

## **Military Deployment Periodic Occupational and Environmental Monitoring Summary (POEMS): Camp Blackfish, Afghanistan: 2018 to 2019**

**AUTHORITY:** This periodic occupational and environmental monitoring summary (POEMS) has been developed in accordance with Department of Defense (DoD) Instructions 6490.03, and 6055.05 (References 2-3).

**PURPOSE:** This POEMS documents the Department of Defense (DoD) assessment of deployment occupational and environmental health (OEH) risk for Base Camp Blackfish (Combat Outpost DeAlencar), Afghanistan. It presents a qualitative summary of health risks identified at this location and their potential medical implications. The report is based on information collected from 01 January 2018 through 31 December 2019 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.

This assessment assumes that the OEH sampling for Camp Blackfish 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 01 January 2018 through 31 December 2019.

The POEMS can be useful to inform healthcare providers and others of environmental conditions experienced by individuals deployed to Camp Blackfish 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 record on a Standard Form (SF) 600 (Chronological Record of Medical Care).

**SITE DESCRIPTION:** Camp Blackfish was established on an abandoned Afghan farm compound. It was located in the eastern portion of Afghanistan in the middle of the Nangarhar Valley.

**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 Blackfish. 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. Table 3 provides the Disease Threat Assessment taken from the OEHS for Camp Blackfish.

**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 Blackfish:

For heat stress, risk can be greater during months of May through September, and greater for susceptible persons including those older than 45, of low fitness level, unacclimated, or with underlying medical conditions, and those under operational constraints (equipment, PPE, vehicles). Risks from heat stress may have been reduced with preventive medicine controls, work-rest cycles, proper hydration and nutrition, and mitigation.

For continuous noise exposure, the risk was 'High to Low'; risk may have been reduced by appropriate hearing protection used by personnel in higher risk areas (around sources of continuous noise such as flight lines, generators, and power production).

**Air Quality:**

For inhalable coarse particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>) from environmental dust (including burn pits/boxes and/or incinerators), the PM<sub>10</sub> overall short-term health risk was not evaluated due to insufficient data for analysis.

For inhalable fine particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) from environmental dust (including burn pits/boxes and/or incinerators), the PM<sub>2.5</sub> overall short-term health risk was not evaluated due to insufficient data for analysis. However, the Camp Blackfish area is a dusty, semi-arid desert environment, also subject to vehicle traffic. Consequently, exposures to PM<sub>2.5</sub> 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<sub>10</sub> and PM<sub>2.5</sub>, 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.

Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit – see Section 10.7. Where burn pits and/or incinerators exist, exposures may vary, and exposures to high levels of PM<sub>10</sub> and PM<sub>2.5</sub> from smoke may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel and certain subgroups. Although most short-term health effects from exposure to particulate matter and/or burn pit/box and incinerator smoke 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 while at Camp Blackfish. Personnel who reported with symptoms or required treatment while at site(s) with burn pit/box activity should have exposure and treatment noted in the medical record (e.g., electronic medical record and/or on a Standard Form (SF) 600 (Chronological Record of Medical Care).

**Table 1: Continued****Long-term health risks & medical implications:**

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

For continuous noise exposure, the long-term risk was 'High to Low'; risk may have been reduced by appropriate hearing protection used by personnel in higher risk areas (around sources of continuous noise such as flight lines, generators, and power production).

-Air quality: For inhalable coarse particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>) from environmental dust (including burn pits/boxes and/or incinerators), the PM<sub>10</sub> overall long-term health risk was not evaluated due to no available health guidelines.

For inhalable fine particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) from environmental dust (including burn pits/boxes and/or incinerators), the PM<sub>2.5</sub> overall long-term health risk was not evaluated due to insufficient data for analysis. However, Camp Blackfish area is a dusty, semi-arid desert environment and conditions may have varied. Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit – see Section 10.7. Where burn pits exist, exposures may vary, as conditions may have varied. For inhalational exposure to high levels of dust containing PM<sub>10</sub> and PM<sub>2.5</sub>, such as during high winds or dust storms, and for exposures to burn pit smoke, 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 dust and particulate matter exposures and exposures to burn pits are acknowledged, at this time there were 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 burn pits/barrels, incinerators, occupational or specific personal dosimeter data) when assessing individual concerns. 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).

