

# **Individual Longitudinal Exposure Record (ILER) Update and Wearable Capabilities to Assess Military Exposures**

**Steve Jones, MPH  
Office of the Deputy Assistant Secretary of Defense for  
Health Readiness Policy & Oversight**

**8 February 2023**





# Environments and Toxic Exposures





# Environments and Toxic Exposures

## Airborne hazards

- Ambient dusts and combustion products  
**UBIQUITOUS, DIFFICULT TO CONTROL EXPOSURE**
  - **SMALL NUMBER OF CASES WHERE MILITARY EXPOSURE GUIDELINES (MEGs) FOR AIRBORNE CHEMICALS WERE EXCEEDED. SOURCES FROM BIOMASS/FUEL COMBUSTION**

## Soil hazards

- Heavy metals (natural and pollution)
- Pesticides/herbicides
- Industrial compounds/mixtures  
**INHALATIONAL RISKS MOST PROBLEMATIC**
  - **SMALL NUMBER OF MEG EXCEEDANCES INCLUDE PESTICIDES, AND NATURAL METALS**

## Water contact (dermal/ingestion – not drinking water)

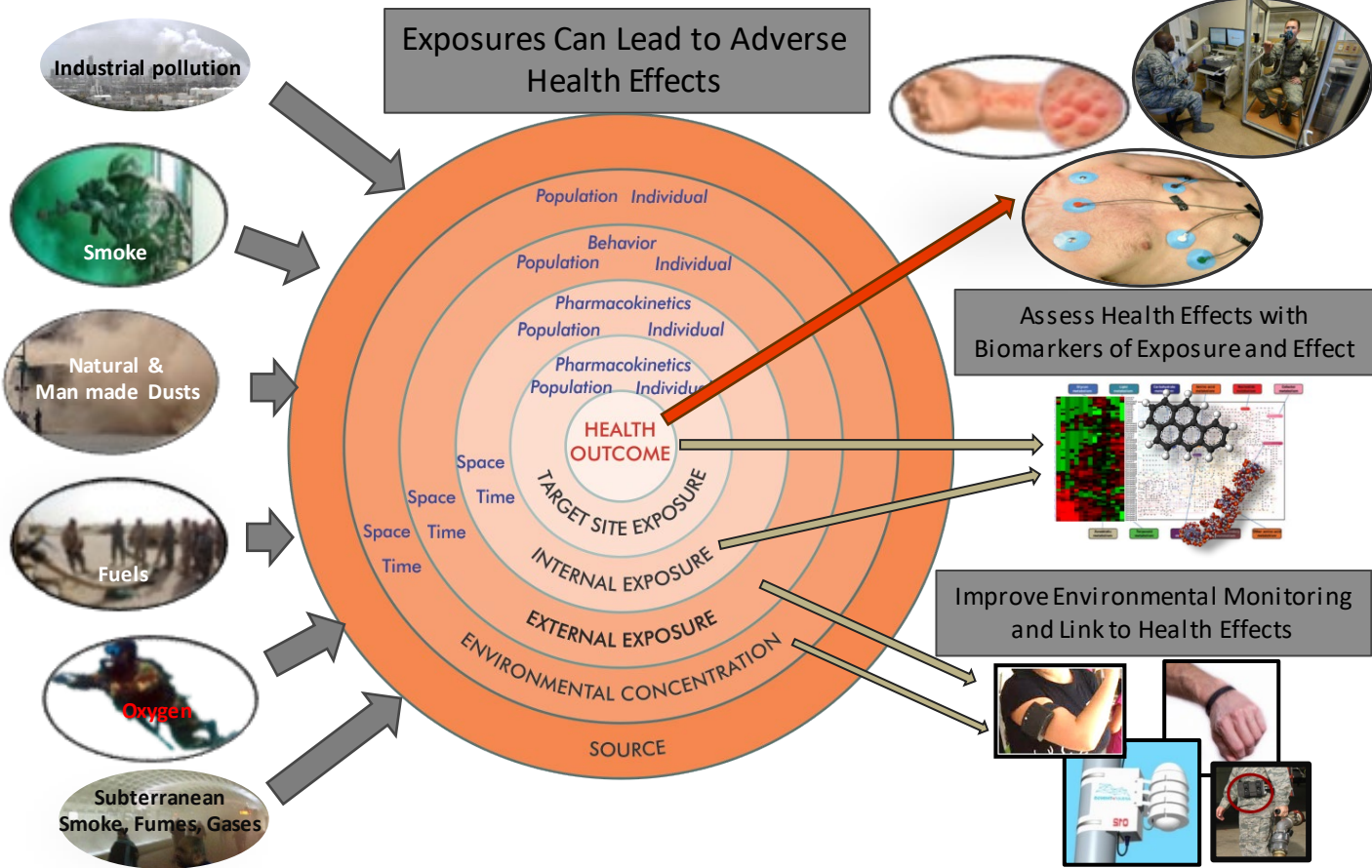
- Heavy metals (natural and pollution)
- Pesticides/herbicides
- Industrial compounds/mixtures

