Environmental Surveys Handbook: Contingency Operations (Overseas)

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Preface

This handbook contains guidelines for conducting an Environmental Baseline Survey (EBS) prior to establishing a base camp during contingency operations; an Environmental Conditions Report to update the EBS when changes occur; an Environmental Site Closure Survey when base camp closure notification has been received; and an Environmental Site Closure Report that will act as a record of the environmental status at the time of base camp closure. The EBS is generally conducted in conjunction with the Occupational and Environmental Health Site Assessment (OEHSA). The EBS and OEHSA look at the proposed base camp location with a focus on force health protection (FHP), but the EBS is focused on environmental concerns while the OEHSA is focused on existing health hazards. If military personnel understand the impact that environmental and health threats can have on mission accomplishment, and they use this information as they plan, occupy, and close deployment sites, they will help to ensure FHP, fiscal and material resource responsibility, reduce Army liability, and strengthen the relationship between the Army and the host nation.

Ideally, EBSs are conducted on one or more possible locations before final base camp site selection is made. However, if the EBS process is not used to finalize site selection, an EBS should be conducted prior to units occupying the site. If this is not possible, it should be done within 30 days of occupation. If the area will be occupied for less than 30 days and an EBS is not feasible, an environmental risk assessment should be done to ensure FHP. Before starting the EBS process, make contact with the combatant command to ensure the use of this handbook does not conflict with specific environmental guidance already in place. Personnel with environmental background and training will conduct the EBS and preventive medicine personnel will conduct the OEHSA as well as assisting with any required environmental sampling necessary for the completion of the EBS. The EBS and OEHSA will overlap in the areas that are examined and the information that is generated. If possible, conducting the two surveys in conjunction is an efficient way to reduce redundancy.

During contingency operations, if qualified personnel are not available to complete the EBS, a Training Support Package (TSP), #052-E-0040, is available from The Directorate of Environmental Integration (DEI), at usarmy.leonardwood.engineer-schl.mbx.dei@mail.mil. Refer to ATP 4-02.82, *Occupational and Environmental Health Site Assessment*, for guidance regarding the completion of the OEHSA.

Data necessary to complete the EBS can be limited or of poor quality due to the inherent challenges of conducting surveys in an operational environment during contingency operations. Those conducting the surveys will need to rely on sound judgment and experience, as well as reachback sources through the combatant command and supporting service organizations. The US Army Public Health Command (USAPHC) provides several resources. For more information, refer to Chapter 2 under *Records Review and Interviews* and the References section.

The EBS is a living document and needs to be amended when new information is developed, incidents occur, there are changes in operations, or base camps expand or retract. The Environmental Conditions Report (ECR) will be used to update the EBS.

When notification of base camp transfer or closure is received an Environmental Site Closure Survey (ESCS) will be completed to identify environmental concerns that will need to be addressed before the base camp can be transferred to another organization or returned to the control of the host nation. The EBS and all ECRs completed during occupation will be used to facilitate the ESCS and the Environmental Site Closure Report (ESCR) that will result from the ESCS. The ESCS documents any changes/variations in conditions from the EBS; provides information regarding steps required or already taken to resolve these changes to achieve the standards agreed upon by the receiving organization or host nation, if necessary; facilitates the corrective action plan and the request for resources; and tracks the completion of environmental tasks necessary for proper closure of a base camp. The ESCR will document the final environmental conditions of the base camp at closure.

Chapter 1: Introduction

Definition and Purpose

The EBS is an extensive review of current and past uses of property conducted prior to the establishment of a base camp to identify and document the existence of environmental concerns such as existing contamination, industrial activity, historical and cultural resources, natural resources and endangered species. It should be conducted prior to the actual occupation of a site, but, if this is not possible, within 30 days of occupation. Documenting the environmental baseline of the location protects Soldiers by identifying areas of environmental concern, facilitates the mission by identifying environmental obstacles and ultimately reduces US liability by providing a snapshot of the existing conditions of the location on occupation. Military engineering elements, or other appropriately trained personnel, will generally be conducting the EBS prior to the establishment of base camps, assembly areas, logistical supply sites, and enemy prisoner of war camps. Personnel may conduct an EBS in conjunction with an OEHSA, for efficiency, or in stages as information and time become available.

