by the available data during the implementation process. Thus, in practice, the above checks are not consistently performed in all of the GWBs due to data limitations in terms of adequacy, continuity, frequency, and spatiotemporal coverage. The quantitative comparison of the balance between recharge and abstraction was not always feasible (e.g. in 39% of the GR12 GWBs), the groundwater level records were sometimes limited to 5 year-long records (e.g. in GR01), impeding trend detection. In these cases the assessment was based on simplified practical criteria, supportive evidence and expert knowledge. It seems that the balance between recharge and abstraction, the groundwater level trends, the impacts of abstractions (considered significant if more than 50% of the total freshwater abstractions of the River Basin with associated SWBs), and the identification of saline intrusion were the criteria mostly considered in the assessment, and of course to the extent that they were underpinned by available data. It has to be noted that the data on abstraction were mostly estimates obtained from water needs and water use data.

10.2 Groundwater chemical status

In the 12 RBDs assessed in this report, approximately 85% of groundwater bodies are in good chemical status and 15% in poor. The main pollutants causing failure to achieve good chemical status were most commonly reported to be chloride, nitrates, conductivity and sulphate, followed by aluminium, lead, chromium, nickel and arsenic. Ammonium was also reported in some cases. It must be noted that the assessment of chemical status has been based on the parameters for which data were available for at least two consecutive years. Thus, in most GWBs these were limited to pH, conductivity, chloride, nitrates, nitrogen dioxide, ammonium, sulphate. Lead, chromium, nickel and aluminium were assessed in a subset of the GWBs, while dissolved oxygen, cadmium, arsenic, mercury, trichloroethylene-tetrachloroethylene and pesticides have not been assessed due to non-availability of data. Some GWBs have been classified as good chemical status although threshold values (TVs) were exceeded at one or more monitoring points, as long as these were less than 20% of the total number of monitoring sites in the whole GWB. Additional criteria are mentioned to be considered in this case such as the assessment of saline intrusion, the assessment of the degradation of chemical and ecological status of the SWBs (in case the contribution of pollutants from a GWB to SWBs is more than 50%, the former is classified as being in poor chemical status), the assessment of the degradation of terrestrial ecosystems, and the assessment of the impact on drinking water resources. It seems, however, that the 20% criterion (maximum allowed number of monitoring sites exceeding GW TVs) was the one that mostly influenced the assessment, along with the identification of anthropogenic pressures.

In general, limited data were available on the groundwater chemical parameters, which often led to the adoption of some simplifications. The diminution of surface water chemistry and ecology and the damage to groundwater-dependent terrestrial ecosystems due to transfer of

pollutants from GWBs has been considered in the assessment of the chemical status of GWBs in cases where possible and based on simplified and practical criteria (e.g. in case the contribution of pollutants from a GWB to SWB(s) is more than 50%, the former is classified as being in poor chemical status).

There is no obvious statement that all pollutants posing a risk of failing environmental objectives for GWBs have been considered. There are no data available for trichloroethylene and tetrachloroethylene. Thus, these parameters have not been considered in the assessments and no relevant maps could be produced. The measurements of heavy metals (Pb, Cd, As, Hg) have not been systematic. Thus, in many GWBs these data have also not been considered in the assessment. There are nevertheless additional parameters and indicators which have been considered in the assessments (additional to the ones proposed by the Annex II Part B of the GWD) such as pH, NO_2, NO_3 and in some cases Fe, Mn, Mg, B, and for which there are indications if TVs are exceeded, which indirectly implies that the actual relevant pollutants might have been considered.

The TVs used for the assessment of the GWBs' chemical status are based on the national values as defined by the Ministerial Decree 1811/30-12-2011. This Ministerial Decree defines the quality standards (QSs) and TVs at national level based on Art. 3 of the Common Ministerial Decision 39626/2208/E130/2009. According to the latter, these TVs have been defined following the Guidelines provided in Annex II Part A of the GWD. For nitrates and active substances in pesticides the QSs are the ones established in Annex I of the GWD. On top of the Annex II substances, Greece has also set TVs for Ni, Cr, Al, NO_2, NO_3 and pH. The national TVs for GWBs are harmonised with the relevant Drinking Water Quality Standards due to the fact that a majority of the GWBs are used to cover drinking water needs, but to also allow the cross-comparison across GWBs and in relation to other EU GWBs. According to the Ministerial Decree 1811 the TVs can be adjusted due to natural background levels on a case-by-case basis, and this was actually applied in some GWBs where the high levels were solely due to natural background and not any anthropogenic causes.

Upward trends have been identified in the GWBs with available data (time-series of significant length). A significant upward trend is defined when the rate of increase of the concentration of a substance is higher than 10% of the respective TV. The trend of the GWB is identified when at least 80% of the monitoring sites of the GWB demonstrate a significant upward trend. The time-series considered were of variable lengths across the GWBs (in some limited to 4 years, while in others 8-15 years long). For the next cycle of the RBMPs it is suggested (as depicted in some RBMPs) that the year 2007-2008 is used as a reference, which is the year benchmarking the beginning of the new Monitoring Programme. All starting points for trend reversal are defined with 75 % of the GW-QS and TVs, but no methodology is defined yet (either because upward trends have not been identified in the GWBs with available data, or due to lack of information). There is no mention of the assessment of plumes in the RBMPs.

10.3 Protected areas

The status of groundwater drinking water protected areas is presented in Table 10.3.1 below. In total 89 groundwater drinking water protected areas are identified for the whole territory, of which 95.5% are classified in good status and 4.5% in unknown.

No information is available on the status of other protected areas such as water-dependent Natura 2000 protected areas, as the objectives have not been set (see section 11.1).

RBD	Good	Failing to achieve good	Unknown
GR01	4		
GR02	5		
GR03	3		
GR04	4*	-	-
GR05	8		
GR06	3		
GR07	10		4
GR08	4*	-	-
GR09	9		
GR10	3		
GR11	14		
GR12	18		
GR13	-	-	-
GR14	-	-	-
Total	*85*	*0*	*4*

Table 10.3.1: Status of groundwater drinking water protected areas
Source: WISE
*corrections/additions provided by EL in late 2014

11. ENVIRONMENTAL OBJECTIVES AND EXEMPTIONS

Based on the information submitted by EL in late 2014, Greece has set the objective to achieve good or better status in 330 surface water bodies (24%) by 2015, with a 5.5 % increase compared with the 2009 figures (Table 6.7). This figure is significantly lower than the EU average.

The numbers of water bodies at good or better status varies significantly from RBD to RBD regarding the increase expected (from 0 to 18%) as well as regarding the number of water bodies in good status in 2015 (1.9% to 59%), even if the number and types of measures taken does not differ significantly among the RBDs.

The issue of water bodies currently in "unknown" status and when they will reach good or better status differs between the RBDs: GR11/12 mention that all water bodies currently in unknown status will reach good or better status by 2015. The other RBDs mention that after more monitoring information becomes available, the situation will have to be assessed and potentially more measures taken.

