

Annex 2.1.1.2 Chemical thresholds values

Parameter	BOD5		Proposed reference values							
Unit :	mg/l				R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
<i>except :</i>	Germany : TOC mg/l		mg/l	mean	2.4	2.4	2	2.4	2.4	2.4
			mg/l	90th perc	3.6	3.6	2.75	3.6	3.6	3.6
				Values						
		Parameter	Statistic	All types	R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
France	no impact threshold - ICMi	BOD5	Mean	2.6		4	3.5	6		2.4
France	Observed values REF sites	BOD5	Mean			2.56	1.8	2.36		2.42
France	no impact threshold - ICMi	BOD5	90th perc	3.75		7	4.8	7		3.6
France	Observed values REF sites	BOD5	90th perc			4.1	2.34	3.25		3.64
France	SEQ Eau classification - High	BOD5	90th perc	3						
UK	Observed values 75th High sites	BOD5	Mean		2.2	1.85	1.85	1.85	2.2	2.2
UK	Observed values 75th High sites	BOD5	90th perc		3.4	2.73	2.73	2.73	3.4	3.4
Italy	DL 152 classification - level 1	BOD5	75th perc	2.5						
Spain (NW)	Observed values REF sites	BOD5	Mean						2	
Spain (NW)	Observed values REF sites	BOD5	90th perc						2.4	
Austria	Observed values High status sites	BOD5	Median				0.9			
Austria	Observed values High status sites	BOD5	90th perc				1.7			
Poland	Observed values REF sites	BOD5	1 value		0.4					
Germany	LAWA classification - High	TOC	90th perc		5		3	5	5	
Denmark	Threshold Leuctra disappear	BOD5	Mean		2.4					

Notes

France : No impact threshold derived on invertebrates with ICM index (Work paper for CB GIG SG, 23/01/06)

France : Observed values on REF sites are provisional.

UK : High Status sites on invertebrates (Work paper 3/02/06 distributed at the CB GIG meeting, Paris).

Spain : Observed values in other types are similar or lower than for R-C5.

Austria : Suggest a 90 perc threshold between 2.5 and 3 mg/l

Germany : Values in TOC; the conversion factor BOD5 to TOC can vary from 20 (for natural organic matter) to 2.7 (for urban input)

Germany : C3 : value for the submontane type

Denmark : Result from the REBECCA project

Parameter	Dissolved Oxygen	Proposed reference values			R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
Unit :	% saturation			mean	95-105	95-105	95-105	95-105	95-105	95-105
<i>except</i>	Germany mg/l			10-90 perc	85-115	90-110	90-110	85-115	85-115	85-115
				Values						
		Parameter	Statistic	All types	R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
France	Observed values REF sites	O2%	Mean			98	97	99		96
France	Observed values REF sites	O2%	10-90 perc			93-108	95-101			88-107
UK	Observed values 75th High sites	O2%	10th perc		85	91	91	91	85	85
Italy	DL 152 classification - level 1	O2%	75th perc	90 - 110						
Spain (NW)	Observed values REF sites	O2%	Mean						102	
Spain (NW)	Observed values REF sites	O2%	90th perc						115	
Germany	LAWA classification - High	02 mg/l	10th perc		6		8	6	6	

Notes

UK : High Status sites on invertebrates (Work paper 3/02/06 distributed at the CB GIG meeting, Paris).

Spain : Observed values in other types are similar or lower than for R-C5.

Germany : Values in mg/l

France : Observed values on REF sites are provisional.

Parameter	N-NH4	Proposed reference values			R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
Unit :	mg/l		mg/l	mean	0.1	0.05	0.05	0.1	0.1	0.1

			mg/l	90-perc	0.25	0.12	0.12	0.25	0.25	0.25
				Values						
		Parameter	Statistic	All types	R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
France	no impact threshold ICMi	N-NH4	Mean	0.04		0.16	0.04	0.07		0.08
France	Observed values REF sites	N-NH4	Mean			0.052	0.039	0.039		0.044
France	no impact threshold ICMi	N-NH4	90th perc	0.1		0.39	0.12	0.27		0.26
France	Observed values REF sites	N-NH4	90th perc			0.092	0.058	0.069		0.086
France	SEQ Eau classification - High	N-NH4	90th perc	0.08						
UK	Observed values 75th High sites	N-NH4	Mean		0.12	0.06	0.06	0.06	0.12	0.12
UK	Observed values 75th High sites	N-NH4	90th perc		0.22	0.12	0.12	0.12	0.22	0.22
Italy	DL 152 classification - level 1	N-NH4	75th perc	0.03						
Spain (NW)	Observed values REF sites	N-NH4	Mean						0.017	
Spain (NW)	Observed values REF sites	N-NH4	90th perc						0.028	
Poland	Observed values REF sites	N-NH4	max (4 values)		0.076					
Germany	LAWA classification - High	N-NH4	90th perc		0.3		0.1	0.3	0.3	

Notes:

Conversion factor N-NH4 mg/l = 0,778* NH4 mg/l

France: No impact threshold derived on invertebrates with ICM index (Work paper for CB GIG SG, 23/01/06)

France: Observed values on REF sites are provisional.