The EBS is complementary to the OEHSA but they assess the site from different perspectives. The EBS focuses on the impact of the Soldiers, mission and occupation on the environment as well as documenting existing environmental issues to reduce US liability and the responsibility for cleaning up a site after operations are completed. The OEHSA identifies potential exposure pathways for chemical, biological and radiological hazards in the environment that may affect the health of deployed personnel. The OEHSA focuses on identifying potential health threats associated with occupational and environmental exposure pathways. For more information regarding the OEHSA, refer to the USAPHC website. Sampling may need to be conducted for both surveys. The EBS sampling will be conducted to determine the type and extent of existing environmental contamination, whereas that done for the OEHSA is primarily focused on how the site may affect the health of Soldiers during occupation of the area. With proper coordination, the sampling can be done only once to cover the needs of both surveys. The EBS will

gather information such as site history, site characteristics, existing man-made structures, water resources, waste management activities, wastewater treatment and disposal, existing active or abandoned industrial sites, possible radioactive contamination, etc. The EBS will also identify the existence of natural resources, endangered species, historical or cultural resources and agricultural implications for the area. Personnel will begin the EBS process during the pre-deployment phase as part of the Preliminary Hazard Assessment and planning.

If a location is to be occupied for less than 30 days and an EBS is not feasible, an environmental risk assessment should be conducted to ensure FHP during occupation. An environmental risk assessment is a judgment based on a technical understanding of the situation. Within the range of technical reconnaissance, an assessment takes less time and technical expertise to perform than a survey but provides less technical detail than a survey. Reconnaissance elements do not require specialized technical expertise to perform an assessment. They conduct assessments following the same basic format of an EBS

Performing a risk management assessment of the area being considered for occupation is an essential initial tool. Leaders manage risk by evaluating hazards and implementing controls continuously throughout the course of the mission. A risk management assessment will help identify areas that should be sampled for further analysis. The EBS will identify hazards present on proposed base camp sites and determine the need for engineering controls to protect force health and prevent future liability. Any contaminated areas not documented during the survey may become the responsibility of the United States once operations cease; taxpayers may have to pay to clean up these areas. Through the risk management assessment, personnel can develop a design for the actual EBS and sampling plan.

The process of collecting, analyzing, and archiving environmental data should be a series of events that continues throughout the life of the base camp.

Risk Management Assessment

Before you begin the EBS, you must conduct a risk management assessment for the proposed base camp. FM 5-19, *Risk Management*, is

an Army publication that can be used as a reference. Leaders should integrate environmental considerations into the risk management process by including environmental-related risk and control measures. This will identify, assess and control environmental-related risk arising from operational factors and facilitate decisions that balance the risk with mission benefits. Commanders must consider risks to mission, all personnel and local populations. This section does not describe the risk management assessment process in full, but provides a brief overview. The risk management assessment process will help identify the areas that need further investigation. If time is limited, a shortened risk management assessment can still be useful as the preliminary site reconnaissance for completing the EBS.

Risk Management Definitions	
Hazard Probability	The likelihood of encountering a hazard.
Hazard Severity	A measure of the impact or consequences of the interaction of the hazard on the health of individuals and on the mission itself.
Risk Level	The matrix in Table 1-1 defines the risk level ranging from low to extremely high.

The risk management assessment involves the following steps:

Step 1. Identify hazards.

Step 2. Assess hazards.

Step 3. Develop controls and make decisions.

Step 4. Implement controls.

Step 5. Supervise and evaluate.

Table 1-1: Risk Assessment Matrix

Hazard Probability					
Hazard Severity	**Frequent**	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Catastrophic	**Extremely High**	**Extremely High**	**High**	**High**	**Moderate**
Critical	**Extremely High**	**High**	**High**	**Moderate**	**Low**
Marginal	**High**	**Moderate**	**Moderate**	**Low**	**Low**
Negligible	**Moderate**	**Low**	**Low**	**Low**	**Low**
Risk Estimate					

Environmental hazards include all activities that may pollute, create negative noise-related effects, degrade archaeological/cultural resources, or negatively affect habitats of threatened or endangered species. Table 1-2 lists common environmental-related hazards identified by environmental media areas.

