

Periodic Occupational and Environmental Monitoring Summary (POEMS TEMPLATE)

As of 28 March 2010

Subject to change as conditions and customers may require.

NOTE:

Yellow and Red highlighted sections will most commonly change with each location. Red section require decisions based on your location.

All sections contain language that must be reviewed based on the history/conditions of your location. This is a template not a cookbook.

For further information, please contact

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INFORMATION PAPER

8 September 2010

SUBJECT: Periodic Occupational and Environmental Monitoring Summaries (POEMS)

BACKGROUND. A POEMS summarizes the medical implications resulting from potential occupational and environmental health (OEH) exposures at major deployment sites.

CONCLUSION. The POEMS assesses the significance of any known or potential acute and chronic health risks to service members during and post-deployment. It provides health care personnel background information if service personnel present with OEH exposure related concerns.

DISCUSSION.

1. POEMS address the documentation requirements established by Department of Defense (DOD) Instructions 6490.03 (*Deployment Health*), DODI 6055.05 (Occupational and Environmental Health), and the JCS Memorandum 0028-07 (*Procedures for Deployment Health Surveillance*), POEMS are a responsibility of the COCOM, although they are usually performed at a service public health center.

2. POEMS will be unclassified and available publicly. However, POEMS are intended to provide information specifically to medical personnel from the DoD, the Veterans Administration, and other Service Member medical providers.

3. The POEMS are population based information and do not represent individual exposures. They will not be included in the medical records of an individual.

4. POEMS are produced at Army Public Health Command, the Navy and Marine Corps Public Health Center, Air Force Central Command, or the Air Force School of Aerospace Medicine. They include a summary of all available OEHS data and are summarized by environmental health professionals and reviewed by an occupational and environmental medicine physician. Data reviewed for a POEMS include:

- Historical records obtained from previous support to a location,
- Sampling data (extracted from DOEHS or other systems),
- Documents and records found in the DOEHS Portal,
- Incident information submitted to the service center, or found by the service center (e.g. a search of operational SIGACT reporting systems).
- Other information as available.

5. Because POEMS are produced using data obtained by preventive medicine personnel in an active conflict, the ability of the data to adequately describe the entire spectrum of environmental exposures is limited. The POEMS must be used within the context of the physician-patient relationship, not as a standalone measure of an individual's risk.

6. Questions about POEMS can be addressed to Tony Pitrat, tony.pitrat@us.army.mil or 410.436.7721 (COMM) 584.7721 (DSN).

Approved for CENTCOM Surgeon:
POC CENTCOM Force Health Protection Office, 25 Apr 2011

THE POEMS TEMPLATE

Military Deployment
Periodic Occupational and Environmental Monitoring Summary (POEMS):
Basecamp and vicinity, Afghanistan, Calendar Years:
Calendar Years in XXXX to XXXX

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) 0028-07, See *REFERENCES*.

PURPOSE: This POEMS documents the DoD assessment of base camp level Occupational and Environmental Health Surveillance (OEHS) exposure data for **Basecamp and vicinity**. It presents the identified health risks and assessments along with associated medical implications. The findings are based on information collected from **Day Month Year** through **Day Month Year** to include deployment OEHS 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. ¹

SITE DESCRIPTION:

Add general site description. If data is scarce include statement e.g. "...risk level general for area and may not be specific to specific base camps".

SUMMARY: Summarized below are the key health risks estimates that present a Moderate or greater risk of medical concern along with recommended follow-on medical actions, if any, that providers should be aware of. A Table on the following pages provides a list of all the identified health risks at **Basecamp and vicinity** (Table 1). As indicated in the detailed sections that follow the table, controls that have been effectively established to reduce health risk levels have been factored into this overall assessment. In some cases, e.g. ambient air, specific controls are noted but not routinely available/feasible.

Short-term health risks & medical implications:

The following may have caused acute health effects in some personnel during deployment at **Basecamp and vicinity**:

To be entered by A Medical Provider

¹ While this assessment may reflect similar exposures and health risks pertaining to historic or future conditions at this site, the underlying data are limited to the time period(s) and area(s) sampled and thus may not reflect fluctuations or unique occurrences. It also may not be fully representative of all the fluctuations during the timeframe. To the extent that the data allow, this summary describes the general ambient conditions at the site and characterizes the health risks at the *population-level*. While useful to inform providers and others of potential health effects and associated medical implications, it does not represent an individual exposure profile. Actual individual exposures and specific resulting health effects depend on many variables and, should be addressed in individual medical records by providers as appropriate at the time of an evaluation of a unique exposure.

Long-term health risks & medical implications:

The hazards associated with potential long-term health effects at Basecamp and vicinity ...

