



Water Framework Directive

Risk Assessment Update

Draft River Basin Management Plan Background Document
Prepared on behalf of the South East River Basin District



December 2008

1 Introduction

Initial characterisation of Ireland's waters was reported in March 2005 in accordance with Article 5 of the Water Framework Directive, based on screening or semi-quantitative assessments of the best available datasets at that time. Data gaps were recognised and national studies put in place to provide more quantitative updated assessments of pressures and impacts in both surface waters and groundwaters. Whilst these updated risk assessments are not formally required for reporting until 2010 under the Directive, they facilitate the development of programmes of measures for inclusion in the Ireland's draft river basin management plans (December 2008).

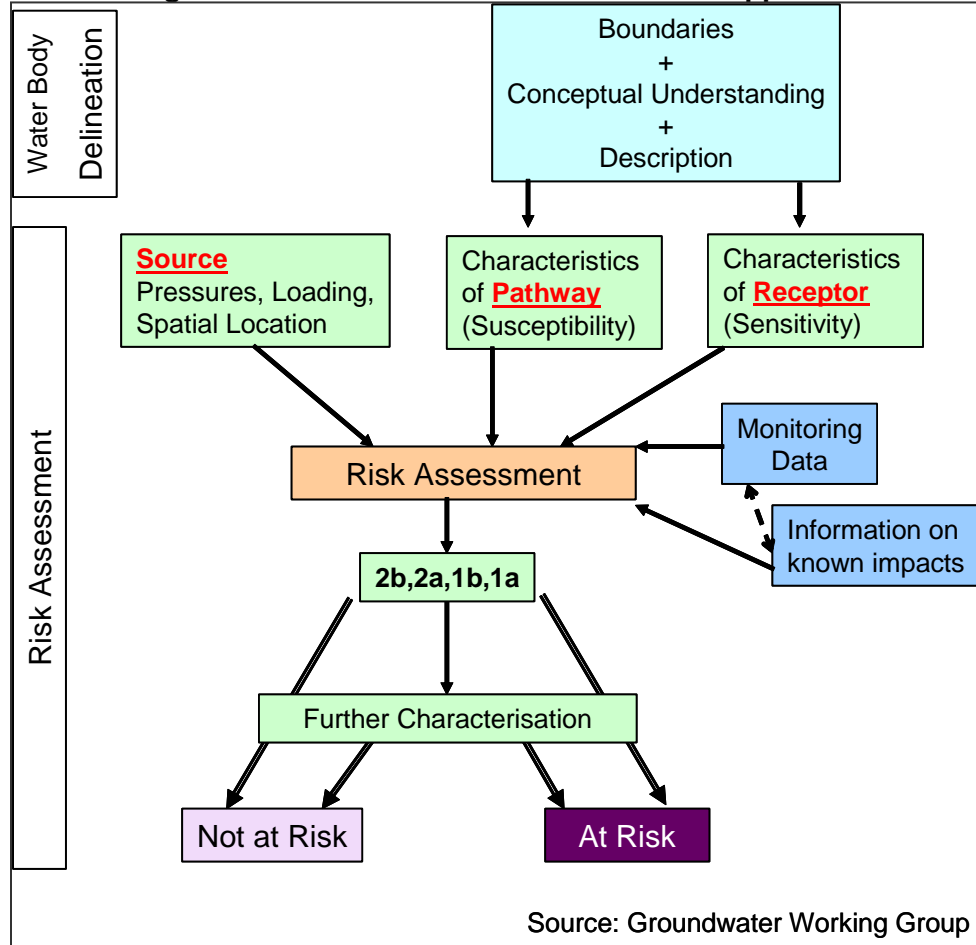
Programmes of Measures and Standards (POMS) studies and Further Characterisation studies have updated a number of the Article 5 risk assessments. This report summarises the results of these updates and provides a revised overall risk assessment retaining the original Article 5 assessment where this was not updated.

2 Groundwater Risk Assessments

2.1 Overview of Article 5 Groundwater Risk Assessment

The Article 5 (Pressures and Impacts) groundwater assessments uses a simple pressure, pathway, receptor model to identify where the impacts on groundwaters are likely to occur. The approach (outlined in Fig. 2.1) is supported by a series of individual risk assessment methodologies developed by GSI (Geological Survey of Ireland) supported through the National Groundwater Working Group by the RBD projects and other state organisations. The approach and methodology documents are available as background information on the www.wfdireland.ie website.

Figure 2.1 Groundwater Risk Assessment Approach



The WFD objectives for groundwaters relate to good quantitative status and good chemical status; risk assessment procedures were developed to deal with both. Table 2.1 summarises the Irish groundwater risk assessment methodologies developed. **D** refers to a procedure that has been deferred due to lack of information to be addressed under further characterisation.

Table 2.1 Article 5 (Pressures and Impacts Assessment) Groundwater Risk Assessments for Relevant Receptors and Pressures

	Receptor	Groundwater Body	Groundwater dependent rivers, lakes & estuaries	Groundwater Dependent Terrestrial Ecosystems	Abstraction points
WFD Objective		Status, trends	Status	Status	Drinking water protected areas
Pressure					

Groundwater Abstraction				
Water balance	GWB1	SW1	GWDTE1	-
Intrusion	GWB2	-	-	-
Diffuse Source Pollutants				
Mobile nutrients (e.g. NO ₃)	GWB3	SW2		DWPA1
Less mobile nutrients (e.g. PO ₄)	-	SW3	GWDTE2a GWDTE2b	-
Mobile chemicals	GWB4	SW4		DWPA2
Clustered on-site systems & leaking urban sewerage systems	GWB5	SW5	GWDTE3	
Sheep dip	D	D	D	D
Less mobile chemicals	-	-	-	-
Point Source Pollutants				
Mining	GWB6	SW6	GWDTE4	
Quarries	GWB7		GWDTE5	
Landfills	GWB8		GWDTE6	
Oil industry infrastructure	GWB9		GWDTE7	
Contaminated land	GWB10		GWDTE8	
Trade effluent discharges	GWB11			
Urban wastewater discharges	GWB12		GWDTE9	

2.2 Overview of Groundwater Further Characterisation and Status Classification

The status classification process follows logically from the Article 5 risk assessments and characterisation carried out for the Water Framework Directive. The process (outlined in Fig. 2.2) involved further detailed characterisation of the pressures and impacts. This resulted in update of some but not all of the Article 5 risk assessments.

Groundwater quality standards are a combination of standards set by the European Union (for example the Groundwater Daughter Directive's quality standards for Nitrate and Pesticides) and "threshold values" developed for Irish

Groundwater bodies. Threshold values only need to be set for those parameters identified under Article 5 as causing the GWB to be "At Risk". Threshold limits are set at the upper limit of natural background for key parameters. No standards have been set for the quantitative aspects of groundwater status. The approach is to determine, based on weight of evidence, whether the abstractions cause measurable and unacceptable impacts either on the groundwater body, or on associated surface water bodies.

In accordance with UK TAG practice "screening values" have been used to improve the risk assessment. If a screening value is exceeded this indicates that there is a potential impact from human activity that needs to be assessed as part of classification.

Groundwater bodies that are "not at risk" are automatically classed as good status. As required by the legislation, the tests described in this report, and which determine status, are carried out only on groundwater bodies that are "at risk".

Groundwater body classification is based on the "objectives" defined in Annex V of the Water Framework Directive and Annexes I – III of the Groundwater Daughter Directive (GWD). These objectives are:

1. No saline or other intrusions;
2. Achieving the objectives of the Water Framework Directive for dependent surface waters including no deterioration in status;
3. No damage to any wetlands that depend on the groundwater body;
4. No impact on Drinking Water Protected Areas;
5. No significant impairment of human uses of groundwater.

If a groundwater body fails any of the classification tests, then the groundwater body is at poor status. The five chemical and four quantitative tests applied by the EPA for groundwater bodies in Ireland are summarised below.

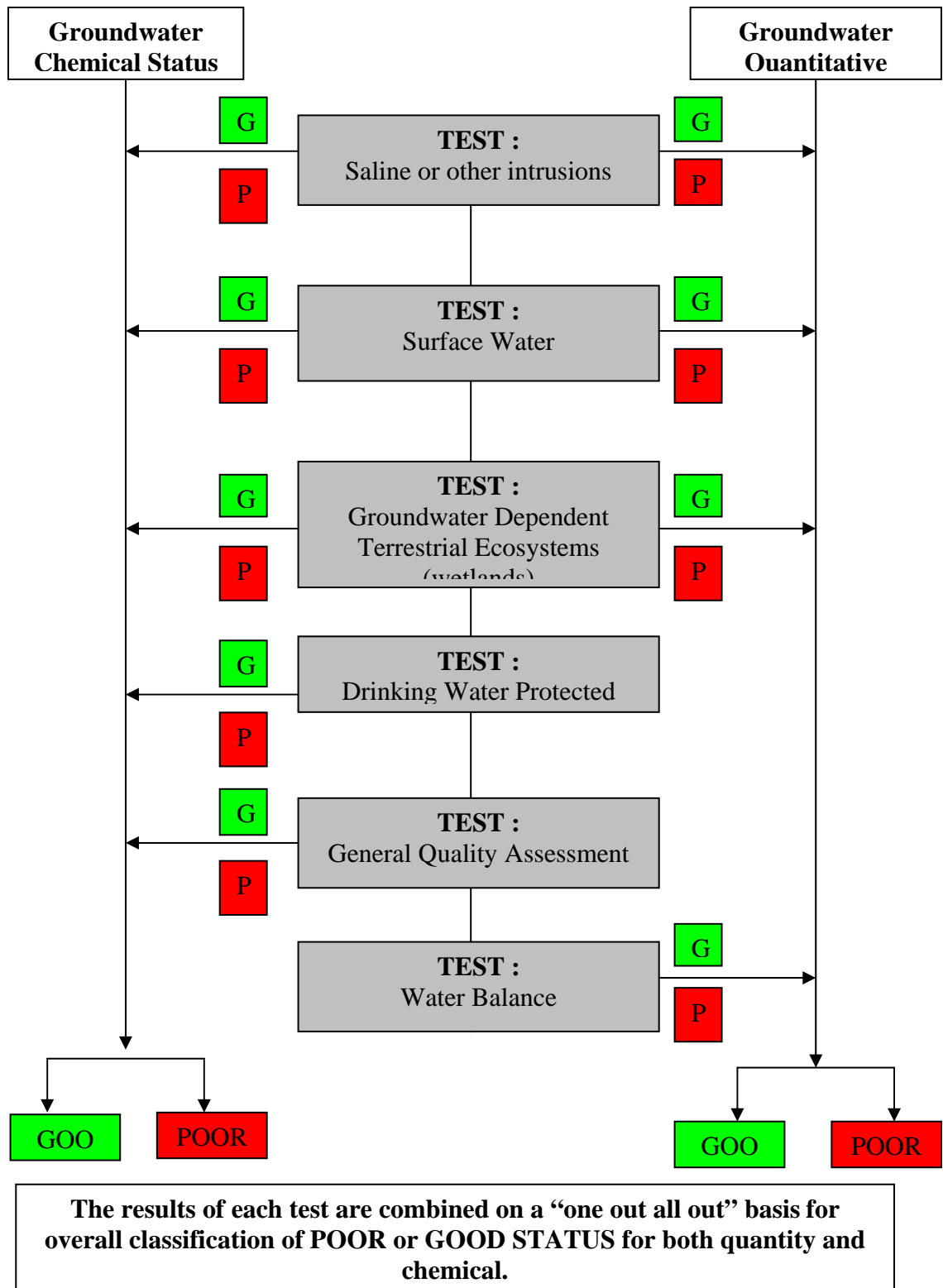


Fig. 2.2 Overall procedure of classification tests for assessing groundwater status (From "Guidance on Groundwater Status and Trend Assessment" EU Working Group C - Groundwater, 2008)

2.3 Article 5 Risk and Classification Assessment Results

This section details the results of the Article 5 Characterisation along with the results of the further characterisation and status classification work. Further characterisation of certain groundwater pressures were carried out as part of various RBD led projects through the Programme of Measures and Standards (POMS) Working Group. Other risk assessments were updated by the EPA by using impact monitoring data gathered through the WFD monitoring programme set up subsequent to the Article 5 Pressures and Impacts Assessment.