Table 1-2: Common Environmental-related Hazards

Environmental Media	***Environmental-related Hazard***
Air	• Equipment exhaust • Convoy dust • Range fires • Open-air burning, smoke • Pyrotechnics/smoke pots/smoke grenades • Parts-washer emissions • Paint emissions • Air-conditioner/refrigeration CFC release • HM/HW release or spills

Environmental Media	***Environmental-related Hazard***
Archaeological/Cultural	• Sensitive area maneuver • Sensitive areas digging • Artifact disturbance or removal • Demolition/munitions effects • HM/HW spills • Sonic booms/prop wash
Noise	• Low-flying aircraft (helicopters) • Demolition/munitions effects • Nighttime operations • Operations near post/camp boundaries and civilian populace • Vehicle convoys/maneuvers • Large-scale exercises
Threatened/ Endangered Species	• Sensitive area maneuver • Demolition/munitions effects, especially during breeding seasons • Individual species disturbance or habitat • HM/HW spills or releases • Poor field sanitation • Improper cutting of vegetation • Coral reef damage

Environmental Media	***Environmental-related Hazard***
Soil (Terrain)	• Maneuver area overuse • Demolition/munitions effects • Range fires • Poor field sanitation • Poor maneuver damage control • Erosion • Troop construction effects • Refueling operations • HM/HW spills • Ecologically sensitive areas (such as wetlands and tundra) maneuver
Water	• Refueling operations near water sources • HM/HW spills • Erosion and unchecked drainage • Amphibious/water-crossing operations • Troop construction effects • Poor field sanitation • Vehicle washing at unapproved sites

Risk assessment is a three-stage process used to determine the risk of potential harm to the environment. Leaders consider two factors, probability and severity, which require individual judgment and a working knowledge of the risk management process. Controls eliminate or reduce the probability and severity of each hazard and lower the overall risk to the mission, health of personnel and damage to the environment. Many environmental-related controls are simply extensions of good management, housekeeping, operations security and leadership practices. Controls may consist of one of the categories listed in Table 1-3.

Table 1-3: Environmental-related Controls

Control Type	***Environmental-Related Control Examples***
Educational	• Conducting unit environmental awareness training • Conducting an environmental briefing before deployment • Performing tasks to environmental standards • Reviewing environmental considerations in AARs • Reading unit environmental SOPs and policies • Conducting spill prevention training • Publishing an environmental annex/appendix to the OPORD/OPLAN
Physical	• Providing spill prevention equipment • Establishing a field trash collection point and procedures • Establishing a field satellite accumulation point and procedures • Policing field locations • Practicing good field sanitation • Filling in fighting positions • Posting signs and warnings for off-limits areas • Installing secondary containment for storage

Control Type	*Environmental-Related Control Examples*
	tanks or waste accumulation points • Installing berms and barriers between incompatible hazardous materials
Avoidance	• Maneuvering around historical/cultural sites • Establishing refueling and maintenance areas away from wetlands and drainage areas • Crossing streams at approved sites • Preventing pollution • Limiting noise in habitats of endangered and threatened species • Avoiding refueling over water sources • Curtailing live vegetation use for camouflage

Once all practical control measures are in place, a leader will reassess the hazards to determine the residual risk. Based on this residual risk the commander may direct the consideration of additional controls or a change in the course of action.

The implementation of risk control measures requires that they be communicated to all subordinates. A leader defines the control and how it will be implemented, then assigns responsibility for the implementation. For example, if the control measures are for a fuel spill hazard, a leader ensures that operators are properly trained and have the appropriate equipment they need. The control may be the use of drip pans or a secondary containment system under a fuel tanker. The leader will ensure these controls are in place before an operation and will continuously monitor them throughout the operation and modify them as needed. Each control implemented must be evaluated to ensure its effectiveness. This evaluation should include feedback provided to the Soldiers associated with the risk.

The ability of a leader to identify hazards, including environmental-related hazards, is key. The earlier the environmental-related risk is identified, the more efficient and cost-effective it is to implement control measures. Integrating environmental considerations into the RM process helps to enhance the mission, protect the health of personnel and adjacent populations, and limit liability for environmental contamination or damage.

