Military Deployment
Periodic Occupational and Environmental Monitoring Summary (POEMS): Camp Redleg, UAE: 2014 to 2016

AUTHORITY: This periodic occupational and environmental monitoring summary (POEMS) has been developed in accordance with Department of Defense (DoD) Instructions 6490.03, 6055.05, and JCSM (MCM) 0017-12, (References 1-3).

PURPOSE: This POEMS documents the Department of Defense (DoD) assessment of occupational and environmental health (OEH) risks for Camp Redleg, United Arab Emirates (UAE). It presents a qualitative summary of health risks identified at these locations and their potential medical implications. The report is based on information collected from January 2014 to March 2016 to include deployment OEH surveillance sampling and monitoring data (e.g., air, water, and soil), field investigation and health assessment reports, as well as country and area-specific information on endemic diseases.

This assessment assumes that environmental sampling at Camp Redleg during this period was performed at representative exposure points selected to characterize health risks at the *population–level*. Due to the nature of environmental sampling, the data upon which this report is based may not be fully representative of all the fluctuations in environmental quality or capture unique occurrences. While one might expect health risks pertaining to historic or future conditions at this site to be similar to those described in this report, the health risk assessment is limited to January 2014 to March 2016.

The POEMS can be useful to inform healthcare providers and others of environmental health conditions experienced by individuals deployed to Camp Redleg during the period of this assessment. However, it does not represent an individual exposure profile. Individual exposures depend on many variables such as; how long, how often, where and what someone is doing while working and/or spending time outside. Individual outdoor activities and associated routes of exposure are extremely variable and cannot be identified from or during environmental sampling. Individuals who sought medical treatment related to OEH exposures while deployed should have exposure/treatment noted in their medical records on a Standard Form (SF) 600 (Chronological Record of Medical Care).

SITE DESCRIPTION: Camp Redleg is located on Al Minhad Airbase in Dubai, UAE. Dubai is located on the southeast coast of the Persian Gulf and is 174 feet (53 meter) above mean sea level. The airbase is operated by the UAE Air Force.

SUMMARY: Conditions that may pose a moderate or greater health risk are summarized in Table 1. Table 2 provides population based risk estimates for identified OEH conditions at Camp Redleg. As indicated in the detailed sections that follow Table 2, controls established to reduce health risk were factored into this assessment. In some cases, e.g., ambient air, specific controls are noted, but not routinely available/feasible.

POEMS
Table 1: Summary of Occupational and Environmental Conditions with MODERATE or Greater Health Risk

Short-term health risks & medical implications:

The following hazards may be associated with potential acute health effects in some personnel during deployment at Camp Redleg, UAE:

Food/waterborne diseases (e.g., bacterial diarrhea, hepatitis A, diarrhea-protozoal); other endemic diseases (Crimean-Congo hemorrhagic fever, Leptospirosis, Q fever); heat stress; and continuous noise. For food/waterborne diseases (e.g., bacterial diarrhea, hepatitis A, diarrhea-protozoal), if ingesting local food and water, the health effects can temporarily incapacitate personnel (diarrhea) or result in prolonged illness (Hepatitis A). Risks from food/waterborne diseases may have been reduced with preventive medicine controls and mitigation, which includes Hepatitis A and Typhoid fever vaccinations and only drinking from approved water sources in accordance with standing CENTCOM policy. For other vector-borne endemic diseases (Crimean-Congo hemorrhagic fever), these diseases may constitute a significant risk due to exposure to biting vectors; risk reduced to low by proper wear of the treated uniform, application of repellent to exposed skin and bed net, and appropriate chemoprophylaxis. For water contact diseases (Leptospirosis) activities involving extensive contact with surface water increase risk. Animal contact diseases (Q fever), pose year-round risk. For heat stress, risk can be greater during months of June through September, and greater for unacclimated personnel, and for susceptible persons including those older than 45, of low fitness level, or with underlying medical conditions. Risks from heat stress may have been reduced with preventive medicine controls, work-rest cycles, and mitigation. For continuous noise exposure, the short-term risk is to personnel working near major noise sources; risk may have been reduced by appropriate hearing protection used by personnel in higher risk areas (around sources of continuous noise such as flightlines, landing zones, and power production/generators).

Air quality: For inhalable coarse particulate matter less than 10 micrometers in diameter (PM_{10}) from environmental dust, the PM_{10} overall short-term risk was not evaluated due to 'no data for analysis'. For inhalable fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) from environmental dust, the $PM_{2.5}$ overall short-term risk was not evaluated due to nonrepresentative and insufficient data for analysis. However, Camp Redleg is a hot, arid and dust-prone desert environment, also subject to vehicle traffic. Consequently, exposures to PM_{10} and $PM_{2.5}$ may vary, as conditions may vary, and may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel while at this site, particularly exposures to high levels of dust such as during high winds or dust storms. For PM_{10} and $PM_{2.5}$, certain subgroups of the deployed forces (e.g., those with pre-existing asthma/cardio-pulmonary conditions) are at greatest risk of developing notable health effects. Although most effects from exposure to particulate matter should have resolved post-deployment, providers should be prepared to consider the relationship between deployment exposures and current complaints. Some individuals may have sought treatment for acute respiratory irritation during their time at Camp Redleg. Personnel who reported with symptoms or required treatment while at this site should have exposure/treatment noted in medical record (e.g., electronic medical record and/or on a Standard Form (SF) 600 (Chronological Record of Medical Care).

Long-term health risks & medical implications:

The following hazards may be associated with potential chronic health effects in some personnel during deployment at Camp Redleg, UAE:

For continuous noise exposure, the long-term risk is to personnel working near major noise sources. Risk may have been reduced to personnel working near major noise sources (e.g., operations around sources of continuous noise such as flightlines, landing zones, and power production/generators) by wearing proper hearing protection. Certain individuals may need to be followed/evaluated for specific occupational exposures/injuries (e.g., annual audiograms as part of the medical surveillance for those enrolled in the Hearing Conservation Program; and personnel covered by Respiratory Protection Program and/or Hazardous Waste/Emergency Responders Medical Surveillance).

