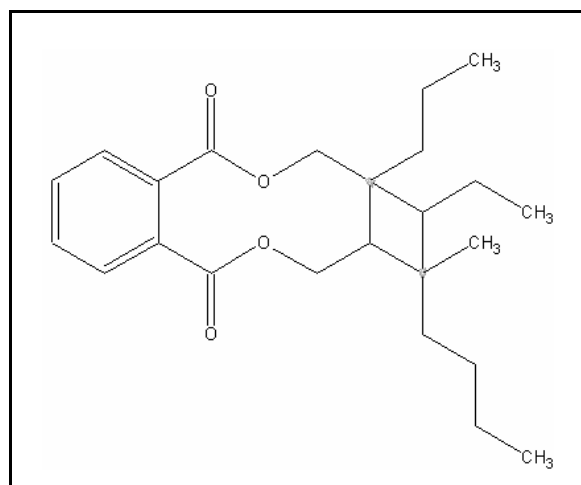




## TIER II HUMAN HEALTH CANCER VALUES

### BIS(2-ETHYLHEXYL) PHTHALATE (DEHP)

CAS RN:	117-81-7
Water Solubility:	0.34 mg/L
Log $K_{ow}$ :	7.453
Risk Associated Dose:	$7.143 \times 10^{-4}$ mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



#### Standard

The human health cancer bis(2-ethylhexyl) phthalate value for drinking water sources is 2.5  $\mu\text{g/L}$ . The human health cancer value for nondrinking water sources is 2.8  $\mu\text{g/L}$ .

#### Calculations

##### Bioaccumulation Factor:

BAF predicted based on Log  $K_{ow}$  and measured BCF (from Stephan 1993)

Log  $K_{ow}$  = 7.453 (slow-stir method),  $K_{ow}$  = 28,379,190, BCF = 114, Percent lipid = 4.8  
Trophic level 3 FCM = 12.517; trophic level 4 FCM = 18.967

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 0.128$$

$$\text{Baseline BAF}_{T3} = (12.517)[(114/0.128)-1](1/0.048) = 231,988$$

$$\text{Baseline BAF}_{T4} = (18.967)[(114/0.128)-1](1/0.048) = 351,532$$

$$\text{Human health BAF}_{T3} = [(231,988)(0.0182)+1](0.128) = 540.6$$

$$\text{Human health BAF}_{T4} = [(351,532)(0.0310)+1](0.128) = 1,395$$

### Acceptable Daily Exposure:

From the IRIS database:

$$\begin{aligned} \text{RAD} &= 0.00001/q1^* = 0.00001/ 1.4 \times 10^{-2} \\ &= 7.143 \times 10^{-4} \end{aligned}$$

Where:

RAD = Risk Associated Dose (mg/kg/day)  
q1\* = Cancer Slope Factor

### Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HCV} &= [(7.143 \times 10^{-4})(70)]/0.01+[(0.0036)(540.6)+(0.0114)(1,395)] \\ &= \mathbf{2.8 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HCV} &= [(7.143 \times 10^{-4})(70)]/2+[(0.0036)(540.6)+(0.0114)(1,395)] \\ &= \mathbf{2.5 \mu\text{g/L}} \end{aligned}$$

## **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 DEHP (117-81-7).
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<sub>ow</sub> 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

July 9, 1997 - Values first developed

April 3, 2000 – Values rechecked (no modifications). Fact sheet updated.

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