

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

April 26, 1994

TO: File for 1,6-hexanediol (CAS# 629-11-8)

FROM: Michael Depa, Toxics Unit

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for 1,6-hexanediol is 14 g/m based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS, RTECS, ACGIH Threshold Limit Values, NIOSH Pocket Guide to Hazardous Chemicals, Environmental Protection Bureau Library, IARC Monographs, CAS Online (1967- March 19, 1994), and NTP Management Status Report. Review of these sources found that EPA has not established an RfC or RfD for 1,6-hexanediol. Occupational exposure limits from ACGIH, NIOSH or OSHA were not available for 1,6-hexanediol. There was no data available meeting the minimum criteria for establishing an RfC or RfD. There was no inhalation data available for 1,6-hexanediol. Spencer et al. (1978) conducted a 12-week oral toxicity study to evaluate effects on central-peripheral distal axonopathy. A group of 6 Sprague-Dawley rats were dosed with 0.5% 1,6-hexanediol in drinking water for 12 weeks. Three rats were used as control and received only water. The dosed animals showed "a largely normal rate of weight gain and normal clinical signs", although no data was presented. Tissues were sampled from the cervico-medullary junction of the spinal cord and the posterior tibial nerve proximal to the calf muscle branches. The researchers noted that tissues taken from the dosed rats were indistinguishable from those obtained from control rats. Because of the limited scope of the pathology exam a NOAEL cannot be identified from this study. Therefore the ITSL was based on an oral LD50 reported by Carpenter et al. (1974) using 5 male Carworth-Wistar rats per dose level. The experimental methods were described by Smyth et al. (1962). The dose levels were not given but were arranged in a logarithmic series differing by a factor of two. Based upon mortalities during an 11-day observation period, the most probable LD50 value was estimated by the method of Thompson using the Tables of Weil. The LD50 was stated as being 3.73 ml/kg. Given a density of 1.116 g/ml for 1,6-hexanediol the LD50 was determined to be 4163 mg/kg. The ITSL was determined as follows:

$$\text{ITSL} = 1/500 \times 1/40 \times 1/100 \times \text{LD50}(\text{mg/kg})/0.167 \times W_a/I_a$$

$$\text{ITSL} = 0.0138 \text{ mg/m}^3 \times 1000 \mu\text{g/mg}$$

$$\text{ITSL} = 14 \mu\text{g/m}^3$$

Where W_a = Weight of the rat = 0.5 kg (EPA, 1988),
 I_a = Inhalation rate of the animal; $I_a = 0.8 \times w^{0.8206} = 0.45 \text{ m}^3/\text{day}$ (EPA, 1988), and
LD50 = 4163 mg/kg in male wistar rat

The ITSL was determined to be $14 \mu\text{g}/\text{m}^3$ based on an annual averaging time.

Carpenter, C., Weil, C., Smyth, H. 1974. Range-finding toxicity data: list VIII. Toxicology and Applied Pharmacology. 28:313-319.

EPA. 1988. Recommendations for and documentation of biological values for use in the risk assessment. PB 88-179874.

Smyth, H., Carpenter, C., Weil, C., Pozzani, U., Stiegel, J. 1962. Range-finding toxicity data: list VI. American Industrial Hygiene Association Journal. 23:95-107.

Spencer, P., Bischoff, M., Schaumgurg, H. 1978. On the specific configuration of neurotoxic aliphatic hexacarbon compounds causing central-peripheral distal axonopathy. Toxicology and Applied Pharmacology. 44: 17-28.