Air Quality: For inhalable $PM_{2.5}$ from environmental dust, the overall long-term risk was not evaluated for Camp Redleg due to nonrepresentative and insufficient data for analysis. Inhalable coarse PM_{10} from environmental dust was not evaluated for long-term risk due to insufficient data for analysis and due no available health guidelines. However, Camp Redleg is a hot, arid and dust-prone desert environment, also subject to vehicle traffic, and conditions may have varied. For inhalational exposure to high levels of dust and particulate matter, such as during high winds or dust storms, it is considered possible that some otherwise healthy personnel who were exposed for a long-term period to dust and particulate matter could develop certain health conditions (e.g., reduced lung function, cardiopulmonary disease). Personnel with a history of asthma or cardiopulmonary disease could potentially be more likely to develop such chronic health conditions. While the

PM exposures are documented and archived, at this time there are no specific recommended, post-deployment medical surveillance evaluations or treatments. Providers should still consider overall individual health status (e.g., any underlying conditions/susceptibilities) and any potential unique individual exposures (such as occupational or specific personal dosimeter data) when assessing individual concerns.

Table 2. Population-Based Health Risk Estimates – Camp Redleg, UAE [1, 2]

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
AIR			
Particulate matter less than 10 micrometers in diameter (PM_{10})	Short-term: No data available. Daily levels vary; acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).	Limiting strenuous physical activities when air quality is especially poor; and actions such as closing tent flaps, windows, and doors.	Short-term: No data available. Daily levels vary; acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).
	Long-term: No health guidelines and insufficient data were available for health risk analysis.		Long-term: No health guidelines and insufficient data were available for health risk analysis.
Particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$)	Short-term: Data not representative of exposure and is insufficient to characterize risk. Daily levels vary; acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).	Limiting strenuous physical activities when air quality is especially poor; and actions such as closing tent flaps, windows, and doors.	Short-term: Data not representative of exposure and is insufficient to characterize risk. Daily levels vary; acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).
	Long-term: Data not representative of exposure and is insufficient to characterize risk. A small percentage of personnel may be at increased risk for developing chronic conditions, particularly those more susceptible to acute effects (e.g., those with asthma/pre-existing respiratory diseases).		Long-term: Data not representative of exposure and is insufficient to characterize risk. A small percentage of personnel may be at increased risk for developing chronic conditions, particularly those more susceptible to acute effects (e.g., those with asthma/pre-existing respiratory diseases).
ENDEMIC DISEASE			
Food borne/Waterborne (e.g., diarrhea-bacteriological)	Short-term: High (Bacterial diarrhea) to Moderate (Hepatitis A, Diarrhea-protozoal) to Low (Brucellosis, Hepatitis E, Typhoid fever). If ingesting local food/water, the health effects can temporarily incapacitate personnel (diarrhea) or result in prolonged illness (Hepatitis A, Typhoid fever, Brucellosis, Hepatitis E).	Preventive measures include Hepatitis A and Typhoid fever vaccination and consumption of food and water only from approved sources.	Short-term: Low to none

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
	Long-term: Not an identified source of health risk.		Long-term: No data available
Arthropod Vector Borne	Short-term: Moderate (Crimean-Congo hemorrhagic fever) to Low (Leishmaniasis-cutaneous, Leishmaniasis- visceral, Sindbis, Sandfly fever, Typhus-murine, West Nile fever).	Preventive measures include proper wear of treated uniform, application of repellent to exposed skin and bed net use.	Short-term: Low
	Long-term: Low (Leishmaniasis-visceral infection)		Long-term: No data available
Water-Contact (e.g., wading, swimming)	Short-term: Moderate for Leptospirosis.	Recreational swimming in surface waters not likely in this area of UAE during this time period.	Short-term: Low to none for Leptospirosis.
	Long-term: No data available		Long-term: No data available
Respiratory	Short-term: Low ([Tuberculosis (TB)], Meningococcal meningitis).	Providing adequate work and living space, medical screening, and vaccination.	Short-term: Low to none
	Long-term: No data available		Long-term: No data available
Animal Contact	Short-term: Moderate (Q-fever), Low (Rabies).	Prohibiting contact with, adoption, or feeding of feral animals in accordance with (IAW) U.S. Central Command (CENTCOM) General Order (GO) 1C. Risks are further reduced in the event of assessed contact by prompt post-exposure rabies prophylaxis IAW The Center for Disease Control's (CDC) Advisory Committee on Immunization Practices guidance.	Short-term: Low to none
	Long-term: Low (Rabies)		Long-term: No data available
VENOMOUS ANIMAL/ INSECTS			
Snakes, scorpions, and spiders	Short-term: Low, if encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects.	Risk reduced by avoiding contact, proper wear of the uniform (especially footwear), and timely treatment.	Short-term: Low, if encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects.
	Long-term: Not an identified source of health risk.		Long-term: No data available
HEAT/COLD STRESS			
Heat	Short-term: Low to High. Risk can be greater during months of June through September and greater for	Work-rest cycles, proper hydration and nutrition, and Wet Bulb Globe	Short-term: Low. Risk can be greater during months of June through September and greater for

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
	unacclimated personnel.	Temperature (WBGT) monitoring.	unacclimated personnel.
	Long-term: Low; However, the health risk may be greater to certain susceptible persons–those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions.		Long-term: Low; However, the risk may be greater to certain susceptible persons–those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions.
Cold	Short-term: Low	Risks from cold stress reduced with protective measures such as use of the buddy system, limiting exposure during cold weather, proper wear of issued protective clothing, and proper nutrition and hydration.	Short-term: Low risk of cold stress/injury.
	Long-term: Low; Long-term health implications from cold injuries were rare but could occur, especially from more serious injuries such as frostbite.		Long-term: Low; Long-term health implications from cold injuries were rare but could occur, especially from more serious injuries such as frostbite.
NOISE			
Continuous (Flightline, Power Production)	Short-term: High to Low; High risk to individuals working near major noise sources without proper hearing protection.	Hearing protection used by personnel in higher risk areas	Short-term: Low risk to the majority of personnel and to individuals working near major noise sources who use proper hearing protection.
	Long-term: High to Low; High risk to individuals working near major noise sources without proper hearing protection.		Long-term: Low risk to the majority of personnel and to individuals working near major noise sources who use proper hearing protection.
UNIQUE INCIDENTS/ CONCERNS			
Burn Pits	Short-term: Camp Redleg does not have a burn pit.		Short-term: Camp Redleg does not have a burn pit.
	Long-term: Camp Redleg does not have a burn pit.		Long-term: Camp Redleg does not have a burn pit.

