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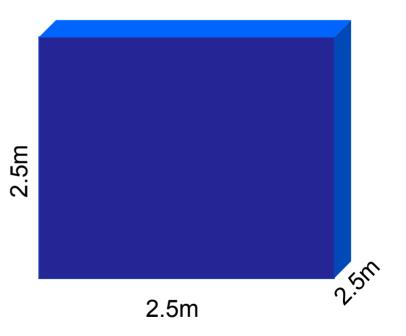
#### **Military Uses**





### Perspective on DU Use In Gulf War

- Total
  - 320 tons equate to a cube measuring:





# Perspective on DU Use In Gulf War

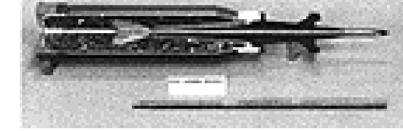
- Air Force
  - -259 tons
    - approx. 750,000 rounds
    - 300 grams each
  - Majority did not strike armor
  - Intact rounds or large fragments in sand at depths of 2 - 30 meters depending on attack angle, altitude, air speed and soil density



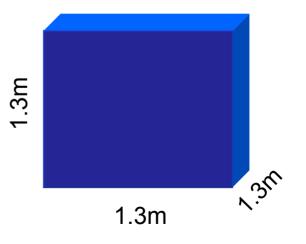


## Perspective on DU Use In Gulf War

- Army
  - 50.5 tons
    - 120mm round weighs 4.9Kg



Equates to a cube measuring:



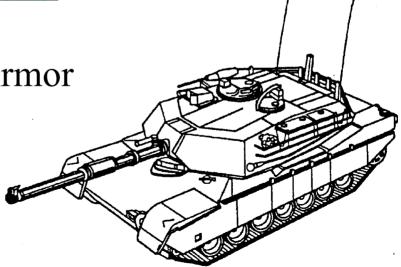


### **Military Uses**



#### Anti-Armor Munitions

#### Abrams Heavy Armor





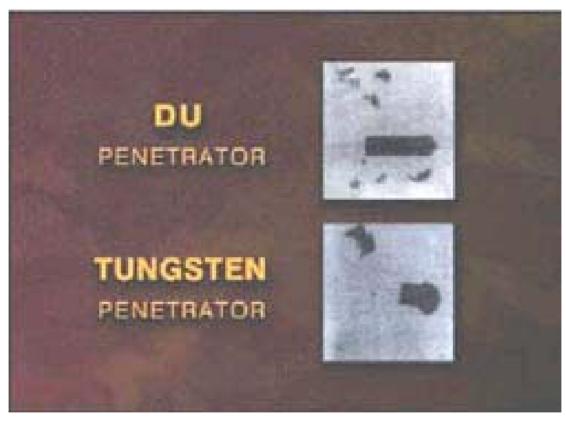
#### How and Why Is DU Used?



Artist depiction shows why a DU penetrator, which sharpens itself as it moves through armor, is much more effective than tungsten, which becomes blunt.



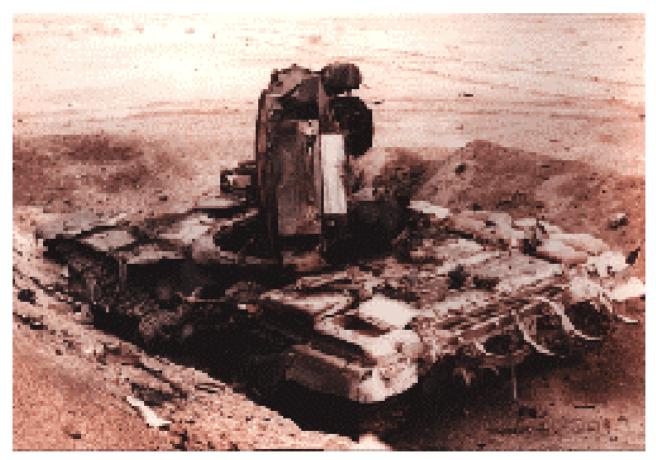
### How and Why Is DU Used?



DU's self-sharpening properties are evident in this x-ray. Note how the tungsten penetrator's tip deforms into a mushroom shape.



#### How and Why Is DU Used?



Iraqi T-72 tank hit with DU penetrator.



## Background

- We eat, drink, breathe natural uranium daily
  - Worldwide 4 tons of natural uranium in the top meter of soil per square kilometer
  - High phosphate region of Florida -160 tons/sq. Km.
- Uranium health hazards studied extensively since 1940s
- Health and environmental impact of DU use has been studied since the early 1970s



# **Health Effects of Depleted Uranium**

- Chemical Primary Concern
  - DU is a heavy metal, like lead, tungsten, and nickel
  - Kidney is the primary target organ
  - Damage to a specific portion of the kidney could occur when very large amounts are internalized
  - Follow-up studies of highly exposed veterans with embedded DU fragments show no adverse residual effects



# Health Effects of Depleted Uranium

- Radiological
  - Chemically DU is the same as natural uranium, but it is 40 percent less radioactive than natural uranium
  - No medical evidence of natural or depleted uranium causing cancers, including leukemias
  - Transuranics account for less than a 1 percent increase in the radiation dose



## **Medical Surveillance**

- Medical surveillance of individuals in or on vehicles hit by DU friendly fire
  - No cancers of bone or lungs, or leukemias
  - No subsequent medical problems from the DU exposure
  - Approximately 20 with embedded DU fragments
  - Urine uranium levels normal in those without DU fragments



### Leukemia

- Rates in U.S. are two cases per 100,000 per year
- Cause is often not known
- Post atomic blast or chemotherapy cases start after two years and peak in four to six years
- Toxic solvent exposures cause disease earlier



# **Environmental Testing of DU Munitions**

- Over 40 tests, DoD and non-DoD
  - External dose measurements
  - DU munitions striking targets
  - Fires in vehicles loaded with DU munitions
  - Fires involving DU munitions in storage
  - CAPSTONE Test
- All but CAPSTONE are summarized in "Environmental Exposure Report, Depleted Uranium in the Gulf War (II)"
- Testing continues



# **Recent Environmental Assessments**

- United Nations Environmental Programme Office
- World Health Organization
- European Commission
- European Parliament
- United Kingdom Royal Society



## **Recent Environmental Assessments**

- United Kingdom Ministry of Defense
- Expert Meeting on "Depleted Uranium in Kosovo: Radiation, Public Health and Environmental Aspects," Germany, June 2001



## **Recent Environmental Assessments**

- Common conclusions
  - DU residue is highly localized
    - No widespread contamination
  - DU residue difficult to locate on battlefield
  - In the context of other cleanup efforts, they recommended collecting loose penetrators on the surface
  - Problems with drinking water are highly unlikely
  - No impact on the health of the residential population or deployed military personnel



### Summary

- Uranium has been extensively studied and shown not to be linked with leukemia in humans
- Medical surveillance of highest exposed shows no adverse health effects related to DU
- Reviewed by multiple U.S. and non-U.S. scientific organizations with consistent conclusions



### Summary

- Scientific evidence assures us of the safety of Depleted Uranium
- DU radiation and chemical doses are below safety standards DU Capstone test is underway
- Research on embedded DU fragments is continuing
- DU munitions and armor give U.S. forces range, lethality, and survivability advantages



### Information Resources

DeploymentLINK.osd.mil/du\_library/

What is depleted uranium? How and why is it used? Use in the Gulf War and the Balkans Health concerns and scientific reports