To be entered by A Medical Provider

TEMPLATE

EXAMPLE TABLE

POEMS

**Table 1. Population-Based Health Risk Estimates –
Bagram Air Field, Afghanistan^{1, 2}**

Sources of Identified Health Risk ³	Health Risk Assessment Summary ⁴	
	Short Term Health Risk	Long Term Health Risks
AIR	Airborne Substances – Overall Short Term Risks:	Airborne Substances – Overall Long-Term Risks:
Particulate matter less than 10 micrometers in diameter (PM ₁₀)	Low to High: Daily levels vary, acute (short term) 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/existing respiratory diseases).	Not evaluated-no available health guidelines.
Particulate matter less than 2.5 micrometers in diameter (PM _{2.5})	Low to High: Moderate short-term health risks for typical exposures, and low to high health risks for peak exposures. A majority of the time mild acute (short term) health effects are anticipated; certain peak levels may produce mild eye, nose, or throat irritation in some personnel and pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.	Low to moderate: Small percentage of persons may be at increased risk for developing chronic conditions (particularly those more susceptible to acute (short term) effects (e.g., those with asthma/existing respiratory diseases).
Metals	Low: Cadmium was detected sporadically between 2005 and 2007 at levels that did not pose a significant risk (low).	Low: Cobalt was detected sporadically between 2005 and 2007 at levels that did not pose a significant risk (low).
ENDEMIC DISEASE	Endemic Disease – Overall Short Term Risks:	Endemic Disease – Overall Long Term Risks
Food borne/Waterborne (e.g., diarrhea-bacteriological)	Moderate to High: High (bacterial diarrhea, hepatitis A, typhoid fever) to Moderate (diarrhea-cholera, diarrhea- protozoal, brucellosis, hepatitis E) If ingesting local food/water, the health effects can temporarily incapacitate personnel (Diarrhea) or result in prolonged illness (Hepatitis A, Typhoid fever, Hepatitis E, Brucellosis). Risk reduced to None with preventive medicine measures, which include Hepatitis A and Typhoid fever vaccination, and consumption of food and water only from approved sources.	None identified.
Arthropod Vector Borne	Low to Moderate: Moderate for Leishmaniasis - cutaneous, Crimean-Congo hemorrhagic fever, Sandfly fever, typhus-miteborne; and Low for malaria, the Plague, and West Nile fever. Risk reduced to low by proper wear of the uniform and application of repellent to exposed skin.	Low for the visceral leishmaniasis.
Respiratory	Low to Moderate: Moderate for tuberculosis to Low for meningococcal meningitis.	None identified based on available data. TB is evaluated as part of the Post Deployment Health Assessment.
Water-Contact (e.g. wading, swimming)	Moderate for Leptospirosis.	None identified based on available data.
Animal Contact	Low to Moderate: Moderate for rabies, anthrax, Q-fever; to Low short-term risk (due to rare occurrence) for H5N1 avian influenza.	None identified based on available data.
VENOMOUS ANIMAL/INSECTS	Venomous Animals/Insects – Overall Short Term Risks:	Venomous Animals/Insects – Overall Long Term Risks:
Snakes, scorpions, and spiders	Low to High: If encountered, effects of venom vary with species from mild localized swelling (e.g. widow spider) to potentially lethal effects (e.g. saw-scaled viper).	None identified.
HEAT/COLD STRESS	Heat/Cold – Overall Short Term Risks:	Heat/Cold – Overall Long Term Risks:
Heat	Moderate: Moderate risk of heat injury in summer months for unacclimatized personnel. Risk of heat injury is reduced through preventive measures.	Low: The long-term risk is 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.
NOISE	Noise – Overall Short Term Risks:	Noise – Overall Long Term Risks:
Continuous	Low with appropriate use of hearing PPE.	Low to Moderate: Low with appropriate use of hearing PPE. When protective measures are not used risk of long-term irreversible effects are increased to moderate.

Sources of Identified Health Risk ³	Health Risk Assessment Summary ⁴	
	Short Term Health Risk	Long Term Health Risks
UNIQUE INCIDENT/CONCERNS	Unique Incident/Concerns – Overall Short-Term Risk:	Unique Incident/Concerns – Overall Long-Term Risk:
Burn Pit Evaluation	Airborne Substances – Overall Short Term Risks:	Airborne Substances – Overall Long-Term Risks:
Particulate matter (PM ₁₀)	Low to High: Low short-term health risks for typical exposures, and high short-term health risks for peak exposures. Personnel may have experienced notable eye, nose, and throat irritation and some respiratory effects. More serious effects are possible in susceptible persons (e.g., those with asthma/existing respiratory diseases).	Not evaluated-no available health guidelines.
Particulate matter (PM _{2.5})	Low to Moderate: Low to moderate short-term health risks for typical exposures and moderate for peak exposures. Personnel may experience notable eye, nose, and throat irritation and some respiratory effects. More serious effects are possible in susceptible persons (e.g., those with asthma/existing respiratory diseases)	Moderate: Small percentage of persons may be at increased risk for developing chronic conditions (particularly those more susceptible to acute (short term) effects (e.g., those with asthma/existing respiratory diseases)

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 BAF. 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 – such as at the burn pit, which has been reported at this site - 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 data and reports obtained from the January 2002 through October 2010 timeframe. It is considered a current representation of general site conditions but may not reflect certain fluctuations or unique exposure incidents. Acute health risk estimates are generally consistent with field-observed health effects.

