



# Depleted Uranium

During the wars against Iraq in 1991 and 2003 and recent conflicts in Afghanistan and Kosovo, the United States and United Kingdom have used weapons made of depleted uranium (DU). In the 2003 conflict in Iraq, over 500 tons of depleted uranium weapons were fired at military and civilian targets. These weapons leave a toxic and radioactive hazard for generations to come. Here's information on why the use of DU weapons should be banned.

Uranium is a mineral mined from the ground and, after processing, is used as a fuel in nuclear reactors. Enriched uranium is separated from natural uranium in order to produce fuel for nuclear reactors. During this process, the fissionable isotope Uranium 235 is separated from uranium. The remaining uranium (which is 99.8% of the isotope Uranium 238) is misleadingly called 'depleted uranium', a term that implies it isn't particularly dangerous.

In fact depleted uranium (DU) is chemically very toxic. It is an extremely dense, hard metal, and can cause chemical poisoning to the body in the same way as lead or any other heavy metal. However, depleted uranium is also radiologically hazardous, as it spontaneously burns on impact, creating tiny aerosolised glass particles which are small enough to be inhaled. These uranium oxide particles emit all types of radiation – alpha, beta and gamma rays – and can be carried in the air over long distances. Depleted uranium has a half life of 4.5 billion years, and the presence of depleted uranium ceramic aerosols can pose a long term threat to human health and the environment.

## TOXICITY

DU is no different from natural uranium in its chemical toxicity. It is a heavy metal that, in its soluble form, accumulates in the kidneys (the primary target organ for uranium). In sufficient quantities, this can increase the risk of renal damage. The scientific evidence to date suggests that ingestion of uranium, even in unusual amounts, does not by itself cause serious or enduring health problems due to chemical toxicity. But, like all heavy metals, DU is a serious risk factor that cannot be dismissed, especially when combined with other toxic substances.

## RADIATION

DU is about 60% as radioactive as natural uranium. About 95% of that radiation is emitted as alpha particles, a weak form of radiation that cannot penetrate the skin. However, a DU-hardened

munition burns during flight and DU aerosolises on impact – when a DU munition hits a target it can create a fine aerosol smoke of uranium oxide that can be easily inhaled and lodge in the lungs. These aerosol particles generated by DU weapons are in a very hard ceramic state, and are likely to be retained in the lung and its regional lymph nodes for a prolonged period. This increases the risk of cellular damage from alpha radiation.

A minute amount of beta and gamma radiation could strike deeper cell tissue if fine particles of DU are inhaled or ingested. This is a danger for soldiers or civilians in the vicinity of a recently exploded DU shell. The US Defence Department has acknowledged radiation hazards for US soldiers struck during "friendly fire" incidents, when US military has mistakenly fired DU weapons at their own troops.

## URANIUM HEALTH STUDIES

Uranium studies conducted over several decades have found that populations with above-average occupational exposure to inhaled or ingested uranium do not suffer from increased rates of the cancers most likely to be associated with radiation, nor do they exhibit the blood disorders that might be expected as a result of chemical toxicity.

**Radon** Other causes, such as radon exposure among uranium miners and mill workers, have been pinpointed for certain specific illnesses. New experimental data suggests a role for dust toxicity in the lung.

**Dust** The main risk from internal radiation, whether the exposure is due to manufacturing processes or DU weapons, is from this inhaled dust.

Concerns about the potential health effects of DU weapons arise primarily from immediate and long-term uranium contamination in areas where they are used.

## USABILITY

As a heavy metal, DU is used for many civilian purposes, such as ballast in aircraft and ships. But it is used by the military because the density and tensile strength of uranium give it unusual armour-piercing capabilities. It's also relatively cheap and abundant, as there's lots of waste generated by the civilian nuclear industry. The US first became interested in using DU in weapons because of these qualities – it's now widely used as tank armour and in armour piercing shells. In total, fifteen countries have DU in their military arsenals: Bahrain, Egypt, France, Greece, Iraq, Israel, Kuwait, Pakistan, Russia, Saudi Arabia, Taiwan, Thailand, Turkey, United Kingdom, United States.

## URANIUM MUNITIONS

There is evidence that the DU munitions used in the Gulf war and in the Balkans were tainted with plutonium, U-236, and other substances far more intensely radioactive than U-238. Recent studies have pointed to the possibility of genetic damage resulting from exposure to some forms of radiation emitted from particles such as those deposited by DU weapons.

