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OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE AT DEPLOYMENT LOCATIONS

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PREFACE

NTRP 4-02.9M/AFTTP 3-2.82/ATP 4-02.82 (JAN 2023), OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE AT DEPLOYMENT LOCATIONS, is available in the Navy Warfare Library (NWL). It provides the tactics, techniques, and procedures for planning, preparing, executing, and assessing performance of occupational and environmental health site surveillance (OEHSS) at deployment locations. It supersedes NTRP 4-02.9/AFTTP 3-2.82/ATP 4-02.82 (APR 2012), OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE ASSESSMENT.

PURPOSE

The purpose of this publication is to facilitate the implementation of deployment occupational and environmental health (EH) surveillance requirements outlined in DODI 6490.03 (JUN 2019), Deployment Health; Joint Chiefs of Staff MCM 0017-12 (DEC 2012), Procedures for Deployment Health Surveillance; and DHA-PI 6490.03 (DEC 2019), Deployment Health Procedures. Additionally, this publication is intended to provide a standardized methodology for military Services to support organic force health protection assets in successfully accomplishing occupational and EH surveillance in various deployed environments.

APPLICATION

This publication is designed for use at the tactical, operational, and strategic levels and is applicable to both kinds of deployment locations—enduring and contingency. It is applicable to conventional forces commanders and staffs at all echelons. It applies to active and reserve components and supports command staffs, and personnel who are performing or assigned OEHSS missions or tasks. The principal audience is the United States Army, United States Marine Corps (USMC), United States Navy (USN), and United States Air Force (USAF) commanders, staffs, and leaders executing or supporting OEHSS at deployment locations.

IMPLEMENTATION PLAN

Participating Service commands of primary responsibility will review this publication, validate the information, and reference and incorporate it in Service and command manuals, regulations, and curricula as follows:

1. The Army will incorporate this publication in Army training and doctrinal publications as directed by the Commander, United States Army Training and Doctrine Command. Distribution is according to Army Form 12-99-R, Initial Distribution Requirements for Publications.

2. The USMC will incorporate this publication in USMC training and doctrinal publications as directed by the Commanding General, Marine Corps Combat Development Command. Distribution is according to the USMC publications distribution system.

3. The USN will incorporate this publication where appropriate. Nothing in this publication will supersede existing Service-specific policy. Distribution is according to the USN publications distribution system.

4. The USAF will incorporate the procedures in this publication in USAF training and doctrinal publications as directed by the USAF staff. USAF strategic objective is “Garrison equals deployed.” Distribution is according to the USAF publications distribution system.

INSTRUCTIONS FOR USE

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CHANGE BARS

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WARNINGS, CAUTIONS, AND NOTES

The following definitions apply to warnings, cautions, and notes used in this manual:

WARNING

An operating procedure, practice, or condition that may result in injury or death if not carefully observed or followed.

CAUTION

An operating procedure, practice, or condition that may result in damage to equipment if not carefully observed or followed.

Note

An operating procedure, practice, or condition that requires emphasis.

WORDING

Word usage and intended meaning throughout this publication are as follows:

“Shall” and “must” indicate the application of a procedure is mandatory.

“Should” indicates the application of a procedure is recommended.

“May” and “need not” indicate the application of a procedure is optional.

“Will” indicates future time. It never indicates any degree of requirement for application of a procedure.

CHAPTER 1
Overview

1.1 FORCE HEALTH PROTECTION

DODD 6200.04, Force Health Protection, states that it is DOD policy that Force Health Protection (FHP) complements full-dimensional force protection efforts. In part, FHP activities provide a healthy and fit force by protecting the force from health hazards through routine inspections and mitigation of industrial, occupational, operational, and environmental hazards and document significant exposures, including those associated with noise, climate, chemicals, radiation, infectious agents, air, food, water, waste, and pests.

The protection of the force from health hazards is a key piece of FHP, which is part of the joint function of protection. JP 4-02, Joint Health Services, provides doctrine to plan, prepare, and execute joint and combined FHP activities (along with other health services) across the competition continuum.

This publication supports the FHP function of health surveillance and risk management at military basing sites in the operational environment (e.g., base camp, airbase, forward operating base (FOB)). According to JP 4-02, health surveillance and risk management plans and requirements must be included in the health service support (HSS) annex for plans and orders. The material within this publication informs the development of such HSS annexes and also comes under the policy umbrella of DODD 6420.02, DOD Biosurveillance.

1.2 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE

Occupational and environmental health surveillance (OEHS) is a significant component of the FHP function of health surveillance and risk management (see JP 4-02). As defined by DODD 6490.02E, Comprehensive Health Surveillance, OEHS is the regular or repeated collection, analysis, archiving, interpretation, and dissemination of occupational and environmental health-related data for monitoring the health of, or potential health hazard impact on, a population and individual personnel, and for intervening in a timely manner to prevent, treat, or control the occurrence of disease or injury when determined necessary.

Occupational and environmental health site surveillance (OEHSS) is focused upon health hazards and exposures at military basing sites in the operational environment (e.g., base camp, airbase, forward operating base (FOB)). It structures and facilitates exposure monitoring, health risk assessment (HRA), and risk management activities at these sites. The OEHSS process is iterative and educates FHP personnel about site environmental conditions, documents those conditions, identifies potential occupational and environmental health (OEH) threats and associated specific health hazards, includes OEH data collection and archiving activities and HRAs, and documents immediate risk mitigation actions. It is part of the risk management process and is performed in accordance with DODI 6055.05, Occupational and Environmental Health; DODI 6490.03, and DHA-PI 6490.03. These policies set the high-level requirements for OEHSS. This doctrinal manual provides the multi-Service tactics, techniques, and procedures (MTTP) for executing OEHSS.

1.2.1 Surveillance Requirements and Deployment Locations

Consistent with policy guidance found in DODI 6490.03 and DHA-PI 6490.03, OEHSS should be conducted at deployment basing locations that last longer than 30 days outside the United States, with rare exceptions. There are two types of deployment locations outside the United States: contingency and enduring. For contingency locations (CLs), all of the OEHSS elements apply; for enduring locations (ELs), only some of the OEHSS elements may be required (per DODI 6490.03). Refer to 2.1 for more details about these types of deployment locations. For some ELs, formal occupational health (OH) programs and/or environmental compliance programs will be established due to their size, infrastructure maturity, and longevity. Such specific OEH considerations should be handled by guidance and doctrine for those industrial hygiene (IH) programs or environmental

compliance programs. These situations can be further clarified by command headquarters and the supporting OEHS Center.

DODI 6490.03 and DHA-PI 6490.03 imply that deployment basing locations of shorter durations (less than 30 days) and those within the United States only require one of the OEHSS components unless the operational commander requires additional OEHSS components based on identified health risks. This component is the preliminary hazard assessment (PLHA).

1.2.2 Components, Phases, and Process

OEHSS supports FHP and risk management through an iterative process that produces an initial PLHA followed by recurring occupational and environmental health site assessment (OEHSA) surveys and surveillance status briefings and leads to on-going site exposure monitoring (OSEM) activities. During deployment, the events, knowledge, and data produced by this on-going iterative process are documented within the Defense Occupational and Environmental Health Readiness System-Industrial Hygiene (DOEHRS-IH) and later captured within both written periodic occupational and environmental monitoring summaries (POEMSs) and the individual longitudinal exposure record (ILER). Figure 1-1 defines these OEHSS components.

Term	Definition
1. PLHA	A document that summarizes relevant medical intelligence data, past hazard assessments, and all other available information for a new deployment location for the purpose of early identification (ID) of potential OEH threats and risk management countermeasures prior to deploying to a newly established location.
2. OEHSA Survey	Formal documentation of the actual OEH conditions at a basing location. These surveys are typically updated annually and/or with the rotations of FHP teams into and out of the area of operations.
3. OEHSS Status Briefings	Briefings used to communicate the top OEH issues and site surveillance priorities for a basing location. Status briefings are typically performed by the FHP team at the end of its site visits that assess OEH conditions, often on a 3- to 6-month recurring basis. Deployment location commanders and their staff elements are the primary audience for the briefings.
4. OSEM	The collection of OEH monitoring and assessment activities performed for a basing location that includes regular site visits, conceptual site model (CSM) adjustments, sampling and analysis plans (SAPs) (see 4.4), field sampling, laboratory analyses, HRAs, and associated documentation. OSEM activities occur in between each OEHSA survey and includes OEH status briefings.
5. DOEHRS-IH	The DOD system of record for managing information, data, knowledge, and activities related to OEHSS and other processes. This captures the activities from the components above (1 through 4) and provides them for use in components below (6 and 7).

Figure 1-1. OEHSS Components (Sheet 1 of 2)

Term	Definition
6. POEMS	A retrospective summary documentation of the OEH exposure concerns and HRAs at a deployment location. These documents compile information covering from one to many years at specific locations. OEH physicians are the primary audience.
7. ILER	An online DOD and Veterans Administration (VA) application that provides a record of every Service and civilian member's documented OEH exposures over the course of his or her career. The ILER includes OEHSS data and information obtained from DOEHRS-IH.
Note: Two key components, OEHSA and OSEM, drive the structure and tempo of all OEHSS activities.	

Figure 1-1. OEHSS Components (Sheet 2 of 2)

OEHSS is conducted according to the phases identified in Figure 1-2 and proceeds over time using an iterative process illustrated in Figure 1-3. The phases are based on the operations process, which drives the conceptual and detailed planning necessary to understand, visualize, and describe the operational environment; make and articulate decisions; and direct, lead, and assess military operations. The activities of the site surveillance approach are not fully discrete; they overlap and recur as circumstances demand. Assessing is continuous and influences the other three phases.

Activities Phase	Operations Process Activities Definition	OEHSS Activities
Planning	The art and science of understanding a situation, envisioning a desired future, and laying out effective ways of bringing that future about.	Before deployment, identify and organize assets and receive predeployment training, conduct initial planning for all assigned sites. Either initiate the OEHSA survey process (for new locations), or review the previously completed OEHSS components (for preexisting locations).
Preparation	Those activities performed by units and personnel to improve their ability to execute an operation.	Once in theater, improve ability to conduct OEHSS activities, to include preparing for specific site visits and refining sampling and analysis plans.
Execution	Putting a plan into action by applying combat power to accomplish the mission.	Execute the plans. Perform site visits, inspections and interviews, execute sampling and analysis plans, generate data, conduct HRAs, report findings to the command, and complete documentation.
Assessment	The continuous determination of the progress toward accomplishing a task, creating an effect, or achieving an objective.	Evaluate progress and performance and develop lessons learned.

Figure 1-2. OEHSS Phases

In reference to Figure 1-3, the first full iteration of the OEHSS process for a deployment location produces a PLHA and baseline assessment of OEH conditions referred to as the initial OEHSA survey. This includes the establishment of the CSM of exposure pathway (EPs) and the initiation of OSEM activities. Occurring between periodic OEHSA surveys, OSEM activities track conditions during site visits and generate information and measurement data for the CSM. The information and data are used to document exposures and perform HRAs.

Subsequent iterations of the OEHSS process (typically on either an annual or FHP team rotation basis) will validate or revise the described conditions in the previous OEHSA survey. A review of the implementation of

previous actionable mitigation actions to reduce OEH risks, updates of the CSM, and revisions of the plans for continuing OSEM activities based on accumulated findings from data collection efforts, HRAs, and any other requirements for data collection to support command risk management processes, will be completed.

All process reiterations are reassessments that serve to verify and prioritize OEH threats and conceptual models of how personnel are, or may be, exposed to the OEH hazards associated with those threats. Each iteration serves as a tool for FHP personnel and commanders to guide allocation of site surveillance resources.

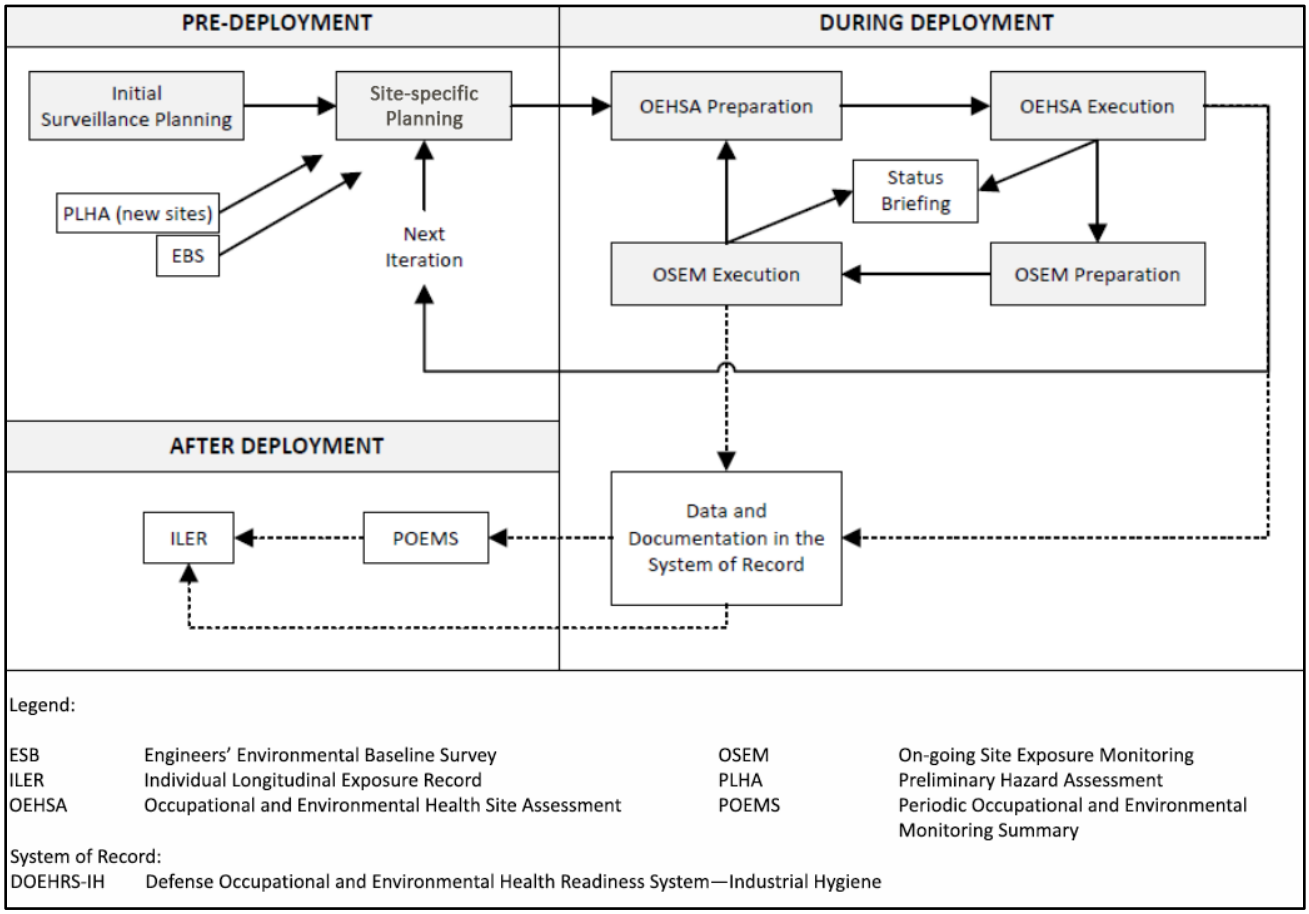

Figure 1-3. OEHSS Iterative Process (High-level View)

The number of OEHSA surveys and OSEM iterations conducted over time will be defined primarily by the longevity of the deployment location and risk-based findings of each successive iteration. For example, if high risks are identified, more frequent monitoring tasks and reports may be required. High risks will require the development of risk reduction steps and a review of the implementation of previous actionable recommendations to reduce OEH risks.

Information and data generated during all iterations of the OEHSS process are to be recorded in the system of record for OEH monitoring and risk assessment data (i.e., DOEHRS-IH) (see JP 4-02). It is preferable to directly document all site surveillance activities within DOEHRS-IH throughout the entire process. Chapter 6 provides more details for this system of record.

All of the activities, information, and data captured in DOEHRS-IH can be used to provide summary information about known exposures and health risks for the POEMS documents and ILER. These help to communicate to OEH professionals, commanders, and Service members regarding known exposure and health risks of those who were stationed at the deployment location.

1.2.3 Planning, Preparation, and Execution Activities

Figure 1-4 summarizes the OEHSS planning and preparation activities and products. Figure 1-5 summarizes the OEHSS execution activities and products. Subsequent chapters provide guidance for the activities and products within these figures.

Planning and Preparation Activities	Products
PLANNING. Before deployment, identify and organize assets and receive predeployment training; conduct initial planning for all assigned sites; and either initiate the OEHSA survey process (for new locations), or review the previously completed OEHSS components (for preexisting locations).	
INITIAL SURVEILLANCE PLANNING • Review combatant command (CCMD) requirements for area of responsibility (AOR). • Identify and organize assets that will conduct and support the OEHSS process. • Establish lines of communication to laboratory and higher echelon support, to specialized theater assets, and to reachback OEHS Center support. • Obtain predeployment technical assistance training, as needed. • Review sampling equipment and other elements of the team's sets, kits, and outfits (SKO). • Develop overall approach for conducting OEHSS across all assigned sites.	
SITE-SPECIFIC PLANNING • New sites: ○ Review CCMD requirements for specific location. ○ Review existing engineers' environmental baseline survey (EBS) and other site conditions reports; coordinate with engineers to build a deployment team to conduct site surveys. ○ Prepare PLHA. ○ Initiate the OEHSA survey within DOEHRS-IH. ○ Develop preliminary CSM. • Existing sites: ○ Review CCMD requirements for specific location. ○ Communicate with out-going field FHP team for lessons learned and OEH issues and concerns. ○ Communicate with OEHS Center for historical site knowledge and best practices. ○ Review existing engineers' EBS and other site conditions reports. ○ Review and understand previous OEHSA survey and active CSM of EPs. ○ Review and understand existing OSEM plans and findings. ○ Review and understand other information documented within DOEHRS-IH. ○ Initiate the OEHSA survey within DOEHRS-IH.	(New sites only) • PLHA • Preliminary CSM • Draft OEHSA survey

Figure 1-4. OEHSS Planning and Preparation Activities and Products (Sheet 1 of 2)

Planning and Preparation Activities	Products
OEHSA SURVEY PREPARATION • Gather additional site background and medical intelligence information, and prepare for site visit. • Update the draft OEHSA survey. • Validate or revise the CSM. • Initiate request for support from specialized assets, if needed. • Prepare for providing site surveillance status briefing for commander. • Prepare for completing site surveillance status checklist (optional). • Prepare rapid sampling and analysis plans (R-SAPs) and plan for personnel and equipment movement to/from site. • Establish approach for rapid HRA (optional).	• Updated CSM • Draft OEHSA survey • R-SAPs
OSEM PREPARATION • Prepare for recurring site visits. • Use OEHSA CSM to prepare for on-going monitoring and data collection. • Initiate request for support from headquarters and/or specialized assets (if needed). • In collaboration with OEHS Center support: ○ Develop enhanced sampling and analysis plans (E-SAPs). ○ Plan for personnel and equipment movement to/from site. ○ Establish approach for enhanced HRA. • Prepare for providing recurring site surveillance status briefings for the commander. • Prepare for completing site surveillance status checklist (optional).	• Updated CSM, if needed • E-SAPs

Figure 1-4. OEHSS Planning and Preparation Activities and Products (Sheet 2 of 2)

Execution Activities	Products
EXECUTION Execute the plans. Perform site visits, inspections and interviews, execution of SAPs, generation of data, development of HRAs; report findings to the command; complete documentation.	
OEHSA SURVEY EXECUTION • Perform site visit, ground truth, conduct interviews, and site reconnaissance. • Validate or revise the CSM of EPs. • Execute R-SAPs and generate data. • Perform rapid HRAs. • Identify risk management options for potentially unacceptable risks. • Complete site surveillance status checklist (optional). • Provide site surveillance status briefing for commander. • Complete DOEHRS-IH documentation details and remaining portions of the OEHSA survey. • Perform OEHSA survey quality assurance review and approval tasks.	• Updated CSM • R-SAP data HRAs • Status checklist (optional) • Status briefing • Risk acceptance memos • Final OEHSA survey

Figure 1-5. OEHSS Execution Activities and Products (Sheet 1 of 2)

Execution Activities	Products
OSEM EXECUTION • Perform recurring site visits, ground truth, and conduct interviews and site reconnaissance. • Perform qualitative monitoring of all active CSM EPs. • Execute E-SAPs and generate monitoring data for EPs of concern. • Perform data quality control checks. • Perform enhanced HRAs. • Identify risk management options for potentially unacceptable risks. • Complete site surveillance status checklist (optional). • Provide site surveillance status briefing for commander. • Update DOEHRS-IH documentation.	• Updated CSM • E-SAP data • HRAs • Status checklist (optional) • Status briefing • Risk acceptance memos
POEMS DOCUMENTS • Establish basing locations that require a POEMS for specified time periods. • Develop the POEMS by compiling all relevant OEHSS data, HRAs, and other information. • Perform POEMS technical review and approval tasks.	• POEMS
ILER APPLICATION • Receive and display DOEHRS-IH exposure pathway (EP) information and data.	• ILER records

Figure 1-5. OEHSS Execution Activities and Products (Sheet 2 of 2)

1.3 DEPLOYMENT TEAMS AND OEHS CENTERS

Successful OEHSS involves collaboration between deployed FHP teams, their command headquarters, and one or more of the Defense Health Agency-Public Health (DHA-PH) OEHS Centers listed below. Appendix A provides the types of deployment teams. The OEHS Centers provide reachback consultation capabilities, develop best practices (a set of guidelines that represents the best course of action), assist in information and data quality review and assessments, and maintain enterprise-level historical knowledge about previous and on-going OEHSS activities at deployment locations worldwide. A key function of these centers is to provide collaborative support to deployed forces in the planning, preparation, execution, and assessment of OEHSS activities. The Defense Health Agency is a combat support agency responsible for OEHS Center support to the combatant commands. FHP teams conducting OEHSS activities require coordination with the DHA-PH OEHS Centers. The FHP teams conducting OEHSS activities simultaneously inform leadership through official command channels for situational awareness.

1. Defense Centers for Public Health–Aberdeen (DCPH-A)

2. Defense Centers for Public Health–Portsmouth (DCPH-P)

3. USAF School of Aerospace Medicine.

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CHAPTER 2

Deployment Locations and Site Assessments

2.1 DEPLOYMENT LOCATIONS

DOD classifies overseas basing into two types of locations: CL and EL. The distinction is important for FHP personnel to understand because the classification informs funding, policy, planning decisions, and strategic and tactical focus. The distinction between these types of overseas bases can impact how OEHSS activities are implemented at a given deployment location (see 1.2.1). While CLs and ELs serve unique purposes in support of U.S. military objectives overseas, both are components of DOD's overall global defense posture and allow DOD to synchronize posture management to achieve efficiencies.

1. CLs (DODD 3000.10, Contingency Basing Outside the United States) support activities in contingency operations or other operations as directed by a combatant commander (CCDR). CLs are categorized as initial, temporary, or semipermanent. CLs support contingency activities that are intended to be temporary in nature. However, if a CL is meeting an enduring requirement, it should transition to an EL.

2. ELs (DODI 3000.12, Management of U.S. Global Defense Posture (GDP) enable ongoing operations activities and interests, which may or may not require a continuous force presence and provide strategic access to support U.S. strategic interests and response to regional and/or global contingencies.