After completing the risk management assessment process, assigned personnel can conduct an EBS to document the conditions of the site. Should the risk management assessment indicate areas that could negatively impact force health protection or that harbor environmental contamination, personnel may need to conduct sampling to document the extent of the hazard and the size of contaminated areas.

Chapter 2: The EBS Process

The EBS Overview:

The EBS process consists of five main focus areas.

1. Information and data collection.
2. Analyze the data and information gathered.
3. Determine the environmental status of the area.
4. Prepare the EBS report.
5. Update the EBS report.

Each aspect of this process will help you determine the suitability of sites for base camp construction. By carefully reviewing and analyzing the initial hazards you will prevent troop exposure to hazards and future liability.

Information and Data Collection

The EBS process is a detailed investigation of an area that has been proposed for use as a base camp to gather information and document the environmental condition, looking for the existence of environmental concerns such as: existing contamination, industrial activity, historical and cultural resources, natural resources and endangered species. A checklist is provided in Appendix A that will help to gather the information required to complete the report. The steps provided in the checklist offer guidance for personnel without environmental experience or background to complete an effective EBS. Following this guidance will help you compile an EBS containing information the commander needs to make appropriate decisions regarding the occupation of a location. The information and data collection step of the EBS process is the most comprehensive step. Use careful research and good interviewing techniques to complete this step. Thoroughly document information obtained.

Records Review and Interviews

The EBS process begins with a careful review of the history and records associated with the site under consideration for occupation. During this

process, you should gather information and data concerning the proposed area from all available sources including maps, satellite imagery, government documents and data repositories, Internet searches, and interviews with previous military and civilian occupants, members of the surrounding communities and neighboring property owners. If possible, begin the information gathering process as soon as you identify a location for potential occupation during the planning phase of the mission or operation.

Reviewing records during contingency operations may be difficult. Actual records, such as permits and titles, may not be readily available for review for contingency sites. Your approach will vary depending on the information available to you. You will likely find that maps and imagery of the area will be available. Study these for information on facilities, structures, infrastructure, available resources, historic/cultural and natural resources, etc. Maps often identify buildings, sites with religious significance, hospitals, railroads, rivers, lakes, etc., while imagery can provide more detailed information such as industrial smokestacks, storage tanks, landfills, storage areas, the number of stories for buildings, and so forth. If a site has been previously occupied, the Environmental Officer of the military activity that occupied the area, in addition to their higher headquarters and any civilian contractors that operated in the area, would be good resources to obtain information regarding typical hazards of the area. There should be a database or information repository in existence where historical EBSs and environmental data are stored. The Internet is a useful tool for finding historical information regarding cultural resources and the existence of endangered species. It can also often help you determine if an area violates international protocol regarding environmental matters. The USAPHC Environmental Surveillance Integration Program, Military Environmental Surveillance Library (MESL) is a resource that can be used to obtain: pre-deployment site surveys; historical EBSs and OEHSAs; preventive medicine unit reports; preventive medicine situational reports; environmental sampling reports; raw sampling data; analytical summaries; OEHS exposure incident reports; chemical, biological, radiological, nuclear (CBRN) incident reports; after action reports (AAR); lessons learned; photographs; and base camp assessments. The data portal allows personnel to submit, search, view and download data. The USAPHC Deployed Environmental Surveillance Program (DESP) provides health information fact sheets on health and environmentally related subjects; deployment occupational and environmental health surveillance and

operational risk management training opportunities; description, instructions, ordering and shipping information for sampling equipment and media; doctrine and technical guidance; pre-deployment evaluation of potential locations; and links to other sites of interest. The DESP may be accessed at http://usaphc.amedd.army.mil/topics/envirohealth/hrasm/Pages/DeploymentEnvironmentalSurveillance.aspx and by email at usarmy.apg.medcom-phc.list.desp-request@mail.mil. For SIPR pre-deployment requests go to https://phc.army.smil/forms/GTAPRFI.aspx. Also check with your theater command for host nation of international references, websites or records that may assist in your data collection.