During flight and on penetration, for example, about 20% of the DU burns spontaneously, creating a fine mist of uranium oxide that can be easily inhaled and lodge itself in the lungs. Fragments of DU weapons are scattered around battlefields, and can become embedded as shrapnel in human and animal flesh.

The US-led military coalition that fought the 1991 Gulf War is reported to have used about 300 tons of ammunition containing depleted uranium (DU) against Iraqi tanks and other armored vehicles. During the 1999 war in the Balkans, NATO forces used about 11 tons of DU in missiles that were fired into the former Yugoslavia. An estimated 1200 tons were used in Afghanistan in 2002, and another 500 tons in Iraq in 2003.

## HEALTH EFFECTS

In the months and years following both of these armed conflicts, a large number of soldiers, UN peacekeepers and civilians have exhibited unexpected and unexplained health problems, including excess leukemias and other cancers, neurological disorders, birth defects, and a constellation of symptoms loosely gathered under the rubric "Gulf War Syndrome".

Depleted uranium, because of its radioactivity and chemical toxicity, has been linked to these acute health effects in the press and in public forums. Some opponents of DU weapons have categorically asserted that exposure to depleted uranium is the direct cause of these excess cancers. Any such effect, if substantiated, could point toward increased risk of cancer or leukemia in the lung or regional lymph nodes above the standard – and controversial – predictions of radiation protection models.

The International Physicians for the Prevention of Nuclear War (IPPNW) and other non-medical NGOs have called for a ban on the use of 'depleted' uranium.

The World Health Organisation has requested \$2 million as an immediate payment toward a four-year \$20 million clinical study of DU health effects in Iraq and the Balkans. The US and NATO have an obligation to promptly and unconditionally fund the WHO's work in this area.

## FOR MORE INFORMATION

- Join the DU email list: [du-watch-subscribe@egroups.com](mailto:du-watch-subscribe@egroups.com)
- Complete list of DU Internet links at: [www.energyjustice.net/nuclear/du/](http://www.energyjustice.net/nuclear/du/)
- Campaign Against Depleted Uranium [www.cadu.org.uk](http://www.cadu.org.uk)
- There are many articles and resources on the VPN website at: [www.vicpeace.org/weapon](http://www.vicpeace.org/weapon)

## Interview with Major Doug Rokke

Question: You have been a military man for over 35 years. You served in Vietnam as a bombardier and you are still in the US Army Reserves. Now you're going around the country speaking about the dangers of depleted uranium (DU). What made you decide you had to speak publicly about DU?

DOUG ROKKE: Everybody on my team was getting sick. My best friend John Sifton was dying. The military refused him medical care, and he died. John set up the medical evacuation communication system for the entire theater. Then he got contaminated doing the work.

John and Rolla Dolph and I were best friends in the civilian world, the military world, forever. Rolla got sick. I personally got the order that sent him to war. We were activated together. I was given the assignment to teach nuclear, biological, and chemical warfare and make sure soldiers came back alive and safe. I take it seriously. I was sent to the Gulf with this instruction: Bring 'em back alive. Clear as could be. But when I got all the training together, all the environmental cleanup procedures together, all the medical directives, nothing happened.

More than 100 American soldiers were exposed to DU in friendly fire accidents, plus untold numbers of soldiers who climbed on and entered tanks that had been hit with DU, taking photos and gathering souvenirs to take home. They didn't know about the hazards.

DU is an extremely effective weapon. Each tank round is 10 pounds of solid uranium-238 contaminated with plutonium, neptunium, americium. It is pyrophoric, generating intense heat on impact, penetrating a tank because of the heavy weight of its metal. When uranium munitions hit, it's like a firestorm inside any vehicle or structure, and so we saw tremendous burns, tremendous injuries. It was devastating.

The US military decided to blow up Saddam's chemical, biological and radiological stockpiles in place, which released the contamination back on the US troops and on everybody in the whole region. The chemical agent detectors and radiological monitors were going off all over the place. We had all of the various nerve agents. We think there were biological agents, and there were destroyed nuclear reactor facilities. It was a toxic wasteland. And we had DU added to this whole mess.

When we first got assigned to clean up the DU and arrived in northern Saudi Arabia, we started getting sick within 72 hours. Respiratory problems, rashes, bleeding, open sores started almost immediately.

When you have a mass dose of radioactive particulates and you start breathing that in, the deposit sits in the back of the pharynx, where the cancer started initially on the first guy. It doesn't take a lot of time. I had a father and son working with me. The father is already dead from lung cancer, and the sick son is still denied medical care.

Full interview at: <http://www.vicpeace.org/stories/09/1230.html>

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