JP 4-04, Contingency Basing, provides doctrine for CLs. JP 4-04 states that basing activities occur along a spectrum in which the standards for facilities, equipment, and services depend on the current and anticipated future operating environment, type and priority of the mission, and the anticipated duration of use. CLs currently have many labels (such as bases, base camps, intermediate staging bases, forward operating bases, patrol bases, and combat outposts). Fundamentally, CLs support CCDRs' operational requirements through the provision of base operating support (BOS) services, physical and technological infrastructure, and logistical assets and capabilities. The contingency basing spectrum spans from those built under the most austere conditions, using organic assets, to those providing semipermanent facilities and enhanced quality of life. Mission requirements and diplomatic considerations and authorities may dictate when locations will transition from CL to EL, but for planning purposes, this transition should ideally happen around the 5-year point.

The base operating support-integrator (BOS-I) is a subfunction of the CLs lead Service. The BOS-I plans and synchronizes the efficient application of resources and contracting. The CL commander (base commander) is a geographic combatant command (GCC)-designated representative responsible for the day-to-day operation, management, protection, and provision of services at a CL. In many cases, the base commander and BOS-I will be the same person.

2.2 ENGINEERS' ASSESSMENTS

The environmental conditions at a site are key pieces of information about a deployment location that FHP personnel should consider during the OEHSS process. The engineers assess and document environmental conditions throughout the operational phases of a CL using what is generally termed an environmental condition study (ECS) (see DODI 4715.22, Environmental Management Policy for Contingency Locations). An ECS is a study, report, analysis, or other documentation that adequately describes the environmental conditions at a CL, and includes an EBS, environmental conditions reports (ECRs), environmental site closure surveys (ESCSs), and other site conditions reports. For new deployment locations, these reports should be reviewed prior to the completion of the PLHA. If environmental conditions have not been documented, the engineers' baseline assessment of environmental conditions is often performed with the OEHSA survey.

JP 4-04 states that an EBS or ECS is recommended during the overseas base planning process, characterizes environmental conditions and risks, and often performed in conjunction with an OEHSA survey (refer to DODI 4715.22). Collectively, they provide valuable information that supports base master planning decisions. In addition to on-base conditions, these surveys can also provide vital information to planners about off-base and regional conditions that could affect base master planning, including local roads, railroads, airports, land use issues, and population density in the base vicinity. Planners should use geospatial software planning tools, when available.

Coordination between deployment location FHP activities and Engineer Operations related to site and environmental considerations is expected. JP 3-34, Joint Engineer Operations, states that successful planning and execution of joint Engineer Operations requires ever-increasing attention to environmental considerations. The engineer staff of a joint force is responsible for environmental support operations, which includes completing EBSs and other environmental surveys, as well as providing the guidance on environmental considerations, risks, and issues. The initial EBS for CLs and other selected sites should occur as a part of the engineers' reconnaissance mission and be linked to the OEHSA survey. Working with other staff officers, the engineer determines the impact of operations on the environment and the corresponding effect of the environment on Service members, and integrates environmental considerations into the decision-making process.

Additional doctrine includes the following:

1. ATP 3-34.5/MCRP 3-40B.2, Environmental Considerations, provides guidance for applying environmental considerations during planning, training, and the conduct of contingency operations.

2. ATP 3-37.10/MCRP 3-40D.13, Base Camps, provides a comprehensive how-to guide for performing all activities of the base camp life cycle during deployments.

3. AFI 32-7020, Environmental Restoration Program, provides USAF guidance for conducting environmental baseline surveys.

Notes

- Completed environmental surveys and reports are available at the following U. S. Army Corps of Engineer's Reachback Engineer Data Integration websites:
  - https://uroc-redi.usace.army.mil/
  - https://uroc-redi.uroc.army.smil.mil/.
- It is highly recommended FHP teams coordinate directly with Engineer Operations personnel rather than solely relying on documentation.

2.3 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE ASSESSMENTS

OEHSAs are similar to engineers' site assessments, but they focus more heavily on OEH threats, health hazards, EPs, sampling and analysis, and the resulting HRAs. Appendix B provides a brief description of the data captured on the OEHSA survey. All the OEH assessments that are embedded within the OEHSS process are identified in Figure 1-1 and listed below. Water system inspections and facility sanitation inspections that are performed alongside the surveillance process, are outside the scope of this manual.

1. PLHA
2. OEHSA survey
3. OEHSS status checklist and briefing
4. OSEM HRA
5. POEMS.

CHAPTER 3
Health Risk Assessment Concepts

3.1 INTRODUCTION

HRA is a core capability that optimizes FHP and readiness in all environments. Within the context of OEHSS, the HRA process is used to:

1. Estimate risk by synthesizing available information to identify sources of OEH threats at a site
2. Identify the health hazards associated with each threat source
3. Identify populations at risk
4. Guide data collection requirements and plans
5. Describe the magnitude and timing of population exposures
6. Describe the kinds of health effects caused by the exposure
7. Characterize the risk information in order to effectively communicate to commanders and stakeholders.

Properly designed HRA frameworks and products support risk management by providing actionable information that is relevant, reliable, timely, and understood. HRA activities and products allow individuals and commanders to make informed risk decisions when necessary as they apply risk management principles. The key output of a formal risk assessment is the risk estimate, which is the ultimate measure of risk to the population, task, or operation. Risk estimates can be qualitative or quantitative. HRAs should be designed to express risk in the way that is most useful to risk managers and be translatable into a format that is understandable to personnel and stakeholders. How health risk estimates are expressed to, and discussed with, personnel and stakeholders should be based on risk communication principles.

HRAs must be designed to deal with uncertainty. Uncertainties exist in the ID and measurement of hazards, estimation of exposures, ID and measurement of health effects associated with exposures, and method used to characterize population and operational risks. The conduct of a risk assessment is an iterative process designed to be refined over several iterations until there is sufficient certainty on the most important factors affecting the results.

While an HRA is a powerful tool to organize and articulate information and knowledge, risk assessment conclusions should not overinterpret data or results. HRA conclusions should focus on facts and knowledge, and accurately reflect the magnitude of uncertainty involved in the assumptions used to derive the estimate. A risk estimate is designed to inform a risk management, and its generation is influenced by assumptions based on data availability and risk perceptions. How confident risk managers need to be on the important but uncertain factors should drive the duration and complexity of the risk assessment life cycle.

3.2 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE HEALTH RISK ASSESSMENT

Within OEHSS, HRA principles are embedded throughout the process and do not only apply to formal HRA reports. There are seven HRA activities that operationalize the above concepts of complexity, uncertainty, and time-to-decision within the framework of OEHSS. Figure 3-1 presents these activities, who typically performs them, and the type of health risk judgments made. Health risk judgments are site-specific and informed

determinations that are made by OEH personnel based on professional judgment that reflect what is known at the time about OEH hazard exposure and health risk. Figure 3-2 illustrates where the key HRA risk judgments are produced within the overall OEHSS process. Each of these HRA risk judgments represent different iterations of the HRA process and are characterized by increasing levels of information, data, knowledge, and levels of skill and experience needed to complete.

OEH Health Risk Assessment Activity	Risk Judgment	Typical Performer
1. Creation of a preliminary CSM of EPs	Exposure potential	FHP team (Note 1)
2. Initial prioritization of each EP	EP Priority Level	
2a. R-SAP planning and execution (optional) (Note 2)	SAP design	FHP team (Note 5)
2b. Rapid exposure pathway health risk assessment (EP/HRA) (optional) (Note 3)	Risk Estimate (Note 4)	
3. R-SAP or E-SAP planning and execution (Notes 2 and 6)	SAP design	FHP team with support from OEHS Center
4. Rapid or enhanced EP/HRA (Notes 3 and 6)	Risk Estimate (Note 4)	FHP team or OEHS Center
5. Revision of the EP priority based on EP/HRA	EP Priority Level	
6. Decisions whether to collect additional data to support exposure monitoring and additional EP/HRAs	Information uncertainty	FHP team with support from higher echelon FHP assets and/or OEHS Centers (Note 7)
7. Sitewide HRA of all EPs (e.g., POEMS)	Summary Risk Estimates (Note 4)	FHP team or OEHS Center (Note 8)

Notes:

1. Creation of EPs within DOEHRS-IH requires specific user permissions provided by user security administrators at each of the OEHS Centers to individuals based on experience and training.
2. Refer to 4.4 for R-SAP and E-SAP definitions.
3. Refer to 3.4 for rapid HRA, enhanced HRA, and sitewide HRA definitions.
4. Refer to 3.6 for more information about risk estimates.
5. FHP teams may have the capability for employing field-screening and/or field-measurement equipment that allows them to avoid the need to send samples to a distant analytical laboratory. This allows teams to perform rapid HRA that can be used to characterize an EP.
6. The requirement to develop and execute an E-SAP with a follow-on enhanced EP/HRA is contingent on the EP priority level and the available resources.
7. In some cases, deployment location commanders may request sampling and analysis activities based on perceived risk or other risk management considerations.
8. Locations that require POEMS are to be identified by CCMD.

Figure 3-1. OEHSS Health Risk Assessment Activities and Risk Judgment Types

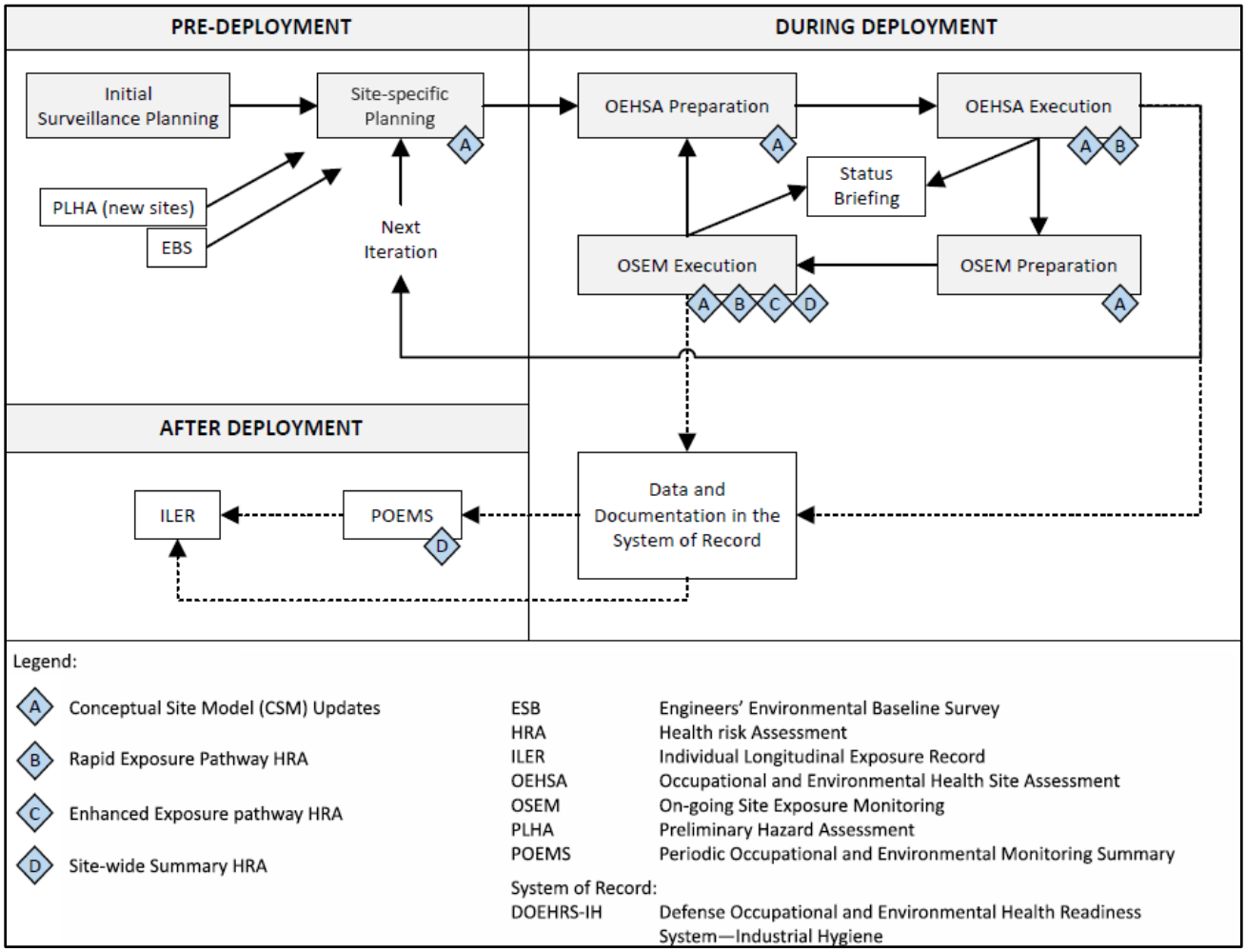

Figure 3-2. Key Health Risk Assessment Products Within the OEHSS Process

3.3 CONCEPTUAL SITE MODELS AND EXPOSURE PATHWAYS

This section introduces the concept of a CSM and its associated exposure pathways. It also identifies best practices for managing CSMs, defines exposure pathway priority levels, and discusses the evolution of a CSM over time.

3.3.1 Conceptual Site Model Concept

A CSM is a graphical, pictorial, and/or tabular depiction of what is known about a site in terms of what, where, when, why, who, and how exposures to health hazards may or may not occur. The CSM serves as the blueprint for understanding the situation, designing surveillance and sampling plans, identifying at-risk populations, describing health risks, and prioritizing risk management actions to control unacceptable risks. A CSM represents the compilation of all the exposure scenarios and their EPs that are associated with a site.

Within DOEHRS-IH, what is referred to as a location's CSM is the table of EPs (see Figure 3-3) and includes any data and information elements that are part of those EPs. There are two types of CSMs for OEHSS that are found within DOEHRS-IH (listed below).

1. Active CSM. This is the current CSM and includes all of the actively managed Defense Occupational and Environmental Health Reporting System (DOEHRS) EPs for a location. Any and all data collection,

monitoring, and EP assessments (e.g., HRAs) for the pathways should be managed from within the active CSM.

2. OEHSA CSM. This CSM represents a snapshot of all the DOEHRS EPs that have been associated with a specific OEHSA survey. An OEHSA CSM may contain EPs that are not in the active CSM because they have been stop-dated and are no longer representative of current conditions.

Note

Any data collection, monitoring, and HRAs for an EP should be managed from within the active CSM. EPs removed from, or added to, an active CSM in the time period between two different OEHSA surveys should be addressed in the newer OEHSA survey.

3.3.2 Exposure Pathways

An EP is defined as a description of how exposure occurs from health hazard release from a source into the environment, transport through the environment within one or more environmental media (air, water, soil, surfaces, etc.), the routes of human exposure (e.g., inhalation, ingestion, skin contact, etc.), and where and when specific personnel come into contact with the hazard (e.g., a specific cohort exposed at the same time or in a similar way). There are six components of an EP. Each must be present in order for an actual exposure to occur.

1. Source
2. Health hazard
3. Exposure point
4. Exposure medium
5. Route of exposure
6. Co-occurrence with a population-at-risk.

A key task in preparing to conduct a risk assessment is to describe the EPs that the risk assessment will need to address.

Within DOEHRS-IH, it is a best practice to manage information, data, and monitoring activities related to EPs in a way that bundles highly related known and potential EPs into a single EP sometimes referred to as a DOEHRS EP. For example, all EPs associated with a water system at a base camp are to be bundled together into a single DOEHRS EP for the water system that is displayed in the active CSM and/or OEHSA CSM. All the OEHSS guidance is based on this bundling approach. This operationalization of the EP concept simplifies documentation requirements, allows flexibility to deal with contingencies over time, reduces the need to constantly rework information, and creates a consistent information structure for communicating exposure monitoring and HRAs. This saves time for FHP personnel involved with OEHSS activities so that they can focus on resolving high-priority problems instead of routine documentation tasks.

3.3.3 Conceptual Site Model Best Practices

For each deployment location where OEHSS activities are performed, an active CSM of EPs should be built and managed through time within the environmental health (EH) module of DOEHRS-IH. The active CSM shown in Figure 3-3 is generally representative of the majority of CLs. The creation of an active CSM of EPs should proceed according to best practices developed and maintained by the OEHS Centers. Refer to Appendix C.

This hypothetical location has no airfield, no active IH program, no active radiation safety program, and solid and hazardous waste is stored and transported off campus for disposal.

#	Exposure Pathway Name	Threat Source (Note 1)	Health Hazards	Exposed Population
1	Ambient air	On-site and local/regional pollution sources	Gases, aerosols, particulate matter	All site personnel
2	Bottled water	Bottled water contamination	Chemical/physical contaminants, radionuclides, toxins, pathogens	All site personnel
3	Field water supply system (260)	Water contamination	Chemical/physical contaminants, radionuclides, toxins, pathogens	All site personnel
4	Soil (hazmat storage area)	Hazmat storage/disposal	Chemical contaminants, radionuclides, pathogens and biosolids, other hazardous materials (Note 2)	Hazmat storage area personnel
5	Soil (solid waste storage area)	Waste storage/disposal	Chemical contaminants, radionuclides, pathogens and biosolids, other hazardous materials (Note 2)	Waste management personnel
6	Soil (vehicle maintenance area)	Vehicle maintenance operations	Fuels, petroleum, oils, lubricants, and other contaminants	Maintenance personnel
7	Soil (fuel distribution area)	Fuel distribution	Fuels, petroleum, oils, lubricants, and other contaminants	Fuel distribution personnel
8	Arthropod vectors	Arthropod disease vectors	Pathogens and parasites	All site personnel
9	Arthropod pests	Arthropod pests	Bites, stings, blisters, allergic reactions, food contamination	All site personnel
10	Vertebrate pests	Birds, bats, rodents, feral and wild animals, snakes, and others	Bites, animal-borne diseases, and envenomation.	All site personnel
11	Workplace noise	Equipment generated noise	Occupational noise	Workplace personnel
12	Ambient noise	Operation-generated background noise	Ambient noise	All site personnel
13	Electromagnetic field radiation	Electromagnetic radiation generating equipment	Electromagnetic radiation	Workplace personnel
14	Industrial device radiation	Commodities/devices	Ionizing radiation (Note 3)	All site personnel

Legend:

260: DOEHRS-IH-generated water system ID number; is to be part of the EP name.

Notes:

This table presents key elements, but not all six elements, of each EP.

This guide provides instructions for how such a CSM table of EPs is to be generated for a deployment location.

1. In DOEHRS-IH, the threat source is rendered using two fields. In this table, only the main field is shown.
2. The label, “other hazardous materials,” is designed to capture hazards such as asbestos and natural or industrial materials not otherwise accounted for by the other labels.
3. Ionizing radiation takes forms of alpha particles, beta particles, gamma rays, or X-rays.

Figure 3-3. Example Active Conceptual Site Model of Exposure Pathways for a Typical Small Base Camp

3.3.4 Exposure Pathway Priority Levels

All EPs in an active CSM require a priority level to be established. The priority of an EP is based on the judgment of potential health risk posed by health hazards associated with the exposure. It is to be used as a guide for understanding and communicating its importance relative to other EPs in determining where, and how quickly, to employ OEH assets and resources including targeted hazard mitigation. The four priority levels are urgent, high, moderate, and low. Figure 3-4 defines the priority levels and provides general expectations for EPs linked to each level. An important aspect of this framework is that low-priority EPs do not require sampling and high- and urgent-priority EPs should be addressed with a commander's risk acceptance memorandum (see 9.6) and mitigated as necessary. Appendix C provides guidance for how to prioritize EPs.

<table>
<tr><th colspan="2" rowspan="2">Exposure Pathway Priority</th><th colspan="2">Expected Activities</th></tr>
<tr><th>When Initially Prioritizing a Pathway (during the first OEHSA survey)</th><th>When Subsequently Prioritizing a Pathway (during OSEM activities)</th></tr>
<tr><td>Urgent</td><td>Potential health risk indicates immediate action as soon as possible and assessment with sampling when appropriate and feasible.</td><td rowspan="2">• Recommend risk mitigation actions (e.g., exposure controls and/or access restrictions).
• When appropriate, execute a R-SAP if equipment is available. Use R-SAP findings to validate or modify priority level.
• Prepare commander's risk acceptance memorandum.
• Document as indicated in last row.</td><td rowspan="3">• Coordinate development and execution of an E-SAP based on theater priorities.
• Use E-SAP findings to report a health risk estimate and validate or modify priority level.
• Recommend risk mitigation actions (e.g., exposure controls and/or access restrictions) based on the commander's risk guidance.
• Prepare commander's risk acceptance memorandum for high- and urgent-priority pathways.</td></tr>
<tr><td>High</td><td>Potential health risk indicates rapid action and assessment with sampling when appropriate and feasible.</td></tr>
<tr><td>Moderate</td><td>Potential health risk indicates routine assessment with sampling when appropriate and feasible.</td><td>• When appropriate, execute a R-SAP if equipment is available. Use R-SAP findings to validate or modify priority level.
• Document as indicated in last row.</td></tr>
<tr><td>Low</td><td>Potential health risk indicates routine assessment without sampling.</td><td>• Document the exposure concern and include pathway within the CSM.</td><td>• Qualitatively monitor conditions and revise EP information and priority level as appropriate.</td></tr>
</table>

Figure 3-4. Conceptual Site Model Exposure Pathway Priority Levels

3.3.5 Conceptual Site Model Evolution

The CSM should evolve over time as more data are collected and knowledge is gained at a deployment location. The evolution of the CSM involves improved documentation of actual exposure conditions that personnel experience at the location. Changing site conditions will need to be reflected in the structure and details of a location's active CSM. Figure 3-5 illustrates the stages of CSM development and maintenance.

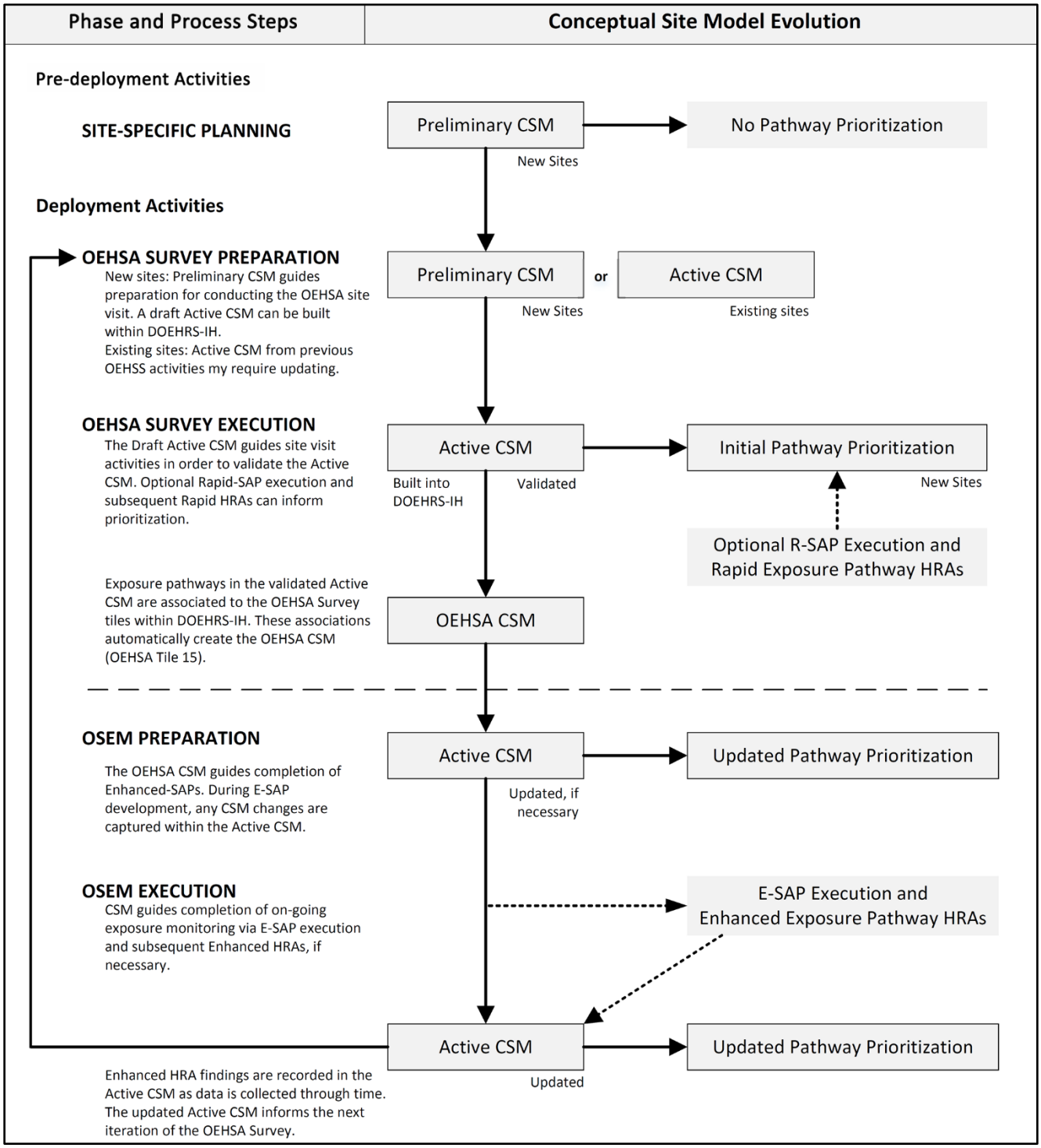

Figure 3-5. Conceptual Site Model Evolution

3.4 TYPES OF HEALTH RISK ASSESSMENTS

There are several types of HRAs that can be produced during the OEHSS process for any given deployment location (Figure 3-6).

