

Memorandum

To: DEQ Water Quality Staff

From: Water Quality Permitting and Program Development; updated by Aliana Britson

Date: 7/22/2024

Subject: Implementation Instructions for the Water Quality Criterion Endosulfan (CAS #: 115297)

This memo clarifies how endosulfan concentrations in effluent and surface water are measured to determine compliance with water quality criteria.

Criteria summary

Oregon water quality standards include numeric criteria for endosulfan to protect aquatic life. There are also numeric criteria for endosulfan alpha, endosulfan beta and endosulfan sulfate to protect for human health and aquatic life (See table below).

Table 1: Summary of Endosulfan-Based Water Quality Criteria

Chemical	Human Health Criteria		Aquatic Life Criteria (Freshwater)		Aquatic Life Criteria (Saltwater)	
	Water + Org (µg/L)	Org Only (µg/L)	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)
Endosulfan	NA	NA	0.22 ^{A,H}	0.056 ^{A,H}	0.034 ^{A,H}	0.0087 ^{A,H}
Endosulfan Alpha	8.5	8.9	0.22 ^A	0.056 ^A	0.034 ^A	0.0087 ^A
Endosulfan Beta	8.5	8.9	0.22 ^A	0.056 ^A	0.034 ^A	0.0087 ^A
Endosulfan Sulfate	8.5	8.9	NA	NA	NA	NA

^A This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines which update minimum data requirements and derivation procedures. The CMC may not be exceeded at any time and the CCC may not be exceeded based on a 24-hour average. The CMC may be applied using a one hour averaging period not to be exceeded more than once every three years, if the CMC values given in Table 30 are divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

^H This value is based on the criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.

Key issues

Technical grade endosulfan is composed of a mixture of two stereoisomers (endosulfan alpha and beta)¹. Endosulfan sulfate is a decomposition product of endosulfan.

According to the EPA [National Recommended Criteria](#) for aquatic life, the individual criterion

¹ US EPA Ambient Water Quality Criteria for Endosulfan, October 1980. EPA 440/5-80-046

values for endosulfan alpha and beta were derived from data for endosulfan and “is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.” The state water quality criterion for Endosulfan (as shown in Note ^H of the table above) indicates that the criterion “should be applied as the sum of alpha- and beta-endosulfan”.

Implementation instructions for NPDES permits

Endosulfan alpha, endosulfan beta, and endosulfan sulfate are listed as a monitoring requirement in 40 CFR 122, Appendix D for certain industrial sources. Although 40 CFR 122, Appendix J does not explicitly require domestic facilities to monitor for Endosulfan, Endosulfan-alpha, Endosulfan-beta, or Endosulfan Sulfate domestic major facilities are required to monitor for all pollutants for which there are state standards (40 CFR 122.21(j)(4)(iv)).

For NPDES permits where endosulfan is a pollutant of concern, monitoring for endosulfan alpha and endosulfan beta will be required. For each monitoring event, these results will be summed and used to evaluate endosulfan either as part of a reasonable potential analysis or to evaluate compliance with a limit. For example, if a permittee reports results of 0.01 ug/L for endosulfan alpha and 0.04 ug/L for endosulfan beta, the final sum of 0.05 ug/L will be used to evaluate endosulfan. In NPDES permits where endosulfan sulfate is a pollutant of concern, monitoring for endosulfan sulfate will be required.

As stated in endnote A of OAR 340-041-8033, the freshwater chronic and saltwater acute aquatic life criteria for endosulfan, endosulfan alpha, and endosulfan beta were based on EPA recommendations issued in 1980. To ensure consistent evaluation with other criteria, the acute (CMC) aquatic life criteria for will be applied using a one hour averaging period not to be exceeded more than once every three years. Therefore, the CMC value will be divided by 2 as stated in Note A and the values in the table below will be used as the criteria to which effluent concentrations are compared.

Table 2: Acute Aquatic Life Criteria Applied as a One-Hour Averaging Period

Chemical	Freshwater (µg/L)	Saltwater (µg/L)
Endosulfan	0.11	0.017
Endosulfan Alpha	0.11	0.017
Endosulfan Beta	0.11	0.017

Conclusion

The individual endosulfan alpha and beta data will be summed together and used in the evaluation of the endosulfan criteria as specified in OAR 340-041-8033 Table 30.

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