**RARE EXPOSURES (FLOODING, FORDING)**





# Exposure Monitoring and Human Health Continuum





# DoD/HRP&O Environmental Health Focus Areas

## • Exposure Monitoring

- Reconstructing past exposure, assessing current exposure, predicting future exposure
- Monitoring exposure, especially in deployed environments, via wearable dosimeters and other technologies, vice relying on area monitoring as surrogates of individual exposure
- Enhancing exposure assessment techniques, including extrapolation of population-level data to estimates of individual exposure
- Assessing combined, complex exposures (e.g., burn pit smoke, mega-city environment); assessing cofounders, e.g., smoking
- Identifying biomarkers of exposure, and biomarkers of early effect (“omics”)
- “At the time” documentation of the acute exposure event, e.g., collecting biospecimens
- Expanding from work-site exposure monitoring to total exposure monitoring



# DoD/HRP&O Environmental Health Focus Areas

- **Exposure Monitoring (continued)**
  - Establishing DoD occupational exposure guidelines for specific hazards of concern (e.g., trichloroethylene, lead)
  - Developing chemical and biological Military Exposure Guidelines; submarine toxicants guidelines
  - Establishing a near real-time “health risk management system” in the operational environment
- **Toxic Exposures**
  - Using a phased approach to gathering toxicity information for new substances proposed for use in new weapon systems and platforms
  - Screening all new military-specific substances to ensure they are safe for the warfighter, worker and the environment (within our “emerging contaminants” program)
- **Individual Longitudinal Exposure Record (ILER)**
  - Establishing an “individual longitudinal record of exposures” (ILER)



## Expanding DoD Exposure Monitoring Capabilities

- Developing a Comprehensive Exposure Monitoring Strategy
- Enhancing monitoring via wearables and other technologies
- Enhancing exposure assessment techniques, including extrapolation of population-level data to estimates of individual exposure
- Identifying biomarkers of exposure
- Expanding to total exposure monitoring
- Establishing DoD occupational exposure guidelines
- Developing chemical & biological Military Exposure Guidelines (MEGs)
- Enhancing understanding of health effects
- Individual Longitudinal Exposure Record (ILER)



