UMRC's Preliminary findings from Afghanistan & Operation Enduring Freedom

1. Unanticipated results of the Afghan civilian studies

2. Afghan civilians contaminated with Non-depleted Uranium – not, Depleted Uranium.

3. Civilian studies corroborated by OEF bomb-crater samples

4. How were the study subjects selected?

5. Why UMRC looked for Non-depleted Uranium (as opposed to DU)

6. Why UMRC conducted radiological studies on Afghans

7. Contrasting the Afghan finding with Gulf War Veterans results

8. Leading, anti-DU activist challenges UMRC's Afghan findings

9. Access to UMRC's Afghan data

10. Examining the origin of Afghan civilians' contamination

1. Unanticipated outcomes of the 2002 Afghan civilian studies

Radiological measurements of the uranium concentrations in Afghan civilians' urine samples indicate abnormally high levels of non-depleted uranium. Radiological measurements of Afghan civilians' have high concentrations of uranium in a range beginning at 4 X's and reaching to over 20 X's normal populations. This is 400% to 2000% higher than the study controls and normal population baselines of the

concentrations of nanograms of uranium per liter of urine in a 24-hour sample. UMRC has completed initial but still preliminary studies that corroborate these finding in biological controls and geological samples taken in Operation Enduring Freedom bombsites.

These findings are significant in three ways:

1. The volumes (total concentrations) of uranium in the civilians studied are abnormally high as compared to local population controls. The only other findings presenting with these high concentrations are historically anomalous in certain populations exposed via unusual geological and technological (including occupational) conditions.

2. 100% of the studied population in the preliminary sample groups in Afghanistan is positive for these abnormally high concentrations.

3. The isotopic signature of the uranium in the Afghan study population is Non-depleted Uranium. This is an unexpected finding in that there has been no report of or confirmed findings of Non-Depleted Uranium in OEF or other military conflicts. It is not know at this point if the uranium is adulterated with transuranics.

2. Afghan civilians exposed to OEF bombing contaminated with Non-depleted Uranium – not, Depleted Uranium.

The isotopic ratios of the uranium contaminant measured in Afghan civilians show that it is not Depleted Uranium (DU). The isotopes of uranium found in the Afghan civilians' urine is Non-Depleted Uranium. The only explanations of this finding are either anomalous geological and agricultural conditions (fertilizers) or the presence of uranium extracted from the front-end of the fuel or weapons production cycles. Whereas DU is a by-product of the uranium enrichment process, non-depleted uranium (NDU) is the feed stock of the enrichment phase of the fuel and weapons development cycles.

3. Civilian studies are corroborated by bomb-crater samples and control samples of local geological samples

UMRC investigated the possible origins of this contamination. The

preliminary results of the radiological urine analysis are corroborated by radiological measurements of debris and weapons' fragment samples at OEF (Operation Enduring Freedom) target sites and bomb-craters. A discussion of the postulated origins of contamination and subsequent field investigations to follow-up these findings are provided in UMRC's Field Report: "Precise Destruction -- Indiscriminate Effects", posted on this web-site and the discussion posted below: "Examining the origin of Afghan civilians' contamination".

4. How were the subjects selected ?

The Afghan urine samples were collected from a group selected randomly within a triaged or first level screening of a broader population. The triaging identified persons who report (or based on physicians' reports) medical symptoms and public health conditions indicating uranium internal contamination. The first level of triage had to satisfy two criteria: (1) the people present with the classic symptoms of acute and/or chronic internal exposure to uranium by inhalation; and, (2) they had a reliable history that placed them within a defined radius of exposure at the time of the OEF bombing (and/or living and working within this radius following the cessation of the bombing).

UMRC's Field Team found several hundred civilians with acute symptoms and reportedly developing, chronic symptoms of uranium internal contamination (including congenital problems in newborns). All subjects' on-set of symptoms are reported to coincide with the calendar dates of the bombing and were not present prior to the bombing. A randomly selected urine specimen donors' sub-group was sub-selected out of the adult male population of the first-level triaged population. Males-only were selected to respect the cultural preferences of communities participating in the study. The sample and specimen collection method is outlined in UMRC's study, which has been accepted for publishing and will be made available on this website following peer review.

