MANAGEMENT PLAN

of the River Basins
of Western Macedonia River Basin District (GR09)

Special Management Plan for the Sub-basin of Prespa in the River Basin Of Prespa (GR01)

Summary

JANUARY 2014

SPECIAL SECRETARIAT FOR WATER

HELLENIC REPUBLIC

MINISTRY OF ENVIRONMENT, ENERGY AND CLIMATE CHANGE
SPECIAL SECRETERIAT FOR WATER

PROJECT: DEVELOPMENT OF THE RIVER BASIN MANAGEMENT PLANS OF THE RIVER BASINS OF WEST MACEDONIA AND CENTRAL MACEDONIA RIVER BASIN DISTRICTS ACCORDING TO THE SPECIFICATIONS OF THE WFD 2000/60/EC, APPLYING THE GREEK LAW 3199/2003 AND THE GREEK PD 51/2007

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DEVELOPMENT OF THE RIVER BASIN MANAGEMENT PLAN OF THE RIVER BASINS OF WEST MACEDONIA RIVER BASIN DISTRICT (GR09)

Special Management Plan for the Sub-basin of Prespa in the River Basin Of Prespa (GR01) - SUMMARY

G.G. of Management Plan's Approval: G.G. B' 181/31.1.2014

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ABBREVIATIONS

AWB	=	Artificial Water Bodies
CEA	=	Cost Effectiveness Analysis
CMD	=	Common Ministerial Decision
CRR	=	Cost Recovery Rate
EC	=	European Commission
EU	=	European Union
fYROM	=	former Yugoslav Republic of Macedonia
GG	=	Government Gazette
GWB	=	Ground Water Bodies
HMWB	=	Heavily Modified Water Bodies
JMD	=	Joint Ministerial Decision
NSRF	=	National Strategic Reference Framework
PD	=	Presidential Degree
RBD	=	River Basin District
SCI	=	Sites of Community Importance
SEIA	=	Strategic Environmental Impacts Assessment
SPA	=	Special Protection Areas
TC	=	Total Cost
TR	=	Total Revenues
WBs	=	Water Bodies
WFD	=	Water Framework Directive
WWTP	=	Waste Water Treatment Plant

1. INTRODUCTION

The "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy"(EU Water Framework Directive or WFD) sets a framework for comprehensive management of water resources in the European Community, within a common approach and with common objectives, principles and basic measures.

The EU Water Framework Directive 2000/60/EC provides the major driver for achieving sustainable management of water throughout Europe, for many years to come. The purpose of the EU Water Framework Directive is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. The fundamental objective of the Water Framework Directive is to prevent any deterioration in water quality and to achieve at least 'good status' for all waters by 2015.

The EU Water Framework Directive 2000/60/EC has been harmonized with the Greek legislation with Law 3199/2003 (Government Gazette A 280) and Presidential Decree 51/2007 (Government Gazette A 54). Under these provisions the basic concepts of the Water Framework Directive are incorporated to the National Legislation. At the same time a new administrative structure is formed and the responsibilities of the Management Bodies are defined nationally and regionally.

A priority and a necessary step for the implementation of the Directive in Greece is the preparation of the River Basin Management Plans of the 14 River Basins, as these are established by the Decision of the National Water Commission of 16.07.2010[1]. The River Basin Management Plans of the country are prepared under the auspices of the competent authorities for every River Basin. Based on the requests of the General Secretaries of the Regions of Western and Central Macedonia the Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change undertook the preparation of the Water Management Plans of the River Basins of the River Basin Areas of West Macedonia (GR09) and Central Macedonia (GR10). In accordance to the law 4117/2013, which amended the law 3199/2003 and the Presidential Decree 51/2007, it is foreseen that in this case the River Basin Management Plans are approved by the National Water Commission, upon recommendation of the Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change.

The Special Secretariat of Water of the Ministry of Environment, Energy and Climate Change launched a public international tender in June 2011 to contract the study «Development of the

[1] www.ypeka.gr/LinkClick.aspx?fileticket=GdFmmT1BtE4%3d&tabid=247

River Basin Management Plans of the River Basins of the River Basin Areas of Western Macedonia and Central Macedonia according to the Specifications of the WFD 2000/60/EC, applying the Greek Law 3199/2003 and the Greek PD 51/2007». Following the tender, the study was contracted on 27.04.2012, by the Special Secretariat of Water to the Consortium:

« EXARCHOU NIKOLOPOULOS BENSASSON CONSULTING ENGINEERS SA »

« GEOSYNOLO LTD »

« ENVIROPLAN SA «

« DIKTIO SA »

« ECO CONSULTANTS SA »

« FOTEINI MPALTOGIANNI »

« LISA BENSASSON »

« ILIAS KOURKOULIS AGRICULTURAL CONSULTANT »

with Representative and Coordinator of the Consortium, the Civil Engineer Abraham Bensasson and Deputy Representative, the Civil Engineer-Environmental Engineer MSc Lisa Bensasson.

2. OBJECTIVE AND CONTENTS OF THE SPECIAL RIVER BASIN MANAGEMENT PLAN

In the context of the Water District of Western Macedonia (GR09) management plan and in compliance with Article 13, paragraph 5 of the Directive:

"River basin management plans may be supplemented by the production of more detailed programmes and management plans for Sub-basin, sector, issue, or water type, to deal with particular aspects of water management".

The Special Management Plan for the Sub-basin of Prespa in the River Basin of Prespa (GR01) in the Water District of Western Macedonia (GR09)» is established, due to the importance of Mikri and Megali Prespa lakes transboundary basin. It constitutes an indispensable part of the River Basin Management Plan of the River Basins of the Water District of Western Macedonia and is annexed to it (Annex I).

The Special Water Management Plan of Prespes Sub-basin, provides in sufficient detail to stakeholders and particular competent bodies the required information, with explicit references to the primary data used, the assumptions adopted and the methodological approaches applied for the implementation of Directive 2000/60/EC. Finally it concludes with relevant measures and recommendations to be implemented in Prespa Sub-basin.

The Prespa Sub-basin is a part of the Transboundary River Basin of Prespa shared between Greece, Albania and fYROM. As such the River Basin of Prespa exceeds the Community boundaries, since the neighboring countries are not Member States of the EU, with Albania to be considered as potential candidate and fYROM as candidate for participation. Taking into account the provisions of Directive's Article 13 for basins exceeding the Community's limits the Special Water Management Plan of Prespa Lake Sub-basin covers the part of the transboundary River Basin laying in Greek territory.

Following the requirements of Article 13 and Annex VII of Directive 2000/60/EC (Article 10 and Annex VII of Presidential Decree 51/2007) on the content of the management plan, the Special Water Management Plan of Prespa Sub-basin includes the following chapters :

1. Introduction
2. Legislative framework - Implementation of Directive 2000/60/EC
3. The Water Management Plan
4. Consultation Process
5. Brief description of Prespa Sub-basin
6. Competent Authorities

7. Water Bodies Identification
8. Pressures on the Water Environment
9. Status of the Water Bodies
10. Water Uses Economic Analysis
11. Environmental Objectives – Exceptions
12. Programme of Measures
13. Next Steps - Implementation of the Management Plan
14. Difficulties during preparation of the Special Management Plan of Prespa Sub-basin
15. Transboundary Prespa Lakes River Basin

The Management Plan of the River Basin of Western Macedonia River Basin District (GR09) has been subjected to a Strategic Environmental Impact Assessment (SEA), in conformance with the Joint Ministerial Decision of the Special Environmental Agency of the Ministry of Environment, Energy and Climate Change No. 107017/28.8.2006 «environmental assessment of certain plans and programs, in compliance with the provisions of Directive 2001/42/EK» (Government Gazette B 1225/2006).

Taking into consideration the harmonization of the Management Plan with other National Plans and Programs and the conclusions of the Public Consultation Procedure, the Strategic Environmental Assessment Study of the Management Plan of the River Basins of Western Macedonia River Basin District (GR09) has been approved with the Ministerial Decision No. 172593/24.12.2013 under the conditions, restrictions and guidelines set out in this decision, which are to be observed at all stages of approval, specification and implementation of the Management Plan by the Planning Authority.

Evaluation and assessment of the impacts of the River Basin Management Plan on the examined environmental factors, concludes that no important negative impact is to be expected. On the contrary, in most cases, the recommended Program of Measures significantly improves -directly or indirectly and cooperatively - the current state, due to the fact that its very aim is to achieve sustainability and to address any adverse conditions related to water resources management. Consequently, no alterations to the recommended Program are required towards environmental integration. Variations to specific points of the Preliminary Management Plan resulting during the process of Public Consultation are recorded in detail in the Joint Ministerial Decision of the Strategic Environmental Impact Assessment approval and have been taken into consideration in the final Management Plan and in the Special Management Plan of Prespa Sub-basin.

3. CONSULTATION PROCESS

Public consultation processes have a key role during preparation, reading and revision of the river basin management plans.

The consultation period of the River Basin Management Plans, with a required minimum duration of 6 months, began on **June, 2012** and has been completed in three phases:

Phase A, lasting until June 2013, addressing the following:

- Report on the consultation measures to be taken, including the Public Consultation Schedule
- Catalogue of stakeholders,

Phase B, from November 2012 until June 2013, addressing the following**:**

- Overview of the significant water management issues

Phase C, lasting from January 2013 to December 2013, with the following main objects:

- The Preliminary Management Plan of the River Basins of Western Macedonia River Basin District
- The Strategic Environmental Impact Assessment

To enhance the involvement of shareholders in the Water District's Preliminary Water Management Plan, open Seminars / Meetings, Conferences and Thematic Consultation Meetings have been organised in major cities of the Water District.

Overall, seven (7) workshops have been held for the public consultation of the Western Macedonia Water District RBs Management Plan, including the "Consultation on the measures to be taken and consultation on critical water issues" that took place in Kozani on 26.02.2013 and the "Consultation on the Preliminary Western Macedonia Water District Management Plan - Prespa River Basin" in Florina on 16/07/2013, which highlighted particular issues relating to Prespa Sub-basin.

At the same time, intensive communication with all stakeholders during the Project has decisively contributed to the content of the Management Plan. For the Prespa Sub-basin in particular, the study group collected a valuable data set through communications and discussions with the Municipality of Prespa, the TOEV[2] of Prespa, the Prespa National Park Management Body (PNPMB) and the Society for the Protection of Prespa (SPP). Meetings were held in both Laimos (14/9 / 2012) and at the offices of the Special Secretariat for Water (30/04/2013), in Athens.

All parties/stakeholders of the Prespa Sub-basin (Municipality, PNPMB, SPP, professional associations) have demonstrated active participation in the public consultation through written

[2] *Local Irrigation and Drainage Organisation*

comments and annotations on a range of issues. In particular the SSW has received two letters signed by a number of local stakeholders each:

- ✓ ″Comments on the Review Report of Significant Water Management Issues (D.1.17) of the Water District of West Macedonia (GR09)″ on 20.02.2013.
- ✓ "Comments on the text of "P.2.3. Preliminary River Basin Management Plan - Prespa Sub-basin of RB of Prespa Lakes (GR01), Water District of Western Macedonia (GR09) (version 1.1, May 2013)" on 24.07.2013.

Also, on 01.11.2013 the Management Body of Prespa National Park sent their "Opinion on the Strategic Environmental Impact Assessment (SEA) of the River Basin Management Plan of Western Macedonia (GR09)».

The set of information, comments and suggestions of stakeholders have been taken into account in finalizing the RBMP of WD09 and the Special Management Plan of Prespa Sub-basin.

