VALUE(S) ADDED 7-24-85

FACT SHEET REVISED 1-8-86

VALUE(S) REMOVED ----------

SURFACE WATER QUALITY

STANDARD DOCUMENTATION

Endosulfan

The attached aquatic fact sheet was prepared in 1983 and used to support the proposed standard during the public hearings. All the fact sheet values were promulgated as standards for the indicated classes except the A, B and C surface freshwater classes. A value of 0.009 ug/l was promulgated for those classes. The Final Environmental Impact Statement states that "NYS DEC will revise its proposal and adopt the EPA (1980) criteria of 0.009 mg/l as the numerical standard". A value of 0.009 was specified by EPA as ug/l and for certain of the saltwater classes. DEC records indicate that the ug/l units were intended.

Date: August 8, 1983

Surface Water Quality
Standard Documentation

Chemical: Endosulfan

C.A.S, No.(s): 115-29-7

Basis (Human/Aquatic): Aquatic

Standard by Water Classification:

	ug/l	Notes
Classes AA,AA-s;A;A-s;B;C	0.003	H
Class D	0.22	H
Classes SA;SB;SC;I	0.001	H
Class SD	0.034	H

Remarks:

Summary of Information

1. EPA. 1976. Quality criteria for water. Wash., D.C. 256 pp.

   -0.003 ug/l recommended to protect sensitive freshwater aquatic life; based in acute effects to rainbow trout.
   -0.001 ug/l recommended to protect sensitive marine aquatic life; based on acute effects to striped bass.

2. Macek, K.J. 1979. Endosulfan. In Thurston et al. (ed) A review of the EPA Red Book: Quality criteria for water. Amer. Fish Soc., Bethesda, MD.

   -suggests that an application factor of 0.1 would be appropriate, using EPA (1976) data, which would result in a freshwater criterion of 0.03 ug/l.

3. EPA. 1980. Ambient water quality criteria for endosulfan. USEPA, Wash., D.C.

   -0.056 ug/l and 0.22 ug/l recommended as 24 hr. average and "any time" criteria respectively, to protect freshwater aquatic life.
   -0.0087 ug/l and 0.034 ug/l recommended as 24 hr. average and "any time" criteria, respectively, to protect saltwater aquatic life.

4. Priyamvada Devi, A., et al. 1981. Relative toxicity of the technical grade material, isomers, and formulations of endosulfan to the fish Channa punctata. Bull. Envir. Cont. Toxicol. 27:239-243.

   -technical endosulfan 96 hLC_{50} = 4.8 ug/l
   -isomer-A 96hLC_{50} = 0.16 ug/l

5. Anana Swarup, P. et al. 1981. Toxicity of endosulfan to the freshwater fish Cirrhinus mrigala. Bull. Envir. Cont. Toxicol. 27:850-855.

   -technical endosulfan 96 hLC_{50} = 1.3 ug/l
   -isomer-A 96hLC_{50} = 0.6 ug/l.

6. Callahan, M.A. et al. 1979. Water related fate of 129 priority pollutants, two Vol., EPA-440/4-79-029 a, b. USEPA Wash., D.C.

   -endosulfan degrades via several paths to endosulfan sulfate which is more persistent and possibly more bioaccumulable than endosulfan.

Standard Derivation

The criteria recommended by EPA (1976) are recommended for all FW and SW except classes D & SD: the "any time: criteria of EPA (1980) are recommended for classes D & SD. The procedure used by EPA (1980) for deriving chronic criteria results in values which may not adequately protect sensitive species in classes other than D and SD. Support follows.

No chronic data were available in EPA (1980) for rainbow trout, copepods or pink shrimp, the most sensitive species in acute tests. Macek (1979) reviewed only date in EPA (1980). Data from references 4-6 above suggest that the variability and extreme toxicity of the forms of endosulfan warrant deriving a statewide criteria that protects from all forms of endosulfan or its degradation products (evidence is not available that demonstrates that endosulfan sulfate is less toxic than endosulfan).

Finally, several SW species exhibit acute toxicity at levels considerably below FW species, and chronic tests have not been done with these SW species. It has not been adequately demonstrated that the range of sensitivities for many toxics for FW and SW species are truly different. Reasons have not been found to explain why FW species are more sensitive to some chemicals and SW species to others. It is likely that for most chemicals that the sensitivity of all SW and FW aquatic life lie within a similar range. Therefore, in the case of endosulfan it would be imprudent to adopt very dissimilar FW and SW criteria. EPA (1980) "any time" criteria should be adequate for survival of most species in Classes D and SD.