Chemical Name: 1,1-Dichloroethylene Developed by: Bob Heitzman, John Estenik
CAS # 75-35-4 IRIS Data Retrieval Date: 2-11-98
Internal Code # 56 Fact Sheet Preparation Date: 2-13-98

CRITERIA SUMMARY

Lake Erie Basin			
Tier I HNC (μg/l)		Tier II HCV (μg/l)	
Drinking	Nondrinking	Drinking	Nondrinking
240	6,400	0.56	15

EXPOSURE AND TOXICITY DATA

Human health trophic level 3 bioaccumulation factor ($BAFHH_{TL3}$) = 3.4 l/kg (MDEQ)
Human health trophic level 4 bioaccumulation factor ($BAFHH_{TL4}$) = 5.0 l/kg (MDEQ)
Acceptable daily exposure (ADE) = 9E-3 mg/kg/day (IRIS RfD, last revised 04/01/89)
Carcinogen assessment: Class C; possible human carcinogen (IRIS, last revised 02/01/98)
Cancer slope factor (q_1*) = 0.6 per mg/kg/day (IRIS, last revised 02/01/98)
Body weight of average human (BW) = 70 kg (OAC 3745-1-38)
Relative source contribution factor (RSC) = 0.8 (OAC 3745-1-38)
Per capita water consumption (WC) = 2.0 l/day for drinking water criteria (OAC 3745-1-38)
= 0.01 l/day for nondrinking water criteria (OAC 3745-1-38)
Mean consumption of trophic level three fish (FC_{TL3}) = 0.0036 kg/day (OAC 3745-1-38)
Mean consumption of trophic level four fish (FC_{TL4}) = 0.0114 kg/day (OAC 3745-1-38)

Risk associated dose (RAD) = Risk level ÷ q_1*
= 1E-5 ÷ 0.6 per mg/kg/day
= 1.667E-5 mg/kg/day

REFERENCES

Integrated Risk Information System. USEPA Office of Research and Development, National Center for Environmental Assessment.

Michigan Department of Environmental Quality, Surface Water Quality Division. 1997. Bioaccumulation Factor Worksheet for 1,1-Dichloroethylene. Verification Date: 09/17/97.

Ohio Administrative Code rule 3745-1-38: Methodologies for Development of Human Health Criteria and Values for the Lake Erie Drainage Basin. Effective 10/31/97.

CALCULATION OF HUMAN NONCARCINOGENIC CRITERION (HNC) [a]

$$HNC = \frac{ADE \times BW \times RSC}{WC + [(FC_{TL3} \times BAFHH_{TL3}) + (FC_{TL4} \times BAFHH_{TL4})]}$$

$$\text{Drinking Water HNC} = \frac{9E\text{-}3\ mg/kg/day \times 70\ kg \times 0.8}{2.0\ l/day + [(0.0036\ kg/day \times 3.4\ l/kg) + (0.0114\ kg/day \times 5.0\ l/kg)]}$$

$$= 0.24\ mg/l = 240\ \mu g/l$$

$$\text{Nondrinking Water HNC} = \frac{9E\text{-}3\ mg/kg/day \times 70\ kg \times 0.8}{0.01\ l/day + [(0.0036\ kg/day \times 3.4\ l/kg) + (0.0114\ kg/day \times 5.0\ l/kg)]}$$

$$= 6.4\ mg/l = 6{,}400\ \mu g/l$$

CALCULATION OF HUMAN CARCINOGENIC VALUE (HCV) [a]

$$HCV = \frac{RAD \times BW}{WC + [(FC_{TL3} \times BAFHH_{TL3}) + (FC_{TL4} \times BAFHH_{TL4})]}$$

$$\text{Drinking Water HCV} = \frac{1.667E\text{-}5\ mg/kg/day \times 70\ kg}{2.0\ l/day + [(0.0036\ kg/day \times 3.4\ l/kg) + (0.0114\ kg/day \times 5.0\ l/kg)]}$$

$$= 5.6E\text{-}4\ mg/l = 0.56\ \mu g/l$$

$$\text{Nondrinking Water HCV} = \frac{1.667E\text{-}5\ mg/kg/day \times 70\ kg}{0.01\ l/day + [(0.0036\ kg/day \times 3.4\ l/kg) + (0.0114\ kg/day \times 5.0\ l/kg)]}$$

$$= 0.015\ mg/l = 15\ \mu g/l$$

[a] See Ohio Administrative Code 3745-1-38 effective October 31, 1997.