THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-1200

HEALTH AFFAIRS

SEP 29 2005

The Honorable John W. Warner
Chairman, Committee on Armed Services
United States Senate
Washington, DC 20510-6050

Dear Mr. Chairman:

This letter provides the final 2005 Report to Congress on the requirement for a Department of Defense (DoD) report on Force Health Protection Quality Assurance (FHPQA), as directed by 10 U.S.C. section 1073b(a), as added by section 739 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005.

The enclosed final report provides data and analyses on 138,000 Service members' post-deployment health concerns and deployment-related occupational and environmental exposures, and updated information on the scope and current status of a new DoD Instruction on FHPQA. The report indicates that 91 percent of redeploying Service members rated their overall health from good to excellent. In addition, 53 percent had no reported health concerns at the time of their post-deployment health assessment. Mental health concerns were more common than general health concerns. The majority of those expressing concerns are referred for follow up care and evaluation, and among those referred, approximately 80 to 90 percent are seen within 90 days.

Of note, with implementation of the Department's new post deployment health reassessment program, in which every Service member is required to be evaluated for mental and physical problems three-to six-months after their return to home station, ensures every Service member will be seen in follow up. This program is already underway and being implemented by all Services. As to deployment-related exposures, monitoring data for current Central Command operations contain results from nearly 3,900 air, water, and soil samples taken at over 300 locations. Lastly, the Department's new FHPQA program will encompass a broad range of critical health issues and metrics, with implementation expected by the end of the current calendar year.

I am committed to assuring that our Service members receive the care they need and deserve. Thank you for your continued support of the Military Health System.

Sincerely,

William Winkenwerder, Jr., MD

Enclosure:
As stated

cc:
Senator Carl Levin

DoD Force Health Protection Quality Assurance
Annual Report to Congress
August 2005

BACKGROUND

The Department of Defense (DoD) is required to report annually to Congress on Force Health Protection Quality Assurance, per 10 U.S.C. section 1073b(a), as added by section 739 of the Ronald W. Reagan National Defense Authorization Act (NDAA) for Fiscal Year 2005. On April 25, DoD provided an interim report, based upon the CY2004 DoD Deployment Health Quality Assurance Program. That report addressed maintenance of deployment health assessments in the Defense Medical Surveillance System, storage of blood samples in the DoD Blood Serum Repository, and recording of health assessment data in military health records. The following final 2005 report provides information on actions taken in response to post-deployment health concerns and confirmed deployment-related exposures to occupational or environmental hazards, along with an update on the scope and current status of a new DoD Instruction on Force Health Protection Quality Assurance.

POST-DEPLOYMENT HEALTH CONCERNS

Responsiveness to post-deployment health concerns was determined through analysis of servicemember and health care provider information on the four-page Post-Deployment Health Assessment, DD Form 2796. Copies of these forms are maintained centrally in the electronic database of the Defense Medical Surveillance System (DMSS). As part of the post-deployment health assessment process, health care providers conduct face-to-face interviews with returning servicemembers and document their *Yes* or *No* responses to the following questions:

- Do you currently have any questions or concerns about your health? *(General Health Concerns)*
- During this deployment have you sought, or do you now intend to seek, counseling or care for your mental health? *(Mental Health Concerns)*
- Do you have concerns about possible exposures or events during this deployment that you feel may affect your health? *(Exposure Health Concerns)*

The DMSS was queried to determine positive responses to any of the post-deployment questions, along with responses to four mental health-related questions in the servicemember self-completion section of the assessment questionnaire. DMSS data were also collected on provider-recommended referrals for additional evaluation, as well as the number and timeliness of servicemembers seen for post-deployment follow-up care in the military health system. The following tables depict the results from DMSS-maintained post-deployment health assessments that were accomplished on 138,332 servicemembers returning from deployments in CY2004.