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 BAF. The health risks are presented as Low, Moderate, High or Extremely High for both acute and chronic health effects. The 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 APHC/AIPH. Where applicable, "None Identified" is used when though an exposure was identified, no risk of either a specific acute or chronic 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.

⁴ 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 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.

EXAMPLE TABLE

1 Discussion of Health Risks at Camp XXXX, Afghanistan by Source

The following sections describe the major source categories of potential health risk that were evaluated at Camp XXXX. For each category, the evaluation process includes identifying what, if any, specific sub-categories/health concerns are present. This initial step results in “screening out” certain sub-categories that pose no identifiable health risk (for example if all data is below screening levels). While these sections may include sub-categories that have been determined to present no identifiable health risk, the summary table on the previous page only contains those sub-categories that were determined to pose moderate or higher potential health risks.

2 Air

2.1 Site-Specific Sources Identified

Camp XXXX is situated in a dusty semi-arid desert environment. Inhalational exposure to high levels of dust and particulate matter, such as during high winds or dust storms, may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel. Additionally, 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.

2.2 Particulate matter, less than 10 micrometers (PM₁₀)

2.2.1 Sample data/Notes:

Exposure Guidelines:

Short-term (24-hour) PM₁₀ (µg/m³): Negligible MEG=250, Marginal MEG=420, Critical MEG=600.

Long-term PM₁₀ MEG (µg/m³): Not Available.

A total of XX valid PM₁₀ air samples were collected from XXXX – XXXX. The range of 24-hour PM₁₀ concentrations was XX µg/m³ – XXX µg/m³ with an average concentration of XXX µg/m³.

2.2.2 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term PM₁₀ health risk assessment was Low/Moderate/High based on average and peak PM₁₀ concentrations, and the likelihood of exposure at these hazard severity levels. A Low/Moderate/High/Extremely High health risk assessment for typical and peak exposure concentrations suggests that short-term exposure to PM₁₀ at Camp XXXX was expected to have tactical risk definition (TG 230 Table 3-2). Daily average health risk levels for PM₁₀ show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term PM₁₀ health risk assessment was low/medium/high (TG 230 Table 3-6).

The hazard severity was negligible/marginal/critical for average PM₁₀ exposures. The results indicate that hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

For the highest observed PM₁₀ exposure, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

2.2.3 Long-term health risk:

Not Evaluated-no available health guidelines. The EPA has retracted its long-term standard (NAAQS) for PM₁₀ due to an inability to clearly link chronic health effects with chronic PM₁₀ exposure levels.

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

2.3.1 Sample data/Notes:

Exposure Guidelines:

Short-term (24-hour) PM_{2.5} MEGs (µg/m³): Negligible MEG=65, Marginal MEG=250, Critical MEG=500.

Long-term PM_{2.5} MEGs: Negligible MEG=15, Marginal MEG=65.

A total of XX valid PM_{2.5} air samples were collected from XXXX – XXXX. The range of 24-hour PM_{2.5} concentrations was XX µg/m³ – XXX µg/m³ with an average concentration of XX µg/m³.

2.3.2 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term PM_{2.5} health risk assessment was Low/Moderate/High based on average and peak PM_{2.5} concentrations, and the likelihood of exposure at these hazard severity levels. A Low/Moderate/High/Extremely High health risk assessment for typical and peak exposure concentrations suggests that short-term exposure to PM_{2.5} at Camp XXXX was expected to have tactical risk definition (TG 230 Table 3-2). Daily average health risk levels for PM_{2.5} show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term PM_{2.5} health risk assessment was low/medium/high (TG 230 Table 3-6).

The hazard severity was negligible/marginal/critical for average PM_{2.5} exposures. The results indicate that hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

For the highest observed PM_{2.5} exposure, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

2.3.3 Long-term health risks:

Low/Moderate/High/Extremely High: The long-term health risk assessment was Low/Moderate/High/Extremely High based on average PM_{2.5} concentration, and the likelihood of exposure at this hazard severity level. A Low/Moderate/High health risk level for typical exposure concentrations suggests that long-term exposure to PM_{2.5} at Camp XXXX may require lifecycle risk definition (TG 230 Table 3-3). Confidence in the long-term PM_{2.5} health risk assessment was low/medium/high (TG 230 Table 3-6).