In groundwater bodies, no increase regarding good quantitative status (Table 6.11) is expected from 2009 to 2015 (while the 2009 number of groundwater bodies in good status is already high (83.1%)). There is a similar situation regarding chemical status (Table 6.10), with an increase of 0.3% (from the already high percentage of groundwater bodies in good chemical status (84.7%)).

11.1 Additional objectives in protected areas

Protected areas (for drinking water, shellfish, bathing water and Natura 2000 sites) have been designated in all of the RBDs.

No additional objectives going beyond the achievement of good ecological status/potential are set or defined. For protected areas, the main environmental objectives are the compliance (by 2015 at the latest) with the specific standards and objectives of Community legislation under which the individual protected areas have been established, and achieving good status by 2015.

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

There are some discrepancies in the reporting of the numbers of Article 4.4. and Article 4.5 exemptions applied between the corrections provided by EL in late 2014, the WISE data and the RBMPs/their Annexes. Based on the information provided by EL, there are a total of 430 Article 4.4 exemptions reported, and none for Article 4.5.

Overall, no methodology for the "disproportionality of costs" argument was developed or found. There is very limited use of the "natural conditions" argument.

Most of the Article 4.4 exemptions (266) are applied with the reason of "technical infeasibility" given. The general argument behind these exemptions (even if the details of the argument differ according to the RBD) is that there is insufficient time available for the measures to be implemented or to "work" (long recovery time of the water bodies, which seems to be more related to natural conditions), so that the water bodies reach good status in time. The use of these arguments for exemptions in the Greek RBMPs are therefore not sufficiently clear.

Regarding Article 4.4, indications of which impacts and which drivers are causing the application of this exemption can be found in most RBDs (but not in GR11/12), but with varying level of detail. In some RBDs, a summary table is given for each exemption according to Art. 4.4, in which the "potential reasons for not reaching the environmental objectives" as well as the impacts of these drivers were indicated.

It needs to be noted that a large number of water bodies in Greece is in "unknown" status. For these water bodies, no exemption has been applied so far. It is unclear if – after additional monitoring information becomes available – these water bodies will be in "good status", so additional exemptions might then have to be justified.

RBD	Article 4(4)					Article 4(5)				
	R	L	T	C	GW	R	L	T	C	GW
GR01	5*	0	0	0	2	0	0	0	0	0
GR02	3*	0	0	1*	4*	0	0	0	0	0*
GR03	32*	0	0	1	10	0	0	0	0	0*
GR04	7*	5*	4*	2*	2*	0*	0*	0*	0*	0*
GR05	6*	1	4	4	1*	0*	0	0	0	0
GR06	7	0	0	7	12	0	0	0	0	0
GR07	28	0	1*	6	8	0	0	0	0	0
GR08	50*	1*	0*	2*	11*	0*	0*	0*	0*	0*
GR09	17	5	1	0	14	0	0	0	0	0
GR10	9	2	1	1	12	0	0	0	0	0
GR11	46*	2	1	2	1	0	0	0	0	0
GR12	74*	4	5	2	4	0	0	0	0	0
GR13	-	-	-	-	-	-	-	-	-	-
GR14	-	-	-	-	-	-	-	-	-	-
Total	*284*	*20*	*17*	*28*	*81*	*0*	*0*	*0*	*0*	*0*

Table 11.1.1: Number of WBs with Exemptions for Article 4(4) and 4(5)
Source: WISE, corrections/additions provided by EL in late 2014 (marked with *). Some discrepancies between this information and the RBMPs/their Annexes.

RBD	Global[9]					
	Technical feasibility		Disproportionate costs		Natural conditions	
	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)
GR01	2*	0*	3*	0*	0*	0*
GR02	3*	0*	1*	0*	0*	0*
GR03	21*	0	12*	0*	0*	0*
GR04	18*	0	0	0	0	0
GR05	15*	0*	0	0	0	0
GR06	14	0	0	0	0	0
GR07	35*	0	0	0	0	0
GR08	53*	0	0	0	0	0
GR09	17	0	0	0	6	0
GR10	5	0	8	0	0	0
GR11	51*	0	0	0	0	0
GR12	85*	0	0	0	0	0
GR13	-	-	-	-	-	-
GR14	-	-	-	-	-	-
Total	*266*	*0*	*24*	*0*	*6*	*0*

Table 11.2.1: Number of surface water bodies with Article 4(4) and 4(5) exemptions
Source: WISE, corrections/additions provided by EL in late 2014 (marked with *). Some discrepancies between this information and the RBMPs/their Annexes.

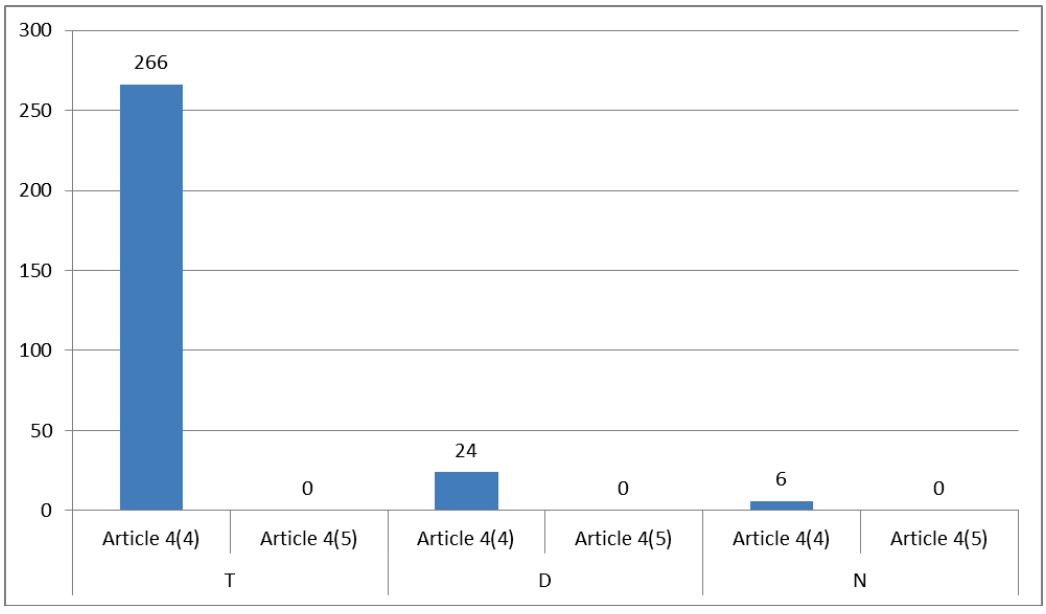

Figure 11.2.1: Number of WBs with Article 4(4) and 4(5) exemptions
T = Technical feasibility, D = Disproportionate costs; N = Natural conditions

[9] Exemptions are combined for ecological and chemical status. Source: WISE, corrections provided by EL in late 2014

11.3 Exemptions according to Article 4(6)

No exemptions according to Art. 4.6 have been applied.

11.4 Exemptions according to Article 4(7)

Overall, the application of article 4(7) for new modifications (in particular for dams) is unclear and incomplete in the Greek RBMPs.

