Fact Sheet Date: March 12, 1998

NEW YORK STATE
- HUMAN HEALTH FACT SHEET -

Ambient Water Quality Value for Protection of Sources of Potable Water

SUBSTANCE: Alachlor **CAS REGISTRY NUMBER:** 15972-60-8

AMBIENT WATER QUALITY VALUE: 0.5 micrograms/liter (0.5 ug/L)

BASIS: Oncogenic Effects

INTRODUCTION

The physical, chemical and toxicological properties of alachlor have been reviewed (US EPA, 1984, 1985, 1986, 1987a,b, 1989, 1991). The following ambient water quality values were derived using these and other references and the procedures outlined in 6 NYCRR 702.2 through 702.7.

SPECIFIC MCL AND PRINCIPAL ORGANIC CONTAMINANT CLASS (702.3)

Alachlor has a Specific MCL of 2 ug/L as defined in 6 NYCRR 700.1. This is a maximum contaminant level for drinking water established by the New York State Department of Health under the State Sanitary Code (10 NYCRR Part 5, Public Water Systems). Therefore, a water quality value of 2 ug/L (the Specific MCL) can be derived based on 6 NYCRR 702.3(a). Alachlor is not in a principal organic contaminant class as defined in 6 NYCRR 700.1.

ONCOGENIC EFFECTS (702.4)

Alachlor induces lung tumors in mice and stomach, thyroid-gland and nasal-turbinate tumors in rats (US EPA, 1986, 1987a) and is an oncogen under 6 NYCRR 700.1. The U.S. EPA (1986) evaluated the dose-response data for alachlor and calculated cancer potency factors that range from 0.1 per milligram per kilogram body weight per day (0.1 $(mg/kg/day)^{-1}$) to 0.003 $(mg/kg/day)^{-1}$ using procedures consistent with those outlined in

paragraphs (a) through (e) of 6 NYCRR 702.4, including the linearized multistage model (extra risk). These cancer potency factors were calculated by the U.S. EPA using a cross-species scaling factor for carcinogen risk assessment based on the assumption that lifetime cancer risks are equal when daily administered doses are in proportion to body weights raised to the 2/3 power (the surface area scaling factor). Proposed New York State regulations state that the scaling factor should be based on the assumption that lifetime cancer risks are equal when daily administered doses are in proportion to body weights raised to the 3/4 power. This change requires application of an adjustment factor to cancer potency factors calculated using a cross-species scaling factor based on surface area.

The water concentration corresponding to the lower bound estimate on the dose associated with an excess lifetime human cancer risk of one-in-one million is 0.5 ug/L. This value was derived using the adjusted cancer potency factor (0.064 $(mg/kg/day)^{-1}$) based on the most sensitive response among the sexes and species tested (US EPA, 1986), and the procedure in paragraph (f) of 6 NYCRR 702.4. The adjusted cancer potency factor was calculated by multiplying the U.S. EPA cancer potency factor of 0.1 $(mg/kg/day)^{-1}$ by 0.64 (the adjustment factor for a rat body weight of 0.35 kg), and is based on the incidence of nasal turbinate adenomas in female rats (0.35 kg, mean body weight) exposed, via food, for two years (0/42, 0/42, 1/47 and 14/48 at doses of 0, 0.5, 2.5 or 15 mg/kg/day) (US EPA, 1986).

NON-ONCOGENIC EFFECTS (702.5)

Alachlor damages the blood, eyes, liver, kidneys, and spleen of laboratory animals (US EPA, 1985, 1986, 1987b). In 1986, the U.S. EPA established an oral reference dose (equivalent to an acceptable daily intake) of 10 micrograms per kilogram body weight per day (10 ug/kg/day) for alachlor (Exhibit 1, taken from US EPA, 1995), using procedures consistent with those outlined in paragraphs (a) and (b) of 6 NYCRR 702.5. This reference dose was derived by application of a 100-fold uncertainty factor to a no-observed-effect level of 1,000 ug/kg/day for kidney and spleen hemosiderosis and hemolytic anemia in dogs exposed for one year (US EPA, 1995). A value of 70 ug/L is derived using the procedure outlined in paragraph (e) of 6 NYCRR 702.5 and allowing 20% of the acceptable daily intake to come from drinking water (6 NYCRR 702.5(c)).

CHEMICAL CORRELATION (702.7)

A value based on chemical correlation was not derived because there were sufficient data to derive values based on oncogenic effects (6 NYCRR 702.4) and non-oncogenic effects (6 NYCRR 702.5).

OTHER STANDARDS AND GUIDELINES

Under the Safe Drinking Water Act, the federal maximum contaminant level goal (MCLG) for alachlor is zero and the MCL for alachlor is 2 ug/L, based on analytical considerations (US EPA, 1991). Under New York State Department of Health regulations for drinking-water standards (10 NYCRR Part 5), the specific MCL for alachlor is also 2 ug/L. The World Health Organization's recommended guideline for alachlor in drinking water is 20 ug/L, based on an excess lifetime cancer risk of one-in-one hundred thousand (WHO, 1993).

SELECTION OF VALUE

According to 6 NYCRR 702.2(b), the selected ambient water quality value shall be the most stringent of the values derived using the procedures found in 6 NYCRR 702.3 through 702.7. This value is 0.5 ug/L (based on oncogenic effects) and is the value selected as the water quality value for alachlor.

REFERENCES

6 NYCRR (New York State Codes, Rules and Regulations). Water Quality Regulations, Surface Water and Groundwater Classifications and Standards: Title 6 NYCRR, Chapter X, Parts 700 - 705. Albany, NY: New York State Department of Environmental Conservation.

10 NYCRR (New York State Codes, Rules and Regulations). Public Water Systems: Title 10 NYCRR, Chapter 1, State Sanitary Code, Subpart 5-1. Albany, NY: New York State Department of Health, Bureau of Public Water Supply Protection.

U.S. EPA (U.S. Environmental Protection Agency). 1984. Alachlor. Special Review Position Document. Washington, DC: Office of Pesticides and Toxic Substances.

U.S. EPA (U.S. Environmental Protection Agency). 1985. National Primary Drinking Water Regulations; Synthetic Organic Chemicals, Inorganic Chemicals and Microorganisms; Proposed Rule. Fed. Register. 50:46936-47022.

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U.S. EPA (U.S. Environmental Protection Agency). 1987b. Alachlor: Health Advisory. Washington, DC: Office of Drinking Water.

U.S. EPA (U.S. Environmental Protection Agency). 1989. National Primary and Secondary Drinking Water Regulations; Proposed Rule. Fed. Register. 54:22062-22160.

U.S. EPA (U.S. Environmental Protection Agency). 1991. National Primary Drinking Water Regulations; Final Rule. Fed. Register. 56:3526-3597.

U.S. EPA (U.S. Environmental Protection Agency). 1995. Alachlor. On-Line as of May 1. Integrated Risk Information System (IRIS). Cincinnati, OH: Office of Research and Development and Environmental Criteria and Assessment.

WHO (World Health Organization). 1993. Guidelines for Drinking-Water Quality, 2nd Edit., Vol. 1: Recommendations. Geneva: World Health Organization.

SEARCH STRATEGY: ON-LINE TOXICOLOGIC DATABASE

Toxline (1981 to May, 1995) was searched linking the CAS Registry Number of alachlor with the keyword "toxicity."

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