The hazard severity was negligible/marginal/critical (XX µg/m³ – XXX µg/m³) for average PM_{2.5} exposures. The results suggest that with repeated exposures above the

negligible/marginal/critical hazard severity threshold, hazard severity definition and associated effects of exposure (TG 230 Table 3-11).

2.4 Airborne Metals from PM₁₀

2.4.1 Sample data/Notes:

The health risk assessment was based on average and peak concentration of XX valid PM₁₀ airborne metal samples collected from XXXX – XXXX, and the likelihood of exposure.

2.4.2 Short-term health risks:

Low/Moderate/High/Extremely High: Metal species had an average (XXX ug/m³) and peak (XXX ug/m³) concentration that exceeded the short-term 14 day negligible/marginal/critical MEG (XXX ug/m³). The short-term health risk assessment for PM₁₀ airborne metal species concentrations was Low/Moderate/High/Extremely High. Confidence in the health risk assessment was low/medium/high (TG 230 Table 3-6).

2.4.3 Long-term health risks:

None identified based on the available sampling data.

2.5 Volatile Organic Compounds (VOC)

2.5.1 Sample data/Notes:

The health risk assessment was based on average and peak concentration of XX valid volatile organic chemical (VOC) air samples collected from XXXX – XXXX, and the likelihood of exposure. None of the analyzed VOC pollutants were found at concentrations above short or long-term MEGs.

2.5.2 Short and long-term health risks:

None identified based on the available sampling data. No parameters exceeded 1-year Negligible MEGs.

3 Soil

3.1 Site-Specific Sources Identified

3.2 Sample data/Notes:

A total of XX valid surface soil samples were collected from XXXX - XXXX to assess OEH health risk to deployed personnel. The primary soil contamination exposure pathways are dermal contact and dust inhalation. Typical parameters analyzed for included SVOCs, heavy metals, 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). The percent of the population exposed to soil and associated dust in the sampled areas was > 75% for X samples, 50 – 75% for X sample, 25 <50% for X samples, 10 > 25% for X sample, and < 10% for X samples. For the risk assessment, personnel are assumed to remain at this location for 6 months to 1 year.

3.3 Short-term health risk:

Not an identified source of health risk. Currently, sampling data for soil are not evaluated for short term (acute) health risks.

3.4 Long-term health risk:

None identified based on available sample data. No parameters exceeded 1-year Negligible MEGs.

4 Water

In order to assess the health risk to U.S. personnel from exposure to water in theater, the APHC identified the most probable exposure pathways. These are based on the administrative information provided on the field data sheets submitted with the samples taken over the time period being evaluated. Based on the information provided from the field, all samples for untreated water samples were associated with source water for treatment and no exposure pathways were associated with those samples. Therefore, untreated samples will not be assessed as potential health hazards. It was assumed that 100% of all U.S. personnel at Camp XXXX will be directly exposed to Reverse Osmosis Water Purification Unit (ROWPU) treated and disinfected fresh bulk water, since this classification of water is primarily used for personal hygiene, showering, cooking, and for use at vehicle wash racks. Field data sheets indicate that bottled water is the only approved source of drinking water.

4.1 Drinking Water: Bottled or Packaged Water

4.1.1 Site-Specific Sources Identified

There were multiple bottled water brands sampled at Camp XXXX. These samples included XXX, XXX, XXX, and XXX brands of bottled water

4.1.2 Sample data/Notes:

To assess the potential for adverse health effects to troops the following assumptions were made: All U.S. personnel at this location were assumed to remain at this site for approximately 1 year. A conservative (protective) assumption is that personnel routinely consumed less than 15L/day of bottled water for up to 365 days (1-year). It is further assumed that control measures and/or personal protective equipment were not used. A total of XX bottled water samples were taken from XXXX - XXXX.

4.1.3 Short-term and long-term health risk:

None identified based on available sample data. All collected samples were below the short and long-term Negligible MEGs.

4.2 Non-Drinking Water: Disinfected

4.2.1 Site-Specific Sources Identified

Although the primary route of exposure for most microorganisms is ingestion of the contaminated water, dermal exposure to some microorganisms, chemicals, and biologicals may

also cause adverse health effects. Complete exposure pathways would include drinking, brushing teeth, personal hygiene, cooking, providing medical and dental care using a contaminated water supply or during dermal contact at vehicle or aircraft wash racks.

4.2.2 Sample data/Notes:

To assess the potential for adverse health effects to troops the following assumptions were made: All U.S. personnel at this location were expected to remain at this site for approximately 1 year. A conservative (protective) assumption is that personnel routinely consumed less than 5L/day of non-drinking water for up to 365 days (1-year). It is further assumed that control measures and/or personal protective equipment were not used. A total of XX disinfected bulk water (Non-Drinking) samples from XXXX to XXXX were evaluated for this health risk assessment. No chemicals were detected at levels above the short or long-term MEGs.

