

**WAT-SG-53**

**Environmental Standards for Discharges to Surface Waters**

January 2024

Contents

[1 Purpose and scope 3](#_Toc187244268)

[2 Typology-specific environmental quality standards 3](#_Toc187244269)

[3 Fundamental intermittent and short-term standards 4](#_Toc187244270)

[4 Environmental quality standards for surface waters 4](#_Toc187244271)

[4.1 Priority substances 4](#_Toc187244272)

[4.2 Specific pollutants 4](#_Toc187244273)

[4.3 Substances under the repealed Dangerous Substances Directive 5](#_Toc187244274)

[4.4 Non-statutory EQS 5](#_Toc187244275)

[5 Operational aquaculture standards 5](#_Toc187244276)

[6 Glossary/Acronyms 5](#_Toc187244277)

[Annex 1: Tables of environmental standards 7](#_Toc187244278)

[A1.1 List of substances and parameters presented in tables 2-8 7](#_Toc187244279)

[A1.2 pH and ANC standards for rivers 19](#_Toc187244280)

[A1.3 Fundamental intermittent and short-term standards 20](#_Toc187244281)

[A1.3.1 Good, short-term and intermittent standards for dissolved oxygen for salmonid rivers 20](#_Toc187244282)

[A1.3.2 Good, short-term and intermittent standards for dissolved oxygen for cyprinid rivers 21](#_Toc187244283)

[A1.3.3 Short-term and intermittent standards for biochemical oxygen demand 21](#_Toc187244284)

[A1.3.4 Short-term and intermittent ammonia standards in rivers 22](#_Toc187244285)

[A1.3.5 Short-term and intermittent un-ionised ammonia standards for salmonid rivers 22](#_Toc187244286)

[A1.3.6 Short-term and intermittent un-ionised good standards for cyprinid rivers 24](#_Toc187244287)

[A1.4 EQS for WFD priority substances and other EU listed pollutants 26](#_Toc187244288)

[A1.4.1 Freshwater EQS for WFD priority substances and other pollutants 26](#_Toc187244289)

[A1.4.2 Marine EQS for WFD priority substances and other pollutants 31](#_Toc187244290)

[A1.4.3 Biota EQS for WFD priority substances and other pollutants 35](#_Toc187244291)

[A1.5 EQS for WFD UK specific pollutants (UK standards)\*\* 38](#_Toc187244292)

[A1.5.1 Freshwater EQS for WFD UK specific pollutants 38](#_Toc187244293)

[A1.5.2 Ammonia standards for rivers 40](#_Toc187244294)

[A1.5.3 Ammonia standards for lochs 40](#_Toc187244295)

[A1.5.4 MarineEQS for WFD UK specific pollutants 41](#_Toc187244296)

[A1.6 EQS for former DSD substances 44](#_Toc187244297)

[A1.6.1 Freshwater EQS for former DSD substances no longer considered under WFD 44](#_Toc187244298)

[A1.6.2 Marine EQS for former DSD substances no longer considered under WFD 45](#_Toc187244299)

[A1.7 Non-statutory EQS values 45](#_Toc187244300)

[A1.7.1 Non-statutory freshwater EQS values for other substances 45](#_Toc187244301)

[A1.7.2 Non-statutory marine EQS values for other substances 50](#_Toc187244302)

[A1.8 Operational standards for aquaculture 56](#_Toc187244303)

[A1.8.1 Operational water quality standards for chemicals used in aquaculture 56](#_Toc187244304)

[A1.8.2 Operational sediment quality standards for chemicals used in aquaculture 58](#_Toc187244305)

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#  Purpose and scope

The purpose of this guidance is to provide information on, and access to, the environmental standards for pollutants in surface waters. The standards are based on the latest scientific understanding of the UK Technical Advisory Group (UKTAG) for the Water Framework Directive (WFD). The surface water standards are taken from in the Scotland River Basin District (Standards) Directions and the Solway Tweed River Basin District (Standards) Directions.

A separate SEPA guidance note provides information on morphology standards: WAT-SG-21: Environmental Standards for River Morphology.

#  Typology-specific environmental quality standards

Some of the environmental standards are dependent on the type of surface water, such as its altitude, alkalinity and concentration of dissolved organic carbon (DOC). Details on types of surface water can be found in The Scotland River Basin District (Standards) Directions 2024.

 The parameters that depend on the surface water typology include:

* Dissolved oxygen (DO) standards in relation to short-term and intermittent changes to DO.
* Biochemical oxygen demand (BOD) standards in relation to short-term and intermittent changes to BOD.
* Ammonia standards for rivers and lochs, including standards for short-term and intermittent changes in ammonia concentration.
* pH and acid neutralising capacity (ANC) in rivers.

#  Fundamental intermittent and short-term standards

[Table 3](#_A1.3_Fundamental_intermittent) contains the fundamental intermittent and short term (99th percentile) standards for DO, BOD and Ammonia. These account for short term and intermittent discharges that can occur in wet weather.

#  Environmental quality standards for surface waters

The WFD requires environmental quality standards (EQS) for polluting substances. If these standards are exceeded, they could result in adverse effects to ecosystems. The tables in sections A1.4-A1.8 provide details of statutory EQS and non-statutory standards that may be used for regulatory reasons. For reference purposes, the full list of substances that SEPA is required to take account of is found in [Table 1](#_A1.1_List_of) (Additional general water quality requirements can be found in The Scotland River Basin District (Standards) Directions 2024).

## 4.1 Priority substances

The WFD priority substances list is a group of substances shown to be of major concern for European Waters due to their toxicity, bio-accumulating properties and/or persistence in the environment. SEPA is required to take account of these substances when assessing risks to the water environment, classifying the status of water bodies and controlling discharges. The list of WFD priority substances is found in [Table 4](#_Table_3:_List). This list includes Priority Hazardous Substances (PHS) and Other Pollutants (for which a European standard applies).

## 4.2 Specific pollutants

Specific pollutants are substances that may have a harmful effect on biological quality, and which have been identified by UKTAG as being discharged to the water environment in significant quantities in the UK. The list of Specific pollutants SEPA is required to take account of is found in [Table 5](#_Table_5:_EQS).

## 4.3 Substances under the repealed Dangerous Substances Directive

The Dangerous Substances Directive (DSD) was repealed in 2013. [Table 6](#_Table_6:_Application) lists those former DSD substances which are no longer considered to be discharged in significant quantities, and as such no longer used for Classification purposes. However, the standards listed for these have been determined using the rigorous process required of WFD substances and should be used where required.

## 4.4 Non-statutory EQS

[Table 7](#_Table_8:_Non-statutory) contains non-statutory EQS. These are not set out in legislation or the Directions but have been used for regulatory purposes. These standards should be used unless you wish to propose a new value following the latest guidelines provided you can provide evidence to justify the value.

#  Operational aquaculture standards

[Table 8](#_Table_9:_Operational) contains SEPA operational standards specifically for the regulation of fish farm chemicals. These have been derived in-house for our own regulatory purposes.

#  Glossary/acronyms

AA – Annual Average

ANC – Acid Neutralising Capacity

CAS – Chemical Abstract Service

Cyprinid – Environments in which populations of salmonid fish do not naturally occur

DETR – Department of the Environment, Transport and the Regions

DO – Dissolved Oxygen

DoE – Department of Environment

DSD – Dangerous Substances Directive

EA – Environment Agency

EQS – Environmental Quality Standard

HMSO – Her Majesty’s Stationery Office

MAC – Maximum Allowable Concentration

PAH – Polyaromatic Hydrocarbons

PS – Priority Substance

PHS – Priority Hazardous Substance

OP – Other Pollutant

Salmonid –Environments which would naturally support populations of salmonid fish