On **December 10, 2013** the consultation process of the SEA was completed. After transmition by the Special Secretariat for the Environment (Ministry of Environment, Energy and Climate Change) to the stakeholders for their opinion.

On **December 13, 2013** the Special Secretariat for Water announced the completion of the public consultation process on the Preliminary River Basin Management Plan for the Water District of Western Macedonia (GR09).

4. NATURAL AND ADMINISTRATIVE CHARACTERISTICS OF PRESPA SUB-BASIN

River Basins: Prespa Sub-basin, with an area of 347 km^2, is part of the RB of Prespa Lakes Basin (GR01), covering an area of 1.210 km^2, which is one (1) of the two (2) River Basins (RB)[3] of the Water District of Western Macedonia (GR09),

Administrative status**:**

The Prespa Sub-basin is administratively attached to the Prespes Municipality of Florina's Regional Unit, which is according to Law 3852/10 (Government Gazette 87 A/07.06.10) 'New Architecture of Local Government and the Decentralized Administration - Kallikratis Programme", consisting of the former Kapodistrian Municipality of Prespes and the former community of Krystallopigi. It hosts fourteen (14) of the Municipality twenty one (21) agglomerations. Out of these thirteen (13) belong administratively to the Municipal Unit of Prespa and one (1) belongs to the Municipal Unit of Krystallopigi. The permanent population of Prespa Lake Sub-basin, based on ESYE census data for 2011 reaches 1.374 residents, a reduction of 25,5% since the census of 2001.

Land Uses: The largest part of the Prespa Sub-basin is covered with forest (62%) while agricultural land covers 7,7% and pasture 1,4% of each surface. A small extent within the Prespa Lake Sub-basin is barely 1,1% occupied by urban land and roads. Finally, it comes as no surprise that a significant portion of the Prespa Sub-basin is covered by water (23,5%).

Major water uses: Water uses in Prespa Lake Sub-basin are identified for water supply, irrigation and livestock.

The total annual demand for all uses is 5,9 hm^3 approximately, of which 90% goes for irrigation, while water supply and livestock water use correspond to 7% and 3%, respectiveley. Total annual abstractions in Prespa Sub-basin from surface water bodies is estimated at 5,3 hm^3 approximately and primarily serving irrigation at a rate of 94%, while the remaining 6% serves the drinking water supply. The annual groundwater abstractions from the which reach 0,6 hm^3 are distributed to all three principal uses : 50% for irrigation, 33,3% for livestock and 16,7% for drinking water supply.

[3] *According to Decision No. 706/16.7.2010 of the National Water Commission (Official Gazette B / 1383)*

5. COMPETENT AUTHORITIES

Law 3199/2003 (Government Gazette A 280), for the Protection and Management of the Water Bodies, as amended and in force, specifies the following competent authorities for the protection and management of waters at national level :

The **National Water Commission** has been designated as the high-level inter-ministerial body and is responsible for the management and protection of water bodies at national level.

The **National Water Council**, issues opinions to the National Water Commission on national water resources protection and management programs.

The **Special Secretariat for Water**, of the Ministry of Environment, Energy and Climate Change, has the authority to prepare national programs for the protection and management of water resources and to coordinate state services and bodies on any matter related to the protection and management of water bodies.

The **Water Directorate of Western Macedonia** [4] of the Decentralized Administration of Ipiros – Western Macedonia the competent authority for the management and protection of the Prespa Lakes RB of Western Macedonia Water District according to Decision No. 706/16.07.2010 of the National Water Commission (Official Gazette B 1383/02.09.2010)[5].

In addition, the **Technical Services of Prespes Municipality**, which is characterized as mountainous, according to Law 3852/2010, Article 209, paragraph 2, as amended by Article 4 of Law 4071/2012, exercises certain powers relating to the control and management of water, either independently or in cooperation with the region.

Finally, the operation of Prespa National Park Management Body, established by Law 3044/2002, as a need and at the same time as an obligation arising from the implementation of Law 2742/1999 of the Greek Law and Directions 92 / 43 and 79/409 of the European Union, from the Greek side carries a special importance for the area.

[4] *The Government Gazette refers to Regions, the competences of which are carried out, in accordance with Article 280 of law 3852/2010, by the Decentralized Administrations, with the exception of the authorities vested by Article 186 of the Law relevant to the Regions.*
[5] *As amended by Government Gazette B 1572/28.09.10.*

6. IDENTIFICATION OF WATER BODIES

6.1 Surface Water Bodies (SWBs)

Surface waters according to the WFD fall within one of the following categories: rivers, lakes, transitional waters or coastal waters. In the Prespa Sub-basin only two (2) surface water body categories are identified: rivers and lakes.

Category of SWB	Number	Characteristic measurable quantity	Total
Rivers	4	Length (km)	22,9
Lakes	2	Surface (km²)	329,1 (81,5 Greece)

6.1.1 Rivers

In the Prespa Sub-basin, four (4) rivers are identified, falling under two (2) different types :

River Type	Type Description
NsH0	Rivers with low runoff in high altitude areas with gentle slope
NsH1	Rivers with low runoff in high altitude areas with steep slope

6.1.2 Lakes

In the Prespa Sub-basin, two (2) lakes are identified, which are classified under two (2) different types:

Lake	Lake SWB Type	Type Description
Mikri Prespa	B	Medium depth Lakes (> 6m and ≤ 15m) of polymictic type in humid areas at a medium - high elevation
Megali Prespa	C	Large, deep lakes (> 15 m) of monomictic type in humid areas

6.2 Groundwater bodies

Four (4) GWBs or subsystems are designated at the the wider region of Prespa Sub-basin. Only, one (1), the granular subsystem of Prespa (total area of 24,8 km²), is located entirely therein.

Within the Prespa sub-basin lay of 91% the karstic subsystem of Prespa Lakes – Florinas (112,3 km²), of 8,2 % the karstic subsystem Triklariou – Kastorias and of 19% the system of Varnounta – Vernon.

6.3 Heavily modified water bodies (HMWB) and Artificial water bodies (AWB)

No heavily modified (HMWB) or artificial (AWB) water bodies are identified in the Prespa Sub-basin.

6.4 Protected Areas

The water bodies included in the Register of Protected Areas of the Prespa Sub-basin Special Water Management Plan in accordance with the Water's Framework Directive Article 6 requirements, are outlined below per protected area category.

6.4.1 Areas designated for the abstraction of water intended for human consumption

Two (2) karstic groundwater subsystems (of those Prespa River Basin - Florina and Kastoria-Triklariou) are included in the Register of Protected Areas because of their vulnerability, while no surface water body is identified for human consumption.

6.4.2 Areas designated for the protection of habitats or species

All six (6) Prespa Sub-basin surface water bodies are designated for the protection of habitats or species, as they are associated to NATURA 2000 sites. These include both Sites of Community Importance (SCI) and Special Protection Areas (SPA).

Protected Area				Associated Water Bodies		
Code	Name	Area (ha)	Category	Code	Name	Category
Wetlands						
GR 1340001	PRESPA NATIONAL PARK	26613	SCI & SPA	GR0901L0A0000013N GR0901LFA0000014N	Mikri and Megali Prespa	Lake
Terrestrial areas						
GR 1340003	ORI VARNOUNTA	6076	SCI & SPA	GR0901R000001018N	Paliorema (Ag. Germanos)	River
				GR0901R000001019N	Ag. Germanos	
				GR0901R000002021N	Sirakio	
				GR0901R000001020N	Kaloneri	

Finally, it is noted that none of the Prespa Sub-basin water bodies is identified in the following protected areas categories:

- Recreational waters
- Sensitive areas in accordance with the provisions of Directive 91/271/EEC
- Vulnerable areas/zones due to Nitrates from agricultural sources.

7. ANALYSIS OF PRESSURES ON THE WATER BODIES

The evaluation of anthropogenic pressures and their impacts on the surface and ground water bodies is based on the listing of the total pressures and impacts (as a result of point and diffuse pollution sources, water abstractions, water flow regulations, morphological alterations to water bodies, etc.), in order to fully understand the most crucial management issues and mechanisms by which they influence each and every Water Basin.

Any such pressure is characterized as **important** for a certain Water Body as long as it is likely to impede achievement of the environmental quality objectives set under Article 4 of the WFD for the particular Water Body.

Urban wastewater

All Local Departments (LD) of Prespa Municipality have an urban wastewater network, apart from Psarades Community, where the wastewater is collected in individual disposal systems.

In Prespa Sub-basin, there are no settlements with a population greater than 2.000 inhabitants, consequently there is no obligation to construct Wastewater Treatment Plant (WWTP).

However two (2) WWTP have been constructed by the method of artificial wetlands with a view to serve the Local Departments of Laimou-Ag.Germanou-Plateos and Kallithea-Lefkona.

These facilities have operational problems and currently they are about to be commisioned and to be accepted by Prespa Municipality. As the hydrogeological basin of Mikri Prespa Lake is closed, the settlements' sewage through the sewerage network and streams and up into Megali and Mikri Prespa Lakes as final recipients.

Industry

In Prespa Sub-basin neither industrial nor industrial units in operation are identified.

Livestock

Livestock production is an important traditional economic activity in Prespa National Park. Involving mainly industry is the sheep and goat farming and pig/swine farming and secondarily the pig farming.

The pig farms identified in Prespa Sub-basin, cause point pollution as waste water is not suitable as fertiliser and is excluded from dispersion in the fields.

In contrast, by-products from cattle farms and free livestock other than pigs, end up in the fields to improve soil conditions or are further processed and used in various ways.

Landfill Sites – Uncontrolled Waste Dumping Sites

Wastes of Prespa Municipality, are collected and transported to the Waste Transfer Station (WTS) of Florina. There, they are transhipped and transported for final disposal at Kozani's landfill site. Wastes of Krystallopigi Community are collected and transported to the Waste Transfer Station (WTS) of Kastoria, from whrere they are also transfered to Kozani's landfill site.

Mines – Quarry

Quarries operated in the past in Prespa Sub-basin. These operations have ceased and are banned in Prespa National Park according to Joint Ministerial Decision 28651/2009 (GG D 302/23.07.2009).

Aquaculture

In Prespa Sub-basin no inland water fish farms are identified.

Agriculture

In Prespa Sub-basin, arable land covers 8% of the total area. Nitrogen loads which end up to water bodies are, approximately, 79 tonnes per year, while the phosphorus load is , approximately, 1 tonne. It is estimated that annually 13 tons of nitrogen and about 10 kg of phosphorus are percolated.

In Prespa Sub-basin the nitrogen load generating from agricultural land accounts for 50% of agricultural land while that from forest areas accounts for 41% of the total.

In order to co-evaluate the individual significant pollution sources and quantify the total impact on surface waters, intensity criteria have been determined. Taking into account total pressure intensity per surface water body sub-basin, a classification has been carried out regarding likelihood to meet the environmental quality objectives set for each particular body.

Abstraction pressures

Abstraction pressures are assessed comparing yearly abstractions volumes against total available water resources.

Failure to achieve the environmental objectives of the WFD in Prespa Sub-basin may be partly attributed to farming and to natural eutrophication processes. Other causes of failure to reach the environmental objectives seemed to be pressures from the neighboring countries.

The pressures on groundwater bodies in Prespa Lake Sub-basin are not significant, as both abstractions and pollutant loads ending up in groundwater bodies, are limited.

In Prespa Sub-basin, water exploitation index is estimated at 11%, taking into account an approximation of the environmental water needs for the ecosystem of Prespa Sub-basin.