**Table 2. Population-Based Health Risk Estimates –Camp Blackfish <sup>1,2</sup>**

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Control Measures Implemented	Residual Health Risk Estimate <sup>4</sup>
<b>AIR</b>			
Particulate matter less than 2.5 micrometers in diameter (PM <sub>2.5</sub> )	Short-term: A majority of the time mild acute (short term) health effects are anticipated. Elevated 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.	Limiting strenuous physical activities when air quality is especially poor; and actions such as closing tent flaps, windows, and doors.	Short-term: A majority of the time mild acute (short term) health effects are anticipated. Elevated 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.
	Long-term: 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: 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).
<b>ENDEMIC DISEASE</b>			
Food borne/Waterborne (e.g., diarrhea-bacteriological) Arthropod Vector Borne Water-Contact (e.g., wading, swimming) Respiratory Animal Contact Aerosolized Dust or Soil-Contact	Risk levels are no longer provided in Section 6 (Endemic Diseases). OEHSA's provide risk levels for particular endemic diseases; however, it is not specified how the risk levels were obtained. Although risk levels are no longer provided, country specific endemic disease information can be found in Section 6.	Mitigation measures are provided under each endemic disease category in Section 6.	Risk levels are no longer provided in Section 6 (Endemic Diseases). OEHSA's provide risk levels for particular endemic diseases; however, it is not specified how the risk levels were obtained. Although risk levels are no longer provided, country specific endemic diseases information can be found in Section 6.
<b>VENOMOUS ANIMAL/ INSECTS</b>			
Snakes, scorpions, and spiders	Short-term: Low; If encountered, effects of venom vary with species from mild localized swelling (e.g., <i>Scorpiops afghanus</i> ) to potentially lethal effects (e.g., <i>Gloydius halys</i> ).	Risk reduced by avoiding contact, proper wear of uniform (especially footwear), and proper and timely treatment.	Short-term: Low; If encountered, effects of venom vary with species from mild localized swelling (e.g., <i>Scorpiops afghanus</i> ) to potentially lethal effects (e.g., <i>Gloydius halys</i> ).
	Long-term: No data available		Long-term: No data available

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Control Measures Implemented	Residual Health Risk Estimate <sup>4</sup>
<b>HEAT/COLD STRESS</b>			
Heat	Short-term: Variable; Risk of heat injury is High (for May – September), Low for all other months.	Work-rest cycles, proper hydration and nutrition, and Wet Bulb Globe Temperature (WBGT) monitoring.	Short-term: Variable; Risk of heat injury is High (for May – September), Low for all other months.
	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.		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 risk of cold stress/injury.	Risks from cold stress reduced with protective measures such as use of the buddy system, limiting exposure during cold weather, proper hydration and nutrition, and proper wear of issued protective clothing.	Short-term: Low risk of cold stress/injury.
	Long-term: Low; Long-term health implications from cold injuries are rare but can occur, especially from more serious injuries such as frostbite.		Long-term: Low; Long-term health implications from cold injuries are rare but can occur, especially from more serious injuries such as frostbite.
<b>NOISE</b>			
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.
<b>UNIQUE INCIDENTS/ CONCERNS</b>			
Burn Pits/Incinerators	Short-term: Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit. Exposure to burn pit smoke is variable. Exposure to high levels of PM <sub>10</sub> and PM <sub>2.5</sub> from smoke may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel and certain subgroups, such as those with pre-existing health conditions (e.g., asthma, or cardiopulmonary disease, which may be exacerbated).	Risks reduced by limiting strenuous physical activities when air quality was especially poor; and action such as closing tent flaps, windows, and doors. Other control measures included locating burn pits downwind of camps, increased distance from troop populations, and improved waste segregation and management techniques. Other control measures included decreased duration of burning, specifying burn times	Short-term: Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit. Exposure to burn pit smoke is variable. Exposure to high levels of PM <sub>10</sub> and PM <sub>2.5</sub> from smoke may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel and certain subgroups, such as those with pre-existing health conditions (e.g., asthma, or cardiopulmonary disease, which may be exacerbated).
	Long-term: Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit. Exposure to burn pit smoke is variable. Exposure to high levels of PM <sub>10</sub> and PM <sub>2.5</sub> in the smoke may be associated with some otherwise healthy		Long-term: Burn pits and/or incinerators were present at Camp Blackfish. However, there were no samples collected near the burn pit. Exposure to burn pit smoke is variable. Exposure to high levels of PM <sub>10</sub> and PM <sub>2.5</sub> in the smoke may be associated with some otherwise healthy

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Control Measures Implemented	Residual Health Risk Estimate <sup>4</sup>
	personnel, who were exposed for a long-term period, possibly developing 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.	(beginning 3 hours after sunrise; ceasing 3 hours before sunset), and voluntary use of NIOSH-certified N95 filtering face piece respirators.	personnel, who were exposed for a long-term period, possibly developing 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.