Summary of 138,332 CY2004 Post-Deployment Health Assessments:

Post-Deployment Health Assessments	General Health Concerns	Mental Health Concerns	Exposure Concerns
Health Concerns Indicated	26,618 (19%)	49,408 (36%)	28,526 (21%)
Follow-up Referrals Indicated	18,247 (13%)	22,494 (16%)	17,965 (13%)
Individuals Seen < 90 Days	16,228 (89%)	17,921 (80%)	16,067 (89%)

General Health Concerns:

Branch of Service	Health Assessments	General Health Concerns	Referred for Care	Seen within 90 Days
Army	95,579	23,515	16,670	91%
Navy	3,502	690	362	78%
Air Force	26,344	1,317	585	81%
Marines	12,907	1,096	630	45%
Total	138,332	26,618 (19%)	18,247 (13%)	89%

Mental Health Concerns:

Branch of Service	Health Assessments	Mental Health Concerns	Referred for Care	Seen within 90 Days
Army	95,579	39,304	19,667	86%
Navy	3,502	1,063	351	58%
Air Force	26,344	3,772	779	71%
Marines	12,907	5,269	1697	13%
Total	138,332	49,408 (36%)	22,494 (16%)	80%

Exposure Health Concerns:

Branch of Service	Health Assessments	Exposure Concerns	Referred for Care	Seen within 90 Days
Army	95,579	25,375	16,450	92%
Navy	3,502	576	348	78%
Air Force	26,344	1,391	530	79%
Marines	12,907	1,184	637	43%
Total	138,332	28,526 (21%)	17,965 (13%)	89%

Some key findings and observations regarding post-deployment health concerns include:

- Over 91% (126,192 of 138,332) of redeploying servicemembers reported their overall health as good, very good, or excellent in the provider interview section of the post-deployment health assessment, DD Form 2796.
- Approximately 53% (73,817 of 138,332) of the servicemembers indicated no post-deployment health concerns, per negative responses to the seven questions previously noted from the DD Form 2796, Post Deployment Health Assessment.
- Servicemembers were more likely to indicate post-deployment concerns about their mental health (36%) than about general health (19%) or exposures (21%).

- Providers recommended post-deployment referrals at a slightly higher rate for servicemembers indicating mental health concerns (16%) than for those indicating general health or exposure concerns (13%).
- Servicemembers for whom referrals were indicated received follow-up care within 90 days in the military health system at a slightly greater rate for general health or exposure concerns (89%) than for mental health concerns (80%). It should be noted that a 100% referral completion rate is highly unlikely, due to improvements in health status or individuals changing their minds. This could more likely be the case for mental health concerns, where there are alternative sources of counseling and support such as clergy, respected relatives, or close friends. Conversely, the results can be lower because of unwillingness to seek follow-up care for a variety of reasons, including stigma. However, we would expect that servicemembers who were willing to answer the questions positively and discuss them with the reviewing health care provider during the post-deployment process probably would not be as concerned about perceived stigma.
- The Marine Corps has been analyzing and aggressively addressing the relatively low rate for completion of follow-up referrals. Many of these referrals are for minor medical conditions typically treated at Battalion Aid Stations, which often lack the capability of capturing encounter data in automated information systems. At this time, gaining an accurate picture of the Marine Corps referral completion rate would require a manual review of the referral medical records of all Marines who deployed. Although not feasible for the entire Corps, individual medical records are reviewed during on-site deployment health QA visits, and results have been considerably higher than those found within central electronic databases. For example, during a review at Camp Pendleton, the referral completion rate was 90% (140 medical records reviewed, 29 with referral recommended, and 26 of 29 with appropriate referral documented in the medical record).

DEPLOYMENT-RELATED EXPOSURES

The DoD, through the US Army Center for Health Promotion and Preventive Medicine (USACHPPM), has implemented a comprehensive program for Deployment Occupational and Environmental Health Surveillance to identify potential health hazards, mitigate adverse impact from exposures, and report and archive relevant deployment-related occupational and environmental health surveillance data. The most current USACHPPM report on occupational and environmental monitoring for Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF), covering January 2003 – April 2005, contains results and analyses of nearly 3,900 air, water, and soil samples taken at over 300 locations. Complementing that data, USACHPPM maintains approximately 10,000 environmental surveillance and preventive medicine documents from the US Central Command area of responsibility. Collectively, these occupational and environmental health surveillance documents give the Department a clear look at the operational environments in which our servicemembers are deployed.

