2013 Health Based Value for Groundwater
Health Risk Assessment Unit, Environmental Health Division
651-201-4899

Web Publication Date: May 2013
Expiration Date: May 2018

Chemical Name: Triclocarban

CAS: 101-20-2

Synonyms: 3,4,4'-Trichlorocarbanilide; N-(4-Chlorophenyl)-N'-(3,4-dichlorophenyl)urea; TCC; Urea, N-(4-chlorphenyl)-N'-(3,4-dichlrophenyl)-; 1-(3',4'-Dichlorphenyl)-3-(4—chlorophenyl) urea; 3,4,4'-Trichlorodiphenylurea; Carbanilide, 3,4,4'-trichloro-

Acute Non-Cancer Health Risk Assessment Advice (RAA_{Acute}) = Not Derived (Insufficient Data)

Short-term Non-Cancer Health Risk Assessment Advice ($RAA_{Short\text{-}term}$) = Not Derived (Insufficient Data)

Subchronic Non-Cancer Health Risk Assessment Advice ($RAA_{Subchronic}$) = Not Derived (Insufficient Data)

Chronic Non-Cancer Health Risk Assessment Advice ($RAA_{Chronic}$) = 100 µg/L

$$= \frac{\text{(Reference Dose, mg/kg/d) x (Relative Source Contribution) x (Conversion Factor)}}{\text{(Chronic intake rate, L/kg/d)}}$$

$$= \frac{\text{(0.024 mg/kg/d) x (0.2) x (1000 µg/mg)}}{\text{(0.043 L/kg-d)}}$$

= 112 rounded to **100 µg/L**

Reference Dose/Concentration:	0.024 mg/kg-d (Sprague-Dawley rat)
Source of toxicity value:	MDH, 2013
Point of Departure (POD):	25 mg/kg-d (NOAEL) (Monsanto, 1981, unpublished study as cited in EC 2005)
Human Equivalent Dose (MDH, 2011):	7.25 mg/kg-d [25 mg/kg-d x 0.29] (MDH, 2011)
Total uncertainty factor:	300
Uncertainty factor allocation:	3 for interspecies differences (for toxicodynamics), 10 for

	intraspecies variability, and 10 for database uncertainty to account for uncertainties regarding the POD for the multigenerational reproductive study, the lack of adequate developmental studies, and the lack of adequate repeat-dose studies in at least two mammalian species.
Critical effect(s):	Testicular degeneration, anemia, increased liver and spleen weights, microscopic changes in spleen, bone marrow, liver and kidney
Co-critical effect(s):	None
Additivity endpoint(s):	Hematological (blood) system, Hepatic (liver) system, Male reproductive system, Renal (kidney) system

Cancer Health Risk Assessment Advice (RAA) = Not Applicable

Volatile: No

Summary of Guidance Value History:
There are no existing health-based guidance values for triclocarban. The chronic RAA represents a new value.

Summary of toxicity testing for health effects identified in the Health Standards Statute:

	Endocrine	Immunotoxicity	Development	Reproductive	Neurotoxicity
Tested?	Yes	No	Yes	Yes	No
Effects?	Yes[1]	Secondary[2]	Yes[3]	Yes[4]	Secondary[5]

Note: Even if testing for a specific health effect was not conducted for this chemical, information about that effect might be available from studies conducted for other purposes. Most chemicals have been subject to multiple studies in which researchers identify a dose where no effects were observed, and the lowest dose that caused one or more effects. A toxicity value based on the effect observed at the lowest dose across all available studies is considered protective of all other effects that occur at higher doses.

Comments on extent of testing or effects:
[1]Endocrine effects of triclocarban have not been studied in humans and are not sufficiently studied in animals. Recently published *in vitro* studies using a variety of mammalian cells suggest that triclocarban may amplify the actions of certain estrogen and androgen hormones, especially testosterone. Triclocarban may also impact thyroid hormones based on *in vitro* studies. Although it is difficult to compare concentrations studied *in vitro* to concentrations relevant for human exposure, most *in vitro* studies with mammalian cells only reported effects at concentrations that were much higher than blood levels reported in humans. In one laboratory animal study, triclocarban was reported to increase male sex organ weights in castrated rats when given in combination with testosterone, but not when triclocarban was given alone. The triclocarban HED dose given to the rats was about 12 to 25 times higher than the reference dose. Additionally, endocrine effects have been reported in non-mammalian species, including fathead minnow, freshwater mudsnail, and zebrafish embryos.

[2] The immune system was not specifically studied; however, effects on spleen weight and microscopic changes noted in both spleen and bone marrow were reported in a chronic study. Both of these organs are involved with production of immune cells; however, immune cells and function were not studied. The effects on spleen and bone marrow were used, in part, as the basis for the point of departure.

[3]Triclocarban was tested for developmental toxicity in a 3-generational study in rats. Effects reported include decreased pregnancy rate, decreased number of live pups at birth and decreased pup body weight at weaning; however, the effects did not occur consistently among generations or litters. Additionally, decreased relative kidney weights and splenic congestion were reported in weanlings. Limitations in study design and data reporting prevented use of this study for derivation of quantitative guidance; however, based on the currently available information, the reported effects occurred at a dose which is about 1,400 times higher than the reference dose. Study design and reporting limitations are addressed in the selection of the database uncertainty factor for the chronic duration.

[4]Triclocarban was tested for reproductive toxicity in a multi-generational study in rats. Effects reported include decreased pregnancy rate and decreased number of live pups at birth; however, the effects did not consistently occur among generations or litters. Limitations in study design and data reporting prevented use of this study for development of quantitative guidance; however, based on the currently available information, the reported reproductive effects occurred at a dose which is about 1,400 times higher than the reference dose. Study design and reporting limitations are addressed in the selection of the database uncertainty factor for the chronic duration.

[5]Neurotoxicity symptoms have only been reported in a few acute studies at high doses designed to evaluate acute lethality. In dogs, decreased activity was reported at doses over 4,000 times higher than the reference dose and tremor at doses over 8,000 times higher than the reference dose. In monkeys, activity and postural tone were affected at doses over 6,000 times higher than the reference dose.

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