<sup>1</sup>This Summary Table provides a qualitative estimate of population-based short- and long-term health risks associated with the occupational environment conditions at Camp Blackfish. It does not represent an individual exposure profile. Actual individual exposures and health effects depend on many variables. For example, while a chemical may have been present in the environment, if a person did not inhale, ingest, or contact a specific dose of the chemical for adequate duration and frequency, then there may have been no health risk. Alternatively, a person at a specific location may have experienced 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.

<sup>2</sup> This assessment is based on specific environmental sampling data and reports obtained from 01 January 2018 through 31 December 2019. 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.

<sup>3</sup>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 Blackfish. The health risks are presented as Low, Moderate, High, or Extremely High for both acute and chronic 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 Defense Centers for Public Health-Aberdeen (formerly Army Public Health Center (APHC)). Where applicable, "None Identified" is used when though a potential exposure is identified, and no health risks of either a specific acute or chronic health effects are determined. More detailed descriptions of OEH exposures that are evaluated but determined to pose no health risk are discussed in the following sections of this report.

<sup>4</sup>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 Blackfish by Source

The following sections provide additional information about the deployment 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.

## 2 Air

### 2.1 Site-Specific Sources Identified

Camp Blackfish 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.

Personnel deployed to Camp Blackfish are exposed to various airborne constituents that have been identified through monitoring and sampling efforts over the years. One constituent of concern is ambient particulate matter (PM) which comes primarily from windblown dust and sand. PM levels at this location fluctuate over time; for instance, seasonal variation in the data could indicate higher levels of particulate matter in warmer months (summer).

### 2.2 Particulate Matter

Particulate matter is a complex mixture of extremely small particles suspended in the air. The PM includes solid particles and liquid droplets emitted directly into the air by sources such as: power plants, motor vehicles, aircraft, generators, construction activities, fires, and natural windblown dust. The PM can include sand, soil, metals, volatile organic compounds (VOC), allergens, and other compounds such as nitrates or sulfates that are formed by the condensation or transformation of combustion exhaust. The PM composition and particle size vary considerably depending on the source. Generally, PM of health concern is divided into two fractions: PM<sub>10</sub>, which includes coarse particles with a diameter of 10 micrometers or less, and fine particles less than 2.5 micron (PM<sub>2.5</sub>), which can reach the deepest regions of the lungs when inhaled.

### 2.3 Particulate Matter, less than 10 microns (PM<sub>10</sub>).

One valid PM<sub>10</sub> air samples was collected in May 2018. The sample quantity was insufficient to characterize the potential short- or long-term health risk from PM<sub>10</sub> exposure to U.S. personnel.

## 2.4 Particulate Matter, less than 2.5 microns (PM<sub>2.5</sub>)

### 2.4.1 Exposure Guidelines:

A total of three valid PM<sub>2.5</sub> air samples were collected from 01 January 2018 – 31 December 2019. One sample each was collected in May 2018, April 2019, and June 2019. The sample quantity was insufficient to characterize the potential short- or long-term health risk from PM<sub>2.5</sub> exposure to U.S. personnel.

## 2.5 Airborne Metals

A total of three airborne PM<sub>2.5</sub> samples were collected for metal analyses from 01 January 2018 – 31 December 2019. No airborne metals were detected in the samples.

## 2.6 Volatile Organic Compounds (VOC)

No VOC samples were taken between 01 January 2018 and 31 December 2019.

## 3 Soil

No soil samples were taken between 01 January 2018 and 31 December 2019.

## 4 Water

In order to assess the health risk to U.S. personnel from exposure to water in theater, the Defense Centers for Public Health-Aberdeen (formerly Army Public Health Center (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 or from exposure pathways identified by the unit on the ground. At this time, the exposure pathways are primary ingestion from treated secondary drinking water and dermal contact from untreated well water.

### 4.1 Drinking Water: Bottled or Packaged Water

#### 4.1.1 Site-Specific Sources Identified

Water used as drinking water was from a municipal water source. The primary source of drinking water at Blackfish was bottled water.

#### 4.1.2 Sample data/Notes:

Water analyzed as secondary drinking water was municipal treated water. Two samples were collected in 2018: one sample in May and one sample in November. For the two samples received, no chemicals were detected above the short- or long-term MEGs. However, one sample tested positive for total coliform and one sample free available chlorine (FAC) residual was 7 mg/L which exceeds the 4 mg/L for potable water.