The Management Plan concludes that:

- Anthropogenic activities in the greek part of the transboundary Prespa basin do not represents a significant pressure.
- It is important to maintain the exploitation of water resources at low levels, but also to re-evaluate the ecological water requirements on the basis of a well documented and acceptable at the European level methodology.

Other Pressures

Hydromorphological alterations, sand extraction, forest fires, etc are evaluated on the basis of qualitative assessments.

8. STATUS OF WATER BODIES

8.1 Assessment and classification of status of surface water bodies

The quality of surface waters is defined by its ecological and chemical status. Good surface water status means the status achieved by a surface water body when both its ecological status and its chemical status are at least good.

8.1.1 Surface water bodies ecological status

According to the WFD ecological status mainly concerns biological parameters, depending on the category of the water body, and secondly general physico-chemical conditions or other parameters (specific pollutants).

In the Prespa Lake Sub-basin two (2) out of six (6) surface Water Bodies are not achieving "good" status at the present. More specifically:

- All four (4) river water bodies of Prespa Sub-basin, with a total length of 22,92 Km, are not classified as to the ecological status due to lack of reliable data.
- Regarding the lake water bodies, natural lake Megali Prespa, whith a surface within Greek territory of 38,6 Km² (which corresponds to 47% of the total area of lake water bodies of the sub-basin) is classified at "**moderate ecological status**", while the natural lake Mikri Prespa, covering an area within Greek territory of 42,9 Km² (which corresponds to 53% of the total area of lake water bodies) is classified as "**poor ecological status**".

8.1.2 Surface water bodies chemical status

The criterion of classification of the chemical status of surface water bodies -in a two-class scale- is compliance with the limit values of quality objectives of certain hazardous substances in the aquatic environment, as follows:

- **"Good",** when all parameters meet the Environmental Quality Standards set out in the Common Ministerial Decree 51354/2641/E103/2010, Annex 1, Part A
- **"Failing to achieve good",** when even one of the parameters does not meet the Environmental Quality Standards set out in the Common Ministerial Decree 51354/2641/E103/2010, Annex 1, Part A.

There are two (2) surface water bodies in the Prespa Sub-basin with "good" chemical status and two (2) more that "fail to achieve good" chemical status, while the other two (2) are characterized as "unknown", due to the lack of priority substances monitoring data. Specifically:

- The chemical status of two (2) rivers, with a total length 11,97 km, corresponding to 52% of the total length of all rivers in the Prespa Sub-basin, are classified at "good" chemical status. Due to lack of data, chemical status of the other two (2) rivers is not classified.
- The chemical status of the two (2) lakes, is classified as "failing to achieve good".

The classification of ecological, chemical and total status for each surface water body is presented in the table here below.

WB category	WB code	WB name	Ecological status	Chemical Status	Total status
RW	Paliorema (Ag. Germanos)	GR0901R000001018N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Ag. Germanos	GR0901R000001019N	UNKNOWN	UNKNOWN	UNKNOWN
RW	Kaloneri	GR0901R000001020N	UNKNOWN	GOOD	UNKNOWN
RW	Sirakio	GR0901R000002021N	UNKNOWN	GOOD	UNKNOWN
LW	Megali Prespa	GR0901LFA0000014N	MODERATE	FAILING TO ACHIEVE GOOD	MODERATE
LW	Mikri Prespa	GR0901L0A0000013N	POOR	FAILING TO ACHIEVE GOOD	POOR

8.2 Assessment and classification of groundwater bodies status

The overall groundwater status is determined by its quantitative and its chemical status. "Good groundwater status" means that both its quantitative status and its chemical status are "good".

8.2.1 Groundwater bodies quantitative status

The quantitative status of a ground water body is characterized as poor when either of the following occurs:

a. over 20%, of the monitoring points have shown interannual decreasing water level

b. annual water abstraction from ground water bodies is higher than the annual recharge, resulting with a continuous increase of the pumping depth.

The quantitative status of all four (4) Prespa Sub-basin GWBs is classified as "good".

8.2.2 Groundwater bodies quality (chemical) status

Evaluation of the chemical status of a ground water body is based on the criterion of 20% and more specifically on the rule: «*if the percentage of hydropoints that exceed the maximum acceptable values is ≥20%, for the entire groundwater body, then the groundwater body has a poor chemical status*».

The qualititative (chemical) status of four (4) Prespa Sub-basin GWBs is classified as "good".

Quantitative and qualititative (chemical) status classification results are presented in the table here below, per GWB.

No	GWB Code	Name	Chemical status	Quantitative status
1	GR09AF010	GR09AF011: Sub. Triklario Kastoria	GOOD	GOOD
		GR09AF012: Prespes Florina		
		GR09AF013: Prespes		
2	GR090F300	Varnounta	GOOD	GOOD

8.3 Classification results of WBs status of the Prespa Sub-basin

The total status of the Prespa Sub-basin WBs is presented in the table below for all WB categories (rivers, lakes, transitional waters, coastal water, groundwater) in terms of number of units and percentage.

Type of WB	Status								
	Number of WBs			WB Percentage (%)			Surface / Length Percentage (%)		
	High or Good	Less than good / Poor*	Unknown	High or Good	Less than good / Poor*	Unknown	High or Good	Less than good / Poor*	Unknown
River	-	-	4	-	-	100	-	-	100
Lake	-	2	-	-	100	-	-	100	-
Groundwater	4	-	-	100	-	-	100	-	-

[*] *"Less than good" corresponds to surface WBs status that may be "moderate", "poor", or "bad", while "Poor" corresponds to GWBs.*

8.4 Monitoring Program

8.4.1 Surface Water Systems Monitoring Program

Officially established monitoring program for surface waters

The monitoring program provided in the Joint Ministerial Decision 140384/2011 includes a total of forty-five (45) monitoring sites for the surface waters of the River Basin District of Western Macedonia; seven (7) of which are located in the Prespa RB and five (5) of these are located in Prespa Sub-basin:

One (1) operational monitoring station, located in the rivers of Prespa Sub-basin, provides data for the identification of biological, hydromorphological and physico-chemical variables.

Four (4) operational monitoring stations, located in the lakes of Prespa Lake Sub-basin, provide identification of biological variables, hydromorphological, physico-chemical and various chemical variables (specific pollutants and priority substances).

Revised Monitoring program for surface waters

The Revised Monitoring Programme for surface waters was based on new information obtained under the River Basin Management Plan, i.e. new water bodies along with the analysis of anthropogenic pressures and their impact, the determination of the ecological and chemical status of surface waters and the inventory of protected areas. This programme is optimised both in terms of the monitoring sites selected, as well as the type, the parameters and frequency of monitoring.

According to the revised monitoring program of the River Basin District of Western Macedonia, one monitoring station is removed from each of the Lakes of Megali Prespa and Mikri Prespa, while two (2) more stations are relocated to obtain a more characteristic recording of the parameters. The station in the stream of Agios Germanos remains.

8.4.2 Monitoring of groundwaters

Officially established monitoring program for groundwaters

The monitoring programme of the Joint Ministerial Decision 140384/2011 includes eighty-eight (88) sites for the GWBs of the RBD of Western Macedonia; forty-four (44) for surveillance and forty-four (44) for operational monitoring, for groundwaters.

Regarding Prespa Sub-basin, the current national monitoring programme is limited to only two (2) points.

Revised Monitoring program for groundwaters

The revised Monitoring programme for groundwater bodies is prepared on the basis of the officially established monitoring programme as well as additional data elaborated under the RBMP including, specifically, the characterization of GWBs, the analysis of anthropogenic pressures and their impacts, the inventory of protected areas and the GWBs status classification.

The revised monitoring programme of the RBD of Western Macedonia provides for three (3) monitoring points, in addition to the existing 2 (two) points, in order to ensure monitoring of both the qualitative and the quantitative status of groundwater water bodies to be monitored at five (5) points .

9. ECONOMIC ANALYSIS OF WATER USES

Article 9 §1 of the Directive 2000/60/EC states that Member states "shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis [...]". For the estimation of cost recovery ratio, water services, users and polluters of the water resources in the respective water basins of the Water District was defined. Thereof, the total cost of water services as well as the cost recovery ratio was calculated.

Firstly, the financial cost, which includes expenditures on the procurement and management of water services (operating costs, maintenance costs, administrative expenses, depreciation, and other direct costs), was estimated. The environmental cost was also quantified, representing the valuation in monetary units of the environmental impacts on water resources and related ecosystems, caused by various socio-economic activities. Finally, the resource cost, which refers to the foregone benefits that are due either to the inefficient allocation of water resources or the excessive use of water resources, i.e. water withdrawals greater than the renewable water reserves, was also estimated. Consequently, the resource cost equals to the foregone benefits of the service that is deprived of the use of the particular natural resource, while under conditions of effective allocation this would have not have occureed.

The general formula used for calculating the cost recovery rate of water services has the form: CRR = [(TR – Subsidy)/ TC]*100%, where CRR is the Cost Recovery Rate, TR the total revenues (in €/year), Subsidy the total amount of subsidies paid to the water service, and TC the economic costs (in €/year) of the water service provided.

The financial cost recovery was analyzed and then the overall cost-recovery was estimated taking into consideration the environmental and resource cost. The analyses were conducted at the level of water uses and services, in order to facilitate the application of the "polluter-pays" principle.

The cost recovery for public water supply and sewerage has been estimated as follows:

Water supply & wastewater services: Cost categories	Cost of Service & Cost Recovery Ratio
Financial Cost (million €)	81
Environmental Cost(million €)	0
Resource Cost (million €)	0
Total Cost (million €)	81
Cost Recovery Ratio	75%

The cost recovery for agriculture has been estimated as follows:

Organized agriculture: Cost categories	Cost of Service & Cost Recovery Ratio
Financial Cost (million €)	212
Environmental Cost(million €)	25
Resource Cost (million €)	0
Total Cost (million €)	237
Cost Recovery Ratio	67%

In the process of evaluation of the pricing policy efficiency in terms of attaining cost recovery and ensuring rational utilization of water resources, the recovery ratio appears quite low, in certain cases, particularly as regards irrigation services, not only in Prespa Sub-basin but even more so at the River Basin District level, where the cost recovery ratio of organized irrigation is as low as 56%.

The findings show that water pricing under the current circumstances should follow the following principles:

- Prioritisation concerning cost recovery per water service
- Water pricing based on increasing block rates per capita
- Prices should reflect external costs
- Seasonal price differentiation
- Full recovery of financial cost

The economic analysis identified data collection issues and data gaps issues. The economic analysis conclusions produced specific measures.

10. ENVIRONMENTAL OBJECTIVES – EXEMPTIONS

Article 4 paragraphs 4.4, 4.5, 4.6 and 4.7 of the WFD, provides a list of possible exemptions from the environmental objectives and a description of the terms and procedures for their application. Exemptions fall under the following cases:

- Article 4.4: Deadline extension
- Article 4.5: Less strict environmental objective
- Article 4.6: Temporary deterioration in status
- Article 4.7: New Modifications – Sustainable human development activities

The status of Mikri Prespa and Megali Prespa in combination with the pressures, that have their origin in both the national and the transboundary part of the basin, lead to the conclusion that "the scale of improvements required can only be achieved in phases exceeding the timescale" meaning that there are grounds for "exception" according to Article 4, paragraph 4a (deadline extension) of the Water Directive.

Application of the methodology set out for the documentation of the exemptions, showed the appropriate time extension depending on the nature of the problem and what measures should be taken to achieve the environmental objectives for each water body subject to the scope of Article 4, paragraph 4, as shown in the table here below.

