

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

October 15, 2003

TO: File for distillates (petroleum), crude oil (68410-00-4)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for *distillates (petroleum), crude oil* is 19 $\mu\text{g}/\text{m}^3$ based on an annual averaging time.

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

A definition of this petroleum hydrocarbon distillate is provided by the Toxic Substance Control Act Chemical Substance Inventory (Initial Inventory; Volume 1; 1979):

"distillates (petroleum), crude oil, is a complex combination of hydrocarbons produced by distillation of crude oil. It consists of hydrocarbons having carbon numbers predominately in the range of C₁₁ through C₅₀ and boiling in the range of approximately 401°F to above 923°F."

A complete reference check was conducted for *distillates (petroleum), crude oil*, but only an LD₅₀ value supported with the minimum data reporting requirements for acute toxicity testing was available to derive an ITSL. The LD₅₀ data was obtained from an EPA TSCA 8(e) submittal obtained from the EPA TSCA library. According to the study, seven groups of five male Wistar rats were dosed by gavage at 1.0, 1.47, 2.15, 3.16, 4.64, 6.81, and 10.0 g/kg body weight. Rats were observed 1, 2, 4 and 6 hours after dosing and once daily for 14 days. Deaths occurred at the four highest dose levels of 3.16, 4.64, 6.81, and 10.0 g/kg. Eight out of ten animals died at the two highest dose levels. Significant pre-death toxic signs included tremors, lethargy, ptosis, ataxia, prostration, negative righting reflex, flaccid muscle tone, piloerection, diarrhea, chromodacryorrhea, dyspnea and chromorhinorrhea. Normal body weight changes were noted in the survivors. Significant necropsy findings in the animals that died during the study included dilated hearts and gastrointestinal irregularities. The LD₅₀ was calculated to be 5.88 (4.31-8.02) g/kg according to the method of Horn (Biometrics 12:311, 1956).

The ITSL was determined as follows:

LD₅₀ = 5.88 g/kg or 5880 mg/kg

$$\text{ITSL} = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{5880}{0.167 \times 0.919} = 0.0192 \text{ mg/m}^3$$

0.0192 mg/m³ x 1000 = 19.2 ug/m³ based on annual averaging.

The ITSL for *distillates (petroleum), crude oil* = 19 ug/m³ based on annual averaging.

References:

1. TSCA 8(e) submittal. 2001. Test for oral toxicity in rats. MB Research Laboratories for Exxon Chemical Co. MB 70-3702. June 19, 1979. EPA/OTS 0536024; 88-920001036.
2. TSCA. 1979. Toxic Substance Control Act Chemical Substance Inventory (Initial Inventory; Volume 1. U.S. EPA, Office of Toxic Substances, Washington, DC 20460, May 1979.
3. Biometrics, 1956. (as cited in reference 1, above).