4.2.3 Short and long-term health risks:

None identified based on available sample data. All 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 Defense Occupational and Environmental Health Readiness System (DOEHRS), or the Military Exposure Surveillance Library (MESL) data portal.

5.2 Depleted Uranium (DU)

No specific hazard sources were documented in DOEHRS or MESL data portal.

5.3 Ionizing Radiation

No specific hazard sources were documented in DOEHRS or MESL data portal.

5.4 Non-Ionizing Radiation

No specific hazard sources were documented in DOEHRS or MESL data portal.

6 Endemic Disease²

Information can be obtained from a number of sources including CDC and WHO.

6.1 Foodborne and Waterborne Diseases

² NOTE: "Risk" level refers to both severity of disease (without controls, for example vaccinations) and probability of disease based on local rates/endemic status. Diseases described are those presenting greater risk when compared with U.S. conditions. Most identified disease risks can and are being mitigated with military preventive medicine measures/policies.

Food borne and waterborne diseases in the area are transmitted through the consumption of local food and water. Sanitation is poor throughout the country, including major urban areas. Local 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.

Key disease risks are summarized below:

6.1.1 Diarrheal diseases (bacteriological)

Risk: Discussion

6.1.2 Hepatitis A

Risk: Discussion

6.1.3 Typhoid / paratyphoid fever

Risk: Discussion

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6.1.4 Diarrhea - protozoal

Risk: Discussion

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6.1.5 Brucellosis

Risk: Discussion

6.1.6 Diarrhea - cholera

Risk: Discussion

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6.1.8 Short-term Health Risks:

Moderate to high:

Risk: Discussion

6.1.9 Long-term Health Risks:

None identified based on available data.

6.2 Arthropod Vector-Borne Diseases

6.2.1 Malaria (*Risk can vary with location*)

Moderate or High depending on location: Risk: Discussion

6.2.2 *Leishmaniasis - cutaneous*

Risk: Discussion

6.2.2 ...

6.2.3 ...

6.2.X *Short -term health risks:*

Low to High:

Risk: Discussion

6.2.9 *Long -term health risks:*

Risk: Discussion

6.3 Water Contact Diseases

Operations or activities that involve extensive water contact may result in personnel being temporarily debilitated with leptospirosis in some locations. ...

6.3.1 *Leptospirosis*

Risk: Discussion

6.3.2 *Short -term health risks:*

Risk: Discussion

6.3.3 *Long -term health risks:*

Risk: Discussion

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. 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.

6.4.1 *Tuberculosis (TB)*

Moderate: Potential health risk to U.S. personnel is Moderate year round. Transmission

typically requires close and prolonged contact with an active case of pulmonary or laryngeal tuberculosis (TB), although it also can occur with more incidental contact. The likelihood of exposure to an active case varies with the overall incidence and the degree of contact with the local population, particularly those living in conditions of crowding and poverty. Tuberculin skin test (TST) conversion rates may be elevated over baseline for personnel with prolonged close exposure to local populations. A TST screening to detect latent infection may be warranted in personnel with a history of prolonged close exposure to local populations. Tuberculosis is evaluated as part of the Post Deployment Health Assessment (PDHA).

6.4.2 Meningococcal meningitis

Risk: Discussion

6.4.3 Short-term health risks:

Risk: Discussion

6.4.4 Long-term health risks:

Risk: Discussion

6.5 Animal-Contact Diseases

6.5.1 Rabies

Moderate: Potential health risk to U.S. personnel is possible year round. Rabies is transmitted by exposure to virus-laden saliva of an infected animal, typically through bites. Prevalence in feral and wildlife populations are well above U.S. levels due to the lack of organized control programs. Personnel bitten by potentially infected reservoir species may develop rabies in the absence of appropriate prophylaxis. The circumstances of the bite should be considered in evaluating individual health risk; in addition to dogs and cats, bats or wild carnivores should be regarded as rabid unless proven otherwise. General Order 1B mitigates rabies risk by prohibiting contact with or adoption or feeding of feral animals. Very severe illness with near 100% fatality rate can occur in the absence of post-exposure prophylaxis. Typically the time period from exposure to the onset of symptoms is 2 – 12 weeks, but can rarely take several years.

6.2.X ...

Risk: Discussion

6.5.5 Short-term health risks:

Risk: Discussion

6.5.6 Long-term health risks:

Risk: Discussion

7 Venomous Animal/Insect

All information was taken directly from the **Clinical Toxinology Resources web site** (<http://www.toxinology.com/>) from the University of Adelaide, Australia. The species listed below have home ranges that overlap the location of **Camp XXXX**, and may present a health risk if they are encountered by personnel. See Section 9 for more information about pesticides and pest control measures.

