



[Web Publication Date:](#) March 21, 2011

**Chemical Name: Metolachlor OXA**

**CAS: 152019-73-3**

**Synonyms: Oxanilic acid degradate of metolachlor**

**Acute Non-Cancer Health Risk Limit (nHRL<sub>acute</sub>) = Insufficient Data (Not Derived)**

**Short-term Non-Cancer Health Risk Limit (nHRL<sub>short-term</sub>) = 3000 µg/L**

(Reference Dose, mg/kg/d) x (Relative Source Contribution) x (Conversion Factor)  
(Short-term Intake Rate, L/kg/d)

$$= \frac{(1.7 \text{ mg/kg/d}) \times (0.5) \times (1000 \text{ µg/mg})}{(0.289 \text{ L/kg-d})}$$

$$= 2941 \text{ rounded to } \mathbf{3000 \text{ µg/L}}$$

Reference Dose: 1.7 mg/kg-d (laboratory animal)

Source of toxicity value: MDH, 2009

Point of Departure: 500 mg/kg-d (NOAEL based on a 90 day dog feeding study submitted to MDH by Syngenta (6/23/2004))

Human Equivalent Dose Adjustment: Insufficient data

Total uncertainty factor: 300

UF allocation: 10 interspecies extrapolation, 10 intraspecies variability, and 3 for database insufficiencies (e.g., lack of a 2 generation reproductive study)

Critical effect(s): Changes in blood chemistry but unable to identify specific target organ

Co-critical effect(s): None

Additivity endpoint(s): None

Secondary effect(s): None

**Subchronic Non-Cancer Health Risk Limit (nHRL<sub>subchronic</sub>) = Short-term nHRL = 3000 µg/L**

$$= \frac{(\text{Reference Dose, mg/kg/d}) \times (\text{Relative Source Contribution}) \times (\text{Conversion Factor})}{(\text{Subchronic Intake Rate, L/kg/d})}$$

$$= \frac{(1.7 \text{ mg/kg/d}) \times (0.2) \times (1000 \text{ µg/mg})}{(0.077 \text{ L/kg-d})}$$

$$= 4415 \text{ rounded to } 4000 \text{ µg/L}$$

Reference Dose: 1.7 mg/kg-d (laboratory animal)

Source of toxicity value: MDH, 2009

Point of Departure: 500 mg/kg-d (NOAEL based on a 90 day dog feeding study submitted to MDH by Syngenta (6/23/2004))

Human Equivalent Dose Adjustment: Insufficient data

Total uncertainty factor: 300

UF allocation: 10 interspecies extrapolation, 10 intraspecies variability, and 3 for database insufficiencies (e.g., lack of a 2 generation reproductive study)

Critical effect(s): Changes in blood chemistry but unable to identify specific target organ

Co-critical effect(s): None

Additivity endpoint(s): None

Secondary effect(s): None

**The Subchronic nHRL must be protective of the short-term exposures that occur within the subchronic period and therefore, the Subchronic nHRL is set equal to the Short-term nHRL of 3,000 µg/L. Additivity Endpoints: None.**

**Chronic Non-Cancer Health Risk Limit (nHRL<sub>chronic</sub>) = 800 µg/L**

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

$$= \frac{(0.17 \text{ mg/kg/d}) \times (0.2) \times (1000 \text{ µg/mg})}{(0.043 \text{ L/kg-d})}$$

$$= 790 \text{ rounded to } 800 \text{ µg/L}$$

Reference Dose: 0.17 mg/kg-d (laboratory animal)

Source of toxicity value: MDH, 2009

Point of Departure: 500 mg/kg-d (NOAEL based on a 90 day dog feeding study submitted to MDH by Syngenta, 6/23/2004)

Human Equivalent Dose Adjustment: Insufficient data

Total uncertainty factor: 3000

UF allocation: 10 interspecies extrapolation, 10 intraspecies variability, 10 use of a subchronic study (inadequate information for comparing effects across exposure duration - default value was used), and 3 database insufficiencies (e.g., lack of a 2 generation reproductive study)

Critical effect(s): Changes in blood chemistry but unable to identify specific target organ

Co-critical effect(s): None

Additivity endpoint(s): None

Secondary effect(s): None

**Cancer Health Risk Limit (cHRL) = Not Applicable**

Cancer classification: Information on carcinogenicity is unavailable<sup>1</sup>

Slope factor: None

Source of slope factor: None

Tumor site(s): Unavailable

<sup>1</sup>Nonlinear approach is recommended for the parent compound (metolachlor). MDH considers the RfD protective of cancer.

**Volatile: No**

**Summary of Guidance Value History:**

There is no 1993/94 HRL for metolachlor OX. The chronic 2011 nHRL (800 µg/L), is slightly lower than the HBV issued in 2004 (1000 µg/L) due to 1) incorporation of a database uncertainty factor; 2) utilization of a lower intake rate; and 3) rounding to one significant digit.