Type	Description
Rapid HRA	• An optional activity typically reserved for FHP teams that have the necessary equipment and expertise to perform them. • Produced during, or immediately after, a site visit without reliance on reachback support from an OEHS Center. It represents a basic, screening-level assessment of a DOEHRS-IH EP that relies on-site observations, professional judgments, and data generated by field expedient methods. Ideally, any data used in the assessment will be generated via the execution of an R-SAP based on best practices published by the OEHS Centers.
Enhanced HRA	• An expected activity which follows the execution of an E-SAP. It is typically produced by an experienced FHP team and/or the OEHS Center. • Represents a more formal assessment of a DOEHRS IH EP that relies on-site observations, professional judgments, and data generated by analytical laboratories and/or advanced exposure models. Ideally, any data used in the assessment will be generated via the execution of an E-SAP based on best practices published by the OEHS Centers.
Sitewide HRA (e.g., POEMS)	• An optional activity depending on requirements identified by command headquarters or the OEHS Center. • Usually produced by the OEHS Center and/or an experienced FHP team. It represents a formal assessment of the exposure risks across multiple EPs associated with the deployment location over a specified time period. • A POEMS report is a version of a sitewide HRA.
Note: Each of the above types of HRAs can be designed as a screening-level HRA. A formal HRA can be executed for an enhanced HRA or a sitewide HRA. The depth and complexity of analysis is the main difference between the HRA approaches. These differences are defined below.	
Screening-level HRA	• One that uses preliminary data and information to determine if a more formal HRA may be necessary. Conservative (safe-sided) exposure guidelines referred to as screening levels are used in this type of HRA.
Formal HRA	• In the context of OEHSS, a formal HRA is one that uses more information and a larger (or more robust) data set in conjunction with a more specific set of exposure guidelines. Such HRAs are designed to provide, at a minimum, qualitative health-based operational risk estimates (e.g., low, moderate, high, and extremely high risk). Refer to 9.5 and 11.5 of Technical Guide 230, Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel, for more information.

Figure 3-6. Types of Health Risk Assessments

3.5 EXPOSURE ESTIMATES AND GUIDELINES

Exposure estimates are measurements or predictions of the level of exposure to a given health hazard. For example, over the course of a 24-hour period, a population of soldiers was exposed to chemical X at an average concentration of 100 milligrams per cubic meter of air (i.e., 100 mg/m^3). Such an estimate is a 24-hour, time-weighted average exposure. Measurement datum is necessary to develop exposure estimates for particular health hazards. Chapter 4 provides guidance for generating measurement data.

Exposure guidelines are hazard-specific environmental concentrations or measures of magnitude that are associated with a given level of health risk for defined exposure scenarios. Exposure guidelines can be categorized into tiers relative to importance or stature. For example, such guidelines can be referred to as criteria, standards, or guidelines. The terminology difference is important. Criteria and standards generally carry legal weight and are regulatory in nature, and guidelines tend to serve as consensus risk assessment recommendations. For OEHSS, the main exposure guidelines of interest vary by the type of health hazard being evaluated. For

chemical exposures, the most often used guidelines are the military exposure guidelines (MEGs) published in Technical Guide 230. The comparison of site-specific exposure estimates for each health hazard to the appropriate exposure guideline is the crux of the risk assessments embedded within OEHSS process. The OEHS Centers provide consultative support for exposure guidelines and how they are to be used.

3.6 HEALTH RISK ESTIMATES

A health risk estimate is the main conclusion of an HRA, it is the most important of the risk judgments made during OEHSS (3.2 introduced the various risk judgments). It is a determination of the level of risk that a population is subject to in terms of the likelihood to experience adverse health effects associated with the hazards at the levels to which they were exposed.

In the vast majority of cases during OEHSS, the risk estimate will be a determination of one of the four qualitative risk levels presented in Figure 3-7. The risk estimate should be determined by OEH personnel based on professional judgment using standard HRA methodologies specific to the EP and health hazards under investigation. One such method, for exposures to chemicals in air, water, and soil is Technical Guide 230.

HRA methods are occasionally updated to reflect lessons learned, improved concepts, and advances in scientific understanding of exposure and health effects. Within OEHSS, when exposure guidelines are available (see 3.5), they are integral to the HRA method. The OEHS Centers provide guidance and consultative support for performing HRAs for the various EPs and health hazards.

Risk Level (Note 1)	Short-term Effects Risk (Note 2)	Long-term Effects Risk (Note 3)
Extremely High Risk	Health Impact: Health effects may lead to the loss of the ability to accomplish the mission. Risk Management: Significant FHP actions and medical countermeasures expected (e.g., protection, treatment, mitigation); exposure incident investigation and report required.	Health Impact: Long-term health effects possible. Risk Management: Significant active medical surveillance and medical provider involvement; exposure incident investigation and report required. Designate registry to track identified personnel from the exposure incident report.
High Risk	Health Impact: Health effects may lead to significant degradation of mission capabilities. Risk Management: FHP actions and medical countermeasures expected (e.g., protection, treatment, mitigation); exposure incident investigation and report required.	Health Impact: Long-term health effects possible. Risk Management: Notable active medical surveillance and possible medical provider involvement; exposure incident investigation and report required. Ensure exposed personnel are identified in the exposure incident report.
Moderate Risk	Health Impact: Health effects may lead to limited degradation of mission capabilities. Risk Management: Limited FHP actions; routine exposure documentation and, if triggered, an exposure incident report.	Health Impact: Long-term health effects not expected, but possible for sensitive personnel. Risk Management: Passive medical surveillance; routine exposure documentation and, if triggered, an exposure incident report.
Low Risk	Health Impact: Short-term health effects, if any, will have little or no impact on accomplishing the mission. Risk Management: No specific FHP actions beyond routine exposure documentation and, if triggered, an exposure incident report.	Health Impact: Long-term health effects not expected. Risk Management: No specific FHP actions beyond routine exposure documentation and, if triggered, an exposure incident report.

Source: Adapted and refined from DHA-PI 6490.03, ATP 4-02.7/MCRP 4-11.1F/NTTP 4-02.7/AFTTP 3-42.3, Multi-Service Tactics, Techniques, and Procedures for Health Service Support in a Chemical, Biological, Radiological, and Nuclear Environment, and Technical Guide 230.

Notes:

1. The short-term and long-term risk levels are determined separately. The long-term risk level does not automatically equal the short-term risk level; they are determined by different types of risk assessments.

2. Short-term effects risk is associated with effects that occur during the deployment period. Personnel may be grouped into different exposure categories (reflecting different exposure levels/durations/estimated severity of exposure). These different groups may each be designated with different risk levels.

3. Long-term effects risk is associated with effects that either continue or first emerge after deployment. Personnel may be grouped into different exposure categories (reflecting different exposure levels/durations/estimated severity of exposure). These different groups may each be designated with different risk levels. It is recommended that long-term risk estimates be coordinated with an OEHS Center occupational/environmental physician.

Figure 3-7. Health Risk Levels, Impacts, and Force Health Protection Measures

CHAPTER 4

Data Generation for Exposure Monitoring and Health Risk Assessment

4.1 INTRODUCTION

Exposure monitoring and HRA require the generation of measurements of exposure or potential exposure. Such measurement data can be generated by direct reading instruments (DRIs), field sampling and laboratory analyses (using either field confirmatory or theater validation laboratories, reachback support laboratories, and/or a definitive OEHS Center laboratory), exposure modeling, or a combination of all methods. Exposure estimation should be based on data generation plans, often referred to as sampling and analysis plans (SAPs).

The primary objective of OEHSS data generation is to estimate exposure levels and characterize health risks associated with OEH threat sources and their health hazards. Data generation activities are best employed in a two-phased approach, whereby the first phase is to screen for potential exposures of concern and the second phase is to further characterize those exposures and the associated health risks. These two phases are embedded within the OEHSS processes.

The first screening phase involves making rapid judgments about exposure and risk by setting EP priority levels (see Figure 3-4). These judgments may be based on employment of rapid field measurement capabilities if they are available to the deployed FHP team. If such rapid field screening capabilities are not available, EP priority levels are established using qualitative judgments based on-site visit observations and other information.

The second characterization phase begins after an EP's priority level is initially set to moderate, high, or urgent (see Figure 3-4). This phase involves additional and more advanced data collection techniques and typically results in an HRA (see Figure 3-6). Here the data generation goal is to produce quantitative estimates of health hazard exposure. The HRA process then compares the exposure estimates to guidelines, such as the MEGs, to characterize health risks. The data collection techniques associated with this phase typically include larger sample sizes and analytical laboratory analyses; however, all available data generation methods can and should be used depending on the level of concern, time available to perform the assessment, and available sampling equipment and other data generation capabilities.

4.2 SAMPLING, ANALYSIS, AND QUALITY ASSURANCE PLANS

Data generation and exposure monitoring during OEHSS should proceed according to defined, written SAPs that address sampling strategies, sample management, laboratory analyses (field confirmatory, theater validation, definitive laboratory analysis), and associated quality assurance. As exposure concerns progress from being identified to the conduct of a formal HRA, the level of detail and sophistication of the SAP used to generate the data will necessarily need to increase. Due to the operational realities in the deployment environment, it is unreasonable to expect every FHP field team to independently develop and execute a robust SAP for each EP of concern at all the deployment locations under its purview. For some AORs, this can be a massive burden placed upon usually stretched FHP field teams during active contingency operations. Therefore, the OEHS Centers play an especially important role by developing best practices guidance and SAP templates for FHP teams to use during their OEHSS activities. Additionally, under certain circumstances, the OEHS Center may need to consult and/or collaborate with field teams in order to jointly develop and execute a sampling and analysis program.

Most of the best practice SAP guidance that is available to the OEH community has been developed for regulatory and compliance-type risk management programs, without specific planning adaptations documented for adoption to OEHSS at deployment locations.

Examples of such guidance include the following:

1. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA, QA/G-4. Office of Environmental Information. Washington, D.C., 2006

2. Technical Project Planning (TPP) Process. USACE, EM 200-1-2, 1998

3. DOD General Data Validation Guidelines. EDQWG, Revision 1, 2019

4. DOD Environmental Field Sampling Handbook. EDQWG, Revision 1, 2013

5. DOD/DOE Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, 2019

6. Uniform Federal Policy for Quality Assurance Project Plans: Evaluating, Assessing, and Documenting Environmental Data Collection/Use and Technology Programs. Intergovernmental Data Quality Task Force. Part 1: UFP-QAPP Manual, Version 1, 2005

7. Incremental Sampling Methodology (ISM) Update, ISM-2. ITRC. Washington, D.C., 2020. Available at: https://ism-2.itrcweb.org/.

Appendix D provides general guidance for SAP development and information on how to access the most current guidance for OEHSS activities. Current data generation planning manuals prepared by the Service OEHS Centers provides Service-specific guidance. However, there have been significant OEHSS lessons learned and recent advances in professional best practices for OEH data generation and quality assurance that the OEHS Centers can translate into programmatic and site-specific approaches for OEHSS activities. Deployed FHP field teams should coordinate with their OEHS Center and Geographic CCMD Surgeons Office to obtain current, operationally practical SAP guidance and templates based on best practices.

4.3 STRUCTURED PLANNING DOCUMENTS

Controlling the data quality of OEH sampling and analysis that occurs at deployment locations worldwide is not a simple task. It involves many teams and individuals with a range of technical expertise and experience who work their tasks at different times and locations. Therefore, a hierarchical planning approach has been adopted in order to define common data quality expectations, establish expected planning documentation, and guide site-specific sampling plans and activities. Figure 4-1 illustrates the planning structure.

A key feature of this planning approach is that it does not ask FHP field teams to be subject matter experts (SMEs) on the most current sampling and analysis methodologies, nor does it expect independent, time-consuming efforts to develop and execute robust SAPs all on their own. The approach is designed to base sampling and analysis tasks on current best practice recommendations in light of constraints of the deployment environment, make the planning process transparent for stakeholders, and facilitate ease of implementation for the dispersed, operationally challenged field sampling teams. The OEHS Centers establish common DQOs for sampling at deployment locations in order to establish broad expectations for data quality for OEHSS activities and to provide a foundation for standard deployment sample laboratory analyses and site-specific sampling plans.

Structured planning documents, to include programmatic plans and model SAPs, are available at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

4.4 SITE-SPECIFIC SAMPLING AND ANALYSIS PLANS

Within the OEHSS framework, there are two types of site-specific SAPs, as defined below. Guidance for both, and the available current model SAP templates, can be obtained from the OEHS Centers (see Appendix D).

1. R-SAP. A site-specific plan that relies on organic field equipment and that can be developed and executed by a deployed FHP team without consultation with an OEHS Center. It typically relies on DRI and field screening and/or theater level analytical laboratory capabilities. An R-SAP can be used during an OEHSA survey site visit to assist in the initial prioritization of an EP, or during any site visit that occurs during OSEM activities.

2. E-SAP. A site-specific plan that represents what might be considered a normal SAP. It does not necessarily rely on organic field equipment, as equipment augmentations may be required to execute the plan. Typically, FHP teams will need to collaborate with the OEHS Centers to develop and execute an E-SAP because its construction requires more advanced skillsets than are typical for most deployed FHP teams. While execution of the field sampling elements of an E-SAP might be performed by organic FHP personnel, the full plan and the supporting laboratory analysis elements will require participation or even oversight by theater laboratory assets and/or OEHS Center personnel.

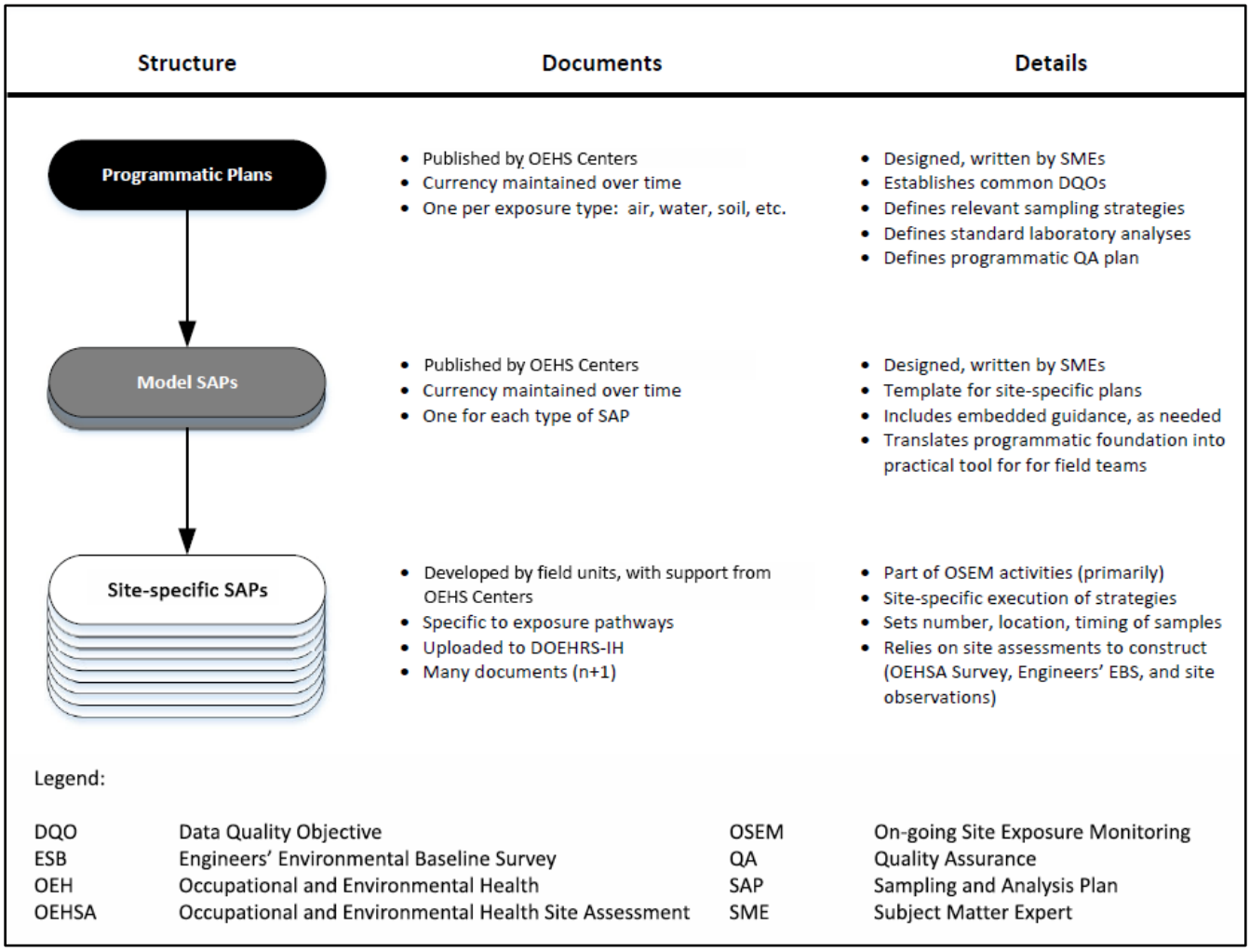

Figure 4-1. Sampling, Analysis, and Quality Assurance Planning Structure

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CHAPTER 5

Occupational and Environmental Health Exposure Incidents and Site Surveillance

5.1 EXPOSURE INCIDENT REPORTS

Incident reports are triggered by OEH incidents that result in exposures with either acute illness or the potential to cause latent illness. The reporting of OEH exposure incidents is required, and essential, in order to support an investigation and health surveillance for potentially exposed personnel (see DHA-PI 6490.03). Such reports are documented in the Incident Reporting module of DOEHRS-IH. Appendix E provides details for OEH exposure incident reports.

5.2 IMPLEMENTATION OF EXPOSURE INCIDENT CRITERIA

Incident reports should be prepared for exposure incidents if at least one of the six criteria in Figure 5-1 is met. The determination of whether an OEH exposure is significant enough to be considered an exposure incident is subjective. During OEHSS, it is possible that an exposure incident will occur and lead to the need to create a new EP or be associated with one that was already established. Appendix E provides guidance for implementing these criteria during OEHSS.

OEH Exposure Incident Criteria
1. Visual/sensory cues are, or were, present indicating potential presence of an OEH hazard (e.g., smoke/cloud, odors, strange liquid/powders, etc.).
2. The presence of an acute OEH hazard is indicated through positive detection using real-time field equipment (e.g., direct reading instruments, joint chemical agent detector, improved chemical agent monitor, M8 chemical detector paper, or M256 chemical agent detector kit).
3. Evaluation of data by an appropriate medical/health professional indicates that exposure could plausibly result in some significant adverse health outcome, either short- or long-term.
4. Incident results in a significant exposure to any deployed individual(s), including from chemical, biological, radiological, and nuclear (CBRN) agents and acutely toxic industrial chemicals.
5. The presence of a health hazard is plausibly associated with actual observed (acute) clinical health outcomes that are reported and/or treated (e.g., complaints of headaches, dizziness, skin or eye irritation/burning, coughing, nausea, etc.).
6. Concern over a perceived or potential adverse health exposure leads to involvement of preventive medicine (PVNTMED [also referred to as Operational Public Health]) assets and military leadership for investigation, assessment, determination and response. Document these actions as an incident report even when there is a determination that no adverse exposures or impacts to human health are expected.
Note: These criteria are sourced directly from DHA-PI 6490.03.

Figure 5-1. Occupational Environmental Health Exposure Incident Criteria

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CHAPTER 6
Documentation and the System of Record

The DOEHRS-IH is a DOD application funded, developed, and maintained by the Military Health System. It is the DOD system of record used to manage unclassified OEH data, including selected public health data, for garrison and deployment operations. DOEHRS-IH is also the DOD's system of records for informing OEH risk management, as well as a foundational system for the ILER.

DOEHRS-IH is located at: https://doehrs-ih.csd.disa.mil/Doehrs.

DOEHRS-IH is a common access card (CAC)-enabled, web-based system containing seven business areas often referred to as modules: Industrial Hygiene (IH), EH, Food Protection, Radiation, Incident Reporting, Registries, and Document Library. It also includes a module for filtering and reporting data from these areas.

The documentation of the OEHSS information and data occurs in the EH business area of DOEHRS-IH. The EH business area is designed to capture location-specific surveillance data related to OEH hazards and facility sanitation. This business area's components include features for documenting OEHSA surveys and associated surveillance activities for air, water, soil, thermal stress, entomology, food sanitation, general sanitation, and waste management.

The business objects reporting feature in DOEHRS-IH allows users to conduct data queries and trend analysis. Users are able to view current and historical data either discretely or collectively, including laboratory results for food and environmental samples collected in theater and processed through a military public health laboratory.

Unclassified surveillance, inspection, and sampling data associated with each of the DOEHRS-IH business areas can be entered in DOEHRS-IH whenever a CAC-enabled unclassified computer with internet connectivity is available.

When connectivity is not available, information can be collected on documents available from the DOEHRS-IH resources support website (https://phc.amedd.army.mil/topics/envirohealth/hrasm/pages/doehrs_resources.aspx). At the time connectivity is reestablished, an electronic record is created in DOEHRS-IH, datum is entered, and the original paper document can be scanned and posted to the official DOEHRS-IH record.

Prior to DOEHRS-IH use, training is highly recommended for navigating, entering data, and retrieving information from the system. Training is available through the OEHS Centers.

Note

No classified OEHSS information or data should be entered into the DOEHRS-IH. Any information that could cause an OEHSS-related report to be classified should be submitted separately according to CCMD and Service-specific guidance and/or submitted to the APHC's internal Military Exposure Surveillance Library (MESL) (oehs.data.army@mail.smil.mil).

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CHAPTER 7
Planning Site Surveillance

7.1 INTRODUCTION

As described in Figure 1-2, planning occurs before deployment. The goal is to identify and organize assets and receive predeployment training, conduct initial planning for all assigned sites, and either initiate the OEHSA survey process (for new locations) or review the previously completed OEHSS components (for preexisting locations).

7.2 SURVEILLANCE ASSETS, CAPABILITIES, AND LEVELS OF SUPPORT

Appendix A summarizes the Services' deployment teams and capabilities that perform OEHSS. No matter what teams are performing OEHSS activities within an AOR, successful surveillance will often require some degree of collaborative support from an OEHS Center (see 1.3). The support staff and SMEs at these centers provide consultative advice, guidance for crafting site-specific SAPs, authoritative analytical laboratory services, data quality review, and expert assessments for problems beyond the capabilities of a field team.