[1] This Summary Table provides a qualitative estimate of population-based short- and long-term health risks associated with the general ambient and occupational environment conditions at Camp Redleg. It does not represent a unique individual exposure profile. Actual individual exposures and health effects depend on many variables. For example, while a chemical may be present in the environment, if a person does not inhale, ingest, or contact a specific dose of the chemical for adequate duration and frequency, then there may be no health risk. Alternatively, a person at a specific location may experience a unique exposure which could result in a significant individual exposure. Any such person seeking medical care should have their specific exposure documented in an SF600.

[2] This assessment is based on specific environmental sampling data and reports obtained from January 2014 to March 2016. Sampling locations are assumed to be representative of exposure points for the camp population but may not reflect all the fluctuations in environmental quality or capture unique exposure incidents.

[3] This Summary Table is organized by major categories of identified sources of health risk. It only lists those sub-categories specifically identified and addressed at Camp Redleg. The health risks are presented as Low, Moderate, High or Extremely High for both short- and long-term health effects. The health risk level is based on an assessment of both the potential severity of the health effects that could be caused and probability of the exposure that would produce such health effects. Details can be obtained from the Army Public Health Center (Provisional) [APHC (Prov)]. Where applicable, "None Identified" is used when a potential exposure was identified, no health risk of either a specific short- or long-term health effects were determined. More detailed descriptions of OEH exposures that were evaluated but determined to pose no health risk are discussed in the following sections of this report.

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]

[4] Health risks in this Summary Table are based on quantitative surveillance thresholds (e.g., endemic disease rates; host/vector/pathogen surveillance) or screening levels, e.g., Military Exposure Guidelines (MEGs) for chemicals. Some previous assessment reports may provide slightly inconsistent health risk estimates because quantitative criteria such as MEGs may have changed since the samples were originally evaluated and/or because this assessment makes use of all historic site data while previous reports may have only been based on a select few samples.

1 Discussion of Health Risks at Camp Redleg, UAE by Source

The following sections provide additional information about the OEH conditions summarized above. All risk assessments were performed using the methodology described in the U. S. Army Public Health Command Technical Guide 230, *Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel* (Reference 4). All OEH risk estimates represent residual risk after accounting for preventive controls in place. Occupational exposures and exposures to endemic diseases are greatly reduced by preventive measures. For environmental exposures related to airborne dust, there are limited preventive measures available, and available measures have little efficacy in reducing exposure to ambient conditions.

The ProUCL version 5.0 software package was used for statistical analyses (Reference 5). Means are followed by standard deviation (SD). Risk characterization was based on the 95 percent upper confidence level of the arithmetic mean (95% UCL) or the arithmetic mean depending on the quality and quantity of the data being evaluated. The sample mean is an uncertain estimate of the true mean of the population exposure point concentration (PEPC). The 95% UCL reduces the uncertainty inherent in the sample mean and states with a higher level of confidence that the mean PEPC is no greater than the 95% UCL.

2 Air

2.1 Site-Specific Sources Identified

Personnel deployed to Camp Redleg were exposed to various airborne contaminants as identified by monitoring and sampling efforts between January 2014 to March 2016. Sources of airborne contaminants at the base camp included diesel vehicle and generator exhaust, and dust from unpaved roads and surfaces. In addition, dust storms and periods of high winds contributed to particulate matter (PM) exposures above health-based MEGs at Camp Redleg.

2.2 Particulate Matter, less than 10 micrometers (PM_{10})

2.2.1 Exposure Guidelines:

Short Term (24-hour) PM_{10} (micrograms per cubic meter, ($\mu g/m^3$):

- Negligible MEG = 250
- Marginal MEG = 420
- Critical MEG = 600

Long-term PM_{10} MEG ($\mu g/m^3$):

- Not defined and not available.

2.2.2 Sample data/Notes:

There were no PM_{10} samples from Camp Redleg.

2.2.3 Short-term and long-term health risks:

Not Evaluated.

2.3 Particulate Matter, less than 2.5 micrometers ($PM_{2.5}$)

2.3.1 Exposure Guidelines:

Short Term (24-hour) $PM_{2.5}$ ($\mu g/m^3$):
- Negligible MEG = 65
- Marginal MEG = 250
- Critical MEG = 500

Long-term (1-year) $PM_{2.5}$ MEGs ($\mu g/m^3$):
- Negligible MEG = 15
- Marginal MEG = 65

2.3.2 Sample data/Notes:
Nine valid $PM_{2.5}$ sample was collected in 2014 (five samples), 2015 (two samples) and 2016 (two samples). The range of 24-hour $PM_{2.5}$ concentrations was 32 $\mu g/m^3$ to 153 $\mu g/m^3$ with an average concentration of 58 $\mu g/m^3$, SD=36. The data were not representative of annual exposure and were insufficient to characterize the potential short-term and long-term health risks from $PM_{2.5}$ exposure to U.S. personnel.

2.3.3 Short-term and long-term health risks:
Not Evaluated.

2.4 Airborne Metals from PM_{10} and $PM_{2.5}$

All airborne metals from PM_{10} and $PM_{2.5}$ were below their respective MEGs.

2.5 Volatile Organic Compounds (VOC)

The likely sources of VOCs on Camp Redleg were fuel storage, fuel transfers between storage tanks, and vehicle and aircraft emissions.

