MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Methyl Chloroform (1,1,1-Trichloroethane) (CAS # 71-55-6)

FROM: Robert Sills, AQD Toxics Unit Supervisor

SUBJECT: Methyl Chloroform ITSL

DATE: December 5, 2016

The current ITSL for Methyl Chloroform (6000 ug/m^3, 24 hr averaging time (AT)) was established on September 28, 2007. The basis for the ITSL is the EPA (2007; IRIS) Reference Concentration (RfC) assessment. EPA (2007) provided several RfCs, as summarized below:

RfC (ug/m^3)	Averaging Time	Basis	Uncertainty Factors
9000	1 hr	Neurobehavioral tests in humans for 3.5 hrs; LOAEL=950 mg/m^3 (Mackay et al. (1987); PBPK modeling (Rietz et al. (1988)	Total UF= 100. UF_H = 10 UF_L = 10
7000	4 hrs		
7000	8 hrs		
6000	24 hrs		
5000	Short-term (24 hrs to 30 days)		
5000	Subchronic (>30 ds up to 10% of lifetime)	Liver histiopathic changes; 14-week mouse inhalation study and 2 yr rat inhalation study; NOAEL (HEC)= 1553 mg/m^3 (Quast et al. (1988, 1984); McNutt et al. (1975).	Total UF= 100. UF_A = 3 UF_H = 10 UF_{db} = 3
5000	Chronic		

The ITSL was set at 6000 ug/m^3 (24 hr AT), noting that all of the EPA RfCs are within a small range; the more acute RfCs are based on human data which is generally preferred over animal bioassay data. The ITSL and AT are expected to provide protection from potential neurological and liver effects from long-term and shorter-term (peak) exposure durations.

References:

EPA. 2007. Integrated Risk Information System (IRIS database). Chemical file for 1,1,1-trichloroethane. Last revised 9/28/07. Still current as of 12/5/16.

Mackay, CJ, et al. 2007. Behavioral changes during exposure to 1,1,1-trichloroethane: time-course and relationship to blood solvent levels. Am J Ind Med 11: 223-239.

McNutt, NS, et al. 1975. Hepatic lesions in mice after continuous inhalation exposure to 1,1,1-trichloroethane. Lab Invest 32: 642-654.

Quast, JF, et al. 1984. Chloroethane VG: a chronic inhalation toxicity and oncogenicity study in rats and mice (parts 1 and 2) with cover letter dated 082184. The Dow Chemical Company, Midland, MI. Submitted under TSCA Section 4; EPA Document No. 40-8424496; NTIS No. OTS 0510656. As cited in: EPA (2007).

Quast, JF, et al. 1988. 1,1,1-Trichloroethane formulation: a chronic inhalation toxicity and oncogenicity study in Fischer 344 rats and B6C3F1 mice. Fundam Appl Toxicol 11:611-625.

Rietz, RH, et al. 1988. Physiologically based pharmacokinetic modeling and methylchloroform: Inplications for interspecies, high dose / low dose, and dose route extrapolations. Toxicol Appl Pharmacol 95:185-199.