The following analyses of incidents from OIF illustrate the Department's commitment and capability to monitor, evaluate, document, retain, and report on deployment-related occupational and environmental exposures. In all cases, incident-specific information on occupational and environmental exposures is being placed in the medical records of individual servicemembers. Rosters of servicemembers involved in specific incidents are also developed to facilitate future

contact for treatment or evaluation by DoD, as well as claims adjudication or clinical case management by the VA. With the possible exception of exposures from the sulfur mine fire at Al Mishraq, for which follow-up evaluations continue to be monitored by the USACHPPM, there are no indications of any significant long-term adverse health effects for US servicemembers.

442nd MP Company at Al Samawah. The 167 soldiers of the 442nd Military Police Company deployed to Iraq in the spring of 2003, with their bivouac site at an old railroad repair facility at Al Samawah. Environmental sampling was performed at the site in May 2003, with all soil samples testing negative for depleted uranium (DU); therefore, exposure to DU was not anticipated. However, because of concerns expressed by servicemembers returning from Iraq, biomonitoring was performed to rule out health effects from unrecognized exposure to DU.

Twenty-three of the soldiers returned to Fort Dix in the fall of 2003 due to various medical problems unrelated to DU. (The remaining 144 soldiers returned to Fort Dix in April 2004.) Because of concerns regarding possible exposure to DU expressed by some of the early returnees (and arising from discussions with on-site coalition personnel), three of these soldiers were tested under the direction of the USACHPPM. All three had normal levels of uranium when compared to the general US population. None of the specimens warranted further analysis to differentiate depleted uranium from the natural form since they did not contain elevated uranium levels.

Upon the return of the remaining 442nd MPC soldiers to the US in 2004, all who had deployed were offered testing for uranium. Sixty-six of the 167 soldiers initially participated in the testing; one soldier participated several months later. All tested within the normal range. The samples were analyzed by the USACHPPM, the Armed Forces Institute of Pathology (AFIP), and the US Centers for Disease Control and Prevention (CDC). The uranium levels of the 442nd were found to be lower than those seen in the unexposed general population, in which the main source of uranium is dietary. This testing confirmed that the 442nd servicemembers were not exposed to DU.

To help allay servicemember concerns about exposures and address associated health issues, medical experts on DU from the Army met with 442nd MP members during their time in medical hold status at Fort Dix in April 2004. A similar town hall meeting was held two weeks later with the 442nd Family Support Group in Orangeburg, NY. Another group of military DU experts simultaneously met with the main body of 442nd personnel in Kuwait (prior to their return) to discuss DU and testing, and then held a follow-up meeting at Fort Dix one week later.

Qarmat Ali Water Treatment Plant. In March 2003, the US Army Corps of Engineers engaged a contractor to restore operations at the Qarmat Ali Industrial Water Treatment Plant in Iraq in support of oil production. In late April 2003, the Army's 1st Battalion (162nd Infantry) and the 133rd Military Police Company (MPC) arrived at the site to provide security. The contractor expressed concern in July 2003 about chemical contamination at that location, including sodium dichromate, polychlorinated biphenyls (PCBs), and chlorine, which was leaking from gas cylinders. Environmental samplings were performed from August through October 2003 by the contractor and a British military unit, as well as by a US Army Special Medical Augmentation Response Team. In September, the 152nd Infantry assumed security

duties, and the contractor applied an encapsulation layer of liquid asphalt and aggregate over contaminated soil at the site.

Before encapsulation, testing by the contractor reportedly showed elevated chromium blood levels in some of its personnel, although the US Army preventive medicine team was unable to verify this. Soil and air sampling by the contractor were inconsistent, with very high levels of hexavalent chromium in the soil but minimal chromium in the air. Sampling by the British forces also indicated elevated chromium levels in the soil pre-containment, but after containment all environmental monitoring data were satisfactory. Following the containment procedure, repeat air sampling by the US Army team showed extremely low levels of airborne hexavalent chromium. By that time, sodium dichromate was no longer being used at the facility.