The way new modifications are presented and grouped varies significantly (similar in each of the groups of RBMPs GR 1/2/3, GR 4/5/8, GR 6/7, GR9/10 and GR11/12). In addition, the way these modifications are initially assessed regarding if Article 4.7 needs to be tested, also varies among the RBDs and cannot be seen as sufficiently clear; there are many modifications reported for which it appears that an Article 4.7 exemption should have been justified (or at least tested).

In seven RBDs (GR4/5/8/9/10/11/12), such exemptions have been applied, while there are differences regarding the number of water bodies exempted due to Article 4.7 (see Table 11.4.1 below). In addition and beyond these, there are another five RBDs where an Article 4.7 “test” was done, but in the end the exemptions were not applied:

- GR01: 6 cases tested;
- GR02: 7 cases tested;
- GR03: 13 cases tested;
- GR04: 3 additional cases tested to the ones where Art. 4.7 was applied;
- GR05: 9 additional cases tested to the ones where Art. 4.7 was applied;
- GR06: 6 cases tested;
- GR07: 1 case tested (while another 6-8 are briefly discussed in the Art. 4.7 context);
- GR08: 11 additional cases tested to the ones where Art. 4.7 was applied;
- GR09: 3 additional cases tested to the ones where Art. 4.7 was applied;
- GR010: no additional cases tested to the ones where Art. 4.7 was applied;
- GR012: 1 additional case tested to the ones where Art. 4.7 was applied.

These tested cases mostly relate to the construction of new dams. Given the severe impacts that dams have on water bodies, it would be expected that article 4.7 would be applied in all cases, not only "tested". This appears not to be the case. This may be related to the way the hydromorphological pressures are assessed (see section 4.4). Only large dams above 15 m are considered "significant" if the regulating capacity in relation to the river flow is beyond certain threshold. The impacts are then considered significant downstream of the dam. This approach overlooks the following important issues:

- smaller hydromorphological impacts can be severe, e.g. disruption of continuity is significant for dams smaller than 15 m
- the impacts on the water bodies where the dams will be located and the upstream stretches where the river is converted into a reservoir are not properly assessed; the approach seems to consider that if the reservoir, once built, would achieve GEP, article 4.7 is not needed. Quite the contrary, the achievement of GEP is not equivalent to GES and therefore all river water bodies which are modified into a reservoir should

be considered under article 4(7) as the works will prevent the water bodies from achieving GES.

- overlooks the obligation under article 4.7a to incorporate all mitigation measures into the new modifications, including the necessary ecological flow to ensure that downstream water bodies achieve good status.

The justification for the dams according to the conditions in article 4.7 should be included in the RBMPs, including the strategic alternatives to the dams (e.g., other projects which may achieve the same objective by other means).

It needs to be noted also that small hydropower plants are treated very differently regarding the Article 4.7 "testing" (aggregated or per plant, etc.).

As an example of a RBD where no Article 4.7 exemption was identified but the issue was discussed, GR01 first excludes small projects as well as projects that "have generally (at a higher level) a positive impact on reaching the WFD-objectives". It should be stressed that if a project is liable to cause deterioration or prevent the achievement of GES in a water body, the fact that has beneficial impact on other water bodies does not mean that article 4.7 would not be applied. The information on impacts and benefits should be used in the assessment under article 4.7c in a transparent way. GR01 RBMP presents a very long list (119 projects) of all planned new measures and modifications (at any planning phase) and states that "for modifications that will not be completed by 2015 or additional modifications, these have to be analysed regarding their effects on WFD-implementation and be included in the future revisions of the RBMP". This long list includes a column "affects reaching the WFD-objectives", where for projects that are already constructed, under construction or with secured financing, a simple "yes/no" answer is given (NB: nothing is indicated for the projects in the category with environmental permit or in final/preliminary planning phase). For six specific projects (the "primary list"), including two dams (one of which is under construction), one programme regarding at least eleven new micro-dams for hydropower (in addition to the existing four), as well as three projects for water supply, Article 4.7 is discussed but not applied.

Regarding the way Article 4.7 is "tested", again significant variation can be found between the RBDs. Overall, the plans do not provide sufficiently detailed analysis of the application of Article 4.7 provisions. For example, the way the environmental effects of a new modification are assessed is brief with arguments used being e.g. "EIA performed", no deterioration of status (even if a big dam is planned), no water bodies affected (since smaller than 0.5 km^2), etc. A benefit of the modification that is often mentioned is reducing abstractions from groundwater bodies. An especially significant element is the "check" of alternatives that would be better environmental options (e.g. water demand options) which often is very brief or non-existent. Cumulative effects have not been taken into account for the assessment under Article 4(7).

It should be stressed that completion of an EIA does not substitute the assessment under article 4.7. The objectives, requirements and assessments of the EIA and WFD are complementary but distinct. Therefore the fact that EIA has been performed does not exempt Member States from applying article 4.7.

RBD	Number of Water Bodies acc. to corrections provided by EL in late 2014	Number of Water Bodies acc. to WISE-submission	Number of Water Bodies acc. to the RBMPs/Annexes
GR01	0	0	0
GR02	0	0	0
GR03	0	0	0
GR04	5	0	11
GR05	1	0	2
GR06	0	0	0
GR07	0	0	0
GR08	2	0	4
GR09	3	3	3
GR10	4	1	4
GR11	1	1	1
GR12	9	5	9
GR13	-	-	-
GR14	-	-	-
Total	25	10	34

Table 11.4.1 Number of WBs with Article 4(7) exemptions
Source: WISE, corrections provided by EL in late 2014, RBMPs/Annexes.

11.5 Exemptions to Groundwater Directive

Overall, no information is included in the RBMPs on exemptions under Article 3 of the Groundwater Directive.

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 of the WFD. The programmes should have been established by 2009, but are required to become operational only by December 2012. Due to the delayed submission of the Greek RBMPs, this deadline cannot be kept.

The assessment in this section is based on the PoMs as summarised by the Member State in its RBMPs.

12.1 Programme of measures – general

Most RBMPs report that after results of the new monitoring network are available, the RBMP/PoMs will be revised or updated by 2015 (with the exception of GR11/12).

There is no clear link between the identified pressures, the status of water bodies, and thus the specific needs for the measures to be taken. The RBMPs do not indicate that the status assessments of surface water and groundwater bodies were used to identify their Programmes of Measures.