2.5.1 Sample data/Notes:
One valid VOCs air sample was collected at Camp Redleg in March 2015. There were no sampling data for 2014 and 2016.

2.5.2 Short-term and long-term health risks:
The data were not representative of annual exposure and were insufficient to characterize the potential short-term and long-term health risks from VOCs exposure to U.S. personnel. However, 1,3,5-trimethylbenzene, acrolein, and butadiene exceeded their respective 1-Year MEGs.

3 Soil

3.1 Site-Specific Sources Identified

3.1.1 Sample data/Notes:
Five valid soil samples were collected at Camp Redleg in April 2014 (three samples) and March 2015 (two samples). The two composite samples were taken at the Camp Redleg and a nearby reverse osmosis water purification unit site. The three discrete samples were taken at a hazardous waste collection point, fuel blivet and the nearby PX. There were no sampling data for 2016.

The primary soil contamination exposure pathways are via dermal contact and dust inhalation. Typical parameters analyzed for included semi volatile organic compounds (SVOCs), heavy metals, polychlorinated biphenyls (PCBs), pesticides, herbicides. If the contaminant was known or suspected, other parameters may have been analyzed for (i.e., Total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) near fuel spills). For the risk assessment, personnel are assumed to remain at this location for 6 months to 1 year.

3.1.2 Short-term health risk:
Currently, sampling data for soil are not evaluated for short-term (acute) health risks.

3.1.3 Long-term health risk:
No parameters exceeded the 1-year Negligible MEGs.

4 Water

In order to assess the risk to U.S. personnel from exposure to water in theater, the Army Public Health Center (Provisional) [APHC (Prov)] identified the most probable exposure pathways based on available information. The water exposures considered were the ingestion of water used for drinking and the use of water for non-drinking purposes (such as personal hygiene, or showering).

4.1 Drinking Water

4.1.1 Site-Specific Sources Identified
Water used as drinking water was bottled water from the Emirates bottling plant. One valid drinking water sample was collected in 2014. There were no sampling data for 2015 and 2016.

4.1.2 Short-term and long-term health risks:
The data were insufficient to characterize the potential short-term and long-term health risks from drinking water exposure to U.S. personnel. All detected chemicals from collected samples were below the short- and long-term Negligible MEGs.

4.2 Water: Used for Other Purposes (Personal Hygiene, Showering, etc.)

U.S. personnel used municipal water at Camp Redleg for non-drinking purposes (i.e., personal hygiene, showering, etc.).

4.2.1 Sample data/Notes:
Three valid water samples representing non-drinking water were collected in 2014 (one sample), 2015 (one sample) and 2016 (one sample) from municipal water.

4.2.2 Short-term and long-term health risks:
The data were not representative of exposure and were insufficient to characterize the potential short-term and long-term health risks from non- drinking water exposure to U.S. personnel. All detected chemicals from collected samples were below the short- and long-term Negligible MEGs.

5 Military Unique

5.1 Chemical Biological, Radiological Nuclear (CBRN) Weapons:

No specific hazard sources were documented in the Defense Occupational and Environmental Health Readiness System (DOEHRS) or the Military Exposure Surveillance Library (MESL) from January 2014 to March 2016 timeframe (References 1 and 6).

5.2 Depleted Uranium (DU):

No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

5.3 Ionizing Radiation:

No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

5.4 Non-Ionizing Radiation:

No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

6 Endemic Diseases[1]

This document lists the endemic diseases reported in the region, its specific health risks and severity and general health information about the diseases. CENTCOM Modification (MOD) 12 (Reference 7) lists deployment requirements, to include immunizations and chemoprophylaxis, in effect during the timeframe of this POEMS.

6.1 Foodborne and Waterborne Diseases

Foodborne and waterborne diseases in the area are transmitted through the consumption of local food and water. Local unapproved food and water sources (including ice) are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. Service Members have little or no natural immunity. There is still underreporting of specific disease incidence. Diarrheal diseases are expected to temporarily incapacitate a very high percentage of U.S. personnel within days if local food, water, or ice is consumed. Hepatitis A and typhoid fever infections typically cause prolonged illness in a smaller percentage of unvaccinated personnel. Vaccinations are required for DOD personnel and contractors. In addition, although not specifically assessed in this document, significant outbreaks of viral gastroenteritis (e.g., norovirus) and food poisoning (e.g., Bacillus cereus, Clostridium perfringens, Staphylococcus) may occur. Key disease risks are summarized below:

Mitigation strategies were in place and included consuming food and water from approved sources, vaccinations (when available), frequent hand washing and general sanitation practices.

6.1.1 Diarrheal diseases (bacteriological)

High, mitigated to Low: Unmitigated health risk to U.S. personnel was high year round. Diarrheal diseases (bacteriological) could be expected to temporarily incapacitate a very high percentage of personnel (potentially 50% per month) within days if local food, water, or ice was consumed. Field conditions (including lack of hand washing and primitive sanitation) may facilitate person-to-person spread and epidemics. Typically, these result in mild disease treated in outpatient setting; recovery and return to duty in less than 72 hours with appropriate therapy. A small proportion of infections may require greater than 72 hours limited duty, or hospitalization.

6.1.2 Hepatitis A

Moderate, mitigated to Low: Unmitigated health risk to U.S. personnel was moderate year round. U.S. Personnel did not drink untreated water, and vaccination for Hepatitis A is required for deployment into the CENTCOM Area of Responsibility (AOR). Hepatitis A typically occurs after consumption of fecally contaminated food or water or through direct fecal-oral transmission under conditions of poor hygiene and sanitation. Field conditions (including primitive sanitation, lack of hand

washing) may facilitate outbreaks driven by person-to-person spread. A typical case involves 1 to 3 weeks of debilitating symptoms, sometimes initially requiring inpatient care; recovery and return to duty may require a month or more.