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

	Endocrine	Immunotoxicity	Development	Reproductive	Neurotoxicity
Tested?	No	No <sup>1</sup>	Yes <sup>2</sup>	No <sup>2</sup>	No
Effects?	--	--	No	--	--

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:**

The database for metolachlor OXA is limited (one developmental study in rats, one subchronic study in rats and one subchronic study in dogs). The database for the parent compounds is comprehensive and includes reproductive, numerous developmental, and chronic (oncogenicity) studies.

<sup>1</sup> Dermal sensitization studies have been done, and some sensitization is observed. However, there is no indication of toxicity to the immune system.

<sup>2</sup> The single available developmental study reported no observable effects to pregnant animals or fetuses even at the highest dose tested. This dose level is higher than the critical study LOAEL. The database for the parent compound demonstrated that developmental toxicity observed in the 2 generation reproductive study occurred at lower doses than the teratology endpoints assessed in the standard developmental study. No 2 generation reproductive study has been conducted for metolachlor OA. A database uncertainty factor was incorporated into the RfD derivation to address this data gap.

## References:

ATSDR (Agency for Toxic Substances and Disease Registry). Minimal Risk Levels.  
<http://www.atsdr.cdc.gov/mrls.html>

California Environmental Protection Agency, OEHHA Toxicity Criteria Database.  
<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>;  
<http://www.oehha.ca.gov/risk/pdf/cancerpotalpha81005.pdf>

EPA (Environmental Protection Agency) 2000. Office of Pesticides Programs Health Effects Division. Data Evaluation Report, Metolachlor OA subchronic oral toxicity feeding - rat. MRID 44929509. January 2000. Reviewed by EPA in 2001.

EPA 2000. Office of Pesticides Programs Health Effects Division. Data Evaluation Report, Metolachlor OA Developmental toxicity - rat. MRID 44929510. January 2000. Reviewed by EPA in 2001.

EPA 2001a. Office of Prevention, Pesticides and Toxic Substances. MEMO Metolachlor and s-Metolachlore. Results of the Health Effects Division (HED) Metabolism Assessment Review Committee (MARC) Meeting Held on 14-August-2001. Memo from Virginia Debozy dated August 14, 2001.

EPA 2001b. Office of Prevention, Pesticides and Toxic Substances. MEMO METOLACHLOR AND S-METOLACHLOR - Report of the Hazard Identification Assessment Review Committee. Memo from Virginia Debozy dated September 28, 2001

EPA 2001c. Office of Prevention, Pesticides and Toxic Substances. MEMO Review of toxicology studies with Metolachlor/S-Metolachlor metabolites updated executive summaries for metolachlor DERs, Memo from Virginia Debozy dated December 12, 2001

EPA 2002a. Office of Prevention, Pesticides and Toxic Substances. MEMO Revised Toxicology Chapter for Metolachlor/S-Metolachlor. Memo from Virginia Debozy dated May 13, 2002

EPA 2002b. Office of Prevention, Pesticides and Toxic Substances. MEMO Metolachlor. Revised HED Science Assessment for Tolerance Reassessment Eligibility Decision. May 23, 2002.

EPA 2003. Office of Prevention, Pesticides and Toxic Substances. MEMO Metolachlor. Revised HED Science Assessment for the Tolerance Reassessment Eligibility Decision. Memo from Sherrie Kinard dated February 12, 2003

EPA. Office of Drinking Water. Drinking Water Standards and Health Advisories (August, 2006)  
<http://www.epa.gov/waterscience/criteria/drinking/dwstandards.pdf>

EPA Region 3. Risk Based Concentration. (click on RBC Tables PDF link)  
<http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1006.pdf>

EPA Region 9. Preliminary Remediation Goal. (click on Region 9 PRGs 2004 Table link)  
<http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf>

International Agency for Research on Cancer (IARC). Agents Reviewed by the IARC Monographs. <http://monographs.iarc.fr/ENG/Classification/Listagentsalphorder.pdf>

Oak Ridge National Laboratory. Screening Levels for Chemical Contaminants. <http://epa-prgs.ornl.gov/chemicals/download.shtml>

Syngenta (personal communication from Patrick McCain, June 23, 2004). Metolachlor metabolite – oxanilic acid 90-day oral toxicity study in dogs. Central Toxicology Laboratory CTL/PD1240/Regulatory/Report. March 16, 2004.

Syracuse Research PhysProp Database. <http://www.syrres.com/esc/physdemo.htm>

WHO Recommended Classification of Pesticides by Hazard. 2004.  
[http://www.who.int/ipcs/publications/pesticides\\_hazard\\_rev\\_3.pdf](http://www.who.int/ipcs/publications/pesticides_hazard_rev_3.pdf)

World Health Organization. Guidelines for Drinking-Water Quality. Chapter 12 Chemical Fact Sheets. [http://www.who.int/water\\_sanitation\\_health/dwq/gdwq0506\\_12.pdf](http://www.who.int/water_sanitation_health/dwq/gdwq0506_12.pdf)