All of the RBMPs include a Programme of Measures (PoM), while no sub-basin reports regarding the RBMP or the PoM have been prepared with the exception of the Prespa sub-basin management plan (part of GR09). The PoMs are structured in the following way (this structure and its specification are similar between the different RBDs, but not identical – the same approach is taken each in GR1/2/3, GR4/5/6/7/8 and GR11/12):

- Basic measures and "programmed actions": first, the existing implementation status regarding "other Directives" is presented (mainly by indicating the legal transposition and actions taken to implement them); while all Directives are indicated as "implemented", indications are given per Directive on what additional activities are planned in order to implement the WFD. These "programmed actions" are presented differently between PoMs and with varying levels of detail or specification (e.g. sometimes a clear "bullet list" of actions/summary table is given, indication of the responsible institution for their implementation, inclusion of relevant information in WISE, which are missing in other cases). For two RBDs (GR011/12), the "programmed actions" called "proposals" and their specification is less clear. The number of these "actions" varies in the different RBDs, while the number of Directives considered and for which additional action is needed varies too, e.g. with fewer Directives in GR04/5/8.
- "Other basic measures": here, a list of measures is presented for each RBD (according to categories as required by Article 11(3)(b-i)); these are similar across the RBDs, but with some differences (some measures not found in some RBDs) or the addition of "specific" measures to be taken in some RBDs.
- Supplementary measures: these are in support of the basic and other basic measures in order to comply with the WFD-objectives. Some RBDs (e.g. GR1/2/3) include a specific explanation or analysis for which water bodies supplementary measures are needed (that is, supplementary measures taken for water bodies which - based on the current limited knowledge - are in either moderate, poor or bad status as well as for water bodies that are either in unknown or in good condition but there is clear evidence through the analysis of pressures that they are at risk of not achieving the

environmental objectives; GR09/10 explain that the decision regarding for which WBs supplementary measures are needed was an assessment on if the basic/other basic measures are sufficient to reach good status or not). Such an explanation is missing in other RBDs; a clear indication that supplementary measures are taken also in water bodies of "unknown" status is only found in GR01/2/3. Overall, it remains unclear how the need for supplementary measures is identified in practice, since there is no methodology developed for the assessment of the effects of basic and other basic measures. GR01/2/3/9/10 also include a distinction of supplementary measures into horizontal (for the whole RBD) and specific (for specific water bodies), which has not been done for the other RBDs. Some RBDs indicate which measure is applied in which water body, others do not. In most cases, "construction works" (new dams, etc.) are included as supplementary measures in the PoM. There are no measures specifically oriented towards water bodies that are in "unknown" status, although some of the more general measures will affect them.

Regarding the timing of measures, in all RBDs a "prioritisation" of measures has been done, which is similar but not identical among the different plans. In principle, the short-term measures will be implemented within this management period (i.e. by 2015); measures implemented 2015-2021 are mid-term, while the appropriate preparation and programming of activities takes place in the current management period; measures implemented 2021-2027 are long-term, since these need a long preparation time for their implementation. All RBMPs contain an indication of whether measures are short-, mid- or long-term.

Regarding the indication of the level or scale at which the measures have been established, this varies greatly among the RBDs. Many measures presented in the RBMPs have a national or basin-wide scope; at the same time, the information provided in WISE on the geographic scope varies between the RBDs, even for the same measure (e.g. concerning the "other basic" measures, GR1/2/3 indicate "national level" while e.g. for GR11/12 the implementation level is indicated as national, RBD, part of RBD or groundwater body for each measure).

The authorities responsible for the implementation of measures are indicated in most RBDs (in some they are called: "involved authorities"), with public authorities being responsible for almost all measures (there is specific mention of private entities also contributing to some specific measures in GR04/5/7/8/9/10).

Regarding the cost-effectiveness calculation of measures, this is not referred to in any PoM or RBMP. At the same time, in each RBD a cost-effectiveness calculation was done in a separate document with diverging methodologies, but all of them seem not to have been used for the actual "prioritisation" of measures.

Some information regarding costs of individual measures is provided (mostly for supplementary measures), but is not clearly identified for all measures.[10] The summary information found on total costs of measures is diverging: GR6/7/11/12 indicate summary figures for each basic/other basic and supplementary measures (with GR11/12 providing disaggregated figures for basic and other basic measures), GR9/10 provide summary numbers

[10] According to information from the Greek authorities provided in late 2014, the PoM-Implementation Progress Report- submitted by EL as a reply to an EU enquiry in December 2014 contains more information on costs of individual measures. The PoM-Implementation Progress Report (national level) was provided via WISE on 22.1.15 and has not been assessed to date.

only for all basic measures, while GR1/2/3/4/5/8 indicate total costs only for the supplementary measures.

In most cases, new "construction works" (e.g. WWTP and new dams, some of which are already under construction) are part of the PoM and their relevant costs are included in the total costs calculations. For some of them, financing is indicated as secured, including EU-funds.

Information on financing is available for only a few plans and differs between plans: some RBDs (GR1/2/3/6/7) mention the "state of funding" when discussing the supplementary measures (showing that for most measures, no financing is available or secured yet and has to be found), while some (GR1/2/3) indicate the "available financial resources for water management measures per RBD" based on an allocation of available funding to the different RBDs. No systematic indications regarding financing are found in GR4/5/8/910//11/12, yet fragmentary financing information for some specific measures is indicated. GR06/07 show explicitly that for most measures, no financing is available yet and has to be found ("the relevant authorities have included this measure in their planning in order to find funding for them").

For the international RBDs, there is no reference found on coordination of the PoM with neighbouring countries so far; only GR11/12 indicate plans to coordinate the RBMP for the next implementation cycle with Bulgaria.

12.2 Measures related to agriculture

All RBMPs refer to agriculture as a significant pressure due to diffuse pollution and abstractions (while for some RBDs the issue of abstractions is seen as relevant for only a limited number of water bodies). The issue of pressures related to self-abstractions is not considered in detail. Point source pollution from agriculture is not cited as a significant pressure. Regarding hydromorphological pressures from agriculture, these are only mentioned in a general way and as related to "big" construction works for irrigation (e.g. dams). There is no consideration or discussion of "smaller" hydromorphological pressures linked to agriculture, such as bank reinforcements, land reclamation, drainage, etc., nor is there consideration of soil erosion due to agriculture.

The extent of the sector's involvement in the preparation of the RBMPs is limited; there is no specific approach regarding this sector for the public participation activities regarding the RBMP/PoM development (see the general discussion of public participation activities). Therefore, the extent to which the specific measures have been discussed and agreed with the agricultural sector cannot be assessed at this point.

There is no further specific indication given regarding the scope of measures as related to agriculture as well as regarding to their timing (see PoM-general section above on these two issues). Regarding the costs of measures and financing commitments, also here the general information provided holds (see PoM-general), so the costs of measures is unclear and in the majority of cases there is no secured funding. In some RBDs there is fragmentary information regarding Rural Development Programme (RDP) funds being used. There are no indications that compensation payments according to Article 31 will be used.

No information was found on how and when the detailed specifications on the implementation of the measures will be done. Overall, the detailed contribution of each measure to achieving the objectives is not specified, while no specific information on the control or inspection of the implementation of agricultural measures is provided.

The Programmes of Measures identify a range of measures to address pressures arising from agriculture, but these are in most cases general measures, mainly referring to legal, licensing or permitting changes and further information collection.

There are technical measures identified in most RBDs dealing with fertiliser and pesticide application and changes towards low-input farming, while at the same time remaining quite general or limited in scope with unclear impacts on the related pollution issues. Regarding hydromorphological measures, specific measures related to agriculture are limited and mainly refer to specific "hot spots" (deltas, lagoons, etc.) in some RBDs that refer indirectly to agriculture (also as part of multi-objective measures). Erosion is mentioned only very generally in the RBMPs and PoMs, with no specific PoM-measures found relating to this issue (even though desertification is an issue for Greece). At the same time and according to information provided by EL in late 2014, the Code for good agricultural practice that has been implemented with the 125347/568/2004 ministerial decision includes details of legal requirements for sustainable soil management that farmers must follow to ensure soil conservation and reduce soil erosion.

