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COMMISSION STAFF WORKING DOCUMENT

Member State : Ireland

Accompanying the document

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

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

River Basin Management Plans

{ COM(2012) 670 final }

1. GENERAL INFORMATION

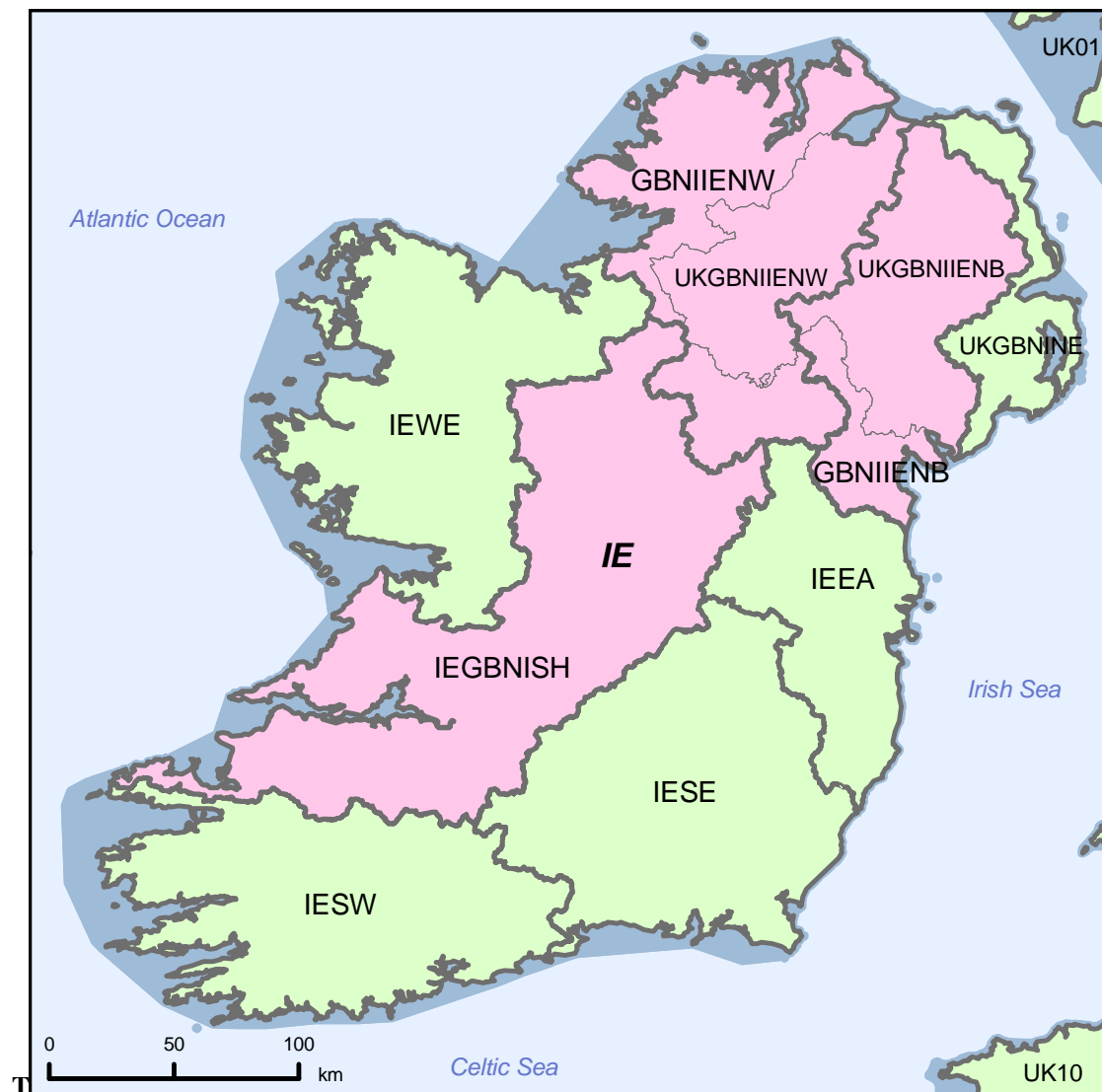
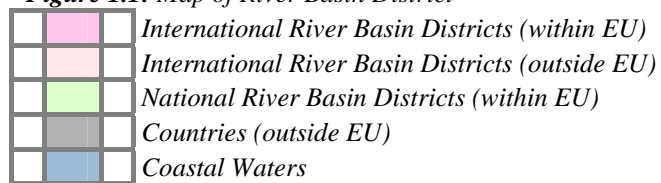


Figure 1.1: Map of River Basin District



Source: WISE

The Republic of Ireland has a population: 4.48 million¹, and an area of 70,000 km². Of the seven river basin districts (RBDs), three RBDs are shared with Northern Ireland (UK).

RBD	RBD Name	Size (km ²) ²	Countries sharing RBD
GBNIIENB	Neagh Bann IRBD	8121 (2000 in IE)	UK
GBNIIENW	North Western IRBD	14793 (7400 in IE)	UK
IEEA	Eastern RBD	6657	-
IEGBNISH	Shannon IRBD	19452 (19450 in IE)	UK
IESE	South Eastern RBD	13941	-
IESW	South Western RBD	15077	-
IEWE	Western RBD	16952	-

Table 1.1: Overview of Ireland's River Basin Districts

Source: River Basin Management Plans reported to WISE³: <http://cdr.eionet.europa.eu/ie/eu/wfdart13>

Three RBDs are jointly designated as international RBDs, and some RBDs have several transboundary river basins. Only a very small part of the Shannon RBD is in the UK.

Name international river basin	Countries sharing RBD	Co-ordination category		Total 1-4	
		1			
		km²	%	km²	%
Neagh Bann	UK	2002	24.6	2002	24.6
North Western (rivers Erne and Foyle)	UK	7400	60.2	7400	60.2
Shannon	UK	17957	>99	17957	>99
<i>Total</i>		27359		27359	

Table 1.2: Transboundary river basins by category (see CSWD section 8.1) and % share in Ireland⁴

Category 1: Co-operation agreement, co-operation body, RBMP in place.

Category 2: Co-operation agreement, co-operation body in place.

Category 3: Co-operation agreement in place.

Category 4: No co-operation formalised.

Source: EC Comparative study of pressures and measures in the major river basin management plans in the EU.

2. STATUS OF RIVER BASIN MANAGEMENT PLAN REPORTING AND COMPLIANCE

The RBMPs were adopted on to be 6 July 2010. RBMPs were reported to the Commission in October 2010: Eastern, South Eastern, North Western and Neagh Bann on 4th, Western on 7th,

¹ Eurostat 2011.

² Size includes coastal waters.

³ This MS Annex reflects the information reported by the MS to WISE which may have been updated since the adoption of the RBMPs. For this reason there may be some discrepancies between the information reported in the RBMPs and WISE.

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

Shannon on 21st and South Western on 28th, after which the infringement case for non-reporting of plans was closed.

2.1 Major strengths

- The Article 5 risk assessment was updated to inform the development of the RBMPs.
- The methodology used to identify specific pollutants and set Environmental Quality Standards (EQSs) is clear and transparent and in accordance with WFD Annex V 1.2.6.
- Additional objectives have been set for shellfish protected areas and sites designated for protection of pearl mussel populations. Additional measures are taken to achieve these objectives.
- Mandatory measures to address agricultural pollution have been put in place.
- The requirements of groundwater dependent terrestrial ecosystems have been taken into account when identifying measures to deal with groundwater abstractions.
- Joint International strategy documents on the coordination with the United Kingdom were adopted for the shared RBDs.
- Climate change is mentioned throughout and the Programme of Measures was climate checked. A national climate change strategy was also referred to.

2.2 Major gaps

- The level of ambition is low – only 18% more rivers are expected to meet objectives in 2015 than in 2009, and large numbers of exemptions are applied.
- Assessment methods for classification of ecological status are not fully developed for all biological and physico-chemical quality elements (QEs) in all water categories. Only interim status has been reported.
- Not all the required quality elements(QEs) are included in the monitoring programme for lakes and coastal waters. Coastal and estuarine monitoring programmes have not yet been fully implemented.
- There is currently no recovery of costs of water supply to households, costs are met by government funding. Environmental and Resource costs have not been estimated due to a lack of suitable data.

3. GOVERNANCE

3.1 Timeline of implementation

Consultations as required by Article 14 of the WFD were held as follows:

- WFD work programme: 6 months.
- Significant Water Matters Ireland reports: 22/06/2007 – 22/12/2007.
- Consultations were undertaken for the Water body characterisation report: 2 month period but no dates listed and "Managing our Shared Waters" Consultation Paper: 10 weeks.
- Consultation of the draft RBMP from the date of submission: 22/12/2008 - 22/06/2009.

3.2 Administrative arrangements

Responsibility for implementation of the WFD is split between a large number of local and national authorities, which has made the process more challenging to coordinate. Discussions are underway to change the administrative arrangements, establishing a three tier structure of Government Departments, the EPA and regional networks. The national authorities that were involved in the initial development of the plans were:

Authority	Responsibilities
Environmental Protection Agency (EPA)	Reporting to EU, coordinating national activities, other tasks include assigning status, monitoring programmes, review of RBMPs.
Department of the Environment, Heritage and Local Government	Coordinating WFD implementation, determining priority for investment in infrastructure and resource availability to local authorities.
Other Government Departments	Implementing policy and programmes in their respective policy areas.
Water Framework Directive National Advisory Committee	Oversee implementation of plan at a national level.

Table 3.2.1: Authorities responsible for the implementation of the WFD

Source: RBMPs

Activities in each RBD are coordinated by the local authorities, with a lead authority for each which is supported by the other local authorities in the area. The Lead Authorities are: Monaghan County Council (Neagh Bann IRBD), Donegal County Council (North Western IRBD), Limerick County Council (Shannon IRBD), Dublin City Council (Eastern RBD), Carlow County Council (South Eastern RBD), Cork County Council (South Western RBD) and Galway County Council (Western RBD).

A national approach is generally followed in implementation of the WFD, with some differences in the International RBDs due to coordination with the neighbouring Member State.

A reform of water authorities has been announced, but details have not yet been provided.

3.3 RBMPs - Structure, completeness, legal status

Three RBDs are shared with the UK (Neagh Bann, North Western and Shannon), but no final single international RBMP has been reported by Ireland for any of these RBDs.

The adopting authority for the RBMPs are the local authorities, and the formal approval is done by the Minister for the Environment, Heritage and Local government, but the type of document adopting the act is unclear to the Commission. As regards the **legal status**, the RBMP's are high level strategic planning documents. They are not in themselves legal instruments, though have a statutory basis. The European Communities (Water Policy) Regulations 2003 (SI No 722/2003) places a general duty on every public authority to take such actions as may be appropriate in the context of its functions to secure compliance with the Directive and with the provisions of any river basin management plan made, and any programme of measures established, in accordance with the Regulations. There is an obligation to take into account environmental objectives of RBMPs in individual decisions. In addition, the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009) and new European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010) were adopted to give effect to the measures needed to achieve surface water and groundwater environmental objectives established in RBMP's. These Regulations place a legal obligation on public authorities to aim to achieve those objectives in the context of their statutory functions, e.g. both sets of Regulations require the relevant authorities to review all pollutant discharge authorisations to take account of the objectives established in river basin plans. Permitting authorities are bound by the RBMPs.⁵

3.4 Consultation of the public, engagement of interested parties

The methodology used for the consultation process was generally consistent across all RBDs in Ireland. The consultation process on the draft RBMP was carried out through a number of different routes, including meetings, written consultation and web based comments. Information on the consultation process could be obtained through the internet, direct mail to households, and local authorities, and printed media was available at local libraries and schools. The **stakeholders** involved in the consultation included a wide range of sectors, such as agriculture, energy, fisheries, industry, NGOs and universities and involvement was through both regular and ad-hoc meetings. It is not clear whether there is **continuous involvement** of these stakeholders or the general public. The comments provided led to adjustments to specific measures and the addition of new information to the RBMPs, but did not change the selection of measures used. A full list of these changes has not been provided.

3.5 International cooperation and coordination

IE contains three IRBDs (Neagh Bann (GBNIIENB), North Western (GBNIIENW) and Shannon (IEGBNISH)), all of which are shared with the UK. Only a very small part (2.5 km²)

⁵ Pressures and Measures study, task 1d, Governance.

of the Shannon IRBD is within the UK area. There was very close coordination between the relevant authorities in the Ireland and the UK within the IRBDs, with the North/South WFD Coordination Group being supported by a number of technical working groups and implementing authorities in both countries. A high level strategy document for each of International RBDs has been agreed between both jurisdictions⁶, here placing these IRBDs in Category 1, as RBDs with international River Basin Management Plans.

3.6 Integration with other sectors

The RBMP contains links to other sectors such as agriculture, through the Nitrates National Action Programme, and the chemical industry, through the IPPC licensing programme. These plans include issues such nutrient enrichment and chemical pollution, as well as flood protection and rural and urban planning. There are also links with conservation status under the Habitats Directive.

4. CHARACTERISATION OF RIVER BASIN DISTRICTS

4.1 Water categories in the RBD

Each of the seven RBDs in Ireland has rivers, lakes, groundwater, transitional and coastal waters. Where transitional water bodies have been delineated the typology was based on the 'System B' approach, and used the factors tidal range, salinity, mixing characteristics, substratum composition and extent of intertidal area. The Typology is described in detail in the UK Technical Advisory Group (UKTAG) on the Water Framework Directive document "Guidance on Typology for Coastal and Transitional Waters of the UK and the Republic of Ireland".

4.2 Typology of surface waters

The RBMP shows that typologies have been developed for all water categories in Ireland. For rivers and lakes, these typologies have been **verified using biological data** to check that they are ecologically meaningful. However, although biological validation of the data for transitional and coastal waters was attempted, it was not possible to statistically validate the physical typologies using the available biological dataset. An alternative approach using both physical and biological data was used to define typologies for these waters.

