

**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 Water Quality Criterion DDT,-4,4' (CAS #: 50-29-3)

This memo clarifies how DDT,-4,4' 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 DDT,-4,4' to protect human health and aquatic life. There are additional human health criteria for its metabolites—DDD,-4,4' and DDE,-4,4' (See table below).

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)
DDD,-4,4'	0.000031	0.000031	---	---	---	---
DDE,-4,4'	0.000022	0.000022	---	---	---	---
DDT,-4,4'	0.000022	0.000022	1.1 <sup>G</sup>	0.001 <sup>G</sup>	0.13 <sup>G</sup>	0.001 <sup>G</sup>
	<sup>G</sup> This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).					

### **Key Issues**

The footnote associated with the aquatic life criteria indicates that “this criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).” However, it does not specifically denote which metabolites to include. The EPA 1985 reference document<sup>1</sup> used to develop the DDT criteria does not provide additional clarity.

The criteria developed for human health does not have a footnote referencing “metabolites.” For evaluation of the human health criteria, samples are analyzed for DDD,-4,4', DDE,-4,4', and DDT,-4,4' and then compared to the applicable criteria.

<sup>1</sup> EPA. Ambient Water Quality Criteria for DDT. EPA 440/5-80-038. October 1980. See: [http://water.epa.gov/scitech/swguidance/standards/current/upload/2001\\_10\\_12\\_criteria\\_ambientwqc\\_ddt\\_80.pdf](http://water.epa.gov/scitech/swguidance/standards/current/upload/2001_10_12_criteria_ambientwqc_ddt_80.pdf)

Because there is no clear direction on what DDT metabolites are included in the analysis of DDT for the aquatic life criteria, DEQ will refer to the DDT metabolites included as human health criteria. Therefore, separate analyses for DDD,-4,4', DDE,-4,4', and DDT,-4,4' must be completed and then each result added together and compared to the aquatic life criterion for DDT,-4,4'.

### **Recommended Analytical Method**

Any of the following methods are suitable provided they are adequately sensitive to meet the required limits: EPA Method 608 – Organochlorine Pesticides and PCBs by GCECD; EPA Method 617 – Organohalide pesticides and PCBs by GCECD; and EPA Method 625 – Base, Neutrals and Acids by GCMS.

To determine the applicable quantitation limits for individual permit holders, please refer to Schedule B of the relevant permit. For older permits without quantitation limits in 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**

For human health criteria, the samples must be analyzed for DDD,-4,4', DDE,-4,4', and DDT,-4,4' and each result compared to the applicable criterion for each metabolite. These results may be used for effluent and ambient characterization, determination of “reasonable potential,” calculation of effluent limits and compliance.

For aquatic life criteria, samples must be analyzed for DDD,-4,4', DDE,-4,4', and DDT,-4,4'. The results of the three analyses are summed together and compared to the most stringent applicable aquatic life criterion for DDT,-4,4'. These results may be used for the purposes of effluent and ambient characterization, determination of “reasonable potential,” calculation of effluent limits and compliance.

### **Conclusion**

In summary, the aquatic life criteria for DDT,-4,4' include separate analyses for DDD,-4,4', DDE,-4,4', and DDT,-4,4'. These results are summed together and compared to the most stringent applicable aquatic life criterion for DDT,-4,4'. Data results for the DDT human health criteria are directly compared to the applicable criteria for DDD,-4,4', DDE,-4,4', and DDT,-4,4'.