7.3 INITIAL SURVEILLANCE PLANNING

Surveillance planning involves several focus areas. First is the review and validation of deployment team's skillsets and capabilities. This may require predeployment technical assistance, refresher training, and performance exercises using deployment team equipment SKO.

The second focus area is where lines of communication are established between higher headquarters, deployment teams, specialized theater assets (if they exist), and the supporting OEHS Center.

Lastly, the team should develop an overall approach for conducting its OEHSS activities across all assigned sites. It involves the when and where planning considerations for the entire area of operations (AO) to which the FHP team is deploying. This includes all of the deployment locations within the AO that will require some level of surveillance by the team.

7.4 SITE-SPECIFIC PLANNING

During site-specific planning, the deployment team educates itself about each of the deployment locations for which it will be responsible. The purpose of this planning is to identify as much information as possible concerning potential OEH threats associated with a particular deployment location before arrival on site. This involves reviewing existing site assessments produced by Engineer Operations for each deployment location, such as the EBS, ECRs, and ESCSs. See 7.4.1 for the engineers' EBS and other site conditions reports.

While some site-specific planning activities are slightly different for new versus existing sites, engaging with Engineer Operations personnel should always be a key activity for deploying FHP personnel.

Note

A new site is a deployment location where an OEHSA survey has not yet been conducted.

7.4.1 Engineers' Environmental Baseline Survey

The deploying FHP team should coordinate with the existing FHP team in the AOR and/or Engineer Operations personnel and obtain and review existing assessments for the site. The EBS is typically the most important assessment to review and understand. This section provides an overview of Engineer Operations doctrine and the assessments that should be used by FHP teams to understand site conditions to support the creation of the FHP team's OEHSA survey.

ATP 3-34.5/MCRP 3-40B.2 provides Army and USMC doctrine for integrating environmental considerations into operations and for documenting environmental conditions throughout the operational phases of a deployment location. AFI 32-7020 provides USAF doctrine for environmental considerations and conducting an EBS.

The EBS and ESCS are completed using the following forms. If available, FHP should obtain these completed forms, and other documentation that adequately describes the environmental conditions, and use them to inform its planning at each deployment location.

1. DD Form 2993 (EBS checklist) is completed during the planning phase of a contingency operation and for each potential deployment location. It is used to thoroughly document the environmental conditions of a site prior to selecting and occupying the deployment location.

2. DD Form 2994 (EBS report) is also completed during the planning phase of a contingency operation, for each EBS checklist, and is used to summarize and highlight those conditions identified in the checklist that potentially impact the site's selection, use, and planning as a deployment location.

3. DD Form 2995 (ESCS) is completed at least three times during the transfer/closure process of a deployment location. It is used to determine necessary closure actions and resources, as well as documenting the final environmental conditions at the CL at the time of transfer/closure.

An EBS should be completed before a deployment location is selected and occupied. If this is not possible, it should be completed within 30 days of site occupation. This survey helps to accomplish three primary goals: the documentation of initial site conditions, ID of hazards and risk factors, and determination of site selection and layout. Documenting initial site conditions helps to prevent liability to the U.S. Government for damage or contamination that was present before site occupation. Also, by identifying existing environmental hazards and potential health risks during the planning phase of a contingency operation, the overall suitability of a site can be used in the site selection process, and concerns can possibly be mitigated with proper planning. For example, water or soil contamination, air pollution, poor site drainage, and improper waste management are environmental hazards and health risk factors that impact site suitability and planning. Hazards may be generated on and off the survey site, and include both those impacting personnel on the survey site and those impacting the surrounding indigenous populations and institutions. The survey can help planners determine the best site layout, including locations (from an environmental and health standpoint) for life support areas, maintenance, sanitation, hazardous material storage, etc.

Additional information documented in an EBS includes descriptions about site occupants, physical characteristics of the land, current and previous site uses, current and previous uses of adjacent properties, structures and roads, power generation, hazardous materials, waste management, historical and cultural resources, nonpest and pest species, noise, air quality, and water. Completion of the EBS requires personnel with the necessary technical training and expertise to identify potential hazards and may require the collection of various air, soil, and water samples. FHP personnel can obtain environmental documentation, like an EBS, and information, like site-specific environmental considerations, from the CCMD engineering and environmental staff.

7.4.2 Site-specific Planning for New Sites

In addition to coordinating with Engineer Operations personnel and their existing assessments (see 7.4.1), site-specific planning for new sites involves conducting (or obtaining) the PLHA and initiating the first OEHSA survey.

7.4.2.1 Preliminary Hazard Assessment

For new deployment locations (i.e., without any previous OEHSA survey), conduct a PLHA. If the deployment team does not prepare a PLHA, it should contact the CCMD force health protection officer (FHPO) in order to obtain one.

A PLHA is a document that summarizes relevant intelligence data, past hazard assessments, and all other available information for a new deployment location for the purpose of early ID of potential OEH threats and risk management countermeasures prior to deploying to a newly established location. It serves as the starting point for an understanding of the OEH threats and hazards that may exist at a site for which military personnel have very little knowledge. It aids in the development of health risk communication messages, the initial health threat briefing, and first OEHSA survey. Once the first OEHSA survey has been completed, a PLHA is no longer needed. The following seven sections of a PLHA mirror the sections of the OEHSA survey:

1. General Location Information: Describes the conditions at the proposed location and provides relevant information about what is known or has been reported about local hazards or conditions.

2. Subsistence (Food/Water): Identifies the general sanitary practices of the local food supply and municipal potable water system to help answer address concerns of deployed personnel eating or drinking on the local economy.

3. Endemic Threats: Identifies the infectious diseases that could impact deployed personnel, necessary immunizations and countermeasures needed for prevention, and zoological threats that could cause operational concern.

4. Ambient Air Quality: Identifies what is known or has been reported about general ambient air quality to help answer questions about pollution sources in the deployment area and whether special air sampling equipment needs exist for deployed FHP teams.

5. Radiological Hazards: Identifies the radiological sources that exist within 10 miles (16 kilometers) of the proposed location.

6. Health Concerns from Past/Current Land Use: Describes how the land has been used over the past 3 years and documents suspected or known major chemical spills or contamination.

7. Industrial Operations: Identifies industries in the surrounding area and suspected or known contamination associated with these industries.

The PLHA is accomplished by reviewing all available and relevant information about the deployment location. Most of the information needed to complete a PLHA can be obtained using sources that are readily available to the general public and a few CAC-enabled websites. Classified datum is generally not required but can be obtained as necessary. Gathering health threat data for a specific location prior to visiting the site can be quite challenging and further complicated if there is a short turnaround time. Much of the available data address regional threats rather than those specific to the local area. Remotely collected data may prove to be unreliable or outdated. These PLHA limitations are addressed by generating site-specific information and knowledge during the first OEHSA survey.

Although much of the information contained in the PLHA is unclassified, once the information is aggregated and locations identified, it may require a different classification. All established policies and procedures should be followed to ensure the proper handling of potentially classified information.

Unclassified PLHAs should be saved in the EH module of DOEHRS-IH by uploading it as an attachment to the Location–Detail page for the location. Contact APHC to add a new location in the DOEHRS-IH. Classified PLHAs should be submitted to the APHC internal MESL (oehs.data.army@mail.smil.mil).

7.4.2.2 Occupational and Environmental Health Site Assessment Survey Initiation for New Sites

For new sites, the first OEHSA survey should be initiated during this planning step. The information obtained from the PLHA and the engineer s' EBS can be used to initiate the documentation of OEH conditions at the deployment location. This information will be preliminary in nature until FHP personnel can perform a site visit and verify actual conditions on the ground. Service FHP personnel should make a substantial effort to identify as many of the potential OEH threats associated with on- and off-site sources before arrival at a site. This is the beginning of the OEHSA survey process and includes the generation of a preliminary CSM.

7.4.2.2.1 Occupational and Environmental Health Site Assessment Survey Elements

At this point in the process, it can be reasonably expected that existing OEH information may be limited, depending on current or past operations conducted at the location. However, an extensive search to obtain general information concerning the location should be accomplished in order to begin the documentation for each of the OEHSA survey sections (see Appendix B for a summary of the sections).

Figure 7-1 identifies some typical questions that Service FHP personnel should attempt to answer before arriving on site. The amount of lead time available prior to the deployment will largely affect the amount of information that can be obtained. During this process, the OEHSA survey template should be used as a guide to collect information. Keep in mind that available information may only be descriptive of the country or region and not specific to the deployment location. Service FHP personnel should make an effort to complete as much of the OEHSA survey template as possible.

Sources of information to answer the questions shown in Figure 7-1 can be varied. Much of the information can be extracted from the PLHA and, if completed, the engineers' EBSs and other environmental conditions reports. Additional information sources can be vast and should not be restricted. Prior to predeployment surveillance planning (see 7.3), Service FHP personnel should have already contacted their headquarters' Service component command FHPO, CCMD FHPO, and/or their OEHS Center to assist in gathering relevant information for all deployment locations for which they are planning OEHSA surveys.

Google Earth and similar open-source satellite mapping tools contain surprisingly accurate overhead visual layouts of most geographic areas. These mapping tools can aid in identifying potential sources of OEH threats (e.g., large industry, major emission sources, lakes, lagoons) surrounding the deployed site. Figure 7-2 provides an example of a Google Earth visual layout of Balad Air Base, Iraq. The program has a more refined resolution as you zoom in to an area of the base. This image gives Service FHP personnel a visual of the base before arrival, allowing the assessor to start formulating a site reconnaissance approach.

Data on the prevailing wind is another critical piece of information that Service FHP personnel need to aid in identifying potential OEH exposure concerns. Wind direction and speed play a pivotal role in the migration of OEH health hazards. Information on prevailing winds can be obtained from the supporting meteorological detachment or weather squadron and open-source weather sources. A wind rose shows how wind speed and direction are typically distributed at a particular site. Presented in a circular format, as in Figure 7-3, the wind rose shows the frequency of winds blowing from a particular direction. The wind rose may not be available for every deployment location. In which case, Service FHP personnel may use wind information from a nearby airfield or airport as representative data for the site. However, the greater the distance this information source is from the site, the less accurate it may be in representing site-specific characteristics.

Service FHP personnel should begin documenting the gathered OEHSA survey information using DOEHRS-IH. The extent of the information and documentation will be directly related to the amount of lead time available prior to the deployment. The development of a preliminary CSM is a key deliverable associated with predeployment OEHSA survey planning for new sites. Based on the gathered information and the preliminary CSM (see 7.4.2.2), Service FHP personnel should begin to formulate courses of action needed soon after arrival at the deployed location, such as prioritizing site reconnaissance and interviews to address the more important OEH concerns first (e.g., specific threat or source located upwind of living areas).

1. Are there U.S. personnel already present at the deployed location? How many? (If there are no personnel currently on site, the scope of the OEHSA will change to identifying any OEH threat sources at the site and allow Service FHP personnel to make recommendations concerning site layout to minimize exposure potential to existing OEH threats.)
2. What is the primary mission of the site? (Provide insight into the following: weapon systems present or planned, industrial workplaces present or planned, and OEH threats associated with these operations.)
3. What are the primary activities performed on the location? Will there be specific at-risk populations as a result of these activities?
4. What types of geography, topography, and/or meteorological conditions are associated with the site (urban/rural area, temperature range, predominant wind direction, etc.)?
5. What are the agricultural or industrial operations adjacent to the site? (Obtain information on typical OEH threats from these operations and confirm appropriate screening capability on site.)
6. What types of structures are on site (temporary/permanent structures, types of housing, etc.)?
7. How will these structures be used during the current mission? What were the prior uses of these structures? Are intended uses compatible with prior uses?
8. What is the historical use of the land prior to current site development and use? (Provides insight to possible soil contamination [e.g., agricultural, industrial].)
9. Are there other water sources (above/below ground) on or near the site that may be utilized for purposes other than drinking water (i.e., sewage lagoons, cooling ponds for industrial uses, irrigation ditches, livestock watering holes, etc.)? Are there potential health hazards associated with those water sources, (i.e., agricultural runoff containing pesticides and fertilizers, animal/human waste, industrial discharges into the water source that may contain heavy metals, etc.)? What are the drinking water sources? How is the distribution system setup? (Identify typical drinking water sources and possible health risks to common water contaminants in country.)
10. What is the security posture of the environment near the location? (An environment with active insurgents/terrorists could increase the likelihood of drinking water contamination and/or toxic industrial chemical release.)

Figure 7-1. Predeployment Occupational and Environmental Health Site Assessment Survey Planning Questions

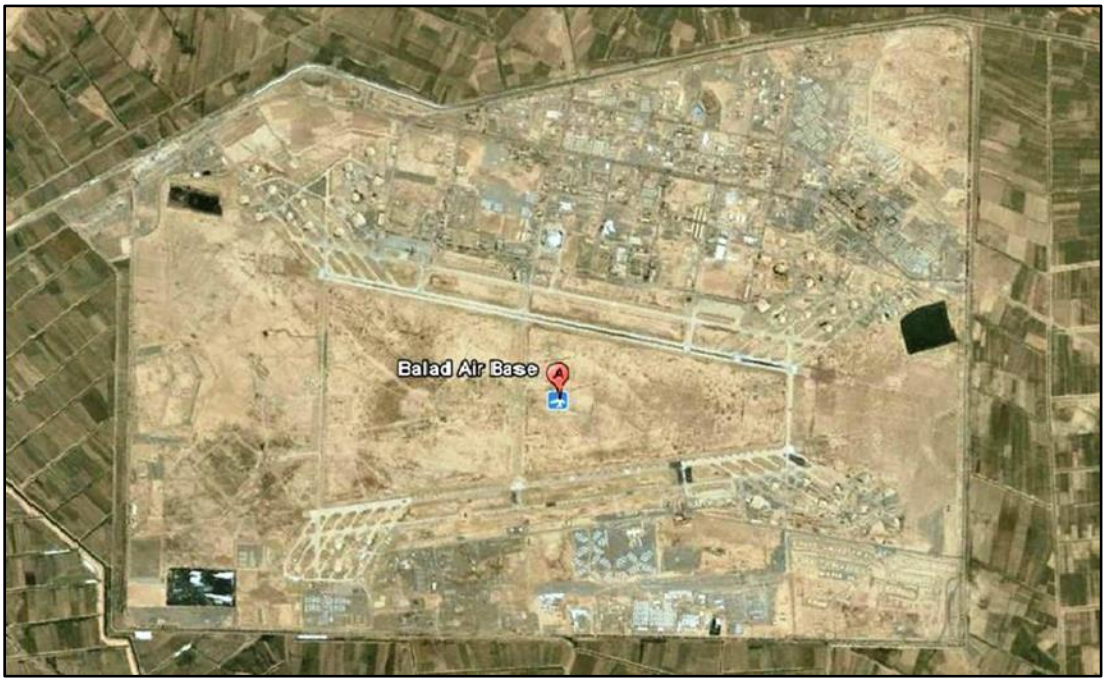

Figure 7-2. Google Earth Visual Layout of Balad Air Base, Iraq

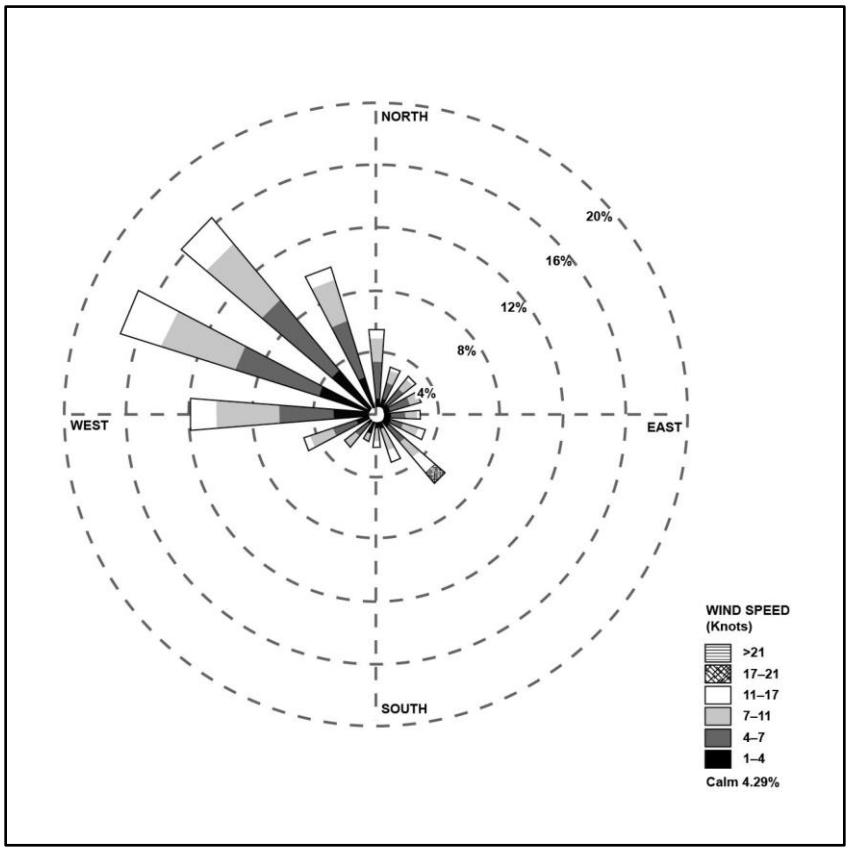

Figure 7-3. Example Deployment Location Wind Rose

7.4.2.2.2 Preliminary Conceptual Site Model

As illustrated in Figure 3-5, a key part of the initial planning for the OEHSA survey is generating a preliminary CSM of EPs. This CSM should identify all of the probable and potential EPs the team thinks might need to be established for the location. These pathways should be based on all the gathered information from the PLHA, EBS, and other sources. EPs should generally not be generated within DOEHRS-IH at this step in the process. Rather, a preliminary CSM should be crafted and used to structure plans for the site visit. There are three key features of preliminary CSMs:

1. Preliminary CSMs are not recorded in DOEHRS-IH. They are planning tools used to structure FHP team site visit activities and to project what EPs might eventually get created within DOEHRS-IH.

2. Preliminary CSMs do not include all EP details. They are limited to the type of content in the example CSM shown in Figure 3-3. Additional details are not needed at this planning step.

3. Preliminary CSMs do not include any EP priority levels. The priority levels will be established by the team after the initial site visit once actual site conditions are verified by the FHP team.

Note

Once an EP is created in the active CSM area of DOEHRS-IH, a priority level is required.

7.4.3 Site-specific Planning for Existing Sites

For existing sites where an OEHSA survey has already been conducted and OSEM activities have been on-going, the predeployment, site-specific planning step involves gaining a full understanding of site conditions as described by others, initiating the next OEHSA survey, and comprehending the OSEM plans and data generation activities.

This is accomplished by reviewing previously completed OEHSS components, such as the previous OEHSA survey, recent OEH status checklists, the current active CSM of EPs as recorded in DOEHRS-IH, existing and active OSEM monitoring strategies and SAPs, and any HRAs previously conducted for the location. In summary, the following are expected for an FHP team planning to perform OEHSS activities at an existing location:

1. Communicate with out-going FHP team for lessons learned and OEH issues and concerns.

2. Communicate with OEHS Center for historical site knowledge and best practices.

3. Review existing engineers' EBS and other site conditions reports.

4. Review and understand previous OEHSA survey and the active CSM of EPs.

5. Review and understand other information documented within DOEHRS-IH.

6. Review and understand existing OSEM plans and findings.

7. Initiate the OEHSA survey within DOEHRS-IH.

A key enabling success factor for site-specific planning for existing sites is early communication with the current, out-going FHP team. They can provide all the information documentation and other lessons learned to the in-coming FHP team.

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CHAPTER 8

Preparation for Occupational and Environmental Health Site Assessments

8.1 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE ASSESSMENT SURVEY PREPARATION FOR NEW AND EXISTING SITES

As described in Figure 1-2, preparation occurs during deployment and improves the ability to conduct OEHSS activities, to include preparing for specific site visits and refining SAPs.

Once in theater, Service FHP personnel prepare for conducting site visits and performing the first OEHSA survey at each deployment location for which they are expected to conduct OEHSS activities. At new sites, this is the first OEHSA survey to be conducted. At existing sites, this will be the first OEHSA survey conducted by the in-coming Service FHP team.

8.2 GENERAL SURVEY PREPARATIONS

Preparing for the OEHSA survey site visit generally involves establishing the tools and activity plans for conducting interviews, site visit reconnaissance, validation of EPs in the preliminary CSM (new sites) or active CSM (existing sites), and initial prioritization of those EPs.

Note

Some EPs can be immediately assessed via the execution of an R-SAP.

Additional activities that can occur at this point are generating requests for support from specialized assets that may already be in theater (such as area medical laboratory support) and preparing the FHP team's approach to conducting rapid (on-site) HRAs, if they are to be performed.

While preparing for these activities, the FHP team can update the draft OEHSA survey in DOEHRS-IH based on all the information gathered. Completing as much of the OEHSA survey as possible prior to the site visit can speed up the timeline for survey completion. Additionally, the preliminary CSM may be able to be partially validated and/or updated after learning more about the site when performing initial email or phone interviews of deployed personnel prior to arriving for the site visit.

The Service FHP team should engage with higher headquarters on the following:

1. General review of OEHSA survey requirements and procedures
2. Review of the location's preliminary CSM
3. Establishment of the required activities during the site visit
4. OEHSA survey key activities and timelines:
    a. Finalization of CSM EPs to be documented in DOEHRS-IH
    b. Documentation of any R-SAPs executed while on site along with the findings
    c. Performance and documentation of any rapid HRAs while on site

d. Site visit OEHSS out-briefs to include immediate recommendations

e. OEHSA survey completion and review tasks.

8.3 PREPARE TO UPDATE THE CONCEPTUAL SITE MODEL OF EXPOSURE PATHWAYS

During OEHSA survey preparation, Service FHP personnel can start building the active CSM in DOEHRS-IH, as shown in Figure 3-5. Performing this activity during OEHSA preparation is optional and, if performed, should temporarily set all of the EP priority levels to low. After the site visit, the FHP team would revise its pathway prioritization based on actual site conditions observed during the site visit.

Documentation of CSM EPs within DOEHRS-IH should occur in the active CSM area of DOEHRS-IH (see 3.3.1 and 3.3.5). After the EPs have been built in the active CSM, they will later be associated to various sections of the OEHSA survey. Detailed EP documentation should follow CSM best practices (refer to Appendix C).

8.4 PREPARE RAPID SAMPLING AND ANALYSIS PLANS

During OEHSA survey preparation, the FHP team considers the need for developing R-SAPs for its site visit. Ensuring its equipment is ready for such an activity is an important preparation step. During the initial OEHSA survey, the primary function of an R-SAP is to assist in the initial prioritization of an EP. These plans should be designed to use field measurement capabilities such as DRIs while performing site reconnaissance. Examples of an R-SAP in action during a site visit includes the following:

1. Field confirmatory testing of base camp water systems to compare water quality to short-term potability standards

2. Area measurements of noise levels using sound level meters.

Best practices for R-SAP development and execution will evolve over time as capabilities are advanced and lessons learned are translated into improved techniques. Preparation for this activity is important and should involve obtaining up-to-date guidance from the OEHS Centers. Guidance and model SAP templates are provided by the Service OEHS Centers and made available at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

Note

An R-SAP is a SAP that can be generated and executed by Service FHP teams without reachback support from a Service OEHS Center. Refer to 4.4 for background information.