RBD	Rivers	Lakes	Transitional	Coastal
GBNIIENB	13	14	6	12
GBNIIENW	13	14	6	12
IEEA	12	13	6	12
IEGBNISH	13	14	6	12

⁶ Working Together – Managing our shared waters. Neagh Bann
<http://www.environ.ie/en/Publications/Environment/Water/FileDownload,26909.en.pdf>

North Western <http://www.environ.ie/en/Publications/Environment/Water/FileDownload,26908.en.pdf>

RBD	Rivers	Lakes	Transitional	Coastal
IESE	13	14	6	12
IESW	12	13	6	12
IEWE	13	14	6	12

Table 4.2.1: Surface water body types at RBD level

Source: WISE

Reference conditions have been developed for all types of river, transitional and coastal waters. For lakes, reference conditions were developed for all lake types for macrophytes, but only applied to types LA1/2 for phytoplankton-chlorophyll-a. Fish were not intercalibrated in phase 1 of intercalibration, so reference conditions were not available for the 1st RBMPs, although Irish authorities have clarified that the second phase of intercalibration has allowed development of reference conditions for all elements. The methodologies used for establishment of these reference conditions included the use of water chemistry and biological and palaeolimnological data from high status sites along with expert judgement. Where not enough sites were available within Ireland, historical data or equivalent sites in other Member States were also used.

For rivers, 12 different **types** were defined, based on information on geology and slope⁷. For lakes, 13 typologies were defined, using characteristics such as altitude, depth, alkalinity and size⁸. For Transitional and Coastal waters, the same typologies are used as for the UK, with 6 types of transitional water and 12 types of coastal water. This typology is based on factors including salinity, mixing characteristics and tidal range⁹.

4.3 Delineation of surface water bodies

Due to the fact that just under 2% or 209 of the total of 12,206 Irish lakes are greater than 0.5 km² in surface area a number of **small water bodies** (smaller than the size criteria in Annex II) have been included in the RBMPs, especially where they are designated as in protected areas e.g. important drinking water abstraction sources or within special areas of conservation.

RBD	Surface Water								Groundwater	
	Rivers		Lakes		Transitional		Coastal			
	Number	Average Length (km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)
GBNIIENB	90	6	17	2	8	6	3	49	28	105

⁷ Rivers: Reference Conditions for Irish Rivers – Description of River Types and Communities
<http://www.wfdireland.ie/Documents/Characterisation%20Report/Background%20Information/Analysis%20of%20Characters/Rivers/Reference%20Conditions%20for%20Irish%20River6.doc>

⁸ Lakes: Summary note of Irish lake typology to be applied in Ireland's river basin districts
http://www.wfdireland.ie/Documents/Characterisation%20Report/Background%20Information/Analysis%20of%20Characters/Rivers/Lake_Typology_Summary_Guidance.pdf

⁹ T&CW: Guidance on Typology for Coastal & Transitional Waters of the UK and Republic of Ireland
http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Marine%20typology_Final_281003.pdf

RBD	Surface Water								Groundwater	
	Rivers		Lakes		Transitional		Coastal			
	Number	Average Length (km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)	Number	Average Area (sq km)
GBNIIENW	682	4	226	2	21	8	23	97	72	119
IEEA	365	5	26	3	13	2	8	45	75	83
IEGBNISH	900	6	113	4	20	13	11	111	242	73
IESE	672	6	12	3	21	5	9	114	151	85
IESW	891	4	90	3	42	5	27	133	84	134
IEWE	966	4	322	4	65	4	30	153	104	113
Total	4565	5	807	3	190	6	111	119	756	94

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

Source: WISE

4.4 Identification of significant pressures and impacts

The methodology used for identification of significant pressures generally follows a national approach, using a combination of numerical tools and expert judgement¹⁰. Information on pressures was found in the Article 5 assessment and technical follow-up documents¹¹. The most significant pressures identified are shown in the table 4.4.1 below.

Across the RBDs, the percentages of water bodies affected by these pressures are similar, although numbers of water bodies at risk from abstraction, morphological alterations and other pressures are higher in Eastern RBD than others.

As regards **point sources**, only wastewater treatment works (WWTW) with a population equivalent (PE) greater than 500 were investigated as potential risks. Some smaller plants were *de facto* included based on previous monitoring results. A number of factors were assessed, including compliance with discharge consents, deterioration in the receiving water body, the use of the treatment plant compared with its capacity and the assimilative capacity of the receiving water. In designated areas, water quality was also assessed against bathing and shellfish water standards. Industrial discharges were assessed using the same methodology. The risk from combined sewer-overflow (CSO) discharges was assessed in all discharges with a PE greater than 2000, and was based on the number of spills per year. Where necessary, expert judgement was used to verify the assessment. No data is available for mines, quarries, contaminated land or older closed landfills but large landfills are licences by the EPA, so expert judgement is used to assess the level of pressure. The OSPAR procedure for eutrophication assessment¹² is used to identify transitional and coastal waters at risk, and look at pressures from unsewered industry and rural areas. Land use data were used

¹⁰ The Characterisation and Analysis of Irelands River Basin Districts – National Summary Report http://www.wfdireland.ie/Documents/Characterisation%20Report/Ireland_Article_5_WFD.pdf

¹¹ Article 5 characterisation report <http://www.wfdireland.ie/wfd-charreport.html>
Follow up reports <http://www.wfdireland.ie/docs/>

¹² Common Procedure for the Identification of the Eutrophication Status of the OSPAR Maritime Area http://www.ospar.org/documents/dbase/decrecs/agreements/05-03e_common%20procedure.doc

to assess **diffuse source** pressures, such as urban, highway and agricultural runoff, with >1.3% arable land cover or 0.03% urban land cover indicating a high risk to the river water body. Expert judgement was used for factors such as septic tanks¹³, which could not be indicated in the land use models.

Abstractions in river, lake and transitional waters were assessed by investigating the percentage of flow removed from Q95 flow levels. The presence of flow regulation structures, such as a hydroelectric dam, water supply reservoir, or more than three weirs indicated a high level of risk to a river¹⁴. Flood defence structures also put a water body at risk if they covered more than 60% of a river or 30% of a lake. For transitional and coastal waters the TraC-MIMAS tool as used to assess flood defence structures, dredging and marine construction¹⁵.

¹³ Ireland has not yet complied with the judgment in case C-188/08 in which the Court condemned Ireland for not having a system of verifying the efficiency of the domestic waste water treatment systems (mostly septic tanks) in rural areas. There are about 500.000 such systems, not thought to be controlled effectively and which may have an impact on the aquatic environment.

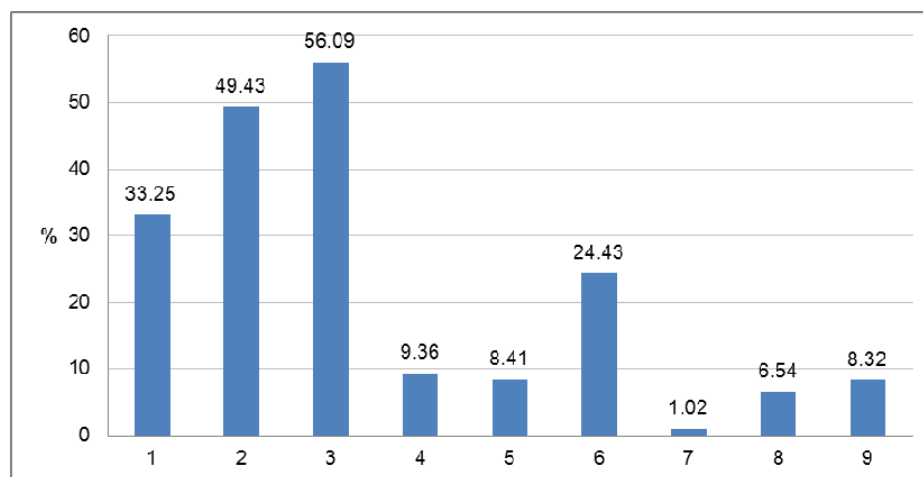
¹⁴ WFD Surface Water Morphological Risk Assessment Methodology – Guidance of Thresholds and Methodology to be applied in Ireland’s River Basin Districts
http://www.wfdireland.ie/docs/31_RiskAssessments/Surface%20Water%20Risk%20Assessment/Hydrology_Risk_Assessment_Guidance.pdf

¹⁵ Marine Morphology National Methodology Report
http://www.wfdireland.ie/docs/21_MarineMorphology/Marine%20Morphology%20POMS%20Chapters%201%20to%205.pdf

RBD	No pressures		Point source		Diffuse source		Water abstraction		Water flow regulations and morphological alterations		River management		Transitional and coastal water management		Other morphological alterations		Other pressures	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
GBNIIENB	26	22.03	74	62.71	68	57.63	18	15.25	0	0	53	44.92	4	3.39	0	0	14	11.86
GBNIIENW	401	42.12	358	37.61	415	43.59	127	13.34	7	0.74	91	9.56	4	0.42	0	0	37	3.89
IEEA	21	5.1	381	92.48	380	92.23	221	53.64	371	90.05	371	90.05	16	3.88	371	90.05	306	74.27
IEGBNISH	216	20.69	576	55.17	701	67.15	49	4.69	49	4.69	445	42.62	10	0.96	0	0	36	3.45
IESE	76	10.64	582	81.51	598	83.75	25	3.5	1	0.14	146	20.45	9	1.26	0	0	20	2.8
IESW	453	43.14	404	38.48	508	48.38	56	5.33	27	2.57	50	4.76	10	0.95	0	0	29	2.76
IEWE	693	50.11	429	31.02	512	37.02	35	2.53	22	1.59	230	16.63	5	0.36	0	0	30	2.17
Total	1886	33.25	2804	49.43	3182	56.09	531	9.36	477	8.41	1386	24.43	58	1.02	371	6.54	472	8.32

Table 4.4.1: Number and percentage of surface water bodies affected by significant pressures

Source: WISE



- 1 = No pressures
- 2 = Point source
- 3 = Diffuse source
- 4 = Water abstraction
- 5 = Water flow regulations and morphological alterations
- 6 = River management
- 7 = Transitional and coastal water management
- 8 = Other morphological alterations
- 9 = Other pressures

Figure 4.4.1: Graph of percentage of surface water bodies affected by significant pressures

Source: WISE

The sectors listed as contributing significantly to chemical pollution include: industrial emissions (directs and indirect discharges), households (including through sewage treatment plants), atmospheric deposition, transport network (road runoff and herbicides) and contaminated land and mines.

4.5 Protected areas

RBD	Number of PAs										
	Article 7 Abstraction for drinking water	Bathing	Birds	European Other	Fish	Habitats ****	Local	National	Nitrates	Shellfish	UWWT
GBNIIENB	38	4	3			4			1	2	5
GBNIIENW	142	19	25		6	54			1	12	3
IEEA	104	20	16		2	33			1	2	4
IEGBNISH	270	19	30		2	127			1	6	12
IESE	155	11	13		3	42			1	5	9
IESW	105	22	17		6	48			1	19	8
IEWE	129	31	32		12	118			1	17	1
<i>Total</i>	<i>943**</i>	<i>126</i>	<i>136</i>		<i>31</i>	<i>426</i>			<i>7***</i>	<i>63</i>	<i>42</i>

Table 4.5.1: Number of protected areas of all types in each RBD and for the whole country, for surface and groundwater*

Notes : * This information corresponds to the reporting of protected areas under the WFD. More/other information may have been reported under the obligations of other Directives.

** All groundwater bodies are drinking water protected areas, so 733 DWPA are Groundwater bodies

*** Ireland has established and applies action programmes in the whole of its territory and therefore, in accordance with article 3.5 of the Nitrates Directive (1991/676/EEC), it is exempted from designation of specific vulnerable zones.

**** Additional data provided by Irish Authorities, not reported to WISE.

Source: WISE

5. MONITORING

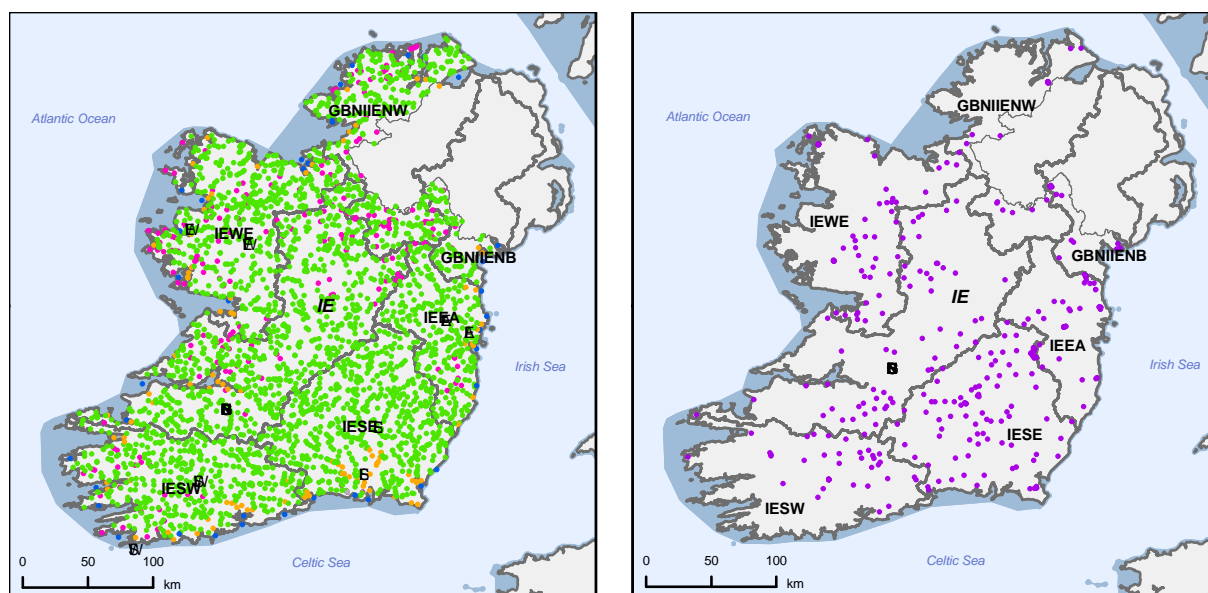


Figure 5.1: Maps of surface water (left) and groundwater (right) monitoring stations

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

Source: WISE, Eurostat (country borders)

Overall, the monitoring programme has changed little since the 2009 implementation report. The numbers of monitoring sites included now are 2726 (compared with 2724 in 2009) for rivers, 217 (222) for lakes, 36 (33) coastal, and 81 (84) transitional. Ireland has a relatively dense monitoring network for rivers and lakes, measured as monitoring station per 1000 km², but relatively low percentage of water bodies(5%) are subject to surveillance monitoring(5%) and fewer water bodies are subject to operational monitoring than there are water bodies with significant pressures. Data on which QEs were monitored per station was not supplied to WISE, and therefore the overview table of QEs monitored per water category is not included.. Irish authorities refer to the Art 8 reports (submitted 2007), which the Commission then assessed as not including all relevant quality elements in monitoring.¹⁶

¹⁶ According to the Irish authorities, the Article 8 Monitoring Programme submission includes appendices which lists the station locations and topic-specific subnets to which they belong: together with hyperlinks to separate worksheets for each subnet linking to both the frequency of monitoring and the quality elements to be monitored. In general all QEs including priority substances and a full suite of biological QEs and hydromorphology are monitored for surveillance water bodies and a reduced suite for operational monitoring – typically general physico-chemical, macroinvertebrates and aquatic macrophytes

RBD	Rivers		Lakes		Transitional		Coastal		Groundwater		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
GBNIENB	4	59	1	5	0	2	1	1	8	2	5
GBNIENW	20	262	18	55	3	4	3	4	17	1	14
IEEA	15	244	6	16	3	5	1	4	38	7	30
IEGBNISH	46	602	17	50	5	7	0	2	48	26	21
IESE	33	536	0	5	6	9	1	4	74	39	41
IESW	30	391	7	23	3	16	3	5	39	23	19
IEWE	31	422	25	63	6	12	3	4	50	14	56
<i>Total by type of site</i>	<i>179</i>	<i>2516</i>	<i>74</i>	<i>217</i>	<i>26</i>	<i>55</i>	<i>12</i>	<i>24</i>	<i>274</i>	<i>112</i>	<i>186</i>
<i>Total number of monitoring sites*</i>	2726		217		81		36		338		

Table 5.1: Number of monitoring sites by water category

Surv = Surveillance

Op = Operational

Quant = Quantitative

Note : * Number of sites calculated from data reported at site level. If no data reported at site level, then table supplemented with data reported at programme level.

