

**AMBIENT SURFACE WATER QUALITY  
STANDARDS DOCUMENTATION****CHEMICAL:** Azinphosmethyl**CAS NO. (s):** 86-50-0**BASIS (Human/Aquatic):** Human**WATER CLASSIFICATION:** AA; AA-s; A; A-s**STANDARD:** 0.07 ug/l **Note A****REMARKS:****SUMMARY INFORMATION:**

The toxicologic data base for this compound has been reviewed.<sup>1</sup> It is an animal oncogen as defined in Part 701.1(p). Chronic exposure of laboratory animals to this compound via the diet has resulted in a significant increase in the incidence of tumors of the thyroid gland and the pancreas in male rats.<sup>2</sup> It has also shown genotoxic activity in short-term tests.<sup>3-5</sup>

**STANDARD DERIVATION:**

Dose-response data from a National Cancer Institute<sup>2</sup> carcinogenesis bioassay were used for extrapolation. Using the protocol in Part 701.4 and a linearized multistage extrapolation procedure (GLOBAL82)<sup>6</sup>, an azinphosmethyl concentration of 0.07 ug/l in water was calculated to correspond to an increased human cancer risk of  $1 \times 10^{-6}$  over a lifetime (see calculations below). The recommended ambient water quality standard for azinphosmethyl is 0.07 ug/l.

**Calculations:****1. National Cancer Institute Bioassay Data**

The incidence of pancreatic tumors in male rats fed azinphosmethyl in the diet at time-weighted average levels of 0, 78 and 156 ppm during the exposure period is the dose-response data for the most sensitive tumor type in the most sensitive species and sex, occurring at a statistically significant level.

2. Average Daily Intake (for animals)\*

| <u>Concentration<br/>in diet</u> | <u>Average Daily Intake<br/>During Lifetime</u> |
|----------------------------------|-------------------------------------------------|
| 0                                | 0 mg/kg/day                                     |
| 78 ppm                           | 2.7 mg/kg/day                                   |
| 156 ppm                          | 5.5 mg/kg/day                                   |

\*Since specific information on food consumption was not provided, the general formula ppm in diet x 0.05 = daily dose in mg/kg/day was used to calculate the average daily intake for rats at each dose level during exposure. However, rats lived an additional 35 weeks without exposure after being exposed for 80 weeks; therefore, average daily doses during exposure were multiplied by 0.70 to calculate average daily doses during lifetime.

3. Data Input for GLOBAL82 Computer Program

| <u>Dose<br/>(mg/kg/day)</u> | <u>Number of animals<br/>with tumors</u> | <u>Number of<br/>experimental animals</u> |
|-----------------------------|------------------------------------------|-------------------------------------------|
| 0                           | 1                                        | 9                                         |
| 2.7                         | 14                                       | 44                                        |
| 5.5                         | 14                                       | 43                                        |

4. GLOBAL82 Result (for animals)

The lower 95% confidence limit value of the azinphosmethyl dose corresponding to an increased lifetime cancer risk of  $1 \times 10^{-6}$  for the experimental animals was 0.01 ug/kg/day.

5. Conversion of the animal dose (ug/kg/day) to a human dose using surface area conversion rule

$$\text{rodent dose (ug/kg/day)} \times \left( \frac{\text{animal body wt. (kg)}}{\text{human body wt. (kg)}} \right)^{0.33} = \text{human dose (ug/kg/day)}$$

$$0.01 \text{ ug/kg/day} \times \left( \frac{0.50 \text{ kg}}{70 \text{ kg}} \right)^{0.33} = 0.002 \text{ ug/kg/day}$$

6. Calculation of the azinphosmethyl level in water corresponding to an increased cancer risk of  $1 \times 10^{-6}$  for a 70 kg human ingesting 2 liters of contaminated water per day over a lifetime.

$$\frac{0.002 \text{ ug/kg/day} \times 70 \text{ kg}}{2 \text{ l/day}} = 0.07 \text{ ug/l}$$

**REFERENCES:**

- (1) National Academy of Sciences. 1977. Drinking Water and Health, Vol. 1. National Academy of Sciences. Washington, D.C.
- (2) National Cancer Institute. 1978. Bioassay of azinphosmethyl for possible carcinogenicity. Carcinogenesis Tech. Rep. Ser. No. 69.
- (3) Gilot-Delhalle, J. *et al.* 1983. Mutagenicity of some organophosphorus compounds at the adele locus of Schizosaccharomyces pombe. Mut. Res. 117: 139-148.
- (4) Alam, M.T. and S. S. Kasatiya. 1977. Chromosome aberrations induced by an organic phosphate pesticide. Can. J. Genet. Cytol. 16: 701. (abstract)
- (5) Simmon, V.F. *et al.* 1976. In vitro mutagenic studies of twenty pesticides. Toxicol. Appl. Pharmacol. 37: 109. (abstract)
- (6) Howe, R.B. and K.S. Crump. 1982. GLOBAL82 Computer Program. Science Research Systems, Inc., Ruston, LA.

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