6.1.3 Diarrhea - protozoal

Moderate, mitigated to Low: Unmitigated health risk to U.S. personnel was moderate year round. In general, *Cryptosporidium* spp., *Entamoeba histolytica*, and *Giardia lamblia* were the most common protozoal causes of diarrhea wherever sanitary conditions were significantly below U.S. standards. A small number of cases (less than 1% per month attack rate) could occur among personnel consuming local food, water, or ice. Outbreaks affecting a higher percentage of personnel were possible with *Cryptosporidium*. Symptomatic cases may vary in severity; typically mild disease demonstrating recovery and return to duty in less than 72 hours with appropriate therapy; severe cases may require 1 to 7 days of supportive care, followed by return to duty.

6.1.4 Typhoid/paratyphoid Fever

Low: Unmitigated health risk to U.S. personnel was low year round. Risk was likely elevated during warmer months. Typhoid and paratyphoid fever are acquired through the consumption of fecally contaminated food or water. The two diseases are clinically similar, and in areas where they are endemic, typhoid typically accounts for 90% of cases. Asymptomatic carriers are common with typhoid and contribute to sustained transmission. In countries with a mixture of primitive and modern sanitation and hygiene, outbreaks of typhoid fever can occur and may involve all age groups. A small number of cases (less than 1% per month attack rate) could occur among unvaccinated personnel consuming local food, water, or ice. With appropriate treatment, typhoid and paratyphoid fever are debilitating febrile illnesses typically requiring 1 to 7 days of supportive care, followed by return to duty.

6.1.5 Brucellosis

Low: Unmitigated health risk to U.S. personnel was low year round. Brucellosis is a common disease in cattle, sheep, goats, swine, and some wildlife species in most developing countries. Humans contract brucellosis through consumption of contaminated dairy products (or foods made with such products) or by occupational exposures to infected animals. The health risk from direct animal contact was likely to be highest in rural areas where livestock were present. The health risk from contaminated dairy products exists countrywide, including urban areas. Rare cases (less than 0.1% per month attack rate) could occur among personnel consuming local dairy products or having direct contact with livestock. With appropriate treatment, brucellosis is a febrile illness of variable severity, potentially requiring inpatient care; convalescence is usually over 7 days even with appropriate treatment.

6.1.6 Hepatitis E

Low: Unmitigated health risk to U.S. personnel was low year round. Risk was typically highest following spring floods. Hepatitis E occurs in four major genotypes. Genotypes 1 and 2, found primarily in Africa and Asia, cause large numbers of sporadic cases, as well as large outbreaks. Fecal contamination of drinking water is the most common source of exposure for these genotypes. Large outbreaks are usually associated with particularly severe breakdowns in baseline sanitation, as often occurs during heavy rainfall which increases mixing of sewage and drinking water sources. Secondary household cases from person-to-person transmission are uncommon. Unlike hepatitis A, where local populations living in poor sanitary conditions were usually highly immune from childhood exposures, immunity levels for hepatitis E were often much lower, even in areas of extremely poor sanitation. Typically, outbreaks of hepatitis E occur primarily among adults. Although data are insufficient to assess potential disease rates, we cannot rule out rates approaching 1% per month

among personnel consuming local food, water, or ice. Rates may exceed 1% per month for personnel heavily exposed during outbreaks in the local population. A typical case involves 1 to 3 weeks of debilitating symptoms, sometimes initially requiring inpatient care; recovery and return to duty may require a month or more.

6.1.7 Short-term health risk:
Low: The overall short-term unmitigated health risk associated with other food borne and waterborne diseases at Camp Redleg was considered high (bacterial diarrhea), moderate (diarrhea-protozoal, hepatitis A) and low (brucellosis, hepatitis E, typhoid fever/paratyphoid fever) if local food or water was consumed. Confidence in the risk estimate was medium.

6.1.8 Long-term health risk:
None identified based on available data. Confidence in the risk estimate was medium.

6.2 Arthropod Vector-Borne Diseases

During the warmer months, the climate and ecological habitat support populations of arthropod vectors, including mosquitoes, ticks, mites, and sandflies. Significant disease transmission is sustained countrywide, including urban areas. Mitigation strategies were in place and included proper wear of treated uniforms, application of repellent to exposed skin, and use of bed nets and chemoprophylaxis (when applicable). Additional methods included the use of pesticides, reduction of pest/breeding habitats, and engineering controls.

6.2.1 Crimean-Congo hemorrhagic fever
Moderate, mitigated to Low: Unmitigated health risk to U.S. personnel was moderate year round. Crimean-Congo hemorrhagic fever (CCHF) infections can occur as sporadic cases or clusters of cases, and are associated with tick bites or occupational contact with blood or secretions from infected animals. Outbreaks of CCHF occur infrequently. It is a very severe illness typically requiring intensive care with fatality rates from 5% to 50%.

6.2.2 Leishmaniasis
Low: Unmitigated health risk to U.S. personnel was low year round. Leishmaniasis is transmitted by sandflies. A small number of cases (less than 1% per month attack rate) could occur among personnel exposed to sandfly bites in areas with infected people, rodents, dogs, or other reservoir animals. In groups of personnel exposed to heavily infected sandflies in focal areas, attack rates can be very high (over 50%). There are two forms of the disease; cutaneous (acute form) and visceral (a more latent form of the disease). The leishmaniasis parasites may survive for years in infected individuals and this infection may go unrecognized by physicians in the U.S. when infections become symptomatic years later. Cutaneous infection is unlikely to be debilitating, though lesions may be disfiguring. Visceral leishmaniasis disease can cause severe febrile illness, which typically requires hospitalization with convalescence over 7 days.

6.2.3 Sandfly fever
Low: Unmitigated health risk to U.S. personnel was low year round. The disease is transmitted by sandflies, which typically bite at night and breed in dark places rich in organic matter, particularly in rodent or other animal burrows. Rare cases are possible. Although data are insufficient to assess potential disease rates, 1% to 10% of personnel could be affected per month; under worst conditions disease rates can be as high as 50% with no mitigation measures in place. Incidents can result in debilitating febrile illness typically requiring 1 to 7 days of supportive care followed by return to duty.