Source: WISE

5.1 Monitoring of surface waters

A number of quality elements are not included in the design of the monitoring programme, particularly for **surveillance monitoring**. For rivers, all required QEs are monitored for surveillance purposes in every RBD. For lakes, the hydrological regime is monitored where ecological status is potentially high, using the Lakes-MImAS tool. For transitional waters, all BQEs and physico-chemical QEs are included in the monitoring programme but sufficient data to reports status on all elements was not available at the time of reporting.. There is also no monitoring of any hydromorphological QEs in these RBDs, although risk is assessed using the TraC-MImAS tool. This indicated that waters at high ecological status were not at risk from hydrological pressures. For coastal waters, phytoplankton is not monitored in Shannon RBD, and tidal regime is not monitored in Shannon and South Western RBDs. It should be noted that no robust relationship has been made between aquatic morphology and ecological impacts.

Not all coastal waters have been included in the monitoring programme for the first RBMP, but it should be noted that the RBMPs state that a fully compliant monitoring programme for all transitional and coastal waters will be made operational by December 2011 and 12 water bodies are reported to WISE.

An **operational monitoring** programme has been established, but it is not clear what is monitored for operational purposes compared to surveillance purposes. For transitional and coastal waters, QEs have been included based on their sensitivity to pressures such as nutrient enrichment, organic enrichment, contamination by priority substances, and altered habitats caused by hydromorphological alterations, it appears that the same BQEs are used as used in the surveillance monitoring programme. For rivers, macroinvertebrates are the primary BQE used in the operational monitoring programme. For lakes, the operational monitoring programme was very similar to the surveillance monitoring programme. Biological elements

which had not been intercalibrated were not used to assign status, but data were collected in anticipation of achieving intercalibration in the second decision. Irish authorities have also signalled that the lakes operational monitoring programme was changed in 2010 – of the BQEs, only macrophytes and chlorophyll are monitored in operational lakes plus macroinvertebrates where necessary i.e. for acidification pressure

Priority substances and other specific pollutants are monitored particularly in all surveillance monitoring waters. Monitoring in transitional waters began 2007. Sediment and biota are also monitored, but are not included in the assessment of chemical status as there is no EQS in place for most substances in tissue and sediment. In future, this monitoring will be used to give a comprehensive picture of chemical status; EQS values have now been established for transitional and coastal waters.

Grouping of water bodies has been applied to river, transitional and coastal water bodies, but not for lakes. Rivers were divided in 20 clusters based on typology and pressures, and information is given of the number of groups for transitional and coastal water bodies. A description of the methodology used is given in the background documents to the RBMP (subfolders). A donor-recipient relationship is used to link un-monitored river water bodies to the nearest, most similar monitored water body.

A **transboundary monitoring programme** for river, transitional and coastal waters is applied in the Neagh Bann and North Western international RBDs, which has been coordinated with the UK. There are seven transboundary lakes: McNea Upper and Lower, Lattone, Melvin, Black, Summerhill, Upper lough Erne and the sampling of these lakes is coordinated with our NIEA colleagues in Northern Ireland by the North-South Technical Advisory Group on Rivers and Lakes which meets regularly.

Compared to the situation in 2007 (reported in 2009) there has only been a significant increase in lake monitoring, where around 10% more sites were included in operational monitoring. The numbers of monitoring sites in the other water categories were largely unchanged from 2007.

5.2 Monitoring of groundwater

Quantitative and chemical groundwater monitoring has been established in Ireland, with both surveillance and operational monitoring programmes. A single national document was produce on the details of groundwater monitoring.

The groundwater operational monitoring contains core parameters and additional parameters selected based on the pressures identified in the risk assessments. Operational programmes have been selected to take into account pressures from pesticides, hydrocarbons and heavy metals.

The monitoring programme is designed to be able to detect significant and sustained upward trends in pollutant concentrations¹⁷.

¹⁷ Methodology for establishing groundwater threshold values and the assessment of chemical and quantitative status of groundwater, including an assessment of pollution trends and trend reversal

There has been a 25% increase in the number of sites used for chemical surveillance and quantitative status monitoring in Ireland since the report in 2007: the number of sites for operational chemical monitoring has remained largely the same.

As for surface waters, there is a transboundary monitoring programme in place in the Neagh Bann and North Western international RBDs, which is coordinated with the UK¹⁸.

5.3 Monitoring of protected areas

There are no specific monitoring programmes reported for surface water drinking water protected areas. Monitoring of drinking water protected areas in lakes is said to take place 4-12 times per year and include general physical parameters and chlorophyll, but not priority substances unless part of surveillance monitoring. All groundwater bodies are designated as drinking water protected areas (DWPAs), and the national groundwater monitoring network was selected to be representative of all groundwater bodies. The number of monitoring sites located in protected areas is not reported to WISE, but the Irish Authorities have provided complementary information partly showed in table 5.3.1. Irish authorities have also confirmed that all Bathing water protected areas are monitored. The Nitrates areas set out in the table below are from the 2004-7 Nitrates Directive reporting period.

RBD	Surface waters									Ground-water drinking water
	Surface drinking water abstraction	Quality of drinking water	Bathing water **	Birds sites **	Fish **	Habitats sites **	Nitrates **	Shellfish **	UWWT **	
GBNIIENB	5	5	2	3	0	3	14	6	5	8
GBNIIENW	22	22	10	36	23	113	66	21	2	7
IEEA	25	24	6	20	25	68	60	2	11	18
IEGBNISH	54	54	10	102	11	159	136	5	13	47
IESE	18	18	6	7	50	254	129	9	48	65
IESW	32	32	11	37	44	221	83	25	11	28
IEWE	67	68	19	85	77	270	112	29	6	22
<i>Total</i>	<i>223</i>	<i>224</i>	<i>64</i>	<i>290</i>	<i>230</i>	<i>1088</i>	<i>600</i>	<i>97</i>	<i>96</i>	<i>300</i>

Table 5.3.1: Number of monitoring sites in protected areas.

Note: * Number of sites calculated from data reported at site level. If no data reported at site level, then table supplemented with data reported at programme level.

** Based on complementary data provided by Irish Authorities.

Source: WISE, Irish Authorities

<http://www.epa.ie/downloads/pubs/water/ground/Methodology%20for%20Groundwater%20Chemical%20&%20Quantitative%20Status%20Methodology,%20TVs%20and%20Trends.pdf>

¹⁸ Ireland Water Framework Directive Monitoring Programme

http://www.epa.ie/downloads/pubs/water/other/wfd/EPA_water_WFD_monitoring_programme_main_report.pdf

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

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
GBNIIENB	118	0	0	21	17.8	42	35.6	32	27.1	4	3.4	19	16.1
GBNIIENW	947	162	17.1	329	34.7	253	26.7	146	15.4	13	1.4	44	4.6
IEEA	405	19	4.7	151	37.3	133	32.8	73	18.0	27	6.7	2	0.5
IEGBNISH	1038	52	5.0	384	37.0	320	30.8	231	22.3	25	2.4	26	2.5
IESE	711	46	6.5	281	39.5	250	35.2	115	16.2	14	2.0	5	0.7
IESW	1045	341	32.6	347	33.2	265	25.4	64	6.1	1	0.1	27	2.6
IEWE	1383	392	28.3	547	39.6	214	15.5	159	11.5	15	1.1	56	4.0
<i>Total</i>	<i>5647</i>	<i>1012</i>	<i>17.9</i>	<i>2060</i>	<i>36.5</i>	<i>1477</i>	<i>26.2</i>	<i>820</i>	<i>14.5</i>	<i>99</i>	<i>1.8</i>	<i>179</i>	<i>3.2</i>

Table 6.1: Ecological status of natural surface water bodies

Source: WISE

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
GBNIIENB	0	0	0	0	0	0	0	0	0	0	0	0	0
GBNIIENW	5	0	0	2	40.0	3	60.0	0	0	0	0	0	0
IEEA	7	0	0	4	57.1	3	42.9	0	0	0	0	0	0
IEGBNISH	6	0	0	2	33.3	4	66.7	0	0	0	0	0	0
IESE	3	0	0	2	66.7	1	33.3	0	0	0	0	0	0
IESW	5	0	0	0	0	5	100	0	0	0	0	0	0
IEWE	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Total</i>	<i>26</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>38.5</i>	<i>16</i>	<i>61.5</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>

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

Source: WISE

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GBNIIENB	118	22	18.6	5	4.2	91	77.1
GBNIIENW	947	196	20.7	4	0.4	747	78.9
IEEA	405	140	34.6	10	2.5	255	63.0
IEGBNISH	1038	382	36.8	7	0.7	649	62.5
IESE	711	297	41.8	5	0.7	409	57.5
IESW	1045	272	26.0	1	0.1	722	73.9
IEWE	1383	293	21.2	6	0.4	1084	78.4
<i>Total</i>	<i>5647</i>	<i>1602</i>	<i>28.4</i>	<i>38</i>	<i>0.7</i>	<i>3957</i>	<i>70.1</i>

Table 6.3: Chemical status of natural surface water bodies

Source: WISE

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GBNIIENB	0	0	0	0	0	0	0
GBNIIENW	5	0	0	0	0	5	100
IEEA	7	0	0	1	14.3	6	85.7
IEGBNISH	6	0	0	1	16.7	5	83.3
IESE	3	1	33.3	0	0	2	66.7
IESW	5	0	0	1	20.0	4	80.0
IEWE	0	0	0	0	0	0	0
<i>Total</i>	26	1	3.8	3	11.5	22	84.6

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

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GBNIIENB	28	26	92.9	2	7.1	0	0
GBNIIENW	72	72	100	0	0	0	0
IEEA	75	68	90.7	7	9.3	0	0
IEGBNISH	242	182	75.2	60	24.8	0	0
IESE	151	148	98	3	2	0	0
IESW	84	78	92.9	6	7.1	0	0
IEWE	104	70	67.3	34	32.7	0	0
<i>Total</i>	756	644	85.2	112	14.8	0	0

Table 6.5: Chemical status of groundwater bodies
Source: WISE

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
GBNIIENB	28	28	100	0	0	0	0
GBNIIENW	72	72	100	0	0	0	0
IEEA	75	74	98.7	1	1.3	0	0
IEGBNISH	242	242	100	0	0	0	0
IESE	151	149	98.7	2	1.3	0	0
IESW	84	83	98.8	1	1.2	0	0
IEWE	104	104	100	0	0	0	0
<i>Total</i>	756	752	99.5	4	0.5	0	0

Table 6.6 Quantitative status of groundwater bodies
Source: WISE

RBD	Total	Global status (ecological and chemical)					Good ecological status 2021		Good chemical status 2021		Good ecological status 2027		Good chemical status 2027		Global exemptions 2009 (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015									Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	No.	%	No.	%	%	%	%	%
GBNIIENB	118	5	4.2	7	5.9	1.7	125				125				66	0	0	0
GBNIIENW	952	83	8.7	108	11.3	2.6	959				963				27	0	0	0
IEEA	412	45	10.9	74	18.0	7.0									40	0	0	9
IEGBNISH	1044	140	13.4	213	20.4	7.0	1028				1035				37	0	0	0
IESE	714	119	16.7	150	21.0	4.3									39	0	0	0
IESW	1050	153	14.6	176	16.8	2.2	1021				1023				20	0	0	0
IEWE	1383	171	12.4	199	14.4	2.0	1328				1329				20	0	0	0
<i>Total</i>	<i>5673</i>	<i>716</i>	<i>12.6</i>	<i>927</i>	<i>16.3</i>	<i>3.7</i>									<i>29</i>	<i>0</i>	<i>0</i>	<i>1</i>

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

Waterbodies with good status in 2009 fall into the following category:

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

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

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

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

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

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

Note: * Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

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

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

RBD	Total	Ecological status					Good ecological status 2021		Good ecological status 2027		Ecological exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	118	21	17.8	27	22.9	5.1					66.1	0	0	0
GBNIIENW	947	491	51.8	650	68.6	16.8					27.0	0	0	0
IEEA	405	170	42.0	210	51.9	9.9					38.8	0	0	9.6
IEGBNISH	1038	436	42.0	635	61.2	19.2					37.0	0	0	0
IESE	711	327	46.0	433	60.9	14.9					38.7	0	0	0
IESW	1045	688	65.8	822	78.7	12.8					19.4	0	0	0
IEWE	1383	939	67.9	1061	76.7	8.8					19.5	0	0	0
Total	5647	3072	54.4	3838	68.0	13.6					28.7	0	0	0.7

Table 6.8: Natural surface water bodies: ecological status in 2009 and expected status in 2015, 2021 and 2027*