## Comprehensive Exposure Monitoring (CEM) Capabilities-Based Assessment (CBA)

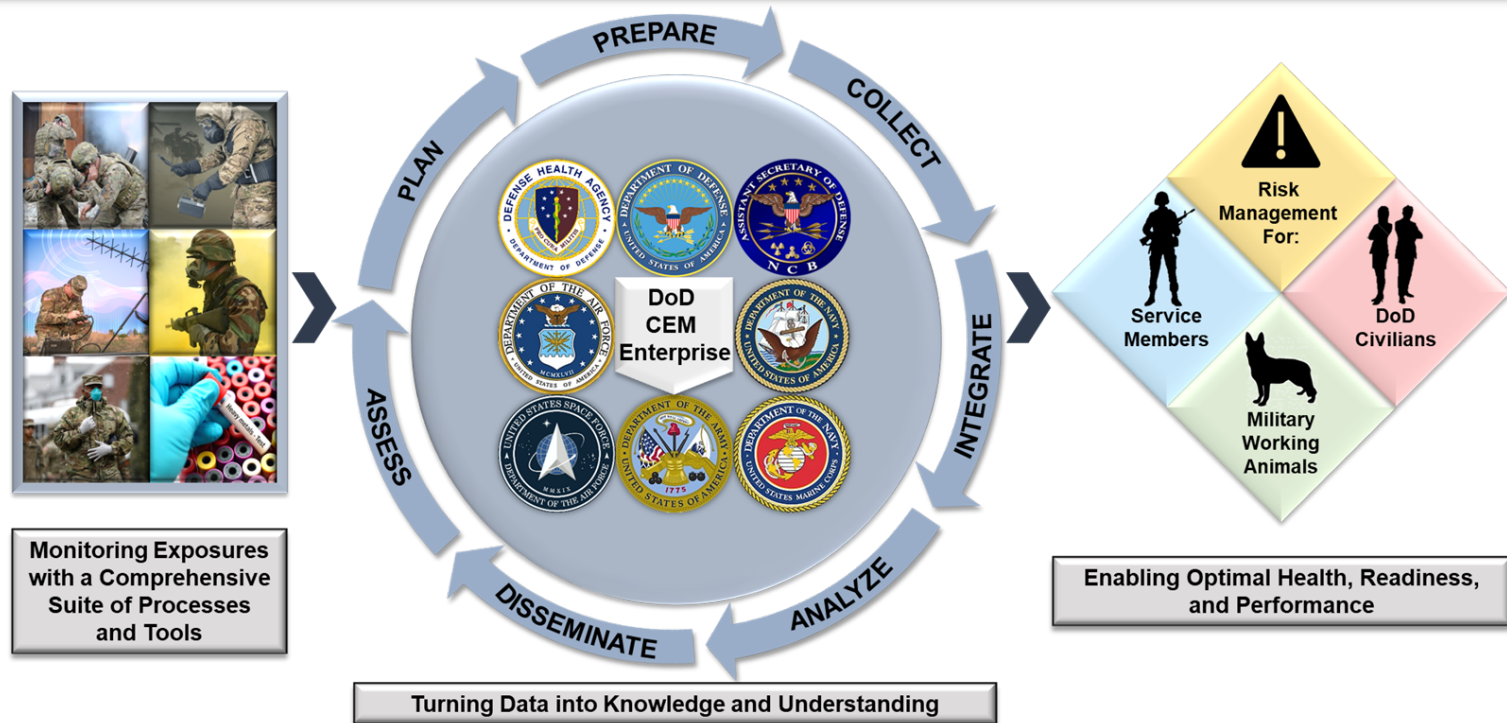
- ▶ Purpose: Identify requirements, assess capabilities, and recommend solution approaches to improve DoD's ability to conduct comprehensive exposure monitoring that enables DoD to recognize and take risk management actions to mitigate effects on the short- and long-term health, performance, and readiness of DoD personnel (Service members and DoD civilians) and military working animals.
- ▶ Objectives:
  - Develop capability requirements for the full spectrum of DoD CEM activities
  - Identify and assess gaps, shortfalls, and issues
  - Recommend suitable, feasible, and acceptable solution approaches
  - Develop Joint Capabilities Integration and Development System (JCIDS)-ready documents and implementation plan to institutionalize solutions



# CEM CBA Operational Viewpoint-1 (OV-1)

**Challenge:** Given a current and expected future security environment characterized by known and unknown exposures to a variety of hazards across garrison, training, and operational environments, how can DoD effectively and efficiently monitor and assess the full spectrum of exposures to DoD personnel to better understand risks to health, readiness, operational capability, and missions?

**Ends:** Exposure-informed, data-driven recommendations to support risk management activities that optimize health, readiness, and performance of DoD personnel



**Means:** Well-coordinated tools, capabilities, and processes across the DoD exposure monitoring enterprise that provide a collective and comprehensive understanding of the full spectrum of hazards to DoD personnel



## Wearables Program Objectives

- Address Hardware Solutions
- Inform Requirements
- Enable Collaboration
- Align to Chem/Bio Defense mission space
- Assess Wearables Usefulness and value to decision support (Early warning and detection)
- Evaluate current policy and future policy needs
- Assess Regulatory Implications (i.e. FDA)
- Investigate Cybersecurity for existing or new technology
- Survey clinical research and testing capabilities to assess wearables infrastructure
- Assess Technology Readiness



## Proposed Wearable Functional Areas

- Health and Clinical Care
- Force Health Protection/ Health Surveillance / Occupational and Environmental Health
- Biosurveillance
- Human Performance and Wellness
- NCB Defense
- Operations/Combat
- Training and Exercise
- IT Systems and Cyber security
- Privacy
- Realtime reporting
- Data and Research





