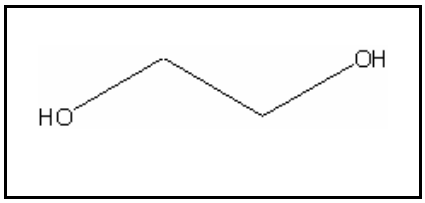
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

ETHYLENE GLYCOL

CAS RN:	107-21-1
Water Solubility:	100,000 mg/L
Log K_{ow}:	-1.37^{P}
Reference Dose:	2 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer ethylene glycol criterion for drinking water sources is 56,000 µg/L. The human health noncancer criterion for nondrinking water sources is 4,500,000 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow}

Log K_{ow} = -1.37 (CLOGP program), K_{ow} = 0.04266

Trophic level 3 FCM = 1.000; trophic level 4 FCM = 1.000

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 1.0$

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (1.0)(.04266) = 0.04266$

Baseline $BAF_{T4} = (1.0)(0.04266) = 0.04266$

Human health BAF_{T3} = [(0.04266)(0.0182)+1](1.0) = 1.0

Human health BAF_{T4} = [(0.04266)(0.0310)+1](1.0) = 1.0

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Kidney toxicity

$$ADE = \frac{NOAEL}{UF} = \frac{200\ mg/kg\text{-}day}{100} = 2\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNV = [(2)(70)(0.8)]/0.01+[(0.0036)(1.0)+(0.0114)(1.0)]

= **4,500,000 μg/L**

Drinking Water HNV = [(2.0)(70)(0.8)]/2+[(0.0036)(1.0)+(0.0114)(1.0)]

= **56,000 μg/L**

References

1. USEPA 1989. Integrated Risk Information System (IRIS database) chemical file for ethylene glycol (CAS # 107-21-1).

2. Leo,A. and D.Weininger 1997. Daylight Software CLogP Version 3.15+ for Unix Pomona Medical Chemistry Project, Pomona College, Claremont, CA. Distributed by Daylight Chemical Information Systems, Inc., 3952 Claremont St., Irving, CA 92714 (Reference for the Log K_{ow}).

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
RPLC	Reverse-phase Liquid Chromatography
UF	Uncertainty factor

Revision History

August 19, 1997 - Criteria first developed
April 19, 2000 – Fact sheet updated. No modifications to criteria.

Contact Information

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