Note : Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

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

RBD	Total	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	0	22	18.6	27	22.9	4.2					0	0	0	0
GBNIIENW	5	196	20.7	200	21.1	0.4					0	0	0	0
IEEA	7	140	34.6	144	35.6	1.0					1.5	0	0	0
IEGBNISH	6	382	36.8	389	37.5	0.7					0	0	0	0
IESE	3	297	41.8	302	42.5	0.7					0	0	0	0
IESW	5	272	26.0	273	26.1	0.1					0	0	0	0
IEWE	0	293	21.2	298	21.5	0.4					0.1	0	0	0
Total	26	1602	28.4	1633	28.9	0.5					0.1	0	0	0

Table 6.9: Natural surface water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*

Note Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs :

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

RBD	Total	GW chemical status					Good chemical status 2021		Good chemical status 2027		GW chemical exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	28	26	92.9	26	92.9	0	28	100	28	100	7	0	0	0
GBNIIENW	72	72	100	72	100	0	72	100	72	100	0	0	0	0
IEEA	75	68	90.7	68	90.7	0					8	1	0	0
IEGBNISH	242	182	75.2	238	98.3	23.1	237	98	242	100	2	0	0	0
IESE	151	148	98.0	148	98.0	0	148		151	100	2	0	0	0
IESW	84	78	92.9	84	100	7.1	84	100	84	100	0	0	0	0
IEWE	104	70	67.3	104	100	32.7					0	0	0	0
Total	756	644	85.2	740	97.9	12.7					2	0.1	0	0

Table 6.10: Groundwater bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*

Note : * Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

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

RBD	Total	Groundwater quantitative status					Good quantitative status 2021		Good quantitative status 2027		GW quantitative exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	28	28	100	28	100	0	28	100	28	100	0	0	0	0
GBNIIENW	72	72	100	72	100	0	72	100	72	100	0	0	0	0
IEEA	75	74	98.7	74	98.7	0					1	0	0	0
IEGBNISH	242	242	100	242	100	0	242	100	242	100	0	0	0	0
IESE	151	149	98.7	151	100	1.3					0	0	0	0
IESW	84	83	98.8	84	100	1.2					0	0	0	0
IEWE	104	104	100	104	100	0					0	0	0	0
Total	756	752	99.5	755	99.9	0.4					0.1	0	0	0

Table 6.11: Groundwater bodies: quantitative status in 2009 and expected status in 2015, 2021 and 2027*

Note : * Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs

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

RBD	Total HMWB	Ecological potential	Good ecological	Good ecological	Ecological exemptions (% of all HMWB/AWB)
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		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	0	0	0	0	0	0					0	0	0	0
GBNIIENW	5	2	40.0	5	100	60.0					0	0	0	0
IEEA	7	4	57.1	6	85.7	28.6					28.6	0	0	0
IEGBNISH	6	2	33.3	4	66.7	33.3					50	0	0	0
IESE	3	2	66.7	3	100	33.3					0	0	0	0
IESW	5	0	0	2	40.0	40.0					60	0	0	0
IEWE	0	0	0	0	0	0					0	0	0	0
Total	26	10	38.5	20	76.9	38.4					30.8	0	0	0

Table 6.12: Heavily modified and artificial water bodies: ecological potential in 2009 and expected ecological potential in 2015, 2021 and 2027

Note : Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

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

RBD	Total HMWB and AWB	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all HMWB/AWB)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
GBNIIENB	0	0	0	0	0	0					0	0	0	0
GBNIIENW	5	0	0	0	0	0					0	0	0	0
IEEA	7	0	0	1	14.3	14.3					0	0	0	0
IEGBNISH	6	0	0	1	16.7	16.7					0	0	0	0
IESE	3	1	33.3	1	33.3	0					0	0	0	0
IESW	5	0	0	0	0	0					20	0	0	0
IEWE	0	0	0	0	0	0					0	0	0	0
Total	26	1	3.8	3	11.5	7.7					3.8	0	0	0

Table 6.13: Heavily modified and artificial water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*

Note : Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

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

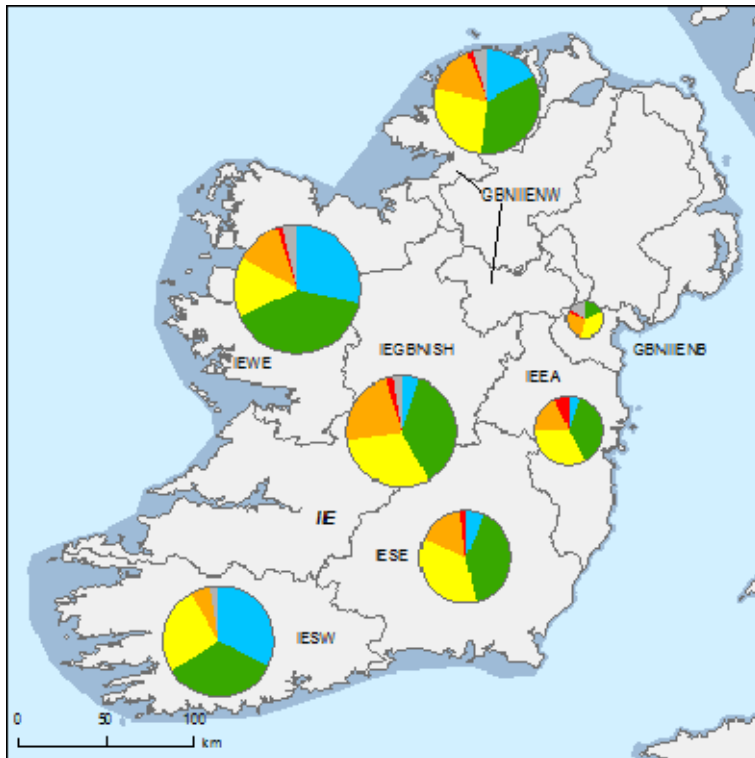


Figure 6.1: Map of ecological status of natural surface water bodies 2009

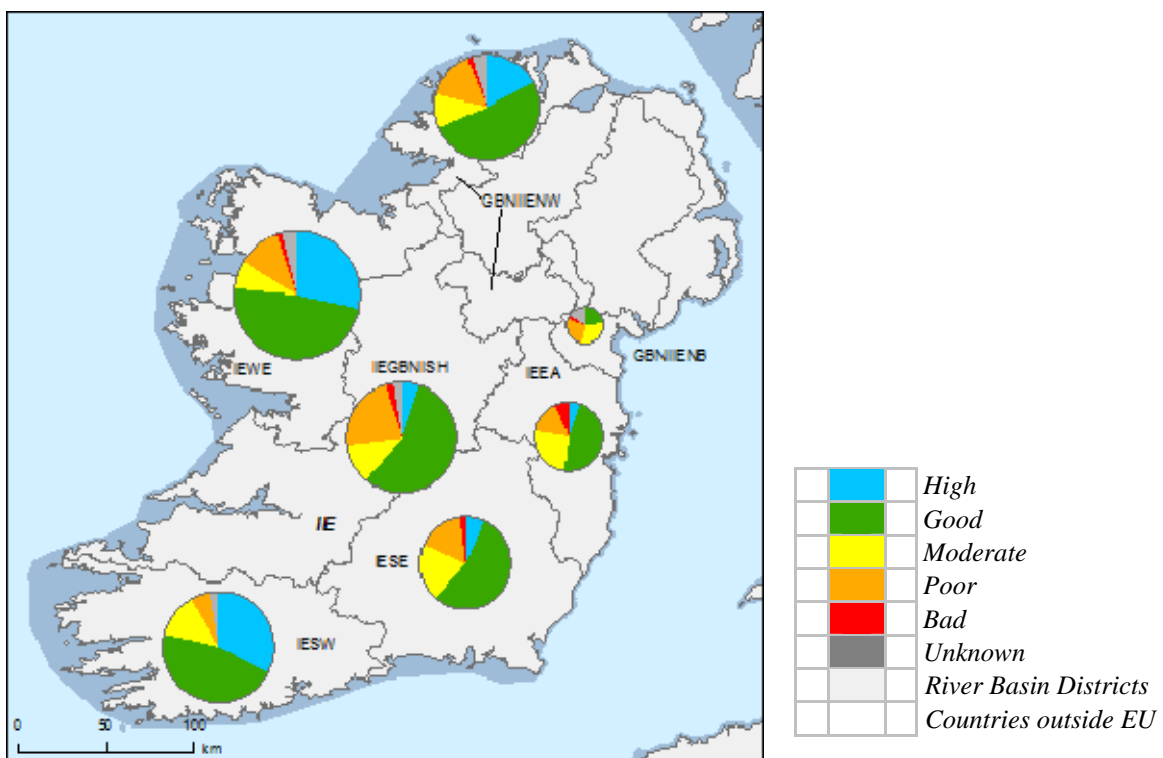


Figure 6.2: Map of ecological status of natural surface water bodies 2015

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

Source: WISE, Eurostat (country borders)

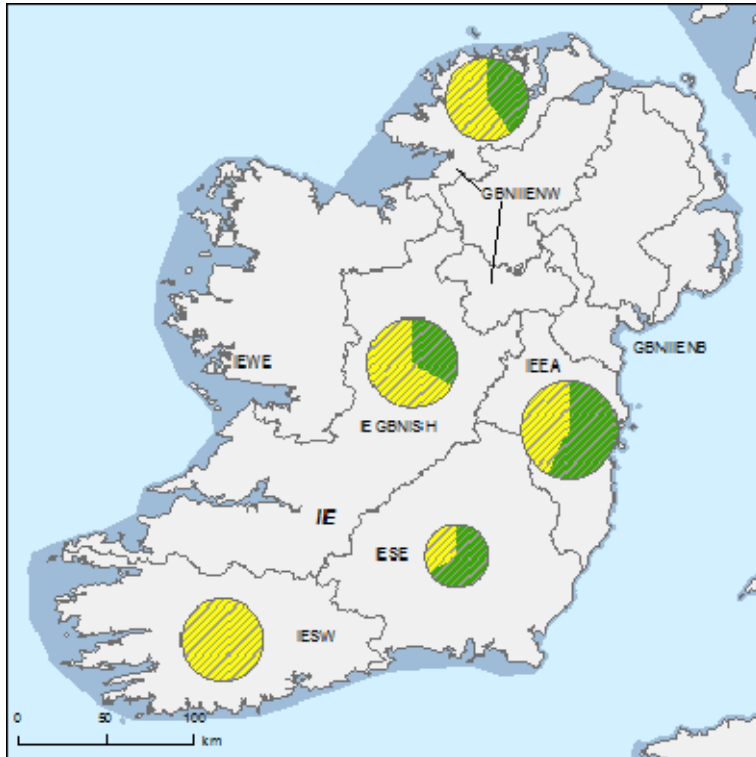


Figure 6.3: Map of ecological potential of artificial and heavily modified water bodies 2009

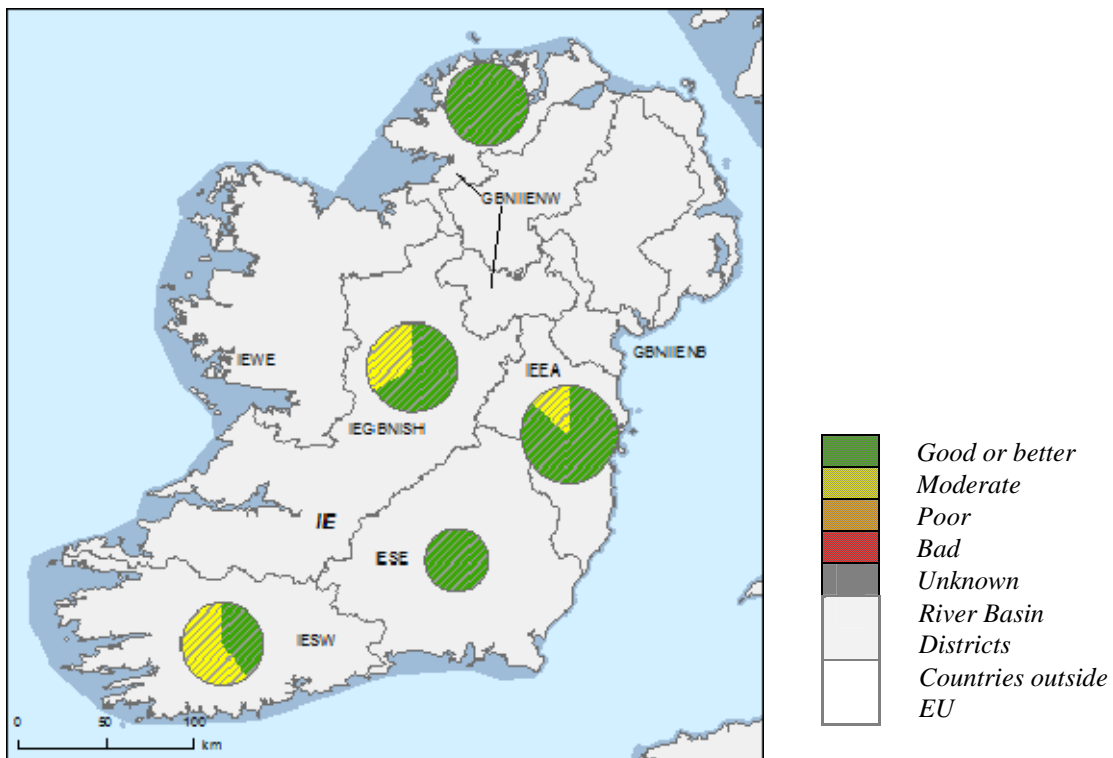


Figure 6.4: Map of ecological potential of artificial and heavily modified water bodies 2015

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

Source: WISE, Eurostat (country borders)