#### 4.1.3 Short-term and long-term health risks:

**None identified based on available sample data.** The data quantity was insufficient to characterize the potential short-term and long-term health risks from drinking water exposure. However, for short-term health risks, higher FAC residuals may cause burning/irritation of the eyes, mouth and skin, and ingesting total coliform may result in gastrointestinal issues.

#### 4.2 Non-Drinking Water: Used for Other Purposes (Personal Hygiene, Cooking, Showering, etc.)

##### 4.2.1 Site-Specific Sources Identified

Although the primary route of exposure for most microorganisms is ingestion of contaminated water, dermal exposure to some microorganisms, chemicals, and biologicals may also cause adverse health effects. Complete exposure pathways for non-drinking water 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 about dose and duration: 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.

One valid water sample was collected in April 2019. The sample was untreated water.

##### 4.2.3 Short-term and long-term health risks:

**None identified based on available sample data.** No health risks from non-drinking exposures were identified based on the available data. No chemicals were detected above the short- or long-term MEGs for the analyzed sample.

## 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) from 01 January 2018 – 31 December 2019 timeframe (Reference 1).

#### 5.2 Depleted Uranium (DU):

No specific hazard sources were documented in DOEHRS from 01 January 2018 – 31 December 2019 timeframe (Reference 1).

### 5.3 Ionizing Radiation:

No specific hazard sources were documented in DOEHS from 01 January 2018 – 31 December 2019 timeframe (Reference 1).

### 5.4 Non-Ionizing Radiation:

A Satellite Communication System (SATCOM) was used at Camp Blackfish (References 5-6). The SATCOM was located 10 meters from personnel.

## 6 Endemic Diseases

This document lists the endemic diseases reported in the region, the specific health risks and severity and general health information about the diseases. USCENTCOM MOD 13 (Reference 9) lists deployment requirements, to include immunizations and chemoprophylaxis, in effect during the timeframe of this POEMS. Additionally, some information was found under the disease threats section in the OEHS for Camp Blackfish. Information from the OEHS is summarized in Table 3 below (References 5-6).

**Table 3. Disease Threat Assessment in Blackfish OEHSAs**

Disease Threat	Hazard Severity	Hazard Probability	Risk Estimate
Rabies	Catastrophic	Unlikely	Low
Diarrheal Diseases (Enteric, Filth Fly)	Marginal	Occasional	Moderate
Leishmaniasis (Cutaneous)	Critical	Unlikely	Moderate

### 6.1 Food borne and Waterborne Diseases

Food borne 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. Effective host nation disease surveillance does not exist within the country. Only a small fraction of diseases is identified or reported in host nation personnel. 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)

Diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel (potentially over 50 percent per month) within days if local food, water, or ice is 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, typhoid fever, and diarrhea-protozoal

Hepatitis A, typhoid fever, and diarrhea-protozoa can cause prolonged illness. Hepatitis A and typhoid fever can cause prolonged illness in a small percentage of personnel, (less than 1 percent per month). However, because all deployed U.S. Forces, including civilians and contractors, were vaccinated for Hepatitis A and Typhoid fever, no risk is identified for U.S. Forces from Hepatitis A and Typhoid fever. A typical case of Hepatitis A involves 1 to 3 weeks of debilitating symptoms, sometimes initially requiring inpatient care; recovery and return to duty may require a month or more. With appropriate treatment, typhoid fever is a debilitating febrile illness that typically requires 1 to 7 days of supportive care, followed by return to duty. Symptomatic cases of diarrhea – protozoal 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.

#### 6.1.3 Polio

Despite a concerted global eradication campaign, poliovirus continues to affect children and adults in Afghanistan. Polio is a highly infectious disease that invades the nervous system. The virus is transmitted by person-to-person, typically by hands, food or water contaminated with fecal matter or through direct contact with the infected person's saliva. An infected person may spread the virus to others immediately before and about 1 to 2 weeks after symptoms appear. The virus can live in an infected person's feces for many weeks. About 90% of people infected have no symptoms, and about 1% have a very severe illness leading to muscle weakness, difficulty breathing, paralysis, and sometimes death. People who do not have symptoms can still pass the virus to others and make them sick.