All of the PoMs include measures for water savings or increased efficiency of water usage in agriculture, highlighting the importance of this sector's abstractions; at the same time, they focus mostly on irrigation efficiency measures and improving or changing the supply infrastructure, thus e.g. substituting groundwater abstractions with other water sources (new dams). It is difficult to estimate if these measures are sufficient to reduce the abstraction pressures from agriculture to a sufficient degree, especially since no indication could be found on the expected water savings for each measure.

Regarding economic instruments, in some RBDs the promotion of cooperative measures is referred to, while the general "other basic" measure regarding revision of the water pricing policy is stated to be applied for all RBDs. At the same time, it remains unclear if this water pricing measure is also oriented towards agricultural water pricing (see Article 9 measures section).

A range of non-technical measures are cited in the PoM: these mainly include measures for implementing existing relevant EU-Directives, measures related to increased knowledge for decision-making, measures related to environmental permitting and licencing, and some measures regarding improved controls, institutional changes, advice/training/awareness raising and specific projects are included.

Table 12.2.1 includes an overview of which measures are considered in the RBMPs regarding agriculture.

Measures	GR01	GR02	GR03	GR04	GR05	GR06	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
Technical measures														
Reduction/modification of fertiliser application	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		
Reduction/modification of pesticide application	✓	✓	✓	✓		✓	✓	✓	✓	✓				
Change to low-input farming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Hydromorphological measures												✓		
Measures against soil erosion														
Multi-objective measures				✓	✓			✓	✓	✓	✓	✓		
Water saving measures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Economic instruments														
Compensation for land cover														
Co-operative agreements				✓	✓	✓	✓	✓	✓	✓	✓	✓		
Water pricing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
Nutrient trading														
Fertiliser taxation														
Non-technical measures														
Implementation and enforcement of existing EU legislation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Institutional changes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Codes of agricultural practice				✓				✓						
Advice and training	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Awareness raising		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Measures to increase knowledge for improved decision-making	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Certification schemes														

Measures	GR01	GR02	GR03	GR04	GR05	GR06	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
Zoning														
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

Overall, as stated in previous sections, the pressures regarding hydromorphology are described very generally and with significant differences between RBDs. They mostly refer to the impacts of "big" construction works (related to dams, hydropower, water supply-storage), but not of "smaller" modifications like dams smaller than 15 meters, dredging, river straightening, land reclamation, drainage, bank modifications, etc. In many cases it is assumed that the existence of the dam does not hinder reaching the WFD-objectives (linked also to the fact that the relevant water bodies are defined as HMWB/AWB - even if GEP is not defined yet). The issue of potential impacts of small hydropower dams is not discussed in detail; the information presented on those (either existing or planned) is fragmentary and refers mostly to the Environmental Impact Assessment (EIA) studies conducted for them, not linking to reaching the WFD-objectives in related water bodies.

Very few measures have been included regarding hydromorphology in the Greek RBMPs. No specific measures are included e.g. regarding river restoration, remeandering, inundation of floodplains, removal of structures, fish ladders, etc., bank reinforcement and channelisation for flood protection. Very limited measures are reported regarding habitat restoration (in specific "hot spots", see e.g. GR11/12), while some specific actions for the protection or rehabilitation of specific lagoons, lakes and deltas are reported that should also include improvements of hydromorphological characteristics.

Measures for sediment and debris management are mentioned in most cases, relating to the management of gravel extraction. There are some additional measures proposed that are linked to the development of specific (investigative) studies in order to better understand the impacts of modifications (e.g. impacts of dams on fish populations), as well as for the development of criteria for defining limits of overall abstractions for specific water bodies.

Regarding ecological flows and environmental water allocation, no reference could be found to national legislation or requirements regarding such flows (or national legislation or guidance regarding other issues related to hydromorphology) as linked to the WFD-objectives in the RBMPs/Annexes. For some specific (big) dams the establishment or reconsideration and/or related studies regarding environmental flows (e-flows) are proposed, but there is no overall plan for establishment of national legislation regarding the e-flows issue linked to the WFD-objectives. According to information provided by EL in late 2014, ecological flows are established for small hydropower dams according to existing legislation (MD 196978/2011); for all other cases the definition of ecological flow is made on an ad hoc basis though the Environmental Impact Assessment and permitting process. Furthermore, a medium-term basic measure has been included in the PoMs of the RBMPs for the development of national guidance on e-flows, which is under development; Greece however has not specified when the guidance will be ready.

There is no overview given in any of the plans regarding the existing current e-flows regulation for all dams in place (only fragmentary information found, especially in the context of dams (potentially to be) considered under Art. 4.7).

The (limited) measures regarding hydromorphology are defined for both natural water bodies and HMWBs/AWBs. These are summarised in Table 12.3.1.

Measures	GR01	GR02	GR03	GR04	GR05	GR06*	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
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														
Other: Reduction/control/ban of sand/material extractions from river beds	✓	✓	✓	✓	✓		✓							
Other: research/study at the basin level on the impact of dams on fish populations and determining best methods to overcome impacts	✓	✓	✓	✓								✓		
Other: Determination of selected areas for abstracting materials for engineering needs				✓	✓				✓	✓	✓	✓		
Other: development of criteria for defining the limits of overall abstractions per WB				✓	✓				✓	✓	✓	✓		

Measures	GR01	GR02	GR03	GR04	GR05	GR06*	GR07	GR08	GR09	GR10	GR11	GR12	GR13	GR14
Other: improving the water supply to one lake through reconnection to 2 springs					✓									
Other: various (investigative) studies				✓	✓			✓	✓	✓				
Other: Investigation of potential artificial wetlands sites.											✓	✓		
Other: Studies regarding sediment transport of the Strimonas river											✓			
Other: Specific actions for the protection / rehabilitation of lagoons/lakes/deltas (including studies, but also "water balance rehabilitation")									✓	✓		✓		

Table 12.3.1: Types of WFD measures addressing hydromorphological pressures, as described in the PoM
Source: RBMPs
* No specific hydromorphological measures are going to be taken in GR06.

12.4 Measures related to groundwater

Many measures related to groundwater target specific pressures, such as over-exploitation, and many refer to the sectors driving these pressures: abstraction for irrigation, for example, is frequently cited. However, detailed links between risks, impacts, pressures and measures are not provided.

Regarding quantitative status, basic measures mentioned in most RBDs relate to:

- A better information basis: e.g. reshaping the monitoring network for groundwater bodies in accordance with their final delineation and their qualitative and quantitative status; creating a single register of licensed water abstractions; installation of systems for recording groundwater abstractions;
- Better regulation or licencing: e.g. review of the regulatory framework for water use licensing and execution of water resources development projects; updating the regulation regarding the minimum and maximum limits of the necessary quantities of irrigation water; determination of criteria for setting limits for total abstraction by water bodies; ban on new construction of water abstraction projects from groundwater (boreholes, wells, etc.) in certain cases;
- Incentives: adjusting the water pricing policy in a flexible and efficient way in order to serve the primary target of environmental sustainability and avoid water wastage (see Article 9 section below; it is unclear if this holds also for irrigation water);
- Increasing water use efficiency or water saving: e.g. establishment of an institutional framework and a programme of measures for private user water conservation; restructuring and rationalisation of the institutional operational framework of collective management bodies of irrigation networks; and,
- Investigation of the conditions for implementing artificial recharge of groundwater bodies.