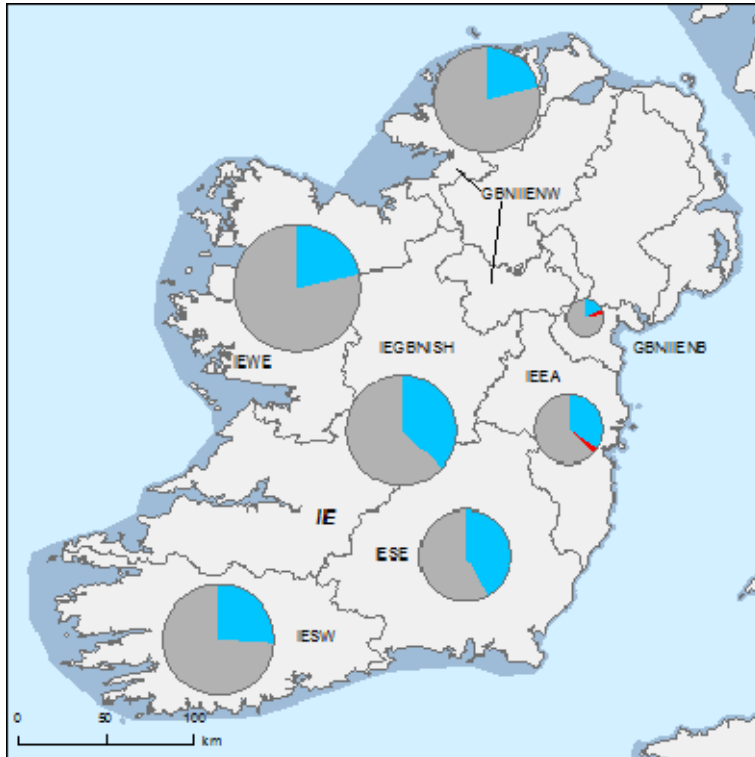


Figure 6.5: Map of chemical status of natural surface water bodies 2009

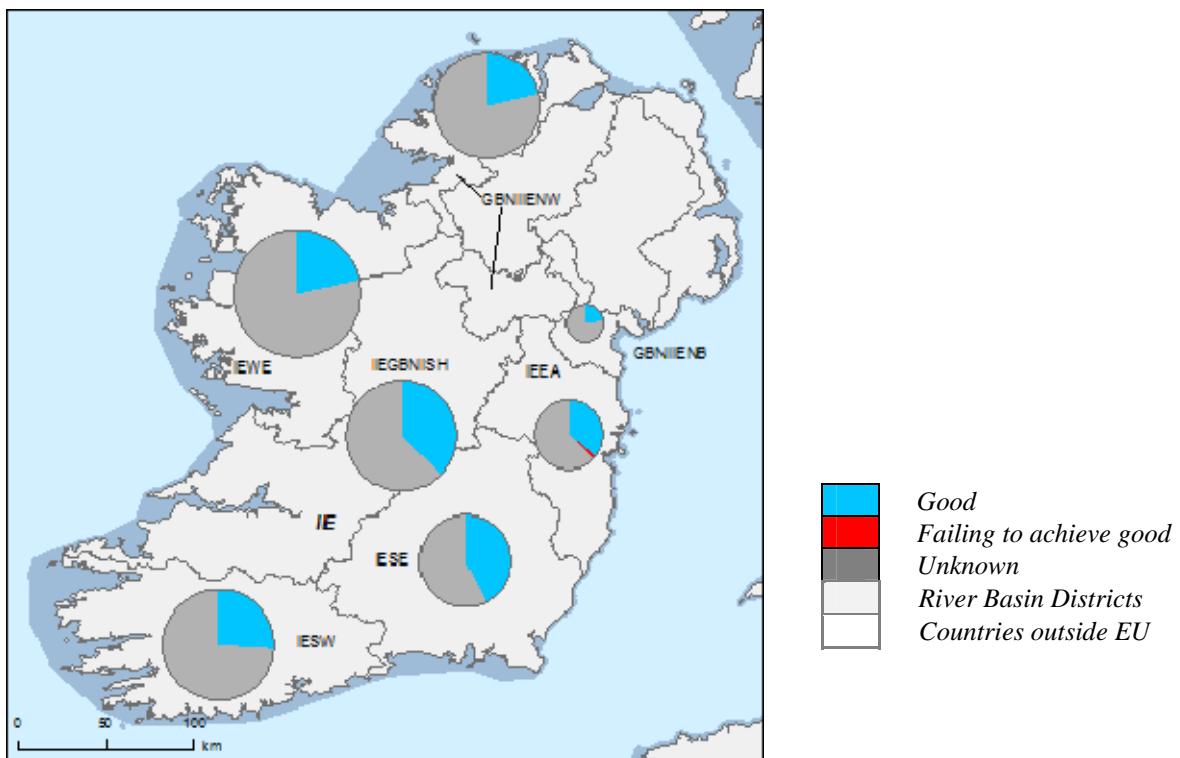


Figure 6.6: Map of chemical status of natural surface water bodies 2015

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

Source: WISE, Eurostat (country borders)

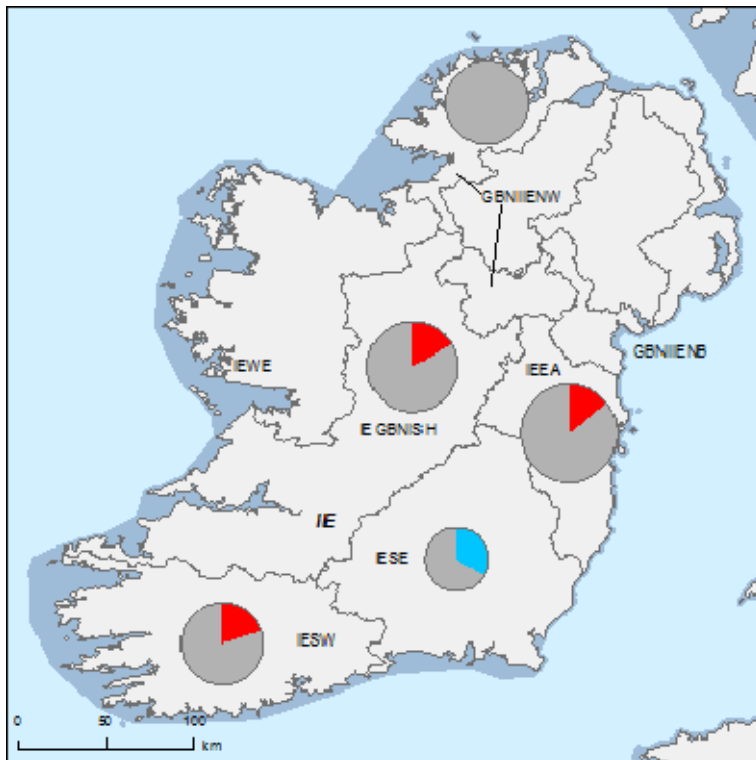


Figure 6.7: Map of chemical status of artificial and heavily modified water bodies 2009

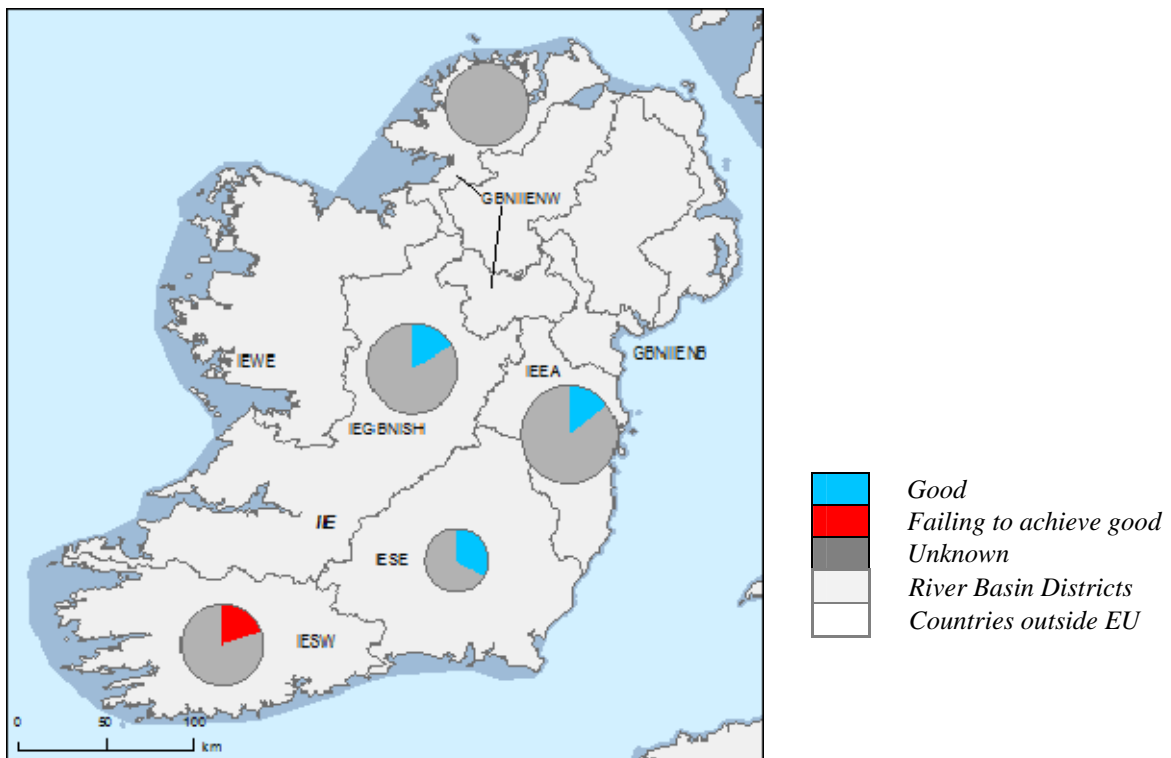


Figure 6.8: Map of chemical status of artificial and heavily modified water bodies 2015
Note: Standard colours based on WFD Annex V, Article 1.4.3.
Source: WISE, Eurostat (country borders)

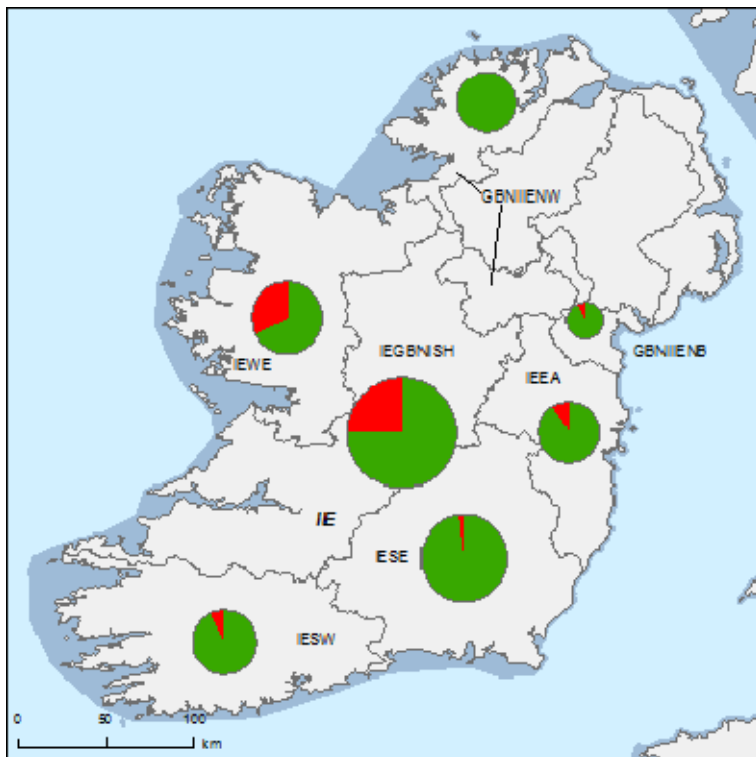


Figure 6.9: Map of chemical status of groundwater bodies 2009

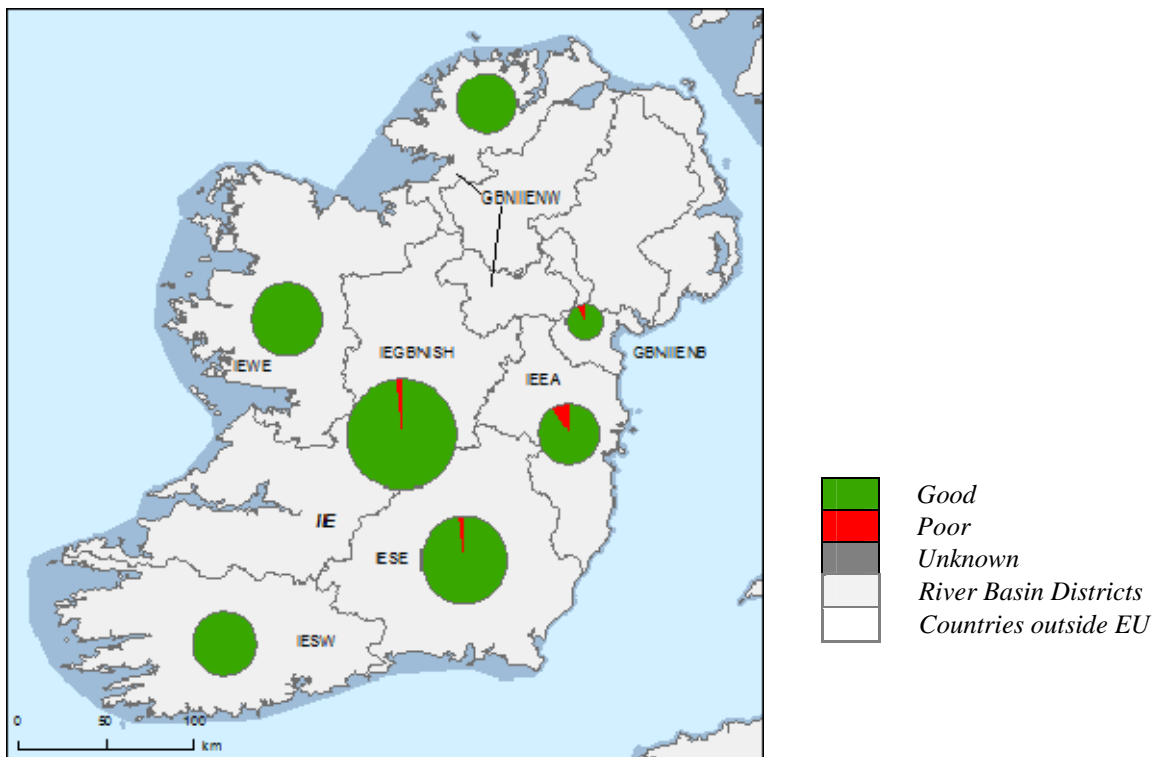


Figure 6.10: Map of chemical status of groundwater bodies 2015

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

Source: WISE, Eurostat (country borders)