6.2.4 Sindbis (and Sindbis-like viruses)
Low: Unmitigated health risk to U.S. personnel was low year round. Sindbis and sindbis-like viruses are maintained in a bird-mosquito cycle in rural areas and occasionally caused limited outbreaks among humans. The viruses are transmitted by a variety of *Culex* mosquito species found primarily in rural areas. A variety of bird species may serve as reservoir or amplifying hosts. Extremely rare cases (less than 0.01% per month attack rate) could have occurred seasonally (April - November). Debilitating febrile illness often accompanied by rash, typically requires 1 to 7 days of supportive care; significant arthralgias may persist for several weeks or more in some cases.

6.2.5 Typhus-murine (fleaborne)
Low: Unmitigated health risk to U.S. personnel was low year round. Typhus-murine is assessed as present, but at unknown levels. Rare cases are possible among personnel exposed to rodents (particularly rats) and fleabites. Incidents may result in debilitating febrile illness typically requiring 1 to 7 days of supportive care followed by return to duty.

6.2.6 West Nile fever
Low: Unmitigated health risk to U.S. personnel was low year round. West Nile fever was present and maintained by the bird population and mosquitoes that help to transfer the diseases from birds to humans. The majority of infections in young, healthy adults are asymptomatic although it can result in fever, headache, tiredness, and body aches, occasionally with a skin rash (on the trunk of the body) and swollen lymph glands. West Nile fever is a febrile illness typically requiring 1-7 days of inpatient care followed by return to duty; convalescence may be prolonged.

6.2.7 Short-term health risk:
Low: The overall short-term unmitigated health risk associated with arthropod vector-borne diseases at Camp Redleg was considered moderate (Crimean-Congo hemorrhagic fever) and low (sandfly fever, leishmaniasis (cutaneous and visceral), typhus-murine (fleaborne), West Nile fever, and sindbis). Preventive measures such as proper wear of treated uniforms and application of repellent to exposed skin reduced the health risk to low to none for arthropod vector-vector borne diseases. Confidence in the risk estimate was medium.

6.2.8 Long-term health risk:
Low: The unmitigated risk is moderate for leishmaniasis-visceral (chronic). Risk was reduced to low by proper wear of the uniform and application of repellent to exposed skin. Confidence in the risk estimate is high.

6.3 Water Contact Diseases

Tactical operations or recreational activities that involve extensive contact with surface water such as lakes, streams, rivers, or flooded fields may result in significant exposure to leptospirosis. Arid portions of UAE without permanent or persistent bodies of surface water do not support transmission of leptospirosis. Risk was restricted primarily to areas along rivers and lakes. These diseases can debilitate personnel for up to a week or more. Leptospirosis risk typically increases during flooding. In addition, although not specifically assessed in this document, bodies of surface water are likely to be contaminated with human and animal waste. Activities such as wading or swimming may result in exposure to enteric diseases including diarrhea and hepatitis via incidental ingestion of water. Prolonged water contact also may lead to the development of a variety of potentially debilitating skin conditions including bacterial or fungal dermatitis. Mitigation strategies were in place and included avoiding water contact and recreational water activities, proper wear of uniform (especially footwear), and protective coverings for cuts/abraded skin.

6.3.1 Leptospirosis

Moderate, mitigated to Low: Unmitigated health risk to U.S. personnel was moderate year round. Human infections occur through exposure to water or soil contaminated by infected animals and is associated with wading, and swimming in contaminated, untreated open water. The occurrence of flooding after heavy rainfall facilitates the spread of the organism because as water saturates the environment *Leptospira* present in the soil passes directly into surface waters. *Leptospira* can enter the body through cut or abraded skin, mucous membranes, and conjunctivae. Infection may also occur from ingestion of contaminated water. The acute, generalized illness associated with infection may mimic other tropical diseases (for example, dengue fever, malaria, and typhus), and common symptoms include fever, chills, myalgia, nausea, diarrhea, cough, and conjunctival suffusion. Manifestations of severe disease can include jaundice, renal failure, hemorrhage, pneumonitis, and hemodynamic collapse. Recreational activities involving extensive water contact may result in personnel being temporarily debilitated with leptospirosis.

6.3.2 Short-term health risk:

Low: The overall short-term unmitigated health risk associated with water contact diseases at Camp Redleg was considered moderate (leptospirosis). Preventive measures such as avoiding water contact and recreational water activities; and protective coverings for cuts/abraded skin reduced the health risk to low to none. Confidence in the risk estimate was medium.

6.3.3 Long-term health risk:

None identified based on available data. Confidence in the risk estimate was medium.

6.4 Respiratory Diseases

Although not specifically assessed in this document, deployed U.S. forces may be exposed to a wide variety of common respiratory infections in the local population. These include influenza, pertussis, viral upper respiratory infections, viral and bacterial pneumonia, and others. The U.S. military populations living in close-quarter conditions are at risk for substantial person-to-person spread of respiratory pathogens. Influenza is of particular concern because of its ability to debilitate large numbers of unvaccinated personnel for several days. Mitigation strategies were in place and included routine medical screenings, vaccination, enforcing minimum space allocation in housing units, implementing head-to-toe sleeping in crowded housing units, implementation of proper personal protective equipment (PPE) when necessary for healthcare providers and detention facility personnel.

6.4.1 Tuberculosis (TB)

Low: Unmitigated health risk to U.S. personnel was low year round. Tuberculosis (TB) is usually transmitted through close and prolonged exposure to an active case of pulmonary or laryngeal TB, but can also occur with incidental contact. Individuals with prolonged indoor exposure to the local population are at increased risk for latent TB infection.

6.4.2 Meningococcal meningitis

Low: Unmitigated health risk to U.S. personnel was low year round. Meningococcal meningitis is transmitted from person to person through droplets of respiratory or throat secretions. Risk is comparable to the U.S. among unvaccinated personnel who have close contact with the local population. Close and prolonged contact facilitates the spread of this disease. Meningococcal meningitis is a potentially very severe disease typically requiring intensive care; fatalities may occur in 5-15% of cases.