2.3.1 Abstraction and Saline Intrusion Pressure

2.3.1.1 Article 5 Groundwater Risk Assessments Results

The assessment of significant abstraction pressures was undertaken by comparing known significant groundwater abstractions with the available estimated natural recharge of each water body. The risk for each water body was identified depending on the proportion of recharge abstracted, supported by observed water level trends in boreholes/monitoring wells. The receptors considered in the quantitative assessment were groundwater bodies, dependant surface water bodies and terrestrial ecosystems.

Groundwater bodies at risk for saline intrusion were also assessed in localised areas where it was considered that there may be potential impacts.

Table 2.2 Article 5 Assessment: abstractions and saline intrusion

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	5	6.7	1.5
	2a probably not at risk	14	8.7	46.8
	2b not at risk	56	74.6	51.7
Total at Risk	(1a+1b)	5	6.7	1.5
SE-RBD	1a at risk	4	2.6	0.5
	1b probably at risk	3	2	0.7
	2a probably not at risk	9	6	4.1
	2b not at risk	135	89.4	94.7
Total at Risk	(1a+1b)	7	4.6	1.2
SW-RBD	1a at risk	1	1.2	0.3
	1b probably at risk	0	0	0
	2a probably not at risk	6	7.1	1.2
	2b not at risk	77	91.7	98.6

Total at Risk	(1a+1b)	1	1.2	0.3
Shannon-IRBD	1a at risk	0	0	0
	1b probably at risk	19	7.9	2.1
	2a probably not at risk	45	18.6	29.9
	2b not at risk	178	73.5	68.0
Total at Risk	(1a+1b)	19	7.9	2.1
W-RBD	1a at risk	0	0	0
	1b probably at risk	8	7.6	0.8
	2a probably not at risk	1	1	0.3
	2b not at risk	96	91.4	98.9
Total at Risk	(1a+1b)	8	7.6	0.8
NW-IRBD	1a at risk	0	0.0	0.0
	1b probably at risk	0	0.0	0.0
	2a probably not at risk	0	0.0	0.0
	2b not at risk	72	100.0	100.0
Total at Risk	(1a+1b)	0	0.0	0.0
Neagh/Bann IRBD	1a at risk	1	3.6	2.9
	1b probably at risk	1	3.6	0.5
	2a probably not at risk	1	3.6	6.7
	2b not at risk	25	89.2	89.9
Total at Risk	(1a+1b)	2	7.2	3.4
Grand total at risk (for all RBDs)	(1a+1b)	42	5.5	1.2

2.3.1.2 Groundwater Further Characterisation and Status Classification Results

Further assessment of abstraction risk was determined through the abstraction POMS study. In addition, the EPA updated the saline intrusion risk assessment. These tests were updated to assist in groundwater quantitative status classification and the following assessments were carried out:

- Assessment for the presence of saline or other intrusions
- Assessment of adverse impacts of groundwater abstraction on associated surface water bodies
- Assessment of adverse impacts of groundwater abstraction on groundwater dependent terrestrial ecosystems (wetlands)
- Water balance (*GWB scale*)

Table 2.3 is a summary of the overall National results these tests and the results update the Article 5 characterisation results above.

	<i>EA</i>	<i>WE</i>	<i>SW</i>	<i>SH</i>	<i>SE</i>	<i>NW</i>	<i>NB</i>	<i>National</i>
Good	74	105	83	242	149	72	28	753
Poor	1	0	1	0	2	0	0	4
Total	75	105	84	242	151	72	28	757

2.3.2 Significant groundwater diffuse pressures

2.3.2.1 Article 5 Groundwater Risk Assessments Results

The significant groundwater diffuse pressures addressed in the Irish risk assessment process are nutrients from agricultural activities (including livestock farming, arable activities and intensive enterprises), nutrients from unsewered human populations (septic tanks) and usage of dangerous substances from all land use sectors including agrochemicals, urban and household products.

All receptors were considered in the diffuse assessment; groundwater bodies, dependant surface water bodies, terrestrial ecosystems and drinking water protected areas.

Table 2.4 Groundwater bodies affected by diffuse source pollution

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	42	56.0	20.9
	2a probably not at risk	19	25.3	63.4
	2b not at risk	14	18.7	15.7
Total at Risk	(1a+1b)	42	56.0	20.9
SE-RBD	1a at risk	0	0	0
	1b probably at risk	86	57	31.3
	2a probably not at risk	38	25.2	55.6
	2b not at risk	27	17.8	13.1
Total at Risk	(1a+1b)	86	57	31.3
SW-RBD	1a at risk	0	0	0
	1b probably at risk	52	61.9	44
	2a probably not at risk	10	11.9	6.6
	2b not at risk	22	26.2	49.4

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Total at Risk	(1a+1b)	52	61.9	44
Shannon-IRBD	1a at risk	0	0	0
	1b probably at risk	53	21.9	14.6
	2a probably not at risk	85	35.1	45.8
	2b not at risk	104	43.0	39.6
Total at Risk	(1a+1b)	53	21.9	14.6
W-RBD	1a at risk	0	0	0
	1b probably at risk	26	24.8	29.5
	2a probably not at risk	29	27.6	14.1
	2b not at risk	50	47.6	56.3
Total at Risk	(1a+1b)	26	24.8	29.5
NW-IRBD	1a at risk	0	0.0	0
	1b probably at risk	10	13.9	5.8
	2a probably not at risk	7	9.7	33.9
	2b not at risk	55	76.4	60.3
Total at Risk	(1a+1b)	10	13.9	5.8
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	12	42.9	12.1
	2a probably not at risk	11	39.2	81.4
	2b not at risk	5	17.9	6.5
Total at Risk	(1a+1b)	12	42.9	12.1
Grand total at risk (for all RBDs)	(1a+1b)	281	37.1	24.6

2.3.2.2 Groundwater Further Characterisation and Status Classification Results

The EPA carried out groundwater chemical status tests which resulted in refining the results of the Article 5 risk assessment using impact monitoring data from the National WFD groundwater monitoring programme. The following chemical status tests were carried out:

- Assessment for the presence of saline or other intrusions;
- Assessment of adverse impacts of the chemical inputs from groundwater on associated surface water bodies;
- Assessment of adverse impacts of groundwater on groundwater dependent terrestrial ecosystems (wetlands);

- Assessment whether the quality of untreated groundwater satisfies the drinking water protected areas requirements;
- Assessment of the general quality of groundwater in the body in terms of whether its ability to support human uses has been significantly impaired by pollution.

Table 2.5 summaries the overall National results of these chemical status tests.

	<i>EA</i>	<i>WE</i>	<i>SW</i>	<i>SH</i>	<i>SE</i>	<i>NW</i>	<i>NB</i>	<i>National</i>
Good	68	72	78	185	145	72	26	646
Poor	7	33	6	57	6	0	2	111
Total	75	105	84	242	151	72	28	757

2.3.3 Significant groundwater point pressures

2.3.3.1 Article 5 Groundwater Risk Assessments Results

The significant groundwater point pressures addressed in the Irish risk assessment are mines, quarries, contaminated land, landfills, oil industry infrastructure, IPPC sites, licensed trade effluent and urban wastewater discharges. Groundwater bodies, dependant surface water bodies and terrestrial ecosystems were considered as receptors in the point source assessment.

Conservative, mobile chemicals from mines, quarries, contaminated sites and unlined waste disposal sites are the main point source concerns in Ireland. The results of the Article 5 characterisation for point source pressures are outlined in Table 2.6.

Table 2.6 Groundwater bodies affected by point source pollution

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	2	2.7	13.9
	1b probably at risk	32	42.7	3.8
	2a probably not at risk	11	14.6	49.9
	2b not at risk	30	40.0	32.4
Total at Risk	(1a+ 1b)	34	45.4	17.7
SE-RBD	1a at risk	3	2	0.2
	1b probably at risk	47	31.1	1.6
	2a probably not at risk	0	0	0

	2b not at risk	101	66.9	98.1
Total at Risk	(1a+1b)	50	33.1	1.8
SW-RBD	1a at risk	5	6	0.6
	1b probably at risk	36	42.9	1.8
	2a probably not at risk	0	0	0
	2b not at risk	43	51.1	97.6
Total at Risk	(1a+1b)	41	48.9	2.4
Shannon-IRBD	1a at risk	19	7.9	0.7
	1b probably at risk	105	43.4	2.6
	2a probably not at risk	0	0	0
	2b not at risk	118	48.7	96.7
Total at Risk	(1a+1b)	124	51.3	3.3
W-RBD	1a at risk	0	0	0
	1b probably at risk	16	15.2	0.9
	2a probably not at risk	46	43.8	87.9
	2b not at risk	43	41	11.2
Total at Risk	(1a+1b)	16	15.2	0.9
NW-IRBD	1a at risk	3	4.2	0.1
	1b probably at risk	13	18.1	0.5
	2a probably not at risk	16	22.2	11.2
	2b not at risk	40	55.5	88.2
Total at Risk	(1a+1b)	16	22.3	0.6
Neagh/Bann IRBD	1a at risk	1	3.6	0.6
	1b probably at risk	13	46.4	4.3
	2a probably not at risk	5	17.9	76.0
	2b not at risk	9	32.1	19.1
Total at Risk	(1a+1b)	14	50.0	4.9
Grand total at risk (for all RBDs)	(1a+1b)	295	39.0	3.5

2.3.3.2 Groundwater Further Characterisation and Status Classification Results

The point sources of pollution assessed as part of the groundwater body characterisation process were contaminated lands, landfills, mines quarries and urban area. The impact of these point sources of pollution was undertaken in each river basin district. These were considered to be the primary point sources with the potential to impact on groundwater and/or surface water body status and or associated protected areas.