7.1 Spiders

- *Latrodectus dahlia* (widow spider): Severe envenoming possible, potentially lethal. However, venom effects are mostly minor and even significant envenoming is unlikely to be lethal.

7.2 Scorpions (Coordinates given for species with limited natural range within Afghanistan)

- *Androctonus afghanus* (latitudes 35-38N, and longitudes 68-72E), *Androctonus amoreuxi*, and *Androctonus baluchicus*: Severe envenoming possible, potentially lethal. Severe envenoming may produce direct or indirect cardio toxicity, with cardiac arrhythmias, cardiac failure. Hypovolaemic hypotension possible in severe cases due to fluid loss through vomiting and sweating.

- *Afghanobuthus nuamanni* (latitudes 35-38N and longitudes 65-69E), *Buthacus striffleri* (latitudes 32-35N and longitudes 63-68E), *Compsobuthus afghanus* (latitudes 32-35N and longitudes 62-68E), *Compsobuthus rugosulus*, *Compsobuthus tofti* (latitudes 36-38N and longitudes 68-71E), *Mesobuthus caucasicus*, *Mesobuthus eupeus*, *Mesobuthus macmahoni*, *Orthochirus afghanus*, (latitudes 33-36N and longitudes 68-72E), *Orthochirus bicolor*, *Orthochirus danielleae* (latitudes 31-34N and longitudes 62-66E), *Orthochirus erardi* (latitudes 30-33N and longitudes 60-65E), *Orthochirus heratensis* (latitudes 33-36 and longitudes 60-65), *Orthochirus. Jalalabadensis* (latitudes 33-36N and longitudes 69-72E), *Orthochirus monodi* (latitudes 33-36N and longitudes 61-65E), *Orthochirus pallidus*, *Orthochirus samrchelsis* (latitudes 33-36N and longitudes 69-72E), *Orthochirus scrobiculosus*, and *Sassanidotus gracilis* (latitudes 27-35N and longitudes 60-65E): There are a number of dangerous Buthid scorpions, but also others known to cause minimal effects only. Without clinical data it is unclear where this species fits within that spectrum.

- *Hottentotta alticola*, and *Hottentotta saulcyi*: Moderate envenoming possible but unlikely to prove lethal. Stings by these scorpions are likely to cause only short lived local effects, such as pain, without systemic effects.

- *Scorpiops afghanus* (latitudes 30-35N and longitudes 69-72E), *Scorpiops lindbergi* (latitudes 36-38N and longitudes 64-71E): Mild envenoming only, not likely to prove lethal. Stings by these scorpions are likely to cause only short lived local effects, such as pain, without systemic effects.

7.3 Snakes

- *Boiga trigonata* (Common Cat Snake), and *Telescopus rhinopoma* (leopard viper) (southwest region from Herat province to Kandahar province and eastern Pakistan border from Paktika province to Nuristan province): Unlikely to cause significant envenoming; Bites by these rear fanged Colubrid snakes are rarely reported. They are likely to cause minimal to moderate local effects and no systemic effects.

- *Echis multisquamatus* (central Asian saw-scaled viper) (latitudes 29-39N and longitudes 60-68E), *Echis sochureki* (Sochurek's saw-scaled viper) (latitudes 29-33N and longitudes 61-70E near Pakistan border), *Gloydius halys* (Haly's Pit Viper) (latitudes 33-39N and longitudes 60-75E): Severe envenoming possible, potentially lethal. Bites may cause moderate to severe coagulopathy and haemorrhagins causing extensive bleeding.

- *Eristocophis mcmahoni* (McMahon's Viper) (latitudes 29-30N and longitudes 63-67E): Severe envenoming possible, potentially lethal. Mild to Moderate neurotoxic effects may occur.
- *Hemorrhis ravergeri* (mountain racer) (latitudes 30-39N and longitudes 60-72E), *Psammophis leithii* (latitudes 34-36N and longitudes 70-72E), and *Psammophis lineolatus* (Teer snake): Unlikely to cause significant envenoming. Bites require symptomatic treatment only.
- *Macrovipera lebetina obtuse* (Levantine Viper) (latitudes 31-37N and longitudes 66-72E), and *Macrovipera lebetina turanica* (Levantine Viper) (latitudes 34-39N and longitudes 60-72E): Severe envenoming possible, potentially lethal. Bites may cause mild to severe local effects, shock & coagulopathy.
- *Naja oxiana* (Oxus cobra) (below 2000 m, northwest (Farah province to Badakshan province) and southeast (Zabol province to Nuristan province) of central mountains): Severe envenoming possible, potentially lethal. Bites can cause systemic effects, principally flaccid paralysis.
- *Platyceps rhodorachis* (Jan's desert racer): Mild envenoming only, not likely to prove lethal. Requires symptomatic treatment only.
- *Pseudocerastes persicus* (Persian dwarf snake) (southwest region from Herat province to Kandahar province): Unlikely to cause significant envenoming; limited clinical data suggest bites result in local effects only.