5. Why UMRC looked for Non-depleted Uranium (as opposed to DU)

Radiological measurements of any populations' urine specimens identify, as a standard practice, the abundance of each of the 3 naturally occurring isotopes of uranium (U234, 235, 238). These isotopes' abundances (quantities) are measured as a fraction of the uranium released in a 24-hour sample of urine. The ratios of the two most abundant isotopes (235, 238) are also measured. This ratio presents a specific

signature that expresses the type of uranium in the sample. The isotopic ratios (proportions) of the uranium in the urine collected in Afghanistan has the unmistakable signature of Non-Depleted Uranium. It does not express the isotopic ratio of DU. This does not rule out the possibility that future studies of Afghans may detect Depleted Uranium. This depends on the weapons that may be linked to any possible contamination identified in other exposed groups.

6. Why UMRC conducted radiological studies on Afghans

UMRC's initial research on Afghan civilians was undertaken in response to five leading indicators:

Within weeks of the cessation of Operation Enduring Freedom's bombing campaign, public health officials, civilians, the Afghan government, international NGO's (including UN agencies) began to report public health problems matching the profile of uranium internal contamination. These anecdotal reports were similar to veterans and civilian health problems reported from the Gulf War (Desert Storm and Desert Fox) and Operation Allied Force (Serbia, Herzegovina and Kosovo).

Operation Enduring Freedom was reported to be using some of the same weapons' delivery systems and ordnance used in Operation Desert Storm, Operation Desert Fox, and Operation Allied Force. Operation Desert Fox, which took place in Iraq in the mid-1990's, was known to be using advance weaponry and testing new generations of precision guided missiles (not used in Desert Storm). Official and unofficial medical and public health reports from Iraq indicated a growing number of deleterious health effects associated with the 1991 Desert Storm bombing and the continued bombing of Iraq's northern and southern, non-fly zones. Reports also stem from certain Middle Eastern countries adjacent to the Persian Gulf conflict areas.

Independent research and publicly available documentation of NATO and US weapons' development programs hinted at or noted directly that non-fissionable (non-thermal nuclear) uranium weapons (including DU) development programs are still underway. Sources include: military research laboratories and sub-contract research & development programs; the US Science Based Stockpile Stewardship Program; the Federation of American Scientists; veterans' reports; and, the annual reports and advertising of independent weapons contractors. US military health warnings to OEF personnel indicate the presence of radiological contaminants; recommending troops take protection measures. OEF's forward targeting personnel, Special Forces and post-bombing, site inspection teams have been given radiation protection instructions, radiation detectors and protective equipment prior to and since entering

Afghanistan.

The U.S. DBHT (Deeply Buried Hard Target) Project, aimed at developing weapons to destroy biological, nuclear and chemical weapons storage and manufacturing facilities in rogue states; and, the US Strategic Military Plan and US Nuclear Posture Review expresses intentions to use new classes of weapons in Afghanistan and other states. This program was known to be accelerating its weapons development and experiments in readiness for a possible Iraqi incursion. The White House and US-DOD spoke frequently about the development and use of fission, low-yield and non-fission, seismic bunker- and cave-busters. These weapons, by design, require heavy ballast and narrow diameter casings that can drive deeply into the earth or through super-reinforced military targets, tough enough to withstand high velocity impacts before they reach detonation depth.

These new generations of weapons and the targets for which they are designed dictate specific features and functions: They are designed as “self-forging” and capable of punching through multi-layered, extra-reinforced, hardened-targets. They must be able to defeat 14 to 20 feet of heavily reinforced concrete. Unlike the Gulf War DU armour defeat penetrators, these new warheads would be used in conjunction with high explosive charges and or high-pressure, shaped charges and delayed-action detonators (set to predetermined stand-off distances in some cases and to penetration depths controlled by altitude and void sensitivity sensors in others – depending on the ordnance and target).

By the DOD's own admission, the best performing metal that consistently fits these functional military profiles is uranium and alloys of uranium. Titanium and tungsten are not suitable as the prime alloy base for these purposes. Uranium (whether NDU or DU) offers unique structural features and the chemistry best suited for the defeat of deep, bunkerized targets, multiple types of targets in area denial munitions, and penetrating composite ceramic and metal armoured targets.