Because amounts of PCBs and chromium in the air were so small after the encapsulation, and because exposure before encapsulation was so brief, the Army team estimated that exposures to those substances by the 152nd personnel would not exceed the long-term guidelines established by the military. However, the team concluded that some US forces might possibly have been exposed to PCBs in the soil, and chromium in the soil and air, for a very brief period. Because of a potential risk from possible short-term exposure to chromium and PCBs, comprehensive occupational health assessments were performed during October 2003 on Army personnel providing security at the site.

A total of 105 members of the 1st Battalion (162nd Infantry) and the 133rd MPC were administered a questionnaire on exposures and symptoms. Only 85 individuals reported spending any time at the water treatment facility (averaging 8.6 hours), with only 15 reporting symptoms that the servicemembers themselves felt were related to the facility. The majority of symptoms involved non-specific eye and throat irritations that the Army team thought could be related to dust. Based on environmental data projections and the short time spent on-site, occupational and environmental health specialists assessed the risk as extremely low; consequently, comprehensive physical examinations and testing were not carried out. In retrospect, and based on the absence of significant findings for the 152nd Infantry personnel who had far greater potential exposures (see below), this assessment appears correct.

Because the 152nd did not arrive at the site until September 2003, and since the containment procedure occurred shortly thereafter, the one-year maximum exposure limits for airborne chromium and PCBs were not exceeded for that group. These individuals had been on-site at the water treatment plant for an average of 147 hours at the time of their evaluations. Of the 161 individuals, 137 (including 10 civilians) underwent comprehensive occupational medicine evaluations. (Ten individuals declined evaluation and 14 were unavailable.) Each evaluation included a history and physical examination, blood and urine testing for chromium, complete blood counts, liver and kidney function tests, serum chemistries, and urinalysis related to possible chromium exposure. Pulmonary function tests and chest x-rays were also performed.

Thirty-seven of the 137 individuals (27%) reported non-specific symptoms, with nasal irritation being the most common. Individuals with symptoms had spent an average of 197 hours on site, compared to an average of 129 hours for those without symptoms. Upon testing the blood for chromium, more than half the results were below the detection level. When compared

to two reference ranges for chromium blood values, these results were no different than those that could be expected in a normal population without any occupational exposure to chromium. Also, the presence of symptoms did not correlate with elevated chromium levels. The group with symptoms had lower chromium levels, suggesting that the symptoms were unrelated to any possible chromium exposure. Upon physical examination, 39 individuals (30%) had some abnormal findings, with 29 having nasal findings including minimal signs of irritation related to allergies, dust, sand, and wind. No personnel exhibited any of the classic symptoms associated with excessive chromium exposure, such as nasal lining defects or skin ulcers. The presence of any abnormal physical findings did not correlate with either a higher chromium blood level or other laboratory abnormality.

In summary, there was no evidence of any abnormalities associated with potential environmental exposures at the Qarmat Ali site. Because exposure durations were brief and levels of contaminants were low, US personnel at the Qarmat Ali site did not exceed the annual limit of exposure to PCBs and chromium, and never exceeded the short-term exposure limit for chlorine. Analysis of the data did not show any association between blood chromium levels and time spent at the site, the presence of symptoms, or abnormal physical findings. The US Army team evaluating the environmental exposures concluded that pre-existing individual medical conditions along with exposures to the heat, sand, dust, and wind pervasive in that area of the world, could likely have accounted for the symptoms and any abnormal findings demonstrated by the servicemembers. Based on the low exposure levels and absence of short-term health effects, no long-term adverse health effects were anticipated.