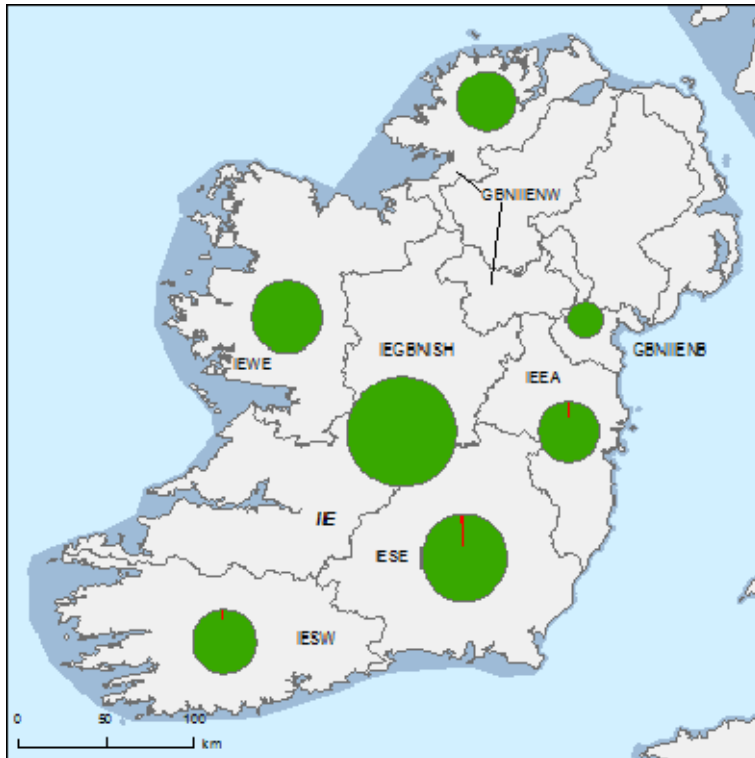


Figure 6.11: Map of quantitative status of groundwater bodies 2009

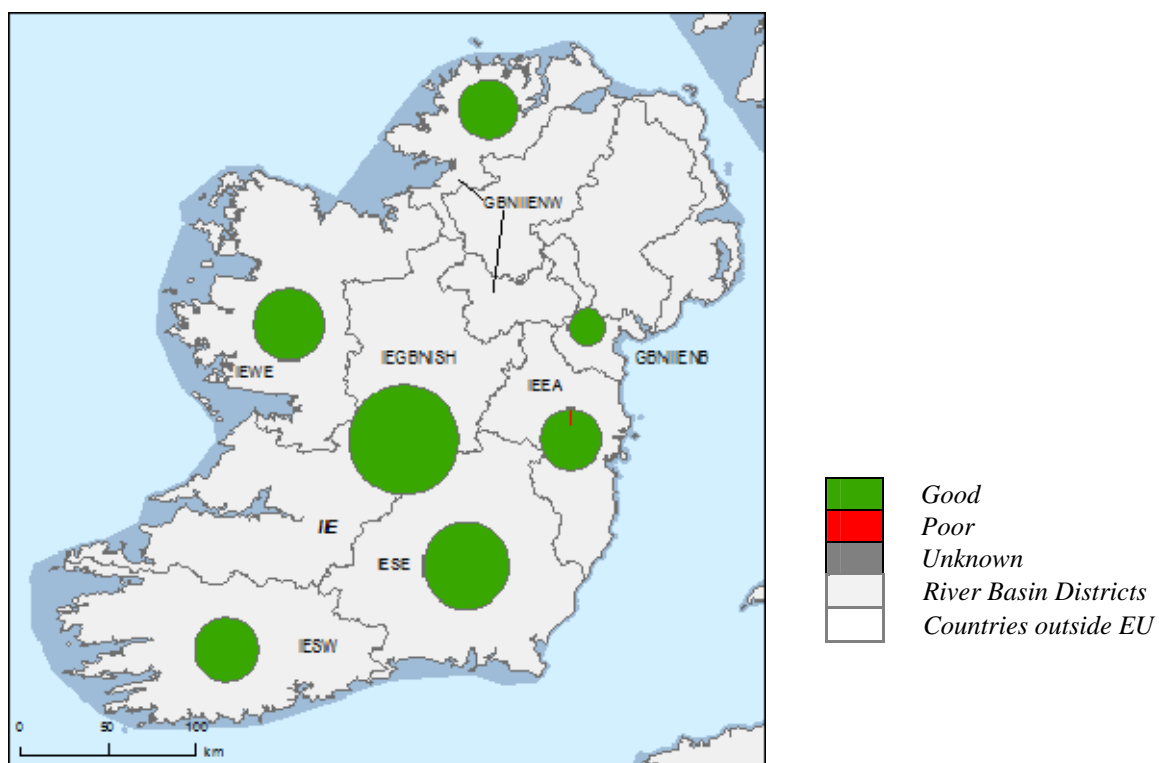


Figure 6.12: Map of quantitative status of groundwater bodies 2015

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

Source: WISE, Eurostat (country borders)

7. ASSESSMENT OF ECOLOGICAL STATUS OF SURFACE WATERS

The assessment of ecological status generally follows a national approach.

7.1 Ecological status assessment methods

WFD compliant biological assessment methods were not fully developed in the first river basin planning cycle. The quality elements (QEs) for which assessment methods were missing or only partially developed according to the assessment of the RBMPs and information reported to WISE were¹⁹:

Water category	BQEs
Rivers	Macrophytes, phytobenthos, fish
Lakes	Phytobenthos, benthic fauna, fish
Transitional	Phytoplankton, angiosperms, benthic fauna, fish
Coastal	Benthic fauna

Table 7.1.1: BQEs monitored by water category

Source: RBMPs

It should be noted that **interim methodologies** were used for a number of QEs until methods are fully developed. Some classifications were based only on expert judgement for the first RBNMPs. Methodologies for these biological QEs(BQEs) have however since been developed, or are under developed and included in Phase 2 of the intercalibration process. As part of this process, a method for assessing acidification status using macroinvertebrates in lakes will be adopted and a method for trophic status using macroinvertebrates is still in development. It is not clear if methods for phytoplankton and benthic invertebrates in transitional waters will be developed. Phytoplankton is not considered relevant in Irish rivers as rivers have low retention times, leading to low phytoplankton populations. Because of this Phytoplankton is not monitored nor assessed in Irish rivers.

Compared to 2007 there still appear to be no assessment methods for fish in rivers, lakes and transitional waters.

¹⁹ In 2012, Irish Authorities have clarified that all biological quality elements listed in Annex V of the WFD now have methods in use and most are intercalibrated in Decision 1 or due in Decision 2.

RBD	Rivers							Lakes							Transitional							Coastal					
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Physico-Chemical	Hydromorphological
IEEA																											
GBNIIENB																											
GBNIIENW																											
IESE																											
IEGBNISH																											
IESW																											
IEWE																											

Table 7.1.2: Availability of biological assessment methods

	Assessment methods fully developed for all BQEs
	Assessment methods partially developed or under development for all or some BQEs
	Assessment methods not developed for BQEs, no information provided on the assessment methods, unclear information provided
-	Water category not relevant

Source: RBMPs

It is not clear whether the biological assessment methods are suitable to **detect all relevant pressures**. The intercalibration process has primarily intercalibrated methods for the most widespread pressure – organic enrichment. Specific methods to detect other pressures such as acidity are under development but have been difficult to intercalibrate with confidence.

Not all physico-chemical QEs would be expected to clearly relate to biological status. For rivers, some boundaries are clearly related to the class boundaries, while those for salinity and nitrogen are not. Other standards such as the Salmonid Regulation standards were used for setting boundaries for temperature and dissolved oxygen in rivers and lakes, while statistical analysis of unpolluted sites was used for ammonia and phosphate. Class boundaries are set for hydromorphological QEs, but there is no evidence that the boundaries set are clearly related to biological QEs.

EQSs which are clear and transparent have been set for all **relevant specific pollutants**. The method used followed that in Annex V.

For rivers, transitional and coastal waters, the **one-out-all-out principle** for the classification of overall ecological status is applied and follows the procedure in the classification guidance. However, for lakes, the principle was not deemed appropriate due to the limited amount of data available. For the purpose of advising status of the 1st RBMPs a weight of evidence approach was taken, and for most lakes this was one-out-all-out.

For rivers and lakes, a methodology is in place for assessment of **confidence** and precision of results. For rivers, statistical confidence could be assessed for all metrics except fish, where the assessment was based on expert judgement. There was a lack of data for the first RBMPs due to low sample frequency and low coverage of elements/ parameters. As a result, confidence was low in the assigned status for some lakes. Expert judgment was therefore applied for the given reasons to biological status for seven lakes and for 15 additional lakes for ecological status. For transitional and coastal waters confidence for the interim assessment was based on data availability and was outlined in the explanatory note accompanying the interim status. Irish authorities have indicated that more robust methods will be developed for future assessments.

Assessment methods have been developed for all national river types. However, methods are not in place for transitional and coastal waters, and it is not clear if methods have been developed for lakes. The second intercalibration decision will expand on the network of BQEs and lake types covered.

For rivers, the **class boundaries** set for the ecological status assessment for the 1st RBMPs were consistent with the results of the intercalibration of phase 1. For lakes and coastal waters, it is not clear if this is the case. For lakes, standards for macrophytes match the intercalibration results, but those for phytoplankton do not. For transitional waters, the only intercalibrated QE is angiosperms, for which there are no standards set in IE. For coastal waters, the high/good standard is different to the intercalibration results, though the good/moderate boundary is the same. National boundaries for phytoplankton and coastal macroalgae did match the IC boundaries and similarly for river invertebrates among others.

7.2 Application of methods and ecological status results

Not all QEs were used in the **classification of status** of surveillance and operational monitoring sites. For rivers all BQE (fish, macrophytes, macroinvertebrates, phytobenthos) and supporting physico-chemical QEs including hydromorphology were used to assess the ecological status of surveillance sites. For operational sites the primary BQE was macroinvertebrates and combined on a one-out all-out basis with the supporting physico-chemical QEs as per the list in SI 272 of 2009 and the parameters listed in the monitoring programme. Some specific pollutants were also used where these posed threats (mining or industrial discharges) with failures reported individually in e.g. Water Quality in Ireland 2007-2009. For lakes, the only QEs used were phytoplankton, macrophytes and fish. The BQEs used for transitional and coastal waters were phytoplankton and macroalgae. Hydromorphological and physico-chemical QEs and specific pollutants were also used, the individual substances were specified in the monitoring programme submitted under article 8.

The **assessment methods** for classification of ecological status are not fully developed for all BQEs in all water categories. While it is noted that for transitional and coastal waters, classification systems are in place to assess nutrient enrichment, organic enrichment, contamination by priority substances and altered habitats, there is no equivalent information on the pressures targeted for rivers and lakes, and there is no assessment of whether the classification system in place is relevant to all major pressures.

Information on the assessment of confidence is limited. For rivers this assessment is built into the status assessment, with a very high (99%) degree of confidence that the standard is exceeded. For lakes, the weight of evidence approach means that the assessment of confidence depends on the driving elements, and is largely done through expert judgement. For transitional and coastal waters no information was supplied on the methods used to assess confidence, except to say that confidence was generally not high enough to classify below moderate. Where confidence was very low, status was set to ‘unassigned’. Irish authorities have clarified that further information on confidence was available, but may not have been reported.

7.3 River basin specific pollutants

The only parameters or **substances which are identified as causing failure of ecological status** are total phosphorus, BOD, molybdate reactive phosphorus, ammonia and dissolved inorganic nitrogen, all in Eastern RBD. No substances causing failures are identified in other RBDs.

RBD	CAS Number	Substance	Percentage Water Bodies Failing Status (%)
IEEA		Total Phosphorus	55% of lakes
IEEA		BOD	15% of Transitional
IEEA		Molybdate Reactive Phosphorus	38% of transitional
IEEA		Dissolved Inorganic Nitrogen	40% of coastal
GBNIIENB			
GBNIIENW			

RBD	CAS Number	Substance	Percentage Water Bodies Failing Status (%)
IESE			
IEGBNISH			
IESW			
IEWE			

Table 7.2.1: River basin specific pollutants causing failure of status
Source: RBMPs

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

The article 5 analysis indicated that less than 5% of water bodies in Ireland would be identified as Heavily Modified or Artificial.

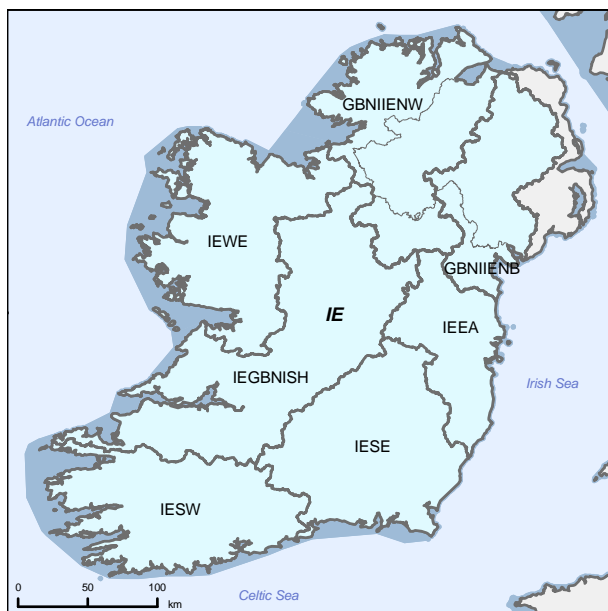
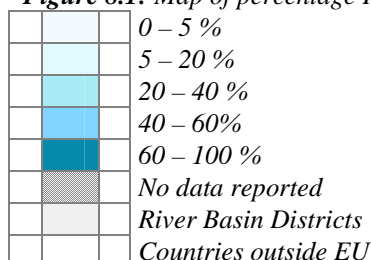


Figure 8.1: Map of percentage Heavily Modified and Artificial waterbodies by River Basin District



Source: WISE, Eurostat (country borders)

8.1 Designation of HMWBs

The number of designated HMWBs and AWBs is reported in WISE.

The RBMP states that HMWBs can be designated where the water use is listed as navigation, storage for drinking water supply, storage for power generation, flood protection or impounded by railway. The physical modifications leading to designation may include locks, weirs, dams, reservoirs, channelization, dredging, bank reinforcement, land reclamation, abstraction or intensive land use. The methodology used to designate HMWBs and AWBs completely followed the process written in CIS Guidance No. 4. Uncertainty in relation to the designation of HMWBs is not discussed in the RBMP.

The RBMP does not include details on the test used to identify ‘significant adverse effect on use’ or the criteria used to define significance. There are also no details on the analysis of alternative options for WFD article 4(3)b²⁰.