8.5 PREPARE FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE STATUS BRIEFINGS

At the end of each site visit, an out-brief should be provided with the status of the OEH conditions at the location to the base camp commander/BOS-I. During OEHSA survey preparation, the FHP team should develop an approach for completing the OEHSS status briefing. The primary goal of the OEH status briefing is to highlight the most important OEH findings that require risk management attention. An optional OEHSS status checklist can be used to support the development of the briefing. The checklist can be used by FHP personnel who perform OEHS and inspections to summarize findings and recurring reassessments over time. Appendix F provides an overview of the briefing template and checklist, which covers the following assessment areas:

1. OEHSA survey

2. Water

3. Food sanitation
4. Waste management
5. Hazardous materials
6. Radiological hazards
7. Pest management
8. General sanitation
9. Noise hazards
10. Air quality
11. Soil contamination
12. OSEM activities
13. Service-specific elements
14. Camp clinic and other concerns.

8.6 RAPID HEALTH RISK ASSESSMENTS (OPTIONAL)

A rapid HRA is an optional activity typically reserved for experienced FHP teams with the necessary equipment and expertise to perform them. Figure 3-6 defines a rapid HRA in contrast to an enhanced HRA. A rapid HRA is produced during, or immediately after, a site visit without reliance on reachback support from a Service OEHS Center. It represents a basic, screening-level assessment of a DOEHRS EP that relies on-site observations, professional judgments, and data generated by field expedient methods. Ideally, any data used in the assessment will be generated via the execution of an R-SAP based on best practices published by the OEHS Centers.

During OEHSA survey preparation, the FHP team considers the need for performing rapid HRAs during or immediately after its site visit. Developing the HRA approach and ensuring its equipment is ready for such an activity is an important preparation.

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CHAPTER 9

Execution of Occupational and Environmental Health Site Assessments

9.1 INTRODUCTION

The deployment location site visit represents the beginning of the execution phase of the OEHSA survey. The site visit and associated activities are all based on predeployment planning (see Chapter 7), active deployment preparation for the OEHSA survey (see Chapter 8), and observations and surveillance decisions made during the site visit. In summary, execution of the OEHSA survey involves the following activities:

1. Ground truthing and perform site interviews and reconnaissance.
2. Validate or revise the active CSM of EPs.
3. Execute R-SAPs and generate data.
4. Perform rapid HRAs.
5. Identify risk management options for potentially unacceptable risks.
6. Complete DOEHRS-IH documentation details and remaining portions of the OEHSA survey.
7. Perform OEHSA survey quality assurance review and approval tasks.

Site interviews and reconnaissance allow Service FHP personnel to understand OEH conditions at the deployment location, identify and/or validate OEH threats associated with the location, and identify and/or validate active CSM EPs. The primary objective of interviews and reconnaissance is to identify and visually verify the existing OEH conditions at the site that could negatively impact the health of personnel. Site reconnaissance and interviews allow Service FHP personnel to cultivate what was learned in both the predeployment planning and early deployment preparation phases, generate more detailed information, and identify other potential sources of OEH threats.

OEHSA survey information and data can become classified. Service FHP personnel must be aware of what data or information can cause the OEHSA survey to become classified (e.g., vulnerabilities, recording grid coordinates, including maps of the site, and photographs of potentially high-interest facilities). Service FHP personnel should consult with the appropriate original classification authority guidance and procedures for classification and distribution.

Note

Within DOEHRS-IH, the start and stop dates for an OEHSA survey should correspond to the dates of the actual initial site visit and last date content within the survey was added or revised. The stop date may be modified during the survey quality assurance (QA) process if changes are needed to achieve a QA-approved status. The duration of any given OEHSA survey (i.e., the duration between the OEHSA survey start and stop dates) will vary. A general rule is that an initial OEHSA survey can be prepared and marked “Ready for QA” within 2 to 30 days, and subsequent OEHSA surveys prepared and marked “Ready for QA” within 1 to 10 days. There is flexibility in deciding when to stop an OEHSA survey. Waiting until the end of an FHP team’s deployment cycle is an option, but not the general expectation for all Services.

9.2 SITE INTERVIEWS

Service FHP personnel should conduct interviews with personnel who are familiar with the deployed location and its historical land use. Interviews are necessary to obtain site information that may not have been previously available and/or to validate previously collected information identified in the OEHSA survey template. Interviews should be conducted before reconnaissance, when able (see Chapter 8), and can be continued during and after reconnaissance to clarify information on potential sources of OEH threats. Credible, knowledgeable individuals may be on hand for established locations; however, these individuals may not be readily available for a site without existing infrastructure. Figure 9-1 lists organizations/personnel from which Service FHP personnel can gain valuable information required to complete the OEHSA survey. Interviews with host nation liaisons may provide a wealth of information pertaining to local or surrounding industries or sources of OEH threats at the site, and may provide insight on historical land use.

OEHSA Survey Section	Air Force Sites	Navy/Marine Corps Sites	Army Sites	All Sites
Site description	Civil engineering (CE) operations; CE asset management; weather squadron; security forces; Department of the Air Force Office of Investigations; fire department	FHPO; FOB operations officer; combat engineer/Navy construction battalion personnel	GCC (environmental program managers); engineer assets (environmental officer and geospatial); United States Army Corps of Engineers (USACE); reconnaissance team members; civil affairs; PVNTMED; BOS services/directorate of public works (DPW)	Host nation liaison
Site infrastructure	Bioenvironmental engineering (BEE); CE operations; CE power production; force support squadron; fire department	FHPO; organic PVNTMED; FOB operations officer	GCC (environmental program managers); engineer assets (environmental officer, geospatial, waste managers, and USACE); reconnaissance team members; civil affairs; PVNTMED; unit field sanitation team; BOS services/DPW; water support personnel	Industrial shop supervisors; contracting office
Hazmat	CE operations; CE asset management; logistics readiness squadron; fuels management; Hazmat pharmacy; fire department; BEE	FHPO; unit Hazmat operator; Hazmat coordinator; unit safety officer/representative	GCC (environmental program managers); engineer assets (environmental officer, geospatial, and USACE); reconnaissance team members; civil affairs; PVNTMED; BOS services/DPW; logistics and Defense Logistics Agency (DLA); CBRN units	Fire department; industrial shop supervisors; radiation safety officer

Figure 9-1. Interview Points of Contact Guidance (Sheet 1 of 2)

OEHSA Survey Section	Air Force Sites	Navy/Marine Corps Sites	Army Sites	All Sites
Waste management	CE asset management; hazardous/solid waste program manager	FPHO; hazardous/solid waste manager; organic PVNTMED-EH officer (EHO)/PVNTMED technician; expeditionary medical facility (EMF) PVNTMED	GCC (environmental program managers); engineer assets (waste managers, environmental officer, geospatial, and USACE); reconnaissance team members; civil affairs; PVNTMED; unit field sanitation team; BOS services/DPW; logistics and DLA	
Entomology	Pest management shop; public health	Organic PVNTMED-entomologist/PVNTMED technician; FPHO officer; pest management shop; EMF PVNTMED	GCC (environmental program managers); Armed Forces Pest Management Board; engineer assets (environmental officer, geospatial, and USACE); reconnaissance team members; civil affairs; PVNTMED; BOS services/DPW	Host nation medical liaison
Physical hazards	BEE; CE asset management; site frequency manager; veterinary detachment	FOB safety office; FHPO; veterinary detachment	GCC (environmental program managers); engineer assets; (environmental officer, geospatial, and USACE); reconnaissance team members; civil affairs; PVNTMED and occupational health BOS services/DPW safety	Radiation safety officer
Air quality	CE asset management; BEE; air emission program manager	FHPO; FOB safety office; mobile construction battalion	GCC (environmental program managers); engineer assets (environmental officer, geospatial, waste managers, and USACE); reconnaissance team members; civil affairs; PVNTMED; BOS services/DPW	Host nation liaison
Water	BEE; CE operations; CE utilities; water treatment plant operator	FHPO; USMC water engineers; water treatment plant management; organic PVNTMED-EHO/PVNTMED technician; EMF PVNTMED	GCC (environmental program managers); engineer assets (environmental officer, geospatial, USACE, and waste managers); reconnaissance team members; civil affairs; PVNTMED; unit field sanitation team; BOS services/DPW; water support personnel	Host nation liaison; host nation water treatment plant operators
General/food sanitation	Public health; force support squadron	Marine Corps galley supervisor/watch captains; organic PVNTMED-EHO/PVNTMED technician; EMF PVNTMED	GCC (environmental program managers); engineer assets (environmental officer, geospatial, USACE, and waste managers); reconnaissance team members; civil affairs; PVNTMED; field sanitation team; BOS services/DPW; water support personnel; veterinary services (food inspection/safety)	Host nation food vendors; facility managers

Figure 9-1. Interview Points of Contact Guidance (Sheet 2 of 2)

9.3 SITE VISIT RECONNAISSANCE

Service FHP personnel should request that personnel who have historical knowledge of the site, and other SMEs from the organizations providing base operating support (see Figure 9-1), participate in the on-site reconnaissance. The major objectives of reconnaissance are to identify and verify existing occupational and environmental conditions at, or adjacent to, the site that could impact the health of personnel. Furthermore, Service FHP personnel should be on the lookout for industrial operations that are conducted inside and outside the wire of the deployment location. If, in the professional judgment of the lead FHP professional, the OEH threats associated with these operations may pose an immediate health threat, actions should be taken to preclude or avoid unnecessary OEH exposures.

One of the first steps of site reconnaissance is to obtain or update the current map of the area (e.g., aerial or satellite photographs). This can usually be obtained from the PLHA or the EBS. Obtaining on-site and off-site maps to support site reconnaissance is vital. Photographs also provide excellent documentation. Obtain approval prior to taking photographs, if necessary, and be careful not to include photographs that may change the classification of the OEHSA. All photographs must have a good description depicting the context of the photo (e.g., "This picture depicts the burn pit from the closest occupied work center, 250 meters SSW of the pit."). When conducting reconnaissance, Service FHP personnel should focus on potential OEH threats identified in the preliminary CSM (for new site) or active CSM (for existing sites), living areas, and/or primary work locations. However, the site reconnaissance should span every area of the site in order to identify additional OEH threat sources. As part of the site reconnaissance, all buildings and industrial areas within the deployment location should be systematically visited. Passive observations of hazard threat sources outside the wire (e.g., industrial emissions and noise) should be documented. No attempt should be made to actively surveil or investigate activities outside the wire due to legal considerations (e.g., Geneva Convention limitations).

Service FHP personnel shall drive or walk the inside perimeter of the site to identify the boundaries of the site, recording the military grid reference system coordinates for the corners, and estimating the total area occupied by the site. The site reconnaissance must be extensive enough to identify all outfalls or potential incoming sources of pollution that may affect personnel living and working on the site. The list below outlines some key items, areas, and hazard sources that Service FHP personnel must look for and describe during site reconnaissance. The majority of these are covered in the OEHSA survey (see Appendix B).

1. Building’s exterior/interior conditions
2. Storage tanks (above and below ground)
3. Pits, ponds, or lagoons
4. Current use (adjacent properties)
5. Pools of liquid
6. Stained soil
7. Geology, hydrology, topography
8. Drums
9. Stressed vegetation
10. Type of roads
11. Unidentified containers
12. Ambient air conditions

13. Signage indicating hazardous material use/storage areas

14. Water source

15. Wastewater and storm water disposal methods.

Site perimeter reconnaissance provides an opportunity to identify potential off-site industrial operations that could impact site operations. As a minimum, any major industrial operations identified in the PLHA should be recorded in the OEHSA survey along with observational notes added from the perimeter reconnaissance. Service FHP personnel should follow any Service specific guidance that dictates otherwise.

Site reconnaissance includes entering/describing existing buildings/structures and identifying all key on-site industrial operations (e.g., maintenance and transportation), existing controls, and the frequency/duration these operations are performed. Industrial shops and potentially hazardous processes should be documented in the appropriate sections of the OEHSA survey. Service FHP personnel should observe all operations or processes to determine whether or not these processes have the potential to affect another population outside the workplace.

Note

Formal IH programs may be established for some ELs due to their size, infrastructure maturity, and longevity (see 2.1). In such cases, these workplaces should be identified in the OEHSA survey by a comment that exposure monitoring activities for those workplaces are captured in the IH module of DOEHRS-IH rather than within the EH module for the ongoing monitoring. It is advisable that when this situation arises, requirements are clarified by higher headquarters. EPs that address IH workplaces SHOULD NOT be created when there is an IH program for the workplace.

If the OEHSA survey represents the first FHP team visit to the site, responsibilities may include recommending ideal living and work locations for the site to eliminate or mitigate potential EPs. Temporary locations for sleeping and eating quarters, work locations, etc., may need to be quickly identified with the understanding that relocation may be necessary based on on-going OEHSS activities. In this situation, coordination should be made to reassess the site once the camp is established, preferably within 30 days, in order to determine additional potential EPs relevant to site configuration and operations.

9.4 RAPID SAMPLING AND ANALYSIS PLAN EXECUTION

During site visit reconnaissance, the FHP team should execute R-SAPs as part of its assessments of EPs previously identified during preparation and validated during reconnaissance. The findings should be used to help prioritize each EP. Using a model SAP template, an R-SAP can be completed and immediately executed by the FHP team while on site. Once completed, an R-SAP should be uploaded to the EP inside the active CSM within DOEHRS-IH. Information and data generated during the execution of R-SAPs should be used to perform an EP assessment and documented as such within DOEHRS-IH (refer to Appendix C).

Note

Initial prioritization of EPs does not always require execution of an R-SAP. Also, guidance and model SAP templates evolve over time as capabilities are advanced and lessons learned are translated into improved techniques. Preparation for this activity is important (see 8.4) and should involve obtaining up-to-date guidance from the OEHS Centers.

9.5 CONCEPTUAL SITE MODEL EXPOSURE PATHWAY PRIORITIZATION AND COMPLETION

Based on the findings of the interviews, site reconnaissance and other information collection, and any rapid sampling and analysis, validated EPs should be established and prioritized (see Figure 3-4) during OEHSA survey

execution. Initial priority levels should be assigned to each validated EP according to CSM best practices (see Appendix C, specifically C.7.). Final documentation of CSM EPs and their priority levels should occur in the active CSM area of DOEHRS-IH (see 3.3.1 and Figure 3-5). Detailed EP documentation should follow CSM best practices (see Appendix C).

After the active CSM is completed, the FHP team associates each of the active CSM EPs to one or more sections within the OEHSA survey in DOEHRS-IH. All the EPs that have been associated to the sections of the survey will appear in the OEHSA CSM. This evolution of the CSM is reflected in Figure 3-5.

Note

Multiple EPs can be associated to a single OEHSA survey section and a single EP can be associated to multiple OEHSA survey sections. Within DOEHRS-IH, the OEHSA CSM will display all the EPs that have been associated to the survey.

9.6 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE SURVEILLANCE STATUS BRIEFING AND RISK ACCEPTANCE MEMORANDA

At the end of the OEHSA survey site visit, the FHP team provides an out-brief to the base camp commander and/or BOS-I referred to as the OEHSS status briefing (also referred to as the OEH status briefing). The primary goal of the OEH status briefing is to highlight the most important OEH findings that require risk management attention. The briefing should be designed to support the commander's risk management process and identify when potential health risks for one or more EPs may require command attention. The OEH status briefing can be supported by the OEH status checklist, which can assist FHP personnel summarize site surveillance and sanitary inspection findings. Appendix F provides a briefing template and the checklist.

When an EP is assigned a priority level of high or urgent (see Figure 3-4 for definitions), a commander's risk acceptance memorandum shall be prepared. Consistent with the risk management requirements in DODI 6055.01, DOD Safety and Occupational Health (SOH) Program and DODI 6490.03, the memorandum documents the commander's decisions on whether to implement identified OEH risk mitigation recommendations. All risk acceptance memoranda should be adequately documented as part of the OEHSA survey within DOEHRS-IH. Updates to commanders' decisions and their risk acceptance memoranda need to be documented in concert with each successive iteration of the OEHSA survey for a deployment location. Appendix G provides a suggested format and list of minimum elements for the memorandum.

9.7 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE ASSESSMENT SURVEY CREATION

By fully addressing each subject area within the OEHSA template (Appendix B), the FHP team will capture all the necessary information and data to complete the OEHSA survey. Development and completion of the survey is largely impacted by whether or not the FHP team has access to the DOEHRS-IH. It is highly recommended that the survey be completed online within DOEHRS-IH.

During OEHSA survey execution, Service FHP teams should input all the collected information and data into the online OEHSA survey section of DOEHRS-IH. Once all the information, EPs, and associated data are entered into the online OEHSA survey, the DOEHRS-IH OEHSA survey should be marked "QA ready" and a review of the survey should commence.

Service FHP teams without DOEHRS-IH access will have to generate the OEHSA survey manually. The completed OEHSA survey template (see Appendix B) will be the primary OEHSA information used to generate the assessment. At a minimum, the survey should include: an executive summary identifying significant OEH threats that have potential to affect one or more populations living/working on site, the operational mission and recommended courses of action, an OEHSA CSM of EPs that have been prioritized, and any limitations of the assessment due to time and operational mission constraints. The survey should be reviewed and approved by the FHP team's approving official.

9.8 OCCUPATIONAL AND ENVIRONMENTAL HEALTH SITE ASSESSMENT SURVEY REVIEW AND APPROVAL

The CCMD FHPO is responsible for QA review and approval of the OEHSA survey. Review and/or approval may be delegated to the senior on-site FHP professional or elevated to a higher echelon FHP professional. If performed outside of DOEHRS, the approval must be documented in the OEHSA survey.

Before submitting the OEHSA survey through the chain of command for final approval, the FHP team should seek a peer review through technical channels from Service FHP personnel on the joint task force (JTF) and Service component command surgeon staff. Additionally, peer review can also be conducted by the appropriate OEHS Center.

Final approval of an online OEHSA survey is achieved when it is marked "QA approved" within DOEHRS-IH by the OEHSA survey approving official. If the OEHSA survey was prepared manually (outside of DOEHRS-IH), the FHP team should submit the approved OEHSA survey document to the DOEHRS-IH document library and notify the appropriate OEHS Center.

Note

Classified material should be submitted to the classified portal (refer to Chapter 6).

Once the DOEHRS-IH OEHSA survey is approved, surveillance can focus on OSEM activities until the next OEHSA survey iteration is required. The survey can be generated electronically from within DOEHRS-IH and handled as a PDF or hardcopy document.

9.9 RAPID HEALTH RISK ASSESSMENTS (OPTIONAL)

As described in 8.6, only experienced FHP teams are expected to potentially perform rapid HRAs. These units have the training necessary to make reliable risk judgments using direct reading/field portable analytical instruments. Additionally, if theater laboratory capabilities are nearby, they can take samples and generate laboratory analytical results within days. Remote laboratories can also receive samples in order to begin analytical results generation process. It is recognized that remote laboratories may be able to produce results before the rapid HRA must be completed; however, the generated information can be used after the fact to further assessment of the original rapid HRA findings. Rapid HRAs should be planned for, practiced, and based on use of a documented R-SAP (see 9.4). Guidance for how to conduct rapid HRA can be obtained from the OEHS Centers. Once completed, a rapid HRA should be uploaded to the EP as an EP assessment inside the active CSM within DOEHRS-IH. Refer to Appendix C for best practice guidance for how to perform this action.

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CHAPTER 10

Preparation for On-going Site Exposure Monitoring

10.1 GENERAL PREPARATION CONSIDERATIONS

OSEM preparation activities begin when the OEHSA survey's EPs have been formally documented and prioritized according to best practices guidance. Figures 1-3 and 1-4 illustrate the timing of OSEM preparation within the OEHSS process.

At a minimum, OSEM activities will involve two tasks:

1. Qualitative monitoring of all EPs looking for more information and/or changing conditions that may lead to an elevation or downgrading of exposure concerns for the pathway (i.e., reasons to change the priority level or stop-date the pathway).

2. Tracking the conditions at the deployment location for the possible addition of new EPs. These tasks can occur during recurring site visits and/or via remote communications with location personnel (e.g., phone conversations and email).

During the preceding OEHSA survey, when the priority level of one or more CSM EPs is moderate, high, or urgent (refer to Figure 3-4 for definitions), OSEM activities will also include consideration of quantitative exposure monitoring using E-SAPs along with follow-on HRAs. The development and execution of an E-SAP for an EP is not automatic. Refer to 10.4.

10.2 SCHEDULE RECURRING SITE VISITS AND SITE SURVEILLANCE STATUS BRIEFINGS

During OSEM preparation, FHP teams should establish a site visit schedule addressing all the deployment locations to which they are assigned. The frequency of site visits for any given location should be based on characteristics and purpose of the location, available time and resources, the range of priority levels within the active CSM and any E-SAPs, guidance from the Service component command's FHP officer, and CCMD risk management guidance.

During site visits to some locations, various degrees of E-SAP execution activities will need to be coordinated. E-SAP guidance and preparation tasks are addressed in 10.4. At the end of each site visit, provide a site surveillance status briefing (out-brief) to the base camp commander/BOS-I. Refer to 8.5 for general site surveillance status briefing preparation guidance.

10.3 PREPARE TO UPDATE CONCEPTUAL SITE MODEL OF EXPOSURE PATHWAYS

During OSEM preparation, FHP teams should develop an approach for how they will translate the findings of their OSEM activities (both qualitative and quantitative monitoring) into updated CSM EP documentation within the active CSM (see Figure 3-5), and how they will communicate adverse findings to commanders and higher headquarters.

FHP teams execute qualitative monitoring for all EPs regardless of their priority levels. Findings that relate to changing site conditions or more information clarifying exposures should be recorded in the EP detail form within DOEHRS-IH.

Note

New information may be discovered that leads to need to change the priority level of an EP.

The FHP team should have a plan for who validates new EP information and who makes the actual priority level change within the active CSM in DOEHRS-IH. It is recommended the lead Service's OEHS Center is informed and/or consulted when the following actions are being considered:

1. Changing the priority level
2. Stop-dating an EP
3. Creating a new EP in between recurring OEHSA surveys.

Best practice guidance is available for how to approach these changes (see Appendix C).

For moderate, high, or urgent priority EPs, OSEM may also include quantitative monitoring based on E-SAPs. The FHP team should use guidance from and coordinate with its specialized support assets, analytical laboratories, and/or their OEHS Center to establish how data generated during E-SAP execution and follow-on HRAs will be recorded and attached to the EP within DOEHRS-IH. As the data and assessments are developed, it is best to know ahead when and who will make updates to the EP documentation within DOEHRS-IH.

Note

Detailed EP documentation should follow CSM best practices (refer to Appendix C). During OSEM, all data and information updates for an EP should only occur in the active CSM area within DOEHRS-IH. The OEHSA CSM should not be used to perform OSEM tasks.

10.4 DEVELOP ENHANCED SAMPLING AND ANALYSIS PLANS

Development and execution of an E-SAP should be considered during the preceding OEHSA survey when the priority level of one or more CSM EPs is established as moderate, high, or urgent (refer to Figure 3-4 for definitions). Execution of this data generation plan will generate exposure monitoring data for follow-on HRA activities.

Consideration should be given to whether an E-SAP and associated HRA should be conducted for the EP. The development and execution of an E-SAP for an EP requires appropriate resources but may not be needed to address the exposure concerns. A deliberate decision will need to be made as to whether to pursue such monitoring based on command risk management guidelines, available capabilities and resources, and support from specialized assets and/or the appropriate OEHS Center. The decision to pursue additional monitoring should generally be made by the FHP team in coordination with the location commander, higher echelon FHP assets, and/or the supporting OEHS Center.

Note

CCMD policy may override or alter such decision-making processes.

Once the decision has been made to develop and execute an E-SAP for an EP, the FHP team should initiate the process by obtaining the most recent guidance and model SAP templates from its Service's OEHS Center and the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

Note

Gathering all EP E-SAPs into one sitewide SAP is acceptable but may create an overly burdensome administrative task and, over time, may not allow sufficient, speedy adaptation to changing ground conditions; this may affect some EPs.

As described in 4.4, the development of an E-SAP will typically involve the OEHS Center in support of the deployed team. The construction of an E-SAP requires more advanced skillsets than are typical for most deployed FHP teams. While execution of the field sampling elements of an E-SAP will typically be performed by a deployed FHP team, the full plan and the supporting laboratory analysis elements will require participation or oversight by theater laboratory assets and/or OEHS Center personnel.