Baghdad Sarin Exposure. On May 15, 2004, an improvised explosive device (IED) was reported along a coalition force supply route in southwest Baghdad. The IED subsequently exploded and a US Army explosive ordnance detachment (EOD) team responded to the site approximately 45 minutes after detonation. While evacuating IED pieces back to camp, two EOD team soldiers displayed symptoms of Sarin exposure, consistent with a mild dose. The two soldiers were treated at their unit's aid station, fully recovered, and returned to full duty within two weeks of their exposure. Other US forces responding to the IED (including an escort team, ambulance crew, and additional EOD personnel) were also potentially exposed to the Sarin and may have received a minor dose, certainly less that what the two EOD team soldiers received. These individuals were medically evaluated on the same day as the IED explosion and none demonstrated any symptoms consistent with exposure to Sarin. Subsequent field tests of the IED confirmed the presence of Sarin, which is a militarized chemical agent. The health effects of acute exposure are well documented, and soldiers who did not exhibit symptoms at the time should not experience later health effects. While the population present in Baghdad on May 15, 2004, was exposed to minute amounts of Sarin from the exploded IED, these amounts were too small to have caused any adverse health effects.

Ash Shuaiba Port. The US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has been conducting environmental surveillance at Ash Shuaiba Port in Kuwait since 1999, when results of air samples showed high concentrations of sulfur dioxide and carbon monoxide. At that time, the USACHPPM recommended housing personnel off-site in a less industrialized area to reduce potential exposures. The Camp Spearhead life support area (LSA) was later established at Ash Shuaiba Port in support of Operation Iraqi Freedom. Continuous air

monitoring began in April 2003. In 2003, the USACHPPM reported that suspended particulate matter poses a potential threat to LSA occupants. The risk level was identified as moderate for short-term upper respiratory symptoms, especially for individuals who may be susceptible to respiratory distress. Concentrations are low enough not to cause long-term effects. Accidental or intentional release of toxic industrial chemicals could prove catastrophic, with deaths or long-term disabilities. Mitigation strategies include continuation of air sampling; improved risk communication (including two USACHPPM-led town hall meetings, a fact sheet, and briefings for commanders and soldiers); implementation of dust suppression measures; work schedule adjustments to reduce time spent outdoors; and the use of air purifying respirators such as the M-40 mask, when appropriate.

Camp War Eagle. From October 9 through 14, 2004, the 1st Brigade Combat Team (BCT) of the 1st Cavalry Division at Camp War Eagle in Iraq collected six air samples that indicated levels of small particulates and lead that exceeded long-term exposure guidelines for the military. Experts from the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) were consulted and determined that biomonitoring of personnel would be necessary if there was continual exposure to these levels of lead. The USACHPPM specifically recommended that additional samples be obtained at Camp War Eagle to test current levels of particulates; that the military units on site at the time of the sampling be identified; and that biomonitoring of personnel be implemented if indicated by the sample test results.

The USACHPPM prepared facts sheets on airborne lead for reference by on-site health care providers and servicemembers, and also provided copies of the current fact sheet on particulate matter to the 1st Brigade Combat Team, while continuing their investigation to determine a potential source for the particulates and lead. USACHPPM also developed risk communication messages to assist health care providers in reviewing blood lead determinations and in making recommendations for follow-up with soldiers, and additionally coordinated with the Centers for Disease Control and Prevention (CDC) to provide a portable blood lead analyzer to the 1st Brigade Combat Team.

Because of the continuing concern over increased lead in the air, approximately 1400 blood lead, zinc protoporphyrin (ZPP), and complete blood counts were drawn to monitor for toxic effects due to lead exposure. There were a few slightly elevated ZPP test results that, upon follow-up, were attributed to other causes, and when repeated, were within normal limits. (The ZPP test reflects chronic lead exposure; it is usually not elevated unless the individual has been exposed to increased lead for at least four months. However, it is not a specific test of lead toxicity. Some of the other conditions that cause elevation of the ZPP include certain anemias and liver diseases.) The remaining test results were normal when compared to the general US population without any occupational lead exposure. Consequently, it was determined that none of the servicemembers had lead toxicity associated with exposures at this site.

