UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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SUBJECT: Aquatic Use Proposal for Glyphosate

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The Office of Drinking Water has completed its review of the notice describing the proposed revisions to the CFR Title 40, Chapter 1, Subchapter E, Part 180, with respect to the herbicide, glyphosate (N-phosphonomethylaminoglycine) and its metabolite, aminomethylphosphonic acid, and the accompanying background materials.

The manufacturer has petitioned for the establishment of tolerances in certain commodities resulting from the use of irrigation waters previously treated with a glyphosate formulation. In addition, it is proposed that residue levels in the waters of 0.5 ppm be allowed.

Of concern to ODW, of course, is whether or not the consumption of water as drinking water containing residues of glyphosate up to 0.5 ppm constitutes an adverse health risk to the human population. This proposed tolerance represents an allowable level based upon lifetime, or chronic, exposure. Therefore, it would likely be most appropriate to relate the tolerance to exposure to the substance by a 70 kg adult, drinking two liters of water per day, rather than the 10 kg child, imbibing 1 liter of water per day. However, we can look at it both ways.

The material accompanying the notice contains a series of memos from individuals within the branches of the Hazard Evaluation Division of OPP, describing their evaluations of the data gathered in support of this petition. No actual study data were available for ODW evaluation. In a September 1, 1981, memo from W. Dykstra (Toxicology Branch) to B. Taylor (Registration Division), it is stated that, based upon the results of a three-generation rat reproduction study, a NOEL of 10 mg/kg/day can be identified, following the observation

that renal focal tubular dilation was observed in the high dose male F3b weanlings.] In the two-year rat feeding study, a NOEL of 100 ppm (5 mg/kg/day) was identified. Yet in a memo dated April 14, 1982, Dr. Dykstra has identified a NOEL of 31 mg/kg/day for chronic toxicity, presumably from the same study. No explanation for the change was provided.

The Office of Pesticide Programs established the Acceptable Daily Intake (ADI) from the NOEL of 100 ppm identified in the three-generation reproductive study. If this NOEL is, in fact, the appropriate one to use for the ADI, then an allowable level in drinking water for the 70 kg adult could be derived as follows:

$$\frac{10 \text{ mg/kg/day} \times 70 \text{ kg} \times 100\% \times 100\%}{100 \times 2 \text{ l}} = 3.5 \text{ mg/l}$$

Where: 10 mg/kg/day = NOEL
70 kg = weight of protected individual
100% = percentage of substance absorbed and retained
100% = percentage contribution from drinking water
100 = uncertainty factor (good animal data, no equivalent human data)
2 l = volume of water imbibed per day by 70 kg adult

With the measure of uncertainty about the actual NOEL from the two-year feeding study, if we were to use the originally-identified NOEL of 5 mg/kg/day, the allowable level for the 70 kg adult would be 1.75 mg/l. In addition, if one were to derive a guidance level for the 10 kg child, the level would equal 1.0 mg/l for the NOEL of 10 mg/kg/day, and 0.5 mg/l for the NOEL of 5 mg/kg/day. For the adult, then, the resulting guidance would be 3.5 or 7 times higher than the proposed potable water tolerance. For the 10 kg child, the guidance level would be equal to or twice the potable water tolerance of 0.5 ppm. In the case of the 70 kg adult, if it can be shown that exposure to glyphosate residues in other media, namely foodstuffs for which tolerances have already been or will be granted, along with exposure to the drinking water, does not exceed the ADI, then the tolerance of 0.5 ppm in potable water should be protective of human health. No such assurance can be made with respect to the 10 kg child. However, the 10 kg child does not remain so throughout his lifetime, and since the ADI is based upon lifetime data, there actually may be an adequate margin of safety, in this instance.

This is subject to reconsideration should additional data be generated such as relative to nitroso product. This should not be treated as an "acceptable" drinking water level. If a drinking water standard is needed, it may be based upon additional considerations.

[Editorial Comments on the Notice]

Page 1, ¶ 2, line 2: no comma after "crustacean"

Page 2, ¶ 2, last line: no "/" after "kg" unless "day" is inserted.

Page 3, ¶ 2, line 2: "criteria" should be inserted between "(RPAR)" and "have."

Attachments