SNIFFER – Scotland and Northern Island Forum for Environmental Research

UKTAG – United Kingdom Technical Advisory Group

WFD – Water Framework Directive

# Annex 1: Tables of environmental standards

## A1.1 List of substances and parameters presented in tables 2-8

**Table 1a: List of substances presented in tables 2-8**

| **Substance/Parameter Name** | **CAS Number** | **Statutory Status** | **Table** |
| --- | --- | --- | --- |
| 1,1,1-Trichloroethane | 71-55-6 | Former DSD List | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| 1,1,2-Tricholorthane | 79-00-5 | Former DSD List | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| 1,2-Dichloroethane | 107-06-2 | WFD PS/PHS/OP | [[T4a](#_Table_4a:_Freshwater(i))](#_Table_4a:_Freshwateri), [[T4b](#_Table_4b:_Marinei)](#_Table_4b:_Marinei) |
| 2,4-D (2,4-Dichlorophenoxyacetic acid) | 94-75-7 | WFD UK Specific Pollutant | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| 2,4-Dichlorophenol  | 120-83-2  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| 2-Chlorophenol  | 95-57-8  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| 3,4-Dichloroaniline  | 554-00-7  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| 3-Chlorophenol (Monochlorophenol) | 108-43-0  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| 4-(1,1’,3,3’-Tetramethylbutyl)-phenol (octylphenol)  | 140-66-9  | WFD PS/PHS/OP  | [[T4a](#_Table_4a:_Freshwater(i))](#_Table_4a:_Freshwateri), [[T4b](#_Table_4b:_Marinei)](#_Table_4b:_Marinei) |
| 4-Chloro-3-methylphenol  | 59-50-7  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| 4-Chlorophenol (Monochlorophenol) | 106-48-9  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| 4-Nonylphenol (Nonylphenol) | 25154-52-3  | WFD PS/PHS/OP  | [[T4a](#_Table_4a:_Freshwater(i))](#_Table_4a:_Freshwateri), [[T4b](#_Table_4b:_Marinei)](#_Table_4b:_Marinei) |
| Abamectin  | 71751-41-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Acid neutralising capacity (ANC) | n/a | WFD UK Specific Parameter | [T2a](#_A1.2_pH_and) |
| Aclonifen  | 74070-46-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Alachlor  | 15972-60-8  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Aluminium (reactive)  | 7429-90-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Ammonia (Total) | 7664-41-7 | WFD UK Specific Pollutant | [T3d](#_Table_2d:_Ammonia), [T5b](#_Table_5b:_Ammonia), [T5c](#_Table_5c:_Ammonia) |
| Ammonia (unionised)  | 7664-41-7  | WFD UK Specific Pollutant  | [T3d](#_Table_2d:_Ammonia), [T3e](#_Table_2e:_Un-ionised), [T3f](#_Table_2f:_Un-ionised), [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Anthracene  | 120-12-7  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Arsenic  | 7440-38-2  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Atrazine  | 1912-24-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Azamethiphos  | 35575-96-3  | Non-statutorySEPA operational aquaculture | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) [T8a](#_Table_9a:_Operational)  |
| Azinphos-methyl  | 86-50-0  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Bentazone  | 25057-89-0  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Benzene  | 71-43-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Benzo(a)pyrene  | 50-32-8  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [[T4c](#_Table_4c:_Biota(i))](#_Table_4c:_Biotai) |
| Benzo(b)fluoranthene  | 205-99-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [[T4c](#_Table_4c:_Biota(i))](#_Table_4c:_Biotai) |
| Benzo(k)fluoranthene  | 207-08-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [[T4c](#_Table_4c:_Biota(i))](#_Table_4c:_Biotai) |
| Benzo(g,h,i)perylene  | 191-24-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [[T4c](#_Table_4c:_Biota(i))](#_Table_4c:_Biotai) |
| Benzylbutylpthalate  | 85-68-7  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei)  |
| Bifenox  | 42576-02-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Biological oxygen demand (BOD) | n/a | WFD UK Specific Parameter | [T3c](#_A1.3.3_Short-term_and) |
| Biphenyl  | 92-52-4  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Boron (total)  | 7440-42-8  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Brominated diphenylether (pentaBDE only)  | 32534-81-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [[T4c](#_Table_4c:_Biota(i))](#_Table_4c:_Biotai)  |
| Bromine  | 7726-95-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Bromoxynil  | 1689-84-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Bronopol  | 52-51-7  | SEPA operational aquaculture  | [T8a](#_Table_9a:_Operational) |
| C10-13 Chloroalkanes  | 85535-84-8  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Cadmium  | 7440-43-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Carbendazim  | 10605-21-7  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| Carbon tetrachloride  | 56-23-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Chlorfenvinphos  | 470-90-6  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Chloride  | 16887-00-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory) |
| Chlorine  | 7782-50-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Chloronitrotoluenes  | 25567-68-4  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Chloropropham  | 101-21-3  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Chlorothalonil  | 1897-45-6  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| Chlorotoluron  | 15545-48-9  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Chlorpyrifos  | 2921-88-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Chromium III  | 16065-83-1  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| Chromium VI  | 18540-29-9  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Cobalt  | 7440-48-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Copper  | 7440-50-8  | WFD UK Specific Pollutant | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Coumaphos  | 56-72-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Cyanide (hydrogen cyanide) | 57-12-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Cybutryne | 28159-98-0 | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Cyclodiene pesticides (aldrin, dieldrin, endrin, isodrin)  | NA  | WFD UK Specific Pollutant | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Cyfluthrin  | 68359-37-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Cypermethrin  | 52315-07-8  | WFD PS/PHS/OPSEPA operational aquaculture | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) [T8a](#_Table_9a:_Operational) |
| Deltmethrin | 52918-63-5  | SEPA operational aquaculture | [T8a](#_Table_9a:_Operational) |
| DDT total (Dichlorodiphenyltrichloroethane) |  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Demeton  | 919-86-8  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Diazinon  | 333-41-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Dibutylphthalate (DBP)  | 84-74-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Dichlorobenzene  | 25321-22-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Dichloromethane  | 75-09-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Dichlorvos  | 62-73-7  | WFD PS/PHS/OPSEPA operational aquaculture | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)[T8a](#_Table_9a:_Operational) |
| Dicofol  | 115-32-2  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai)  |
| Dicyclohexylphthalate (DCHP)  | 84-61-7  | Non-statutory | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Diethylphthalate (DEP)  | 84-66-2  | Non-statutory | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Di(2-ethylhexyl)phthalate (DEHP) | 117-81-7 | WFD PS/PHS/OP | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Diflubenzuron  | 35367-38-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Dimethoate  | 60-51-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Dimethylphthalate (DMP)  | 131-11-3  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Dioctylphthalate (DOP)  | 117-84-0  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Dioxins |  | WFD PS/PHS/OP Non-statutory | [T4c](#_Table_4c:_Biotai)[T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Dissolved Oxygen (DO) | n/a | WFD UK Specific Parameter | [T3a](#_A1.3.1_Good,_short-term), [T3b](#_A1.3.2_Good,_short-term) |
| Diuron | 330-54-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Doramectin | 117704-25-3  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| EDTA (Ethylenediaminetetraacetic acid) | 60-00-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Emamectin Benzoate | 137512-74-4  | WFD PS/PHS/OPSEPA operational aquaculture  | [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei)[T8a](#_Table_9a:_Operational), [T8b](#_Table_8b:_Operational) |
| Endosulfan  | 115-29-7  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Ethofumesate  | 26225-79-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Ethylbenzene  | 100-41-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Fenchlorphos  | 299-84-3  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Fenitrothion  | 122-14-5  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Flucofuron  | 370-50-3  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Flumethrin  | 69770-45-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Fluoranthene  | 206-44-0  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai)  |
| Fluoride  | 16984-48-8  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Flusilazole  | 85509-19-9  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Formaldehyde  | 50-00-0  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Glyphosate  | 38641-94-0  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Heptachlor and heptachlor epoxide  | 1024-57-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Hexabromocyclo dodecane (HBCDD)  | 25637-99-4,3194-55-6,134237-50-6,134237-51-7and134237-52-8 | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Hexachlorobenzene (HCB)  | 118-74-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Hexachlorobutadiene (HCBD)  | 87-68-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Hexachlorocyclohexane (HCH)  | 608-73-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Hydrogen sulphide  | 7783-06-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Imazethapyr  | 81334-34-1  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Indeno(123-cd)pyrene  | 193-39-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Ioxynil  | 1689-83-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Iron  | 7439-89-6  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Isoproturon  | 34123-59-6  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Ivermectin  | 70288-86-7  | Non-statutory SEPA operational aquaculture | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) [T8a](#_Table_9a:_Operational) |
| Lead  | 7439-92-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Lindane (included in HCH)  | 608-73-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Linuron  | 330-55-2  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Malachite Green  | 569-64-2  | Non-statutory SEPA operational aquaculture | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)[T8a](#_Table_9a:_Operational) |
| Malathion  | 121-75-5  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Mancozeb  | 8018-01-7  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Maneb  | 12427-38-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Manganese | 7439-96-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| MCPA (4-Chloro-2-methylphenoxyacetic acid) | 94-74-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Mecoprop | 93-65-2  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Mercury  | 7439-97-6  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Methiocarb  | 2032-65-7  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| Methylphenols  | NA  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Mevinphos  | 7786-34-7  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Monochlorobenzene  | 108-90-7  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Monochlorophenols  | 25167-80-0  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory)  |
| Naphthalene  | 91-20-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Nickel  | 7440-02-0  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Nonylphenol (4-nonylphenol)  | 104-40-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| NTA (Nitrilotriacetic acid) | 139-13-9  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Octylphenol ((4-(1,1‘,3,3‘-tetramethylbutyl)- phenol))  | 140-66-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Omethoate  | 1113-02-6  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater)](#_Table_7a:_Freshwater) |
| Oxolinic acid  | 14698-29-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Oxytetracycline  | 6153-64-6  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| para-para-DDT (Dichlorodiphenyltrichloroethane) | 50-29-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| pH | n/a | WFD UK Specific Parameter | [T2a](#_A1.2_pH_and) |
| Polychloro Chloromethyl Sulphonamido Diphenyl Ethers (PCSDs)  | NA  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Pendimethalin  | 40487-42-1  | WFD UK Specific Pollutant Non-statutory | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri)[T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Pentabromodiphenylether (brominated diphenylether) | 32534-81-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Pentachlorobenzene  | 608-93-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Pentachlorophenol  | 87-86-5  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Perfluorooctane sulfonic acid and its derivatives (PFOS)  | 1763-23-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Permethrin  | 52645-53-1  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Phenol  | 108-95-2  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Pirimicarb  | 23103-98-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Pirimiphos-methyl  | 29232-93-7  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Polyaromatic hydrocarbons (PAHs) (See Benzo(a)pyrene) | NA  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei), [T4c](#_Table_4c:_Biotai) |
| Prochloraz  | 67747-09-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Propetamphos  | 31218-83-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Propyzamide | 23950-58-8 | Non-statutory | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Quinoxyfen  | 124495-18-7  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei)  |
| Silver  | 7440-22-4  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Simazine  | 122-34-9  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Sodium  | 7440-23-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Styrene  | 100-42-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Sulcofuron (sulcofuran sodium)  | 3567-25-7  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Sulphate  | NA  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Tecnazene  | 117-18-0  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Teflubenzeron | 83121-18-0  | SEPA operational aquaculture  | [T8a](#_Table_9a:_Operational), [T8b](#_Table_8b:_Operational) |
| Terbutryn  | 886-50-0  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Tetrachloroethane  | 79-34-5  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri) |
| Tetrachloroethylene  | 127-18-4  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Thiabendazole  | 148-79-8  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Tin  | 7440-31-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Toluene  | 108-88-3  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei)  |
| Triallate  | 2303-17-5  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Triazophos  | 24017-47-8  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Tributyl phosphate  | 126-73-8  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Tributyltin  | 36643-28-4  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Trichlorobenzenes  | 12002-48-1  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Trichloroethylene  | 79-01-6  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Trichloromethane (Chloroform)  | 67-66-3  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Triclosan | 3380-34-5 | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |
| Trifluralin  | 1582-09-8  | WFD PS/PHS/OP  | [T4a](#_Table_4a:_Freshwateri), [T4b](#_Table_4b:_Marinei) |
| Triphenyltin  | NA  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Vanadium  | 7440-62-2  | Non-statutory  | [T7a](#_Table_7a:_Non-statutory), [T7b](#_Table_7b:_Non-statutory) |
| Xylene  | 1330-20-7  | Former DSD List  | [[T6a](#_Table_7a:_Freshwater),](#_Table_7a:_Freshwater) [[T6b](#_Table_6b:_Marine)](#_Table_7b:_Marine) |
| Zinc  | 7440-66-6  | WFD UK Specific Pollutant  | [[T5a](#_Table_5a:_Freshwater(i))](#_Table_5a:_Freshwateri), [[T5d](#_Table_5d:_Marine(i))](#_Table_5b:_Marinei) |

