MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

October 13, 2015

TO: 1 3-Dichloropropene file (CAS #542-75-6)

FROM: Mike Depa, Toxics Unit, Air Quality Division

SUBJECT: Screening levels for 1,3-dichloropropene

The initial threshold screening level (ITSL) for 1,3-dichloropropene is 20 µg/m³ with annual averaging time. This is based on a U.S. Environmental Protection Agency (EPA) Reference Concentration (RfC) of the same value. EPA based the RfC on an increased incidence of hypertrophy/hyperplasia of the nasal respiratory epithelium in a chronic inhalation study in B6C3F1 mice. An uncertainty factor (UF) of 3 was used for interspecies extrapolation to reflect the pharmacodynamic component of interspecies uncertainty. An additional uncertainty factor of 10 was used for within-species variation. Total UF = 30. The current file review concludes that the AT may appropriately be set at annual, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is being changed from 24 hours to annual at this time.

The cancer risk-based screening levels for 1,3-dichloropropene were established on 6/7/2000. They are as follows:

IRSL = 0.2 µg/m^3, annual averaging time;

SRSL = 2 µg/m^3, annual averaging time.

EPA (2000) concluded that 1,3-dichloropropene is classified as, “B2; probable human carcinogen” based on inadequate human data and sufficient evidence of carcinogenicity in animals, namely an increased incidence of bronchioalveolar adenomas in male mice exposed by inhalation but not in rats or female mice. The human equivalent concentration for a Category 1 gas was derived by multiplying the duration- and purity-adjusted exposure concentrations by an interspecies dosimetric adjustment for gas:respiratory effects in the tracheobronchial and pulmonary (i.e., thoracic) regions of the lung. The regional gas dose ratio for the thoracic (i.e., tracheobronchial and pulmonary) area of the lung was calculated to be 3.21. Using the linearized multistage model, extra risk, EPA calculated the inhalation unit risk (IUR) of 4E-6 per µg/m³.

Based on this IUR, the IRSL and SRSL are derived as follows:

$$\text{IRSL} = \frac{1\text{E-}6}{4\text{E-}6\ (\mu g/m^3)^{-1}} = 0.2\ \mu g/m^3 \text{ (annual AT)}$$

$$\text{SRSL} = \frac{1\text{E-}5}{4\text{E-}6\ (\mu g/m^3)^{-1}} = 2\ \mu g/m^3 \text{ (annual AT)}$$

Reference

EPA. 2000. IRIS database. Chemical entry for 1,3-dichloropropene. Reference Concentration and Carcinogenicity assessment; last revised 1/1/2000. Still current as of 10/13/15
http://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=224