6.4.3 Short-term health risk:
Low: The overall short-term unmitigated health risk associated with respiratory diseases at Camp Redleg was considered low (tuberculosis, meningococcal meningitis). Preventive measures such as vaccination and routine medical screenings reduced the health risk to low to none. Confidence in the risk estimate was medium.

6.4.4 Long-term health risk:
None identified based on available data. TB was evaluated as part of the post deployment health assessment (PDHA). A TB skin test was required post-deployment if potentially exposed and was based upon individual service policies.

6.5 Animal-Contact Diseases

6.5.1 Q-Fever
Moderate, mitigated to Low: Unmitigated health risk to U.S. personnel was moderate year round. Rare cases were possible among personnel exposed to aerosols from infected animals, with clusters of cases possible in some situations. Significant outbreaks (affecting 1-50%) could occur in personnel with heavy exposure to barnyards or other areas where animals are kept. Unpasteurized milk may also transmit infection. The primary route of exposure is respiratory, with an infectious dose as low as a single organism. Q-Fever is a debilitating febrile illness, sometimes presenting as pneumonia, typically requiring 1 to 7 days of inpatient care followed by return to duty. Mitigation strategies include consuming approved food sources, avoidance of animals and farms, dust abatement when working in these areas (wet mop, water sprayed on high volume traffic areas, etc.), and proper PPE for personnel working with animals, and immunization.

6.5.2 Rabies
Low: Unmitigated health risk to U.S. personnel was low year round. Dogs were the primary reservoir of rabies in UAE, and a frequent source of human exposure. Rabies is transmitted by exposure to the virus-laden saliva of an infected animal, typically through bites, but could occur from scratches contaminated with the saliva. No cases of rabies acquired in UAE have been identified in U.S. Service Members to date. The vast majority (>99%) of persons who develop rabies disease will do so within a year after a risk exposure. There have been rare reports of individuals presenting with rabies disease up to six years or more after their last known risk exposure. Mitigation strategies included command emphasis of CENTCOM GO 1C, reduction of animal habitats, active pest management programs, and timely treatment of feral animal scratches/bites.

6.5.3 Anthrax
No risk from anthrax.

6.5.4 Short-term health risk:
Low to None: The overall short-term unmitigated health risk associated with animal contact diseases at Camp Redleg was considered moderate (Q-fever) to low (rabies). Preventive measures such as consuming approved food source, immunization and avoidance of animals and farms reduced the health risk to low to none. Confidence in risk estimate was medium.

6.5.5 Long-term health risk:
Low: The long-term risk for rabies is low because the incubation period for rabies can be several years in rare cases.

7 Venomous Animal/Insect

All information was taken directly from the Armed Forces Pest Management Board (Reference 8) and the Clinical Toxinology Resources web site from the University of Adelaide, Australia (Reference 9). The species listed below have home ranges that overlap the location of Camp Redleg, and may present a health risk if they are encountered by personnel. See Section 10.3 for more information about pesticides and pest control measures.

7.1 Scorpions

- *Androctonus crassicauda (black scorpion)*: Severe envenoming possible and potentially lethal, however most stings cause only severe local pain.

- *Buthacus leptochelys*, *Buthacus yotvatensis*, *Compsobuthus arabicus*, *Compsobuthus maindroni*: Clinical effects unknown; there are a number of dangerous Buthid scorpions, but there are also some known to cause minimal effects only. Without clinical data it is unclear where this species fits within that spectrum.

- *Hemiscorpius arabicus*: Clinical effects uncertain, but related to medically important species, therefore major envenoming cannot be excluded.

- *Hottentotta jayakari*: Moderate envenoming possible but unlikely to prove lethal.

- *Vachoniolus globimanus:* Clinical effects unknown; there are a number of dangerous Buthid scorpions, but there are also some known to cause minimal effects only. Without clinical data it is unclear where this species fits within that spectrum.

7.2 Snakes

- *Cerastes cerastes* and *Cerastes gasperettii*: Potentially lethal envenoming, though unlikely.

- *Echis sochureki and Echis omanensis*: *S*evere envenoming possible, potentially lethal.

- *Pseudocyclophis persicus*: Unknown, but unlikely to cause significant envenoming, most unlikely to be dangerous.

- *Walterinnesia morgani*: Unknown, but potentially lethal envenoming, though unlikely, cannot be excluded.

7.4 Short-term health risk:
Low: If encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects. Confidence in the health risk estimate is low (Reference 4, Table 3-6).

7.5 Long-term health risk:
None identified.

8 Heat/Cold Stress

Camp Redleg is located in Dubai, UAE. Dubai has a hot desert climate. The maximum temperature averages 100 degrees Fahrenheit (°F) from June through September. Most of the rainfall occurs from December through April and averages between 3.9 - 7.9 inches annually. Roughly, 90% of the annual rainfall occurs between November and April, most of it in the winter months from December

through March. The remaining six months, particularly the hottest ones of June, July, and August, are dry.

The summer months are marked by two kinds of wind phenomena. The southern and southeasterly *sharqi*, a dry, dusty wind with occasional gusts of 50 miles per hour, occurs from April to early June and again from late September through November. It may last for a day at the beginning and end of the season but for several days at other times. This wind is often accompanied by violent dust storms that may rise to heights of several thousand meters and close airports for brief periods. From mid-June to mid-September the prevailing wind, called the shamal, is from the north and northwest. It is a steady wind, absent only occasionally during this period. The very dry air brought by this shamal permits intensive sun heating of the land surface, but the breeze has some cooling effect. Heat stress/injuries and cold stress/injuries are largely dependent on operational and individual factors instead of environmental factors alone (Reference 10).

8.1 Heat

8.1.1 Short-term health risk:
Low: The short-term health risk of heat injury was high in unacclimated personnel. Preventive measures such as work-rest cycles; and proper hydration reduced the health risk to low.

8.1.2 Long-term health risk:
Low: The long-term health risk may be greater to certain susceptible persons–those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions. Long-term health implications from heat injuries were rare but could occur–especially from more serious heat injuries such as heat stroke. It was possible that high heat in conjunction with various chemical exposures could increase long-term health risks, though specific scientific evidence was not conclusive. Confidence in these risk estimates was medium.