Regarding supplementary measures (which are considered to be needed in all RBDs), there is a greater variety of measures proposed in the different RBDs. Some commonly found are: installation of functional valves in artesian wells; identification of groundwater areas or restrictions for coastal groundwater that face saltwater intrusion; promoting voluntary agreements with big water users and especially the agricultural sector; awareness raising and information activities.

Beyond that, there are specific supplementary measures regarding, in most cases, specific groundwater bodies, e.g. regarding the introduction of artificial recharge, specific studies or monitoring regarding water availability and water needs linked to a specific groundwater body, etc., investigation of specific water transfers, construction of appropriate drainage works, modernisation (e.g. to drip or "micro" irrigation) and maintenance of irrigation networks; subsidies for irrigation systems change; use of treated effluents for supporting water supply or artificial recharge; total groundwater withdrawals not to exceed a certain amount for a specific groundwater body; restrictions of new boreholes in specific groundwater bodies; and, on-site inspections for licensed abstractions (big water consumers) at least twice per year.

Here, it is important to note that various "construction works" (mainly new dams, but also improvements or expansions of irrigation networks, sometimes leading to irrigation areas to be expanded) are proposed in order to reduce quantitative pressure on groundwater bodies

(among other objectives) by shifting abstraction to surface water bodies. At the same time, not all of the planned new dams are mentioned as "WFD-measures" or no criteria could be found regarding which of these construction works would become part of the WFD-PoM and which not. According to information provided by the Greek authorities, construction projects shifting abstraction from groundwater to surface water have been included in the PoM where the quantitative status of groundwater is below good or exhibits downward trends.

Regarding measures to prevent and limit inputs of pollution to groundwater bodies, for GR5/6/7/8 basic measures are not considered as sufficient for point and diffuse sources. For GR1/2/4, basic measures are considered as sufficient for both sources, while for GR3 supplementary measures are seen as needed for point sources and for GR9/10 for diffuse sources. For GR11, basic measures are not enough regarding point sources, but supplementary measures are taken also for diffuse sources, with the explanation given that supplementary measures are taken to maintain good status and to deal with localised quality issues. For GR12, supplementary measures are taken, even though only one groundwater body faces quality issues due to saltwater intrusion, with the same explanation given as for GR11. In all RBDs, measures regarding chemical pollution of groundwater bodies are provided in the PoM (see section "measures related to chemical pollution" for details).

Specific measures oriented towards groundwater bodies with exceedances were rarely found (the exceptions are specific studies to further investigate the occurrence of a specific substance, e.g. in GR01/2/3/5).

In transboundary RBDs, co-ordination with neighbouring countries regarding measures for groundwater management is not mentioned.

12.5 Measures related to chemical pollution

There is no information regarding an inventory of sources of chemical pollution; however, all RBDs mention the "establishment of an inventory of pollution sources (emissions, discharges and losses)" as one of the "other basic measures" (mid-term).

Overall, there is very limited information regarding the existence of chemical pollution, due to significant gaps in monitoring information.

In general, it is considered that the Greek legislation previous to the WFD implementation (regarding e.g. authorisation and control of point source discharges) should cover most of the issues related to chemical pollution. At the same time, a variety of actions or measures on the issue are planned, mostly linked to legal changes, the development of inventories and guidelines and voluntary activities.

Some of these main measures (regarding "programmed actions") include : legislative actions regarding permitting or licensing as well as the use of sludge; continued and in many cases better monitoring information, databases and registers; completion of required works for the collection and processing of urban wastewater or for facilities falling under IPPC; rational use of plant protection products (putting the legal requirements or measures into practice); delineation of new nitrate vulnerable areas and developing action plans for them; incentives for improving livestock facilities.

Regarding "other basic" measures, some found in most RBDs are: better monitoring, information or management systems (e.g. for pollution accidents; aquaculture; setting up an inventory of sources of pollution); measures for improving the regulatory framework or licensing regarding protection of protected areas for drinking water, aquaculture, sludge management, emission limits for priority substances and other pollutants, industrial waste

water and waste and truck transportation of wastewater; protection of surface water abstraction installations for irrigation; investigations regarding implementing artificial recharge of groundwater bodies; development and use of specialised tools for the Rational Use of Fertilisers and Water; and, strengthening the synergy of the water management plans with the emergency plans of facilities included in the IPPC and SEVESO.

Regarding the main supplementary measures found in many RBDs, these include: information or capacity building events for agriculture; special protection measures for groundwater bodies in areas where geothermal or thermal waters exist; additional monitoring for e.g. areas of existing landfills, systems with high natural background levels (chlorides, sulphates) and lagoons; investigation of possible sources of pollution associated with pesticides; definition of restriction zones for new wells or water uses extensions of licenses linked to coastal groundwater bodies facing salinisation (and defining the groundwater body areas affected); upgrading WWTP from secondary treatment; and, rational management of waste water from agglomerations with a population peak < 2000 pe. Beyond that, there are also specific supplementary measures in some RBDs regarding specific chemical pollution "hot spots" (e.g. in GR06 regarding the Asopos river and related groundwater bodies and chemical pollution from industry)

Measures to reduce or phase-out the emissions of specific pollutants have not been identified in the PoMs, although in some cases there is a specific investigative study planned regarding the occurrence or exceedance of a certain pollutant (GR1/2/3/5).

12.6 Measures related to Article 9 (water pricing policies)

Overall, the work done on the economic analysis differs significantly between RBDs (with common approaches each in GR1/2/3, GR4/5/8, GR6/7, GR9/10 and GR11/12). According to the Greek authorities, this is due to the extensive lack of data and the different RBDs following the approach deemed most suitable for the data available to them. There seems to be no clear national guidance on the issue.

For all RBDs, the economic analysis shows gaps regarding the actual information used or available (e.g. division of costs for public water supply and sewage is not possible; lack of information regarding assets, (operational) costs and revenues for many water supply companies/municipalities; there is a lack of metering in agriculture, etc.) and questionable methodologies and assumptions are used (e.g. regarding the way financial costs are calculated (using "average values" for many important elements of the calculation), the way (cross-) subsidies are (not) considered (especially regarding irrigation), for the calculation of environmental costs (e.g. taking as a basis the "status" of water bodies while many of them are in "unknown status", linking the existence of environmental costs to the existence of a waste water treatment plant which does not cover non internalised environmental and resource costs, including costs the costs related to water abstraction, assuming in many cases that irrigation does not entail environmental costs, etc.).

There is no consideration or discussion of the polluter pays principle, the contribution of water users to the costs of water services and the implementation of incentive pricing.

There is no clear definition of water services. In general, water supply and wastewater treatment services are treated together as one service, while also "irrigation water services, mainly from organised irrigation" seem to be considered as a water service (GR01/2/3 explicitly also mention "self-service" for irrigation as a water service). In other cases (e.g. GR04/5/8), additional water services are identified (e.g. recycled water provision). There is

no clear approach to the identification of relevant water uses in the Article 9 context across the RBDs.