Uranium can be engineered to be “self-sharpening” so that when it hits a target, it retains its punching point as material erodes off the warhead (titanium and tungsten will not do this). Uranium's molecular structure can re-formed, using metallurgical and “nano-technologies” to deliver a selected range of ballistic features, including kinetic, thermal, pyrophoric, liquid metal and high-pressure/high-heat, plasma effects. Uranium is a readily available metal, cheap to produce and is in abundance in DOE's, DOD's and their weapon's contractors' stockpiles. Uranium has been designated a high priority material for scientific research on new weapons and “stockpile re-cycling” as a strategic and capital asset into multiple military applications.

In the early stages of OEF, the Afghan government reported publicly, radiological illnesses amongst the civilian population. The White House reported finding uranium-alloyed warheads in local arsenals. UK intelligence and the Pentagon reported that there is evidence from captured Taliban strongholds that uranium dispersion and dirty-bombs were being developed in Afghanistan.

7. Contrasting Afghan results with Gulf War Veterans' results

UMRC's preliminary radiological measurements and analysis of Afghan civilians who live and/or work adjacent to Operation Enduring Freedom (OEF) bombsites are notably different from the Gulf War veterans' findings:

Radiological assessments of Afghan civilians show the presence of a distinctly different form or type of uranium. The Afghan civilians' urine, studied to date, does not contain Depleted Uranium. It contains abnormally high levels of Non-depleted Uranium. Gulf war veterans, on the other hand, present, conclusively, with Depleted Uranium. See: The Quantitative Analysis of Depleted Uranium Isotopes in British, Canadian, and U.S. Gulf war Veterans, Military Medicine, August 2002. UMRC's continued research in Afghanistan may or may not identify DU. This will depend upon the munitions deployed, the bombsites inspected and results of further urine studies of populations that may have been exposed to DU.

The abundance (quantities) of the uranium in 100% of the Afghan urine samples showing abnormally high total concentrations and the isotopes specific to Non-Depleted Uranium have been identified 4 to 8 months after the cessation of the bombing. 50% of the Gulf veterans tested by UMRC were positive for detectable levels of DU. The quantities of DU in the Gulf veterans' urine were measured 7 – 9 years after exposure. Normal biological and metabolic processes and the life cycle of uranium incorporated via inhalation result in a progressive reduction, over time, of the amounts that can be found in urine.

The veterans in UMRC's studies were also triaged based on their symptom profiles and histories of exposure. The fact that radiological studies on veterans yielded approximately 50% positive results for DU can be explained by the relative elapsed time from the date of exposure to the date of analysis and the estimated total concentrations of uranium and DU taken into the body at the time of exposure. It is possible that the Gulf veterans who did not test positive were originally contaminated but the quantities of DU in their urine may be below instrument detection limits this late after exposure.

The Afghan civilian studies began within a few months following the reported dates of exposure to OEF bombing. The amount of uranium per weapon and possibly the ballistic behaviors of the weapons used in Afghanistan may result in greater relative volumes of aerosolized particulate available for inhalation. The chemistry of the Afghan uranium, the biospheric transport mechanisms and the metabolic characteristics may also be different. The Afghan population studied is relatively stable and concentrated, unlike the transient patterns of military personnel in the Gulf. There are differences in the length of time of exposure and potential for chronic and repeated exposure of Afghans (via re-suspension of uranium particulate) whose environmental risk is on-going. The associated environmental contamination will be long-term, leading to chronic exposure to the civilian population and foreign workers.

8. Leading, anti-DU activist challenges UMRC's Afghan findings

UMRC's Afghan civilian findings have been criticised by a leading anti-DU activist. Responding to this criticism may shed light on questions of those who are understandably confused by the discovery of Non-depleted Uranium and its possible use by Operation Enduring Freedom. Below is the reply (objections are indented and in quote marks):

> "UMRC's findings of Non-depleted Uranium (as opposed to Depleted Uranium) confuses the public's understanding of the issues":

Depleted Uranium and Non-depleted Uranium are both species of uranium. UMRC is reporting the isotopic signatures of the uranium found in the Afghan civilians' urine. Since Depleted Uranium was not found, it was not reported. This does not rule out the possibility that future studies may identify DU in Afghanistan. For a discussion of the possible origins of this contamination, see below: "Origin of the Afghan civilians' uranium, internal contamination".

