VALUE(S) ADDED 7-24-85

FACT SHEET REVISED _____

VALUE(S) REMOVED _____

AMBIENT SURFACE WATER QUALITY STANDARDS DOCUMENTATION

CHEMICAL: Aldrin

CAS NO.(s): 309-00-2

BASIS (Human/Aquatic): Human

WATER CLASSIFICATION: AA; AA-s; A; A-s

STANDARD: 0.002 ug/l Note A

REMARKS:

SUMMARY INFORMATION:

The toxicologic data base for this compound has been reviewed.[1-6] 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 liver tumors in male mice.[7,8]

STANDARD DERIVATION:

Dose-response data from a National Cancer Institute[7] carcinogenesis bioassay were used for extrapolation. Using the protocol in Part 701.4 and a linearized multistage extrapolation procedure (GLOBAL82)[9], an aldrin concentration of 0.002 ug/l in water was calculated to correspond to an increased human cancer risk of 1×10^{-6} over a lifetime (see calculations below). The recommended ambient water quality standard for aldrin is 0.002 ug/l.

Calculations:

1. National Cancer Institute Bioassay Data

The incidence of liver tumors in male mice fed aldrin in the diet at time-weighted average levels of 0, 4 and 8 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)*

Concentration in diet	Average Daily Intake During Lifetime
0	0 mg/kg/day
4 ppm	0.34 mg/kg/day
8 ppm	0.69 mg/kg/day

*Since specific information on food consumption was not provided, the general formula ppm in diet x 0.10 = daily dose in mg/kg/day was used to calculate the average daily intake for mice at each dose level during exposure. In addition, mice lived an additional 13 weeks without exposure after being exposed for 80 weeks; therefore, average daily doses during exposure were multiplied by 0.86 to calculate average daily doses during lifetime.

3. Data Input for GLOBAL82 Computer Program

Dose (mg/kg/day)	Number of animals with tumors	Number of experimental animals
0	3	20
0.34	16	49
0.69	25	45

4. GLOBAL82 Result (for animals)

The lower 95% confidence limit value of the aldrin dose corresponding to an increased lifetime cancer risk of 1×10^{-6} for the experimental animals was 8.1×10^{-4} ug/kg/day.

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

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

$$8.1 \times 10^{-4} \text{ ug/kg/day} \times \left(\frac{0.035 \text{ kg}}{70 \text{ kg}}\right)^{0.33} = 6.6 \times 10^{-5} \text{ ug/kg/day}$$

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

$$\frac{0.000066 \text{ ug/kg/day} \times 70 \text{ kg}}{2 \text{ l/day}} = 2.3 \times 10^{-3} \text{ ug/l}$$

REFERENCES:

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(3) National Academy of Sciences. 1982. An Assessment of the Health Risks of Seven Pesticides used for Termite Control. National Academy Press. Washington, D.C.

(4) International Agency for Research on Cancer. 1974. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. 5: 25-38.

(5) U.S. Environmental Protection Agency. 1980. Ambient water quality criteria for aldrin/dieldrin. NTIS No. PB81-117301.

(6) N.Y.S. Department of Health. 1984. Testimony submitted to public hearings held by the N.Y.S. Department of Environmental Conservation on proposed amendments to termiticide regulations, 6NYCRR 326, Restricted pesticides. Albany, N.Y.

(7) National Cancer Institute. 1978. Bioassays of aldrin and dieldrin for possible carcinogenicity. Carcinogenesis Tech. Rep. Ser. No. 21.

(8) Davis, K.J. and O.G. Fitzhugh. 1962. Tumorigenic potential of aldrin and dieldrin in mice. Tox. Appl. Pharm. 4: 187-189.

(9) Howe, R.B. and K.S. Crump. 1982. GLOBAL82 Computer Program. Science Research Systems, Inc., Ruston, LA.

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