Article 4, paragraph 4.4
Surface water bodies

	WB Name / WB code	WB Category	Ecological Status	Chemical Status	Exemption justification	Supplementary Measures	
1	MIKRI PRESPA / GR0901L0A0000013N	Lake	Poor	Failing to achieve good	Technical feasibility	SM03-010 SM06-010 SM08-010 SM15-010 SM15-020 SM15-030	SM16-040 SM16-050 SM17-010 SM17-060 SM17-070
2	MEGALI PRESPA / GR0901LFA0000014N	Lake	Moderate	Failing to achieve good	Technical feasibility	SM03-010 SM15-010 SM15-020 SM15-030	SM06-010 SM16-040 SM16-050 SM17-010

In conclusion, the date for achieving environmental objectives is 2015 for eight (8) water bodies of Prespa Sub-basin, and the year 2021 for two (2) of them, or as soon as possible after the completion of this year, when natural conditions permit.

No cases of new modifications or new activities were identified in the Prespa Sub-basin that would cause application of Article 4, paragraph 7 of Directive 2000/60/EC.

Eventual future modifications and activities not examined regarding compatibility to the WFD shall be examined during the process of environmental permit issuing.

In conclusion, the environmental objective is achievement of good status in the year 2015, for eight (8) water bodies (WBs) of the Prespa Sub-basin, while two (2) WBs are subject to exemptions. The WBs to achieve the environmental objectives by 2015 include WBs with unknown status, due to lack of data. Results of the Monitoring Program of the period 2012-2015 are expected to allow for classification of their status.

In total the number of WBs that will achieve the environmental objectives by 2015 or are included in the exemptions, per WB category are as follows:

	Environmental objectives		
	Achievement by 2015	Exemption	
WB category		Article 4, Paragraph 4	Article 4, Paragraph 7
rivers	4	0	0
lakes	0	2	0
groundwater	4	0	0

In the following table exemptions of WBs in the Prespa Sub-basin and relevant justification per water body are presented.

Type of Exemption	% percentage of WBs total length	Justification	% percentage of WBs of each justification	Comments
Article 4.4	100%	1) Technical infeasibility 2) disproportionate cost 3) natural conditions	1) 100% 2) 0% 3) 0%	
Article 4.5	0%	1) Technical infeasibility 2) disproportionate cost	1) - 2) -	
Article 4.6	0%	1) natural causes (floods, droughts) 2) unforessen circumstances 3) accidents	1) - 2) - 3) -	
Article 4.7	3%	1) new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater 2) New sustainable human development activities	1) - 2) -	

11. PROGRAM OF MEASURES

The program of measures is the key element of the River Basin Management Plan for the achievement of the 2000/60/EC Directive objectives. Measures are divided into basic and supplementary:

- **Basic measures** result from the implementation of national and European legislation on water protection, including 2000/60/EC Directive and the overall environmental policy.
- **Supplementary measures** include measures designed and implemented in addition to the basic measures in specific Water Bodies which, even after the implementation of the basic measures, are likely to fail to achieve the environmental objectives.

It should be noted that all of the Basic Measures listed in the "Management Plan River Basin Water District of Western Macedonia", apply on the entire Water District, including the Prespa Sub-basin as long as these are applicable based on the Sub-basin's characteristics and the activities taking place in it.

For Prespa Sub-basin eleven (11) Complementary Measures are finally proposed to be implemented of which six (6) are horizontal complementary measures applied throughout WD 09.

The Basic Measures of the Prespa Sub-basin Programme of Measures, are presented in the following table:

Measure code	Measure Title	Description
MEASURES TO IMPLEMENT THE COST RECOVERY PRINCIPLE (ARTICLE 9)		
0M01-01	Customization of pricing policy in a flexible and efficient way in order to serve as primary target the environmental sustainability and avoid water wastage.	Formulation of a common pricing policy for refined water for domestic use in order to curb wasting water and gradually recover the cost of water, taking into account social and environmental parameters.
MEASURES TO PROMOTE AN EFFICIENT AND SUSTAINABLE WATER USE (ARTICLE 4)		
0M02-01	Actions to enhance the operation of water supply networks of large agglomerations of the RBD. Leakage control.	The control of leakages in the water supply networks aims at detecting leaks and preventing great losses of water. It is supported by the OPESD, in the framework of the Priority Axis 2 "Water Resources Protection and Management", within the Invitation 2.6 "Leakages Minimization projects in problematic urban water supply networks", with a budget of 60 million Euros and a time horizon for project implementation until 2015. Leakages of any type due to defective connections or damages on pipelines, illegal connections, measurement errors, due to defective water meters or merely the absence of water meters, contribute to a non-pricing of water, which the Municipal Enterprises for Water Supply and Sewerage have estimated to be between 5 % and 45%. Methods for the detection of water losses in water distribution networks should be implemented under the responsibility of the Municipal Enterprises for Water Supply and Sewerage on an on-going basis. The detection should be followed by the repair and restore of the proper operation. The installation of water meters and/or replacement of the defective ones should be promoted. Projects involving such actions have already been integrated in the OPESD. However, such actions must be generalized as a priority in all Municipal Enterprises for Water Supply and Sewerage, where losses in the water distribution network of more than 50%

Measure code	Measure Title	Description
		occur. Indicatively, such projects for the Municipalities of Ptolemaida are integrated in the OPESD and should be promoted with responsibility of the competent authorities. In order to extend such actions to other Municipal Enterprises for Water Supply and Sewerage, initially the losses on networks should be recorded by the respective Municipal Enterprises under the supervision of the Direction of Water and the area priorities should be set, so that similar projects can be launched within the next programming period.
0M02-02	Introduction of institutional framework and program of measures for water saving in households.	The potential for water saving at residences has been investigated in the framework of the project "Technical Support to the General Secretariat for Water for the preparation of a Programme of Measures and of the Institutional framework for Residential Water savings", funded by the OPESD. The implementation of residential water saving programs leads to the promotion of new technologies for water reuse and conservation. The relevant study, which has been completed, indicated that simple interventions in the household equipment can achieve important water savings (at least 30% in individual households and around 10% in total). The Ministry of Environment, Energy and Climate Change, through the General Secretariat for Water, started at April of 2014 examining the development of an Institutional Framework and Program of Measures for residential water savings. The measures promoted are of institutional, regulatory, financial and demonstrating character. The New Building Code foresees already the installation of water saving equipment (which will be specified by decisions of the Minister of Environment, Energy and Climate Change) in new residences.
0M02-03	Projects for the rehabilitation / enhancement of existing water supply networks.	The measure refers to the restoration of old damaged water pipes and to the reinforcement of external water supply reservoirs in order to cover increased water supply demand. These projects, aiming at the effective covering of the increasing water needs in agglomerations and municipalities, are priority projects for the implementation of the Directive.
0M02-04	Enhancing actions to contain leakages to the collective irrigation networks	It is necessary to: (1) optimize the irrigation programme through the cooperation of the Local Land Reclamation Organization with the farmers, so that the irrigation during the hours of the day with a very high temperature is avoided. If it is necessary, it is also suggested to update the irrigation programmes after recommendation of the Regional Authority and in collaboration with the supervising department of the Local Land Reclamation Organization. It is noted that the Local Land Reclamation Organizations are already obliged by the existing legislative framework to develop timeschedules and irrigation programme. (2) The water transfer infrastructure should be maintained at a high standard, under the care of the Regional Authority
0M02-05	Reorganization / rationalization of the institutional framework for the operation of management authorities of collective irrigation systems.	The framework for the operation of the Land Reclamation Organisations was enacted in 1958 and since then has been amended / supplemented by a series of acts. The measure refers to the formulation of proposals and institutional changes associated with the upgrade of operation and the clarification of the institutional framework of the Local Land Reclamation Organisations / General Land Reclamation Organisations, so that they are adapted to the current administrative structure of the State and that the irrigation water management is substantially improved. In this framework, the creation of a special group with representatives of all involved authorities is deemed necessary in order to propose the required institutional and regulatory modifications for the modernization of LLRO /GLRO operation.

Measure code	Measure Title	Description
0M02 -06	Enhancing efficient methods of crops irrigation and increasing the crops that are receptive to these methods	The measure aims to the expansion of efficient methods of irrigation, which reduce the volume of irrigation water required. Such method is the micro-irrigation, which applies in tree crops and other receptive crops.
0M02- 07	Compilation of technical specifications manual for the implementation of water reuse methods.	Drafting of a Technical Specifications Manual for the implementation of the reuse methods foreseen in the Common Ministerial Decision 145116/2.3.2011 (OJ 354B) where the following will be indicatively determined: A) The description of the potential reuse methods, in which cases the implementation of each method is recommended, the minimum implementation requirements for each method, as well as the proper and effective Implementation practices. B) The reuse study and application procedures, i.e. the successive approach stages (expression of intent - preliminary study, Environmental Impact Assessment Study, Consultation of interested Parties, Technical implementation study, Licensing, Pilot implementation, implementation), as well as the specification of responsibilities of the stakeholders.
0M02-08	Compilation of the water supply Masterplans from Municipal Water and Sewage Companies (DEYA).	Preparation of general water supply plans, which will identify water resources required to cover the medium and long term demand, will adopt the appropriate protection measures and will design the appropriate external aqueducts at a preliminary level. It is suggested that these Masterplans be developed by the Municipal Enterprises for Water Supply and Sewerage being the competent authorities. These plans should be in accordance with the provisions of the RBMPs as regards status of Water Bodies and programs of measures and should have the consent of the competent Directorate of Water.
MEASURES FOR DRINKING WATER (ARTICLE 7)		
0M03-01	Protection of abstraction projects for drinking water from surface water bodies.	Designation of a protection area around the surface water bodies that are being used for water supply, where no Water Safety Plan is being applied. These areas will be designated by the conduction of special studies. Until those studies are finished, in case of a permission request regarding either new projects and/or activities in the River Basin of the particular WB or the discharge of their wastewater in the RB, the Competent Authorities that are responsible for the environmental permitting should consider the impact of the abovementioned activities on the quality of the surface water, aiming at the preservation of the quality on the current levels. For the WBs that are designated for abstraction of drinking water, during the environmental permission of the projects regarding the utilization of the water resources, the developer of the project should deliver to the competent authorities the following: • Detailed plan of the areas designated for the protection of water, • Regulatory framework of the abovementioned designation and of the permitted activities
0M03-02	Designation of protection zones of works for the abstraction of drinking water.	In the drinking water abstraction infrastructure (drillings, springs, wells), and until the completion of the specific hydrogeological studies, temporary protection zones of water abstraction points are defined as follows: ❖ Zone of absolute protection I: 10-20 m around the abstraction site. ❖ Zone of controlled protection II: defined depending on the type of aquifer as follows: • Karstic systems: 1000 m upstream and both sides (recharge area) and 500m downstream of water abstraction site. • Fractured systems: 500 m upstream and on both sides (recharge area) and 300m downstream of water abstraction site.