> "UMRC's field research investigations concluding that the US and NATO have deployed a new generation of weapons incorporating Non-depleted Uranium is not substantiated by public domain information about the ordnance deployed by Operation Enduring Freedom in Afghanistan":

UMRC's Field Trip Report's conclusions as to the origin of the Afghan civilians' uranium internal contamination is preliminary, based on (1) a follow-up field investigation to identify the origins and (2) radiological analysis of bomb-crater debris

taken from the sites adjacent to the contaminated population and survivors from the blasts. The reader is invited to review UMRC's Afghan Field Report excerpts: "Precise Destruction-Indiscriminate Effects" found on this web-site.

> "The abnormally high levels of uranium found in Afghan civilians are exaggerated and needlessly alarm troops, veterans and civilians in Operations Enduring Freedom":

UMRC is not pleased to have identified such high concentrations of uranium in the biological specimens Afghan civilians. These levels of uranium internal contamination are considered medically significant. They point to a potential public health disaster for Afghanistan if corroborated by on-going studies of a wider population and OEF bombsites. The results reported are not discretionary and have been reported according to the laboratory readings.

The abnormally high levels of internalised uranium in Afghans were measured at a point in time much closer to the date of bombing. This may point to higher than previously calculated risks to Operations' Desert Storm veterans who might have presented with significantly higher concentrations of uranium if studies of their urine had been conducted at a responsible point in time more closely following exposure. These results are also indicative that, if uranium is in use, the new generation of OEF weapons produce significantly higher levels of contaminant than DU penetrators.

9. Access to UMRC's detailed Afghan data

UMRC does not release, publicly, its detailed findings until they are peer-reviewed and published. The peer review and scientific publishing process is lengthy but necessary to ensure efficacy and accuracy. UMRC's results on Afghanistan civilians are presented on this web site as "preliminary" (pending peer review). Until our research is published UMRC's policy is to withhold all but general and summary information about research-in-process. Detailed information about UMRC's Gulf War Veterans' studies are published and can be found on our web site and in the published, peer-reviewed journals and proceedings of scientific conferences.

10. Origin of the Afghan civilians' uranium, internal contamination

Irrespective of the source of the uranium contaminant resulting in the Afghan results, abnormally high concentrations of uranium are medically significant.

The Non-depleted Uranium in the subjects' urine has warranted further investigation to expand the scope of the research, corroborate the biological and geological results and broaden the study populations. UMRC's continues to investigate all possible origins of this uranium contamination.

UMRC's follow-up and on-going research results will be reported in future, peer reviewed studies. A discussion of the possible origins or this contamination can be found in the Field Trip #2 Report: "Precise Destruction – Indiscriminate Effects". To date, there is no evidence of geological or other conditions that might explain the contamination. Significantly, the on-set of acute, uranium internal contamination symptoms coincide with the dates of Operations Enduring Freedom's bombing campaign and match bomb-crater and target site samples.

Other possible origins investigated include geological sources, agricultural sources (fertilizers), local military uses, and possibly other foreign technological and military sources. To date, all postulated alternatives pertain to a variety of other types of uranium (signified by different arrays of isotopic ratios): Naturally occurring Uranium (NU), Depleted Uranium (DU), Low Enriched Uranium (LEU), Highly Enriched Uranium (HEU), dirty uranium (spent fuel products, reactor and weapons' development or manufacturing waste and re-mixed military grade and reactor oxides); local uranium mining, milling and processing; agricultural use or other commercial phosphates; Soviet fission weapons disassembly; and, natural uranium ore products released and aerosolized by the kinetic and high explosive impacts of conventional, deep-penetrator ordnance.

With the exception of Natural Uranium, alternative explanations are attributable to radio-isotopic signatures (ratios of isotopes of uranium) not substantiated by the laboratory results of Afghan civilians and bombsites. The isotopic measurements are objectively reliable and cannot be misrepresented other than by intentional adulteration of the specimens or intentional efforts to contaminate the population to mask the origins of contamination. Notably, the results of the analysis of biological specimens (urine) and the bomb-crater samples are compatible.

The possibility of Natural Uranium remains under investigation. Local geological samples and controls do not substantiate a source other than the OEF bombing. There are no geological, commercial and agricultural phenomena or activities and uses in the environs of the contaminated populations that might explain the contamination. UMRC invites reasonable explanations and continues to investigate alternatives or evidence that might explain origins other than uranium-alloyed and composite uranium-high-explosive ordnance deployed by Operation Enduring Freedom.

What