8.2 Cold

Short-term and Long-term health risks: The risk of cold injury was low. Confidence in this risk estimate was medium.

9 Noise

9.1 Continuous:

Aircraft operations have the potential to cause significant noise hazard to flight line and helicopter landing zone support personnel. Because of the potential noise hazard inherent in the helicopter landing zone, personnel are required to wear dual hearing protection when working on the flight line.

Personnel residing in close proximity to generators will routinely be exposed to noise levels as high as 82.0 decibels (dB). Although this is below the 85 dB threshold requiring hearing protection, it still presents a concern for hearing conservation.

9.1.1 Short-term health risk:
Low: The short-term risk of noise injury with appropriate hearing protection use is low. Few exposed personnel (if any) are expected to have noticeable health effects during mission.

9.1.2 Long-term health risk:
Low to moderate: The long-term risk of noise injury with appropriate hearing protection use is low with few exposed personnel (if any) expected to develop delayed onset, irreversible effects. If protective measures are not used, the risk is elevated to moderate and many exposed personnel are plausibly expected to develop delayed onset, irreversible effects.

9.2 Impulse:
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10 Other Unique Occupational Hazards

10.1 Potential environmental contamination sources
DoD personnel are exposed to various chemical, physical, ergonomic, and biological hazards in the course of performing their mission. These types of hazards depend on the mission of the unit and the operations and tasks which the personnel are required to perform to complete their mission. The health risk associated with these hazards depends on a number of elements including what materials are used, how long the exposures last, what is done to the material, the environment where the task or operation is performed, and what controls are used. The hazards can include exposures to heavy metal particulates (e.g., lead, cadmium, manganese, chromium, and iron oxide), solvents, fuels, oils, and gases (e.g., carbon monoxide, carbon dioxide, oxides of nitrogen, and oxides of sulfur). Most of these exposures occur when performing maintenance task such as painting, grinding, welding, engine repair, or movement through contaminated areas. Exposures to these occupational hazards can occur through inhalation (air), skin contact, or ingestion; however, exposures through air are generally associated with the highest health risk.

10.2 Fuel/Petroleum Products/Industrial Chemical Spills
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.3 Pesticides/Pest Control
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.4 Waste Sites/Waste Disposal
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.5 General Sanitation
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.6 Lead- based Paint
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.7 Asbestos
No specific hazard sources were documented in the DOEHRS or the MESL from January 2014 to March 2016 timeframe (References 1 and 6).

10.8 Burn Pits

Camp Redleg does not have a burn pit.

11 References[2]

1. Defense Occupational and Environmental Health Readiness System (referred to as the DOEHRS-EH database) at https://doehrs-ih.csd.disa.mil/Doehrs/. Department of Defense (DoD) Instruction 6490.03, *Deployment Health*, 2006.

2. DoDI 6055.05, Occupational and Environmental Health, 2008.

3. Joint Staff Memorandum (MCM) 0017-12, Procedures for Deployment Health Surveillance, 2012.

4. USAPHC TG230, June 2013 Revision, Final Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel TG230.

5. Singh, A. and Singh, A.K., 2013. ProUCL Version 5.0. 00 Technical Guide-Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. *EPA: Washington, WA, USA*.

6. DoD MESL Data Portal: https://mesl.apgea.army.mil/mesl/. Some of the data and reports used may be classified or otherwise have some restricted distribution.

7. Modification 12 to United States Central Command Individual Protection and Individual Unit Deployment Policy, 13 December 2013.

8. Armed Forces Pest Management Board: http://www.afpmb.org/content/venomous-animals-country-i#Iraq. U.S. Army Garrison - Forest Glen, Silver Spring, MD.

9. Clinical Toxinology Resources: http://www.toxinology.com/. University of Adelaide, Australia.

[2] NOTE. The data are currently assessed using the 2013 TG230 document. The general method involves an initial review of the data which eliminates all chemical substances not detected above 1-yr negligible MEG. Those substances screened out are not considered acute or chronic health hazards so are not assessed further. For remaining substances, acute and chronic health effects are evaluated separately for air and water (soil is only evaluated for long-term risk). This is performed by deriving separate short-term and long-term population exposure level estimates (referred to as population exposure point concentrations (PEPC) that are compared to MEGs derived for similar exposure durations. If less than or equal to negligible MEG the risk is Low. If levels are higher than negligible then there is a chemical-specific toxicity and exposure evaluation by appropriate SMEs, which includes comparison to any available marginal, critical or catastrophic MEGs. For drinking water, 15 L/day MEGs are used for the screening while site specific 5-15 L/day are used for more detailed assessment. For non-drinking water (such as that used for personal hygiene or cooking), the 'consumption rate' is limited to 2 L/day (similar to the EPA) which is derived by multiplying the 5 L/day MEG by a factor of 2.5 to conservatively assess non-drinking uses of water.

10. Goldman R.F. 2001. Introduction to heat-related problems in military operations. *In*: Textbook of Military Medicine: Medical Aspects of Harsh Environments Vol. 1, Pandolf KB, and Burr RE (Eds.), Office of the Surgeon General, Department of the Army, Washington DC.

12 Where Do I Get More Information?

If a provider feels that the Service member's or Veteran's current medical condition may be attributed to specific OEH exposures at this deployment location, he/she can contact the Service-specific organization below. Organizations external to DOD should contact Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O).
Army Public Health Center (Provisional) Phone: (800) 222-9698. http://phc.amedd.army.mil
Navy and Marine Corps Public Health Center (NMCPHC) (formerly NEHC) Phone: (757) 953-0700. http://www.med.navy.mil/sites/nmcphc/Pages/Home.aspx
U.S. Air Force School of Aerospace Medicine (USAFSAM) (formerly AFIOH) Phone: (888) 232-3764. http://www.wpafb.af.mil/afrl/711hpw/usafsam.asp
DoD, Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O) Phone: (800) 497-6261. http://fhpr.dhhq.health.mil/home.aspx