

AGMIN NEWSLETTER No. 234

EPA Permits to Discharge Cupricide® Treated Water from Dams into Rivers

The following ten (10) key points should be considered and, where required, supported by actual field data:

1. Water treated with Cupricide®, will conform to the “Water Quality and River Flow Environmental Objectives” published by the EPA for each River. Refer to the Table attached for key indicators and their Numerical Criteria.
2. Municipal Water Reservoirs are “contained water bodies” and are **not** subject to EPA Permits or Guidelines. Cupricide® has been approved by the NRA for use in these waters.
3. Only water discharges from reservoirs into natural streams or aquatic ecosystems are subject to the EPA Water Quality Objectives.
4. Municipal water storages must conform to WHO Drinking Water Standards, especially in regard to copper levels and organic toxins from blue-green algae.
5. A detailed paper on “Cupricide®– Environmental Chemistry and Fate” has been published and is available to any EPA Branch.
6. Extensive data from laboratory and field tests have demonstrated that Cupricide® is bio-accumulated by algae (within 3 hours) and adsorbed on clay sediments (within 24-48 hours). (Refer to Newsletters No. 223 and 229).
7. As a result of these two copper removal processes in aquatic ecosystems, the copper concentration in water treated with Cupricide® falls to less than 100 µg/L within 48 hours in contained water bodies. The residual concentration depends on many variables including original dose rate, water quality, algal cell density, suspended clay, natural humic substances, water depth, and degree of mixing.
8. When water from reservoirs is discharged downstream into rivers, there is a dilution factor of 1:2 (in low flow conditions) up to 1:10 (in high flow conditions). This dilution process in streams will reduce the residual copper to 50 µg/L (maximum level) and to less than 10 µg/L in high flow rivers.
9. The residual, chelated copper from Cupricide® is not toxic to fish, macro-invertebrates and water plants (macrophytes) at concentrations below 100 µg/L. This level is achieved within 24-48 hours after addition of Cupricide® to the reservoir water.
10. It is important to measure the existing, background levels of copper prior to Cupricide® treatment in water storages and in downstream rivers, which may be affected by discharges. In our experience, there has been no detectable increase in copper concentrations in rivers receiving discharges of Cupricide® treated water.

Agmin Chelates is prepared to assist in quantitative determinations of copper in treated waters at the µg/L level to verify this point.

EPA - Water Quality Environmental Objectives

Aquatic Ecosystems – Key Indicators

Indicator	Numerical Criteria
Total Phosphorous	Rivers 10 – 100 µg/L Lakes 5 – 50 µg/L
Chlorophyll a	Lakes 2 – 10 µg/L
Dissolved Oxygen	> 6 mg/L (80 – 90% Satd)
Chemical Contaminants	ANZECC Guidelines (1992) Section 2.4. “Waters shall be free from pollutants in amounts that are toxic to humans, animals, plants and other organisms.”
Macroinvertebrates	Species richness of the predominant invertebrate assemblages should not be altered; impacts that result in significant changes in species composition (compared with those in similar, local, unaffected systems) should not be permitted.
Water Plants	Species richness of the predominant macrophyte assemblages should not be altered; impacts that result in significant changes in species composition (compared with those in similar, local, unaffected systems) should not be permitted.
Fish	Communities should be protected so that species composition, diversity and functional organisation remain comparable to that of the natural habitat of the region; impacts that result in significant changes in species composition or diversity should not be permitted.



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