The methodology for calculation of cost recovery rates shows differences depending on the RBD, but overall it is based on fragmentary data and various assumptions and extrapolations regarding both the methodology and data.

The information provided on existing cost recovery (CR) levels varies: cost recovery rates (financial, but additionally including environmental and resource costs (ERC) are calculated for agricultural water supply and urban water supply and sewage treatment (as one). In some cases (e.g. GR06/7), more disaggregated CR numbers are given for the financial costs of "households/state users" and "industry". In other cases (e.g. GR01/2/3), disaggregated numbers are given for public water supply and sewage companies and municipalities providing these services directly. Self-abstractions are included in the ERC calculations of GR06/07.

Significant gaps are apparent regarding the identification and consideration of subsidies for organised irrigation (especially investments).

Environmental and resource costs have been calculated and included in the cost recovery calculations in all RBDs, however they are based on many assumptions and simplifications, which are not adequately justified.

No information was found on the application of flexibility provisions or provisions of Article 9(4) of the WFD, or on international cooperation regarding the implementation of Article 9.

One "other basic" measure of all the PoMs is "adjusting the water pricing policy in a flexible and efficient way in order to serve the primary target of environmental sustainability and avoiding water wastage" (but not referring to pricing regarding pollution or sewage-related services). It remains unclear if this revision of the water pricing policy will also cover agricultural water pricing (when describing the measure GR11/12 also refer explicitly to irrigation water; the other RBMPs do not). Some general principles that this revision will be based on are given, but without indicating the specific content so far (the measure is indicated as "short term", thus to be implemented by 2015). In this context, there is no discussion or specific measures for dealing with non-metered water consumption in agriculture.

12.7 Additional measures in protected areas

Overall, no specific additional measures in protected areas are part of the WFD-PoMs, since no specific, additional objectives going beyond the WFD-objectives are included in the RBMPs (beyond what is required for the implementation of "other" Directives, Natura 2000, etc.).

The measures to comply with the objectives of other Directives (all of them indicated as "already implemented") are mentioned in the PoMs as measures taken for the implementation of these Directives. Some of the "other basic" measures mentioned in the PoMs also refer to the Directives related to protected areas.

Regarding the drinking water collection areas, the RBMPs refer to the establishment of safeguard zones for these; one of the measures described in the PoMs is related to finalising the establishment of safeguard zones based on hydrological studies. While safeguard zones have not been finally or specifically established yet, some "other basic measures" have been mentioned that are linked to safeguarding drinking water quality. These include: the implementation of Water Safety Plans in large water supply companies; establishing or updating General Water Supply Plans Water Supply (Masterplan) from the public water and

sewage companies; the detailed delineation of protection zones of groundwater abstraction points (springs, boreholes) for water supply abstractions greater than 1 million cubic metres per year; the definition of protected areas for abstractions for drinking water; the protection of groundwater bodies included in the register of protected areas for drinking water; and, setting an institutional protection framework.

In some cases, specific measures are related to the protection of the water abstractions from specific dams or reservoirs (e.g. in GR06/7/12).

13. CLIMATE CHANGE ADAPTATION, WATER SCARCITY AND DROUGHTS, FLOOD RISK MANAGEMENT AND OTHER EMERGING AND LINKED ISSUES AS PART OF THE RBMP

13.1 Water Scarcity and Droughts

Water scarcity and droughts are identified as significant issues in most RBDs; for all, there are specific areas or times of the year where these phenomena are of importance.

For all RBDs, a drought management plan has been established (for GR01/2/3, it is a combined one); in most cases the specific sub-units or specific river basins are looked at separately. Quantity issues are discussed in the RBMP and some measures related to quantity management have been identified in the PoMs, but the links between the two plans are weak. For the characterisation of Drought & Water Scarcity conditions the Standard Precipitations Index (SPI) and the Water Exploitation Index (WEI) have been used (in some RBDs differentiated between surface and groundwater – e.g. GR06/07).

The information used in the Drought Management Plans (DMPs) is based on historical data for water availability, without consideration of e.g. the impacts of Climate Change on this availability in all RBDs. For water demands, theoretical data is used since actual information on water abstractions is fragmentary or missing. The water balances at the catchment scale are based on modelling carried out in the framework of a previous national project, and thus they have not been updated. The actual calculation methods, time horizons, etc. differ between RBDs.

The "proposals" for measures identified in the DMPs are in most cases early warning and emergency response measures (sometimes called "reactive" measures) to a drought situation, while some RBDs also list preventive (pro-active) measures. In GR06/07 a methodology for early warning based on precipitation is developed, and alert levels have been established on the basis of the observed 3-month and 6-month precipitation (SPI3 and SPI6 respectively) during the month of March. A list of measures for each alert level are also provided, mainly focusing on demand management and awareness measures. In GR01/2/3/4/5/9/10 the link is built to the PoM according to the WFD by identifying the PoM-measures proposed that support the prevention and mitigation of water scarcity and droughts (not done in GR06/7/11/12). Most of the PoM-measures linked to combatting water scarcity and droughts are construction works in order to increase available water to cover demands (e.g. new dams), but there are few demand-side measures (reduction of water losses, changes in the way agriculture is using water).

It remains unclear what the next activities are to put the DMPs into practice, since the measures described in the DMPs are "proposals", thus not fully decided (evident in the "next steps" section - in the cases where it exists - of the DMPs). Thus, further work is required to develop the DMPs into operational plans.

No international coordination has taken place so far on the DMPs, while in GR11/12 some future activities regarding early drought warning data exchange with neighbouring countries have been proposed.

13.2 Flood Risk Management

The RBMPs by and large make very few references to floods and flood risk management or the Floods Directive (FD); there is no reference to the coordination needed for the implementation of the WFD and the FD.

There is no clear, practical reference or link in the RBMPs to the development of the Flood Risk Management Plans currently underway. According to information provided by the

Greek authorities in late 2014, all data developed and used for the first cycle implementation of the WFD was available and used for preliminary flood risk assessment (PFRA) and for Flood Mapping elaboration. Also, more detailed information derived from the PFRA and from the FD-flood mapping on water bodies' hydromorphological alterations and on environmental pressures due to flooding will be used in the second cycle of the WFD (for a better analysis of hydromorphological pressures and for the elaboration of PoMs). The information and programme of measures contained in each future management plan (WFD or FD), will consider all the information and measures produced in previous cycles.

Most RBMPs mention floods as a side issue, such that some measures are also being targeted to provide security against floods (mainly related to dam infrastructure and related to HMWB/AWB designation and the Art. 4.7 – new modifications issue). At the same time, there is no specific discussion or chapter building the links of the PoM to floods management. Overall, no natural water retention measures were found that can serve towards reducing flood risk.

13.3 Adaptation to Climate Change

Climate change has not been taken into consideration in any of the RBMPs, PoMs or DMPs, (no specific chapter or discussion), e.g. regarding expected changes in water availability. No plans or related measures to do so in the future can be found.