Measure code	Measure Title	Description
		• Granular unconfined systems: perimeter with radius of 500m • Granular confined or semi-confined aquifers: perimeter with radius of 500m For the karstic and fractured systems in case no data is available regarding the piezometric level or the recharge area, a protection zone with radius equal to the abovementioned upstream distance is implemented. ❖ Zone of protection III: It refers to the recharge basin of the abstraction site and can be determined only by the aforementioned hydrogeological study. Activities in principle prohibited by zone: ❖ Protection zone I (absolute protection): The zone, which protects the immediate environment of the abstraction from pollution, is characterized as zone of full ban. Within this zone, all activities are prohibited, with the exception of the necessary works for the operation and maintenance of the water abstraction works. ❖ Protection zone II (controlled): This zone protects the drinking water mainly from the microbiological pollution (50-day zone) and from the pollution cause by human activities or works that are dangerous due to their proximity with the abstraction site. Within this zone, all activities with high polluting risk, such as (indicatively) intensive agricultural activities using pesticides – agrochemicals, livestock facilities, industrial – handicraft facilities, facilities for treatment or transfer of wastewater or solid waste, garages, quarrying and mining activities, cemeteries, and generally any relevant activity that can be a potential pollution source equal or greater than the aforementioned, are prohibited. ❖ Protection zone III (supervised): It surrounds the zones I and II and develops throughout the recharge basin that feeds the underground aquifer from which the abstraction is supplied. In Zone III the existing legislation on water protection applies. The specifications for the aforementioned hydrogeological studies will be determined by the competent authorities, under the coordination of the General Secretariat for Water.
0M03-03	Delineation of protection zones for groundwater abstraction (springs, boreholes) for drinking water abstractions > 1.000.000m^3 per year.	Detailed delineation of protection zones of groundwater abstraction points (springs, drillings) for drinking water abstractions> 1.000.000 m^3 per year. The elaboration of special hydrogeological studies, after the completion of which the detailed delineation will be feasible, is a prerequisite.
0M03-04	Protection of GWBs included in the register of protected areas as drinking water areas and issuing/amendment of the legal framework for their protection.	First, for the installation of new activities the prohibitions of the protection zone II of groundwater abstraction points for drinking with the exception of cemeteries, garages and parkings, and quarrying activities, are implemented. The installation of new activities may be permitted in specific locations after the submission of the hydrogeological study or report, depending on the size and category of the activity and after the positive decision issued by the competent Water Direction. Determination of the legislative protection framework, where the measures for the protection of the groundwater systems included in the register of protected areas will be adopted in detail.

Measure code	Measure Title	Description
0M03-05	Implementation of Water Safety Plans in Large Municipal Water and Sewage Companies (DEYA).	The Water Safety Plans are a holistic approach related to the qualitative management of water from the water source to the distribution, adopting the principle of multiple barriers and focusing on the need for implementation of control measures in all links of the water supply chain. The Specifications for the implementation of the Water Safety Plans were developed in the framework of the project "Technical Support to the General Secretariat for Water of the Ministry of Environment, Energy and Climate Change for the recording of the problems for the implementation of the Directive 98/83/EC on the quality of drinking water in Greece and investigation of possibilities for the adoption of Water Safety Plans", which was funded by the Operational Programme "Environment and Sustainable Development" (OPESD) and completed by 2011. It is proposed to implement the Water Safety Plans in big Municipal Enterprises for Water Supply and Sewerage, such as these of Thessaloniki, Kilkis, Thermis, Thermaikou and Pellas, aiming at safeguarding public health and adopting and implementing good practices in the drinking water supply network, through the minimization of pollutants in the drinking water and especially at its source, the right water treatment and distribution to water supply networks regardless the size of these networks.
MEASURES TO CONTROL SURFACE AND GROUNDWATER ABSTRACTIONS		
0M04-01	Monitoring surface water bodies abstractions	This measure refers to abstractions greater than 10 m^3 per day and includes the installation or modernization of existing recording equipment (water meters, water level loggers, etc.) at surface water abstraction projects. The associated necessary equipment will be determined upon issuing of a new water use license or renewal of an existing one and the relevant cost will be covered by the individual or entity that performs the abstraction of water; it is possible to provide suitable incentives for the implementation of this measure. The person or entity responsible shall be obliged to declare the start of operation of the metering equipment to the relevant Water Directorate. The measurements of the quantities of water abstracted annually will be communicated to the Water Directorate during the first ten days of November of each year.
0M04-02	Designation of Criteria for the determination of the total abstraction quantities per Water Body	This measure is aimed at investigating the possibility of establishing a methodology and criteria for determining environmental flows downstream of major water projects based on the results of the National Monitoring Network on the status of surface water bodies in the country and having as goal the development of specific standards.
0M04-03	Update of the Decision F16/6631/1989 which specifies the minimum and maximum of quantities of irrigation water.	The Ministerial Decision Φ16/6631/1989 defined minimum and maximum necessary quantities for rational use of irrigation water, per category of crop and per River Basin District. These limits were calculated on a monthly basis for the period April - September and can also be applied cumulatively. The calculation of the necessary quantities was done by means of the Blaney – Griddle method. The update of the abovementioned Ministerial Decision is proposed, taking into account meteorological data from 1989 onwards, as well as the provisions of the River Basin Management Plans.
0M04-04	Review of the legal framework for licensing water uses and execution of water resources exploitation projects.	The provisions of JMD 43504/2005 (Government Gazette No. 1784 B') and other relevant regulations should be revised in order to, among other things, (a) examine the compatibility of any water development project with the provisions of the River Basin Management Plan at an early stage for the timely information of stakeholders, and (b) to investigate the licensing procedure of water use for geothermal purposes

Measure code	Measure Title	Description
0M04-05	Creation of a data base for all water abstractions through the process of licensing water uses.	This measure refers to the unification of the basic information collected by the Water Directorates when issuing water use licenses, mainly in relation to the location of the abstraction, the quantities abstracted and the water body affected, as well as information on the accountable person or persons, so that a rationalization of controls required for compliance with the terms and conditions of each license may be achieved. The information which should be included in the registry will be determined by SSW in cooperation with the Water Directorates. The registry will be available to the regional authorities so as to facilitate the necessary checks provided for such projects.
0M04-06	Installation of monitoring systems to record groundwater bodies abstractions.	This measure requires the gradual installation of water meters in all forms of groundwater abstraction (boreholes, wells or spring water diversions) from which a volume of water equal to or greater than 10m^3 per day is abstracted, for the monitoring and control of groundwater abstractions. This measure refers to all individuals and legal entities responsible for the operation of abstraction (e.g. Municipal Water and Sewerage Companies, Municipalities, Irrigation Boards, individuals). The cost of the necessary associated equipment will be covered by the abovementioned persons or entities, while it is possible to provide incentives for the implementation of the measure. The persons or entities responsible shall be obliged to declare the start of operation of the metering equipment to the relevant Water Directorate while large users (Municipal Water and Sewerage Companies, municipalities, industries, collective irrigation networks) are obliged to report to the Water Directorate the measurement data on the quantities annually abstracted within the first ten days of November of each year.
0M04-07	Prohibition of projects for the exploitation of groundwater bodies (boreholes , wells , etc) for new water uses and the expansion of existing water use permits : • In areas with GWB in bad quantitative status • Within areas of collective irrigation systems • Within the protection zones (I and II) for the abstraction of drinking water.	In GWBs which have been determined to be in poor quantitative status, within areas serviced by collective irrigation networks and within the protection zones of drinking water abstraction points, new drilling should be forbidden in order to avoid further deterioration of their status and to protect these GWBs. This rule excludes special cases with priority to drinking water use projects and projects which can lead to a measurable decrease of abstraction from GWBs. Such projects will be reviewed and approved by the competent Water Directorate after submission of a documented hydrogeological desk study for abstractions less than 10 m^3/day or a full hydrogeological study for abstractions greater than 10 m^3/day. The technical specifications for the aforementioned hydrogeological studies will be determined by the competent authorities under the coordination of SSW. Within areas of collective irrigation networks, new borehole licenses may be granted to reinforce the collective irrigation network towards greenhouse water supply, protection against frost and other uses excluding irrigation.
0M04-08	Protection of the Surface Water Bodies from the direct and indirect abstractions via the correlated Ground Water Bodies	This measure refers to inland surface Water Bodies, rivers and lakes. **I.** New direct extraction and utilization of surface water from lakes and rivers is allowed under the following precincts: **i.** For river water bodies the maintenance of the minimum required downstream flow for the protection of the environment and for the guarantee of the needs of the downstream water uses will be examined, during the authorization process. **ii.**Drafting an abstraction program for the average hydrological year and a program for reduced abstractions in case of a prolonged drought to meet a) the minimum water level for the lakes and b) the minimum flow for the rivers. **iii.** In case of abstraction for irrigation, this serves collective networks and / or groups of producers Lakes Volvi and Koronia are excluded because no new direct

Measure code	Measure Title	Description
		abstractions are allowed. **II.** For abstractions from GWBs: • with association between the water level of the aquifer and the water level of SWBs and • where no other measures of the RBMP are applied, the hydraulic relation and the maximum possible abstraction of groundwater should be established by a special study (hydaulic-hydrological and hydrogeological). The Directorate of Water defines the areas for which these studies will be elaborated in priority, taking into account the RBMPs, new data from the monitoring network, other relevant studies and research, as well as the number of petitions for new abstraction works permitions. Until the completion of the above mentioned studies: - A special zone of 250 m from the shoreline is determined in which new boreholes are not permitted. - At the stage of the environmental licensing for new lake HMWBs /AWBs or for new abstractions from existing HMWBs /AWBs the above mentioned provisions should be met and especially in the case of par II here above the relevant special studies should be submitted by the concerned party. - for existing lake HMWBs /AWBs relevant provisions included in the approved environmental terms are maintained. Where rules of protection areas (as per Law 3937/2011) apply, the stricter rules are imposed. For the purposes of this measure, in areas that the coastline has not been determined, the limit of the coastline will be defined by the competent Water Directorate based on the available data regarding maximum water level of the lake. This measure aims at protecting the SWBs from impairment of water resources through direct abstractions or through abstractions from a related GWB.
MEASURES TO CONTROL THE ARTIFICIAL RECHARGE OF GROUNDWATER BODIES		
0M05-01	Investigation of conditions for implementing artificial recharge in groundwater bodies, as a mean of quantitative enhancement and qualitative protection of GWBs.	The artificial recharge of groundwater aquifers is an essential tool for addressing the quantitative reduction or qualitative degradation of GWBs which is caused by the various pressures on groundwater such as over-pumping, contamination, etc. This is an environmental action taking advantage of natural underground reservoirs, formed in the subsoil, for storing good quality water during the winter period to be available for use during the summer period of increasing demands. The implementation of artificial recharge aims to enhance the quantitative and qualitative upgrading of GWBs. The measure is also important due to its contribution to the mitigation and gradual repelling of the seawater intrusion front in coastal aquifers. The effectiveness of artificial recharge is determined by several factors such as the determination of the storage capacity of aquifers, the water availability in sufficient quantity for the needs of the application and in the desired quality compatible or better than the quality of the recharged GWB. The artificial recharge procedures described are based on the exploitation of good quality surface water and are not related to artificial recharge foreseen by the JMD 145116/8.3.2011 (Government Gazette No. 354 B'). For the implementation of artificial recharge applications it will be necessary to conduct a specific hydrogeological study which will investigate the depth of the aquifer, the presence or absence of superimposed strata, the hydraulic conductivity and the depth of enrichment. This study will incorporate the detailed design of the recharge program, the appropriate method and the best implementation procedures. Technical specifications for these Hydrogeological Studies of artificial recharge will be determined by the Special Secretariat for Water (SSW).

