Massachusetts Military Reservation

Impact Area Groundwater Study Program

Chemical Fact Sheet – RDX

Fact Sheet 2001-04

This fact sheet is a part of a series of chemical fact sheets to address community concerns on public health and environmental issues associated with the Massachusetts Military Reservation (MMR).

What is RDX?

RDX (Hexahydro-1, 3, 5-trinitro-1, 3, 5 -triazine) is also known as cyclonite, hexogen, Research Department Explosive, Royal Demolition Explosive or Royal Dutch Explosive. It is used as an explosive and is also used in combination with other ingredients in explosives. RDX is produced at military arsenals and is used as an explosive in military munitions and plastic explosives. RDX is a manmade chemical not occurring naturally in the environment.

How is RDX used at MMR?

No training with RDX is currently taking place at MMR. In the past, the Army National Guard fired artillery and mortar shells containing RDX into the Impact Area. RDX is used at MMR on an intermittent basis to detonate unexploded ordnance (UXO).

Where is RDX found at MMR?

RDX has been found at MMR in both soil and groundwater at the following general locations: the impact area, the explosive training and disposal areas known as Demolition Areas 1 and 2, the contractor and military training ranges located southeast of the impact area (Southeast Ranges), and in several other areas where munitions containing this explosive were utilized.

RDX has been detected in groundwater outside of the current MMR property, near the northern area of Snake Pond. It is believed that the detections in the Snake Pond area originated from sources in the Southeast Ranges area.

Where can I get more information about this chemical?

For additional technical information and review of current research, contact EPA's Safe Drinking Water Hotline at (800) 426-4791, the Massachusetts Office of Research and Standards at (617) 556-1160, or see the Agency for Toxic Substance and Disease Registry's (ATSDR) Toxicological Profile for RDX.

Information about obtaining this profile is available by calling ATSDR's 24-hour Toxicology Information Service at 888-422-8737. Or at http://www.atsdr.cdc.gov/toxfaq.html

To order toxicological profiles contact the National Technical Information Service at (800) 553-6847.

The Impact Area Groundwater Study Program has been working on an investigation and cleanup of groundwater-related contamination on the upper 15,000 acres at Camp Edwards on the Massachusetts Military Reservation since 1996. The goals of the program are to protect public health and safety through their investigation and cleanup actions.

How may RDX affect my health?

If you are not exposed to RDX, it does not pose a risk to your health. If there is exposure to RDX, several factors will determine whether harmful effects may occur and what the type and severity of those health effects may be. These factors include:

- The dose (how much)
- The duration (how long)
- The route or pathway by which you are exposed (breathing, eating, drinking, or skin contact)
- Other chemicals to which you are exposed

Various other personal factors (e.g. age, sex, family traits, lifestyle, personal habits, state of health).

In scientific experiments conducted on rats and mice eating RDX for 3 months resulted in decreased body weights, kidney damage and liver tumors in mice. When large amounts are inhaled or eaten, RDX can cause seizures (problems with the nervous system) in humans and animals. While it is not known if the health effects seen in laboratory animals will be the same for people, the results of animal studies are used to predict potential health effects in people.

Laboratory studies in pregnant rats resulted in smaller offspring but similar effects were not seen in rabbits. There is no information that RDX causes birth defects in people.

Is exposure to RDX likely to cause cancer?

No studies are available regarding representative effects in humans following inhalation, oral or dermal exposure to RDX. However, a laboratory study in mice given RDX orally found RDX could cause liver tumors. The EPA has listed RDX as a possible human carcinogen via oral exposure as a result of the mouse study. No studies have been conducted on whether drinking or eating of RDX by people could cause cancer.

How might I be exposed to RDX?

You can be exposed to RDX only when you come in contact with it by drinking, breathing, eating or touching it. Examples include:

- Drinking contaminated water
- Eating plants grown in soil contaminated by RDX
- Breathing contaminated air
- Contacting RDX in water while swimming or bathing
- Playing in contaminated soil

What Federal and State standards exist to protect public health and the environment?

The EPA has established a lifetime Health Advisory guidance level of 2 ppb (parts per billion) for RDX in drinking water. The EPA and MADEP have not established an ambient air level for RDX or a cleanup standard for RDX in soil.

Contributing Agencies

U.S. Environmental Protection Agency (EPA)
Massachusetts Department of Environmental Protection (MADEP)
Air Force Center for Environmental Excellence
Massachusetts Department of Public Health
Army Environmental Center
United States Air Force
Agency for Toxic Substance and Disease Registry

For Additional Information, Contact:

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