Review all available records for the property being considered for occupation, as well as surrounding properties, for past or current usage. Try to obtain adequate and complete records that will help you determine the environmental condition of the area under consideration for occupation or base camp establishment. Follow the guidelines below:

Step 1. Identify reasonably available records and information sources. For example, records that are publicly available, can be obtained from the source in a reasonable timeframe, within cost constraints, and practically reviewable, i.e. are written in English or can be translated.

- Intelligence Preparation of the Battlefield (IPB)
- Current reconnaissance reports of a given location/site
- Intelligence reports
- Site records and history (deeds, property descriptions, previous environmental studies or reports, etc.)
- Government records and documents
- Digital information sources (National Geospatial-Intelligence Agency, Armed Forces Medical Intelligence Center, Defense Intelligence Agency, and others)
- Other geospatial information and products (such as maps, satellite imagery, or GIS data)

- Interviews with previous occupants and people in the area (to include military, civilian, local nationals)

- Internet searches (websites like redlist.org, the USAPHC Environmental Surveillance Integration Program, Military Exposure Surveillance Library (MESL) and Deployed Environmental Surveillance Program (DESP), and http://whc.unesco.org/en/list/)

Step 2. Request all records relevant to the environmental history of the property. Include permits, titles, previous EBSs or OEHSAs, surveys for radioactive materials, asbestos, radon, drinking water quality, transformers containing polychlorinated biphenyls (PCB), waste storage areas and underground storage tanks (USTs)/ aboveground storage tanks (ASTs). Search for records indicating release of hazardous materials (HM) or hazardous waste (HW). Look for records of specific processes, raw materials used onsite, waste produced, etc. (This step will vary depending on the country in which contingency operations occur).

Step 3. Check for aerial photographs and satellite imagery to determine property use, current and historical.

Step 4. Use government and military data repositories to access historical information about the proposed base camp location if it has previously been used.

Step 5. Obtain information directly through interviews and non-governmental sources if records are not available from standard sources. Interviews should also be conducted with State Department Staff and local antiquities authorities, if available and feasible. Consult reachback expert sources through the combatant commands and supporting service organizations. Gather as much information as possible through these interviews. Interviews with local nationals may have to be conducted during the site reconnaissance.

If the site was previously occupied by the US military, interview Soldiers who first occupied the site. Ask the following

questions (this list is not intended to be comprehensive or all inclusive):

- Have there been any incidents?
- Is an EBS report currently available for the site? Has it been kept up to date?
- Were any areas intentionally destroyed by the enemy or US forces?
- Where were HM/HW storage areas?
- Where were the ammunition dumps and trash disposal areas located?
- Where were the maintenance/refueling areas?
- Where were the medical treatment facilities located?
- Are there any historical/cultural resources in the area?
- Are there any endangered species in the area?

Step 6. Interview previous occupants of the area and all adjacent properties, both civilian and military. Interviews with local nationals can be invaluable. Interview members of the local populace, including residents and current owners/operators of businesses and agricultural activities and their employees. Ask the following questions (this list is not intended to be comprehensive or all inclusive):

- Ask about past property usage/occupation.
- What types of activities or operations occurred?
- How do they manage solid waste, wastewater and hazardous waste?
- Does the property have a history of flooding?
- Are there areas the current population avoids?

- Are there areas of significance that need to be protected?
- Have there been any environmental incidents? What were they?
- Do they bury their dead? What procedures do they use to prepare their dead for burial, i.e. embalming, mummification? Where are their local burial locations? Are they marked or unmarked?

Step 7. Document all sources of information even if they reveal no findings. Include:

- Source used.
- Date information was last updated by original source.
- Names of persons interviewed and interpreter (if used).
- Any additional information needed to validate source information.

Environmental Site Characteristics and Reconnaissance

Within the data and information gathering aspect of the EBS process, the next step is conducting a detailed site reconnaissance and recording site characteristics for the area and all adjacent properties. The site reconnaissance facilitates verification of information gathered during the records review and identifies issues previously undocumented. A thorough walk through provides needed information for the decision-making process before designating a base camp site. During the initial reconnaissance, efforts should be focused on areas of concern identified by the records review and gathering as much information as possible. Take digital color photos. The need for a good photographic record of the initial site conditions cannot be overstated. Enough information should be included with the photos so other personnel are able to find and identify the location during subsequent surveys. This includes a description of the areas photographed, the reasons for taking the photos, the date the photos were taken and the site location. Make sketches and maps of significant findings which include the surveyor's name and unit, a north

pointing arrow, a scale and a legend, the 8-digit military grid coordinates including the 3 character zone designator and 2 character grid square identifier (GPS can be used in addition to the grid coordinates). Create a general description of the area.