The process of developing a site-specific E-SAP will require the deployed FHP team's attention for the following elements:

1. Awareness of the EP's health hazards in comparison to actual monitoring capabilities
2. Review of organic exposure monitoring equipment and standing operating procedures
3. Consideration of the need to potentially augment the equipment set with specialized capabilities
4. Establishment of the strategy and timing for site sample collection or use of DRI capabilities
5. Confirmation of sample management procedures with respect to supporting analytical laboratories
6. Health and safety considerations for the sampling team during the sampling event(s).

Once completed, an E-SAP should be uploaded as an attachment to the EP inside of the active CSM within DOEHRS-IH.

10.5 PREPARE FOR ENHANCED HEALTH RISK ASSESSMENTS

Enhanced HRA activities will generally follow execution of an E-SAP and data quality reviews of the generated data. In general, enhanced HRAs should be conducted by an experienced FHP team or the lead Service's OEHS Center. Other than confirming lines of communication and sampling and analysis methods during E-SAP development, the key considerations for preparing for an enhanced HRA include the following:

1. Who will conduct the HRA and who will receive the results?
2. The types of quantitative data to be generated during E-SAP execution.
3. Data quality assurance and control checks to be performed on generated data.
4. Time periods covered by the sampling in relation to actual (or potential) exposure timeframes.
5. The types of exposure estimates that can be generated and planned exposure guidelines (see 3.5).
6. Expectations for the turn-around time of any analytical laboratory analyses and data results.
7. Expectations for the turn-around time of the overall HRA.

For EPs dealing with chemical health hazards, the HRA methodology for conducting an enhanced HRA will typically involve use of the MEGs and follow the guidance within Technical Guide 230. Additional exposure guidelines and HRA methodologies may be necessary depending upon the circumstances, health hazards under consideration, and guidance and/or consultative advice from the Service's OEHS Center.

For more context, refer to Chapter 3 for the general HRA framework used during OEHSS activities.

Note

Enhanced HRA methodologies for dealing with health hazards other than chemical substances are available on the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

CHAPTER 11

Execution of On-going Site Exposure Monitoring

11.1 INTRODUCTION

When OSEM preparation activities are completed, OSEM execution begins immediately (see Figure 1-3). Generally, after every recurring OEHSA survey is completed, the scope and magnitude of OSEM activities that will occur between each OEHSA survey should be reassessed. OSEM execution will sometimes involve both site visit and remote activities at supporting laboratories and the Service's OEHS Center.

Throughout all OSEM activities, deployed FHP teams should continuously communicate with their chain of command and supporting remote assets on the progress of site findings and potential health risks as they are identified and assessed.

Note

After the OEHSA survey, the priority level for each EP is further assessed on a recurring basis using information and data generated during OSEM.

11.2 ON-GOING SITE EXPOSURE MONITORING SITE VISIT ACTIVITIES

During OSEM execution, the deployed FHP team is responsible for the site visit activities listed below:

1. Recurring site visits and communications with personnel stationed at the deployment location
2. Site visit reconnaissance, facility inspections, EP validation and qualitative assessments
3. E-SAP field execution activities for selected EPs during site visits
4. OEH status briefings to the base camp commander/BOS-I
5. Facilitating new or potential updates to the commander's risk acceptance memoranda
6. Associated updates to DOEHRS-IH documentation.

Guidance for nearly all of these activities is the same as covered in Chapter 9 for executing an OEHSA survey. The main difference during OSEM is the nearly sole focus on the active CSM of EPs; however, the execution of E-SAPs for selected pathways also occurs.

The frequency of recurring site visits to any given deployment location should be directed by CCMD FHP policy and may be tailored to the conditions at the location and priority levels of EPs within the CSM. For example, locations with multiple EPs set to high are likely to require more frequent site visits compared to locations with all EPs set to low.

A major activity during OSEM is the recurring execution of E-SAP tasks that were developed during OSEM preparation (see 10.4). The execution of most SAPs will include challenges and unforeseen events. Therefore, the execution of an E-SAP should generally involve regular communication between the deployed FHP team performing on-site tasks and its support elements in-theater and at remote locations (e.g., the supporting OEHS Center). Dealing with contingencies and making adjustments to deal with sampling strategy hurdles and other

difficulties is a major enabler for effective and successful E-SAP execution. All deviations from the written E-SAP should be communicated and documented along with the original E-SAP. The E-SAP documents should be uploaded to the EP inside the active CSM within DOEHRS-IH. Information and data generated during the execution of E-SAPs should be included as part of an enhanced HRA (refer to 11.5) and/or as part of an EP assessment documented within DOEHRS-IH (refer to Appendix C).

11.3 ON-GOING SITE EXPOSURE MONITORING REMOTE ACTIVITIES

During OSEM execution, the specialized assets, laboratories, and the OEHS Center supporting the deployed FHP team may be responsible for the remote activities listed below:

1. E-SAP laboratory execution activities at in-theater or remote analytical laboratories
2. E-SAP data quality assurance reviews
3. E-HRA activities for the selected EPs
4. Updates to the active CSM of EPs based on the aggregation of all relevant findings
5. Development of risk mitigation recommendations, as needed
6. Support for OEH status briefings to commanders, if requested by the deployed field team
7. Associated updates to DOEHRS-IH documentation.

Guidance for key activities is provided below. The specialized assets, laboratories, and the OEHS Center should be aware that the deployed FHP team may turn to them for assistance to deal with on-the-ground contingencies and other unforeseen events that might impact SAPs.

11.4 DATA GENERATION AND QUALITY CONTROL CHECKS

This manual does not address the specifics of the methods that in-theater or remote analytical laboratories use to generate data. However, laboratory-generated data should always be produced in support of a written site-specific SAP. After data has been generated and documented in DOEHRS-IH, data quality control checks should be performed prior to use within OEH assessments. Field sampling and laboratory analytical procedures and the results should undergo the qualitative and quantitative data evaluation and assessment to ensure generated data meets data quality standards defined within programmatic SAPs, or as documented in site-specific SAPs if deviation from programmatic standards was deemed necessary (see Chapter 4 and Appendix D).

1. Data verification will consist of a review of field sampling and laboratory analytical records to determine that sampling and analytical procedures were carried out according to plan.

2. Data validation will consist of a precision, accuracy (bias), representativeness, completeness and comparability (often referred to as the PARCC criteria) review of field and laboratory data to determine the extent to which variances in actual field or laboratory procedures or results may have affected data usability. Overarching standards for OEHSS activities should be defined within programmatic SAPs.

3. Data assessment will consist of a review of all generated data for an EP to assess whether the data address the exposure concerns; likelihood that health hazards are present; likely environmental fate and transport pathways; and if EP scenarios are properly documented within the active CSM. Any deficiencies should be documented and considered during follow-on HRA activities.

11.5 ENHANCED HEALTH RISK ASSESSMENTS

Enhanced HRA concepts are highlighted in Figures 3-1 and 3-6, and 10.5. In general, enhanced HRAs should be conducted by the OEHS Center or an experienced FHP team and based on an E-SAP (see 9.4) and any other supporting data deemed necessary. Enhanced HRAs should either include data quality reviews or follow such reviews (see 11.4).

For EPs dealing with chemical health hazards, the HRA methodology for conducting an enhanced HRA will typically involve MEGs and follow Technical Guide 230. Additional exposure guidelines and HRA methodologies may be necessary depending upon the circumstances, health hazards under consideration, and consultative advice from the Service's OEHS Center.

Note

Enhanced HRA methodologies for dealing with health hazards other than chemical substances are available on the OEHSS support website https://www.milsuite.mil/book/groups/oehss.

At the conclusion of the risk assessment, sufficient information should be available to reassess the EP's priority level and whether to collect additional data to support exposure monitoring and performance of additional HRAs over time. Appendix C provides best practice guidance for how to revise the priority level based on the results of the HRA. If the priority level changes, the OSEM plans for the EP may need to be altered to correspond to the health risk estimation results. Higher priority generally means more monitoring activity or risk mitigation actions.

Once completed, an enhanced HRA should be uploaded to the EP as an EP assessment inside of the active CSM within DOEHRS-IH. Refer to Appendix C for best practice guidance on how to perform this action.

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CHAPTER 12

Periodic Occupational and Environmental Monitoring Summaries

A POEMS is a retrospective summary document of the OEH exposure concerns and HRAs at a deployment location. The document compiles information from one to many years at specific locations. OEH clinical providers are the primary audience for POEMS. The following is the formal definition:

> POEMS. Unclassified and publicly releasable OEH monitoring summaries (e.g., noise, thermal stress, airborne pollutants, soil and water contaminants, incidents, and infectious diseases) that identify location-specific OEH hazards and population based health risks. POEMS provides estimated exposures, assessment of whether estimated exposures [were] acceptable or unacceptable, and the criteria used for the estimate (i.e., above or below Military Exposure Guidelines) along with anticipated acute, chronic, or latent health effects. POEMSs are updated or certified as current at least annually.
>
> *DODI 6490.03 (JUN 2019), Deployment Health*

A POEMS should be considered for every major deployment location as soon as sufficient data are available. In general, a POEMS should reflect the results of the OEHSS process, information and data generated, and assessments performed over a year or more, in order to adequately evaluate potential health risks from long-term exposures that personnel experienced at a deployment location.

As shown in Figure 1-3, the development of a POEMS for a deployment location is generally considered an activity that is performed after deployment because it is a retrospective assessment. For deployment locations that persist through longer periods of time, the process to prepare a POEMS will overlap with successive FHP team deployments.

Per DHA-PI 6490.03, CCDRs specify which deployment locations require a POEMS document and all completed POEMSs are to be recorded in DOEHRS-IH, with any portion-marked classified content recorded in the MESL (using the SECRET Internet Protocol Router). Completion of the POEMS is the responsibility of the geographic CCDR who prioritizes and ensures POEMSs are completed by either developing them or requesting OEHS Center support to author and accomplish in accordance with CCMD written guidance. Appendix H provides POEMS template information.

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CHAPTER 13
Individual Longitudinal Exposure Record

The ILER is an online application designed to create a complete record of every Service member's OEH exposures over the course of the Service member's career. It is a web-based application that provides DOD and VA the ability to link an individual to known exposure events to compile an exposure history to improve the efficiency and quality of health care. ILER provides DOD and VA clinicians, claims adjudicators, and benefits advisors actionable data required to improve care to Service members and veterans. The ILER is a relatively new capability and will eventually represent the complete and authoritative source for all OEHS data, including hazardous exposures to Service members in theater as well as to critical nontheater exposures that impact DOD and VA medical care and disabilities. The information, data, and assessments on CSM EPs that are compiled over time and documented within DOEHRS-IH will eventually be included in the ILER and made available for review by DOD and VA clinicians, claims adjudicators, and benefits advisors.

Access to the ILER is restricted to specific users and is accessible at: https://iler.csd.disa.mil/iler/.

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CHAPTER 14
Assessment and Training

14.1 ASSESSMENT

Assessment measures the approach to and performance of OEHSS activities used to provide adequate FHP and inform future decisions. An assessment helps to answer the following questions:

1. What happened? (Collection and Monitoring)
2. Why? So what? (Analysis and Evaluation)
3. What do we need to do? (Action for Improvement)

Assessment is a continuous activity that begins in its design and continues through execution. It should include subordinates and mission partners and incorporate both quantitative and qualitative indicators. It is best practice to understand that human judgment is integral to assessment and often key to success. Assessment should balance a reliance on human judgment (qualitative) with direct observation and mathematical rigor (quantitative) to reduce the likelihood of skewed conclusions and decisions. A key best practice is to be careful of falling into the trap of assessing what you can versus what you should.

1. Task assessment. Focuses on, Are we doing things right? It assesses performance of our tasks. Task assessment, much like after-action reviews and hot washes, helps review and improve techniques and procedures in how tasks are performed.

2. Operational environment (OE) assessment. Focuses on, Are we doing the right things? It assesses how we are changing the OE, for better or worse. Within the context of OEHSS, OE assessment evaluates the accomplishment of the key tasks within the comprehensive OEHSS process in terms of speed, quality, and relevance. OE assessment informs prioritization, amending current plans—if off course—and future planning.

3. Campaign assessment. Focuses on, Are we accomplishing the mission? It assesses progress in achieving objectives. Campaign assessments occur at higher echelon commands and simultaneously at the OEHS Centers. Within the context of OEHSS, this includes assessment of the actual protection of health and readiness of the force at each deployment location, and how exposures and assessments are properly documented in the DOEHRS-IH for future recall within POEMS documents and the ILER. Campaign assessment focuses on whether the operation is progressing as planned in terms of timelines or success criteria, and provides recommendations for addressing shortfalls or emerging challenges.

A well-balanced assessment process (between qualitative and quantitative indicators) avoids excessive and time-consuming assessment schemes or quantitative collection efforts that squanders valuable resources and may be insufficient in informing the decision cycle. Avoid assessments performed at the speed of irrelevance or cost of other important activities. This is best accomplished with a continuous assessment cycle involving all staff and functional elements.

14.2 TRAINING GUIDELINES

These MTTP describes standard procedures and establishes uniform operational concepts based on a common terminology. Lead Military Services and other pertinent organizations will adapt training with this MTTP for maximum FHP and combat effectiveness. A phased approach to training OEHSS activities can be an effective strategy for preparing FHP teams; however, the approach to each training event should be tailored to the situation and audience. The list below is an example of a phased approach:

1. OEHSS training should initially focus upon the full framework components and fundamental concepts discussed within Chapters 1 through 6, and an overview of the entire manual. Brief highlights of relevant parts of DOEHRS-IH should be included.

2. OEHSS training should focus upon how to engage with basing location Engineer Operations, understand the basics of deployment location design, and perform site visit related activities of the OEHSA survey in cooperation with Engineer Operations personnel, or independently.

3. Training should focus upon CSMs and how to conceive and/or construct a set of valid EPs for a deployment location. How EPs are to be associated to elements of the OEHSA survey should be included, as well as how the CSM is to be maintained during OSEM activities over time. The CSM elements of DOEHRS-IH are also important to cover at this phase.

4. Training should re-engage in HRA concepts and how important EPs will need to be assessed using HRA activities. HRA topics should include who performs them, how they are conducted, where they are documented in DOEHRS-IH, and how to communicate the results and recommendations. The training should also introduce the important concepts of data generation plans and the role of site-specific SAPs.

5. Since the role of data generation and data quality plans would have been introduced in the previous topic (HRA Concepts), the next phase of training should focus on how to use the EP-specific model SAPs to create and execute site-specific SAPs. This will involve how to collaborate with OEHS Centers and possibly include refresher training related to exposure monitoring equipment and other capabilities. This part of training will necessarily be the most hands-on and field-relevant and should include field exercises and actual use of equipment and exercises of example site-specific SAPs.

6. Topics related to measuring data quality and how that impacts use of data and long-term exposure records, should be an immediate follow-up to SAP-related training.

7. Teams should be trained on how to complete the OEHSA survey within DOEHRS-IH, initiate the survey review process, and get the survey approved and finalized.

8. FHP teams can also learn how to evaluate the OEH status of a deployment location, with or without use of an OEH status checklist; develop risk mitigation options; and create and give a status briefing to commanders.

9. Training for experienced FHP personnel should also include use of emerging technologies and capabilities and how to handle unique CSM EP problems.

APPENDIX A
Deployment Teams

The deployment teams that implement OEHSS activities are identified in the following tables. Each Service has one or more specialty teams that provide additional support and expertise beyond the capabilities of the primary deployment teams (see Figures A-1., A-2, and A-3).

Army Deployment Teams	
Field Sanitation Team (FST)	A team of 1 or 2. Provides basic field sanitation and operational public health support to tactical ground forces.
Brigade Combat Team (BCT) operational public health personnel	A team of 2. Provides direct support to brigade and below elements including special operations forces (SOF); supports operational public health; provides training and support to FSTs.
PVNTMED (Operational Public Health) Detachment	A team of 12. Provides area support to BCT operational public health staff and organic operational public health personnel as required and enhanced technical support for public health issues that exceed the capacity and capability of the operational public health assets assigned throughout the theater of operations.
Area Medical Laboratory (AML)	The 1st AML is the Army's only specialized, deployable theater medical laboratory, capable of field confirmatory analysis and theater validation laboratory support. Its primary role is to provide in-theater validation, analytical laboratory support collection, processing and interpretation for environmental samples (e.g., air, water, and soil), epidemiological samples, food and water, and infectious disease and CBRN samples. Its focus is the total health profile of the theater environment, not individual patient care. The 1st AML is designed to deploy worldwide as a unit or, more typically, by subunit-level troops capable of performing all or some of the previously mentioned tasks in multiple global theaters simultaneously.
Specialty Team	
Specialized U.S. Army Medical Center Response Capability–Public Health	A specialized team of 10 available for tailoring to each mission requirement. Provides expert hazardous material or public health consultation (e.g., disease surveillance, entomology, EH surveillance, environmental engineering, industrial hygiene, health physics, and veterinary services) during regional and domestic support, civil-military cooperative assistance, disaster relief, and humanitarian assistance operations.

Figure A-1. Army Deployment Teams Responsible for OEHSS Activities

Air Force Deployment Teams	
Preventive and Aerospace Medicine Advanced Echelon (PAM ADVON)	A team of 4. Provides initial public health and OEH assessment, surveillance, intervention, and abatement; provides medical support planning and input into the layout of base facilities and operations; provides PVNTMED and limited clinical services for up to 500 personnel; provides OEH assessment and surveillance, field sanitation and hygiene, infectious disease control, toxic industrial chemicals/toxic industrial materials/water/food safety and vulnerability assessments, and limited CBRN defense.
SOF Medical Element Augmentation	A team of 4. Augments bare base operations that are serviced by a SOF medical element. Enhances capabilities to perform food protection, field hygiene/sanitation, vector surveillance, communicable disease control tasks, medical logistics and operational planning. Additionally, it provides CBRN and environmental threat detection, limited patient decontamination, and long-term IH sustainability and environmental protection surveillance.
PAM	A team of 10. Provides BEE and public health personnel augmentation to PAM ADVON team.
Specialty Teams	
Theater Epidemiology Team	A team of 5 to 7. Provides threat assessments of environmental and occupational factors, evaluates infectious disease risks and disease and nonbattle injury rates from all sources, and recommends interventions to minimize degradation of combat strength. Travels light and is extremely mobile so it can provide timely assessments and intervention recommendations. The team is designed for rapid deployment and may be deployed in smaller components to meet the needs of the theater surgeon.
Biological Augmentation Team (BAT)	A team of 2. Expands theater FHP by introducing best available advanced microbiological diagnostic capabilities. BAT diagnostic tools can identify pathogens in clinical samples and other environmental media rapidly and with superior sensitivity and specificity. The BAT provides a preventive capability; the team provides diagnostic data to support early warning of pathogen exposures as well as assessment of extent and type of microbial contamination in other various substances (food, air, water, or soil).
Infectious Disease Team	A team of 3. Diagnoses, treats, and controls the spread of infectious diseases to return patients to normal activities. This includes diagnosis and treatment of infectious disease, operation of a six-bed isolation unit, oversight of effective basewide infection control activities, consultation with the PAM teams on epidemiological issues, diagnosis, and treatment of biological warfare diseases.
Air Force Radiation Assessment Team (AFRAT)	A team of 14 or 22. Provides rapid global response expertise, manpower, and equipment necessary to respond to accidents/incidents involving radioactive materials. Provides complete radiological hazard ID, site-characterization, and consultative support for mitigation, force protection, and remediation activities.
PAM Counter-CBRN Team	A team of 6. Conducts CBRN surveillance, performs HRAs, and advises commanders on CBRN health effects, threat impact, protective action posture, and recovery activities. The team performs environmental sampling, analysis, and monitoring for FHP purposes and participates in the confirmatory ID process for suspected biological threat agents.
Global Reach Laydown (GRL) Team	A team of 4. Provides medical support during rapid opening of contingency airfields. This team deploys with the squadron and provides care and initial PVNTMED surveillance. The GRL has similar equipment and manning as the PAM ADVON team and is designed to provide initial airfield support and then turn over to the PAM team when it arrives.

Figure A-2. Air Force Deployment Teams Responsible for OEHSS Activities

Navy Deployment Teams	
PVNTMED Personnel Assigned to Ground Forces	A team of 2 or 3 (typically). Provides PVNTMED support to operational ground forces to preserve unit combat effectiveness. Provides informed technical information concerning PVNTMED and EH threats.
PVNTMED Personnel Assigned to the Marine Expeditionary Force (MEF)	A team of 3. Provides expertise in PVNTMED, public health, or occupational medicine; develops MEF-level PVNTMED policies, operations plans, and training; conducts routine and operational disease surveillance and disease outbreak investigations using biostatistical analysis of health trends.
PVNTMED Personnel Assigned to the Marine Aircraft Wing/Division	A team of 4. Provides organic PVNTMED support to the Marine aircraft wings and the Marine divisions by conducting disease and environmental surveillance, developing health threat assessments and countermeasures, and ensuring commanders have the most complete situational awareness of potential and actual health threats, risks, and hazards.
PVNTMED Personnel Assigned to the Marine Logistics Group	A team of 3. Provides direct PVTMED support and FHP to the ground combat element of the MEF throughout the AO.
Specialty Teams	
Forward-deployable Preventive Medicine Unit (FDPMU)	A team of 13. Provides PVNTMED, chemical, microbiological, entomological, and logistical services in support of FHP by assessing, preventing, and controlling health threats in a theater of operations and enhancing the capabilities of organic PVNTMED assets.
FDPMU Advanced	A specialized team of 16. Augments and increases laboratory and CBRN defense capabilities of the basic FDPMU configuration. This team adds the radiation health officer, radiation health technician, and a biochemist.
OEHSA Team	A team of 5 task organized out of the FDPMU. Determines if contaminants from current and prior land use, disease vectors, or other environmental conditions exist at deployment sites that could pose health risks to deployed personnel. Identifies industrial facility operations, and commodities on or near a deployment site that, if destroyed, damaged, or released, could result in catastrophic health risk to deployed forces.

Figure A-3. Navy Deployment Teams Responsible for OEHSS Activities

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APPENDIX B

Occupational and Environmental Health Site Assessment Survey

The OEHSA survey provides a comprehensive overview of both occupational and EH threats associated with a deployment location and the activities and missions that occur there. Figure B-1 defines the 21 sections of the OEHSA template. The OEHSA survey template is the data/information collection tool used to describe site conditions and identify OEH threats in order to build a comprehensive CSM for a particular deployed location. The OEHSA survey should be recorded directly into the EH module of DOEHRS-IH. A template is available at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

OEHSA Survey Categories	Data Description
1. Administrative data	Basic site information (e.g., location name, geographic coordinates, units assigned, camp population)
2. Survey background	OEHSA mission scope, purpose, methodology, and limitations/assumptions
3. Site description	Site physical characteristics, meteorological data, water sources, soil types, proposed site usage, current/past uses of the property/adjacent property, and nearby industrial facilities
4. Site infrastructure	Existing on-site industrial operations, description of structures/roads and power generation and any contractor services
5. Hazardous materials	Hazardous material storage (above/below ground), petroleum distribution points, past/present releases, evidence of spill containment/mitigation practices, and disposal methods
6. Waste management	Solid/hazardous waste management to include landfills, burn pits, incinerators, and wastewater management
7. Entomology	Disease threats, vectors present, and pest control measures in place
8. Physical hazards	Physical hazard sources (e.g., ionizing and nonionizing radiation sources and environmental noise sources present)
9. Air quality	Ambient air quality and indoor air quality sources
10. Water	Water sources (e.g., municipal, bottled, ground or surface, water treatment and distribution systems, and water surveillance)
11. General sanitation	General facilities
12. Food sanitation	Dining facilities
13. Personnel contacted	List of points of contact for each category
14. Other EH concerns	Captures OEH threats not captured in any of the other categories

Figure B-1. Sections of OEHSA Survey (Sheet 1 of 2)

OEHSA Survey Categories	Data Description
15. CSM	OEHSA CSM of EPs for all categories
16. On-site screening results	Pathway screening sampling/limited exposure assessment sampling results
17. DRIs and associated calibration	Equipment inventory for any sampling performed during reconnaissance
18. Executive summary findings	Detailed environmental conditions of health/mission significance
19. Executive summary recommendations	Health risk communication to local command
20. Reviewed and communicated to command	Documents the reviewer of the assessment and information pertaining to providing the assessment results to the site command
21. Samples collected for off-site analysis	Specific samples taken for laboratory analysis

Figure B-1. Sections of OEHSA Survey (Sheet 2 of 2)

APPENDIX C
Conceptual Site Model Best Practices

The creation of a CSM of EPs should proceed according to a set of best practices developed and maintained by the OEHS Centers. Technical Guide 392, Conceptual Site Model Best Practices and Exposure Pathway Guidance, provides current best practices and is available on the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

The CSM best practices for EPs include the following (details are provided in the technical guide):

Preliminary CSM:

1. The creation of a preliminary CSM is an activity best suited for planning the first site visit to a new location. Preliminary CSMs do not need to be created within DOEHRS-IH.