## A1.2 pH and ANC standards for rivers

**Table 2a: pH and ANC standards for rivers**

| **Class** |  | **pH for clear waters** | **ANC for clear waters** | **pH for humic waters** | **ANC for humic waters** |
| --- | --- | --- | --- | --- | --- |
| High |  | 6.60 | 80 | 5.10 | 80 |
| Good |  | 5.95 | 40 | 4.55 | 50 |
| Moderate |  | 5.44 | 15 | 4.22 | 10 |
| Poor |  | 4.89 | -10 | 4.03 | 5 |

ANC is calculated by the Cantrell method[[1]](#footnote-2)

## A1.3 Fundamental intermittent and short-term standards

### A1.3.1 Good, short-term and intermittent standards for dissolved oxygen for salmonid rivers

**Table 3a: Standards for good dissolved oxygen (DO) concentrations in relation to short-term and intermittent changes in dissolved oxygen concentrations in salmonid rivers.**

| **Return period** | **1 hour DO concentration (mg/l)** | **6 hour DO concentration (mg/l)** | **24 hour DO concentration (mg/l)** |
| --- | --- | --- | --- |
| 1 month | 5 + F | 5.5 + F | 6 + F |
| 3 months | 4.5 + F | 5 + F | 5.5 + F |
| 12 months | 4.0 + F | 4.5 + F | 5 + F |

For the purposes of this Table, “F” has the value:

1. “Zero” when the concurrent concentration of un-ionised ammonia is ≤ 0.02 mg/l.
2. “(0.97 x log10(concentration of NH3-N in mg per litre) + 3.8)” when the concurrent concentration of un-ionised ammonia is ≥ 0.02 mg/l and ≤ 0.15 mg/l.
3. “2” when the concurrent concentration of un-ionised ammonia is ≥ 0.15 mg/l; or
4. “3” for salmonid spawning grounds.

### A1.3.2 Good, short-term and intermittent standards for dissolved oxygen for cyprinid rivers

**Table 3b: Standards for good dissolved oxygen (DO) concentrations in relation to short-term and intermittent changes in dissolved oxygen concentrations in cyprinid rivers.**

| **Return period** | **1 hour DO concentration (mg/l)** | **6 hour DO concentration (mg/l)** | **24 hour DO concentration (mg/l)** |
| --- | --- | --- | --- |
| 1 month | 4 + F | 5 + F | 5.5 + F |
| 3 months | 3.5 + F | 4.5 + F | 5 + F |
| 12 months | 3 + F | 4 + F | 4.5 + F |

For the purposes of this Table, “F” has the value:

1. “Zero” when the concurrent concentration of un-ionised ammonia is ≤ 0.02 mg/l.
2. “(0.97 x log10(concentration of NH3-N in mg per litre) + 3.8)” when the concurrent concentration of un-ionised ammonia is ≥ 0.02 mg/l and ≤ 0.15 mg/l.
3. “2” when the concurrent concentration of un-ionised ammonia is ≥ 0.15 mg/l; or
4. “3” for salmonid spawning grounds.

### A1.3.3 Short-term and intermittent standards for biochemical oxygen demand

**Table 3c: Standards for biochemical oxygen demand (BOD) in rivers in relation to short-term and intermittent changes in BOD concentrations**

|  | **Concentration of BOD for types 1, 2, 4 & 6 as a 99th percentile**  | **Concentration of BOD for types 3, 5 & 7 as a 99th percentile**  |
| --- | --- | --- |
| High | 7 | 9 |
| Good | 9 | 11 |
| Moderate | 14 | 14 |
| Poor | 16 | 19 |

### A1.3.4 Short-term and intermittent ammonia standards in rivers

**Table 3d: Ammonia (Total and Un-ionised) standards in rivers in relation to short-term and intermittent changes in ammonia concentrations**

|  | **Total ammonia (mg- N/l) as a 99th percentile for types 1, 2, 4 & 6**  | **Total ammonia (mg- N/l) as a 99th percentile for types 3,5 & 7**  | **Un-ionised ammonia (mg NH3-N/l) as a 99th percentile for all types**  |
| --- | --- | --- | --- |
| High | 0.5 | 0.7 | 0.04 |
| Good | 0.7 | 1.5 | 0.04 |
| Moderate | 1.8 | 2.6 | - |
| Poor | 2.6 | 6.0 | - |

### A1.3.5 Short-term and intermittent un-ionised ammonia standards for salmonid rivers

**Table 3e: Un-ionised ammonia standards for salmonid rivers in relation to short-term and intermittent changes in un-ionised ammonia concentrations**

| **Return period** | **1 hour un-ionised ammonia (NH3-N) concentration (mg/l)** | **6 hour un-ionised ammonia (NH3-N) concentration (mg/l)** | **24 hour un-ionised ammonia (NH3-N) concentration (mg/l)** |
| --- | --- | --- | --- |
| 1 month | 0.065 x F | 0.025 x F | 0.018 x F |
| 3 months | 0.095 x F | 0.035 x F | 0.025 x F |
| 12 months | 0.105 x F | 0.040 x F | 0.030 x F |

The value of F is dependent upon concentration of dissolved oxygen, pH and temperature. F is calculated as in i-viii below depending on the value of those variables:

1. “1” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is ≥ 7 and temperature is ≥ 5 degrees Celsius.
2. “0.0003 x (pH)4.17” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is < 7 and temperature is ≥ 5 degrees Celsius.
3. “0.5” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is ≥ 7 and temperature is < 5 degrees Celsius.
4. “0.0003 x (pH)4.17 x 0.5” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is < 7 and temperature is < 5 degrees Celsius.
5. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72” when the concurrent concentration of dissolved oxygen is ≤ 5 mg/l, pH is ≥ 7 and temperature is ≥ 5 degrees Celsius.
6. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.0003 x (pH)4.17” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is < 7 and temperature is ≥ 5 degrees Celsius.
7. 0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.5” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is ≥ 7 and temperature is < 5 degrees Celsius.
8. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.0003 x (pH)4.17 x 0.5” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is < 7 and temperature is < 5 degrees Celsius.