The only exceptions to this are GR04/5/8, in the DMP of which a two-page chapter is dedicated to the issue of climate change. It summarises two studies that are annexed to the DMPs, dealing with (for GR04, 05 and 08 combined) the “Effects of climate change on rainfall, temperature and evaporation”, which develops different relevant scenarios, and another on the “Effects of climate change on agriculture and irrigation”, which describes changes in irrigation needs and proposes some measures for increasing irrigation water productivity in order to reduce irrigation water needs and to conserve water. These two studies use different assumptions and thus reach different results on the climate change effects and are not taken into further consideration in the relevant DMP/RBMP/PoM. Similar studies cannot be found for the other RBDs.

A climate check of the Programmes of Measures was not performed. The PoMs do not include specific adaptation measures.

A national strategy for climate change adaptation was not in place when the RBMPs were in preparation; however, preparatory steps have recently been taken to establish one (commissioning a study on the development of a National Climate Change Adaptation Strategy is underway as of September 2014).

14. RECOMMENDATIONS

Greece should:

- Urgently adopt and report to the Commission the two outstanding Greek RBMPs.
- Improve transboundary cooperation, building on the progress achieved so far; additional efforts in the context of WFD-implementation are needed, so that the second RBMPs for international RBDs are developed in close cooperation with neighbouring countries.
- Make fully operational the new National Monitoring Programme (NMP). All outstanding assessment methods should be developed and made operational as soon as possible. All water bodies should be classified according to WFD compliant methods. The one-out all-out principle should be used across the board. Data must be collected on a regular basis for all relevant quality elements. The recommendations of the RBMPs regarding the proposed modifications to the NMP need to be carefully considered and actions for their implementation pursued. The data of the new NMP must be quality assured, organised and archived. It is recommended that these data are made available to all users and the general public through easily accessible formats.
- Develop publicly available WFD compliant National Guidance Documents, addressing the key implementation steps where significant weaknesses have been identified (characterisation of pressures, typology, reference conditions, monitoring and grouping of water bodies, methods for the status classification, HMWB designation, application of exemptions and in particular regarding Article 4.7, etc.), necessary to ensure WFD compliance and increased comparability and transparency.
- The information obtained regarding chemical pollution needs to be extended by filling gaps in monitoring, including the monitoring of mercury and other relevant pollutants in biota, and trend monitoring in biota and/or sediment.
- Ensure in the updated RBMPs a better understanding and identification of the main risks and pressures in each river basin, based on detailed harmonised methodologies, and underpinned by consolidated and robust data.
- Particularly urgent is the development of sound methodologies to address hydromorphological pressures. The current combination of weak pressure analysis (with not precautionary enough thresholds of significance), lack of ecological status assessment methods sensitive to hydromorphological pressures, unclear process for designation of HMWB and lack of development of GEP makes it very likely that significant hydromorphological pressures are completely overlooked in the implementation process. Potential effects of "smaller" modifications such as dams lower than 15 m, dredging, river straightening, drainage, etc., including impacts to transitional and coastal waters, should be assessed.
- Agriculture is indicated as exerting a significant pressure on the water resource in most Greek RBDs. There needs to be further investigation regarding the hydromorphological pressures from agriculture. In addition, the measures taken as regards agriculture need to be more specific, in order to have more reliable positive results regarding the WFD-objectives.
- Regarding GW quantity issues, very limited information about actual abstractions has been used. The latter are based on estimates. Even if the revised NMP will provide better information the issue of illegal abstractions/boreholes, their potential effects and ways to deal with them needs to be considered most thoroughly.

- Regarding exemptions: overall and even if a large number of water bodies are in "unknown" status, there is a limited number of exemptions, linked to the fact that only a limited number of water bodies "fail" the objectives of the WFD. This needs to be significantly re-considered after monitoring information becomes available - and consequently, most probably, more measures will need to be taken.
- The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. This especially holds true for a coherent and complete approach regarding Article 4.7 exemptions. 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 a proper assessment of whether the project will cause deterioration or prevent the achievement of good status, whether the project is of overriding public interest, 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.
- No clear link between measures and status assessment is made. In order to address this, the gaps in the steps leading to the Programme of Measures, such as pressure and impact assessment, monitoring and status classification, should be addressed. This is important in order to implement measures where they are needed to reach the WFD objectives.
- In relation to chemical pressures, the intention to compile inventories of emissions in accordance with Directive 2008/105/EC needs to be carried out, but does not in itself count as a measure against chemical pollution. More information on relevant measures needs to be included in the 2nd RBMPs.
- In relation to hydromorphological pressures, and based on a sound assessment, measures should be taken to mitigate the impacts (e.g. river restoration, removal of structures, etc.).
- Meaningful information regarding the scope, the timing and the funding of the measures should be included in the PoM so the approach to achieve the objectives is clear and the ambition in the PoM is transparent.
- PoM in RBMPs: the limited level of ambition, and lack of clarity regarding expected effects, need to be rectified. The PoM includes mostly administrative acts that may not make a difference (particularly if implementation is not enforced). Many projects that are in apparent conflict with the WFD (e.g. new dams not properly justified, new irrigation network projects) are included in the PoM (e.g. for improving GW quantitative status since the irrigation water will come from a new reservoir in the future). A thorough check of such projects that are included in the PoM is needed in order to check if they really are WFD-relevant measures (linked also to the Article 4.7 issue above). This inclusion of new dams/irrigation schemes, etc. in most of the PoM also affects the costs indicated: a part of the costs of the PoM-supplementary measures (as defined up to 2015) come for such projects (often financed through the EU). Otherwise, there is very limited financing included for "core" WFD-measures to achieve the environmental objectives (e.g. restoration/mitigation, etc.) without clear commitments for after 2015. There needs to be a clear separation of measures designed to achieve WFD environmental objectives from measures designed to increase water supply and other objectives.
- Develop fully the economic analysis of water use (including the polluter pays principle, including a clear definition of water services, harmonising methodologies and data in all

RBMPs) and ensure that the water tariffs/fees lead to adequate recovery of the costs of water services and provide incentives for users to use water resources efficiently. This is particularly important for agriculture. The implementation of measures on cost recovery and water pricing based on a common approach across RBDs is urgent, in order to fulfil the Article 9 requirements and to achieve economic sustainability.

- Up to now, there is no consideration of climate change - no "climate proofing" of the RBMP/PoMs. These issues need to be dealt with urgently.
- The Drought Management Plans (DMP) developed as supplementary to the RBMPs are a valuable addition. However, they need to be taken a step further, be more harmonised, and evolve into an operational level with the "measures proposals" being implemented in areas where relevant.
- Ensure that the authorities responsible for water management are fully in charge of the contents and development of the RBMPs. Support from consultants and researchers is often necessary, but the authorities' ownership of the RBMP should be ensured to embed the WFD principles and obligations into practice and avoid the disconnection of the planning process from the water management reality. Long-term capacity and expertise building should be ensured in the water administration, based on sufficient resources and personnel available at all relevant administrative levels.
- The consultation process needs to be strengthened. More efforts should be done to ensure active participation of all relevant stakeholders and the comments should be taken under consideration in a more transparent way.