Where there is a potential risk to status but confidence in the available data is low monitoring may be required to establish the significance of the risk from various point sources in the first River Basin Management Cycle. Methodologies were compiled by various RBD project consultants guided by the Groundwater Working Group for each of the point source areas. These methodologies are available from the EPA Groundwater Section upon request.

The classification assessment of the impacts from point sources on groundwater bodies is summarised in Table 2.7. The results are broken down by River Basin District.

Table 2.7 Summary Risk Assessment Results from Point Source Further Characterisation

	Landfill	Quarry	Mine	Contaminated Land	Urban Area
National groundwaters at risk	Confidence 0 High 122 Low	Confidence 0 High 9Low	Confidence 5 High 2 Low	Confidence 23 High 15 Low	Confidence 9 High 59 Low
Groundwaters at risk	ERBD 0, 4 NBIRBD 0, 2 NWIRBD 0, 8 SERBD 0, 8 ShIRBD 0, 79 SWRBD 0, 17 WRBD 0, 4	ERBD 0, 2 NBIRBD 0, 0 NWIRBD 0,1 SERBD 0, 1 ShIRBD 0, 0 SWRBD 0, 3 WRBD 0, 2	ERBD 1, 0 NBIRBD 0,0 NWIRBD 0, 0 SERBD 2, 0 ShIRBD 2, 1 SWRBD 0, 0 WRBD 0, 1	ERBD 4, 4 NBIRBD 1, 1 NWIRBD 0, 0 SERBD 9, 3 ShIRBD 3, 4 SWRBD 5, 2 WRBD 1, 1	ERBD 7, 11 NBIRBD 0, 2 NWIRBD 0, 2 SERBD 2, 13 ShIRBD 0, 20 SWRBD 0, 7 WRBD 0, 4
Groundwaters at poor status in the North Western District	ERBD 0 NBIRBD 0 NWIRBD 0 SERBD 0 ShIRBD 0 SWRBD 0 WRBD 0	ERBD 0 NBIRBD 0 NWIRBD 0 SERBD 0 ShIRBD 0 SWRBD 1 WRBD0	ERBD 1 NBIRBD 0 NWIRBD 0 SERBD 2 ShIRBD 2 SWRBD0 WRBD 0	ERBD 0 NBIRBD 0 NWIRBD 0 SERBD 1 ShIRBD 1 SWRBD 1 WRBD 0	ERBD 0 NBIRBD 0 NWIRBD 0 SERBD 2 ShIRBD 0 SWRBD 0 WRBD 0

2.4 Overall Results

2.4.1 Article 5 Groundwater Risk Assessments Results

Table 2.8 summaries the overall results from the Article 5 Risk Assessment Results.

Table 2.8 Groundwater bodies affected summary

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	2	2.7	13.9
	1b probably at risk	51	68.0	14.7
	2a probably not at risk	18	24.0	67.6
	2b not at risk	4	5.3	3.8
Total at Risk	(1a+1b)	53	70.7	28.6
SE-RBD	1a at risk	7	4.6	0.8
	1b probably at risk	101	66.9	31.6
	2a probably not at risk	29	19.2	56.3
	2b not at risk	14	9.3	11.3
Total at Risk	(1a+1b)	108	71.5	32.4
SW-RBD	1a at risk	6	7.1	0.9
	1b probably at risk	58	69.0	44.1
	2a probably not at risk	5	6	6.5
	2b not at risk	15	17.9	48.5
Total at Risk	(1a+1b)	64	76.2	45
Shannon-IRBD	1a at risk	19	7.9	0.7
	1b probably at risk	125	51.7	16.1
	2a probably not at risk	56	23.1	49.9
	2b not at risk	42	17.3	33.3
Total at Risk	(1a+1b)	144	59.6	16.8
W-RBD	1a at risk	0	0	0
	1b probably at risk	47	44.8	30.9
	2a probably not at risk	41	39	63.7
	2b not at risk	17	16.2	5.4
Total at Risk	(1a+1b)	47	44.8	30.9
NW-IRBD	1a at risk	3	4.2	0.1
	1b probably at risk	19	26.4	6.0
	2a probably not at risk	19	26.4	41.2
	2b not at risk	31	43.0	52.7

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Total at Risk	(1a+1b)	22	30.6	6.1
Neagh/Bann IRBD	1a at risk	2	7.1	3.5
	1b probably at risk	19	67.9	15.3
	2a probably not at risk	6	21.4	78.4
	2b not at risk	1	3.6	2.8
Total at Risk	(1a+1b)	21	75.0	18.8
Grand total at risk (for all RBDs)	(1a+1b)	459	60.6	26.7

2.4.2 Groundwater Further Characterisation and Status Classification Results

For each groundwater body, the lowest classification from the five chemical tests has been reported as the overall chemical status, and the lowest classification from the four quantitative tests have been reported as the overall quantitative status. The confidence associated with the results for the lowest classification case test has also been reported as either high or low confidence.

Additionally the results for chemical and quantitative status have ultimately been combined to give an overall classification of good or poor. If either the chemical or the quantitative assessment is poor, then a “one out all out” approach is used to determine the overall classification.

The overall results depicted in Table 2.9 show that nationally 85% of the groundwater bodies are at Good Status and 15% (which relates to 16.6% of the total land area) are at Poor Status.

	<i>EA</i>	<i>WE</i>	<i>SW</i>	<i>SH</i>	<i>SE</i>	<i>NW</i>	<i>NB</i>	<i>National</i>
Good	67	72	77	185	143	72	26	642
Poor	8	33	7	57	8	0	2	115
Total	75	105	84	242	151	72	28	757

3 River Risk Assessments

Overview of River Risk Assessments

The risk procedures applied to Irish rivers involved a combination of both predictive (pressure) and impact assessments. The analysis includes abstraction, flow regulation, morphological, point and diffuse pressures and also incorporates impact data from national river monitoring datasets. Figure 3.1 summarises the Irish surface water risk assessment approach.

The pressures and impacts methodologies under Article 5 were developed from the UK TAG surface water assessment methodologies, to ensure compatibility throughout the ecoregion.

All rivers in Ireland are considered as potential salmonid fishery habitats; consequently high receptor sensitivity thresholds were adopted throughout the river assessments.

Impact data obtained from the EPA national river biological surveys and the supporting physico-chemical monitoring database under Article 5 were used to refine the final risk category of water bodies where impact data with high confidence is available. Good status is assumed to be equal to or better than an existing biological status of Q4. NPWS (National Parks and Wildlife Service) identified river water bodies where the sustainability of sensitive aquatic species populations within designated SAC (Special Areas of Conservation) sites were impacted and this was also taken into account in the refined assessments update. Environmental quality standards have been adopted from existing European and National surface water quality standards for example the Phosphorus Regulations and these have been used as thresholds for assigning risk in the refined assessments.

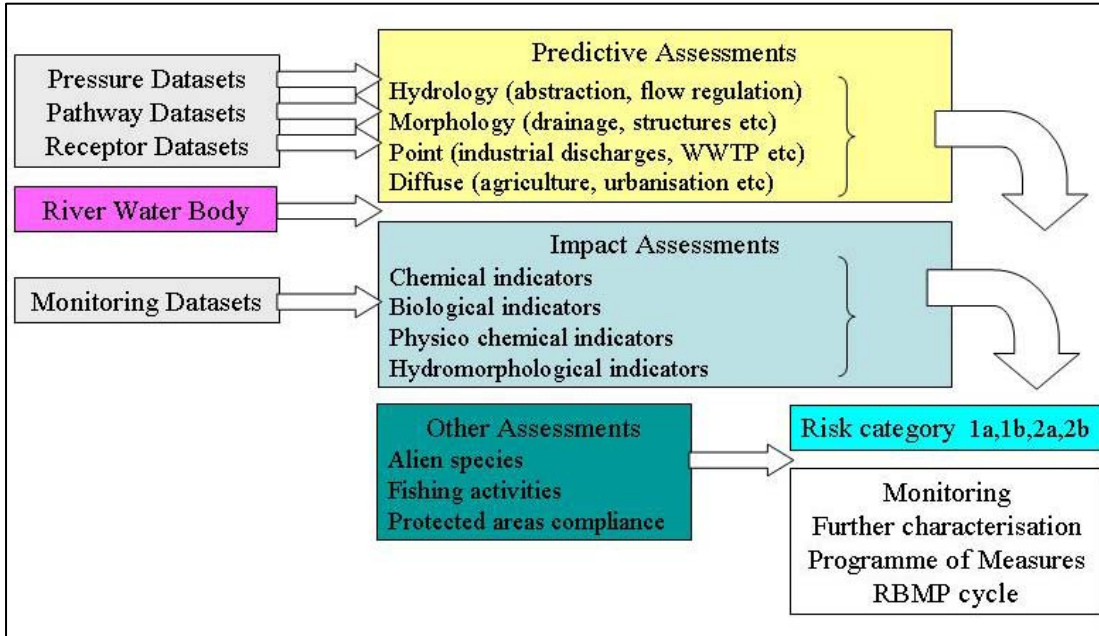


Figure 3.1 Surface Water Risk Assessments Approach (using river example)

The environmental objectives for surface waters entail achieving at least good ecological and good chemical status; risk assessments have been applied to deal with both objectives. Table 3-1 summarises the Irish river risk assessment methodologies developed. The abstraction, flow regulation and morphological assessments relate to hydromorphological pressures. The point and diffuse assessments represent pollution pressures.

Table 3-1 WFD River Risk Assessments for Relevant Pressures for Article 5 and updates

Pressure/Activity	Main Features
Water abstraction and flow regulation	Surface water abstraction
	Presence of major impoundments
Morphological alterations	Channelisation & Dredging
	Flood Protection & Embankments
	Impounding (dams)
	Water regulation (locks & weirs)
Point source pollution	Wastewater treatment plant (WWTP) discharges (updated)
	Integrated pollution prevention & control (IPPC) industry discharges (updated)
	Local Authority Licensed (Section 4) industry discharges (updated)

	Combined sewer overflow (CSO) discharges
	Water Treatment Works (WTP) discharges
Diffuse source pollution	General diffuse – urban, grassland and arable areas
	Transport – road drainage (soluble copper, zinc, total hydrocarbons)
	Transport – railways
	Forestry – acidification, suspended solids, eutrophication_ updated
	Un-sewered areas pathogens (updated), phosphorus and hydraulic (new)
	Priority substances – arable, sheep dip
Impact	River biological survey
	Supporting physico-chemical data
	Margaritifera pollution recruitment condition

There have been a number of changes to the water body layer since the preparation of the Article 5 risk assessments these include:

- four riverwater bodies in the Shannon district have been amalgamated into two
- two river water bodies in the North Western district have been amalgamated
- a number of cross border river water bodies have been added

These changes to the water body layer account for the difference in numbers of water bodies in the Article 5 risk assessments and the updated risk assessments.