7.4 Short-term health risk:

Low: If encountered, effects of venom vary with species from mild localized swelling (e.g. widow spider) to potentially lethal effects (e.g. Haly's Pit Viper). See effects of venom above. Confidence in the health risk estimate is low (TG 230 Table 3-6).

7.5 Long-term health risk:

None identified.

8 Heat/Cold Stress

Camp XXXX is located in the XXXX Province of XXXX Afghanistan near the town of ...
Geographical description.

8.1 Heat

Average daily peak temperature during the summer months (June – September) is XX °F with an average monthly peak temperature of XXX °F. The health risk of heat stress/injury based on temperatures alone is Low (< 78 °F) from month – month, Moderate (78-81.9°F) from month – month, high (82-87.9°F) from month – month, and extremely high (≥ 88°F) from month – month. However, work intensity and clothing/equipment worn pose greater health risk of heat stress/injury than environmental factors alone (Goldman 2001).

8.1.1 Short-term health risk:

Low to High: High health risk of heat injury in unacclimatized personnel from month – month, and Low from month – month. The risk of heat injury is reduced through preventive measures. Because the occurrence of heat stress/injury is strongly dependent on operational factors (work intensity and clothing), confidence in the health risk estimate is low (TG 230 Table 3-6).

8.1.2 Long-term health risk:

Low: Long-term health implications from heat injuries are rare but can occur, especially from more serious injuries such as heat stroke. 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. The long-term health risk is Low; confidence in the health risk estimates is medium (TG 230 Table 3-6).

8.2 Cold

8.2.1 Short-term health risks:

Even on warm days there can be a significant drop in temperature after sunset by as much as 40 °F. There is a risk of cold stress/injury when temperatures fall below 60 °F, which can occur from month – month. The health risk assessment for non-freezing cold injuries (chilblain, trench foot, and hypothermia) is Low based on historical temperature and precipitation data. Frostbite is unlikely to occur because temperatures rarely drop below freezing. However, personnel may encounter significantly lower temperatures during field operations at higher altitudes. As with heat stress/injuries, cold stress/injuries are largely dependent on operational and individual factors instead of environmental factors alone. With protective measures in place the health risk assessment is low for cold stress/injury; confidence in the health risk estimate is medium.

Low: The health risk of cold injury is Low. Confidence in the health risk estimate is medium.

8.1.2 Long-term health risk:

Low: The health risk of cold injury is Low. Confidence in the health risk estimate is high

9 Noise

9.1 Continuous

Preventive Medicine Base Camp assessments of Camp XXXX indicate that noise ...

9.1.1 Short-term and Long-term health risks:

Low/Moderate/High/Extremely High: short-term health risk of noise injury with appropriate hearing protection use is Low/Moderate/High/Extremely High. Tactical risk definition. Confidence in the health risk assessment is low/medium/high (TG 230 Table 3-6).

9.2 Impulse

9.2.1 Short-term and Long-term health risks:

No impulse noise evaluations conducted, not evaluated.

10 Unique Incidents/Concerns

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 exposure 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 Waste Sites/Waste Disposal

If no data, say there was no data available.

10.3 Fuel/petroleum products/industrial chemical spills

If no data, say there was no data available

10.4 Pesticides/Pest Control:

The health risk of exposure to pesticide residues is considered within the framework of typical residential exposure scenarios, based on the types of equipment, techniques, and pesticide products that have been employed, such as enclosed bait stations for rodenticides, various handheld equipment for spot treatments of insecticides and herbicides, and a number of ready-to-use (RTU) methods such as aerosol cans and baits. The control of rodents required the majority of pest management inputs, with the acutely toxic rodenticides staged as solid formulation lethal baits placed in tamper-resistant bait stations indoors and outdoors throughout cantonment areas. Nuisance insects, including biting and stinging insects such as bees, wasps, and ants, also required significant pest management inputs. Use of pesticides targeting against these pests generally involved selection of compounds with low mammalian toxicity and short-term residual using pinpoint rather than broadcast application techniques. No specific hazard sources were documented in DOEHRS or MESL data portal. A total of XX monthly pesticide application reports in the MESL data portal for Camp XXXX (month year to month year) list the usage of pesticides on the site. For each pesticide product applied during this period, the USEPA approved label has been archived, providing a framework how each pesticide handled and applied (see below).

10.4.1 Rodenticides

XXXX were used to control rodents.

