

To: DEQ Water Quality Staff**Date:** November 28, 2014**From:** Jennifer Wigal, *Surface Water Management Section Manager*
Debra Sturdevant, *WQ Standards and Assessment Section Manager*
Sarah Krepps, *Organic Laboratory Manager***Prepared By:** Spencer Bohaboy, *Surface Water Management Section*
Andrea Matzke, *WQ Standards and Assessment Section***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 for 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).

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 | | | 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 | | | | |

^A See expanded endnote A at bottom of **Table 30** for 30 alternate frequency and duration of this criterion
^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

According to the 1990 **Ambient Water Quality Criteria for Endosulfan**, technical grade endosulfan is composed of a mixture of two stereoisomers (Endosulfan Alpha and Beta). Endosulfan sulfate is a decomposition product of endosulfan.

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

Recommended Analytical Method

The recommended analytical method for endosulfan and the various endosulfan derivatives is EPA 608

To determine the applicable quantitation limits for individual permit holders, please refer to Schedule B of the applicable permit. For older permits without quantitation limits in their Schedule B, please refer to Revision 3.0 of the Reasonable Potential Analysis for Toxic Pollutants IMD to determine applicable quantitation limits.

Implementation Instructions for NPDES Permits

Endosulfan Sulfate is listed as a monitoring requirement in 40 CFR 122, Appendix D for certain industrial and domestic sources.

When evaluation of endosulfan is indicated as part of the permit application or renewal process, the permit writer will require monitoring for endosulfan-alpha and endosulfan-beta using EPA Method 625 or 608 as part of the Tier 1 monitoring process. For each monitoring event, these results will be summed and used to evaluate endosulfan and determine if it is a pollutant of concern (POC). Endosulfan sulfate will be separately evaluated using EPA Method 625 or 608. The RPA Workbook has been configured to use Endosulfan-alpha and -beta data when evaluating Endosulfan.

Conclusion

There is not a direct analytical method to determine the quantity of Endosulfan in a water column. Instead, the individual Endosulfan-alpha and -beta data will be summed together and used in the evaluation of the Endosulfan criteria.