### 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 Malaria

Malaria incidents are often associated with the presence of agriculture activity, including irrigation systems and standing water, which provide breeding habitats for vectors. A small number of cases may occur among personnel exposed to mosquito (*Anopheles* spp.) bites. Malaria incidents may cause debilitating febrile illness typically requiring 1 to 7 days of inpatient care, followed by return to duty. Severe cases may require intensive care or prolonged convalescence.

### 6.2.2 Crimean-Congo hemorrhagic fever

Crimean-Congo hemorrhagic fever occurs in a small number of cases (less than 1% per month attack rate) and is transmitted by tick bites or occupational contact with blood or secretions from infected animals. The disease typically requires intensive care with fatality rates from 5% to 50%.

### 6.2.3 Leishmaniasis

Leishmaniasis is transmitted by sandflies. 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 can be disfiguring. Visceral leishmaniasis causes a severe febrile illness, which typically requires hospitalization with convalescence over 7 days. Mitigation measures in place include individual protective measures (e.g., permethrin treated uniforms). Definitive treatment previously required non-urgent evacuation to the continental United States; currently, not all cases require evacuation.

### 6.2.4 Typhus-miteborne (scrub typhus)

Typhus-miteborne potential disease rates are from 1 percent to 10 percent of personnel could be affected per month under worst-case conditions. The disease is transmitted by the larval stage of trombiculid mites (chiggers), which are typically found in areas of grassy or scrubby vegetation. The disease can cause debilitating febrile illness typically requiring 1 to 7 days of inpatient care, followed by return to duty.

### 6.2.5 Sandfly fever

Sandfly fever potential disease rates are from 1 percent to 10 percent of personnel could be affected per month under worst-case conditions. It is transmitted by sandflies and occurs more commonly in children though adults are still at risk. Incidents can result in debilitating febrile illness typically requiring 1-7 days of supportive care followed by return to duty.

### 6.2.6 West Nile fever

West Nile fever is present and is 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.

### 6.2.7 Plague

Bubonic plague typically occurred as sporadic cases among people who encounter wild rodents and their fleas during work, hunting, or camping activities. Outbreaks of human plague are rare and typically occur in crowded urban settings associated with large increases in infected commensal rats (*Rattus rattus*) and their flea populations. Some untreated cases of bubonic plague may develop into secondary pneumonic plague. Respiratory transmission of pneumonic plague is rare but has the

potential to cause significant outbreaks. Close contact is usually required for transmission. In situations where respiratory transmission of plague is suspected, weaponized agent must be considered. Extremely rare cases (less than 0.01% per month attack rate) could occur. Incidence could result in potentially severe illness which may require more than 7 days of hospitalization and convalescence.

### 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. 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.

Leptospirosis. 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.

### 6.4 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 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)

Tuberculosis is usually transmitted through close and prolonged exposure to an active case of pulmonary or laryngeal tuberculosis but can also occur with incidental contact. The Army SG has defined increased risk in deployed Soldiers as indoor exposure to locals or third country nationals of

greater than one hour per week in a highly-endemic active TB region. Additional mitigation included active case isolation in negative pressure rooms, where available.

#### 6.4.2 Meningococcal meningitis

Meningococcal meningitis is transmitted from person to person through droplets of respiratory or throat secretions. Close and prolonged contact facilitates the spread of this disease. Asymptomatic colonization and carriage of meningococcal bacteria are common worldwide, including within U.S. military populations; rare symptomatic cases may occur periodically in military populations, regardless of geographic location. *Neisseria meningitidis* group A predominates regionally. Meningococcal meningitis is potentially a very severe disease typically requiring intensive care; fatalities may occur in 5-15% of cases.

#### 6.4.3 Middle East respiratory syndrome coronavirus (MERS-CoV)

Although no cases have been reported in Afghanistan, Middle East respiratory syndrome coronavirus (MERS-CoV) is known to occur within the region. Most MERS patients developed severe acute respiratory illness with symptoms of fever, cough and shortness of breath. MERS-CoV has spread from ill people to others through close contact, such as caring for or living with an infected person. The incubation period for MERS-CoV is usually about 5 to 6 days but can range from 2 to 14 days. Currently, there is no vaccine to prevent MERS-CoV infection.

### 6.5 Animal-Contact Diseases

#### 6.5.1 Q-Fever

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

Dogs were the primary reservoir of rabies in Afghanistan, 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. Laboratory results indicated the Soldier was infected from contact with a dog while deployed. 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 Avian Influenza

Although avian influenza (AI) is easily transmitted among birds, bird-to-human transmission is extremely inefficient. Human-to-human transmission appears to be exceedingly rare, even with relatively close contact. Extremely rare cases (less than 0.01% per month attack rate) could occur. Incidence could result in very severe illness with fatality rate higher than 50 percent in symptomatic cases. Mitigation strategies included avoidance of birds/poultry and proper cooking temperatures for poultry products.