8.2 Methodology for setting good ecological potential (GEP)

GEP has been defined for Ireland. The approach used for definition of GEP was a **combination of a reference-based approach** (according to the CIS Guidance) and the **mitigation measures approach**. The approach used for assessment involved an assessment of mitigation measures as an alternative approach for hydromorphological classification. This measures-based hydromorphological class is combined with the physico-chemical and biological class for the water body to determine the final Ecological Potential class for the HMWB. The approach was in accordance with the UK TAG Guidance on the Classification of Ecological Potential for HMWBs & Artificial Water Bodies which in turn was based on the EU CIS guidance no. 14.

The **mitigation measures** identified as having no significant adverse effects on the wider environment include: fish ladders, habitat restoration, removal of structures, restoration of bank structure, dredging minimisation, restoration of bed structure and habitat creation. Measures are considered per HMWB, but for many HMWBs the only measure mentioned is ‘further investigation to confirm impacts’. A full list of recommended mitigation measures can be found in Appendix B²¹.

8.3 Results of ecological potential assessment in HMWB and AWB

Only an interim assessment of Good Ecological Potential (GEP) in HMWBs and AWBs was reported, in the document Report on the Interim Classification of Ecological Potential and identification of measures for Ireland’s Heavily Modified Water Bodies²². This showed that 35% of HMWB were assessed as having good ecological potential, 53% moderate potential, and 12% poor potential. The data shown in WISE was similar to this, although a smaller number of waterbodies were reported in total. No water bodies were given an assessment of poor ecological potential, 38% had good potential and 62% had moderate potential.

²⁰ Overall summary report Heavily Modified Water Bodies and Artificial Water Bodies
http://www.wfdireland.ie/docs/16_HeavilyModifiedAndArtificialWaterBodies/HMWB_AWB_POMS_Overall_Final_Summary.pdf

²¹ [http://www.wfdireland.ie/docs/16_HeavilyModifiedAndArtificialWaterBodies/ROI_HMWB%20Classification_AppendixB\(25-11-08\).xls](http://www.wfdireland.ie/docs/16_HeavilyModifiedAndArtificialWaterBodies/ROI_HMWB%20Classification_AppendixB(25-11-08).xls)

²² http://www.wfdireland.ie/docs/15%20Status/Heavily%20Modified%20Water%20Body_Status.pdf

9. ASSESSMENT OF CHEMICAL STATUS OF SURFACE WATERS

9.1 Methodological approach to the assessment

Standards are applied for all priority substances listed in Annex 1 to the EQSD, except for Trifluralin. This was omitted after monitoring in 2007-09, when no positive identifications were found. The standards which are used match those listed in Annex 1 of the EQSD. Priority substances were monitored monthly for at least one year at all surveillance monitoring sites as required under Annex V (approximately 300 water bodies across all surface water categories) as per the monitoring programme. A limited number of failures occurred and these are reported individually – see below. No standards are not yet applied in biota and sediment.

All samples were subject to a range of metal analyses, and in most cases concentrations were below those set in EQS documentation so there was no need to take account of background concentrations.

9.2 Substances causing exceedances

The information reported on the chemical status of waters is limited, with large numbers of water bodies reported as ‘unknown’ status. This occurred because full analyses could not be undertaken prior to the submission of the RBMP. More recent information shows 38 failures of Good chemical status in rivers, 34 due to Polyaromatic Hydrocarbons, three due to mercury and one due to cadmium. Other substances reported to cause failures include: brominated diphenylether, lead, anthracence, chloroalkenes, endosulfan and pentachlorobenzene.

Substance	IEEA	GBNIIENB	GBNIIENW	IESE	IEGBNISH	IESW	IEWE
Polyaromatic Hydrocarbons							
Mercury							
Cadmium							
Brominated diphenylether							
Lead							
Anthracence							
Chloroalkenes							
Endosulfan							
Pentachlorobenzene							

Table 9.2.1: Substances responsible for exceedances

Source: WISE

9.3 Other issues

Monitoring within mixing zones is not generally done and results are not used to assign status but treated as investigative monitoring if undertaken.

10. ASSESSMENT OF GROUNDWATER STATUS

The assessment of groundwater status generally follows a national approach.²³

10.1 Groundwater quantitative status

Only 4 GWBs are assessed to be in poor groundwater status in Ireland.

The RBMP notes that associated surface waters and groundwater dependent terrestrial ecosystems (GWDTEs) are considered in the assessment of quantitative status. The impacts of abstraction on GWDTEs and saline or other intrusions have also been considered. The balance between recharge and abstraction is assessed by comparing the annual average abstraction against available groundwater resource for every groundwater body. Final status was assigned based on the abstraction/recharge ratio.

There is a lack of information on ecological flow standards, and subsequently the ecological assessment of associated surface waters could not be undertaken and is planned for the second RBMP cycle.

10.2 Groundwater chemical status

Information on risk is not available for specific groundwater bodies, and is only available for certain pressure categories. Assessments of risk are undertaken using the approach detailed in CIS Guidance no. 18.

Ireland established threshold values for 40 pollutants considering risks to GWBs. All substances in Annex II of the GWD have been taken into account when setting **threshold values (TVs)**. TVs have been established for all of those substances except trichloroethylene. The methodology used for establishment of GW threshold values includes the assessment of saline or other intrusions, impact on chemical status of surface waters, and drinking water protected areas. The impact on groundwater dependent terrestrial ecosystems (GWDTEs) was not assessed in the first RBMP cycle because of the lack of data, although there are 266 GWBs associated with GWDTEs in Ireland. A full assessment of GWDTEs is planned for the second cycle. Threshold values have been coordinated with the UK in international RBDs.

²³ Irish Authorities have clarified that the information is available in a separate report on risk characterisation of Ireland's Groundwater :
http://www.wfdireland.ie/docs/31_RiskAssessments/Groundwater%20Risk%20Assessment/GW8%20Compiled%20RA%20Sheets.pdf

Background levels of naturally occurring substances have been taken into account in the establishment on threshold values. Natural background concentrations were determined through a research project looking at the natural quality of groundwater in Ireland.

Methodology is given for the TV exceedances that are acceptable for good groundwater chemical status. No details are given about TV exceedances themselves.

A methodology has been established for the assessment of trends in line with the CIS guidance document. Starting points for trend reversal are defined with 75% of the quality standards and threshold values, but no methodology for trend reversal has been established as no water bodies with significant upward trends were found in the first RBMP cycle. This will be considered in the second RBMP cycle. Additional trend assessments of existing plumes are also planned in the second RBMP cycle.

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10.3 Protected areas

RBD	Good	Failing to achieve good	Unknown
GBNIIENB	Not separated from UK codes so excluded from IE table.		
GBNIIENW			
IEEA	75		
IEGBNISH	241	1	
IESE	150	1	
IESW	84		
IEWE	104		
<i>Total</i>	<i>731</i>	<i>2</i>	<i>0</i>

Table 10.3.1: Number and status of groundwater drinking water protected areas
Source: WISE

11. ENVIRONMENTAL OBJECTIVES AND EXEMPTIONS

Surface water bodies	Rivers	Lakes	Transitional	Coastal
Number of all surface water bodies at good ecological status/potential or better now (2009)	2500	531	38	40
Number of all surface water bodies at good ecological status/potential or better in 2015	2898	662	62	54
Number of all surface water bodies at good ecological status/potential or better in 2021	4224	785	113	56
Number of all surface water bodies at good ecological status/potential or better in 2027	4238	785	113	56

Table 11.1: Surface water bodies which will achieve objectives by 2015, 2021 and 2027
Source: RBMPs

Groundwater bodies	No.
Number of groundwater bodies at good quantitative status now (2009)	752
Number of groundwater bodies at good quantitative status in 2015	752
Number of groundwater bodies at good quantitative status in 2021	752
Number of groundwater bodies at good quantitative status in 2027	752
Number of groundwater bodies at good chemical status now (2009)	642
Number of groundwater bodies at good chemical status in 2015	646
Number of groundwater bodies at good chemical status in 2021	742
Number of groundwater bodies at good chemical status in 2027	750

Table 11.2: Groundwater bodies which will achieve objectives by 2015, 2021 and 2027
Source: RBMPs

RBD	Article 4(4)					Article 4(5)				
	R	L	T	C	GW	R	L	T	C	GW
GBNIIENB	69	14	8	3	2	0	0	0	0	0
GBNIIENW	210	58	7	5	0	0	0	0	0	0
IEEA	28	5	13	5	8	0	0	0	0	1
IEGBNISH	355	34	6	0	60	0	0	0	0	0
IESE	275	0	5	1	3	0	0	0	0	0
IESW	178	1	23	4	5	0	0	0	0	0
IEWE	253	16	2	0	34	0	0	0	0	0
Total	1368	128	64	18	112	0	0	0	0	1

Table 11.3: Exemptions for Article 4(4) and 4(5)
Source: RBMPs, (revised data supplied by the Irish Authorities).

11.1 Additional objectives in protected areas

The protected areas found in Ireland include drinking water protected areas, shellfish waters, bathing waters, and Natura 2000 sites. Of these, clearly defined objectives have been set for shellfish waters and Natura 2000 sites, but not for drinking water protected areas and bathing waters.

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

The main **impacts** causing extension of the deadline (Article 4(4)) or lowering the objective (Article 4(5)) include: wastewater treatment plant discharges, mines and contaminated lands (groundwater discharges), agriculture (nutrient losses to surface and groundwaters), forestry (acidification risks), chemical pollution, morphology (channelization and overgrazing), nitrogen losses to estuaries and delayed recovery of highly impacted sites.

Economic analysis is not used to justify extension of objectives in Ireland, and no assessment of **disproportionate costs** is included. A number of projects are underway which will support the assessment of disproportionate costs in cycle 2.

Both factors involving **technical infeasibility** and the influence of **natural conditions** on recovery have been defined in the RBMPs. Technical infeasibility is defined as problems for which: 1. No solution is available, 2. It takes longer to fix the problem than there is time available, or 3. There is no information of the cause of the problem, hence no solution can be identified. Exemptions due to the influence of natural conditions are applied where recovery times are too long to meet the requirements of the directive²⁴.

RBD	Global*		
	Technical feasibility	Disproportionate costs	Natural conditions

²⁴ Alternative Objectives: Approach to Extended Deadlines
http://www.wfdireland.ie/docs/36_Objectives/Extended%20Deadlines%20Background%20Document%20final.pdf

	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)
GBNIIENB	10	0	0	0	71	-
GBNIIENW	33	0	0	0	27	-
IEEA	164	0	0	0	1	-
IEGBNISH	58	0	0	0	329	-
IESE	68	0	0	0	207	-
IESW	27	0	0	0	180	-
IEWE	15	0	0	0	256	-
<i>Total</i>	<i>375</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>1271</i>	<i>-</i>

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

Note : *Exemptions are combined for ecological and chemical status

Source: WISE

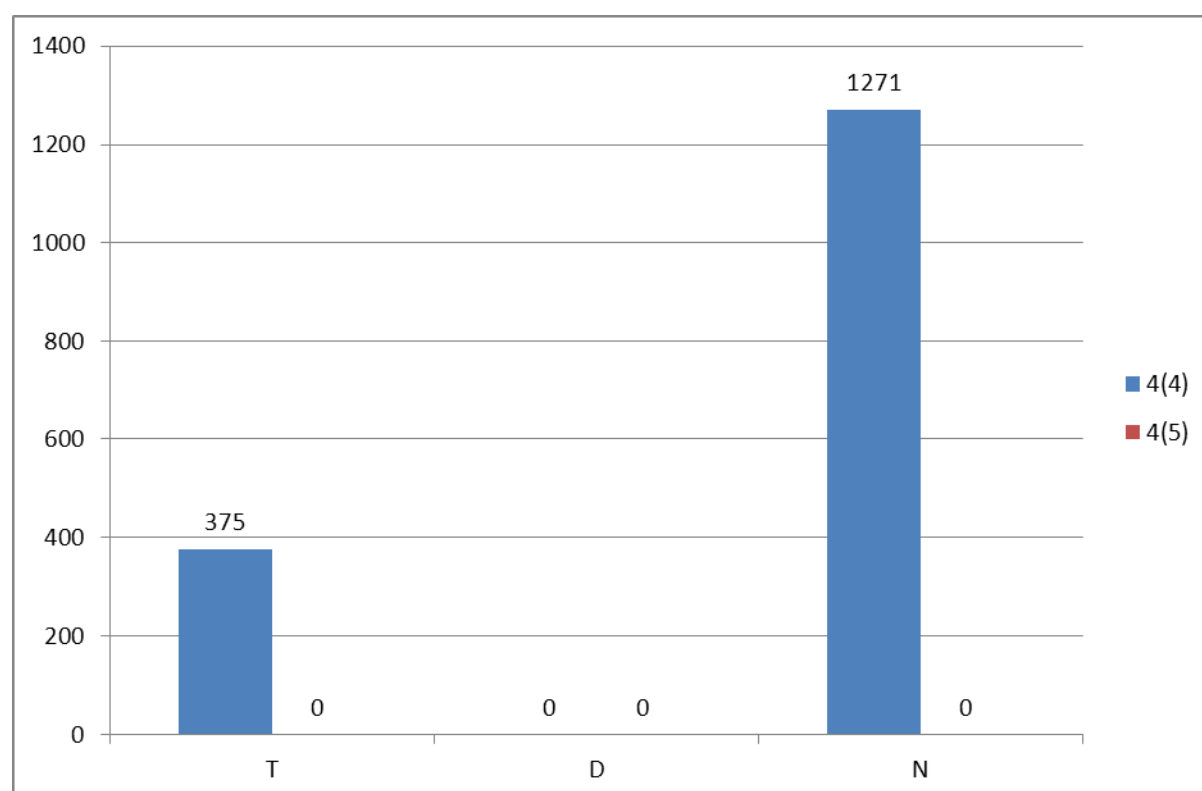


Figure 11.2.1: Numbers of Article 4(4) and 4(5) exemptions

T = Technical feasibility

D = Disproportionate costs

N = Natural conditions

Blue = Article 4(4) exemptions

Red = Article 4(5) exemptions

Source: WISE

11.3 Exemptions according to Article 4(6)

No exemptions are applied under article 4(6).

11.4 Exemptions according to Article 4(7)

No exemptions are applied under article 4(7). However, several projects are planned which may require the application of article 4(7) if the schemes progress.

11.5 Exemptions to Groundwater Directive

No exemptions according to the Groundwater Directive have been applied.

12. PROGRAMMES OF MEASURES

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

It therefore does not include a comprehensive assessment of compliance with the requirements of Article 11(3)²⁵ on basic measures. It focuses in particular on key sets of measures. Member States will report to the Commission by December 2012 on the full implementation of their PoMs, including on the progress on the implementation of basic measures as required by Article 11(3). The Commission will assess what Member States report and will publish its assessment in accordance with Article 18 WFD.