Measure code	Measure Title	Description
0M05-02	Creation of a data base for wastewater application for irrigation purposes or for artificial recharge of groundwaters (FEK354/B/08.03.2011).	Under the current institutional framework for the reuse of treated wastewater either through irrigation or through artificial recharge, the Water Directorate of the Decentralized Administration decides after the submission of the design study. The measure regards the creation of a registry of disposal areas, that will include the details of the body responsible for the construction of the project, the basic technical specifications, the Water Body affected as well as any additional monitoring measure and any data collected from monitoring that was possibly asked during the permitting procedure and was delivered to the Water Directorate. The determination of the information that should be included in the register will be determined from the Special Secretariat for Water in collaboration with the Water Directorates. The register will be available to the competent audit authorities of the Regional Unit in order to facilitate the programmed necessary audits of these projects.
MEASURES FOR POINT SOURCE POLLUTION		
0M06-01	Establishment of terms and conditions for the connection of industries to sewerage networks / reception of industrial waste in WWTP	The management bodies of the sewerage networks and WWTP will have to issue sewerage networks operation rules or revise the existing ones in order to define the conditions for connection of industries to sewerage networks and/or terms for the reception of industrial wastes in WWTP. For the issuance of such regulations the opinion of the Water Directorate is required. The operating rules will be communicated to the Water Directorate, to the Special Secretariat for Water as well as to the competent for the relevant controls authorities of the Region.
0M06-02	Issuing/Amendment of the legal framework for licensing of transport sewage trucks.	There is a need to adopt an integrated legal framework that will govern the licensing of tanks that transport sewage, as the existing legal framework, does not require licensing for the work of collection and transportation of urban waste. According to an earlier decision of the Ministry of Infrastructure, Transport and Networks, the licensing of tanks that transport sewage only required the issuance of a vehicle registration document, which only determines traffic issues. Severe problems arise from unmonitored management and uncontrollable disposal of urban waste transferred by the tanks to protected areas, biotopes, water bodies, surface water drains or sewers, landfills, fields etc. due to lack of a control mechanism . The measure involves the Instruction of a regulatory framework for the licensing of tanks transporting sewage that will define special measures for the positioning and control of the tanks. Indicatively: electronic monitoring for each tank, a register of licensed tanks, provision for crosschecking with industries in the area, provision for the expansion of the inspectors' network (defining the competent monitoring services and imposing strict penalties for environmental violations, (e.g. immediate collectable fines and escalation of the above with license withdraw and vehicle seizure), involvement municipalities, confirmation of the disposal of transported waste to a WWTP.
0M06-03	Promoting the design of central treatment units for agricultural and animal waste	Originally the preparation of techno-economic studies and studies of scope per Regional Unit are recommended in order to investigate the sustainability for agricultural and animal waste as well as their preliminary location so as to allow launching of their construction.
0M06-04	Creation of a data base of pollution sources (emissions, discharges and leaks).	According to the first paragraph of Article 5 of «List of emissions, discharges and leaks» of the CMD 51354/2641/E103 (GG 1909B/8.12.2010)« The Water Divisions of the Regions, based on information collected in accordance with Articles 5 and 11 of PD 51/2007, Regulation (EC) No 166/2006 and other available data, compile for each Water District or part of that District within their administrative boundaries, an List of emissions, discharges and leaks for all priority substances and pollutants

Measure code	Measure Title	Description
		listed in Part A of Annex I of this Decision, including their concentrations in sediment and biota, as appropriate.» In particular, in the context of developing a list of emissions, discharges and leaks setting up a register of pollution sources is proposed. This will include: a) registration of installations, activities and uses constituting sources of release for priority substances and specific pollutants in order to set up the relevant register, b) the description of the waste that is discharged regularly from specific sources accompanied by the chemical analysis of that waste, c)issuing circulars and other information actions for the staff of the competent departments for licensing and control d) updating the relevant licenses to various facilities. The register will include the list of emissions, discharges and leaks for all priority substances and pollutants set out in Appendix I to CMD 51354/2641/E103/2010 in accordance with the provisions of Article 5 of the CMD. The register records the potential sources of pollution and forms the basis for an action plan to reduce the above mentioned substances if the increased concentrations of certain substances are due to anthropogenic causes or natural processes it should be investigated in the context of that measure. In addition, the register will assist the licensing authorities with locating all the bound plants and to proceed with the modification of the environmental licenses, where necessary and other relevant requirements deriving from the legislation.
0M06-05	Establishment of criteria for licensing new / expansion of existing aquaculture units.	During the licensing process of new or the expansion of existing aquaculture units in water bodies whose status is characterized as bad, it must be demonstrated that in the immediate area of the units' installation, the status of the water bodies is good according to the Directive 2000/60/EC. The classification of the water bodies' status as bad is presumed by the Water Management Plans and the results of the National Monitoring Program of JMD 140384 (GG 2017/B/9.92011), which is in progress.
0M06-06	Specification of the process to control and designate zones for aquacultures in inland waters.	This measure refers to establishing special specifications and issuing a regulatory act for the designation of zones for the development of inland waters aquaculture, implementation of operation checks (frequency, intensity, infrastructure, waste), imposition of sanctions and fines in case of environmental conditions violations and / or illegal operation. The co-operation of the Special Secretariat for Water with the competent authorities of the Ministry of Rural Development and Food is required as well as with the competent authorities for environmental licensing.
0M06-07	Amendment of national legislation on urban and industrial waste water management.	The Ministerial Decision E1b/221/1965 on the management of urban and industrial waste waters and its subsequent amendments was and still is even today, the basic institutional framework that governs the disposal of urban sewage and industrial and municipal waste waters. The Ministerial Decision E1b/221/1965 was characterized as an innovative institutional framework at its time, which, however, does not cover for the modern environmental policy. The relevant provisions of Articles 2, 7, 8, 12 and 14 of the Health Act No E1b/221/1965 (GG B'138) as amended, have already been repealed, while Article 59 of the Greek Law 4042/2012 describes its universal abolition, which however brings forward poses ambiguity on an eventual legal loophole. After evaluation of the above mentioned requires the establishment of a modern legal framework for the management of urban and industrial waste water is proposed.

Measure code	Measure Title	Description
0M06-08	Development of a legal framework / guidelines for monitoring water quality in aquaculture units.	In the context of environmental licensing according to the Greek law 1650/86 as amended and in force with the Greek law .3010/2002 as well as protection and management of water bodies in accordance with the Greek law 3199/2003 and Presidential Decree 51/2007 the systematic monitoring of water quality in aquaculture units is provided for. The competent authorities for issuing environmental terms and water use licenses usually apply the CMD No. 46399/1352/27-6-1986 '' Quality required of surface water that are intended for : «drinking water», «bathing», «fish life in freshwater» and « shellfish waters », measuring methods, sampling frequency and analysis of surface water intended for drinking water, in compliance with the instructions of the Council of the European Communities 75/440/EEC, 76/160/EEC, 78/659/EEC, 79/923/EEC and 79/869/EEC" even though it does not relate with the fish life in the sea. It has also been observed that the decisions issued do not include unified terms as to monitoring the parameters for all the units. In this context it is proposed to issue unified guidelines defining the parameters of water and sediment that should be monitored at regular time intervals in aquaculture units of coastal and inland waters in order to protect and maintain the status of the water bodies.
MEASURES FOR DIFFUSE SOURCE POLLUTION		
0M07-01	Gradual, selective conversion of conventional crops to organic	Encouragement and support (Technical & Scientific) of producers that implement conventional cultivation techniques towards conversion of crops to organic, primarily in vulnerable areas of the Directive 91/676/EEC.
0M07-02	Modernization of the institutional framework for sludge management from waste water treatment plants with emphasis on expanding the scope of its applications and review the quality characteristics of the applied sludge.	The agricultural reuse of sludge is subject to the provisions of Directive 86/278/EK which has been incorporated to the National Law with the CMD 80568/4225/91 and amended by the CMD 114218/97 (GG-1016/B/17-11-97). The Public Consultation being completed in January 2012, the Draft Common Ministerial Decision entitled «Measures, conditions and procedures for the use of sludge which derives from domestic and urban sewage treatment as well as some wastewater, in compliance with the provisions of Council Directive 86/278/EEC of the European Communities » has been drafted thereafter. This Draft modernizes and expands the scope of CMD 80568/4225/91 and aims to maximize utilization of sludge and specifically to increase the potential applications of sludge in the form of soil enhancer in agriculture, forestry, urban and suburban green sites and landscape planning. Adoption of a modern institutional framework that will promote viability in the management of sludge and reduce the amount disposed in landfills is recommended.
0M07-03	Development of specialized tools for the sustainable use of fertilizers and water.	Development of specialized tools for the determination of fertilizer treatment, in the pattern of the program «Recording of nutrients, heavy metals and Hydrodynamic Properties of Soils for the rational use of fertilizers and water and Production of Safe Products» of the Region of Central Macedonia to be applied to the nutrient- zones under Directive 91/676/EEC.
MEASURES TO DEAL WITH THE NEGATIVE IMPACT ON THE STATUS OF SURFACE WATER BODIES FROM HYDROMORPHOLOGICAL ALTERATIONS		
0M08-01	Determination of selected areas for taking materials for the needs of construction projects.	The proposed measure aims to deal in a rational and environmentally friendly way with one of the main problems of arbitrary uses and interventions in streams across the country in order to deal with the hydro morphological pressures these undergo. Preparation of a specialized assessment study per river water basin is recommended, with main objects that include: A) Determination of sediment concentration areas along the broad riverbed of streams. B) Assessment of the available quantities per region

Measure code	Measure Title	Description
		C) Ecological assessment per region focusing on natural habitat types (structure, status of preservation) on the flora (herbaceous, shrubby and arborescent emphasizing on the arborescent in a good preservation status) and on habitats of fauna species. D) Classification of the areas according to the concentration of materials and potential for abstractions, taking into consideration all of the above mentioned. The assessment is to be carried out under the responsibility of the Water Division for each River Water Basin and it should be assessed whether it subjects to the need of a Strategic Environmental Impact Assessment The objective of the measure is to manage the sediment transport and regulate the extraction of materials from the riverbed in such a way as to preserve the sustainable management of this resource and to ensure maximum protection of ecosystems developed in the relevant water bodies as well as the protection of the coastline from erosion.
0M08-02	Designation of the minimum water level for lakes	Preparation of a study is proposed for all lakes (natural, heavily modified and artificial) included in the River Basin Management Plans as water bodies, in order to designate the minimum water level is recommended. For this assessment, the following should be taken into account : • The need for periodic alterations of the drainage and flooding zone essential for the life of aquatic organisms, the riparian vegetation and dependent fauna. • Requirements for water storage, intended for human use (taking into account the possibility of safety reserves for use during drought) • Ensuring the desired uses in the riparian zone to the maximum possible extent. • Avoiding unhealthy and unaesthetic conditions due to the creation of water ponds at the zone between minimum and maximum lake water level where the development of septic conditions and insects is favored. The following should also be addressed: • the most complete and fast possible draining of the zone between minimum and maximum lake water level during the periodic water level variations • Avoiding drop of the water level below the minimum designated value. • The quickest possible lake recovery in case the water level falls below the minimum designated water level. Specifications will be prepared by the Special Secretariat for Water by 2015.
SPECIAL MEASURES FOR PRIORITY SUBSTANCES AND OTHER POLLUTANTS		
0M10-01	Designation of emissions levels for each river basin for priority substances and other pollutants included in JMD 51354/2641/E103/2010 as well as for physicochemist parameters in relation to the environmental requirements.	The aim of this measure is the designation of emission limit values for the priority substances and the other pollutants that are established in the Joint Ministerial Decision 51354/2641/E103/2010 and affect the surface water bodies. During the designation of the emission limit values, attention should be paid to the following: i The Environmental Quality Standards that are designated in terms of Annual Average concentration by the Joint Ministerial Decision 51354/2641/E103/2010. ii. The Guidance 91/271/EEC. iii. The dilution during the summer period, when the river discharge is minimum and also the dilution when the wastewater discharge from the industries or from other activities is maximum. iv. The sensitivity of the area. v. The daily and annual estimated pollution load of the

