1. PUBLIC HEALTH STATEMENT

This public health statement tells you about diazinon and the effects of exposure to it.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites are then placed on the National Priorities List (NPL) and are targeted for long-term federal clean-up activities. Diazinon has been found in at least 25 of the 1,699 current or former NPL sites. Although the total number of NPL sites evaluated for this substance is not known, the possibility exists that the number of sites at which diazinon is found may increase in the future as more sites are evaluated. This information is important because these sites may be sources of exposure and exposure to this substance may be harmful.

When a substance is released either from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. Such a release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to diazinon, many factors will determine whether you will be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider any other chemicals you are exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS DIAZINON?

Description	Diazinon does not occur naturally in the environment. The pure chemical is an oil that is colorless and practically odorless. Commercial diazinon is a pale to dark brown liquid.
Uses • **Pesticide uses**	Diazinon is the common name of an organophosphorus insecticide used to control pest insects in soil, on ornamental plants, and on fruit and vegetable field crops. Diazinon is sold under common trade names including Alfatox, Basudin, AG 500, Dazzel, Gardentox, and Knoxout.

For more information on the physical and chemical properties of diazinon, and its production, disposal and use, see Chapters 4 and 5.

1.2 WHAT HAPPENS TO DIAZINON WHEN IT ENTERS THE ENVIRONMENT?

Sources	Diazinon may enter the environment from agricultural and household application of the chemical to control insects. After diazinon has been applied, it may be present in the soil, surface waters (such as rivers and ponds), and on the surface of plants.
How diazinon breaks down	
• Air	Diazinon is rapidly broken down to a number of different compounds.
• Water and soil	Diazinon is quickly broken down in a few hours to 2 weeks.
• Plants and animals	Diazinon is rapidly broken down by most animals that eat it and is not likely to build up to high or dangerous levels in animals or plants that you might eat.

For more information on diazinon in the environment, see Chapter 6.

1.3 HOW MIGHT I BE EXPOSED TO DIAZINON?

Food-primary source of exposure	Small amounts of diazinon have been detected in foods sold to consumers, but studies by the U.S. Food and Drug Administration (FDA) have found that the levels in food are far below the level that might cause any harmful health effects.
Air	You may be exposed to diazinon in air in agricultural areas where diazinon is extensively used or in urban areas where it is applied to lawns and gardens.
Drinking water	You may be exposed to diazinon by drinking contaminated water.
Recently sprayed plants	You may be exposed to diazinon by touching diazinon-treated plant materials such as grass clippings.
Workplace	People who work in the manufacture and professional application of diazinon have the most significant exposure to this insecticide.

Consumer products	Although diazinon was formerly used as the active ingredient in home and garden pest control products, sale of these home and garden products in the United States was stopped in 2004. However, previously purchased diazinon-containing home and garden products may still be in use and present the potential for exposure.

For more information on human exposure to diazinon, see Chapter 6.

1.4 HOW CAN DIAZINON ENTER AND LEAVE MY BODY?

Enter your body	
• **Inhalation**	If you breathe air containing diazinon, you may absorb it into your body through your lungs.
• **Ingestion**	Diazinon in food or water may also rapidly enter your body through the digestive tract.
• **Dermal contact**	Diazinon may enter your body across the skin.
Leave your body	Once in the body, diazinon is rapidly broken down and eliminated from the body mainly in the urine. Diazinon has not been shown to accumulate in any tissues and most of the chemical is eliminated from the body within 12 days.

For more information on how diazinon enters and leaves the body, see Chapter 3.

1.5 HOW CAN DIAZINON AFFECT MY HEALTH?

This section looks at studies concerning potential health effects in animal and human studies.

Human exposure **• High exposure**	Short exposures to high levels of diazinon can affect the nervous system. Symptoms include: • headache, dizziness, weakness • feelings of anxiety • constriction of the pupils of the eye • not being able to see clearly
• Very high exposure	Exposures to very high levels can cause more severe symptoms including: • nausea, vomiting, abdominal cramps, and diarrhea • slow pulse • pinpoint pupils • difficulty breathing • passing out (coma) Signs or symptoms of nervous system damage may occur within 30–60 minutes. If you experience these symptoms, you should seek medical attention immediately. Emergency rooms have drugs that stop the harmful effects of diazinon.
Long-term exposure to low levels	There is no evidence that long-term exposure to low levels of diazinon causes any harmful health effects in people.
Cancer	Diazinon has not been shown to cause cancer in people or animals. The International Agency for Research on Cancer (IARC) has not classified diazinon for carcinogenicity. EPA classified diazinon as a Group E chemical (evidence of noncarcinogenicity for humans).

Further information on the health effects of diazinon in humans and animals can be found in Chapters 2 and 3.