### A1.3.6 Short-term and intermittent un-ionised good standards for cyprinid rivers

**Table 3f: Un-ionised good standards for cyprinid rivers in relation to short-term and intermittent changes in un-ionised ammonia concentrations**

| **Return period** | **1 hour un-ionised ammonia (NH3-N) concentration (mg/l)** | **6 hour un-ionised ammonia (NH3-N) concentration (mg/l)** | **24 hour un-ionised ammonia (NH3-N) concentration (mg/l)** |
| --- | --- | --- | --- |
| 1 month | 0.150 x F | 0.075 x F | 0.003 x F |
| 3 months | 0.225 x F | 0.125 x F | 0.050 x F |
| 12 months | 0.250 x F | 0.150 x F | 0.065 x F |

The value of F is dependent upon concentration of dissolved oxygen, pH and temperature. F is calculated as in i-viii below depending on the value of those variables:

1. “1” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is ≥ 7 and temperature is ≥ 5 degrees Celsius.
2. “0.0003 x (pH)4.17” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is < 7 and temperature is ≥ 5 degrees Celsius.
3. “0.5” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is ≥ 7 and temperature is < 5 degrees Celsius.
4. “0.0003 x (pH)4.17 x 0.5” when the concurrent concentration of dissolved oxygen is ≥ 5 mg/l, pH is < 7 and temperature is < 5 degrees Celsius.
5. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72” when the concurrent concentration of dissolved oxygen is ≤ 5 mg/l, pH is ≥ 7 and temperature is ≥ 5 degrees Celsius.
6. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.0003 x (pH)4.17” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is < 7 and temperature is ≥ 5 degrees Celsius.
7. 0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.5” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is ≥ 7 and temperature is < 5 degrees Celsius.
8. “0.0126 x (concentration of dissolved oxygen in mg/l)2.72 x 0.0003 x (pH)4.17 x 0.5” when the concurrent concentration of dissolved oxygen is < 5 mg/l, pH is < 7 and temperature is < 5 degrees Celsius.

## A1.4 EQS for WFD priority substances and other EU listed pollutants

### A1.4.1 Freshwater EQS for WFD priority substances and other pollutants

**Table 4a: Freshwater(i) EQS for WFD priority substances (including PHS) and other pollutants (EU standards)\***

| **Substance** | **AA (µg/l) (ii) (iii)** | **MAC (µg/l) (ii) (iv)** | **Type** |
| --- | --- | --- | --- |
| 1,2-Dichloroethane | 10 | - | PS |
| Aclonifen | 0.12 | 0.12 | PS |
| Alachlor | 0.3 | 0.7 | PS |
| Anthracene | 0.1 | 0.1 | PHS |
| Atrazine | 0.6 | 2.0 | PS |
| Benzene | 10 | 50 | PS |
| Benzo(a)pyrene (v) | 0.00017 | 0.27 | PHS |
| Benzo(b)fluoranthene (v) | (v) | 0.017 | PHS |
| Benzo(k)fluoranthene (v) | (v) | 0.017 | PHS |
| Benzo(g,h,i)perylene (v) | (v) | 0.0082 | PHS |
| Bifenox  | 0.012 | 0.04 | PS |
| Brominated diphenylether (vi) | - | 0.14 | PHS |
| C10-13 Chloroalkanes | 0.4 | 1.4 | PHS |
| Cadmium (dissolved) (vii) (viii)  | ≤0.08 (class 1)0.09 (class 2)0.12 (class 3)0.25 (class 4) | ≤0.45 (class 1)0.6 (class 2)0.9 (class 3)1.5 (class 4) | PHS |
| Carbon tetrachloride  | 12 | - | OP |
| Chlorfenvinphos  | 0.1 | 0.3 | PS |
| Chlorpyrifos (Chlorpyrifos-ethyl)  | 0.03 | 0.1 | PS |
| Cybutyrne  | 0.0025 | 0.016 | PS |
| Cyclodiene pesticides (Aldrin, Dieldrin, Endrin, Isodrin) | Σ=0.01 | - | OPs |
| Cypermethrin | 0.00008 | 0.0006 | PS |
| DDT total (Dichlorodiphenyltrichloroethane) (ix) | 0.025 | - | OP |
| Dichloromethane | 20 | - | PS |
| Dichlorvos  | 0.0006 | 0.0007 | PS |
| Dicofol  | 0.0013 | - | PS |
| Di(2-ethylhexyl)phthalate (DEHP) | 1.3 | - | PS |
| Diuron | 0.2 | 1.8 | PS |
| Endosulfan | 0.005 | 0.01 | PHS |
| Fluoranthene | 0.0063 | 0.12 | PS |
| Heptachlor and heptachlor epoxide  | 0.0000002 | 0.0003 | PS |
| Hexabromocyclododecane (HBCDD) (x) | 0.0016 | 0.5 | PS |
| Hexachlorobenzene (HCB) | - | 0.05 | PHS |
| Hexachlorobutadiene (HCBD) | - | 0.6 | PHS |
| Hexachlorocyclohexane (includes lindane) (HCH) | 0.02 | 0.04 | PHS |
| Indeno(1,2,3-cd)pyrene (v) | (v) | - | PHS |
| Isoproturon | 0.3 | 1.0 | PS |
| Lead | 1.2 (#) (viii) | 14 (†) (viii) | PS |
| Mercury | - | 0.07 (†) (viii) | PHS |
| Naphthalene | 2 | 130 | PS |
| Nickel | 4 (#) (viii) | 34 (†) (viii) | PS |
| Nonylphenol (4-Nonylphenol) | 0.3 | 2.0 | PHS |
| Octylphenol ((4-(1,1’,3,3’-tetramethylbutyl)-phenol)) | 0.1 | - | PS |
| Para-para-DDT (Dichlorodiphenyltrichloroethane) | 0.01 | - | OP |
| Pentachlorobenzene | 0.007 | - | PHS |
| Pentachlorophenol | 0.4 | 1 | PS |
| Perfluorooctane sulfonic acid and its derivatives (PFOS) | 0.00065 | 36 | PS |
| Quinoxyfen | 0.15 | 2.7 | PS |
| Simazine | 1 | 4 | PS |
| Terbutryn | 0.065 | 0.34 | PS |
| Tetrachloroethylene | 10 | - | OP |
| Tributyltin | 0.0002 | 0.0015 | PHS |
| Trichlorobenzenes | 0.4 | - | PS |
| Trichloroethylene | 10 | - | OP |
| Trichloromethane (chloroform) | 2.5 | - | PS |
| Trifluralin | 0.03 | - | PS |

Notes:

(#) = Bioavailable

(†) = Dissolved

1. Applies to all rivers and freshwater lochs
2. Each EQS is to be construed as the total concentration of the substance in the whole water sample unless specified as dissolved or bioavailable.
3. Unless otherwise specified, AA-EQS apply to the concentration of all isomers.
4. Where the MAC-EQS is marked as “-“, the AA-EQS values are to be considered protective against short-term pollution peaks in continuous discharges since they are significantly lower than the values derived on the basis of acute toxicity.
5. These priority substances are all polyaromatic hydrocarbons (PAHs). The AA-EQS in water refer to the concentration of benzo(a)pyrene, on the toxicity of which they are based. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the AA- EQS in water.
6. For the group covered by brominated brominated diphenylethers, the EQS refers to the sum of the concentrations of congeners 28, 47, 99, 100, 153 and 154
7. For cadmium and its compounds the EQS values vary depending on the hardness of the water as specified in four class categories (Class 1: <50 mg CaCO3/l, Class 2: 50 to <100 mg CaCO3/l, Class 3: 100 to <200 mg CaCO3/l and Class 4: ≥200 mg CaCO3/l).
8. ‘Dissolved’ refers to the portion remaining following filtration through a 0.45µm membrane. Bioavailable refers to the fraction of dissolved metal that has the potential to contribute to toxic effects in aquatic animals or plants as determined in accordance with the metals bioavailability assessment tool.
9. DDT total comprises the sum of the isomers 1,1,1-trichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 50-29-3; EU number 200-024-3); 1,1,1-trichloro-2 (o-chlorophenyl)-2-(p-chlorophenyl) ethane (CAS number 789-02-6; EU Number 212-332-5); 1,1-dichloro-2,2 bis (p chlorophenyl) ethylene (CAS number 72-55-9; EU Number 200-784-6); and 1,1-dichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 72 54-8; EU Number 200-783-0).
10. HBCDD isomers refers to 1,3,5,7,9,11-Hexabromocyclododecane (CAS 25637-99-4), 1,2,5,6,9,10- Hexabromocyclododecane (CAS 3194-55-6), α-Hexabromocyclododecane (CAS 134237-50-6), β-Hexabromocyclododecane (CAS 134237-51-7) and γ-Hexabromocyclododecane (CAS 134237-52-8).