Step 1. Describe the location of the site:

Provide the official name and legal address of the site. Also provide any other names the area is currently or has been previously known as.

- Physical setting: Provide a description of the general geography, topography (terrain is rolling, flat, mountainous, sandy, rocky, grassy, wooded, and note dramatic changes), geology, hydrology, vegetation, raw materials, natural resources, urban and rural settings. Make note of any obvious damage caused by natural events such as earthquakes, flooding, tornadoes, hurricanes, tsunami, etc. Also make note of damage that may have occurred due to man-made activities such as mining.

- Climatic / Weather: Provide information regarding the climate and weather in the area, i.e. temperature range, predominate wind direction, normal rain fall, etc. Also annotate if the area is prone to natural storm events such as hurricanes, tornadoes, tsunamis, monsoons, etc. Document if seasonal. Acquire historical meteorological data for the past 5 years, if possible, in an electronic format. Note the source of the data and obtain a POC for future information.

- Soils: Note the types, permeability, drainage ditches, low lying areas (standing water), unusual/out-of-place mounds, disturbed areas, discolored soil, areas unusually devoid of vegetation, etc. Is the area prone to sink holes? Provide 8-digit military grid coordinates and/or GPS of areas identified.

- Groundwater: Groundwater is any water source present beneath the surface of the ground. What is the depth of the groundwater and in what general direction does it flow?

- Surface water: What surface water is present on the site; lakes, ponds, rivers or streams? Note the direction of flow

for surface water and drainage on graphics or site map. Note any standing (non-flowing or sluggish) water.

- Wetlands, flood zones, coastal zones: Is the site located in or near a wetland, flood zone or coastal zone (i.e. swamp, marsh, bog, areas prone to flooding, etc.)? Note on graphics or site maps as appropriate. Also note any areas that are flooded, show evidence of past flooding or flash flooding, any potential wadis, washes, dry creek beds, etc.

Step 2. Document existing infrastructure.

- Identify buildings: Describe structures and their use past and present: housing, maintenance, or office space; their location on the site; size; basic construction type; number of stories; approximate age; provide building numbers if present. Document existing damage to buildings to prevent future liability. Note condition of materials that may contain asbestos, i.e. roof shingles, floor tiles, or pipe insulation. These may release hazardous fibers if damaged. Look for electrical hazards and structural damage. Document water and sewer capability. Note heating and ventilation systems and potential for radon. Look for evidence of previous spills, hazardous materials or waste storage. Note any chemical-type or strange odors. Look for evidence of pest infestation. Check for water damage and/or mold.

Figure 2-1: Pipes with Visible Asbestos

- Roads / Hardstand: Describe the road conditions: paved, gravel, or dirt. Are there problems with dust generated from vehicle traffic? Is there a parking lot? What kind of parking lot is it: paved, gravel or dirt? Attach a map, sketch or photos.

- Description of power generation: Describe how power is supplied to the camp: individual and/or bulk generators or grid power, include potential electrical hazards and sources of PCB's. Note the presence of transformers, substations, and power lines. Document leaking transformers, 8-digit military grid coordinates/GPS and take photos.

- Contractor services: What services are contractors performing at the site, i.e. food, power, waste, vector control, medical waste, wastewater, laundry, solid waste, hazardous waste, fire fighting? Include contractors, sub-contractor, or host nation contracts with POC/company information and the initiating agency. Is there evidence of past contractor services?

Lessons Learned – Building Usage

Although using existing buildings reduces the need for new construction and can improve Soldier comfort, it can present health risks. Conduct inspections prior to occupying any building. In many instances during theater entry operations, Soldiers were billeted in structures containing

contaminants of unknown origin or pests; were not structurally sound; or lacked adequate ventilation.

