

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU

TOXICOLOGICAL ASSESSMENT FOR
1,2-*cis*-Dichloroethylene (CASRN 156-59-2)
HUMAN NONCANCER VALUE

Literature Review Date: May 9, 2008
Shannon Briggs

No chronic toxicity data were available for *cis*-1,2-dichloroethylene (*cis*-DCE). In a subchronic study conducted by McCauley et al. (1991 and 1995), five groups of rats (10/sex/group) were exposed via gavage to 0, 0.33, 1, 3, or 9 mmol/kg/d (0, 10, 32, 98, or 206 mg/kg/d) *cis*-DCE for 90 days. Male kidney:body weight ratios were increased in all dose groups, but the biological significance of these effects is unknown since no histopathological effects were observed. A significant increase in liver:body weight ratios was observed in male and female rats at 1, 3, and 9 mmol/kg/d, but again, histopathological findings were negative. Hematocrit and hemoglobin levels were significantly decreased in males and females dosed with 3 or 9 mmol/kg/d. The NOAEL for this study was 1 mmol/kg/d (32 mg/kg/d).

The NOAEL of 32 mg/kg/d found in the McCauley et al. study was used to derive an HNV. An uncertainty factor of 1,000 was used to account for interspecies, intraspecies, and subchronic-to-chronic extrapolation.

References:

- McCauley, P.T., M. Robinson, L.W. Condie, and M. Parnell. 1991. The Effects of Subacute and Subchronic Oral Exposure to *cis*-1,2-Dichloroethylene in Rats. U.S. EPA Health Effects Research Laboratory, Cincinnati, Ohio (unpublished) as cited in Fed. Reg. Vol. 56. January 30, 1991.
- McCauley, P.T., M. Robinson, F.B. Daniel, and G.R. Olson. 1995. The effects of subacute and subchronic oral exposure to *cis*-1,2-dichloroethylene in Sprague-Dawley rats. Drug Chem. Toxicol. 18(2&3):171-184.

HUMAN NONCANCER VALUE WORKSHEET

Chemical Name: cis -1,2-dichloroethylene CAS No. 156-59-2
 Developed By: S. Briggs
 Reviewed By: D. Bush Verification Date: 9/30/08

Key Study: McCauley et al. (1990) dosed male and female Sprague-Dawley rats with 0.033, 1, 3, or 9 mmol/kg/d (equivalent to 0.10, 32, 98, or 206 mg/kg/d) of *cis* -1,2-dichloroethylene by corn oil gavage for 90 days. The authors reported a NOAEL of 1.0 mmol/kg/d (32 mg/kg/d) for decreased hemoglobin and hematocrits in male and female rats.

$$\text{ADE} = 0.032 \text{ mg/kg/d}$$

$$\text{ADE} = \frac{32 \text{ mg/kg/d}}{1000}$$

UF = 10x for each interspecies, intraspecies and subchronic-to-chronic extrapolation.

drinking water

$$\text{HNV} = \frac{(0.032 \text{ mg/kg/d}) (70 \text{ kg}) (0.8)}{(2 \text{ L/d}) + (0.0036 \text{ kg/d} * 2.1 \text{ L/kg}) + (0.0114 \text{ kg/d} * 2.8 \text{ L/kg})} = 0.878655343 \text{ mg/L}$$

Human Noncancer Value for drinking water = 880 ug/L

non-drinking water

$$\text{HNV} = \frac{(0.032 \text{ mg/kg/d}) (70 \text{ kg}) (0.8)}{(0.01 \text{ L/d}) + (0.0036 \text{ kg/d} * 2.1 \text{ L/kg}) + (0.0114 \text{ kg/d} * 2.8 \text{ L/kg})} = 36.21665319 \text{ mg/L}$$

Human Noncancer Value for non-drinking water = 36,000 ug/L