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### A1.4.2 Marine EQS for WFD priority substances and other pollutants

**Table 4b: Marine(i) EQS for WFD priority substances (including PHS) and other pollutants (EU standards)\***

| **Substance** | **AA (µg/l) (ii) (iii)** | **MAC (µg/l) (ii) (iv)** | **Type** |
| --- | --- | --- | --- |
| 1,2-Dichloroethane | 10 | - | PS |
| Aclonifen | 0.012 | 0.012 | PS |
| Alachlor | 0.3 | 0.7 | PS |
| Anthracene | 0.1 | 0.1 | PHS |
| Atrazine | 0.6 | 2.0 | PS |
| Benzene | 8 | 50 | PS |
| Benzo(a)pyrene (v) | 0.00017 | 0.027 | PHS |
| Benzo(b)fluoranthene (v) | (v) | 0.017 | PHS |
| Benzo(k)fluoranthene (v) | (v) | 0.017 | PHS |
| Benzo(g,h,i)perylene (v) | (v) | 0.00082 | PHS |
| Bifenox | 0.0012 | 0.004 | PS |
| Brominated diphenylether (vi) | - | 0.014 | PHS |
| C10-13 Chloroalkanes | 0.4 | 1.4 | PHS |
| Cadmium (dissolved) (vii) | 0.2 | - | PHS |
| Carbon tetrachloride  | 12 | - | OP |
| Chlorfenvinphos  | 0.1 | 0.3 | PS |
| Chlorpyrifos (Chlorpyrifos-ethyl)  | 0.03 | 0.1 | PS |
| Cybutyrne | 0.0025 | 0.016 | PS |
| Cyclodiene pesticides (Aldrin, Dieldrin, Endrin, Isodrin) | Σ=0.005 | - | OPs |
| Cypermethrin | 0.000008 | 0.00006 | PS |
| DDT total (Dichlorodiphenyltrichloroethane) (viii) | 0.025 | - | OP |
| Dichloromethane | 20 | - | PS |
| Dichlorvos | 0.00006 | 0.00007 | PS |
| Dicofol | 0.000032 | - | PS |
| Di(2-ethylhexyl)phthalate (DEHP) | 1.3 | - | PS |
| Diuron | 0.2 | 1.8 | PS |
| Endosulfan | 0.0005 | 0.004 | PHS |
| Fluoranthene | 0.0063 | 0.12 | PS |
| Heptachlor and heptachlor epoxide | 0.00000001 | 0.00003 | PS |
| Hexabromocyclododecane (HBCDD) (ix) | 0.0008 | 0.05 | PS |
| Hexachlorobenzene (HCB) | - | 0.05 | PHS |
| Hexachlorobutadiene (HCBD) | - | 0.6 | PHS |
| Hexachlorocyclohexane (includes lindane) (HCH) | 0.002 | 0.02 | PHS |
| Indeno(1,2,3-cd)pyrene (v) | (v) | - | PHS |
| Isoproturon | 0.3 | 1.0 | PS |
| Lead | 1.3 (†) (vii) | 14 (†)(vii) | PS |
| Mercury | - | 0.07 (†)(vii) | PHS |
| Naphthalene | 2 | 130 | PS |
| Nickel | 8.6 (†)(vii) | 34 (†)(vii) | PS |
| Nonylphenol (4-Nonylphenol) | 0.3 | 2.0 | PHS |
| Octylphenol ((4-(1,1’,3,3’-tetramethylbutyl)-phenol)) | 0.01 | - | PS |
| Para-para-DDT (Dichlorodiphenyltrichloroethane) | 0.01 | - | OP |
| Pentachlorobenzene | 0.0007 | - | PHS |
| Pentachlorophenol | 0.4 | 1 | PS |
| Perfluorooctane sulfonic acid and its derivatives (PFOS) | 0.00013 | 7.2 | PS |
| Quinoxyfen | 0.015 | 0.54 | PS |
| Simazine | 1 | 4 | PS |
| Terbutryn | 0.0065 | 0.034 | PS |
| Tetrachloroethylene | 10 | - | OP |
| Tributyltin | 0.0002 | 0.0015 | PHS |
| Trichlorobenzenes | 0.4 | - | PS |
| Trichloroethylene | 10 | - | OP |
| Trichloromethane (chloroform) | 2.5 | - | PS |
| Trifluralin | 0.03 | - | PS |

Notes:

(†) = Dissolved

1. Applies to all transitional waters and coastal waters
2. Each EQS is to be construed as the total concentration of the substance in the whole water sample unless specified as dissolved or bioavailable.
3. Unless otherwise specified, AA-EQS apply to the concentration of all isomers.
4. Where the MAC-EQS is marked as “-“, the AA-EQS values are to be considered protective against short-term pollution peaks in continuous discharges since they are significantly lower than the values derived on the basis of acute toxicity.
5. These priority substances are all polyaromatic hydrocarbons (PAHs). The AA-EQS in water refer to the concentration of benzo(a)pyrene, on the toxicity of which they are based. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the AA- EQS in water.
6. For the group covered by brominated brominated diphenylethers, the EQS refers to the sum of the concentrations of congeners 28, 47, 99, 100, 153 and 154
7. ‘Dissolved’ refers to the portion remaining following filtration through a 0.45µm membrane. Bioavailable refers to the fraction of dissolved metal that has the potential to contribute to toxic effects in aquatic animals or plants as determined in accordance with the method, metals bioavailability assessment tool3.
8. DDT total comprises the sum of the isomers 1,1,1-trichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 50-29-3; EU number 200-024-3); 1,1,1-trichloro-2 (o-chlorophenyl)-2-(p-chlorophenyl) ethane (CAS number 789-02-6; EU Number 212-332-5); 1,1-dichloro-2,2 bis (p chlorophenyl) ethylene (CAS number 72-55-9; EU Number 200-784-6); and 1,1-dichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 72 54-8; EU Number 200-783-0).
9. HBCDD isomers refers to 1,3,5,7,9,11-Hexabromocyclododecane (CAS 25637-99-4), 1,2,5,6,9,10- Hexabromocyclododecane (CAS 3194-55-6), α-Hexabromocyclododecane (CAS 134237-50-6), β-Hexabromocyclododecane (CAS 134237-51-7) and γ-Hexabromocyclododecane (CAS 134237-52-8).

\*UKTAG (2014) River and Lake Assessment Method, Specific Pollutants (Metals), Metal Bioavailability Assessment Tool (M-BAT) ISBN: 978-1-906934-57-6

### A1.4.3 Biota EQS for WFD priority substances and other pollutants

**Table 4c: Biota(i) EQS for WFD priority substances (including PHS) and other pollutants (EU standards)\***

| **Substance** | **Biota EQS (µg/kg wet weight) (i)** | **Type** |
| --- | --- | --- |
| Benzo(a)pyrene (ii) | 5 | PHS |
| Benzo(b)fluoranthene (ii) | (ii) | PHS |
| Benzo(k)fluoranthene (ii) | (ii) | PHS |
| Benzo(ghi)perylene (ii) | (ii) | PHS |
| Brominated diphenylether (iii)  | 0.0085 | PHS |
| Dicofol  | 33 | PS |
| Dioxins and dioxin-like compounds  | Sum of PCDD+PCDF+PCB-DL 0.0065 µg/kg TEQ (iv) | PS |
| Fluoranthene | 30 | PS |
| Heptachlor and heptachlor epoxide  | 0.0067 | PS |
| Hexabromocyclododecane (HBCDD) (v) | 167 | PS |
| Hexachlorobenzene (HCB) | 10 | PHS |
| Hexachlorobutadiene (HCBD) | 55 | PHS |
| Indeno(123-cd)pyrene (iii) | (iii) | PHS |
| Mercury | 20 | PHS |
| Perfluorooctane sulfonic acid and its derivatives (PFOS)  | 9.1 | PS |

Notes:

