MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

September 24, 2002

TO: File for tripropylene glycol diacrylate (42978-66-5)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for tripropylene glycol diacrylate (TPGD) is 22 $\mu g/m^3$ based on an annual averaging time. The critical effect of tripropylene glycol diacrylate inhalation exposure appears to be dermal and mucous membrane irritation.

The following references or databases were searched to identify data to determine the ITSL: IRIS, HEAST, NTP Management Status Report, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC, NIOSH Pocket Guide, and ACGIH Guide.

TPGD belongs to a class of compounds called multifunctional acrylates. These compounds are generally used as monomers in formulations for cross linking the polymer to provide bulk properties such as hardness, abrasion resistance, flexibility, elasticity, and resistance.

A number of Toxic Substance Control Agency (TSCA) 8e submittals were obtained for TPGD, but only one contained information to derive a screening level. In this TSCA LD_{50} submission, groups of 10 male and 10 female HC/CFY (remote Sprague-Dawley) rats were orally dosed with tripropylene glycol diacrylate. The test compound was administered according to the experimental procedure recommended under the Organization for Economic Co-operation and Development (OECD) guideline for Testing of Chemicals No. 401 *Acute Oral Toxicity*. The animals were observed for 14 days, and the LD_{50} value was estimated by the method of Finney (1971). The LD_{50} for tripropylene glycol diacrylate was determined to be 7.5 g/kg (males), 6.2 g/kg (females), and 6.8 g/kg (combined).

The remaining submittals provided general toxicity information for TPGD, but none of the data was complete enough to use it in place of the LD_{50}. Although this compound has a high LD_{50}, it still has some toxicologic properties that should be discussed. Multifunctional acrylates (MFA), as a class, are materials that represent appreciable eye and skin contact hazards. They are as a rule, materials that are either corrosive to eyes or are severely irritating. Several MFAs have been demonstrated to be absorbed from the skin to cause systemic effects and death. Such is not the case for TPGD; repeated exposure from this compound does not cause death, but produces

skin irritation leading to skin necrosis after a few days. MFAs do not appear to represent a fetotoxic or teratogenic hazard from available data (data consisted of only one dose group). As a class of compounds, MFAs are mutagenic in the mouse lymphoma assay, but not the Ames test, and the nature of these results makes their extrapolation to other genotoxcity test systems or to human hazard controversial. Additionally, this group of compounds does not appear to be strong carcinogens by the dermal application route in spite of causing skin necrosis.

The ITSL will be based on the LD_{50} for both male and females at 6800 mg/kg.

The ITSL was derived as follows:

LD_{50} = 6.8 g/kg = 6800 mg/kg

$$ITSL = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{6800 mg/kg}{0.167 \times 0.945\ m^3/kg} = 0.0215\ mg/m^3$$

$0.0215\ mg/m^3 \times 1000 = 1\ ug/m^3$ based on annual averaging.

The ITSL for tripropylene glycol diacrylate = 22 ug/m^3 based on annual averaging.

References:

1. Andrews LS and Clary JJ. 1986. Review of the toxicity of multifunctional acrylates. Journal of Toxicology and Environmental Health. 19:149-164.

2. TSCA 8(e) submittal. 1994. 86940000323. [UCB Radcure Inc. 1984. Acute oral toxicity to rats of TPGDA (tripropylene glycol diacrylate with cover letter dated 3/28/94. Huntington Research Center].