# Individual Longitudinal Exposure Record (ILER) Overview

- **ILER** is a web application that compiles, collates, and presents available occupational and environmental exposure information in an individual/person-centric format
- **ILER** delivers the capability to:
  - Create a longitudinal (historic) record of service-related exposures
  - Improve the medical care for those who have exposure-related health outcomes
  - Research and support epidemiology studies of exposed cohorts
  - Create cohorts based on location, date, time, and exposure
  - Improve both medical surveillance and occupational environmental health surveillance by detecting emerging (latent) health conditions on personnel returning from deployment
  - Assist Veteran disability evaluations and benefits determination
- **ILER** Functionality – DoD and VA Users
  - Health Care
  - Epidemiology and Research
  - Benefits and Disability adjudication





# ILER Data/System Interoperability Summary

## V1.0 (Pilot / IOC) OCT 2019

- Defense Occupation and Environmental Health Readiness System - Industrial Hygiene (**DOEHS-IH**)
- Military Exposure Surveillance Library (**MESL**)
- Armed Forces Public Health Surveillance Branch (**AFHSB**)
  - Annual Health Assessments
  - Periodic Health Assessments
  - Pre-Deployment Health Assessments
  - Post-Deployment Health Assessments
- Defense Manpower Data Center (**DMDC**)\*
  - Limited to 'Reid Memo' data elements
  - Deployment Start / Stop
  - Location Coordinates
- Medical Data Repository (**MDR**)

## v1.1 OCT 2020

- Airborne Hazard and Open Burn Pit (**AHOBPR**)

## v1.2 FEB – JUL 2021

- Read-only Individual Exposure **Summaries in Joint Longitudinal Viewer (JLV)**
- Persistent Defense Manpower Data Center (**DMDC**)\* data feed
- Incorporate all Individual Location Data Elements of the DoDI 6490.3, Deployment Health:
  - Location Start/End Dates
  - Military Occupational Specialty
  - Unit Identification Code (Assigned)
  - Unit Identification Code (Attached)
  - Operation Name
- Gulf War Registry (**GWR**) – *DOEHS-IH*
- Chemical Warfare Agent (**CWA**)

## v2.1 JAN 2023

- VA Gulf War Registry

## v2.2 APR 2023

- Defense Occupation and Environmental Health Readiness System Hearing Conservation (DOEHS HC)
- Veterans Integrated Registry Portal (VIRP)

## v2.3 JUN 2023

- Hazardous Materials Information Resource System (HMIRS)
- Health Artifact and Image Management System (HAIMS)
- Veterans Benefits Management System (VBMS)

## FY23 24

- Electronic Health Record Data (MHS GENESIS) ILER EHR Interoperability
- Dosimetry Data
- enterprise Military Housing (eMH)
- Joint Hearing Loss and Auditory System Injury Registry (JHASIR)
- VA Clinical Data Repositories (VA CDR)
- VA Health Data Repository (HDR)
- VA Ionizing Radiation Registry (IRR)
- VA Toxic Embedded Fragments (TEF)
- VA Depleted Uranium (DU)



# ILER Individual Exposure Summary

For Official Use Only **ILER - Individual Longitudinal Exposure Record**



## Individual Exposure Summary Information

EDIPI/DoD ID	Last Name	First Name	Middle Name	Last 4 SSN	Date of Birth	Gender	Service	Service MOS Description
12804	Platt					Male	Army	Communications-Electronics Automation

Home Phone Number:		Work Phone Number:	
Address:		Email Address:	
Marital Status:		Dependent Quantity:	
Race:		Ethnicity:	
Basic Active Service Date:		Active Duty Loss Date:	
Departing Rank:		Date of Separation:	
Date of Death:		Foreign National:	

**Periodic Occupational and Environmental Monitoring Summary (POEMS) Count: 1 Information from DOEHS-IH**

**\*\*This information is based on population level assessments and does not represent an individual exposure\*\***

Location	Country	Date Start at Location	Date Stop at Location	Health Risks Summary/Estimates	POEMS File	POEMS Begin Date	POEMS End Date
Base Camp BALAD	Iraq	07/01/2007	06/30/2008	Please see the Short and Long-Term Health Risks and Medical Implications, as well as the Population-Based Health Risk Estimates below	poems balad and anaconda, iraq 2003 to 2009.pdf	04/01/2003	10/31/2009