River Risk Assessment Results

The assessment of **significant abstraction pressures** was undertaken by comparing the nett volume of known significant surface water abstractions with the characteristic low flow in each river water body. The risk category was identified based on a percentage threshold of the 95 percentile low flow abstracted. The methodology used to calculate the low flow and nett abstraction for each water body and the thresholds used are described in the background documents.

A significant flow regulation structure (such as a hydroelectric or water supply dam) present in a water body resulted in the water body being placed in the at risk category due to flow regulation pressures.

The results are summarised in Table 3-2 indicating that there are a small number of water bodies nationally at risk from surface water abstraction and flow regulation pressures.

Based on a study on drinking water supplies by Mott MacDonald Pettits for the Department of Environment, Heritage and Local Government the total volume of water abstracted nationally from the 2318 known significant surface abstractions is 626,952,470 cubic metres annually. The national volumetric proportion of surface water abstractions by category is as follows:

- Public water supply 91.4%
- Private water supply 8.6%

Further detail on unregulated abstractions such as abstractions for irrigation will be collected during the development of the first river basin management plan.

An update of this abstraction assessment is currently being undertaken, but was not available at the time of writing of this report. This will be incorporated at a later date.

So the Article 5 risk assessment was retained in this current update.

Table 3-2 River water bodies affected by abstraction and flow regulation under Article 5

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
E-RBD	1a at risk	15	4.2	102.7	5.7
	1b probably at risk	8	2.3	137.1	7.8
	2a probably not at risk	4	1.1	97.9	7.2
	2b not at risk	329	92.4	1522.1	79.3
Total at Risk	(1a+1b)	23	6.5	239.8	13.5
E-RBD WEI 0.497					
SE-RBD	1a at risk	13	2.0	82.0	1.6
	1b probably at risk	8	1.2	50.7	1.1
	2a probably not at risk	8	1.2	105.7	2.5
	2b not at risk	626	95.6	3556.3	94.8
Total at Risk	(1a+1b)	21	3.2	132.7	2.7
SE-RBD WEI 0.051					
SW-RBD	1a at risk	11	1.2	30.3	1.2
	1b probably at risk	24	2.7	124.3	3.0
	2a probably not at risk	18	2.0	177.4	4.5
	2b not at risk	832	94.0	3101.7	91.3
Total at Risk	(1a+1b)	35	4.0	154.6	4.2
SW-RBD WEI 0.046					
Shannon-IRBD	1a at risk	14	1.5	87.0	1.1
	1b probably at risk	20	2.3	168.1	3.1
	2a probably not at risk	15	1.7	129.8	3.5
	2b not at risk	835	94.5	4586.7	92.3

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
Total at Risk	(1a+1b)	34	3.8	255.2	4.2
Shannon-IRBD WEI 0.047					
W-RBD	1a at risk	3	0.3	17.4	0.3
	1b probably at risk	5	0.5	22.2	0.5
	2a probably not at risk	4	0.4	23.0	3.8
	2b not at risk	939	98.8	3562.5	95.4
Total at Risk	(1a+1b)	8	0.8	39.6	0.8
W-RBD WEI 0.093					
NW-IRBD	1a at risk	37	5.6	182.3	8.4
	1b probably at risk	34	5.1	300.7	14.1
	2a probably not at risk	12	1.8	96.6	3.3
	2b not at risk	582	87.5	1768.3	74.2
Total at Risk	(1a+1b)	71	10.7	483	22.5
NW-RBD WEI 0.192					
Neagh/Bann IRBD	1a at risk	2	2.8	7.8	3.4
	1b probably at risk	7	9.9	67.2	14.9
	2a probably not at risk	4	5.6	55.6	13.3
	2b not at risk	58	81.7	283.9	68.4
Total at Risk	(1a+1b)	9	12.7	75	18.3
Neagh/Bann RBD WEI 0.226					
Grand total at risk (for all RBDs)	(1a+1b)	201	4.5	1648.4	6.3

The **significant morphological pressures assessment** relates to physical alterations that have been made to Irish rivers to support human activities such as navigation, urban development or agriculture. A database of morphological pressures was generated by the RBD projects based on collation of datasets from disparate organisations.

The morphological assessment was undertaken by determining the extent of various known significant alterations within each river water body. The morphological assessment for rivers included the following pressures; channelisation and dredging, river straightening, flood protection and embankments, impounding, water regulation and intensive land use. The risk category was identified based on the proportion of the river water body altered. To ensure consistency with the approach applied throughout the ecoregion, the UK TAG methodology and thresholds were adapted to reflect Irish data availability as described in the background documents.

The results are summarised in Table 3-3 indicating that there are a significant number of river water bodies nationally at significant risk from morphology pressures (typically due to intensive land use and impoundment pressures). There is a large group of water bodies probably at significant risk, in particular, due to historic drainage works. These pressures will be investigated further during the first river basin management plan preparation.

Under the POMS Freshwater Morphology Study channelisation was updated with additional information and the threshold between at risk and not at risk increased from 15% to 50%. A pilot study was also undertaken whereby morphology scores (R.A.T.); biology scores (macroinvertebrates and macrophytes) were obtained at sample sites with known channelisation and intensive land use pressures. The study recommended that the Intensive Landuse (ILU) element of the morphology risk assessment be abandoned.

Table 3-3 shows the risk assessment update which was carried out as part of the morphology programme of measures study. The significant changes from the Article 5 risk assessment were that: channelisation was updated and the intensive landuse risk assessment was abandoned.

Table 3-3 River water bodies affected by morphology pressures updated

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
E-RBD	1a at risk	98	27.5	749.3	40.3
	1b probably at risk	0	0	0	0
	2a probably not at risk	0	0	0	0
	2b not at risk	258	72	1111	60
Total at Risk	(1a+1b)	98	28	749	40
SE-RBD	1a at risk	42	6.4	341.5	9.0
	1b probably at risk	0	0	0	0
	2a probably not at risk	0	0	0	0
	2b not at risk	613	94	3453	91
Total at Risk	(1a+1b)	42	6	342	9
SW-RBD	1a at risk	13	1.5	58.1	1.7
	1b probably at risk	0	0	88	3
	2a probably not at risk	0	0	0	0
	2b not at risk	872	98.5	3375.6	98.3
Total at Risk	(1a+1b)	13	1	146	4
Shannon-IRBD	1a at risk	234	27	1755	36
	1b probably at risk	0	0	0	0

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
	2a probably not at risk	0	0	0	0
	2b not at risk	648	73	3189	65
Total at Risk	(1a+1b)	234	27	1755	36
W-RBD	1a at risk	162	17.0	973.4	26.9
	1b probably at risk	0	0	0	0
	2a probably not at risk	0	0	0	0
	2b not at risk	789	83.0	2651.8	73
Total at Risk	(1a+1b)	162	17	973	27
NW-IRBD	1a at risk	34	4.9	183.5	7.0
	1b probably at risk	0	0	0	0
	2a probably not at risk	0	0	0	0
	2b not at risk	667	95.1	2433.7	93.0
Total at Risk	(1a+1b)	34	5	184	7
Neagh/Bann IRBD	1a at risk	37	38.9	286.8	45.9
	1b probably at risk	0	0	0	0
	2a probably not at risk	0	0	0	0
	2b not at risk	58	61.1	337.4	54.1
Total at Risk	(1a+1b)	37	39	287	46
Grand total at risk (for all RBDs)	(1a+1b)	620	14	4435	22
Grand total at risk under Article 5 (for all RBDs)	(1a+1b)	1720	38.5	10776.8	50.1

The **significant point source pressure under Article 5** addressed in the Irish river risk assessments and the data availability thresholds are as follows:

- UWWT & sludge treatment plants (population equivalent (pe)>500);
- combined storm overflows CSOs) (from urban areas with population equivalent (pe)>2000);
- IPPC industries (licensed by the EPA);
- non IPPC industries (licensed by Local Authorities);
- other point sources judged significant at RBD level (e.g. WTP Water Treatment Plant discharges).

The Article 5 point source assessment was undertaken by identifying the location and impact potential of point sources. Where monitoring data was available for a discharge (i.e. for treatment plants or industrial discharges), the risk category of the receiving water bodies was dependant on the compliance of the most recent sampling data with license limits. If exceedance of any statutory limit was recorded, water bodies were placed in the at risk or probably at risk categories (depending on data confidence). Conversely, where all samples complied with consent limits, water bodies were placed in the probably not at risk or not at risk categories, again depending on confidence in the data.

Where monitoring data was not available non-quantitative indicators were used to assign risk category. For example, where the spill frequency of Combined Sewer Overflow (CSO) spillage was unknown a default, probably at risk, category was assigned to ensure that the pressure would be addressed as part of further characterisation. Where local knowledge was available experts from the EPA and Local Authorities reviewed the risk assessment results to verify the assigned risk category.

Datasets for point source pressures were generally available on a national scale with Local Authorities providing data on non IPPC licensed industries.

Under the Municipal and Industrial Regulations POMS study the point source pressure assessment was updated. The following general criteria have been tested against each wastewater treatment plant and industrial point source discharge for the update (note CSO and WTP assessments were not updated).

- Deterioration in Q-status between u/s and d/s of a point source discharge.
- Q value downstream is less than Q4
- Historical deterioration in downstream Q value
- WWTP is at or exceeding capacity
- Insufficient assimilative capacity in receiving waters

If any of the criteria apply to the point source discharge the receiving water body was deemed to be at risk and designated as such. Table 3-4 below sets out the updated point source pollution risk assessment.