EP Creation (within DOEHRS-IH):

2. Within DOEHRS-IH, create, revise, and update EPs within the active CSM area of the EH module. Associate those pathways with specific sections of the OEHSA survey after they have been created, revised, or updated in the active CSM. All pathways linked to the OEHSA survey are viewable in the OEHSA CSM. Refer to Figure C-1 for how to locate these two different CSMs within DOEHRS-IH.

3. When a deployment location has an active IH or occupational radiation safety program, EPs should not be created within the EH module of DOEHRS-IH for the specific workplaces under the management of those programs.

4. The creation, and subsequent management, of EPs over time is a collaborative effort involving boots-on-the-ground FHP teams, their higher echelon FHP officers, and SMEs at the reachback OEHS Centers.

5. Use standard EPs for a given deployment location. Name each EP using the naming conventions in the CSM best practices technical guide. Unique situations can be addressed with nonstandard pathways.

6. Use the CSM best practices technical guide to determine which EPs are required for a location and how to document the details of each EP within the EH module of DOEHRS-IH.

7. Each EP requires the selection of a priority level. The CSM best practices technical guide provides instructions for determining the initial priority level at the time an EP is created. It also provides instructions for potential revisions of the priority level based on the collection and evaluation of additional data and information (see step 10).

8. In the rare situation when there is a desire to assign specific individuals to an EP, consult the CSM best practices technical guide.

EP Management:

9. Ensure the EPs found in the active CSM at any given time reflect the health hazard exposure conditions at the location. Add new pathways as required, modify existing pathways as new information is generated, record risk management decisions and actions taken within the pathway details, and stop-date those pathways that are no longer complete.

10. After EP HRAs, or other kinds of EP assessments, are completed, validate or revise EP priority level using the CSM best practices technical guide.

11. Document EP HRAs, and other kinds of EP assessments, within the EP using the EP assessment feature in the EH module of DOEHRS-IH.

12. Stop-date an EP using the guidance in the CSM best practices technical guide.

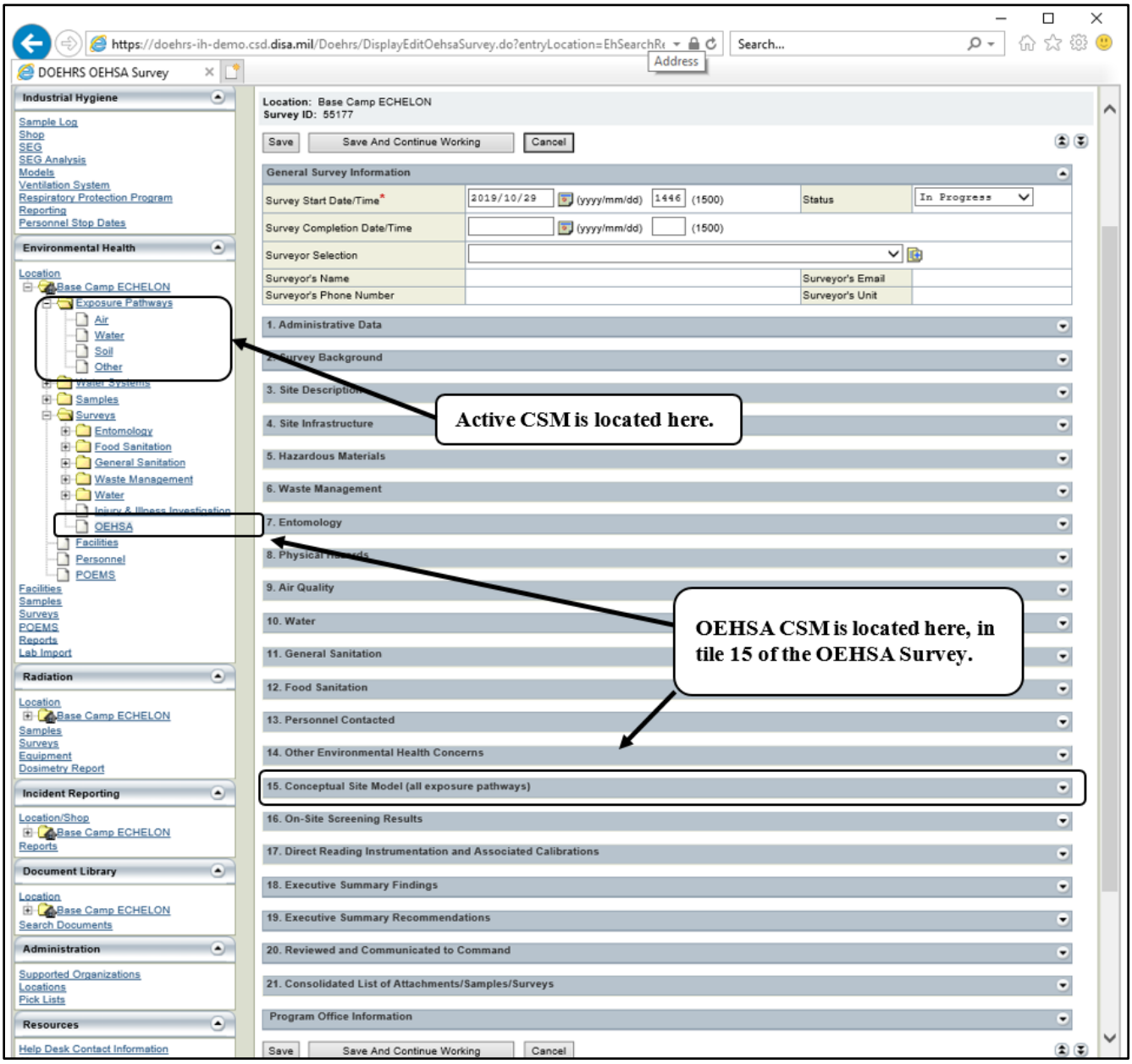

Figure C-1. Locations of the Active CSM and OEHSA CSM Within DOEHRS-IH

APPENDIX D

General Sampling and Analysis Plan Guidance

D.1 INTRODUCTION

This appendix provides general guidance for SAPs. Refer to Chapter 4 for a description of the OEHSS framework for SAPs. Data generation and exposure monitoring during OEHSS should proceed according to defined, written SAPs that address sampling strategies, sample management, laboratory analyses, and associated quality assurance. Basic guidance is provided by current data generation planning manuals prepared by the Service OEHS Centers (e.g., Technical Guide 317, Technical Guide for the Collection of Environmental Sampling Data Related to Environmental Health Site Assessments for Military Deployments; Technical Manual-Preventive Medicine 6490.2, Technical Guide for Collection of Environmental Sampling Data Related to Environmental Health Site Assessments for Military Deployments; and U.S. Air Force 2019 Bioenvironmental Engineering Field Manual, U.S. Air Force Medical Readiness Agency (AFMRA)). However, there have been significant OEHSS lessons learned and recent advances in professional best practices for EH data generation and quality assurance that the OEHS Centers can translate into programmatic and site-specific approaches for OEHSS activities. Deployed FHP field teams should coordinate with their Service OEHS Center to obtain current, operationally practical SAP guidance and templates.

Available programmatic plans and model SAP templates and other guidance can be found at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

D.2 GENERAL GUIDANCE

The primary objective of OEHSS data generation is to estimate exposure levels and characterize health risks associated with OEH threat sources and their health hazards. The right type, quantity, and quality of data over time required to support these objectives throughout the OEHSS process should be defined within programmatic plans and site-specific SAPs. Data generation activities are best employed in a two-phased approach, whereby the first phase is to screen for potential exposures of concern and the second phase is to further characterize those exposures and associated health risks. These two phases are embedded within the OEHSS.

The consequences of inadequate planning for EH investigations have been summarized by the ITRC:

> Many in the environmental community have recognized the need for systematic project planning as reflected in the [Environmental Protection Agency's] DQO process, the USACE TPP Guidance (USACE 1998), and others. Too often during the course of performing environmental investigations, insufficient attention is directed to establishing clear objectives for the work, sometimes leading to unproductive investigations that fail to efficiently gather the information necessary for scientifically defensible decisions.
>
> *Interstate Technology & Regulatory Council, 2003, p.17*

Data generation for OEHSS activities should be based on a systematic planning process that blends available best practice guidance with a heavy emphasis on use of the DQO process (see Figure D-1) in order to provide the structure for articulating the numerous planning factors involved with executing worldwide data collection efforts. The DQO process is one of a number of best practice techniques that guides the resource-effective acquisition of EH data. In its DQO guidance manual, the EPA stated:

> The DQO Process is a series of logical steps that guides managers or staff to a plan for the resource-effective acquisition of environmental data. It is both flexible and iterative, and applies to both decision-making (e.g., compliance/noncompliance with a standard) and estimation (e.g., ascertaining the mean concentration level of a contaminant). The DQO Process is used to establish performance and acceptance criteria, which serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of the study. Use of the DQO Process leads to efficient and effective expenditure of resources; consensus on the type, quality, and quantity of data needed to meet the project goal; and the full documentation of actions taken during the development of the project.
>
> *Environmental Protection Agency, 2006*

DQO Step	Specific Considerations/Examples
Step 1: State the problem Define the problem that necessitates the study; identify the planning team, examine budget, schedule.	• Problem • Planning team • Conceptual model of the problem • Available resources, constraints, and deadlines
Step 2: Identify the goal of the study State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.	• Principal study question • Estimation statement
Step 3: Identify the information inputs Identify data and information needed to answer study questions.	• Types of information needed • Sources of information • Appropriate data acquisition methods including sampling and analysis methods
Step 4: Define the boundaries of the study Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.	• Target sampling population • Spatial and temporal boundaries and other practical constraints • Scale of estimation
Step 5: Develop the analytical approach Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.	• Parameter(s) to be estimated • How results will be presented
Step 6: Specify performance and acceptance criteria Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.	• Accounting for uncertainty in the estimates • Exposure estimate confidence levels • Measurement data quality indicators (DQIs) • Measurement DQI performance criteria
Step 7: Develop the plan for obtaining data Select the resource-effective SAP that meets the performance criteria.	• Candidate sampling designs and analyses • Selected sampling design/schemes • Selected analytic methods • Assumptions and constraints supporting selection
Note: Some answers to the questions within the DQO process steps are programmatic and some site-specific. Guidance provided by the OEHS Centers within programmatic plans provide the broad, common DQOs while site-specific SAPs that involve the deployed FHP teams constitute the completion of the planning process for the remaining elements. Refer to 4.4 for more information.	

Figure D-1. Data Quality Objectives Process Steps

In its guidance on use of the triad approach for environmental project management, the ITRC emphasized that systematic planning revolves around one central concept: understanding and managing uncertainty. It further stated that:

> Environmental investigations are truly multidisciplinary endeavors, and this fact creates a management challenge. The project team must avoid a loss of focus on the specific investigation objectives while integrating different technical viewpoints. This goal is accomplished by achieving consensus on the investigation objectives prior to beginning generation of planning documents that support field work. This vital step of systematic planning is central to a successful investigation.
>
> *Interstate Technology & Regulatory Council, 2003*

The above best practices are recommended. Successful sampling investigations must begin with a shared understanding of the purpose and use of the generated data and planning for the investigation should focus on understanding and managing uncertainty. Figures D-2 (adopted and slightly modified from the EPA DQO guidance (EPA 2006)) and D-3 (see EPA's Guidance on Systematic Planning Using the Data Quality Objectives Process) provide insight to the kinds of considerations that need to be addressed while developing plans.

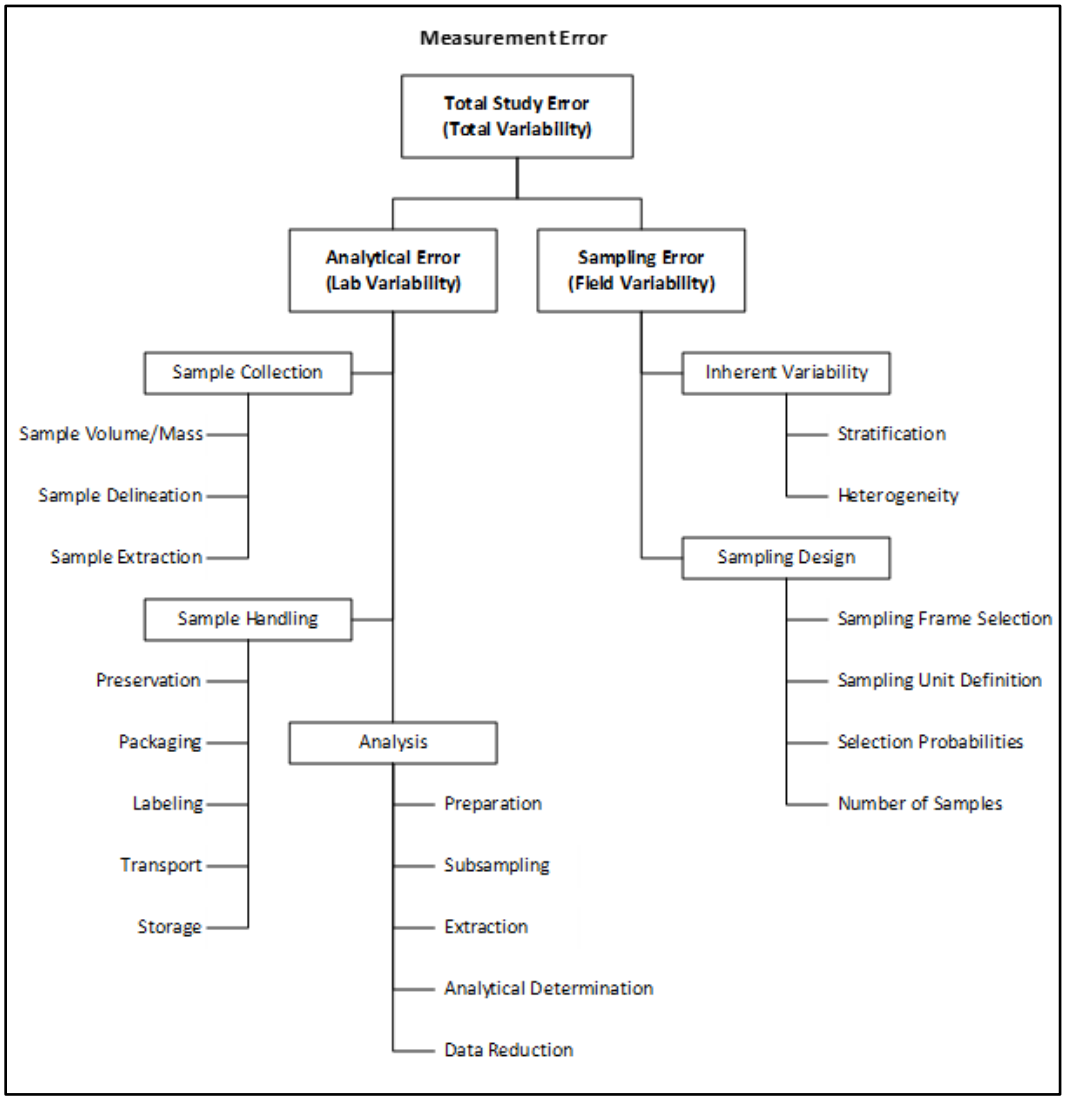

Figure D-2. Example of How Represent Total Measurement Error Components

In a probability-based sampling design, each possible sampling unit has a known probability of being selected, and only those sampling units selected will provide data for the study.

In a judgmental sampling design, the sampling units are not assigned a known probability of being selected, but rather, are selected at the discretion of the person in charge of the sampling effort.

These two types of sampling designs have considerably different types of inference that can be drawn from the sample data.

Statistical inference techniques (e.g., hypothesis tests, confidence intervals) require a probability-based sampling design, as this type of design will allow you to properly characterize uncertainty in the outcome of the data collection process. Because the DQO process is centered on properly dealing with uncertainty in your data, such designs are highly recommended as part of this process. Examples of common probability-based sampling approaches include simple random sampling, stratified sampling, and systematic and grid sampling. Probability-based sampling allows you to draw quantitative conclusions about the target population, while also properly expressing uncertainty in these conclusions through calculating confidence intervals, controlling for decision error probabilities, etc.

Judgmental sampling involves the selection of sampling units on the basis of expert knowledge or professional judgment. Emphasizing historical and physical knowledge of the underlying site condition and sampling units over the need to implement potentially complex statistical sampling theory make judgmental sampling an appealing option for some applications. However, judgmental sampling designs will not allow you to characterize uncertainty properly. As a result, the outcome of statistical analysis on data collected through judgmental sampling cannot be used to make any type of scientifically defensible probabilistic statements about the target population. Conclusions are made solely on the basis of scientific judgment, and therefore, depend entirely on the validity and accuracy of this judgment.

Figure D-3. General Sampling Design Approaches

APPENDIX E
Exposure Incident Guidance and Reports

E.1 GUIDANCE FOR EXPOSURE INCIDENT REPORT DETERMINATION AND ACTIONS

Exposure incidents and reports are not generally part of regular site surveillance exposure monitoring. They only apply when unusual exposure situations occur. OH exposure guidelines should be relied upon to assess OH exposure incidents, and EH exposure guidelines to assess EH exposure incidents. The following guidance can assist in the determination of whether an exposure incident report should be triggered by one or more of the criteria published in the DHA-PI 6490.03.

E.1.1 Exposure Incident Report Criterion 1: Visual/Sensory Cues

DHA-PI 6490.03 Criterion: Visual/sensory cues are, or were, present indicating potential presence of an OEH hazard (e.g., smoke/cloud, odors, strange liquid/powders, etc.).

1. Relevant health hazards. Chemicals, radionuclides, and microbiological organisms or toxins.

2. When triggered. The criterion is triggered if an initial field account survey (IFAS) was prepared, or by professional judgment, when an FHP team learns about the event and determines the cues are indicative of a situation creating an unknown hazard of concern or a known hazard to which personnel may have been exposed in an unusual way. Exposure could have occurred, or is occurring, if all six elements of an EP are satisfied (refer to 3.3.2).

3. When not triggered: The criterion is not triggered if exposure did not occur because one of the six pathway elements was not satisfied or the situation can be quickly explained as nonhazardous by the FHP team.

4. FHP actions: The determination should be documented by the FHP team in the EP within DOEHRS-IH. If the criterion is triggered and exposure is on-going after the incident, EP should be prioritized as urgent and an incident investigation and report (incident report survey (IRS)) is required. Environmental sampling and analysis may need to be performed.

Note

If triggered solely by an IFAS, the incident may not be associated with an existing EP.

E.1.2 Exposure Incident Report Criterion 2: Real-time Detection

DHA-PI 6490.03 Criterion: The presence of an acute OEH hazard is indicated through positive detection using real-time field equipment (e.g., direct reading instruments, joint chemical agent detector, improved chemical agent monitor, M8 chemical detector paper, or M256 chemical agent detector kit).

1. Relevant health hazards: Chemicals, radionuclides, and microbiological organisms or toxins.

2. When triggered: The criterion is triggered if an IFAS was prepared, or by professional judgment when an FHP team, or CBRN team, generates a valid and reliable presumptive hazard detection using real-time field equipment that indicates exposures in an area used by personnel might be higher than what would be considered low risk. For non-CBRN chemicals in air, this would generally not occur unless a concentration was detected higher than the appropriate short-term marginal MEG or equivalent guideline.

3. When not triggered: The criterion is not triggered if the detection is low enough (as defined above), or exposure is not, or did not, occur because one of the six pathway elements was not satisfied (refer to 3.3.2 for these elements).

4. FHP actions: If the criterion is triggered, the determination should be documented in the EP within DOEHRS-IH, the EP should be prioritized as urgent and an incident investigation and report is required. Additional environmental sampling and analysis may need to be performed using field confirmatory, theater validation, and/or definitive analysis.

E.1.3 Exposure Incident Criterion 3: Data Evaluation

DHA-PI 6490.03 Criterion: Evaluation of data by an appropriate medical/health professional indicates that exposure could plausibly result in some significant adverse health outcome, either short- or long-term.

1. Relevant health hazards: Any type of health hazard.

2. When triggered: The criterion is triggered by professional judgment of an appropriate medical or health professional during the course of the performance or review of an HRA generated during OEHSS process. This would only occur when an HRA concludes that the risk was high or extremely high.

3. When not triggered: The criterion is not triggered when an HRA concludes that the risk was low or moderate.

4. FHP actions: If the criterion is triggered, the determination should be included in the HRA report and documented as part of the EP assessment. The EP should be prioritized as urgent until an incident investigation and report is completed. Additional environmental sampling and analysis may need to be performed using field confirmatory, theater validation, and/or definitive analysis.

E.1.4 Exposure Incident Criterion 4: Significant Exposure Occurrence

DHA-PI 6490.03 Criterion: Incident results in a significant exposure to any deployed individual(s), including from CBRN agents and acutely toxic industrial chemicals.

1. Relevant health hazards: CBRN agents and acutely toxic industrial chemicals.

2. When triggered: The criterion is triggered by one or more of the conditions that would trigger criteria numbers 1 (visual/sensory cues), 2 (real-time detection), and/or 3 (data evaluation).

3. When not triggered: The criterion is not triggered in the same way as criteria numbers 1, 2, and/or 3.

4. FHP actions: The actions should match those described for criteria numbers 1, 2, and/or 3 for the situation applicable to the significant exposure occurrence.

E.1.5 Exposure Incident Criterion 5: Observed Acute Clinical Outcomes

DHA-PI 6490.03 Criterion: The presence of a health hazard is plausibly associated with actual observed (acute) clinical health outcomes that are reported and/or treated (e.g., complaints of headaches, dizziness, skin or eye irritation/burning, coughing, nausea, etc.).

1. Relevant health hazards: Any type of health hazard.

2. When triggered: The criterion is potentially triggered by professional judgment of an appropriate medical professional during the course of a clinical encounter at the deployment location, or elsewhere in-theater. If this is the case, the expectation is that the medical professional will contact the supporting FHP assets

in-theater to collectively evaluate whether the reported health effects are plausibly associated with an incident. If agreed, an incident investigation is triggered.

3. When not triggered: The criterion is not triggered when the professional judgment of an appropriate medical professional is that an OEH exposure is not plausibly linked to the outcome(s).

4. FHP actions: If the criterion is triggered, then the supporting FHP assets in-theater will begin an incident investigation and report. The incident may or may not be associated with an existing EP, and the cause of the acute effects in the personnel may not be initially known.