Al Mishraq Sulfur Plant. For two months during the summer of 2003, US military forces, Iraqi firefighters, and civilians fought a sulfur mine fire at the Al Mishraq Sulfur Plant, which is located northwest of Baghdad over the largest proven sulfur mine in the world. The fire started on June 25, 2003, after a company employee accidentally started a fire in the sulfur holding yards. The open storage area contained over 500 million tons of sulfur intended for various

industrial uses. The 1st Brigade Combat Team of the 101st Airborne Division provided most of the 150 soldiers who eventually extinguished the fire. The 326th Engineer Battalion, the 887th Engineer Company, the 938th Fire Fighting Detachment, and the 52nd Engineer Battalion also participated, along with a Reserve engineer company from New Mexico and an Oregon National Guard company, as well as the Iraqi firefighters and civilian volunteers. In addition to actively fighting the fire, US military personnel constructed an earthen dam to prevent contamination of the Tigris River with sulfuric acid from the combination of sulfur dioxide and runoff water from the fire-fighting efforts. Runoff water was pooled and then neutralized with limestone to minimize the risk from contact. Smoke from the fire spread north almost to Mosul, and southeast toward An Nasariyah. Although US forces evacuated Iraqi citizens to minimize civilian exposures, smoke inhalation was suspected in the deaths of two Iraqi civilians.

Firefighters were exposed to various combustion products, including sulfur dioxide and hydrogen sulfide, which exceeded US civilian (EPA) and military guidelines. Initially, personal protective equipment was lacking or inadequate; later, gloves, M40 protective masks, and coveralls were worn. The USACHPPM provided environmental monitoring support, along with the 61st Preventive Medicine Detachment and other preventive medicine assets within the 101st Airborne Division. Elevated hydrogen sulfide levels were confined to within a three-quarter mile radius of the fire. Ambient monitoring showed that sulfur dioxide levels within 12 km downwind exceeded the one-hour military and civilian guidelines. Even up to 48 km, over half of the sulfur dioxide measurements taken downwind exceeded the guidelines. Small particulate matter (less than 10 microns in size) also was measured downwind and found to be high.

Sulfur dust is a mild respiratory and skin irritant; however, combustion products may cause unconsciousness and death (hydrogen sulfide) or breathing difficulties (sulfur dioxide). Sulfur dioxide combines with water (or perspiration) to form sulfuric acid. Molten sulfur creates smoke containing sulfuric acid that can cause dermal or respiratory burns. The USACHPPM estimated that US camps downwind of the fire collectively experienced an average of 20 additional sick calls daily due to respiratory complaints and burns. Particulate matter (consisting of sulfates, ammonium nitrate, carbon, trace elements, and organic compounds) was also measured in high concentration downwind of the fire. Particulates less than 10 microns in size could cause a variety of reversible respiratory and eye symptoms. A small percentage of firefighters experienced symptoms such as runny nose or blood in their nasal mucus due to improperly sealed masks or saturated filters. Firefighters wearing M40 protective masks were initially instructed to change filters once every 24 hours, but the USACHPPM later modified this instruction to every 2-3 hours, which dramatically reduced the number of complaints of irritated sinuses and skin. Additional shower facilities were installed near the fire location to allow firefighters a better opportunity to decontaminate following sulfur dioxide exposures. The USACHPPM recommended that firefighters and anyone else working directly under the plume increase their shower frequency to three times daily.

At its peak, the sulfur plant fire caused short-term health effects, including skin and respiratory irritation. Servicemembers complained of irritation of the nasal passages, throat, lungs, skin, and eyes. However, based on the short duration of exposures, no long-term health effects were anticipated, and no deaths or serious health consequences were recorded for any US military personnel. The 62nd Medical Brigade prepared an info paper for affected individuals to

lessen concerns about adverse health effects and provide detailed instruction on reducing exposure risks. The paper was distributed to the 326th Engineer Battalion, the Combined Joint Task Force 7 partners, Coalition Forces, and Iraqi citizens within 50 miles of the sulfur fire. The document specifically informed potentially exposed individuals of the chemicals present; health effects associated with exposure to these chemicals; ambient levels observed during June 26-27 time frame; and safety precautions to reduce exposure to smoke and pollutants.

The USACHPPM and the 61st Medical Detachment also developed a roster of firefighters, including information on location and amount of time spent fighting the fire. The details regarding each servicemember's exposure to the sulfur fire smoke were recorded, including documentation of major complaints, conditions, exposure levels, test results, health implications associated with the source, treatment, and any follow-up instructions for health care providers conducting post-deployment evaluations. This information was subsequently incorporated into individual medical records, along with copies of the pre- and post-deployment health assessments and documentation of any medical care provided during the deployment.