**Short-Term Health Risks and Medical Implications Summary**

The following may have caused acute health effects in some personnel during deployment at JBB and vicinity that includes Balad AB and LSAA: Inhalable coarse particulate matter less than 10 micrometers in diameter (PM10); certain airborne chemical pollutants (e.g., acrolein and hexachlorobutadiene); food/waterborne diseases (e.g., diarrhea); other endemic diseases (e.g., sandfly fever and cutaneous leishmaniasis), and heat stress. If ingesting local food and water, food/waterborne disease resulting in diarrhea can temporarily incapacitate personnel. For heat stress, risk can be greater for susceptible persons including those older than 45, of low fitness level, or with underlying medical conditions. Risks from food/waterborne diseases and heat stress can be reduced with preventive medicine controls and mitigation. For PM10 and airborne chemical pollutants, certain subgroups of the deployed forces (e.g., those with preexisting asthma/cardio pulmonary conditions) are at greatest risk of developing notable health effects. Although most effects from exposure to PM10 and chemical pollutants should have resolved post-deployment, providers should be prepared to consider the relationship between deployment exposures and current complaints. Some individuals may have sought treatment for acute respiratory irritation during their time at JBB. Personnel who reported with symptoms or required treatment while at this site should have exposure/treatment noted in medical record on a Standard Form (SF) 600 (Chronological Record of Medical Care).

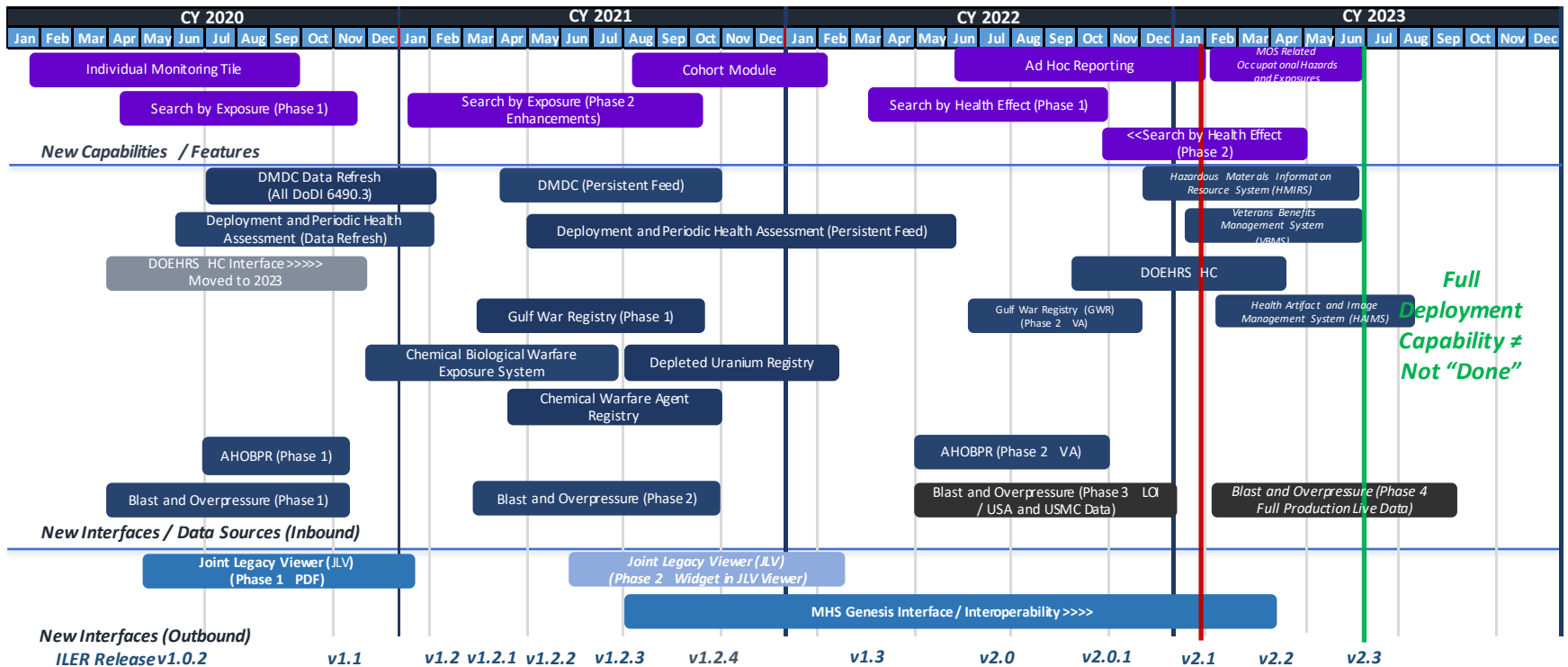
**Long-Term Health Risks and Medical Implications Summary**

