

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Oxadiazon file (CAS # 19666-30-9)

FROM: Gary Butterfield

SUBJECT: Screening level for Oxadiazon

DATE: March 21, 2008

Oxadiazon is known by the common trade name of Ronstar, as well as by the very long, proper chemical name of 2-tert-butyl-4-(2,3-dichloro-5-isopropoxyphenyl)-1,3,4-oxadiazol-5-one. It is a solid, white, crystalline powder. The molecular formula is $C_{15}H_{18}Cl_2N_2O_3$. The molecular weight is 345.2 g/mol. The melting point is 90C. The vapor pressure is 1.1×10^{-7} mmHg at 22C.

Oxadiazon is used as a pre-emergent herbicide often used on grass turf to control weeds on golf courses, parks, athletic fields, etc. These type sites are all considered to be non-food sites, making dietary exposure to oxadiazon not a concern. It is a restricted-use pesticide that is only available to registered pesticide applicators. It was estimated in 2002 that approximately 250,000 pounds of oxadiazon was used.

The following references or databases were searched to identify data to determine the screening level: U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH) Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Michigan Department of Environmental Quality (DEQ) library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1968 - Feb 2008), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on Feb. 13, 2008. There is an RfD of 5 ug/kg in IRIS for oxadiazon. Other documentation from the EPA Pesticide Programs web page identifies an oral cancer potency value for this material.

The RED document identifies several lifetime feeding studies in rats and mice. These studies identify liver effects occurring with long term exposures. The liver effects include descriptions of hepatic centrilobular swelling, hepatocellular diffuse necrosis, as well as, liver tumors. An oral cancer potency of 7.1×10^{-2} (mg/kg)⁻¹ was calculated by EPA from the Shirasu (1987) 98-week study as briefly summarized in the RED document. This potency based on the ICR-JCL male mice incidence of liver adenoma

and/or carcinomas of 3/51, 1/55, 4/57, 11/58, and 29/55 (adjusted for time to tumor) in the control, 3, 10, 100, and 1000 ppm diet groups, respectively. The fed consumption was assumed to be 0.096 kg food per kg body weight, and resulted in doses of 0, 0.288, .96, 9.6 and 96 mg/kg. It can be noted that the brief summaries in the EPA documents did not give details on the study specific food consumption rates, therefore the food consumption rate had to be assumed for these calculations.

For the purpose of establishing an inhalation screening level, the oral potency can be converted to an inhalation potency of $2.03 \times 10^{-5} (\text{ug}/\text{m}^3)^{-1}$ based on a 70 kg human inhaling 20 m^3 a day. This inhalation potency results in an IRSL of $0.05 \text{ ug}/\text{m}^3$ and SRS� of $0.5 \text{ ug}/\text{m}^3$ with annual averaging.

References:

EPA. 2008. IRIS

EPA. 2003. Registration eligibility decision (RED) for oxadiazon. EPA 738-R-04-003

Shirasu. 1987. Oxidiazon 23-month chronic toxicity and carcinogenicity study in mice. (unpublished) MRID 40993301 – as summarized in RED.

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