Measure code	Measure Title	Description
		companies. vi. The concentration of the basic parameters of the pollution load. vii. The correlation with the protected areas for drinking water. The Emission Limit Values will be the maximum values and the wastewater of the industries or other activities developed in the RBD should conform to them in every case. Originally the Water Directorates should determine the rivers basins that are priority for their regions and then to price the activities that are essential in order to be implemented the appropriate researches and surveys in the next managing period.
MEASURES FOR THE PROTECTION FROM ACCIDENTS AND EXTREME NATURAL EVENTS		
0M11-01	Strengthening the synergy of the river basin management plans with the plans to cope with large scale technological accidents (SATAME) for facilities included in the IPPC and SEVESO Directives.	Setting out of a major technological accident prevention policy plan, including ways to protect water bodies from major spills and accidents, especially WBs included in the register of protected areas as well as ways of dealing with such incidents in order to protect the ecosystem (e.g. NATURA 2000 areas), and human health (systems used for or intended for human consumption). Especially for high risk establishments, according to SEVESO, the internal emergency plans should include at least the following: • the WBs in the affected area, which should be visible as points of interest in defining protection areas (and in the relevant maps) • the specification of an early warning system (mobilization in the event of a serious incident) for the responsible water authorities of the Decentralized Administrations and the Regions for the management and protection of the corresponding WBs. Similar changes may be required in the external emergency plans setting out the measures to be taken outside of the establishment in which dangerous substances are produced, used, handled or stored. The external emergency plans implementing the major technological accident prevention policy of the General Plan of Civil Protection Agency, are reviewed, tested, and where necessary updated every three years and in any case whenever there is a significant change in the operation of the establishment or as required by the instructions of the General Secretariat for Civil Protection. Responsible for the preparation of the external emergency plans are the Directorates of Civil Protection of the Decentralized Administration that produce a plan for each Decentralized Administration area which is subsequently elaborated on a regional level within the administrative boundaries of each regional unit. In this context the relevant Water Directorate should send the approved River Basin Management Plan to: (a) the competent authority for environmental licensing of SEVESO establishments in order to initiate the process for updating these licenses according to the existing legislative framework and (b) to the competent Directorates and Offices of Civil Protection of the Decentralized Administration to deal with any necessary amendments to the external emergency plans.

The Supplementary Measures of the Programme of Measures for Prespa Sub-basin, are presented in the following table:

Code	Measure name	Brief Description of the measure
Monitoring abstractions		
SM08-010	Study of the irrigation network in the area of Prespes	Preparing a Study on the the conversion of the existing open channel irrigation network, covering approximately an area of 16,500 acres to a closed irrigation network, east of Mikri Prespa Lake. The surface irrigation network covers a total area less than the total cultivated area and has a normal operating period of 100 days. Of these approximately 800 acres are irrigated with ditches or flooding from St. Germanos stream and the rest from plants that draw water from the Mikri Prespa Lake. The irrigation network operates with open canals and tanks The responsibility for the operation and maintenance of the network belongs to the Local Organization for the Irrigation and Drainage of Prespa. The reasons for replacing and modernizing the infrastructures of the surface irrigation network with drip irrigation network are summarized as follows: •lowering water level of Mikri Prespa Lake, • elevated levels of pollution from agricultural sources, • increased consumption of water resources, • increased soil erosion, • increased energy consumption and therefore economic burden on producers and designed to tackle problems in the best environmentally responsible way while providing support to producers, the promotion of environmental initiatives and actions and wiser management of water resources and crops.
Research, development and demonstration Projects (best practices)		
SM16-040	SSMNature: Innovative space satellite monitoring of the environmental natural resources of cross-border area Greece-Albania (Region of Western Macedonia)	The project aims to establish an innovative and cost-effective method of simultaneously monitoring the natural resources at the borders between Greece and Albania through the study of environmental change and the relationship between human activities -wildlife-nature. It includes satellite monitoring of water resources to identify pollution - but is not limited only to this action. The area that will be monitored includes lakes Prespa and Kastoria. One of the objectives of the project is to evaluate the current situation in relation to water pollution.
Other measures		
SM17-010	Further investigation regarding measurements and causes of exceedances in chemicals substances recorded in lakes Mikri and Megali Prespa	The measure refers to further investigation regarding measurements and causes of exceedances in chemicals substances (in particular phosphorus, molybdenum, selenium, copper, nickel, organophosphates and organochlorine insecticides and triazines) that are recorded in the water system to provide a clar link between state-pressure – measure. Indicatevely the following are to be investigated : 1) Any physical production processes of each pollutant from geological formations of this region will be investigated with further measurements and also the preparation of special geochemical - hydrogeological study. 2) The contribution of pollutants in lake sediments with 3 rows of samples in a year, at of at least 3 positions and analysis for these pollutants.
SM17-060	Sounding of lake Mikri Prespa	The sounding of Lake Mikri Prespa is an additional management tool, which will facilitate decision making by the Wetland Management Committee of Prespes National Park Management Body. The Wetland Management Committee is an advisory committee of the Board of Prespes National Park Management Body and its purpose is counseling and providing scientific opinions on issues related to water management, wetland vegetation and birdlife and the implementation of conservation measures mentioned in the Guideline Document of the Restoration and Management of Wet Meadows in the Lake Mikri Prespa" (2007-2012) as incorporated to the Management Plan of the Prespa National Park (July 2011), promoting proposals for the protection of the environment, and issues related to to cross-border cooperation the abovementioned

Code	Measure name	Brief Description of the measure
		fields. The sounding of Lake Mikri Prespa will become an indispensable tool initially for improving the calculation of the water balance of the lake and consequently contribute to better management of the water system. The sounding will also contribute to the better management of aquatic vegetation particularly reedbeds and wet meadows, that is the two extremely important habitats for nesting and feeding of endangered waterbirds eg Pelicans, pygmy cormorants, herons and endemic fish. Finally, the sounding of Mikri Prespa will take place additionally to the sounding of Megali Prespa which was carried out in the past years ((Institute of Geology and Mineral Exploration (International Atomic Energy Agency. 2000- 2002)).
SM17-070	Hydrogeological characteristics Study of Zone A1 of the Prespa National Park	The project refers to the preparation of a hydrogeological study for Zone A1 (Location a Complete Protection of Nature, Slatina Lemos – Opagias region) of the National Park of Prespes, which will contribute to the understanding of the natural flow of the water and to improve the management of Lake Mikri Prespa. The necessity of this project stems from the lack of integrated scientific knowledge on the hydrogeology of the area between the two lakes. According to the already existing study entitled "Study of hydrology, Study of modernization of the sluice Koula and Management Study for the Level of Lake Mikri Prespa, Phase A ". Karavokyris I. and Partners Consulting Engineers Jul. 2003, it is well known that apart from the overflow of Mikri Prespa to Megali, there are also underground leaks from the strip of land between the two lakes, because of the difference in altitude (and therefore hydro potential difference) while the soil consists of geological mounds. The proposed study is an additional management tool, for the Wetland Management Committee which has a consultative role for the Board of Prespes National Park Management Body on issues related to water management, wetland vegetation and birdlife according to the Guideline Document of the Restoration and Management of Wet Meadows in the Lake Mikri Prespa" (2007-2012). The understanding of interaction between groundwater and lakes will provide the data required for the calculation of the leakage losses and the minimum water level in order not to adversely affect the water level of Mikri Prespa, which is necessary in order to manage the level of the wetland area. It is carried out under the supervision of the Wetland Management of the Management Body through the sluice in Koula. To investigate the hydraulic conductivity of the soil between the two lakes research is required within the hydrogeological study that will focus on estimating the average annual balance, the seasonal variation of the water level and the level of interaction of the aquifer with the water level of Mikri and Megali Prespa. In this way the water balance of groundwater will be protected and the sustainable use in conjunction with the existing level management of Mikri Prespa which is applied since 2005 by the Prespes National Park Management Body will be ensured. The implementation of the study will be carried out on a program contract with the Region of Western Macedonia.

Moreover, the following 'horizontal' measures are foreseen, at National level or at the level of Florina's Regional Unit, consequently also applying to Prespa Sub-basin:

Code	Measure name	Brief Description of the measure
Financial or fiscal measures		
SM03-010	Reform accounting systems for water providers	Configuration and application of a uniform calculation method and recording the cost of water supply by water providers, to strengthen the credibility of its estimation. Based on the available data it is indicated that (a) The way of reporting and recording cost categories is highly nonuniform and (b) there is no systematic recording costs and revenue per service (water supply and sewage with / without WWTP). Finally, the environmental and resource costs should be aggregated, with suitable methodologies. Prerequisite for this is the computerization of water supply. The configuration and application of a uniform method of recording the cost of water concerns the providers of irrigation water, in the context of which the calculation of environmental costs and the costs of the resources with suitable methodologies is essential - even to the ones served by private pumping stations. Prerequisite for the application is the elementary computerization of the providers. An annual publication of the total cost of water supply and the degree of recovery to raise awareness of the public is recommended. The disclosure is to be made in a simplified manner and provide the opportunity to the users to compare the costs.
Codes of Practice		
SM06-010	Monitoring Program for meteorological and water quality parameters	The purpose of the program is the rational use of irrigation water by farmers in the Regional Unit of Florina by irrigation advisory through On-line support of the rural population and the use of recording technology in real time. The existing network of meteorological and hydrological stations is being updated, calculating the water parameters of the crops and developing applications to inform the farmers.
Educational Measures		
SM15-010	Consulting services for farmers to improve implementation of practices and supplies related to the protection of the environment.	This measure includes actions and activities designed to educate the rural community concerning the irrigation water management and the application of fertilizers and pesticides. The main objectives of the educational informative action are the conservation and improvement of the production in relation to the sustainable water use, fertilizers and pesticides aiming at the maximum protection of water systems especially those under protection. The recommended actions include designing ways of communication between the relevant management bodies, experts on irrigation methods, fertilization and plant protection, by organizing educational workshops and seminars with an emphasis on environmental protection and agricultural soil. The legislation texts and circulars are often difficult to comprehend because of their volume and special conditions listed, so there is no success in their implementation. The direct contact between specialist and producer specifies the achievement of the goal which is the harmonious correlation of water systems production and protection.

Code	Measure name	Brief Description of the measure
SM15-020	Enhancement of the Environmental Education Centre of the Regional Sections	The continuation of already existing educational programs, activities and networks for environmental education, and the organization and implementation of the new Environmental Education Centers Regional units is recommended. These educational programs contribute to Inform, educate and raise awareness among students of different levels of education in relation to water management and water systems, through activities and personal experiences.
SM15-030	Educational Measures to promote the rational management of water bodies.	A constant public information campaign related to the sustainable water management and the protection of the water systems is recommended. Actions that indicatively can be implemented in some cases during this campaign are: • implementation of Information Days and training Seminars for public awareness concerning the efficient water use, the prevention of pollution caused from various activities and to promote the use of recycled water. • Strengthening educational programs in primary, secondary and higher education to develop a way of thinking and participatory behaviors that will contribute to the protection of water resources, ecological balance and the quality of life and ensure sustainable development. • Creation of a website including interactive applications concerning the sustainable water supply use in order to inform and sensitize the general public. The online platform is user friendly and allows calculation of the water use in each residence based on consumer habits and household devices. • Promote research in the field of Environmental Education, Biodiversity Protection and Conservation of Water Quality as well as the connection with scientific institutions.
Research, development and demonstration Projects (best practices)		
SM16-050	Soil Survey	Preparation of soil surveys for all the area under cultivation of the water basin along with those that were developed during the construction of land reclamation projectsand the creation an easily accessible database of geotechnical personel of public or private sector and any responsible government body that has the responsibility to provide data to third parties are the main objectives of the project. Benefits of implementation will be the rational use of fertilizers and irrigation water.