The following may have caused acute health effects in some personnel during deployment at JBB and vicinity that includes Balad AB and LSAA: The types of hazards associated with potential long-term health effects at JBB include inhalable fine particulate matter less than 2.5 micrometers in diameter (PM2.5), visceral leishmaniasis and for certain populations, continuous and impulse noise. It is considered possible that some otherwise healthy personnel who were exposed for a long-term period to PM2.5 levels 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 PM2.5 exposures are documented and archived, at this time there are no specific recommended, post-deployment medical surveillance evaluations or treatments. However, providers should consider overall individual health status (e.g., any underlying conditions/susceptibilities). Likewise—especially for noise hazards—providers should consider any potential unique individual exposures (such as occupational or specific personal dosimeter data) when assessing personal concerns. For example, at all basecamps certain individuals 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

- Individual Exposure Summary report viewed via Joint Longitudinal Viewer (JLV) within Electronic Health Record
- Approximately 5.2M exposure summaries available
- Compiles most clinically relevant data available, link individual's current symptoms / disabilities to the relevant
- Present relevant data and information about exposures when exceed thresholds
- Includes Deployment Locations, Incident Reports, Health Assessments, and Relevant Medical Encounters
- Includes a copy of the Burn Pit Registry Questionnaire completed by Service member



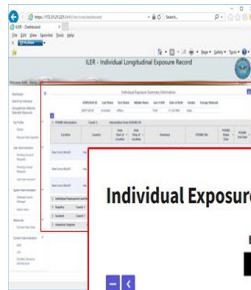
# ILER Development Map (As of Jan 2023)





# ILER Demo

*Mr. Larry Vandergrift  
ILER Project Controller  
Defense Health Agency*



### Individual Exposure Summary Information

ED/PI/DoD ID   Last Name   First Name   Middle Name   Last 4 SSN   Date of Birth   Gender   Service   Service MOS Description

[REDACTED]

- Individual Deployment History   Count: 84   Information from DMDC
- Periodic Occupational and Environmental Monitoring Summary (POEMS)   Count: 1   Information from DOEHRs-IH
- Exposure Pathways   Count: 1   Information from DOEHRs-IH
- Registry   Count: 1   Information from DOEHRs-IH   **\*\*Clinical Correlation Required for Individual Exposure Levels\*\***

Registry	Registry Event Start/End Dates	Potential Hazard and Exposure Routes	Exposure Level	Exposure Type	Potential Target Organs	Potential Symptoms
<input type="checkbox"/> Airborne Hazards and Open Burn Pit	06/01/1990		N/A not specified	Individual Exposure Profile		

**Exposure Profile Start/End Date:** 02/10/2008 - 02/07/2014

**Exposure Profile Notes:** This exposure profile represents the Service member's information gathered from the Veterans Affairs' (VA) Airborne Hazard and Open Burn Pit Registry questionnaire, which is attached. This profile does not represent an individual exposure assessment. It is only a means for documenting those who have registered and completed a questionnaire on the VA website. [Deployment Countries reported: Afghanistan Iraq Kuwait; Service Status: Unknown]

**Exposure Assessment Rationale:** General airborne hazards include windblown dust and other ambient gases, vapors and respirable particulates. Burn pit compounds include smoke and other emissions from an unknown mixture of substances.

- Health Assessments   Count: 9   Information from Armed Forces Health Surveillance Branch (AFHSB)
- Medical Exposure Indicator (For clinical information refer to the Electronic Health Record (EHR))   Count: 8   Information from Military Health Systems Data Repository (MDR)

The following exposure data does not exist for this individual:

- Incident





# Questions?

**Steve Jones, MPH**

**Office of the Deputy Assistant Secretary of Defense for  
Health Readiness Policy and Oversight**

**[steven.p.jones10.civ@mail.mil](mailto:steven.p.jones10.civ@mail.mil)**

**703-681-7335**