2.5. Ecotoxicology

Parameter	Explanation
Terrestrial fauna and flora ecotoxicological endpoint data	Data used to measure the adverse effects on living terrestrial organisms that chemicals can have when released into the natural environment. See **Endpoint Glossary and Key Species data** below.
Aquatic fauna and flora ecotoxicological endpoint data	Data used to measure the adverse effects on living aquatic organisms that chemicals can have when released into the natural environment. See **Endpoint Glossary and Key Species data** below.
Aquatic mesocosm study data	Mesocosm studies are a useful tool for higher-tier aquatic risk assessment. They are widely used in the regulatory assessment processes to evaluate the effects of chemical pollutants on aquatic communities at the ecosystem level.

6.0. Key Species and Endpoint Glossary

Parameter	Explanation
EC_{50}	The concentration of a chemical that can be expected to cause a defined non-lethal effect in 50% of the tested population. In some cases, other percentages may be displayed (e.g. EC_{10} or EC_{15}).
E_rC_{50} E_rC_{10}	The concentration of test substance which results in a 50 percent reduction in **growth rate** relative to the control within the test period exposure. It is usually regarded as the acute endpoint. The E_rC_{10} is the concentration of test substance which results in a 10 percent reduction in growth rate relative to the control within the test exposure period. It can be regarded as a chronic endpoint.
E_bC_{50}	The concentration of test substance which results in a 50 percent reduction in **biomass** (e.g. cell density or chlorophyll content) growth relative to the control within the test exposure period. It is usually regarded as an acute endpoint.
E_yC_{50}	The concentration of test substance which results in a 50 percent reduction in **yield** relative to the control within the test exposure period. It is usually regarded as an acute endpoint
LD_{50}	Used in toxicology this is the median lethal dose (LD_{50}, abbreviation for 'Lethal Dose, 50%'), of a toxic substance and is the dose required to kill half the tested population. LD_{50} figures are frequently used as a general indicator of a substance's acute toxicity.
LR_{50}	Used in ecotoxicology a LR50 value is the lethal application rate that causes 50 % mortality. It is usually compared to the predicted exposure both in-field and off-field. In the regulatory first tier assessment, the risk is characterised by the 'in-field' hazard quotient (HQ): In-field HQ = in-field exposure / LR50.
NOEL/NOEC	'No Observed Effect Concentration'/'No Observed Effect Concentration' - greatest level or concentration of a substance, found by observation or experiment, which causes no detectable effect. It can be regarded as a chronic endpoint.
NOEAEC	'No Observed Ecologically Adverse Effect Concentration' - the highest concentration that causes no observed adverse effect on fauna or flora.

Species	Explanation
Given below are the first-choice species for ecotoxicological endpoints. However, if these are not available data for other species may be given instead. This will be indicated in the accompanying notes. Where data for several species are available, data for the most sensitive is given.	
Mammals	Rat, Mice, Dog (Mainly used for the human health studies)
Birds	Mallard duck (*Anas platyrhynchos*) Bobwhite quail (*Colinus virginianus*)
Soil micro-organisms	Various
Soil macro-organisms	Common brandling worm (*Eisenia foetida*)
Non-target plants	Various
Honeybees	European honeybee (*Apis mellifera*)
Bumblebees	*Bompus* spp. (typically *Bombus terrestris*).
Mason bees	*Osmia* spp.
Other pollinators	For example: *Megachile rotundata*, *Trigona spinipes*
Beneficial insects (Ladybirds)	Seven-spot ladybird (*Coccinella septempunctata*)
Beneficial insects (Lacewings)	Common green lacewing (*Chrysoperla carnea*)
Beneficial insects (Springtails)	*Folsomia* spp. (typically *Folsomia candida*)
Beneficial insects (Parasitic wasps)	Aphid parasitoid (*Aphidius rhopalosiphi*)
Beneficial insects (Predatory mites)	Predatory mite (*Typhlodromus pyri*)
Beneficial insects (Ground beetles)	*Poecilus* spp. (*Poecilus cupreus*)
Fish	Rainbow trout (*Oncorhynchus mykiss*) for temperate studies Bluegill sunfish (*Lepomis macrochirus*) for temperate studies Zebra fish (*Brachydanio rerio*) for tropical studies
Aquatic invertebrates	Daphnids (*Daphnia magna, Daphnia pulex*)
Aquatic crustaceans	Mysid shrimps (*Americamysis bahia*)
Marine bivales	Oysters (*Crassostrea gigas*)
Sediment dwelling organisms	Chironomid midges (*Chironomus riparius*)
Higher aquatic plants (free floating)	Duckweed (*Lemna gibba, Lemna minor*)
Higher aquatic plants (Rooted)	Parrot feather (*Myriophyllum aquaticum*)
Algae	Green algae (*Raphidocelis subcapitata, Desmodesmus subspicatus*)
For ecotoxicological data the 'worst case' data has been selected unless it appears wildly out of character with the majority of studies published. We have chosen specific species and endpoints wherever possible	

to ensure a harmonised and balanced data set. In some cases, endpoints other than these may be used, where this is the case the accompanying text will provide additional information.	
Mammals	Acute oral LD_{50}, short term 90-day NOEL as mg kg^{-1} and reproductive toxicity as mg kg^{-1} d^{-1}
Birds	Acute oral LD_{50} as mg kg^{-1} and reproductive toxicity as mg kg^{-1} d^{-1}
Soil micro-organisms	Various endpoints depending on availability, including information on N & C mineralisation (% effects)
Soil macro-organisms	14-day LC_{50} and chronic reproduction NOEC as mg kg $soil^{-1}$ dry weight
Non-target plants	Various endpoints depending on availability
Honeybees	Reasonable worse case of the 24, 36 and 72 hr values (where available)
Bumblebees	Reasonable worse case of the 24, 36 and 72 hr values (where available)
Mason bees	Reasonable worse case of the 24, 36 and 72 hr values (where available)
Other pollinators	Reasonable worse case of the 24, 36 and 72 hr values (where available)
Beneficial insects (Ladybirds)	Various mortality endpoints depending on availability (incl. LR_{50}, ER_{50}, % mortality, qualitative)
Beneficial insects (Lacewings)	Various mortality endpoints depending on availability (incl. LR_{50}, ER_{50}, % mortality, qualitative)
Beneficial insects (Parasitic wasps)	Various mortality endpoints depending on availability (incl. LR_{50}, EC_{50}, % mortality, qualitative)
Beneficial insects (Predatory mites)	Various mortality endpoints depending on availability (incl. LR_{50}, ED_{50}, % mortality, qualitative)
Fish	Acute 96-hr LC_{50} and 21day NOEC as mg l^{-1}
Aquatic invertebrates	Acute 48-hr EC_{50} and 21day NOEC as mg l^{-1}
Aquatic crustaceans	Acute 96hr LC_{50} as mg l^{-1}
Marine bivalves	Various mortality endpoints depending on availability
Sediment dwelling organisms	96-hr LC_{50} and chronic 28-day NOEC static water only and sediment as mg l^{-1}
Higher aquatic plants (free floating)	7-day growth EC_{50} / E_rC_{50} as mg l^{-1}
Higher aquatic plants (rooted)	14-day growth EC_{50} / E_rC_{50} as mg l^{-1}
Algae	Acute 72 hr EC_{50} and 72 hr NOEC or E_rC_{10} growth as mg l^{-1}

7.0. For further details

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