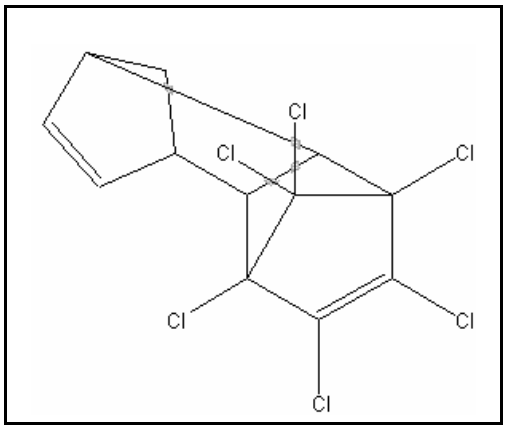
Indiana Department of Environmental Management
Office of Water – Water Quality Standards Section

TIER II HUMAN HEALTH NONCANCER VALUES

ALDRIN

CAS RN:	309-00-2
Water Solubility:	0.18 mg/L
Log K_{ow}:	6.496
Reference Dose:	2.5 x 10^{-5} mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



Standard

The human health noncancer aldrin value for drinking water sources is 8.2 x 10^{-5} µg/L. The human health noncancer value for nondrinking water sources is 8.2 x 10^{-5} µg/L.

Calculations

Bioaccumulation Factor: BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 6.496 (slow-stir method), K_{ow} = 3,133,286
Trophic level 3 FCM = 13.662; trophic level 4 FCM = 24.604

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.571$

Baseline BAF_{T3} = (FCM)(K_{ow}) = (13.662)(3,133,286) = 42,806,953

Baseline BAF_{T4} = (24.604)(3,133,286) = 77,091,369

Human health BAF_{T3} = [(42,806,953)(0.0182)+1](0.571) = 444,859

Human health BAF_{T4} = [(77,091,369)(0.0310)+1](0.571) = 1,364,595

Risk Associated Dose:

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Liver toxicity

$$ADE = \frac{LOAEL}{UF} = \frac{0.025 \text{ mg/kg-day}}{1000} = 2.5 \times 10^{-5} \text{ mg/kg/d}$$

Calculation of Criteria:

Non Drinking Water HNV = $[(2.5 \times 10^{-5})(70)(0.8)]/0.01+[(0.0036)(444,859)+(0.0114)(1,364,595)]$

$$= \mathbf{8.2 \times 10^{-5}\ \mu g/L}$$

Drinking Water HNV = $[(2.5 \times 10^{-5})(70)(0.8)]/2+[(0.0036)(444,859)+(0.0114)(1,364,595)]$

$$= \mathbf{8.2 \times 10^{-5}\ \mu g/L}$$

References

1. Stephen, C.E. 1993. Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative. Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Duluth, MN.

2. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file for aldrin (309-00-2).

3. de Bruijn, J., F. Busser, W. Seinen, and J. Hemens 1989. Determination of octanol/water partition coefficients for hydrophobic organic chemicals with the "slow-stirring" method. Environ. Toxicol. Chem. 8: 449-512. (Reference for the Log K_{ow} value)

Acronyms

ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K_{ow}	Octanol-Water Partition Coefficient
LOAEL	Lowest observed adverse effect level
NOAEL	No observed adverse effect level
P (superscript)	Predicted value
UF	Uncertainty factor

Revision History

April 4, 2000 - Values first developed

Contact Information

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