Some US servicemembers not involved in firefighting activities nonetheless indicated concerns because of their location within a five-mile radius downwind of the fire. The units affected were instructed to interview all servicemembers and provide them with a pulmonary function test (PFT). Approximately 2,500-3,000 servicemembers fell within this category. However, since there was no documented exposure, this evaluation was purely voluntary. Approximately 1,500 of these servicemembers have been interviewed and tested, with the remainder declining to participate. Soldiers with either reduced PFTs or with any respiratory symptoms were referred for an allergy evaluation, with potential referral to pulmonology if the allergist did not arrive at a diagnosis. A total of 294 servicemembers were referred by the Preventive Medicine Service at Fort Campbell to allergists at either the Vanderbilt University School of Medicine or the Walter Reed Army Medical Center. Since there was no indication for any of these servicemembers to undergo pre-deployment pulmonary function tests, there is no baseline for comparison. Many of the referred individuals were smokers who probably would not have exhibited optimal pulmonary functions prior to deployment had they been tested earlier. Moreover, individual variation may result in some persons having reduction in some pulmonary functions while not having any lung disease. The outcomes of these evaluations are being investigated further by the USACHPPM.

Particulate Matter. Respirable particulate matter has been identified as the most significant environmental exposure throughout the US Central Command (CENTCOM) area of responsibility (AOR). Levels of particulate in the air have routinely exceeded EPA guidelines for PM10 (particulate matter less than 10 microns in size). The US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that operational risk management estimate from exposure to elevated levels of PM10 in the CENTCOM AOR is moderate (may impact the mission but do not pose significant operational risks). Short-term adverse health effects typically include coughing, eye and throat irritation, congestion, and potential for an increase incidence of upper respiratory infections, as well as the worsening or reemergence of pre-existing asthma or the development of new-onset asthma. Actions taken to mitigate exposures to dust include curtailing heavy physical activity and training during dust storms and covering respiratory openings with cravats/kerchiefs during high dust events.

Depleted Uranium Bioassay Results. The Assistant Secretary of Defense for Health Affairs has published policy guidance (on May 30, 2003, and April 9, 2004) for the medical management of servicemembers deployed in support of Operation Iraqi Freedom (OIF) who have been exposed to DU. The DoD program for addressing DU medical concerns related to OIF exposures includes the identification of personnel involved in DU exposures, which are divided into three levels: Level I—personnel in or near combat vehicles struck by DU munitions or who entered vehicles immediately afterward to attempt rescue; Level II—personnel who routinely entered DU-damaged vehicles or fought fires involving DU munitions; and Level III—personnel involved in all other DU-related events. Bioassays are required for all personnel with Level I and II DU exposures, and may be ordered for personnel with Level III exposures on a case-specific basis as part of appropriate medical management or to address the concerns of individual servicemembers.

Depleted uranium exposures and bioassay results are tracked and reported by the Military Services on a semi-annual basis. Through March 2005, DU urine bioassays have been performed on a total of 1,970 individuals. Since the inception of reporting, we have identified 136 personnel with *total uranium* levels above 50 ng/gram urine creatinine, which is considered the upper bound of normal dietary uranium in the US population. Seven individuals have been identified with detectable levels of *depleted uranium* in their urine. Six of the seven either had DU fragments removed or are suspected to have had DU fragments retained in their bodies at the time of testing; urine bioassay results for the seventh servicemember are not yet confirmed. None of the 1,970 individuals identified to date have total uranium levels or depleted uranium levels that either caused, or are expected to cause, adverse health effects. The following chart describes the most current Operation Iraqi Freedom DU bioassay results:

OIF Depleted Uranium (DU) Bioassay Results
Cumulative Totals
June 1, 2003 – March 31, 2005