### 6.5.4 Anthrax

Anthrax is a naturally occurring infection; cutaneous anthrax is transmitted by direct contact with infected animals or carcasses, including hides. Eating undercooked infected meat may result in contracting gastrointestinal anthrax. Pulmonary anthrax is contracted through inhalation of spores and is extremely rare. Mitigation measures included consuming approved food sources, proper food preparation and cooking temperatures, avoidance of animals and farms, dust abatement when working in these areas, vaccinations, and proper PPE for personnel working with animals.

## 6.6 Soil-transmitted helminths (hookworm, strongyloidiasis, cutaneous larva migrans)

A small number of cases (less than 1% per month attack rate) could occur among personnel with direct skin exposure to soil contaminated with human or animal feces (including sleeping on bare ground and walking barefoot). Initial skin symptoms typically are mild and are not debilitating. However, systemic symptoms of fever, cough, abdominal pain, nausea, and diarrhea may develop weeks to months after initial infection with hookworm or *Strongyloides*. More severe infections with high worm burden may be debilitating in some cases. Rates of infection in U.S. personnel will be highly variable, depending on specific local environmental conditions. Rates of infection in U.S. personnel are expected to be less than 1 percent per month in most locations. However, rates in some focal areas with heavily contaminated soil could exceed 1 percent per month.

## 7 Venomous Animal/Insect

All information was taken directly from the Clinical Toxinology Resources web site from Reference 9. The species listed below have home ranges that overlap the location of Camp Blackfish and may present a health risk if they are encountered by personnel. See Section 10.5 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

- *Androctonus afghanus*, *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*, *Buthacus striffleri*, *Compsobuthus afghanus*, *Compsobuthus rugosulus*, *Compsobuthus tofti*, *Mesobuthus caucasicus*, *Mesobuthus eupeus*, *Mesobuthus macmahoni*, *Orthochirus afghanus*, *Orthochirus bicolor*, *Orthochirus danielleae*, *Orthochirus erardi*, *Orthochirus heratensis*, *Orthochirus Jalalabadensis*, *Orthochirus monodi*, *Orthochirus pallidus*, *Orthochirus samrchelsis*, *Orthochirus scrobiculosus*, and *Sassanidotus gracilis*: 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 these species fit 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* and *Scorpiops lindbergi*: 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

- *Echis carinatus multisquamatus* (central Asian saw-scaled viper), *Echis carinatus sochureki* (Sochurek's saw-scaled viper), and *Gloydius halys* (Haly's Pit Viper): Severe envenoming possible, potentially lethal. Bites may cause moderate to severe coagulopathy and haemorrhagins causing extensive bleeding.

- *Eristocophis mcmahoni* (McMahon's Viper): Severe envenoming possible, potentially lethal. Venom shows strong hemorrhagic activity. Mild to Moderate neurotoxic effects may occur.

- *Macrovipera lebetina obtuse* (Levantine Viper), and *Macrovipera lebetina turanica* (Levantine Viper): Severe envenoming possible, potentially lethal. Bites may cause mild to severe local effects, shock and coagulopathy.

- *Naja oxiana* (Oxus cobra): Severe envenoming possible, potentially lethal. Bites can cause systemic effects, principally flaccid paralysis.

- *Pseudocerastes persicus* (Persian dwarf snake): Unlikely to cause significant envenoming; limited clinical data suggest bites result in local effects only.

- *Bungarus caeruleus* (Common krait): Severe envenoming likely, high lethality potential. Krait bites can cause moderate to severe flaccid paralysis, respiratory failure, requiring intubation & ventilation in severe cases. Most victims bitten while asleep in huts at night. Bites may produce invisible or barely perceptible puncture marks. Human mortality rate is high without use of antivenom. Antivenom may prevent worsening of paralysis, but may not reverse established paralysis.

- *Gloydius himalayanus* (Himalayan pit viper), and *Gloydius intermedius* (Central Asian pit viper): Potentially lethal envenoming, though unlikely, cannot be excluded. Bites cause local and sometimes systemic effects including necrosis, coagulopathy, and renal failure.

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. Mitigation strategies included avoiding contact, proper wear of uniform (especially footwear), and timely medical treatment. Confidence in the health risk estimate is low (Reference 4, Table 3-6).