1. Except where otherwise indicated, biota EQS relate to fish. An alternative biota taxon, or another matrix, may be monitored if the EQS applied provides an equivalent level of protection. For fluoranthene and PAHs, the biota EQS refers to crustaceans and molluscs. For the purpose of assessing chemical status, monitoring of fluoranthene and PAHs in fish is not appropriate. For dioxins and dioxin like compounds, the biota EQS relates to fish, crustaceans and molluscs.
2. These priority substances are all polyaromatic hydrocarbons (PAHs). The biota EQS in water refer to the concentration of benzo(a)pyrene, on the toxicity of which they are based. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS.
3. Applies to congeners 28, 47, 99, 100, 153 and 154 (pentabromodiphenylether)
4. This refers to the following compounds:
5. polychlorinated dibenzo-p-dioxins (PCDDs): 2,3,7,8-T4CDD (CAS 1746-01-6), 1,2,3,7,8-P5CDD (CAS 40321-76-4), 1,2,3,4,7,8- H6CDD (CAS 39227-28-6), 1,2,3,6,7,8-H6CDD (CAS 57653-85-7), 1,2,3,7,8,9-H6CDD (CAS 19408-74-3), 1,2,3,4,6,7,8-H7CDD (CAS 35822-46-9), 1,2,3,4,6,7,8,9-O8CDD (CAS 3268-87-9)
6. 10 polychlorinated dibenzofurans (PCDFs): 2,3,7,8-T4CDF (CAS 51207-31-9), 1,2,3,7,8-P5CDF (CAS 57117-41-6), 2,3,4,7,8- P5CDF (CAS 57117-31-4), 1,2,3,4,7,8-H6CDF (CAS 70648-26-9), 1,2,3,6,7,8-H6CDF (CAS 57117-44-9), 1,2,3,7,8,9-H6CDF (CAS 72918-21-9), 2,3,4,6,7,8-H6CDF (CAS 60851-34-5), 1,2,3,4,6,7,8-H7CDF (CAS 67562-39-4), 1,2,3,4,7,8,9-H7CDF (CAS 55673-89-7), 1,2,3,4,6,7,8,9-O8CDF (CAS 39001-02-0)
7. 12 dioxin-like polychlorinated biphenyls (PCB-DL): 3,3',4,4'-T4CB (PCB 77, CAS 32598-13-3), 3,3',4',5-T4CB (PCB 81, CAS 70362-50-4), 2,3,3',4,4'-P5CB (PCB 105, CAS 32598-14-4), 2,3,4,4',5-P5CB (PCB 114, CAS 74472-37-0), 2,3',4,4',5-P5CB (PCB 118, CAS 31508-00-6), 2,3',4,4',5'-P5CB (PCB 123, CAS 65510-44-3), 3,3',4,4',5-P5CB (PCB 126, CAS 57465-28-8), 2,3,3',4,4',5- H6CB (PCB 156, CAS 38380-08-4), 2,3,3',4,4',5'-H6CB (PCB 157, CAS 69782-90-7), 2,3',4,4',5,5'-H6CB (PCB 167, CAS 52663- 72-6), 3,3',4,4',5,5'-H6CB (PCB 169, CAS 32774-16-6), 2,3,3',4,4',5,5'-H7CB (PCB 189, CAS 39635-31-9).
8. TEQ: toxic equivalents according to the World Health Organisation 2005 Toxic Equivalence Factors.
9. HBCDD isomers refers to 1,3,5,7,9,11-Hexabromocyclododecane (CAS 25637-99-4), 1,2,5,6,9,10- Hexabromocyclododecane (CAS 3194-55-6), α-Hexabromocyclododecane (CAS 134237-50-6), β-Hexabromocyclododecane (CAS 134237-51-7) and γ-Hexabromocyclododecane (CAS 134237-52-8).

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## A1.5 EQS for WFD UK specific pollutants (UK standards)\*\*

### A1.5.1 Freshwater EQS for WFD UK specific pollutants

**Table 5a: Freshwater(i) EQS for WFD UK specific pollutants (UK standards)\*\***

| **Substance** | **AA (µg/l)** | **95%-ile (µg/l)** |
| --- | --- | --- |
| 2,4 - Dichlorophenol | 4.2 | 140 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | 0.3 | 1.3 |
| 3,4-Dichloroaniline | 0.2 | 5.4 |
| Ammonia (Total) | See Tables 2d, 5b and 5c | See Tables 2d, 5b and 5c |
| Ammonia (unionised) (NH3-N) | See Tables 2d-2f and 5d | See Tables 2d-2f and 5d |
| Arsenic (dissolved) (iii) | 50 | - |
| Benzylbutylphthalate | 7.5 | 51 |
| Carbendazim | 0.15 | 0.7 |
| Chlorine | 2 (ii) | 5 (ii)  |
| Chlorothalonil | 0.035 | 1.2 |
| Chromium III (dissolved) (iii) | 4.7 | 32 |
| Chromium VI (dissolved) (iii) | 3.4 | - |
| Copper (bioavailable in freshwater) (iv) | 1 | - |
| Cyanide (hydrogen cyanide) | 1 | 5 |
| Diazinon | 0.01 | 0.02 |
| Dimethoate | 0.48 | 4 |
| Glyphosate | 196 | 398 |
| Iron (dissolved) (iii) | 1000 | - |
| Linuron | 0.5 | 0.9 |
| Manganese (bioavailable) (iv) | 123 | - |
| Mecoprop | 18 | 187 |
| Methiocarb | 0.01 | 0.77 |
| Pendimethalin | 0.3 | 0.58 |
| Permethrin | 0.001 | 0.01 |
| Phenol | 7.7 | 46 |
| Tetrachloroethane | 140 | 1848 |
| Toluene | 74 | - |
| Triclosan | 0.1 | 0.28 |
| Zinc (bioavailable in freshwater) (iv) (v) | 10.9 | - |

Notes:

1. Applies to all rivers and freshwater lochs.
2. Freshwater standards are for total available chlorine.
3. ‘Dissolved’ refers to the portion remaining following filtration through a 0.45 µm membrane.
4. Bioavailable (for copper, zinc and manganese) annual average standards for freshwater refer to the concentration of bioavailable metal. This is the fraction of dissolved metal that has the potential to contribute to toxic effects in aquatic animals or plants as determined in accordance with the metals bioavailability assessment tool.
5. Prior to applying the standard for bioavailable zinc in rivers and freshwater lochs, SEPA must subtract 1 µg/l from the measured or otherwise estimated concentration of dissolved zinc in the river or part thereof or the loch or part thereof.

\*\* Proposals for Environmental Quality Standards for Annex VIII Substances, UKTAG

### A1.5.2 Ammonia standards for rivers

**Table 5b: Ammonia standards for rivers**

|  | **Total ammonia (mg-N per litre) as 90th percentile standards for river types 1, 2, 4 and 6** | **Total ammonia (mg-N per litre) as 90th percentile standards for river types 3, 5 and 7** |
| --- | --- | --- |
| High | 0.2 | 0.3 |
| Good | 0.3 | 0.6 |
| Moderate | 0.75 | 1.1 |
| Poor | 1.1 | 2.5 |

### A1.5.3 Ammonia standards for lochs

**Table 5c: Ammonia standards for lochs**

|  | **Total ammonia (mg-N per litre) as a 90th percentile, for lochs with an annual mean concentration of CaCO3 (mg/l) ≤ 50** | **Total ammonia (mg-N per litre) as a 90th percentile, for lochs with an annual mean concentration of CaCO3 (mg/l) > 50 to ≤ 200 and an altitude > 80 metres above mean sea level** | **Total ammonia (mg-N per litre) as a 90th percentile, for lochs with an annual mean concentration of CaCO3 (mg/l) > 50 to ≤ 200 and an altitude ≤ 80 metres above mean sea level** |
| --- | --- | --- | --- |
| High | 0.2 | 0.2 | 0.3 |
| Good | 0.3 | 0.3 | 0.6 |

### A1.5.4 MarineEQS for WFD UK specific pollutants

**Table 5d: Marine(i) EQS for WFD UK specific pollutants (UK standards)\*\*\***

| **Substance** | **AA (µg/l)** | **95%-ile (µg/l)** |
| --- | --- | --- |
| 2,4 - Dichlorophenol | 0.42 | 6 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | 0.3 | 1.3 |
| 3,4-Dichloroaniline | 0.2 | 5.4 |
| Ammonia (unionised) (NH3-N) | 21 | - |
| Arsenic (dissolved) (ii) | 25 | - |
| Benzylbutylphthalate | 0.75 | 10 |
| Chlorine (iii) | - | 10  |
| Chromium VI (dissolved) (ii) | 0.6 | 32 |
| Copper (dissolved in marine) (ii) | 3.76 where DOC≤1 mg/l3.76 + (2.677 x ((DOC/2) – 0.5)) where DOC > 1 mg/l  | - |
| Cyanide (hydrogen cyanide) | 1 | 5 |
| Diazinon | 0.01 | 0.26 |
| Dimethoate | 0.48 | 4.0 |
| Emamectin Benzoate | 0.00017 | 0.0012 |
| Glyphosate | 196 | 398 |
| Iron (dissolved) (ii) | 1000 | - |
| Linuron | 0.5 | 0.9 |
| Mecoprop | 18 | 187 |
| Permethrin | 0.0002 | 0.001 |
| Phenol | 7.7 | 46 |
| Toluene | 74 | - |
| Triclosan | 0.1 | 0.28 |
| Zinc (dissolved in marine) (ii), (iv), (v) | 7.9 | - |

1. Applies to all transitional waters and coastal waters.
2. ‘Dissolved’ refers to the portion remaining following filtration through a 0.45 µm membrane.
3. Marine standards are for total residual oxidant.
4. Bioavailable (for zinc) annual average standards for freshwater refer to the concentration of bioavailable metal. This is the fraction of dissolved metal that has the potential to contribute to toxic effects in aquatic animals or plants as determined in accordance with the method, metals bioavailability assessment tool\*\*\*. Refer to Table 10 for application of the marine copper standard.
5. Prior to applying the standard for bioavailable zinc in rivers and freshwater lochs, SEPA must subtract 1 µg/l from the measured or otherwise estimated concentration of dissolved zinc in the river or part thereof or the loch or part thereof.