E.1.6 Exposure Incident Criterion 6: Leadership Concern

DHA-PI 6490.03 Criterion: Concern over a perceived or potential adverse health exposure leads to involvement of (PVNTMED [Operational Public Health]) assets and military leadership for investigation, assessment, determination and response. Document these actions as an incident report even when there is a determination that no adverse exposures or impacts to human health are expected.

1. Relevant health hazards: Any type of health hazard.

2. When triggered: The criterion is triggered by military leadership and the chain of command but not directly by findings from OEHSS activities.

3. When not triggered: The criterion is not triggered until a commander requires an investigation.

4. FHP actions: If the criterion is triggered, the expectation is that an FHP team will be ordered to begin an incident investigation and report. The incident may or may not be associated with an existing EP.

E.2 EXPOSURE INCIDENT REPORTS

The Occupational and Environmental Health Exposure Incident Report actually consists of two forms or sets of reported information, as described below:

1. IFAS. A documentation of the on-site field information regarding the OEH hazard, detection results, exposures, symptoms, visual and witness information, and other details. This form is especially critical and will typically need to involve the units that were part of the incident and the FHP team involved in collection of any samples and reporting. There may be multiple units completing separate IFASs.

2. IRS. A postincident overall health assessment that consolidates the incident information pertaining to personnel exposures, any associated health effects, and an HRA summary of the incident. Completion of the IRS ensures that the necessary information is consolidated and submitted to the designated DOD data archive.

The IFAS and IRS forms are available in the Incident Reporting module of DOEHRS-IH and on the OEHSS support website. Use of this module allows for real-time data archiving; however, typically only PVNTMED/public health assets will have access to this system. If completed as hardcopy only, these forms must be submitted and stored in the MESL (refer to Chapter 6) or Service-specific data collection system.

Note

OEH exposure incident reports are the same as those used to document CBRN-exposure incidents, see:
ATP 4-02.7/MCRP 4-11.1F/NTTP 4-02.7/AFTTP 3-42.3.

E.2.1 Guidance for the Initial Field Account Survey

Typically, the units that are part of the incident would complete the IFAS along with the chain of command involved in the incident. The IFAS should be completed as thoroughly as possible and submitted to the command surgeon or PVNTMED/public health officer within 24 hours of an incident.

Note

If an IFAS was not prepared for an incident by the unit(s) involved, the FHP team that investigates the incident and prepares the IRS (next subsection) does not need to create an IFAS.

Details in the IFAS and underlying reports, such as significant activity (SIGACT) reports and roster may be classified. Unit security personnel must review the IFAS and determine the classification it should have. Since standard SIGACT reports typically do not include all the required information for CBRN/OEH-exposure incidents, ensure the IFAS is filled out to expand the information that may have been put in the SIGACT report. If a SIGACT report already contains all the required information, a separate IFAS is not required and the SIGACT report may be uploaded into DOEHRS-IH; otherwise, the IFAS should be completed by the units involved and reference the SIGACT number.

By completing the IFAS, the involved units can facilitate the assessment of exposure incident and appropriate medical surveillance follow-up. In addition, the information can provide valuable lessons learned that could help mitigate future similar events.

E.2.2 Guidance for the Incident Report Survey

The FHP team and/or one of the OEHS Centers will complete the IRS. The command surgeon/medical officer designates who will prepare the IRS. Ideally, the IRS is prepared as an unclassified document so personnel and providers can have access. While details in some of the underlying documents and reports (e.g., SIGACT, IFAS, and roster) may be classified; to the extent possible, the IRS report itself should be completed at the lowest classification possible for the widest distribution.

Most elements of the IRS are straightforward and/or should be contained in other documents. Information such as SIGACT, IFAS, rosters, field and/or analytical data, and risk communication documents, may be used and referenced as attachments to the form. Additionally, an overall summary of the incident will need to be constructed and the various lines of evidence interpreted to provide an overall assessment of the incident.

An exposure incident HRA may be needed to assist in the full investigation of the incident, which should include risk estimates for acute health effects and the potential for long-term health effects. These risk assessments should be conducted by experienced FHP team members and/or SMEs at one or more of the OEHS Centers (see 1.3). If it is determined that a significant exposure did occur or was likely to have occurred, the possible health effects should be described and any relevant medical information included for future reference by those who will conduct follow-on medical surveillance.

Depending on the incident and/or conclusions of any risk assessment, risk communication products (for example, fact sheets and briefings) may need to be prepared.

The IRS should include reference to the roster that indicates those persons medically treated and their disposition, and provide any rapid medical evaluation reports and any Standard Form 600 (Chronological Record of Medical Care) overlays.

When completed outside of the Incident Reporting module of DOEHRS-IH, the IRS and all associated attachments and documents should be submitted to the combined JTF surgeon/FHP officer who is ultimately responsible for final determination and submittal to the DOEHRS-IH Document Library (or MESL for classified documentation [refer to Chapter 6]) or Service-specific data collection system.

APPENDIX F

Occupational and Environmental Health Site Surveillance Status Templates

The OEHSS status briefing (or OEH status briefing) is an FHP team briefing to the base camp commander/BOS-I that communicates the top OEH priorities for a basing location. Briefings are typically performed at the end of each site visit. The OEH status briefing can be supported by a status checklist, which can be used by FHP personnel who perform OEHSS activities and sanitary inspections to summarize findings and recurring reassessments over time. Figure F-1 defines the sections of the standard OEH status briefing template. The full briefing template and an optional checklist (for the numbered items in the below figure) are available on the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

OEH Status Briefing Slides
• Cover slide • Overview and Top 3 OEH Issues • Top OEH Issue 1: _____ • Top OEH Issue 2: _____ • Top OEH Issue 3: _____ • Active CSM—Exposure Pathways (with priority levels) • On-going Site Exposure Monitoring • Commander's Risk Acceptable Memorandum (if applicable) • Wrap Up • Point of Contact

Figure F-1. Standard Elements of the OEHSS Status Briefing

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APPENDIX G

Risk Acceptance Memorandum

Figure G-1 provides a suggested format for a risk acceptance memorandum. Updates to this guidance can be found at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

Risk Acceptance Memorandum Template

MEMORANDUM FOR _____

THROUGH: _____

SUBJECT: Risk Acceptance Acknowledgement for Force Health Protection (FHP) Recommendations for (Insert Location of assessment)

Ref: (a) (Insert deployment-specific policy if appropriate)
(b) DODI 6055.01 DOD Safety and Occupational Health (SOH) Program
(c) DODI 6055.05 Occupational and Environmental Health

1. The purpose of this memorandum is to acknowledge the Commander's acceptance of risk as outlined in FHP recommendations and the acceptance of the overall risk to force. This memorandum identifies further FHP activities, risk management corrective actions, and/or future actions planned. It also identifies any nonconcurrence of specific FHP recommendations by the _____ Commander.

2. From DDMMYYYY to DDMMYYYY, FHP Elements from the (insert unit name) conducted occupational and environmental health site surveillance (OEHSS) activities for (insert location). They identified the following findings during their assessment:

a. Finding #1. _____.

b. Finding #2. _____.

c. Finding #3. _____.

[continued on next page]

Figure G-1. Standard Elements of a Risk Acceptance Memorandum (Sheet 1 of 2)

Risk Acceptance Memorandum Template

[continued from previous page]

3. I acknowledge the aforementioned reported findings and the risk to force and have or will take the following actions to resolve:

a. Finding #1. _____.
   (1) Summary of finding.
   (2) FHP Recommendation.
   (3) Corrective action.

b. Finding #2. _____.
   (1) Summary of finding.
   (2) FHP Recommendation.
   (3) Corrective action.

4. I acknowledge the aforementioned reported findings and the risk to force. I have determined to accept the operational risk and risk to force as the recommended FHP mitigation measures exceed the capabilities of my unit and those of my higher headquarters.

a. Finding #3. _____.
   (1) Summary of finding.
   (2) FHP Recommendation.
   (3) Risk Acceptance Rationale.

5. This memorandum shall be submitted into the Defense Occupational and Environmental Health Readiness System–Industrial Hygiene (DOEHRS-IH) by the Service FHP organization conducing the assessment.

6. For questions, contact (Rank FName LName) at (insert phone number) or by electronic mail at _____.

FNAME LNAME
Rank, Service
Commander

Attachment:
TAB A: Copy of OEHSS status briefing and/or other survey materials from the FHP team.

Figure G-1. Standard Elements of a Risk Acceptance Memorandum (Sheet 2 of 2)

APPENDIX H

Periodic Occupational and Environmental Monitoring Summary Template

A POEMS document is an unclassified and publicly releasable OEH monitoring summary (e.g., noise, thermal stress, airborne pollutants, soil and water contaminants, incidents, and infectious diseases) that identifies location-specific OEH hazards and population based health risks. The POEMS template is the tool used to consistently document the summary information.

Figure H-1 defines the elements of the POEMS template. The full template is available at the OEHSS support website: https://www.milsuite.mil/book/groups/oehss.

POEMS Template Content Areas
• Deployment Location Title (e.g., Bagram Airfield and Vicinity, Afghanistan) • Time Period Covered • Purpose Statement • Summary • Table 1: Moderate or Greater Long-term OEH Risks • Table 2: Detailed OEH Exposure Data • Table 3: Other Potential Unique Health Hazards • Glossary • References • Appendix: Applicable Deployment Locations

Figure H-1. Standard Sections of the POEMS Template

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REFERENCES

JP 3-34, Joint Engineer Operations, 6 January 2016

JP 4-02, Joint Health Services, 17 December 2017, Change 1, 28 September 2018

JP 4-04, Contingency Basing, 4 January 2019

AFI 32-7020, Environmental Restoration Program, 12 March 2020

ATP 3-34.5/MCRP 3-40B.2, Environmental Considerations, August 2015

ATP 3-37.10/MCRP 3-40D.13, Base Camps, January 2017

ATP 4-02.7/MCRP 4-11.1F/NTTP 4-02.7/AFTTP 3-42.3, Multi-Service Tactics, Techniques, and Procedures for Health Service Support in a Chemical, Biological, Radiological, and Nuclear Environment, March 2016

DODD 3000.10, Contingency Basing Outside the United States, 10 January 2013, Change 2, 31 August 2018

DODD 6200.04, Force Health Protection, 9 October 2004

DODD 6420.02, DOD Biosurveillance, 17 September 2020

DODD 6490.02E, Comprehensive Health Surveillance, 8 February 2012, Change 2, 28 August 2017

DODI 3000.12, Management of U.S. Global Defense Posture (GDP), 6 May 2016, Change 1, 8 May 2017

DODI 4715.22, Environmental Management Policy for Contingency Locations, 18 February 2016

DODI 6055.01, DOD Safety and Occupational Health (SOH) Program

DODI 6055.05, Occupational and Environmental Health, 11 November 2008

DODI 6490.03, Deployment Health, 19 June 2019

DOD Dictionary of Military and Associated Terms, January 2021

DOD Environmental Field Sampling Handbook. EDQWG, Revision 1, April 2013

DOD General Data Validation Guidelines. EDQWG, Revision 1, September 2019

DOD/DOE Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, 2019

DHAPI 6490.03, Deployment Health Procedures, 17 December 2019

Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4. EPA, Office of Environmental Information. Washington, D.C., 2006

Technical Guide 317, Technical Guide for the Collection of Environmental Sampling Data Related to Environmental Health Site Assessments for Military Deployments, February 2009

Technical Guide 392, Conceptual Site Model Best Practices and Exposure Pathway Guidance, September 2022

Technical Manual-Preventive Medicine 6490.2, Technical Guide for Collection of Environmental Sampling Data Related to Environmental Health Site Assessments for Military Deployments, December 2008

Technical Project Planning (TPP) Process. USACE, EM 200-1-2, 1998

U. S. Air Force 2019 Bioenvironmental Engineering Field Manual, U.S. Air Force Medical Readiness Agency (AFMRA)

Uniform Federal Policy for Quality Assurance Project Plans: Evaluating, Assessing, and Documenting Environmental Data Collection/Use and Technology Programs. Intergovernmental Data Quality Task Force. Part 1: UFP-QAPP Manual, Version 1, March 2005

Incremental Sampling Methodology (ISM) Update, ISM-2. ITRC. Washington, D.C., 2020. Available at: https://ism-2.itrcweb.org/

Technical Guide 230, Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel, June 2013. Available at: https://phc.amedd.army.mil/topics/ envirohealth/hrasm /Pages/TG230.aspx

Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management. ITRC. Washington, D.C., 2003. Available at: https://itrcweb.org/

https://doehrs-ih.csd.disa.mil/Doehrs

https://iler.csd.disa.mil/iler/

https://www.milsuite.mil/book/groups/oehss

https://phc.amedd.army.mil/topics/envirohealth/hrasm/pages/doehrs_resources.aspx

https://uroc-redi.usace.army.mil/

GLOSSARY

best practice. A procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption (Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/best%20practice. Accessed 24 May. 2022.)

biosurveillance. The process of gathering, integrating, interpreting, and communicating essential information related to all-hazards threats or disease activity affecting human, animal, or plant health to achieve early detection and warning, contribute to overall situational awareness of the health aspects of an incident, and to enable better decision making at all levels. (DODD 6420.02)

conceptual site model (CSM). A graphical, pictorial, and/or tabular depiction of what is known about a site in terms of what, where, when, why, who, and how exposures to environmental health hazards may or may not occur. A CSM represents the compilation of all the exposure scenarios and their exposure pathways that are associated with a site.

contingency location (CL). A non-enduring location outside of the United States that supports and sustains operations during contingencies or other operations and is categorized by mission life-cycle requirements as initial, temporary, or semipermanent. Also called CL. (DOD Dictionary)

definitive analysis. The employment of multiple state-of-the-art, independent, established protocols and technologies by scientific experts in a nationally recognized laboratory to determine the unambiguous identity of a chemical, biological, radiological, and/or nuclear hazard with the highest level of confidence and the degree of certainty necessary to support strategic-level decisions.
(ATP 3-11.37/MCRP 10-10E.7/NTTP 3-11.29/AFTTP 3-2.44)

enduring location (EL). A main operating base, forward operating site, or cooperative security location designated by the Department of Defense for strategic access and use to support United States security interests for the foreseeable future. Also called EL. (DOD Dictionary)

environmental baseline survey (EBS). A multi-disciplinary site survey conducted prior to or in the initial stage of an operational deployment. Also called EBS. (DOD Dictionary)

environmental conditions report (ECR). A concise summary of events or situations that created a negative or positive change in environmental conditions at a base camp site. It amends the EBS and can help address environmental damage claims or other legal challenges that may arise during the life cycle of the base camp. (ATP 3-34.5/MCRP 4-11B)

environmental health. The programs, activities, and subsequent risk determination associated with the anticipation, recognition, evaluation, and potential control of hazards identified within the media of the environment. Environmental health focuses on the reduction or mitigation of the health hazards identified in the operational or garrison environment. (DODD 6420.02)

exposure estimate. Measurements or predictions of the level of exposure to a given health hazard. These estimates can be qualitative, but are traditionally considered to be numerical, quantitative estimates.

exposure guideline. Hazard-specific exposure levels that are associated with a given level of health risk. Exposure guidelines can be categorized into tiers relative to their importance or stature. For example, such guidelines can be referred to as criteria, standards, or guidelines. The terminology difference can be important. Criteria generally carry legal weight, standards are generally regulatory in nature, and guidelines tend to serve as consensus risk assessment recommendations.

exposure medium. As an element of an exposure pathway, an exposure medium is the part of the physical environment containing a health hazards with which humans come into contact. Examples include water, soil, air, surfaces, and biological fluids.

exposure pathway. A description of how exposure occurs from health hazard release from a source into the environment, transport through environment and within one or more environmental media (air, water, soil, surfaces, etc.), the routes of human exposure (e.g., inhalation, ingestion, skin contact, etc.), and where and when specific personnel come into contact with the hazard (e.g. a specific cohort exposed at the same time or in a similar way as compared). There are six components of an exposure pathway that each must be present in order for an actual exposure to occur: (1) source, (2) health hazard, (3) exposure point, (4) exposure medium, (5) route of exposure, and (6) co-occurrence in time with a population-at-risk.

exposure point. As an element of an exposure pathway, an exposure point is the geospatial location or where a population-at-risk comes into contact with an exposure medium containing a health hazard.

field confirmatory analysis. The employment of technologies with increased specificity and sensitivity by technical forces in a field environment to identify chemical, biological, radiological, and/or nuclear hazards with a moderate level of confidence and the degree of certainty necessary to support follow-on tactical and operational decisions. (ATP 3-11.37/MCRP 10-10E.7/NTTP 3-11.29/AFTTP 3-2.44).

health hazard. As an element of an exposure pathway, a health hazard is a chemical or radiological substance, microbiological organism or toxin, or physical condition (e.g., heat, noise) that has the potential to cause adverse health effects within the human body.

health risk assessment. A scientific/analytic process used to estimate risk by synthesizing available information to identify sources of OEH threats at a site, identify the health hazards associated with each threat source, identify populations at risk, guide data collection requirements and plans, describe the magnitude and timing of population exposures, describe the kinds of health effects caused by the exposure, and characterize the risk information in order to effectively communicate to commanders and stakeholders.

model sampling and analysis plan. A template document (with limited and targeted guidance embedded within it) for generating a site-specific sampling and analysis plan that defines the OEH problem requiring sampling data that addresses data quality objectives, sampling strategies, sample management, laboratory analyses, and associated quality assurance.

occupational and environmental health surveillance (OEHS). The regular or repeated collection, analysis, archiving, interpretation, and dissemination of occupational and environmental health-related data for monitoring the health of, or potential health hazard impact on, a population and individual personnel, and for intervening in a timely manner to prevent, treat, or control the occurrence of disease or injury when determined necessary. (DOD Directive 6490.02E)

occupational and environmental health site assessment (OEHSA). A FHP survey that formally documents the OEH conditions at a basing location. These surveys are typically updated annually and/or with the rotations of deployed FHP teams into and out of the Area of Operations.

occupational and environmental health site surveillance (OEHSS). OEH surveillance focused upon health hazards and exposures at a specific military basing site in the operational environment (e.g., base camp, airbase, forward operating base (FOB)). It structures and facilitates exposure monitoring, health risk assessment, and risk management activities at these sites. The OEHSS process is iterative and educates FHP personnel about site environmental conditions, documents those conditions, identifies potential OEH threats and associated specific health hazards, includes OEH data collection and archiving activities and health risk assessments, and documents immediate risk mitigation actions.

on-going site exposure monitoring. The collection of OEH monitoring and assessment activities performed for a basing location that includes regular site visits, conceptual site model adjustments, sampling and analysis plans, field sampling, sample shipment, laboratory analyses, health risk assessments, and associated documentation. OSEM activities occur in between each recurring OEHSA survey and includes OEH status briefings.

periodic occupational and environmental monitoring summary. Unclassified and publicly-releasable OEH monitoring summaries (e.g., noise, thermal stress, airborne pollutants, soil and water contaminants, incidents, and infectious diseases) that identify location specific OEH hazards and population-based health risks. POEMS provide estimated exposures, assessment of whether estimated exposures [were] acceptable or unacceptable, and the criteria used for the estimate (i.e., above or below Military Exposure Guidelines) along with anticipated acute, chronic, or latent health effects. POEMSs are updated or certified current at least annually. (DODI 6490.03)

population-at-risk. As an element of an exposure pathway, this is a group of individuals who are or may be exposed to a health hazard via one or more routes of exposure.

preliminary hazard assessment. A CCMD document that summarizes their review of relevant intelligence data, past hazard assessments, and all other available information for a new deployment location for the purpose of early identification of potential OEH threats and risk management countermeasures prior to deploying to a newly established location.

route of exposure. As an element of an exposure pathway, an exposure route is the mode by which a health hazard enters or interacts with the human body. Example routes of exposure include, but are not limited to, inhalation of air; ingestion of water or soil; skin contact with water, soil, or air; ocular (eye) contact; puncture wound; physical entry (as for radiation or noise).

sampling and analysis plan. A plan that defines the OEH problem requiring sampling data that addresses data quality objectives, sampling strategies, sample management, laboratory analyses, and associated quality assurance.

source. As an element of an exposure pathway, a source is the origin of a health hazard that is released into the environment. Often referred to as a threat source. Example sources include a field of buried drums, burn pit, bulk chemical storage, incinerator, radio-frequency emitters, fugitive emission from off-site industries, on-site sanding/painting operations, and a transportation route.

theater validation analysis. The employment of multiple independent, established protocols and technologies by scientific experts in the controlled environment of a fixed or mobile/transportable laboratory to characterize a chemical, biological, radiological, and/or nuclear hazard with a high level of confidence and the degree of certainty necessary to support operational to strategic-level decisions.
(ATP 3-11.37/MCRP 10-10E.7/NTTP 3-11.29/AFTTP 3-2.44 (31 March 2021))

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LIST OF ACRONYMS AND ABBREVIATIONS

ADVON	advanced echelon
AFRAT	Air Force Radiation Assessment Team
AML	Area Medical Laboratory
APHC	Army Public Health Center
AO	area of operation
AOR	area of responsibility
BAT	biological augmentation team
BCT	brigade combat team
BEE	bioenvironmental engineering
BOS	base operating support
BOS-I	base operating support-integrator
CAC	common access card
CBRN	chemical, biological, radiological, and nuclear
CCDR	combatant commander
CE	civil engineering
CL	contingency location
CCMD	combatant command (command authority)
CSM	conceptual site model
DCPH-A	Defense Centers for Public Health–Aberdeen
DCPH-P	Defense Centers for Public Health–Portsmouth
DHA-PH	Defense Health Agency–Public Health
DHA-PI	Defense Health Agency–Procedural Instruction
DLA	Defense Logistics Agency
DOD	Department of Defense
DODD	Department of Defense directive
DODI	Department of Defense instruction
DOE	Department of Energy
DOEHRS	Defense Occupational and Environmental Health Reporting System
DOEHRS-IH	Defense Occupational and Environmental Health Readiness System-Industrial Hygiene
DPW	directorate of public works
DQI	data quality indicators
DQO	data quality objective
DRI	direct reading instrument
EBS	environmental baseline survey
ECR	environmental conditions report
ECS	environmental condition study
EDQWG	Environmental Data Quality Work Group
EH	environmental health
EHO	environmental health officer

EL	enduring location
EM	Engineer Manual
EMF	expeditionary medical facility
EPA	Environmental Protection Agency
EP	exposure pathway
E-SAP	enhanced sampling and analysis plan
ESCS	environmental site closure survey
FDPMU	forward-deployable preventive medicine unit
FHP	force health protection
FHPO	force health protection officer
FOB	forward operating base
FST	field sanitation team
GCC	geographic combatant command
GRL	global reach laydown
HRA	health risk assessment
HSS	health service support
ID	identification
IFAS	initial field account survey
IH	industrial hygiene
ILER	individual longitudinal exposure record
JTF	joint task force
IRS	incident report survey
ISM	incremental sampling methodology
ITRC	Interstate Technology & Regulatory Council
JP	joint publication
MEF	marine expeditionary force
MEG	military exposure guideline
MESL	Military Exposure Surveillance Library
MTTP	multi-Service tactics, techniques, and procedures
OE	operational environment
OEH	occupational and environmental health
OEHSA	occupational and environmental health site assessment
OEHSS	occupational and environmental health site surveillance
OH	occupational health
OSEM	on-going site exposure monitoring
PAM	preventive and aerospace medicine
PLHA	preliminary hazard assessment
POEMS	periodic occupational and environmental monitoring summary
PVNTMED	preventive medicine
QA	quality assurance
QAPP	quality assurance project plan
QSM	quality system manual

R-SAP	rapid sampling and analysis plan
SAP	sampling and analysis plan
SIGACT	significant activity
SKO	sets, kits, and outfits
SME	subject matter expert
SOF	special operations forces
TPP	technical project planning
TTP	tactics, techniques, and procedures
UFP	uniform federal policy
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
VA	Veterans Administration

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