Table 3-4 River water bodies affected by point source pollution updated

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
E-RBD	1a at risk	58	16.3	703.2	37.8
	1b probably at risk	10	3	46	2

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
	2a probably not at risk	7	2.0	33.0	1.8
	2b not at risk	281	79	1077	58
Total at Risk	(1a+1b)	68	19	750	40
SE-RBD	1a at risk	115	17.6	1349.0	35.5
	1b probably at risk	9	1	39	1
	2a probably not at risk	0	0	0	0
	2b not at risk	531	81	2407	63
Total at Risk	(1a+1b)	124	19	1388	37
SW-RBD	1a at risk	58	6.6	703.4	20.5
	1b probably at risk	13	1	88	3
	2a probably not at risk	0	0	0	0
	2b not at risk	814	92.0	2642.8	77.0
Total at Risk	(1a+1b)	71	8	791	23
Shannon-IRBD	1a at risk	111	13	1129	23
	1b probably at risk	4	0	73	1
	2a probably not at risk	0	0.0	0.0	0.0
	2b not at risk	767	87	3742	76
Total at Risk	(1a+1b)	115	13	1202	24
W-RBD	1a at risk	46	4.8	513.4	14.2
	1b probably at risk	4	0	19	1
	2a probably not at risk	1	0.1	5.1	0.1
	2b not at risk	900	94.6	3087.7	85
Total at Risk	(1a+1b)	50	5	532	15
NW-IRBD	1a at risk	41	5.8	384.2	14.7
	1b probably at risk	5	1	21	1
	2a probably not at risk	0	0.0	0.0	0.0
	2b not at risk	655	93.4	2212.1	84.5
Total at Risk	(1a+1b)	46	7	405	15
Neagh/Bann IRBD	1a at risk	15	15.8	173.2	27.7
	1b probably at risk	1	1	1	0
	2a probably not at risk	0	0.0	0.0	0.0
	2b not at risk	79	83.2	450.2	72.1
Total at Risk	(1a+1b)	16	17	174	28
Grand total at risk (for all RBDs)	(1a+1b)	490	11	5242	26
Grand total at risk under Article 5 (for	(1a+1b)	602	13.5	7239.7	32.6

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
<i>all RBDs)</i>					

The **significant diffuse source pressure** addressed under Article 5 in the Irish river risk assessment process are as follows:

- Agriculture and urban drainage;
- Transport road drainage;
- Transport railway drainage;
- Forestry - acidification, suspended solids, eutrophication;- updated
- Un-sewered populations (septic tank) drainage;- updated
- Agricultural & forestry activities using priority substances- abandoned

For the Article 5 risk assessments the pressure datasets used in the diffuse assessments included Corine land cover imagery, infrastructure details and vehicle trip information, forestry inventories, acid sensitive geology, soils and subsoil coverage, digital terrain model, extent of urbanised areas and Water Service networks and agricultural statistics supplied by the Central Statistics Office (CSO) and Teagasc.

The assessments considered nutrients, priority substances, acidifying pollutants, suspended solids and other significant pollutants such as metals associated with road drainage.

The primary diffuse assessment addressed diffuse pressure from agricultural and urban areas. This assessment was developed by the EPA based on empirical relationships identified between diffuse land use activities and observed water quality impact as measured by the river biotic index or Quality rating system (Q system). The most significant relationships were observed between pasture, arable and urban land uses and Q value. The observed relationships were used to predict the risk category for all river water bodies based on land use data. The procedure was presented for peer review and is summarised in the background document for the surface water diffuse risk assessment methodology.

The remaining diffuse pressures assessments were predictive analyses based on identifying areas within water bodies with significant potential impact. The risk category for each water body was assigned depending on the proportion of the area identified as having significant impact. The thresholds used in the methodologies were based on expert knowledge derived from Irish or UK research findings. The risk category was refined where monitoring data was available for the pollutant under consideration. Where the risk assessment was not supported by monitoring findings the confidence in the output was

considered lower and the probably not at risk designation was assigned to the water bodies in which the pressure was present. Where there was uncertainty in a risk assessment additional data collection and monitoring will be undertaken during the river basin planning process. All of the diffuse methodologies and the thresholds used are described in the background documents.

As part of the Onsite Wastewater Treatment Plant (OSWTP) POMS study **the national un-sewered populations** (septic tank) drainage diffuse source pressures risk assessments were updated. For the updated OSWTP risk assessments data was derived from the Central Statistics Office (CSO) 2006 Census of Population to provide an indication of the present extent of unsewered systems in Ireland. The An Post Geo Directory which provides the location and distribution of all buildings nationally was incorporated into a GIS system. The sewer networks were also mapped and these areas excluded to identify OSWTS not connected to sewer networks.

The updated unsewered populations risk assessment was based on the pressure-pathway-receptor framework.

A pathogen pathway risk map for groundwaters has been created by combining the Aquifer bedrock type, the GSI Vulnerability mapping and subsoil permeability mapping. The updated unsewered populations risk is assigned on the basis of a pathway risk matrix for pathogens to groundwater. From the matrix risk categories are assigned on the following basis:

- Where vulnerability is indicated as extreme or very high overlying productive aquifers such as karst, the pathway susceptibility risk to pathogens is rated as extreme and very high also.
- Alternatively where the vulnerability is indicated as low or poorly productive aquifers, the pathway susceptibility to pathogens is rated as low also

Unsewered properties located in areas where pathways ratings are extreme or high pose a significant risk of pathogen contamination to groundwater if the onsite system (inclusive of percolation area) is not properly constructed. These properties have been mapped. The locations of unsewered properties and the percolation risk at each location have been further assessed in the context of sensitivities of local aquifers, rivers, lakes, estuaries, coastal areas, protected areas, and also with groundwater and surface water dependent terrestrial ecosystems.

As part of the Forest and Water POMS study the **forestry** risk assessments were updated. The updated risk assessments followed the Pressure-Pathway-Receptor Model. The pressure layer, the 1998 Forest Inventory and Planning System (FIPS) layer was updated to 2007. The key potential pressures from forests and forestry activity were identified, the pathways described and the receptors

identified in terms of their sensitivity to potential impacts. The key pressures identified are:

- Acidification
- Eutrophication (nutrient enrichment with phosphorous and nitrogen)
- Sedimentation
- Pesticide use
- Hydromorphological change

The timing of potential impacts has been considered, recognising that forestry has a long life cycle with key stages.

Detailed pathway information was developed. Information on the hydrogeological setting of forest stands in Ireland developed from the national IFS soils and subsoils mapping and from bedrock geology. These allowed associations between forest and water on different hydro-geological settings to be evaluated.

Surface water bodies have different sensitivity to forest effects dependent on their hydro-geology and chemistry, aquatic species composition, existing status and designations under national and international legislation, such as the Freshwater Fish Directive, Habitats Directive and Birds Directive and location with respect to forest pressure in the catchment. Sensitive areas include Protected Areas designated under the WFD, acid sensitive areas, eutrophication sensitive areas, sediment sensitive areas and areas sensitive to hydrological change. The update pressures, pathway and receptor sensitivity layers were used to update the forestry risk assessments.

Table 3-5 River water bodies affected by diffuse source pollution updated

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
E-RBD	1a at risk	153	43.0	746.9	40.2
	1b probably at risk	124	35	823	44
	2a probably not at risk	79	22.2	289.7	15.6
	2b not at risk	0	0	0	0
Total at Risk	(1a+1b)	277	78	1570	84
SE-RBD	1a at risk	233	35.6	1425.9	37.6
	1b probably at risk	272	42	1680	44
	2a probably not at risk	150	22.9	688.5	18.1
	2b not at risk	0	0	0	0
Total at Risk	(1a+1b)	505	77	3106.2	82
SW-RBD	1a at risk	175	19.8	970.9	28.3

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
	1b probably at risk	717	81	945	28
	2a probably not at risk	539	60.9	1517.7	44.2
	2b not at risk	0	0.0	0.0	0.0
Total at Risk	(1a+1b)	892	101	1916	56
Shannon-IRBD	1a at risk	140	16	703	14
	1b probably at risk	364	41	2352	48
	2a probably not at risk	378	42.9	1882.6	38.1
	2b not at risk	0	0	0	0
Total at Risk	(1a+1b)	504	57	3055	62
W-RBD	1a at risk	227	23.9	1210.7	33.40
	1b probably at risk	117	12	371	10
	2a probably not at risk	607	63.8	2043.5	56.3693
	2b not at risk	24	2.5	0.0	0
Total at Risk	(1a+1b)	344	36	1582	44
NW-IRBD	1a at risk	173	24.7	734.8	28.1
	1b probably at risk	62	9	283	11
	2a probably not at risk	432	61.6	1354.8	51.8
	2b not at risk	34	4.9	244.1	9.3
Total at Risk	(1a+1b)	235	34	1018	39
Neagh/Bann IRBD	1a at risk	37	38.9	260.3	41.7
	1b probably at risk	30	32	190	30
	2a probably not at risk	12	12.6	54.0	8.7
	2b not at risk	16	16.8	119.7	19.2
Total at Risk	(1a+1b)	67	71	451	72
Grand total at risk (for all RBDs)	(1a+1b)	2824	62	12697	62
<i>Grand total at risk under Article 5 (for all</i>	<i>(1a+1b)</i>	<i>2021</i>	<i>45.2</i>	<i>12790</i>	<i>59.8</i>

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
<i>RBDs)</i>					

The **river impact assessment** under Article 5 utilised the EPA national river biological survey dataset covering the period up to 2002. The assessment was supported by a national physico-chemical dataset.

Irish river biological status to date has been expressed as a Q rating/value with Q5 representing the highest biological status and Q1 the poorest. Of the five biological elements that comprise river ecological status under the WFD, the Q system takes account of benthic invertebrates and to a degree macrophytes and phytobenthos. The EPA has undertaken research projects to investigate the relationship between the Q system and other status elements and have identified a correlation with fish population and diversity. Research has also shown that the Q system correlates to physico-chemical parameters, such as phosphorus concentrations. This testing has identified that, in Ireland, the Q system is the best available surrogate for ecological status under the WFD.

The EPA monitoring programme has been in place for over 30 years and has been designed to identify water quality problems due to point and diffuse pollution. Consequently the EPA is confident that if the Q status of a river water body is known then this should over ride the predictive risk category identified by the point and diffuse pressure assessments. Since the Q system was not designed to take full account of hydromorphological pressures the impact status does not over ride the predictive risk category identified by the abstraction, flow regulation and morphology pressure assessments.

The EPA has determined that Q4 status is likely to represent good status. Therefore, for the impact risk assessment any river water body with a recorded status of Q4 or better is identified as not at risk. Placing these best quality water bodies in the not at risk category will ensure Ireland's cleanest sites are prioritised for protective management measures to maintain their status. The programme of measures to prevent deterioration in status will be particularly important for high status sites (Q5 sites) which have been lost at an accelerated rate. Any river water body with a recorded status of less than Q4 is placed in the "at risk" category on the basis that it is already impacted and therefore will not achieve the objective of good status without mitigation measures.

The **river impact assessment** also considered sites within SACs which the NPWS identified as being impacted with regard to the sustainability of sensitive aquatic species populations. The assessment was carried out in relation to the

extremely sensitive Fresh Water Pearl Mussel (*Margaritifera margaritifera* and *Margaritifera durrovensis*). Water bodies upstream of sites at which populations are considered to be unfavourable, that is either declining or failing to recruit, were identified as being at risk or probably at risk.

The impact assessment was retained for the update.

Overall a little over half of the river water bodies are at risk or probably at risk. This reflects the precautionary nature of the process whereby a single pressure can cause a water body to be classified at risk. The dominant influences on the at risk water bodies are impact data, point and diffuse pollution pressures and morphological pressures with hydrological pressures resulting in identification of a small number of river water bodies at risk.

