



## United States Army Training Center Public Affairs Fort Jackson, South Carolina 29207



### Royal Demolition Explosive (RDX) FACT SHEET

#### **What is RDX?**

RDX stands for Royal Demolition Explosive. RDX is a man-made chemical that does not occur naturally in the environment. It is a nitrate explosive compound having both military and civilian applications. It is very stable at room temperature, and detonates only with a detonator.

Military Applications: RDX is commonly used as an ingredient in plastic explosives (composition C-4, composition B, composition A) and as explosive “filler” in most types of munitions compounds. RDX can also be mixed with another explosive, such as trinitrotoluene (TNT), to produce a bursting charge for aerial bombs, mines (Claymore), and blasting caps. RDX is commonly found at hand grenade, anti-tank rocket, and bombing ranges.

Civilian Applications: RDX is also used in the manufacture of fireworks, in demolition blocks, as a heating fuel for food rations, and occasionally as a rodenticide. Combinations of RDX and HMX, another explosive, have been the chief ingredients in approximately 75 products.

#### **How might I be exposed to RDX?**

RDX can enter the body through inhalation of contaminated dust or soil, absorption of contaminated water through the skin, or ingestion of contaminated water through drinking or using it for food preparation. Ingesting contaminated water would most likely introduce a higher amount of RDX into the body than through inhalation or absorption through the skin.

*NOTE: The U.S. Environmental Protection Agency (EPA) has set a Lifetime Health Advisory level of 2 parts per billion (ppb) for RDX. [1 ppb = 1 microgram/liter (ug/L)]. EPA defines the lifetime health risk advisory level as the concentration in drinking water that is not expected to cause any non-carcinogenic adverse health effects over a lifetime of exposure. The amounts of RDX detected in the private well water samples taken to date vary considerably. The U.S. Army is committed to conducting a thorough assessment to protect the health of our Fort Jackson community members.*

#### **How may RDX affect my health?**

Ingestion of large amounts of RDX has the potential to cause negative health effects. Such high doses are 100,000 times greater than the amounts associated with environmental exposures. Possible negative health effects from high doses are muscle twitching, vomiting, change in blood pressure, and/or seizures. These acute effects would decrease over time as the RDX is eliminated from the body.

The body rapidly metabolizes, or processes, any RDX that is inhaled, absorbed or ingested. The RDX is then eliminated from the body and does not build up over time. RDX can be detected in blood or urine tests, but only if the tests are performed before the body has finished metabolizing and eliminating the RDX. Detection of RDX in blood or urine is an indicator that exposure of some kind has occurred, but the amount of RDX present in a blood or urine sample cannot be used to determine the amount, length or frequency of the exposure.

### **Will exposure to RDX cause cancer?**

The EPA has classified RDX as a possible human carcinogen based on animal studies. To date, there have been no studies that reported cancer in people who were exposed to RDX.

### **How can RDX affect children?**

At this time there is very little information available about the potential negative health effects of RDX ingestion in children. There have been no studies of children exposed to RDX, but there was one reported case of a child who accidentally ingested RDX. That child had seizures, which is the same effect that occurs in adults exposed to high amounts of RDX. We do not know whether children are more susceptible to the effects of RDX than adults or whether RDX causes birth defects in humans.

### **I (my spouse, my child) have/has/had (insert medical condition or disease here). Could exposure to RDX cause this?**

At this time, the only known cause and effect of RDX exposure is potential for seizures associated with ingesting large amounts of RDX. Negative health effects related to RDX exposure would not be expected based on the amounts of RDX detected in the training range's monitoring wells. However, if you have any health concerns you are encouraged to discuss those concerns with your private physician. Most diseases and medical conditions do not have one cause, but result from multiple contributing factors. Therefore, your private physician is the best person to determine your personal risk factors, if any, for your medical condition.

### **How can I reduce my risk of exposure to RDX?**

In homes where tap or well water has tested positive for the presence of RDX, exposure can be reduced by drinking and cooking with bottled water or installing activated carbon filters on taps used for drinking or food preparation. Negative health effects would not be expected from bathing in water with low levels of RDX.

### **References:**

1. United States Environmental Protection Agency Technical Fact Sheet, Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), May 2012
2. Agency for Toxic Substances and Disease Registry (ATSDR) of the Centers for Disease Control, Toxicological Profile for RDX, January 2012
3. Dr. Charles McCannon, U.S. Army Public Health Command (USAPHC) Occupational and Environmental Medicine, and Dr. Mark Johnson and Dr. Larry Williams, USAPHC Toxicology