UK: High Status sites on invertebrates (Work paper 3/02/06 distributed at the CB GIG meeting, Paris).

Spain: Observed values in other types are similar or lower than for R-C5.

Germany: C3 : value for the sub-mountain type

Comment from Ireland by John Lucey, March 6 2006:

- 1) Suggest to set a maximum value (not mean or 90th percentile)
- 2) Suggest at least a maximum of 0,1 mg/l NH4 for R-C1, R-C4, R-C5
- 3) Suggest a standard criteria for all types at 0,05 mg/l NH4
- 4) Mean values for High quality class in Ireland is 0,049 mg/l NH4
- 5) Requirement for Margaritifera margaritifera is 0,1 mg/l NH4
- 6) It is not clear if concerns NH4 or N-NH4.

Parameter	P-PO4 (or SRP)	Proposed reference values			R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
Unit :	microgram / l		µg/l	Mean	40	30	20	40	40	40
				Values						
		Parameter	Statistic	All types	R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
France	no impact threshold -ICMi	P-PO4	Mean	46		98	49	42		121
France	Observed values REF sites	P-PO4	Mean			48	24	28		40
France	no impact threshold -ICMi	P-PO4	90th perc	82		179	82	131		196
France	Observed values REF sites	P-PO4	90th perc			89	34	58		73
France	SEQ Eau classification - High	P-PO4	90th perc	33						
UK	Observed values 75th High sites	P-PO4	Mean		33	22	18	33	33	33
Italy	DL 152 classification - level 1	P-PO4	75th perc	35						
Spain (NW)	Observed values REF sites	P-PO4	Mean						10	
Spain (NW)	Observed values REF sites	P-PO4	90th perc						21	
Poland	Observed values REF sites	P-PO4	mean (3 values)		25					
Germany	LAWA classification - High	P-PO4	90th perc		100		40	100	100	
Germany	LAWA classification - High	P-PO4	mean (estimated)		59		24	59	59	

Notes: Conversion factor P-PO4 = 0.326 * PO4
P-PO4 = 0.5 * Total P

France : No impact threshold derived on invertebrates with ICM index (Work paper for CB GIG SG, 23/01/06)

France : Observed values on REF sites are provisional.

UK : High Status sites on invertebrates (Work paper 3/02/06 distributed at the CB GIG meeting, Paris).

Spain : Observed values in other types are similar or lower than for R-C5.

Germany : C3 : value for the sub-mountain type

Germany : Mean values estimated from the 90th percentile with a ratio of 0.59

Italy: Original values in Total P

Sweden: Ref value : 10 µg/l for Total P

Parameter	N-NO3	Proposed reference values			R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
Unit :	mg / l	mg / l	for invertebrates	mean	6	6	2	6	6	6
		mg / l	for diatoms	mean	4	4	2	4	4	4
				Values						
		param.	Statistic	All types	R-C1	R-C2	R-C3	R-C4	R-C5	R-C6
France	no impact threshold - ICMi	N-N03	Mean	No						
France	Observed values REF sites	N-N03	Mean			6.1	0.66	4.2		2.7
France	SEQ Eau classification - High	N-N03	90th perc	0.45						
UK	Suggested values for invertebrates	N-N03	Mean	6						
UK	Suggested values for Diatoms	N-N03	Mean		4	2	2	4	4	4
Italy	DL 152 classification - level 1	N-N03	75th perc	0.3						
Spain (NW)	Observed values REF sites	N-N03	Mean						0.8	
Spain (NW)	Observed values REF sites	N-N03	90th perc						1.2	
Germany	LAWA classification - High	N-N03	90th perc		2.5		1.5	2.5	2.5	

Notes: conversion factor, N-NO3 = 0.226 * NO3

France : No significant relationship between NO3 and ICMi (Work paper for CB GIG SG, 23/01/06)

France : Observed values on REF sites are provisional.

Spain : Observed values in other types are similar or lower than for R-C5.

Germany : C3 : value for the submontane type

Ecotox data : *Camargo et al 2005*

Threshold for most sensitive taxa: 2 mg/l N-NO3

Conversion factor:

NO3 N-NO3 0.226

NH4 N-NH4 0.778

P04 P-PO4 (SRP) 0.326

molar mass:

H 1

N 14

O 16

P 31