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## A1.6 EQS for former DSD substances

### A1.6.1 Freshwater EQS for former DSD substances no longer considered under WFD

**Table 6a: Freshwater EQS for former DSD substances no longer considered to be discharged in significant quantities, and as such no longer considered under WFD**

| **Substance** | **Freshwater AA (µg/l)** |
| --- | --- |
| 1,1,1-Trichloroethane | 100 |
| 1,1,2-Trichloroethane | 400 |
| 2-Chlorophenol | 50 |
| 4-Chloro-3-methylphenol | 40 |
| Azinphos-methyl | 0.01 |
| Bentazone | 500 |
| Biphenyl | 25 |
| Chloronitrotoluenes | 10 |
| Demeton | 0.5 |
| Fenitrothion | 0.01 |
| Malathion | 0.01 |
| Omethoate | 0.01 |
| Triazophos | 0.005 |
| Triphenyltin | 0.02 |
| Xylene | 30 |

### A1.6.2 Marine EQS for former DSD substances no longer considered under WFD

**Table 6b: Marine EQS for former DSD substances no longer considered to be discharged in significant quantities, and as such no longer considered under WFD**

| **Substance** | **Marine AA (µg/l)** |
| --- | --- |
| 1,1,1-Trichloroethane | 100 |
| 1,1,2-Trichloroethane | 300 |
| 2-Chlorophenol | 50 |
| 4-Chloro-3-methylphenol | 40 |
| Azinphos-methyl | 0.01 |
| Bentazone | 500 |
| Biphenyl | 25 |
| Chloronitrotoluenes | 10 |
| Demeton | 0.5 |
| Fenitrothion | 0.01 |
| Malathion | 0.02 |
| Triazophos | 0.005 |
| Triphenyltin | 0.008 |
| Xylene | 30 |

## A1.7 Non-statutory EQS values

### A1.7.1 Non-statutory freshwater EQS values for other substances

**Table 7a: Non-statutory freshwater EQS values for other substances**

| **Substance** | **Freshwater AA (µg/l)** | **Freshwater MAC (µg/l)** | **Reference** |
| --- | --- | --- | --- |
| Abamectin | 0.01 | 0.03 | DETR (1998) |
| Aluminium (reactive) | 15 (pH>6.5) | 10 (pH≤6.5)25 (pH>6.5) | EA/SNIFFER (1998) |
| Azamethiphos | 0.02 | 0.05 | DETR (1998) |
| Boron (total) | 2000 | - | HMSO (1989)(statutory in E&W) |
| Bromine | 2 (Total residual oxidant) | 5 (Total residual oxidant) | EA (1997) |
| Bromoxynil | 100 | 1000 | DoE (1995) |
| Chloride | 250000 | - | EA (1992 and 1999) |
| Chloropropham | 10 | 40 | DoE (1995) |
| Chlorotoluron | 2 (interim guideline) | 20 (interim guideline) | EA (1996) |
| Cobalt (dissolved) | 3 | 100 | DETR (1998) |
| Coumaphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Cyfluthrin | - | 0.001 (95%ile) | HMSO (1989) (statutory in E&W) |
| Dibutylphthalate (DBP) | 8 | 40 | DETR (1998) |
| Dichlorobenzene (dissolved, sum of all isomers) | 20 | 200 | DETR (1998) |
| Dicyclohexylphthalate (DCHP) | No EQS proposed | No EQS proposed | DETR (1998) |
| Diethylphthalate (DEP) | 200 | 1000 | DETR (1998) |
| Diflubenzuron | 0.001 | 0.015 | DETR (1997) |
| Dimethylphthalate (DMP) | 800 | 4000 | DETR (1998) |
| Dimethylphthalate (DOP) | 20 | 40 | DETR (1998) |
| Dioxins | No EQS proposed | No EQS proposed | EA/SNIFFER (1999) |
| Doramectin | 0.001 | 0.01 | DETR (1998) |
| EDTA (Ethylenediaminetetraacetic acid) | 400 | 4000 | DETR (1997) |
| Ethofumesate | No EQS proposed | No EQS proposed | DETR (1997) |
| Ethylbenzene | 20 | 200 | EA/SNIFFER (2001) |
| Fenchlorphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Flucofuron | - | 1 (95%ile) | HMSO (1989) (statutory in E&W) |
| Flumethrin | No EQS proposed | No EQS proposed | EA/SNIFFER |
| Fluoride (dissolved) | 1000 (<50 mg CaCO3/l) 5000 (>50 mg CaCO3/l) | 3000 (<50 mg CaCO3/l) 15000 (>50 mg CaCO3/l) | EA/SNIFFER (1998) |
| Flusilazole | No EQS proposed | No EQS proposed | DETR (1998) |
| Formaldehyde | 5 | 50 | DoE (1993) |
| Hydrogen sulphide (undissociated) | 0.25 | 1.0 | DoE (1993) |
| Imazethapyr | No EQS proposed | No EQS proposed | DETR (1998) |
| Ioxynil | 10 | 100 | DoE (1995) |
| Ivermectin | 0.0001 | 0.001 | DETR (1998) |
| Malachite Green | 0.5 | 100 | DoE (1993) |
| Mancozeb | 2 | 20 | DETR (1997) |
| Maneb | 3 | 30 | DETR (1997) |
| MCPA (4-Chloro-2-methylphenoxyacetic acid) | 12 (pH<7)80 (pH>7) | 120 (pH<7)800 (pH>7) | DETR |
| Methylphenols | 100 | 300 | EA |
| Mevinphos | - | 0.02 | HMSO (1998c) |
| Monochlorobenzene | No EQS proposed | No EQS proposed | DoE (1989) |
| Monochlorophenols (3-chlorophenol, 4-chlorophenol) | 50 | 250 | EA/SNIFFER (1997) |
| NTA (Nitrilotriacetic acid) | 1000 | 10000 | DETR (1997) |
| Oxolinic acid | No EQS proposed | No EQS proposed | DoE (1994) |
| Oxytetreacycline | No EQS proposed | No EQS proposed | DoE (1994) |
| Polychloro Chloromethyl Sulphonamido Diphenyl Ethers (PCSDs) | - | 0.05 (95%ile) | HMSO (1989) (statutory in E&W) |
| Pendimethalin | 1.5 | 6 | DETR (1997) |
| Pirimicarb | 1 | 5 | DoE (1996) |
| Pirimiphos-methyl | 0.015 | 0.05 | DETR (1997) |
| Prochloraz | 4 | 40 | DETR (1998) |
| Propetamphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Propyzamide | 100 | 1000 | DETR (1998) |
| Silver (dissolved) | 0.05 | 0.1 | DoE (1996) |
| Sodium | No EQS proposed | No EQS proposed | EA (1999) |
| Styrene | 50 | 500 | EA (1995) |
| Sulcofuron | - | 25 (95%ile) | HMSO (1989) (statutory in E&W) |
| Sulphate | 400000 | - | EA (1999) |
| Tecnazene (i) | 1 | 10 | DoE (1995) |
| Thiabendazole | 5 | 50 | DoE (1995) |
| Tin (total for freshwater) | 25 | - | DoE (1989) |
| Triallate | 0.25 | 5 | DETR (1998) |
| Tributyl phosphate | 50 | 500 | DETR (1998) |
| Vanadium (total) (ii) | 20 (class 1)60 (class 2) | - | HMSO (1989) (statutory in E&W) |

1. Sum of tecnazene, 2, 3, 5, 6-tetrachloroaniline (TCA) and 2, 3, 5, 6-tetrachlorothioanisole (TCTA).
2. For Vanadium, the annual mean values vary dependent on the hardness of the water as specified in two class categories (Class 1: 0 - 200 mg CaCO3/l, Class 2: >200 mg CaCO3/l).