Table 3-6 River water bodies affected summary updated

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
E-RBD	1a at risk	237	66.6	1406.0	75.6
	1b probably at risk	39	11	143	8
	2a probably not at risk	42	12	91	5
	2b not at risk	38	11	219	12
Total at Risk	(1a+1b)	276	78	1549	83
SE-RBD	1a at risk	328	50.1	2368.3	62.4
	1b probably at risk	186	28	635	17
	2a probably not at risk	74	11	250	7
	2b not at risk	67	10	541	14
Total at Risk	(1a+1b)	514	78	3004	79
SW-RBD	1a at risk	189	21.4	1149.7	33.5
	1b probably at risk	164	19	539	16
	2a probably not at risk	383	43	711	21
	2b not at risk	149	16.8	1034.1	30.1
Total at Risk	(1a+1b)	353	40	1689	49
Shannon-IRBD	1a at risk	432	49	2925	59
	1b probably at risk	136	15	542	11
	2a probably not at risk	185	21	553	11
	2b not at risk	129	15	917	19
Total at Risk	(1a+1b)	568	64	3467	70
W-RBD	1a at risk	276	29.0	1325.5	36.6

RBD	Reporting Category	Number of Water Bodies	% of number	Km Affected	% area of RBD
	1b probably at risk	101	11	215	6
	2a probably not at risk	412	43	887	24
	2b not at risk	162	17.0	1197.3	33
Total at Risk	(1a+1b)	377	40	1541	42
NW-IRBD	1a at risk	226	32.2	1051.7	40.2
	1b probably at risk	46	7	186	7
	2a probably not at risk	295	42	551	21
	2b not at risk	134	19.1	828.3	31.6
Total at Risk	(1a+1b)	272	39	1238	47
Neagh/Bann IRBD	1a at risk	60	63.2	441.3	70.7
	1b probably at risk	9	9	36	6
	2a probably not at risk	9	9	38	6
	2b not at risk	17	17.9	109.4	17.5
Total at Risk	(1a+1b)	69	73	477	76
Grand total at risk (for all RBDs)	(1a+1b)	2429	54	12965	64
Grand total at risk under Article 5 (for all RBDs)	(1a+1b)	2854	63.9	17492.5	76.4

4 Lake Risk Assessments

A number of lakes in the Neagh Bann and North Western RBDs were not delineated or included at the time of Article 5 reporting. These lakes have since been included and have been reported under EU WISE and hence have been included in the risk assessment updates. This accounts for the differences in numbers between the Article 5 and the updated risk assessments.

Lake Risk Assessment Results

The assessment of **significant abstraction pressures** was undertaken under Article 5 by comparing the nett volume of known significant surface water abstractions with the characteristic low flow in each lake water body. The risk category was identified based on a percentage threshold of the 95 percentile low flow abstracted. The methodology used to calculate the low flow and nett abstraction for each water body and the thresholds used are described in the Article 5 background documents.

A significant flow regulation structure present in a water body resulted in the water body being placed in the at risk category due to flow regulation pressures.

An update of this abstraction assessment is currently being undertaken, but was not available at the time of writing of this report. This will be incorporated at a later date.

So the Article 5 risk assessment was retained in this current update

Table 4-1 Lake water bodies affected by abstractions under Article 5

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	9	34.6	36.4
	1b probably at risk	0	0	0
	2a probably not at risk	2	7.7	51.3
	2b not at risk	15	57.7	12.3
Total at Risk	(1a+1b)	9	34.6	36.4
SE-RBD	1a at risk	3	25	30.8
	1b probably at risk	1	8.3	15.3
	2a probably not at risk	1	8.3	23.1
	2b not at risk	7	58.4	30.8
Total at Risk	(1a+1b)	4	33.3	46.1
SW-RBD	1a at risk	12	13.3	8.0
	1b probably at risk	3	3.3	0.7
	2a probably not at risk	3	3.3	3.5
	2b not at risk	72	80.0	87.9
Total at Risk	(1a+1b)	15	16.7	8.6
Shannon-IRBD	1a at risk	13	11.5	2.1
	1b probably at risk	0	0	0
	2a probably not at risk	2	1.8	3.8
	2b not at risk	98	86.7	94.1

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Total at Risk	(1a+1b)	13	11.5	2.1
W-RBD	1a at risk	23	7.1	1.4
	1b probably at risk	4	1.2	0.2
	2a probably not at risk	6	1.9	17.9
	2b not at risk	20	6.2	60.6
Total at Risk	(1a+1b)	27	8.3	1.6
NW-IRBD	1a at risk	14	7.8	5.8
	1b probably at risk	8	4.4	24.0
	2a probably not at risk	11	6.1	15.0
	2b not at risk	147	81.7	55.2
Total at Risk	(1a+1b)	22	12.2	29.8
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	2	100.0	100.0
Total at Risk	(1a+1b)	0	0	0
Grand total at risk under Article 5 (for all RBDs)	(1a+1b)	90	12.1	0.7

The **significant morphological pressures assessment** was undertaken under Article 5 by determining the extent of various known significant alterations within each lake water body. The morphological assessment for lakes included the following pressures; channelisation and dredging, flood protection and embankments, impounding and intensive land use. The risk category was identified based on the proportion of the lake water body altered. To ensure consistency with the approach applied throughout the ecoregion, the UK TAG methodology and thresholds were adapted to reflect Irish data availability as described in the background documents.

Under the Freshwater Morphology POMS study Channelisation was updated with additional information and the threshold between at risk and not at risk increased from 15% to 50%. A pilot study was also undertaken whereby morphology scores (R.A.T.); biology scores (macroinvertebrates and macrophytes) were obtained at sample sites with known channelisation and intensive land use pressures. The study recommended that the Intensive Landuse (ILU) element of the morphology risk assessment be abandoned.

Table 4-2 Lake water bodies affected by morphology pressures update

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	11	42.3	86.4
	2a probably not at risk	0	0	0
	2b not at risk	15	57.7	13.6
Total at Risk	(1a+1b)	11	42.3	86.4
SE-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	12	100	100
	2b not at risk	0	0	0
Total at Risk	(1a+1b)	0	0	0
SW-RBD	1a at risk	2	2.2	14.8
	1b probably at risk	21	23.3	7.5
	2a probably not at risk	0	0	0
	2b not at risk	67	74.4	77.7
Total at Risk	(1a+1b)	23	25.6	22.3
Shannon-IRBD	1a at risk	1	0.9	0.9
	1b probably at risk	41	36.3	33.6
	2a probably not at risk	23	20.4	43.3
	2b not at risk	48	42.5	22.2
Total at Risk	(1a+1b)	42	37.2	34.5
W-RBD	1a at risk	1	0.3	2.0
	1b probably at risk	3	0.9	35.7
	2a probably not at risk	25	7.8	36.8
	2b not at risk	293	91	25.6
Total at Risk	(1a+1b)	4	1.2	37.6
NW-IRBD	1a at risk	1	0.6	1.3
	1b probably at risk	4	2.2	0.5
	2a probably not at risk	10	5.6	15.6
	2b not at risk	165	91.7	82.6
Total at Risk	(1a+1b)	5	2.8	1.8
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	2	100	100

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Total at Risk	(1a+1b)	0	0	0
Grand Total at risk (for all RBDs)	(1a+1b)	85	11.4	32.9
<i>Grand total at risk Article 5 (for all RBDs)</i>	<i>(1a+1b)</i>	<i>135</i>	<i>18.1</i>	<i>35.8</i>

The **significant point source pressures** and methodologies used in the Irish lake risk assessment were the same as those for river analysis namely; UWWT & sludge treatment plants; overflows; IPPC industries; non IPPC industries; and other significant point sources based on expert judgement. Datasets for point source pressures were generally available on a national scale with Local Authorities providing data on non IPPC licensed industries.

The point source assessment was undertaken under Article 5 by identifying the location and impact potential of point sources. Where monitoring data was available for a discharge (i.e. for treatment plants or industrial discharges), the risk category of the receiving water body was dependant on the compliance of the most recent sampling data with license limits. If exceedance of any statutory limit was recorded, water bodies were placed in the at risk or probably at risk categories (depending on data confidence). Conversely, where all samples complied with consent limits, water bodies were placed in the probably not at risk or not at risk categories, again depending on confidence in the data. Where monitoring data was not available, non-quantitative indicators or expert judgement were used to assign risk category.

Under the Municipal and Industrial Regulations POMS study the point source pressure assessment was updated. The following general criteria has been tested against each point source discharge for the update (note CSO and WTPs were not updated).

- WWTP is at or exceeding capacity
- Insufficient assimilative capacity in receiving waters
- Failure of Bathing water quality standards

If any of the criteria apply to the point source discharge the receiving water body was deemed to be at risk and designated as such. Table 4-3 below sets out the updated point source pollution risk assessment.

Table 4-3 Lake water bodies affected by point source pollution updated

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	26	100.0	100.0
Total at Risk	(1a+1b)	0	0.0	0.0
SE-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	12	100	100
Total at Risk	(1a+1b)	0	0	0
SW-RBD	1a at risk	1	1.1	6.8
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	89	98.9	93.2
Total at Risk	(1a+1b)	1	1.1	6.8
Shannon-IRBD	1a at risk	1	0.9	29.6
	1b probably at risk	1	0.9	1.2
	2a probably not at risk	0	0	0
	2b not at risk	111	98.2	69.2
Total at Risk	(1a+1b)	2	1.8	30.8
W-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	322	100	100.0
Total at Risk	(1a+1b)	0	0	0
NW-IRBD	1a at risk	1	0.4	1.6
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	225	99.6	98.4
Total at Risk	(1a+1b)	1	0.4	1.6
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	16	100	100
Total at Risk	(1a+1b)	0	0	0

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Grand total at risk (for all RBDs)	(1a+1b)	4	0.5	11.6
<i>Grand total for Article 5 at risk (for all RBDs)</i>	<i>(1a+1b)</i>	<i>42</i>	<i>5.6</i>	<i>43.6</i>

The **significant diffuse source pressures** assessment of lakes under Article was determined based on the general diffuse risk category of the inflowing river water bodies. The diffuse risk assessment was not updated.

