MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

February 14, 1994

TO: Ethylene glycol monohexyl ether file (CAS # 112-25-4)

FROM: Gary Butterfield

SUBJECT: ITSL for Ethylene glycol monohexyl ether

Ethylene glycol monohexyl ether (CAS # 112-25-4) is also know as EGHE or 2-(hexyloxy)-ethanol. There is no ACGIH TLV, NIOSH REL, EPA RfC or RfD for this material. A Feb 7, 1994 CAS-on-line search found a couple of articles on toxicity studies that could be used to calculate an ITSL.

Klonne et al (1987) exposed rats to EGHE vapors for an one day acute exposure, a 9-day or 13 week exposure. In the 13 week exposure, rats were exposed to 0, 20, 41 or 71 ppm for 6 hr/day, 5 day/wk. Exposure to 71 ppm caused decreased body weight gains, and increased liver weights. No biological significant toxic effects were observed at the 41 ppm exposure level.

Tyl et al (1989) exposed pregnant F344 rats and New Zealand rabbits to EGHE vapors at concentrations of 0, 20, 41 or 79 ppm. Rats were exposed on gestation days 6 through 15 while rabbits were exposed on days 6 through 18. Maternal toxicity, in rabbits, was evident at 79 ppm in the form of reduced body weight gains. In rats, the maternal toxicity was evident as reduced weight gains at 41 and 79 ppm. At 79 ppm, rats also had reduced food consumption, increased water consumption, and excess lacrimation. There was no treatment related effects on the fetuses, either developmental toxicity or teratogenicity. The NOAEL of 20 ppm was identified for maternal toxicity in rats.

Although it is usually more desirable to base the ITSL on a longer term study, and a 13 week study is of long enough duration to satisfy EPA's criteria for calculation of an RfC, in this case, the ITSL is going to be based on the NOAEL of 20 ppm (119 mg/m3) from the study by Tyl et al (1989). The Tyl et al NOAEL was selected as a basis for calculation of the ITSL because a lower NOAEL for maternal toxicity was identified in a commonly occurring and more stressful life stage (pregnancy). The ITSL will be calculated as follows from Rule 232 (1)(d), which is the most consistent equation in the 232 Rules for the use of a short term exposure as occurred only during gestation.

ITSL = [(119 mg/m3)/(35 x 100)] x [6/24] = 8 ug/m3 annual average

References

Klonne et al. 1987. Acute, 9-day, and 13-week vapor inhalation studies on ethylene glycol monohexyl ether. Fundam Appl Toxicol 8:198-206.

Tyl et al. 1989. Evaluation of the developmental toxicity of the ethylene glycol monohexyl ether vapor in Fischer 344 rats and New Zealand white rabbits. Fundam Appl Toxicol 12:269-280.