### A1.7.2 Non-statutory marine EQS values for other substances

**Table 7b: Non-statutory marine EQS values for other substances**

| **Substance** | **Marine AA (µg/l)** | **Marine MAC (µg/l)** | **Reference** |
| --- | --- | --- | --- |
| Abamectin | 0.003 | 0.01 | DETR (1998) |
| Aluminium (reactive) | 15  | 25  | EA/SNIFFER (1998) |
| Azamethiphos (i) | 0.02 | 0.05 | DETR (1998) |
| Boron (total) | 7000 | - | HMSO (1989)(statutory in E&W) |
| Bromine |  | 10 (Total residual oxidant) | EA (1997) |
| Bromoxynil | 100 (interim guidance) | 1000 (interim guidance) | DoE (1995) |
| Chloropropham | 10 (interim guidance) | 40 (interim guidance) | DoE (1995) |
| Chlorotoluron | 2 (interim guideline) | - | EA (1996) |
| Cobalt (dissolved) | 3 | 100 | DETR (1998) |
| Coumaphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Cyfluthrin | - | 0.001 (95%ile) | HMSO (1989) (statutory in E&W) |
| Dibutylphthalate (DBP) | 8 | 40 | DETR (1998) |
| Dichlorobenzene (dissolved, sum of all isomers) | 20 | 200 | DETR (1998) |
| Dicyclohexylphthalate (DCHP) | No EQS proposed | No EQS proposed | DETR (1998) |
| Diethylphthalate (DEP) | 200 | 1000 | DETR (1998) |
| Diflubenzuron | 0.005 | 0.1 | DETR (1997) |
| Dimethylphthalate (DMP) | 800 | 4000 | DETR (1998) |
| Dimethylphthalate (DOP) | 20 | 40 | DETR (1998) |
| Dioxins | No EQS proposed | No EQS proposed | EA/SNIFFER (1999) |
| Doramectin | 0.001 | 0.01 | DETR (1998) |
| EDTA (Ethylenediaminetetraacetic acid) | 400 | 4000 | DETR (1997) |
| Ethofumesate | No EQS proposed | No EQS proposed | DETR (1997) |
| Ethylbenzene | 20 | 200 | EA/SNIFFER (2001) |
| Fenchlorphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Flucofuron | - | 1 (95%ile) | HMSO (1989) (statutory in E&W) |
| Flumethrin | No EQS proposed | No EQS proposed | EA/SNIFFER |
| Fluoride (dissolved) | 5000 | 15000 | EA/SNIFFER (1998) |
| Flusilazole | No EQS proposed | No EQS proposed | DETR (1998) |
| Formaldehyde | No EQS proposed | No EQS proposed | DoE (1993) |
| Hydrogen Sulphide (undissociated) | - | 10 | DoE (1993) |
| Imazethapyr | No EQS proposed | No EQS proposed | DETR (1998) |
| Ioxynil | 10 (interim guidance) | 100 (interim guidance) | DoE (1995) |
| Ivermectin | 0.0001 | 0.001 | DETR (1998) |
| Malachite Green | 0.5 (interim guidance) | 100 (interim guidance) | DoE (1993) |
| Mancozeb | 2 | 20 | DETR (1997) |
| Maneb | 3 | 30 | DETR (1997) |
| MCPA (4-Chloro-2-methylphenoxyacetic acid) | 80 | 800 | DETR |
| Methylphenols | 100 | 300 | EA |
| Monochlorobenzene | No EQS proposed | No EQS proposed | DoE (1989) |
| Monochlorophenols (3-chlorophenol, 4-chlorophenol) | 50 | 250 | EA/SNIFFER (1997) |
| NTA (Nitrilotriacetic acid) | 3000 | 30000 | DETR (1997) |
| Oxolinic acid | No EQS proposed | No EQS proposed | DoE (1994) |
| Oxytetreacycline | No EQS proposed | No EQS proposed | DoE (1994) |
| Polychloro Chloromethyl Sulphonamido Diphenyl Ethers (PCSDs) | - | 0.05 (95%ile) | HMSO (1989) (statutory in E&W) |
| Pendimethalin | 1.5 | 6 | DETR (1997) |
| Pirimicarb | 1 (interim guidance) | 5 (interim guidance) | DoE (1996) |
| Pirimiphos-methyl | 0.015 | 0.05 | DETR (1997) |
| Prochloraz | 4 | 40 | DETR (1998) |
| Propetamphos | 0.03 | 0.1 | EA/SNIFFER (2000) |
| Propyzamide | 100 | 1000 | DETR (1998) |
| Silver (dissolved) | 0.5 (interim guidance) | 0.1 | DoE (1996) |
| Sodium | No EQS proposed | No EQS proposed | EA (1999) |
| Styrene | 50 (interim guidance) | 500 (interim guidance) | EA (1995) |
| Sulcofuron | - | 25 (95%ile) | HMSO (1989) (statutory in E&W) |
| Sulphate | No EQS proposed | - | EA (1999) |
| Tecnazene (ii) | 1 (interim guidance) | 10 (interim guidance) | DoE (1995) |
| Thiabendazole | 5 (interim guidance) | 50 (interim guidance) | DoE (1995) |
| Tin (dissolved for marine) | 10 | - | DoE (1989) |
| Triallate | 0.25 | 5 | DETR (1998) |
| Tributyl phosphate | 50 | 500 | DETR (1998) |
| Vanadium (total) (iii) | 100 | - | HMSO (1989) (statutory in E&W) |

1. See table 8 for aquaculture specific standards.
2. Sum of tecnazene, 2, 3, 5, 6-tetrachloroaniline (TCA) and 2, 3, 5, 6-tetrachlorothioanisole (TCTA).
3. For Vanadium, the annual mean values vary dependent on the hardness of the water as specified in two class categories (Class 1: 0 - 200 mg CaCO3/l, Class 2: >200 mg CaCO3/l).

## A1.8 Operational standards for aquaculture

### A1.8.1 Operational water quality standards for chemicals used in aquaculture

**Table 8a: Operational water quality standards used by SEPA for regulating the use of chemicals in aquaculture**

| **Substance** | **Freshwater AA (µg/l)** | **Freshwater MAC (µg/l)** | **Marine AA (µg/l)** | **Marine MAC (µg/l)** | **Reference** |
| --- | --- | --- | --- | --- | --- |
| Azamethiphos | - | - | - | 0.25 (after 3 hrs)0.15 (after 24 hrs)0.04 (after 72 hrs) | SEPA Policy 17 (1998) |
| Bronopol | - | 70 | - | - | SEPA Guidance (2002) |
| Cypermethrin | Use Table 4 Standards | Use Table 4 Standards | Use Table 4 Standards | Use Table 4 Standards | 2024 SG Direction |
| Deltamethrin | - | - | 0.0003  | 0.009 (after 3 hrs)0.006 (after 6 hrs)0.004 (after 12 hrs)0.002 (after 24hrs)0.001 (after 48 hrs) | SEPA Guidance (2008) |
| Dichlorvos | Use not permitted | Use not permitted | Use not permitted | Use not permitted | DoE (1991) |
| Emamectin Benzoate | - | - | Use table 5 standards | Use table 5 standards | 2024 SG Direction |
| Ivermectin | Use not permitted | Use not permitted | Use not permitted | Use not permitted | - |
| Malachite Green | Use not permitted | Use not permitted | Use not permitted | Use not permitted | SEPA Guidance (2002) |
| Teflubenzeron | - | - | 0.006 | 0.03 | SEPA Policy 29 (1999) |

### A1.8.2 Operational sediment quality standards for chemicals used in aquaculture

**Table 8b: Operational sediment quality standards used by SEPA for regulating the use of chemicals in aquaculture**

| **Substance** | **Marine AA (µg/kg)** | **Marine MAC (µg/kg)** | **Reference** |
| --- | --- | --- | --- |
| Emamectin Benzoate | - | 0.763 (wet weight), equivalent to approximately 1.52 (dry weight) | SEPA Recommendation (1999) |
| Emamectin Benzoate |  | 0.272 (dry weight) | 2024 SG Direction (i) |
| Teflubenzeron | 10,000 (dry weight) (ii)  | 2.0 (dry weight) (iii)   | SEPA Policy 29 (1999) |

1. This standard will come into force for all discharges on the 6th June 2028. This standard will apply immediately for all new applications and for discharges currently on the interim position standard of 0.272 µg/kg (dry weight).
2. 5cm core depth applied within the immediate under cage impact zone, up to 25 m from cage edges.
3. cm core depth outside zone of effects area. 100 m from edge of cages, increased up to 150 m where strong directional currents exist
1. K. J. Cantrell, S. M. Serkiz, and E. M. Perdue, "Evaluation of Acid Neutralizing Capacity Data for Solutions Containing Natural Organic Acids", Geochim. Cosmochim. Acta, 54, 1247-1254 (1990). [↑](#footnote-ref-2)