Table 4-4 Lake water bodies affected by diffuse source pollution under Article 5

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	4	15.4	20.2
	2a probably not at risk	1	3.8	50.5
	2b not at risk	21	80.8	29.3
Total at Risk	(1a+1b)	4	15.4	20.2
SE-RBD	1a at risk	0	0	0
	1b probably at risk	6	50	76.1
	2a probably not at risk	3	25	21.8
	2b not at risk	3	25	2.1
Total at Risk	(1a+1b)	6	50	76.1
SW-RBD	1a at risk	0	0.0	0.0
	1b probably at risk	6	6.7	35.2
	2a probably not at risk	4	4.4	18.0
	2b not at risk	80	88.9	46.8
Total at Risk	(1a+1b)	6	6.7	35.2
Shannon-IRBD	1a at risk	1	0.9	0.1
	1b probably at risk	63	55.8	80.4
	2a probably not at risk	4	3.5	14.3
	2b not at risk	45	39.8	5.2
Total at Risk	(1a+1b)	64	56.7	80.5
W-RBD	1a at risk	1	0.3	0

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	1b probably at risk	13	4.0	2.4
	2a probably not at risk	3	0.9	0.1
	2b not at risk	262	81.4	94.9
Total at Risk	(1a+1b)	14	4.3	2.4
NW-IRBD	1a at risk	3	1.7	0.4
	1b probably at risk	45	25.0	17.3
	2a probably not at risk	48	26.6	45.9
	2b not at risk	84	46.7	36.4
Total at Risk	(1a+1b)	48	26.7	17.7
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	2	100.0	100.0
Total at Risk	(1a+1b)	0	0	0
Grand total at risk (for all RBDs)	(1a+1b)	142	19.1	35.2

The **lake impact assessment under Article 5** was based on national monitoring datasets created by the EPA and the CFB, supplemented by Local Authority monitoring data. The impact data used related to eutrophication pressures and included mean total phosphorus concentration and mean and maximum Chlorophyll *a* values. Classification thresholds were developed by the EPA specifically for each lake type based on the findings of an EPA lakes research programme. Expert judgement was used to refine the risk category of the lake based on local knowledge such as the long-term trends in lake quality including observations of algal blooms and growth in littoral areas.

The process is precautionary in that a single pressure can cause a water body to be classified at risk. The dominant influences on the at risk water bodies are impact data, diffuse pollution pressures and morphological pressures with point pollution and hydrological pressures resulting in identification of a small number of at risk lake water bodies.

This Article 5 impact assessment was retained.

Table 4-5 Lake water bodies affected summary update

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	11	0	40
	1b probably at risk	6	23	6
	2a probably not at risk	4	15	53
	2b not at risk	5	19	1
Total at Risk	(1a+1b)	17	23	46
SE-RBD	1a at risk	0	0	0
	1b probably at risk	7	58	88
	2a probably not at risk	5	42	12
	2b not at risk	0	0	0
Total at Risk	(1a+1b)	7	58	88
SW-RBD	1a at risk	14	16	37
	1b probably at risk	13	14	22
	2a probably not at risk	9	10	21
	2b not at risk	54	60	21
Total at Risk	(1a+1b)	27	30	59
Shannon-IRBD	1a at risk	14	12	65
	1b probably at risk	45	40	24
	2a probably not at risk	36	32	11
	2b not at risk	18	16	1
Total at Risk	(1a+1b)	59	52	88
W-RBD	1a at risk	26	8	65
	1b probably at risk	24	7	15
	2a probably not at risk	67	21	11
	2b not at risk	205	64	8
Total at Risk	(1a+1b)	50	16	81
NW-IRBD	1a at risk	15	7	39
	1b probably at risk	60	27	15
	2a probably not at risk	68	30	36
	2b not at risk	83	37	10
Total at Risk	(1a+1b)	75	33	54
Neagh/Bann IRBD	1a at risk	1	6	65
	1b probably at risk	9	56	23
	2a probably not at risk	3	19	8
	2b not at risk	3	19	4
Total at Risk	(1a+1b)	10	63	88

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Grand total at risk (for all RBDs)	(1a+1b)	245	33	78
<i>Grand total at risk for Article 5 (for all RBDs)</i>	<i>(1a+1b)</i>	<i>280</i>	<i>37.6</i>	<i>85.4</i>

5 Transitional and Coastal Risk Assessments

Overview of Transitional and Coastal Risk Assessments

The risk procedures applied to Irish marine (transitional and coastal) water bodies under Article 5 are similar to the river and lake risk assessment procedures, involving a combination of both pressure and impact assessments. The analysis includes abstraction, flow regulation, morphological and pollution pressures and also incorporates impact data from national marine monitoring datasets.

New cross water bodies which were designated post Article 5 have been included in any updated Risk Assessment.

Table 4-1 summarises the Irish transitional and coastal risk assessment methodologies developed.

Table 4-1 WFD Transitional and Coastal Risk Assessments for Relevant Pressures

Pressure/Activity	Main Features
Water abstraction and flow regulation	Surface water abstraction
	Presence of major impoundments
Morphological alterations	Channelisation & Dredging (including bottom-culture aquaculture) (updated)
	Disposal of Dredge Spoil (updated)
	Coastal defences, Flood Protection & Embankments (updated)
	Impounding (tidal barrages) (updated)
	Built Structures (updated)
	Intensive Land Use (urbanisation, peat extraction, arable & forestry) (updated)

Pressure/Activity	Main Features
Point source pollution	Transitional waters & lagoons - point discharges and aquaculture (line-culture & fish farms) (updated) Coastal embayments & lagoons - point discharges and aquaculture (line-culture & fish farms) and expert judgement (updated)
Diffuse source pollution	Included in impact assessment
Impact	Eutrophication and organic pollution - datasets and designations
	Biota survey data

The pressures and impacts methodologies were developed from the UK TAG surface water assessment methodologies, to ensure compatibility throughout the ecoregion.

National monitoring datasets were obtained from the EPA and the MI to identify impacted water bodies. The risk category of water bodies was refined where reliable impact data was available. Environmental quality standards have been taken from existing European and National surface water quality standards. For example background reference concentrations and ecotoxicological assessment criteria developed for the marine environment under the OSPAR convention have been used to assess impact due to hazardous substances.

The data collection process undertaken in support of the risk assessment revealed a number of data gaps with regard to pressure and impact datasets which will have to be addressed during the development of the first river basin management plan.

Transitional and Coastal Risk Assessment Results

The assessment of **significant abstraction pressures** in transitional water bodies was undertaken under Article 5 by comparing the nett volume of known significant surface water abstractions with the characteristic low flow supplying each water body. The assessment does not apply to coastal water bodies since it is not possible for these to be at risk from over abstraction. The risk category was identified based on a percentage threshold of the 95 percentile low flow abstracted. The methodology used to calculate the low flow and nett abstraction for each water body and the thresholds used are described in the background documents.

A significant flow regulation structure present (such as a tidal barrage) in a water body resulted in the water body being placed in the at risk category due to flow regulation pressures.

This risk assessment was retained.

Table 4-2 Transitional water bodies affected by abstractions under Article

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	3	23.1	34.7
	2b not at risk	10	76.9	65.3
Total at Risk	(1a+1b)	0	0	0
SE-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	21	100	100
Total at Risk	(1a+1b)	0	0	0
SW-RBD	1a at risk	5	11.6	9.3
	1b probably at risk	1	2.3	4.8
	2a probably not at risk	1	2.3	3.0
	2b not at risk	36	83.7	83.0
Total at Risk	(1a+1b)	6	14.0	14.1
Shannon-IRBD	1a at risk	1	5	0.1
	1b probably at risk	1	5	1.2
	2a probably not at risk	2	10	0.8
	2b not at risk	16	80	97.9
Total at Risk	(1a+1b)	2	10	1.3
W-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	68	100	100
Total at Risk	1a at risk	0	0	0
NW-IRBD	1b probably at risk	0	0	0
	2a probably not at risk	3	13.6	3.0
	2b not at risk	7	31.8	3.7
	1a at risk	12	54.6	93.3
Total at Risk	(1a+1b)	3	13.6	3.0
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	4	44.4	7.4

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	2b not at risk	5	55.6	92.6
Total at Risk	(1a+1b)	0	0	0
Grand total at risk (for all RBDs)	(1a+1b)	11	5.6	3.6

The **significant morphological pressures** assessment under Article 5 was undertaken by determining the extent of various known significant alterations within each marine water body. The morphological assessment for transitional water bodies included the following pressures; channelisation and dredging (including specified aquaculture practices); disposal of dredge spoil; flood protection, embankments and coastal defence; impounding; construction and intensive land use. The pressures included in the morphological assessment for coastal water bodies were; dredging; disposal of dredge spoil; flood protection, embankments and coastal defence and construction. The risk category was identified based on the proportion of the water body altered. To ensure consistency with the approach applied throughout the ecoregion, the UK TAG methodology and thresholds were adapted to reflect Irish data availability as described in the background documents.

The marine morphological pressures risk assessment was updated from the Marine Morphology POMS study. This risk assessment was updated using the TraC-MImAS tool. TraC-MImAS uses the concept of system capacity (A measure of the ability of the water environment to absorb morphological alterations) to estimate the risk of a waterbody failing to meet WFD status classes. The same morphological pressures that were looked at under Article 5 were also used for this update. All but one construction assessment was updated by this tool for marine waters.

Table 4-3 Transitional water bodies affected by morphology pressures update

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	10	76.9	90.3
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	3	23.1	9.7
Total at Risk	(1a+1b)	10	76.9	90.3
SE-RBD	1a at risk	7	33.3	41.7
	1b probably at risk	0	0	0

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	2a probably not at risk	0	0	0
	2b not at risk	14	66.7	58.3
Total at Risk	(1a+1b)	7	33.3	41.7
SW-RBD	1a at risk	10	23.3	22.5
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	33	76.7	77.5
Total at Risk	(1a+1b)	10	23.3	22.5
Shannon-IRBD	1a at risk	6	30	5
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	14	70	95
Total at Risk	(1a+1b)	6	30	5
W-RBD	1a at risk	1	1.5	0.05
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	67	98.5	99.95
Total at Risk	(1a+1b)	1	1.5	0.05
NW-IRBD	1a at risk	3	13.6	61.6
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	19	86.4	38.4
Total at Risk	(1a+1b)	3	13.6	61.6
Neagh/Bann IRBD	1a at risk	4	44.4	5.8
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	5	55.6	94.2
Total at Risk	(1a+1b)	4	44.4	5.8
Grand total at risk (for all RBDs)	(1a+1b)	41	5.5	21.4
Grand total at risk under Article 5 (for all	(1a+1b)	70	35.7	66.6

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
<i>RBDs)</i>				

Table 4-4 Coastal water bodies affected by morphology pressures update

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	1	12.5	13.4
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	7	87.5	86.6
Total at Risk	(1a+1b)	1	12.5	13.4
SE-RBD	1a at risk	2	22.2	0.5
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	7	77.8	99.5
Total at Risk	(1a+1b)	2	22.2	0.5
SW-RBD	1a at risk	4	14.8	1.2
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	23	85.2	98.8
Total at Risk	(1a+1b)	4	14.8	1.2
Shannon-IRBD	1a at risk	1	9	1
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	10	91	99
Total at Risk	(1a+1b)	1	9	1
W-RBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	30	100.0	41.05
Total at Risk	(1a+1b)	0	0.0	0.00
NW-IRBD	1a at risk	1	4.3	0.1
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	22	95.7	99.9
Total at Risk	(1a+1b)	1	4.3	0.1

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Neagh/Bann IRBD	1a at risk	0	0	0
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	5	100.0	100.0
Total at Risk	(1a+1b)	0	0	0
Grand total at risk (for all RBDs)	(1a+1b)	9	1.2	0.9
<i>Grand total at risk under Article 5 (for all RBDs)</i>	<i>(1a+1b)</i>	<i>21</i>	<i>18.6</i>	<i>6.6</i>

The **marine pollution impact assessment under Article 5** comprised two impact elements; eutrophication (nutrient and organic enrichment) and hazardous substances. National monitoring datasets were obtained from the EPA and the MI to identify impacted marine water bodies. Predictive elements, such as point discharge and aquaculture activities were also incorporated into the marine pollution impact assessment.