Long-term health risk:

**None identified.**

## 8 Heat/Cold Stress

### 8.1 Heat

Camp Blackfish has a cold semi-arid climate. Summer (May - September) temperatures range from 90 degrees Fahrenheit (°F) to 105 (°F). However, work intensity and clothing/equipment worn pose greater health risk of heat stress/injury than environmental factors alone (Reference 10). Managing risk of hot weather operations included monitoring work/rest periods, proper hydration, and taking individual risk factors (e.g., acclimation, weight, and physical conditioning) into consideration. Risk of heat stress/injury was reduced with preventive measures.

#### 8.1.1 Short-term health risk:

**High, mitigated to Low:** The risk of heat injury was reduced to Low through preventive measures such as work/rest cycles, proper hydration and nutrition, and monitoring Wet Bulb Globe Temperature (WBGT). Risk of heat injury in unacclimatized or susceptible populations (older, previous history of heat injury, poor physical condition, underlying medical/health conditions), and those under operational constraints (equipment, PPE, vehicles) is High from May – September.

#### 8.1.2 Long-term health risk:

**Low:** The long-term risk is Low. However, the risk may be greater for 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 are rare but may occur, especially from more serious injuries such as heat stroke. It is possible that high heat in conjunction with various chemical exposures may increase long-term health risks, though specific scientific evidence is not conclusive.

### 8.2 Cold

Winter (December - March) temperatures range from 10 degrees Fahrenheit (°F) to 35 °F. The risk assessment for Non-Freezing Cold Injuries (NFCI), such as 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 (Reference 10).

Short-term and long-term health risks:

**Low:** The health risk of cold injury is Low.

## 9 Noise

### 9.1 Continuous:

There were several stand-alone generators located throughout Camp Blackfish generating a continuous noise exposure. Workers on or adjacent to flight lines are further exposed to significant noise levels from aircraft. Vehicles also provide a source of occupational exposure to noise. Workers were provided appropriate protective equipment when and where needed (References 5-6).

Short-term and long-term health risks:

**High to Low:** High to Moderate risk for personnel not wearing hearing protection (dependent on magnitude, frequency, and duration of exposures). Low risk for personnel working near major noise sources who wear proper hearing protection.

### 9.2 Impulse:

No specific hazard sources were documented in DOEHRS from 01 January 2018 – 31 December 2019 timeframe.

## 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:

Solid waste was managed by U.S. military personnel. Solid waste was disposed in dumpsters located around the base, collected daily, and transported to the solid waste collection point where it was

burned in a burn pit located 100 meters outside of Camp Blackfish (References 5, 7). A discussion of potential hazards associated with emissions is in section 10.7.

Short-term and long-term health risks:

**Low:** Short-term and long-term health risk is Low.

### 10.3 Fuel/petroleum products/industrial chemical spills

There was a fuel point at Camp Blackfish with JP-8 and diesel stored above ground (References 5-6).

Short-term and long-term health risks:

**Low:** The health risk is Moderate for individuals conducting specific operations without proper personal protection. The risk level was reduced to Low with proper protection to mitigate exposure/contact.

### 10.4 Lead Based Paint

No specific hazard sources were documented in the Defense Occupational and Environmental Health Readiness System (DOEHRS) from 01 January 2018 – 31 December 2019 timeframe (Reference 1).

### 10.5 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 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.

**Low:** Short-term and long-term health risks are Low. Confidence in the health risk assessment is medium.

### 10.6 Asbestos

No specific hazard sources were documented in the Defense Occupational and Environmental Health Readiness System (DOEHRS) from 01 January 2018 – 31 December 2019 timeframe (Reference 1).

### 10.7 Burn Pits

Solid waste collected daily and transported to the solid waste collection point where it was burned in a burn pit located 100 meters outside of Camp Blackfish.

While emissions from the burning of waste at or near deployment locations will increase concentrations of combustion related airborne hazards, estimating the relative contribution of those hazards to a specific increase in risk to the health of Service Members is nearly impossible. Air samples used to support the health risk assessment capture the airborne hazards from all sources at the point of exposure, not just from the burn pit. During contingency operations, the air quality may be affected by combustion sources not typically encountered in a garrison environment (e.g., industry lacking emissions controls, local burning for heating homes and businesses, or combat- or natural disaster-related fires).

The population health risks presented in this POEMS describe - as far as practicable - the risks associated with exposure to the combined hazards that were measured in the ambient air. These risks are from all contributing sources and are not exclusive to burn pit emissions.