10.4.2 Insecticides

Insecticides used to control ants, bees, crickets, fleas, flies, lice, mosquitoes, spiders, termites, and wasps include: XXXX.

10.4.2 Herbicides

XXXX was used to control weeds.

10.4.3 Short-term and Long-term health risks

Low: Long term health risk is **Low**. Confidence in the health risk assessment is **medium** (TG 230 Table 3-6).

10.5 Asbestos

If no data, say there was no data available

10.6 Lead Based Paint

If no data, say there was no data available

10.7 Burn Pit

While not specific to **Camp XXXX**, the consolidated epidemiological and environmental sampling studies on burn pits that have been conducted to date were unable to say whether an association does or does not exist between exposures to emissions from the burn pits and long-term health effects (IOM 2011). The committee's review of the literature and the data suggests that service in Iraq or Afghanistan (i.e., a broader consideration of air pollution than exposure only to burn pit emissions) might be associated with long-term health effects, particularly in susceptible (e.g., those who have asthma) or highly exposed subpopulations (such as those who worked at the burn pit). Such health effects would be due mainly to high ambient concentrations of PM from both natural and anthropogenic sources, including military sources. If that broader exposure to air pollution turns out to be relevant, potentially related health effects of concern are respiratory and cardiovascular effects and cancer. Susceptibility to the PM health effects could be exacerbated by other exposures, such as stress, smoking, local climatic conditions, and co-exposures to other chemicals that affect the same biologic or chemical processes. Individually, the chemicals measured at burn pit sites in the study were generally below concentrations of health concern for general populations in the United States. However, the possibility of exposure to mixtures of the chemicals raises the potential for health outcomes associated with cumulative exposure to combinations of the constituents of burn pit emissions and emissions from other sources.

10.7.1 Particulate matter, less than 10 micrometers (PM₁₀)

10.7.1.1 Sample data/Notes:

Exposure Guidelines:

Short-term (24-hour) PM₁₀ (µg/m³): Negligible MEG=250, Marginal MEG=420, Critical MEG=600

Long-term PM₁₀ MEG (µg/m³): Not Available.

A total of **XX** valid PM₁₀ air samples were collected from **XXXX – XXXX**. The range of 24-hour PM₁₀ concentrations was **XX** µg/m³ – **XXX** µg/m³ with an average concentration of **XXX** µg/m³.

10.7.1.2 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term PM₁₀ health risk assessment was **Low/Moderate/High** based on average and peak PM₁₀ concentrations, and the likelihood of exposure at these hazard severity levels. A **Low/Moderate/High/Extremely High** health risk

assessment for typical and peak exposure concentrations suggests that short-term exposure to PM₁₀ at Camp XXXX was expected to have tactical risk definition (TG 230 Table 3-2). Daily average health risk levels for PM₁₀ show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term PM₁₀ health risk assessment was low/medium/high (TG 230 Table 3-6).

The hazard severity was negligible/marginal/critical for average PM₁₀ exposures. The results indicate that hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

For the highest observed PM₁₀ exposure, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (TG 230 Table 3-10).

TEMPLATE

11 References³

1. Casarett and Doull's Toxicology: the Basic Science of Exposures, Chapter 2- Principles of Toxicology; Fifth Edition, McGraw Hill, New York.
2. Clinical Toxinology Resources: <http://www.toxinology.com/>. University of Adelaide, Australia.
3. 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.
4. DoDI 6055.05, Occupational and Environmental Health, 2008.
5. 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.
6. Goldman RF. 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.
7. IOM (Institute of Medicine). 2011. Long-term health consequences of exposure to burn pits in Iraq and Afghanistan. Washington, DC: The National Academies Press.
8. Joint Staff Memorandum (MCM) 0028-07, Procedures for Deployment Health Surveillance, 2007.
9. USA PHC TG230, June 2010 Revision.
10. USACHPPM 2008 Particulate Matter Factsheet; 64-009-0708, 2008.

³ NOTE. The data are currently assessed using the 2010 TG230. The general method involves an initial review of the data which eliminates all chemical substances not detected above 1-yr negligible MEGs. 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 water (soil is only evaluated for long term risk). This is performed by deriving separate short-term and long term population exposure level and 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 nondrinking 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. This value is used to conservatively assess non drinking uses of water.

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 DoD Force Health Protection and Readiness (FHP & R).

Army Institute of Public Health 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-nehc.med.navy.mil>

U.S. Air Force School of Aerospace Medicine (USAFSAM) (formerly AFIOH) Phone: (888) 232-3764. <http://www.wpafb.af.mil/afri/711hpw/usafsam.asp>

DoD Force Health Protection and Readiness (FHP & R) Phone: (800) 497-6261.
<http://fhp.osd.mil>

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