Actions related to the implementation of European Directives are also included, in the Special Water Management Plan of Prespa Sub-basin. Moreover, **additional environmental activities** are listed, which will contribute to the achievement of the objectives of the Water Basin Management Plan without being a part of it.

The **implementation cost** of the proposed **basic measures** in Prespa Sub-basin is estimated at **861.000 €**, with a budget of 456.017 €, already included in the NSRF 2007-2013.

For the **proposed supplementary measures** a **Cost Effectiveness Analysis (CEA)** was carried out.

Based on the WFD, the CEA is used to assess the cost-effectiveness of potential measures to be implemented in order to achieve the environmental objectives.

The analysis incorporated the following parameters: 1. severeness degree of effect, 2. number of relevant Water Bodies, 3. period of implementation, 4. period of efficiency, 5. social impact, 6. economic impact, 7. environmental impact, 8. Synergy with other measures, 9 Measure cost and 10 Contribution to the durability of the Program of Measures concerning water scarcity-drought.

Following calibration of the multicriteria analysis coefficients the **efficiency ratio** of each measure is calculated and the measures are classified accordingly.

Moreover the Programme of Measures of thiw 1st Management Plan addressed two main restrictions:

- the limited timeframe until the year 2015,
- the limited financial capacity of the country at least until the year 2015.

Taking into account the above limitations, high efficiency was awarded to supplementary measures with low (or zero) cost and horizontal application.

Suplementary measures SM05-20, SM17-070, SM17-060, SM08-010, SM17-010 come next, having a medium efficiency.

For the current river basin management cycle (until 2015), it is estimated that eight (8) out of the total of eleven (11) supplementary measures can be implemented (short-term implementation).

Regarding the remaining three (3) supplementary measures, actions towards their implementation are expected to be initiated during the current management cycle but implementation is expected to be completed in the next river basin management cycle (2016-2021). These measures refer to projects that require either preparatory actions or high investment, which exceed the management and financial capacity of the current river basin management cycle.

12. CROSS BORDER COOPERATION

12.1 The transboundary Prespa basin

The transboundary Prespa basin, with a total area of 1.380 km^2 approximately, is shared among three countries: Greece, Albania and fYROM. Only few areas in Europe exhibit such wide range of biodiversity in such a limited space, as this small river basin, which, includes moreover, two of the most ancient Lakes of Europe, Mikri Prespa and Megali Prespa, which are separated one from the other by a sandy isthmus. Megali Prespa Lake and its watershed extend on three countries, the largest part laying within the fYROM (Lake surface distribution in neighbor countries: fYROM 69%, Albania 18%, Greece 13% , watershed distribution: Greece 4%, fYROM 88%, Albania 8%). Mikri Prespa Lake and its watershed extend mainly in Greece apart from a small part which lays in Albania (Lake surface distribution in neighbor countries: Greece 92%, Albania 8%, watershed distribution: Greece 73%, Albania 27%)[6].

12.2 Pressures and status of WBs in neighboring countries

Inadequately treated urban and industrial effluents, mainly in the part of the basin that belongs to fYROM, as well as intensive agricultural activity are the most important human induced pressures on water resources in the transboundary Prespa.

Several bilateral, trilateral and multilateral actions, programs and projects have been implemented, related to water resources management, improvement of the ecological status of the Lakes, promotion and adoption of best management practices, efficient waste management, development of transboundary cooperation, awareness raising of the local communities and technical infrastructure projects, in the transboundary Prespa basin.

In the context of the Prespa Lakes Watershed Management Plan (PLWMP, fYROM -2012), seventeen (17) surface water bodies are identified in the part of the basin belonging to the fYROM, in accordance with the WDF. Of these, thirteen (13) are natural river water bodies, one (1) is heavily modified river water body (HMWB), two (2) artificial water bodies and one (1) lake water body, Megali Prespa.

Two (2) of aforementioned natural river water bodies are classified at high ecological status, two (2) at good, six (6) at moderate, two (2) at poor and one (1) at bad ecological status. The one (1) Heavily Modified river WB (HMWB) is classified at ecological potential, while one (1) of the two (2) Artificial WBs (AWB) at bad ecological potential and the other at poor ecological potential. Megali Prespa Lake is classified at moderate ecological status.

No equivalent management plan has been implemented by Albanian, as a result no water bodies are identified and thereby neither their condition.

[6] *http://prespa.iwlearn.org/resources/brochures/brochure-on-water*

12.3 Agreements, Meetings and Actions in transboundary Prespa basin

In the Special RB Management Plan for the Sub-basin of Prespa, the international water resources regulations, which define the rights of each country in the use of common resources and determine their obligations, is briefly registered. The key abovementioned international regulations are the Helsinki Convention (1992) and its revision (2004), the Espoo Convention (1991) and the Aarhus Convention (1998).

The establishment of the Transboundary Prespa Park, by a joint declaration of the Prime Ministers of Greece, Albania, and fYROM is the first transboundary protected area in the Balkans. Also, the main milestones and results of the coordination and promotion of joint actions for the protection and sustainable development of the Prespa region and the main points of the international "Agreement on the Protection and Sustainable Development of the Prespa Park Area" (2/2010) among the three states and the European Union.

12.4 Cooperation programs and actions of the neighboring countries in transboundary Prespa basin

In the transboundary Prespa Lakes basin awareness raising of the local communities and technical infrastructure projects and several bilateral, trilateral and multilateral actions, programs and projects have been implemented by Greece, Albania and fYROM, related to water resources management, improvement of the ecological status of the Lakes, promotion and adoption of best management practices, efficient waste management, development of transboundary cooperation. A brief selection includes:

- Preparation of a Strategic Action Plan for Sustainable Development in the Prespa Park (2001-2002). It is the first joint project of three neighboring countries regarding the management of the Prespa Park, and constitutes until now the basis of all activities planning in the Prespa Park.
- TRABOREMA- Concepts For Integrated Transboundary Water Management and Sustainable Socio-Economic Development in The Cross Border Region of Albania, former Yugoslav Republic of Macedonia (fYROM) and Greece (2004-2007).
- Study on the Interaction between Lake Micro Prespa and River Devolli (Albania - Greece) (2005-2006).

  Actions funded by INTERREG IIIA / CARDS Greece - fYROM, include:
  - Developing a network for the promotion of the natural heritage of areas in the Prefecture of Florina and fYROM (2005-2006).
  - Developing an environmental station and environmental programs in the region of Prespa (2005-2006)

- Actions funded of INTERREG IIIA / CARDS Greece - Albania, include:
  - Water supply works of the Municipality of Krystallopigi (2005-2006)
  - Water supply of the Municipality of Prespa (2005-2008)
  - Sewerage system of the Municipality of Prespa (2005-2008)
- Integrated Ecosystem Management in the Prespa Basin in Albania, fYROM and Greece - GEF Project (2006-2011)
- Development of a Transboundary Environmental Monitoring System (2007-2011). In the context of planning a cross-border monitoring environmental parameters system for Prespa Lakes, since 2007 an inventory of existing water monitoring programmes established on the three sides of the watershed/basin, stakeholder's consultations took place in technical level and proposals have been developed on a pilot implementation of specific parameters' measurements in cross-border level.
- Pilot Project of Biodegradable Waste Management in Prespa – fYROM (2010 – 2012)
- Transboundary Biosphere Reserve Prespa – Support to the National Park Prespa in Albania, Albania (2010-2015)
- Protection and Sustainable Use of Biodiversity in the Region of the Large Lakes Prespa, Ohrid and Sckoder, Albania – fYROM (2011-2014)
- Restoration of Prespa Lake Ecosystem (Implementation of the WaterShed Management Plan) – fYROM (2011-2018)
- RULAND/ Interactive Farmers Support System for Efficient Water Use Management, Greece – fYROM (2012-2013)
- SSMNATURE/Innovative Space Satellite Monitoring of the environmental natural resources of the cross-border area – Greece – Albania (2012-2014)

Within the Prespa Lakes Watershed Management Plan, (PLWMP, 2012) a program of measures is established to improve the current status of water resources, which includes, inter alia, projects related to remediation of former artificial fish farms and construction of weir in Golema Reka River, the wastewater treatment plant's improvement in Ezerani, improvement industrial waste water and waste water treatment facilities in region's settlements with less than 2000 inhabitants, improvement of existing sewerage networks in Resen and Jakovec and also in smaller settlements, the construction of Chesinska Reka's dam, the gradual replacement of the existing drip irrigation method, the construction of a licensed waste disposal site in the settlements of the Resen Municipality (PLWMP, 2012) .

The most recently planned infrastructure projects in fYROM comprise six (6) Small Hydropower Plants (SHP) in three rivers (Golema Reka, Brajcinska Reka and Kranska Reka). Regarding Albania, not significant interventions in water bodies are recorded. Exception is the diversion of river Devoli constructed in 1976 and in 2002 stopped to be operational, since extensive alluvium

was observed in the estuary of the diversion to the Mikri Prespa lake resulting ecological degradation. The restoration of these impacts constitutes one of the subjects for which a consensus has been formed under the tripartite cooperation in the Prespa Park.

12.5 Cooperation in Transboundary River Basins in the context of the implementation of 2000/60/EU

The major inhibiting factor for the development of a joint water management plan for Axios and Prespa Lakes river basins, during the present management period is the different status of the trhree states relative to EU and the deriving deifference in the obligations of the WFD application among Greece, Albania and fYROM. Greece, being a member state, is bound to comply with the WFD and to prepare a River Basin Management Plan at least for the part of the transboundary river basin within its territory, as well as to comply with all other relevant directives and regulations which promote the sustainable development and protection of the environment. On the other hand, fYROM as candidate country, and Albania, as a potential candidate country, have no obligation to comply with the WFD or, to that respect, to coordinate with the aim of producing a single transboundary river basin management plan for Axios and Prespa river basin. fYROM, in the framework of the Program of UNDP, entitled “Integrated Ecosystem Management in the Prespa Basin in Albania, fYROM and Greece - GEF Project (2006-2011)” had already prepared the “Prespa River Basin Management Plan”(PLWMP-2012), for the part of the river basin within its territory. Albania on the other hand, has not carried out a similar study yet.

During the current, first river basin management cycle, two meetings with representatives of fYROM have taken place aiming to strengthen the cooperation between Greece and fYROM in environmental policy issues. These meetings, ended up in exchange of verbal notes. The first meeting, took place in Athens, in June 2012 (07/06/2012), where issues such as sectoral cooperation in environmental management were discussed between representatives of the Ministries of the two countries. Moreover, the Special Secretariat for Water of the Ministry of Environment, Energy and Climate Change of Greece composed a note addressed to fYROM towards coordination in specific issues (EU WFD and biodiversity protection). The Greek part placed an invitation for a Bilateral Experts meeting to be held in May 2013. The first Bilateral Expert Consultation on Environmental Affairs, with emphasis on management of transboundary waters, was held in Thessaloniki, on 13 May 2013. The meeting, which was conducted in a spirit of cooperation, allowed exchange of information on Axios river and Prespa Lakes, presentation of actions. The parties agreed to establish a regular cooperation and exchange of data on transboundary waters. Next meeting is expected to be hosted by fYROM.

Requests for data provision on Prespa river basin have also been addressed to the competent authorities of Albania, via the Ministry of foreigh affairs.

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