The information used to identify eutrophication impacts included the findings of the following studies which were submitted to the European Commission by the EPA to fulfil existing obligations:

- Urban Waste Water Treatment Regulations nutrient sensitive designations;
- Results of the application by the EPA of the OSPAR Common Procedure.

These were comprehensive investigations of eutrophication entailing predictive assessment of point and diffuse nutrient loading to marine water bodies and examination of impact indicators such as nutrient concentrations and ratios, phytoplankton biomass and macroalgae, dissolved oxygen levels and observation of fauna and toxic algae blooms. Water bodies identified by these investigations were placed at risk or probably at risk depending on their classification under the above studies, as described in the background documents.

MI biota monitoring data for the period 1997-2003 were analysed to investigate the impacts associated with hazardous substances. The monitoring results for twelve parameters were compared with the OSPAR EAC's (Ecotoxicological

Assessment Criteria) or BRC's (Background Reference Concentration) limits for biota. Any samples with recorded chemical concentrations which were above the EAC limits were deemed failures, as were any samples with recorded chemical concentrations above twice the BRC limits. Each marine water body with available monitoring data was assigned a risk category based on its compliance; any failure of any standard resulted in the water body being placed in the at risk or probably at risk categories, no failures resulted in not at risk or probably not at risk categorisation depending on the length of record available. The risk category of each water body was reviewed by experts from the MI and the risk category was reviewed to reflect the degree of confidence in data.

The marine impact assessment was considered to represent the upstream point and diffuse pressures on marine water bodies on the basis that it included the point and diffuse load assessment. However supplementary point assessments were undertaken for discharges and aquaculture activities in all transitional waters and coastal embayments and lagoons. Expert opinion was also incorporated into the risk assessment where point related impacts were identified at RBD level.

Under the Municipal and Industrial Regulations POMS study the transitional and coastal point assessment was updated.

Under the Municipal and Industrial Regulations POMS study the point source pressure assessment was updated. The following general criteria has been tested against each point source discharge for the update (note CSO and WTPs were not updated).

- WWTP is at or exceeding capacity
- Insufficient assimilative capacity in receiving waters
- Failure of Bathing water quality standards
- Failure of Shellfish water quality standards.

If any of the criteria apply to the point source discharge the receiving water body was deemed to be at risk and designated as such.

Table 4-5 Transitional water bodies impacted by pollution (point & impact) updated

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	8	61.5	74.3
	1b probably at risk	4	31	25
	2a probably not at risk	0	0	0
	2b not at risk	1	7.7	0.1

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
Total at Risk	(1a+1b)	12	92.3	99.8
SE-RBD	1a at risk	9	42.9	79.1
	1b probably at risk	3	14	9
	2a probably not at risk	0	0	0
	2b not at risk	9	42.9	11.6
Total at Risk	(1a+1b)	12	57.1	88.4
SW-RBD	1a at risk	15	34.9	46.6
	1b probably at risk	6	14	35
	2a probably not at risk	0	0	0
	2b not at risk	22	51.2	18.6
Total at Risk	(1a+1b)	21	48.8	81.4
Shannon-IRBD	1a at risk	9	45	71
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	11	55	29
Total at Risk	(1a+1b)	9	45	71
W-RBD	1a at risk	5	7.4	25.84
	1b probably at risk	1	1	7
	2a probably not at risk	0	0	0
	2b not at risk	62	91.2	67.54
Total at Risk	(1a+1b)	6	8.8	32.45
NW-IRBD	1a at risk	4	14.3	72.3
	1b probably at risk	0	0	0
	2a probably not at risk	8	28.6	3.1
	2b not at risk	16	57.1	24.7
Total at Risk	(1a+1b)	4	14.3	72.3
Neagh/Bann IRBD	1a at risk	2	18.2	5.5
	1b probably at risk	0	0	0
	2a probably not at risk	1	9.1	0.1
	2b not at risk	8	72.7	94.7
Total at Risk	(1a+1b)	2	18.2	5.5
Grand total at risk (for all RBDs)	(1a+1b)	66	8.9	66.8
Grand total at risk	(1a+1b)	74	37.8	75.9

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
<i>under Article 5 (for all RBDs)</i>				

Table 4-6 Coastal water bodies impacted by pollution (point and impact) updated

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	5	62.5	82.4
	1b probably at risk	1	13	1
	2a probably not at risk	0	0	0
	2b not at risk	2	25	16.4
Total at Risk	(1a+1b)	6	75.0	83.7
SE-RBD	1a at risk	3	33.3	82.3
	1b probably at risk	2	22	4
	2a probably not at risk	0	0	0
	2b not at risk	4	44.4	13.5
Total at Risk	(1a+1b)	5	55.6	86.5
SW-RBD	1a at risk	5	18.5	8.7
	1b probably at risk	2	7	5
	2a probably not at risk	0	0	0
	2b not at risk	20	74.1	86.0
Total at Risk	(1a+1b)	7	25.9	14.0
Shannon-IRBD	1a at risk	3	27	76
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	8	73	24
Total at Risk	(1a+1b)	3	27	76
W-RBD	1a at risk	5	17	19
	1b probably at risk	1	3	1
	2a probably not at risk	0	0	0
	2b not at risk	24	80.0	163.6
Total at Risk	(1a+1b)	6	20.0	20.2
NW-IRBD	1a at risk	5	21.7	12.4
	1b probably at risk	0	0	0
	2a probably not at risk	1	4.3	0.002

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	2b not at risk	17	73.9	87.8
Total at Risk	(1a+1b)	5	21.7	12.4
Neagh/Bann IRBD	1a at risk	1	20	13
	1b probably at risk	0	0	0
	2a probably not at risk	1	20	18.7384582
	2b not at risk	3	60.0	67.8
Total at Risk	(1a+1b)	1	20	13
Grand total at risk (for all RBDs)	(1a+1b)	33	4.4	29.0
<i>Grand total at risk under Article 5(for all RBDs)</i>	<i>(1a+1b)</i>	<i>13</i>	<i>11.5</i>	<i>4.6</i>

The process is precautionary in that a single pressure can cause a water body to be classified at risk. The assessment of hydromorphological pressures and impact data result in identification of a significant portion of at risk Irish transitional and coastal water bodies although the proportion of at risk water bodies varies from RBD to RBD.

Table 4-7 Transitional water bodies affected summary updated

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	11	84.6	91.3
	1b probably at risk	2	15	9
	2a probably not at risk	0	0	0
	2b not at risk	0	0	0.0
Total at Risk	(1a+1b)	13	100	100
SE-RBD	1a at risk	12	57.1	87.5
	1b probably at risk	1	5	1
	2a probably not at risk	0	0	0
	2b not at risk	8	38.1	11.2
Total at Risk	(1a+1b)	13	61.9	88.9
SW-RBD	1a at risk	18	41.9	48.0
	1b probably at risk	4	9	33

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	2a probably not at risk	0	0	0
	2b not at risk	21	48.8	18.6
Total at Risk	(1a+1b)	22	51.2	81.4
Shannon-IRBD	1a at risk	11	55	72
	1b probably at risk	1	5	1
	2a probably not at risk	0	0	0
	2b not at risk	8	40	28
Total at Risk	(1a+1b)	12	60	72
W-RBD	1a at risk	6	8.8	25.92
	1b probably at risk	1	1	7
	2a probably not at risk	0	0	0
	2b not at risk	61	89.7	67.54
Total at Risk	(1a+1b)	7	10.3	32.53
NW-IRBD	1a at risk	6	21.4	72.6
	1b probably at risk	2	7	1
	2a probably not at risk	10	35.7	7.4
	2b not at risk	10	35.7	18.5
Total at Risk	(1a+1b)	8	28.6	74.1
Neagh/Bann IRBD	1a at risk	4	36.4	5.8
	1b probably at risk	0	0	0
	2a probably not at risk	2	18.2	2.5
	2b not at risk	5	45.5	91.6
Total at Risk	(1a+1b)	4	36.4	5.8
Grand total at risk (for all RBDs)	(1a+1b)	79	10.6	67.4
<i>Grand total at risk under Article 5 (for all RBDs)</i>	<i>(1a+1b)</i>	<i>104</i>	<i>53.1</i>	<i>90.2</i>

Table 4-8 Coastal water bodies affected summary

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
E-RBD	1a at risk	5	62.5	82.4

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
	1b probably at risk	1	13	1
	2a probably not at risk	0	0	0
	2b not at risk	2	25	16.4
Total at Risk	(1a+1b)	6	75.0	83.7
SE-RBD	1a at risk	5	55.6	82.8
	1b probably at risk	2	22	4
	2a probably not at risk	0	0	0
	2b not at risk	2	22.2	13.0
Total at Risk	(1a+1b)	7	77.8	87.0
SW-RBD	1a at risk	7	25.9	8.8
	1b probably at risk	1	4	5
	2a probably not at risk	0	0	0
	2b not at risk	19	70.4	86.0
Total at Risk	(1a+1b)	8	29.6	14.0
Shannon-IRBD	1a at risk	4	36	77
	1b probably at risk	0	0	0
	2a probably not at risk	0	0	0
	2b not at risk	7	64	23
Total at Risk	(1a+1b)	4	36	77
W-RBD	1a at risk	5	17	19
	1b probably at risk	1	3	1
	2a probably not at risk	0	0	0
	2b not at risk	24	80.0	163.6
Total at Risk	(1a+1b)	6	20.0	20.2
NW-IRBD	1a at risk	5	21.7	12.4
	1b probably at risk	0	0	0
	2a probably not at risk	1	4.3	0.002
	2b not at risk	17	73.9	87.8
Total at Risk	(1a+1b)	5	21.7	12.4
Neagh/Bann IRBD	1a at risk	1	20	13
	1b probably at risk	0	0	0
	2a probably not at risk	1	20	18.7384582
	2b not at risk	3	60.0	67.8
Total at Risk	(1a+1b)	1	20	13
Grand total	(1a+1b)	37	5.0	29.2

RBD	Reporting Category	Number of Water Bodies	% of number	% area of RBD
at risk (for all RBDs)				
<i>Grand total at risk under Article 5 (for all RBDs)</i>	<i>(1a+1b)</i>	<i>30</i>	<i>26.5</i>	<i>10</i>