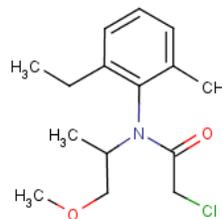




Metolachlor

CAS: 51218-45-2
Water Solubility: 530 mg/L
Log K_{ow} : 3.13



Derived Criteria

Aquatic Life: Where no aquatic life standard is applicable for a chemical substance within General Use waters, acute and chronic criteria may be calculated pursuant to 35 IAC 302.612-630. Aquatic organisms should not be adversely affected providing the four (4) day average concentration of metolachlor does not exceed 30.4 $\mu\text{g/L}$, and if 380 $\mu\text{g/L}$ is not exceeded at any time.

Human Health: Where no human health standard is applicable for a chemical substance within General Use waters, a Human Threshold Criterion (HTC) or Human Nonthreshold Criterion (HNC) may be calculated pursuant to 35 IAC 302.642-657. Human health should not be adversely affected providing the annual average of metolachlor, based on at least eight samples, does not exceed 3,390 $\mu\text{g/L}$ in waters except as provided in 302.208(d).

Aquatic Life Calculations

<u>Acute:</u> Tier II, 35 IAC 302.612(c)	<u>Chronic:</u> Tier III, 35 IAC 302.627(c)(5)
AATC = lowest SMAV / 10	CATC = AATC * 2 / 25
AATC = 3,800 $\mu\text{g/L}$ / 10 = 380 $\mu\text{g/L}$	CATC = 760 $\mu\text{g/L}$ / 25 = 30.4 $\mu\text{g/L}$

Human Health Calculations

HTC: 35 IAC 302.648, BCF based on log K_{ow} (35 IAC 302.663(c)), RfD from IRIS

$$\text{ADI} = \text{RfD} \times 70 \text{ kg} = 15 \mu\text{g/kg/d} \times 70 \text{ kg} = \mathbf{1,050 \mu\text{g/kg/d}}$$

$$HTC = ADI / [W + (F \times BCF)] = 1050 \mu\text{g/kg/d} / [0.01 \text{ L/d} + (0.02 \text{ kg/d} \times 141)] = \mathbf{3,390 \mu\text{g/L}}$$

Acute Aquatic Toxicity Data

Table 1. Acute toxicity data used in criteria derivation for metolachlor.

Species	LC ₅₀ / EC ₅₀ (µg/L)	Test Type	Duration (hours)	Reference Number	SMAV (µg/L)	GMAV (µg/L)
Water flea ² <u>Daphnia magna</u>	23,500 13,000	S,U S,U	48 48	1 2	17,470	17,470
Fathead minnow ¹ <u>Pimephales promelas</u>	8,000	S,U	96	1	8,000	8,000
Midge ³ <u>Chironomus plumosus</u>	3,800	S,U	48	1	3,800	3,800

302.612(a)(1-4) data requirements

¹ Representatives of two families in the Class Osteichthyes (Bony Fishes)

² The family Daphnidae

³ A benthic aquatic macroinvertebrate

⁴ A vascular aquatic plant or a third family in the Phylum Chordata which may also be from the Class Osteichthyes

302.615(f)(1-3) data requirements

⁵ A benthic crustacean, unless such was used in requirement 3, in which case an insect must be utilized

⁶ A member of a phylum not represented in requirements 1-5

⁷ An insect from an order not already represented

Chronic Aquatic Toxicity Data

Table 2. Chronic toxicity data used in criteria derivation for metolachlor.

Species	Conc. (µg/L)	Test Type	Duration (days)	Endpoint	Effect	Reference Number	ACR
---------	-----------------	--------------	--------------------	----------	--------	---------------------	-----

Insufficient data for Tier I criterion, criterion derived from acute data

References

1. Mayer, F.L.J. and M.R. Ellersieck. 1986. Manual of acute toxicity: Interpretation and data base for 410 chemicals and 66 species of freshwater animals. Resour. Publ. No. 160, U.S. Dep. Interior, Fish Wildl. Serv., Washington, DC, 505 p.
2. Wan, M.T., C. Buday, and G. Schroeder, J. 2006. Toxicity to *Daphnia magna*, *Hyallela azteca*, *Oncorhynchus kisutch*, *Oncorhynchus tshawytscha*, and *Rana catesbeina* of atrazine, metolachlor, simazine and their formulated products. Bull. Environ. Contam. Toxicol. 76:52-58.
3. Office of Pesticide Programs. 2000. Pesticide Ecotoxicity Database (Formerly: Environmental Effects Database (EEDB)), Opp# 18723. Environmental Fate and Effects Division, U.S. EPA, Washington, D.C.

Derivation History

Aquatic life: Derived 10/1/07

Human health: Derived 1/20/92, reviewed 10/01/07

Contact Information

Brian Koch
Water Quality Standards, Bureau of Water
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276