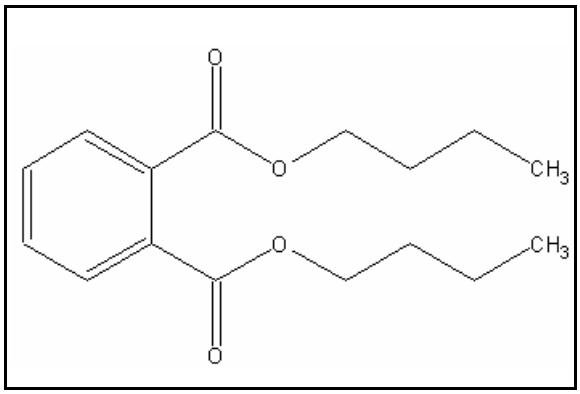
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II HUMAN HEALTH NONCANCER VALUES

DIBUTYL PHTHALATE

CAS RN:	84-74-2
Water Solubility:	13 mg/L
Log K_{ow}:	5.15
Reference Dose:	0.125 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	None



Standard

The human health noncancer di-n-butyl phthalate value for drinking water sources is 31 µg/L.
The human health noncancer value for nondrinking water sources is 31 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 5.15 (RPLC method), K_{ow} = 141,254
Trophic level 3 FCM = 4.188; trophic level 4 FCM = 3.873

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.967$

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (4.188)(141,254) = 591,572$

Baseline $BAF_{T4} = (3.873)(141,254) = 547,077$

Human health BAF_{T3} = [(591,572)(0.0182)+1](0.967) = 10,412

Human health BAF_{T4} = [(547,077)(0.0310)+1](0.967) = 16,401

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Increased mortality

$$ADE = \frac{NOAEL}{UF} = \frac{125\ mg/kg\text{-}day}{1000} = 0.125\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNV = [(0.125)(70)(0.8)]/0.01+[(0.0036)(10,412)+(0.0114)(16,401)]

= **31 μg/L**

Drinking Water HNV = [(0.125)(70)(0.8)]/2+[(0.0036)(10,412)+(0.0114)(16,401)]

= **31 μg/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 1990. Integrated Risk Information System (IRIS database) chemical file for dibutyl phthalate (CAS # 84-74-2).

3. Veith, G.D., N.M. Austin, and R.T. Morris 1979. A rapid method for estimating Log P for organic chemicals. Water Res. 13: 43-47.

Acronyms/Abbreviations

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

July 9, 1997 - Values first developed
April 13, 2000 – Fact sheet updated. No modifications made to values.

Contact Information

David B. Kallander
Water Quality Standards Section
Indiana Department of Environmental Management
100 North Senate Ave., P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 233-2472
Email: dkalland@dem.state.in.us