12.1 Programme of measures – general

The status of the water body is the basis for selection of measures, but only interim status classifications have been made for both surface and groundwaters, because methods for assessment of status were not fully intercalibrated. Measures have been proposed based on this interim classification as if it was a full classification.

It is clear that there has been **international coordination** between Ireland and the UK in the setting of Programmes of Measures for international RBDs. It is noted that there is general coordination between the two states, though there are no separate IRBMPs. All coordination of measures has been overseen by the North-South WFD coordination group. No information is available on what specific measures have been coordinated.

Measures have been implemented on a number of **levels**, including nationally, at an RBD level, and at a sub-basin or water body level. The majority of measures are set at a national level. A range of authorities share responsibility for implementation of measures, including:

²⁵ These are the minimum requirements to be complied with and include the measures required under other Community legislation as well as measures to achieve the requirements of other WFD Articles and to ensure appropriate controls on different activities affecting water management.

national authorities, local authorities, enterprises, farmers and individuals, depending on the type or measure and sector in which it applies.

The only Irish RBD with information on **specific costs** is Eastern RBD. For the other RBDs, there is no information on costs except at a national level. The two main sources of water pollution are targeted through the Water Services Investment Programme (WSIP) and the Good Agricultural Practice Regulations. Under the WSIP €2.8bn of projects are under construction or will be progressed to construction by 2012. Under the Good Agricultural Practice Regulations, over €1bn has been invested in upgrading storage capacity so far.

Costs are calculated based on information from the Water Service Investment Programme and agricultural measures in place, so it is likely that actual costs will be even higher. There is no explicit financial commitment and it is unclear how and by whom the financing of measures will be done, but there is an obligation on public bodies to provide this funding. Cost effectiveness of measures has been calculated for some measures in the household and agricultural sectors.

It is not clear by when measures will be **operational**; dates listed for specific measures include 2010, 2012 and 2015²⁶.

12.2 Measures related to agriculture

The pressures on water from agriculture include: pressures on water quality from diffuse sources of pollutants such as pesticides, nutrients and bacteria; over abstraction for agricultural purposes; morphological modifications; point source pollution and eutrophication due to nutrients. Soil erosion is also noted as a potential issue, but it is not clear if this has been identified as a significant pressure.

Farmers groups were included in the general consultation process, but the RBMP does not mention any further consultation with farmers on these measures.

Technical measures which are selected to address pressures include: fertiliser and pesticide reduction, reduction of agricultural intensity and overgrazing, fencing to prevent soil erosion and buffer strips. Non-technical measures include: specifications regarding the implementation of existing legislation such as the Nitrates Directive, development of action plans and specific projects such as the Agricultural Catchments Programme. No economic instruments were used. While water use is considered to be a significant pressure, no measures are in place to address this.

The only information provided on the **scope** of the recommended measures relates to the geographical area affected.

The majority of measures are financed under the Farm Waste Management Scheme or the Rural Environmental Protection Scheme. There is also some potential funding to protect drinking waters under the Rural Development Programme, but this is not mentioned in relation to any other types of measures.

²⁶ National Summary Programmes of Measures
<http://www.wfdireland.ie/docs/National%20Summary%20Programme%20of%20Measures.pdf>

Under the terms of the Good Agricultural Practice Regulations, agricultural measures are reviewed every four years, the current action programme ends in 2013. In addition, measures related to the Nitrates Directive will be implemented in the period 2009-2015.

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

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

12.3 Measures related to hydromorphology

Hydromorphological measures are listed, but little detail is provided. Measures are mostly of a general nature, including investigations or codes of practice. It is stated that there is a

problem with the legislative framework for some measures, and that amendments have been proposed to address these issues. In general, water abstractions in Ireland are sustainable, but due to increasing demand and the need to modernise resource management, legislation is under preparation for the control of abstraction and impoundments of water.

No information was found relating hydromorphological measures to pressures, and no linkages have been made between the measures and their expected effects. The tables of lake ecological status show, however, that a number of lakes failed to achieve good ecological status due to abstraction pressure impacting on littoral macrophytes.

In some cases, hydromorphological measures are planned for use in HMWBs. These may be directly indicated to a water body, or the setting of GEP may indicate that measures are planned²⁷. Work on the ecological benefits of river restoration has been done in Ireland especially for salmonid species. On-going river restoration is undertaken by the OPW and IFI.

No specific measures have been taken in order to achieve an ecologically based flow regime.

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

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

²⁷ Programmes of Measures & Standards – Overall Summary Report – Heavily Modified and Artificial Water Bodies
http://www.wfdireland.ie/docs/16_HeavilyModifiedAndArtificialWaterBodies/HMWB_AWB_POMS_Over_all_Final_Summary.pdf

12.4 Measures related to groundwater

In terms of **quantitative status**, basic measures are implemented in all RBDs including transposition of the WFD into the Water Policy Regulations and Groundwater Environmental Objectives Regulations, and tighter controls on abstractions. Supplementary measures are only used in Eastern and South Western RBDs, where basic measures are insufficient to prevent all problems. Supplementary measures included changes to regulatory regimes for abstraction, water saving measures and support to voluntary initiatives. It is stated that the current system of licensing in Ireland does not meet the requirements of Article 11 (3) e) WFD, and improvements are needed in this area.

In terms of **chemical status**, measures were put in place to prevent and limit point and diffuse discharges of hazardous and non-hazardous substances. These measures included: legislation, additional regulation of point source discharges and prohibition of direct discharges of pollutants into groundwater. Supplementary measures were implemented in Eastern, Shannon, South Western and Western RBDs to address pressures from point and diffuse sources of pollution, but none were specifically linked to groundwater, as it is anticipated that basic measures will be sufficient.

Consultation was carried out in the international RBDs.

12.5 Measures related to chemical pollution

The **inventory** of sources of chemical pollution includes priority substances and certain other pollutants, non-priority specific substances, deoxygenating substances, nutrients and diffuse mobile organics. Very few sites show exceedances of the specific pollutant standards, and the only substances for which standards are exceeded are zinc, copper and glyphosate. The main sources of dangerous substances are municipal and agricultural pollution.

Measures are applied under: the Waste Water Discharge Regulations, the Good Agricultural Practice Regulations, IPPC Licences, Water Pollution Acts and Shellfish water Pollution Reduction Programmes. These measures include: Improve treatment and monitoring of WWTW discharges under the Urban Wastewater Treatment Directive, Emissions limits for pollutants, review of wastewater and industrial licences, relocate discharge points, implement code of practice on unsewered wastewater discharges, promote use of low phosphorus products, and improve management of un-used landfills and contaminated sites. However, there is no information about the scope of application of these measures, i.e. which sectors, substances targeted etc. No **substance specific measures** are listed, however discharge licences include substance specific emission limit values.

12.6 Measures related to Article 9 (water pricing policies)

A **narrow approach to water services** is used and defined in Water Services Act, 2007 as all services, including the provision of water intended for human consumption, which provide storage, treatment or distribution of surface water, groundwater or water supplied by a water services authority, or waste water collection, storage, treatment or disposal.

Ireland notified to the Commission that the Irish authorities agree to amend national measures implementing the Water Framework Directive in a manner that accords with the

Commission interpretation of water services. This change in policy will be reflected in the second-cycle river basin management plans.

Water uses include households, industry and agriculture.

Cost recovery is actually only calculated for the industrial and household sectors. However only industrial contribution to cost recovery can be seen as adequate (contribution of households is zero). Detailed guidance on the calculation of cost recovery (including, inter alia, capital, operation and maintenance costs) was provided to all local authorities following the adoption of the Government's water pricing policy. The policy applies to each local authority and there are no exemptions. The guidance also explicitly required that any environmental costs and the costs of any borrowing or loans should be included in the user charges.

It is reported that the **polluter-pays-principle** has been used in the cost recovery process, but it is not explained how it is used, or to what extent it is used for non-household customers, who are actually exempted from water pricing.

No charge is made for water to household **users**, so there are no incentives in place to use water efficiently. For non-household customers (business and agriculture), a charge is made and metering is required. This policy (in respect of domestic customers) has now changed. The Government has decided that domestic water charges will be introduced and that the charging system will be based on metered consumption. A programme of domestic metering is to commence later 2012.

The provisions of Article 9(4) on **flexibility** have not been used.

Efforts for **coordination** of Article 9 issues have been made between RBDs within Ireland, but no cooperation with the UK in the International RBDs has been reported.

12.7 Additional measures in protected areas

The RBMP contains a clear description of the water bodies where additional measures are needed, and provides information on the type and magnitude of measures given in the PoM.

Additional measures to aid compliance with the Habitats, Shellfish and Birds Directives have been referred to in PoM documents. Measures to aid compliance with the Habitats and Shellfish Directives are also mentioned in other specific plans.

Referring specifically to measures for protected areas under the Shellfish Directive, the Irish RBMPs include the development of Pollution Reduction Programmes for each of the shellfish waters, defined at national level and then tailored to each area. The details for each of the areas are not included in the RBMP, but the document does acknowledge that they have been developed as required in the RBMP cycle.

Legislation to control abstraction and impoundments for drinking water will be developed in 2012. Additional measures in drinking water protected areas are taken under the Drinking Water Regulations.

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

13.1 Water Scarcity and Droughts

The RBMPs do not refer specifically to Water Scarcity or Droughts, and there is no specific indication that any RBD is at risk. While abstraction is a pressure on GW and surface waters in most RBDs, only small numbers of WBs are considered to be at risk from hydrological pressures and small numbers of GWBs are assessed as being at poor quantitative status. Although droughts may become a problem in future under climate change, no Drought Management Plans have been developed.

There are no reported **datasets** for water scarcity and drought or water demand and availability trend scenarios.

Measures to deal with water scarcity and drought are general and include: increased governance of water systems, measures to enhance ecosystem resilience to drought, reduction of distribution losses, and water saving through metering and rainwater harvesting.

No reference is made to international coordination, as water scarcity and drought are not considered to be an issue in Ireland.

13.2 Flood Risk Management

Floods are mentioned in a number of places in the RBMP. Flood protection is listed as a reason for designation of HMWBs, and increased flooding is listed as a risk under climate change scenarios. However, flooding is not listed as a pressure related to hydromorphological measures, and no exemptions are applied under article 4(6) or 4(7).

It is noted that the implementation of the Floods Directive and the Water Framework will be coordinated.

13.3 Adaptation to Climate Change

Climate change is included in the RBMP, with the focus on issues including changes to seasonal weather patterns causing changes in water quality and biodiversity, changes to water availability and demand, flood and drought risks. A national document entitled 'Adapting the Plans to Climate Change'²⁸ is also available, which gives more details on how climate is expected to change in relation to temperature, precipitation, wind and flooding, as well as habitats and biodiversity.

A climate check of the Programme of Measures has been carried out to screen all the measures identified in the RBMP and assess their vulnerability to climate change. Where measures are identified as vulnerable, adaptation was suggested to address changing

²⁸ Adapting the Plans to Climate Change Final Report
<http://www.wfdireland.ie/docs/Adapting%20the%20Plan%20to%20Climate%20Change.pdf>

conditions. The climate check had not much influence though on the selection of measures in the first RBMP cycle. More detailed climate proofing of measures is planned for the next cycle.

Some measures relating to adaptation to climate change are mentioned in the plans, but most references are made to ways in which existing measures can be adapted to climate change. Where specific climate change adaptation measures are mentioned, it is not clear if they have been implemented.

A reference is made to the national climate change strategy.

In future, the RBMP may involve monitoring which is more focused on climate change impacts reconsideration of water body types and ecological status reference conditions. The full Programme of Measures is also planned to be made climate resilient.

14. RECOMMENDATIONS

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

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

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

- Where there are currently high uncertainties in the characterisation of the RBDs, identification of pressures, and assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle.
- Ireland should provide more transparent and complete reports on issues such as monitoring networks and ecological status assessment, both in the RBMPs and to WISE.
- Assessment methods for classification of ecological status were not fully developed for all biological and physico-chemical quality elements (QEs) in all water categories for the 1st RBMP and only interim status has been reported. Although it is recognised that much development has taken place since the submission of the RBMPs, also following the intercalibration process at the EU level, Ireland is recommended to ensure this process is completed for the second cycle.

- The monitoring programmes need to be fully developed, since not all the required QEs are included in the monitoring programmed for lakes and coastal waters. Coastal and estuarine monitoring programmes have not yet been fully implemented.
- The identification of river basin specific pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combatting chemical pollution and that adequate measures are put in place.
- Mercury, hexachlorobenzene and hexachlorobutadiene should be among the substances monitored in biota (for comparison with the biota standards in the EQSD) to assess chemical status, unless water EQS providing an equivalent level of protection have been derived.
- Ireland needs to provide more transparency in the RBMPs on the assessment of environmental objectives and exemptions. A large number of exemptions have been applied in this first cycle of RBMPs. While the WFD does provide for exemptions, there are specific criteria that must be fulfilled for their use to be justified. The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. Ireland should take all necessary measures to bring down the number of exemptions for the next cycle, including the needed improvements in the characterisation process, monitoring networks and status assessment methods, as well as reducing significantly the degree of uncertainties.
- The use of exemptions under Article 4(7) should be based on a thorough assessment of all the steps as requested by the WFD, in particular an assessment of whether the project is of overriding public interest and whether the benefits to society outweigh the environmental degradation, and regarding the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water. All conditions for the application of Article 4(7) in individual projects must be included and justified in the RBMPs as early in the project planning as possible.
- Agriculture is indicated as exerting a significant pressure on the water resource in all Irish RBDs. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farmers' community to ensure technical feasibility and acceptance. There needs to be a very clear baseline so that any farmer knows the rules this can be adequately advised and enforced and so that the authorities in charge of the CAP funds can adequately set up Rural Development programmes and cross compliance water requirements.
- The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of waste water, also when they are "self-services", for instance self-abstraction for agriculture to collection and discharge of waste water, from scattered settlements, for which for instance environmental and resource costs also need to be recovered. The cost recovery should be transparently presented for all

relevant user sectors, at least broken down into industry, households and agriculture, and environment and resource costs should be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring an efficient use of water. Information on how the polluter pays principle has been taken into account should be provided in the RBMPs.

- Meaningful information regarding the scope, the timing and the funding of the measures should be included in the PoM so the approach to achieve the objectives is clear and the ambition in the PoM is transparent.