1.6 HOW CAN DIAZINON AFFECT CHILDREN?

This section discusses potential health effects in humans from exposures during the period from conception to maturity at 18 years of age.

Effects in children	It is likely that children would have the same health effects as adults. We do not know whether children would be more sensitive than adults to the effects of diazinon. One study found neurological and bone effects in young children living in a house were diazinon was misused to control a flea infestation.
Birth defects	There is no evidence that environmental exposure to diazinon causes birth defects or other developmental effects in people. In animals, levels of exposure to diazinon high enough to affect the health of pregnant mothers caused developmental effects in their newborn babies.
Breast milk	Animal studies have shown that diazinon and/or its breakdown products can be transferred from a pregnant mother to a developing fetus, but no human data were located regarding the transfer of diazinon from the mother to the fetus or nursing infant.

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO DIAZINON?

Cautions for those who live in agricultural areas	People who live near agricultural areas where diazinon is still used should stay away from the area that has been treated. Diazinon can be dispersed some distance from a spray zone by air currents and runoff water. If you are aware that diazinon is being sprayed in the vicinity, you may want to go indoors or leave the area for a short time. Agricultural workers who have come into contact with relatively large amounts of diazinon at work may need to remove and wash contaminated clothing before coming into contact with other family members.
Wash fruits and vegetables	To reduce the risk of exposure to diazinon residue on fresh fruits or vegetables, wash the foods prior to eating them.
Properly use insect sprays	Occasionally, diazinon may be improperly sprayed inside the home to kill insects. Make sure that any person who treats your home with pesticides is properly certified. Ask what chemical or chemicals are being used. Diazinon is a “restricted use” chemical and is no longer registered for residential indoor or garden use.

1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO DIAZINON?

Measuring effects	Most of the signs and symptoms resulting from diazinon poisoning are due to the inhibition of an enzyme called acetylcholinesterase in the nervous system. This enzyme is also found in your red blood cells and a similar enzyme (plasma cholinesterase) is found in blood plasma. The most common test for exposure to many organophosphorus insecticides, including diazinon, is to determine the level of cholinesterase activity in the red blood cells or plasma. It takes time for this enzyme to completely recover to normal levels following exposure. Therefore, a valid test may be conducted a number of days following the suspected exposure. This test indicates only exposure to an insecticide of this type. It does not specifically show exposure to diazinon.
Detecting exposure	Specific tests are available to determine the presence of diazinon or its breakdown products in blood, body tissue, and urine. These tests are only useful if done within a few hours or days of exposure. This is because diazinon is rapidly broken down and excreted from the body.

Information about tests for detecting diazinon in the body is given in Chapters 3 and 7.

1.9 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations *can* be enforced by law. The EPA, the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA) are some federal agencies that develop regulations for toxic substances. Recommendations provide valuable guidelines to protect public health, but *cannot* be enforced by law. The Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH) are two federal organizations that develop recommendations for toxic substances.

Regulations and recommendations can be expressed as “not-to-exceed” levels, that is, levels of a toxic substance in air, water, soil, or food that do not exceed a critical value that is usually based on levels that affect animals; they are then adjusted to levels that will help protect humans. Sometimes these not-to-exceed levels differ among federal organizations because they used different exposure times (an 8-hour workday or a 24-hour day), different animal studies, or other factors.

Recommendations and regulations are also updated periodically as more information becomes available. For the most current information, check with the federal agency or organization that provides it.

Some regulations and recommendations for diazinon include the following:

Drinking water	The EPA has determined that exposure to diazinon in drinking water at a concentration of 20 micrograms per liter (µg/L) for up to 10 days is not expected to cause any harmful effects in a child. The EPA has determined that lifetime exposure to 1 µg/L diazinon in drinking water is not expected to cause any harmful effects.
Food	The EPA has also set tolerances for residues of diazinon in various raw food products of 0.1–40 parts of diazinon per million parts of food (ppm).

For more information on regulations and advisories, see Chapter 8.

1.10 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department, or contact ATSDR at the address and phone number below.

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses that result from exposure to hazardous substances.

Toxicological profiles are also available on-line at www.atsdr.cdc.gov and on CD-ROM. You may request a copy of the ATSDR ToxProfiles™ CD-ROM by calling the toll-free information and technical assistance number at 1-800-CDCINFO (1-800-232-4636), by e-mail at cdcinfo@cdc.gov, or by writing to:

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine
1600 Clifton Road NE
Mailstop F-32
Atlanta, GA 30333
Fax: 1-770-488-4178

Organizations for-profit may request copies of final Toxicological Profiles from the following:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Phone: 1-800-553-6847 or 1-703-605-6000
Web site: http://www.ntis.gov/