Level	Army	Navy/ Marines	Air Force	Total	Elevated Total Uranium	Detectable DU	Retained Fragments or Fragment-Type Injury
I	175	41	2 [2]	218	8 [2,4]	6 [2]	12
II	223	203	7	433	13	0	1 [7]
III	187	22	7	216 [3]	2	0	6 [8]
Uncat [1]	1093	10	0	1103	113 [5]	1 [6]	28
Total	1678	276	16	1970	136	7	47

1. Indicates samples that were submitted with incomplete or missing DU exposure assessment forms. The Services are continuing to clarify the DU exposure classification levels for these servicemembers.
2. One Level I servicemember had a marginally elevated total uranium and possible DU detection. A small fragment removed from his eyelid was positive for DU; confirmatory results are pending.
3. Represents only the number of Level III personnel who received bioassays, which are optional for Level III (incidental) exposures.
4. Only four of the eight individuals with elevated total uranium results (>50ng/L) have been confirmed with a repeat test; results for the others are pending.
5. Includes 23 soldiers identified in the most recent reporting period. Initial elevated total uranium results (>50ng/L) for these soldiers have not yet been confirmed with a repeat test; results are pending.

6. This individual, now separated from active duty, submitted a spot urine sample but no DU exposure questionnaire. The Army is now attempting to contact him to complete the exposure assessment.
7. This Level II servicemember entered a DU-impacted vehicle and received two embedded "splinters" which were subsequently removed, analyzed, and found not to be DU.
8. Fragments from Level III servicemembers have been analyzed for many reasons, such as to ensure DU residues were not used in an improvised explosive device.

The Deployment Health Clinical Center (DHCC), located at the Walter Reed Army Medical Center in Washington, DC, serves as the Department of Defense central source for DU-related case management guidance and the archive for DU-related patient information and test results. The DHCC also coordinates referrals to the Department of Veterans Affairs (VA) program at the Baltimore VA Medical Center for the evaluation and monitoring of servicemembers and veterans with embedded DU fragments. The ongoing identification, evaluation, and clinical management of servicemembers deployed in support of OIF who possibly have been exposed to depleted uranium is both vital to their well-being and critical to the continued use of DU munitions and armor in US military operations.

FORCE HEALTH PROTECTION QUALITY ASSURANCE

Department of Defense Directive 6200.4, "Force Health Protection (FHP)," provides the authority for ensuring that all military servicemembers are physically and mentally fit to carry out their missions; that the health of each servicemember is being effectively promoted, improved, conserved, and restored across the full range of military activities and operations; and that programs and processes are in place to promote and sustain a healthy and fit force, prevent injury and illness, protect the force from health hazards, and deliver the best possible medical and rehabilitative care to the sick and injured anywhere in the world. As the principal staff advisor for DoD health policies and programs, the Assistant Secretary of Defense for Health Affairs is responsible for monitoring Force Health Protection implementation and ensuring that quality assurance programs are in place.

The Department has drafted a DoD Instruction on Force Health Protection (FHP) Quality Assurance (QA) that is currently under review by the Military Services and the Joint Staff. The proposed FHP QA program builds upon and encompasses our current deployment health quality assurance activities, which have been ongoing since January 2004 and were addressed in detail in our interim report last April. As presently envisioned, the DoD FHP QA program will identify, monitor, and report on a minimum core group of key force health protection elements, including individual medical readiness, physical fitness, deployment-related exposures, pre- and post-deployment health assessments and reassessments, research and development, and lessons learned. This QA program is designed to help ensure that DoD's and the Services' actions, programs, and efforts yield positive answers to the following FHP questions:

- Are military servicemembers medically ready and physically fit to deploy?
- Where are they deployed and to what health hazards have they been exposed?
- Are force health protection/deployment-related health needs of servicemembers being met?
- Is force health protection being put into practice by the Military Services and the Combatant Commands?

The Assistant Secretary of Defense for Health Affairs, under the Under Secretary of Defense for Personnel and Readiness, and through the Deputy Assistant Secretary of Defense for Force Health Protection and Readiness, will exercise overall responsibility for the DoD FHP QA program and monitor its DoD-wide implementation. We anticipate Service implementation of the new DoD FHP QA program to begin by the end of CY2005.