In the 2011 study of the health effects associated with service in Afghanistan and Iraq during 2001-2009, the Institutes of Medicine (Reference 11) was unable to determine if exposure to emissions from burn pits was associated with long-term health effects. This was primarily due to significant gaps in environmental monitoring data and health effects reporting. However, the committee's review of the existing literature at the time did suggest that, in general, service in Iraq or Afghanistan could be associated with long-term health effects. For the hazards that they did identify, this would be particularly true for either susceptible (e.g., those with asthma) or highly exposed subpopulations (e.g., those who lived or worked near a burn pit). If these broader conclusions are supported in future health studies, the related health effects of concern will probably be respiratory and cardiovascular effects and cancer. Additionally, the susceptibility to these effects could be exacerbated by other factors such as stress, smoking, local climatic conditions, and co-exposure to other chemicals that affect the same biological or chemical processes.

To follow-up on the 2011 report, the National Academies of Sciences, Engineering, and Medicine (NASEM) published a 2020 report that examined the scientific findings from studies on the respiratory health effects of airborne hazards during deployment (Reference 12). A key conclusion in that report was that particulate matter from regional sources was of potential importance. The committee concluded that respiratory symptoms (shortness of breath, chronic persistent cough, and wheezing) had limited or suggestive evidence of an association with airborne hazards. Additionally, adequate or insufficient evidence was available to determine an association to other health outcomes (pulmonary function changes, respiratory system disease mortality, infectious/non-infectious lower airway occurrences, upper airway disorders, lung disease, and respiratory cancers). These findings do not mean that there is no association between deployment to the Southwest Asia theater and the respiratory health outcomes mentioned above, but instead that the available evidence does not allow a more definitive determination to be made about a potential association.

The 2011 IOM report specifically addressed exposure in Iraq and Afghanistan. While those results are not specific to this location, the overall conclusions about risks due to environmental exposures at locations with burn pits may be similar. However, any specific conclusions about health risks at this location may differ from other locations as exposures can vary significantly due to differences in the types and amounts of materials burned, the operational processes at the burn pit or incinerator, local meteorological conditions, the presence of other pollution sources, and many other variables.

## 11 References

1. Defense Occupational and Environmental Health Readiness System (referred to as the DOEHRS-EH database) at <https://doehrs-ih.csd.disa.mil/Doehrs/>.
2. Department of Defense (DoD) Instruction 6490.03, *Deployment Health*, 19 June 2019.
3. DoDI 6055.05, Occupational and Environmental Health, 13 August 2018.
4. USAPHC 2013 TG230: Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel. June 2013 Revision.
5. Occupational and Environmental Health Site Assessment (OEHSA) Survey Report, Base Camp Blackfish, Afghanistan. September 2019.
6. Occupational and Environmental Health Site Assessment (OEHSA) Survey Report, Base Camp Blackfish, Afghanistan. November 2018
7. Base Camp Assessment, Camp Blackfish, Afghanistan, 10-11 December 2018.
8. Modification 13 to United States Central Command Individual Protection and Individual Unit Deployment Policy, 23 March 2017.
9. Clinical Toxinology Resources: <http://www.toxinology.com/>. University of Adelaide, Australia.
10. 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.
11. IOM (Institute of Medicine). 2011. Long-term health consequences of exposure to burn pits in Iraq and Afghanistan. Washington, DC: The National Academies Press.
12. National Academies of Sciences, Engineering, and Medicine (NASEM). 2020. Military Exposures and Your Health: Information for Veterans Who Served During the Gulf War ERA (1990-Present) and Their Families. 11 September 2020.

## 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).

**Defense Centers for Public Health-Aberdeen (DCPH-A)** (formerly U.S. Army Public Health Center (USAPHC))

Phone: (800) 222-9698. <https://phc.amedd.army.mil/Pages/default.aspx>

**Defense Centers for Public Health-Portsmouth (DCPH-P)** (formerly Navy and Marine Corps Public Health Center (NMCPHC))

Phone: (757) 953-0700. <https://www.med.navy.mil/Navy-Marine-Corps-Public-Health-Center/>

**Defense Centers for Public Health-Dayton (DCPH-D)** (formerly U.S. Air Force School of Aerospace Medicine (USAFSAM))

Phone: (888) 232-3764. <http://www.wpafb.af.mil/afrl/711hpw/usafsam/>

**DoD Health Readiness Policy and Oversight (HRP & O)**

Phone: (800) 497-6261. <https://health.mil/Military-Health-Topics/Health-Readiness>