

Here is a list of chemicals prepared by Dr. Patti TenBrook of USEPA Region 9. It is based on DPR's list and the additional pesticide information provided by Dr. Kelly Moran. For each chemical, it identifies the degradates that were found in fate and/or field studies at  $\geq 10\%$  of applied material, and those which are of toxicological concern (either to human health or aquatic life). There is a reference for the information source. If there are available CAS numbers, these are noted in the table. Where there is no CAS #, there's a good chance there is no readily available analytical method. The list is not in any priority order. This list is a helpful resource for at least knowing which chemicals have degradates of concern.

### **How is degradates of concern defined?**

Here is how OPP determines "degradates of concern" or "major degradates". This is from:

[http://www.epa.gov/oppefed1/ecorisk\\_ders/toera\\_analysis\\_exp.htm](http://www.epa.gov/oppefed1/ecorisk_ders/toera_analysis_exp.htm)

"Degradates formed at greater than or equal to 10% of the amount of applied pesticide are considered significant (i.e., major degradate) and must be identified in the study. In addition degradates of known toxicological or ecotoxicological concern must be quantified and identified even when present at less than 10% of the applied pesticide." Also, this document: <http://www.epa.gov/espp/consultation/ecorisk-overview.pdf> has similar language.

"In addition to assessing the environmental fate of active ingredients, the Agency requirements indicate that the formation of degradates be monitored in the fate studies. This is often accomplished through the use of radio-labeled compound to ensure that detection limits are sufficiently low to allow for detailed tracking of the production of degradates. Degradates formed at greater than or equal to 10% of the applied radioactivity in the environmental fate studies are considered significant (i.e., major degradates) and must be identified (see Support Document #5). The 10% criterion is a general guideline, meaning that degradates approaching concentrations of 10% of the applied radioactivity are usually identified as well. In addition, degradates of known toxicological or ecotoxicological concern must be quantified and identified even when present at less than 10% of the applied radioactivity."

Support Document #5 (see page 38) as it is and you and you is called "Pesticide Assessment Guidelines, Subdivision N, Chemistry Requirements, Environmental

Fate." [http://www.epa.gov/scipoly/sap/meetings/2008/october/subdivision\\_n\\_pesticide\\_assessment\\_guidelines.pdf](http://www.epa.gov/scipoly/sap/meetings/2008/october/subdivision_n_pesticide_assessment_guidelines.pdf).

### **Q: How to evaluate the potential effects of the pesticide active ingredient and its degradates?**

A way to evaluate the potential effects of the pesticide active ingredient and its degradates would be through a toxicity-based approach evaluation. For example, a recent vector study, which evaluated various products use of that program, had several findings. One of importance of this group: "In the case of Naled in water, analysis of only the active ingredient would have underestimated potential impacts to the receiving system because toxicity was attributed to the breakdown product, dichlorvos (Phillips, et al., 2014)." Toxicity testing can provide useful risk information about unidentified, unmeasured toxicants, or mixtures of toxicants.

Phillips BM, Anderson BS, Voorhees JP, Siegler K, Denton DL, TenBrook PL, Larsen KL, Isorena P, Tjeerdema RS. 2014. Monitoring the Aquatic Toxicity of Mosquito Vector Control Spray Pesticides to Freshwater Receiving Waters