Inspect buildings for possible contaminants, previous building use, asbestos, lead, exposed wiring, and structural integrity prior to occupation. Soldiers should refrain from using buildings not originally intended for human occupation for prolonged periods of time. Furthermore, areas where HM/HW were stored should not be used for billeting. Preventive Medicine personnel may be able to assist in identifying any hazardous material in pre-existing structures and can assist in ventilation surveys.

Figure 2-2: Buildings Targeted for Demolition in Iraq

Step 3. Describe any environmental concerns. Note any obvious environmental contamination, often designated by:

- Areas of dead vegetation (flora) and/or wildlife (fauna) and/or insects.
- Stained areas.
- Areas that may contain suspect materials such as toxic industrial chemicals.
- Areas, water supplies, etc., avoided by the local populace.

- Survey the site for areas of radioactivity or radiation hazards. Determine sources and levels. If detection equipment is not available, contact a specialty team, such as a chemical, biological, radiological, and nuclear (CBRN) reconnaissance team.

- Determine if any electrical/hydraulic equipment contains or is likely to contain PCBs. Generally assume PCBs exist and check for leaks. You may need to take samples from stained areas.

Step 4. Determine if current or past use involved HM or petroleum, oil and lubricants (POL) and include a detailed description or indicators of usage, such as the existence of 55-gallon drums, buildings with warning labels, etc. Determine the types of POL products used and the volumes stored, i.e. the number and size of containers. Identify if USTs/ASTs were used for storage. Provide a status; active, inactive, closed or abandoned; for all HM and POL storage areas.

- Describe hazardous materials storage sites and controls, i.e. engineering, administrative, personal protective equipment, etc. Take photos.

- Storage containers: Describe the type, number, contents and volume of all storage containers. Provide grid coordinates/GPS. Is there secondary containment? What is done with water that accumulates in the secondary containment? Note the condition of the containers. Determine if they are currently leaking or have leaked. Look for soil discoloration, stains, rust and any containment of spill residue. Are materials stored inside or outside? Take photos.

- Are there any existing or former fuel points? Take photos. Include information related to the specific distribution point, i.e. availability of spill response/prevention equipment, PPE, posted Spill Plan/Procedures, use of drip pans, alarm systems, protective measure. Annotate signs of obvious ground contamination.

- Hazardous and unidentified substances other than POL. This may also include past use industries that have contaminated the area prior to US occupation. Identify the hazardous substance, location.

- Spills: What caused the spill? Who responded to it? Was a spill plan on site? Was it followed? Is spill response equipment on site? Are there established evacuation routes? How was it cleaned up? How was the waste material handled? Who was notified?

Step 5. Describe waste management activities for solid waste, HW, medical waste, wastewater. Identify the sources; residential or industrial.

- Determine the method of solid waste disposal; landfill onsite, burn pit, incineration or contracted services. Identify the location of off-site disposal and years of operation for existing systems. Describe any filled, graded or mounded areas that would suggest the historical disposal of solid waste.

- Describe all product types and manner/condition of storage of HW. Determine the number, type and status (active, inactive, abandoned or removed) of all tanks used to store HW or HM. Identify areas where releases or disposal of HW was/is evident. Describe HM and waste disposal practices and provide current status to include pesticide use/disposal, if apparent. Describe any noticeable odors, the source if possible and the direction they seem to be coming from. Note all surface water and describe pools or sumps that contain water or other liquids that may contain HM. Describe all drums and their conditions. Describe any open or damaged containers and their suspected contents. Provide 8-digit military grid coordinates to include the zone designator and square identifier and/or GPS of locations for all HW storage areas.

- Describe the type, source and disposal method for medical waste; medical waste incinerator, contractor managed.

Figure 2-3: Solid waste disposed of on or near your proposed base camp site should be documented during your EBS. Improper disposal of solid waste can be an indicator of other environmental issues within the area.

- Describe wastewater management. What are the sources/types of wastewater? How is it collected, treated, discharged or disposed? Black water (burn-out latrines, urinals, portable or chemical toilets, tank trailers, holding tanks, or ponds with capacity, pipes, pump stations, other – explain), grey water (showers, hand washing, laundry, brine water from the reverse osmosis water purification unit, tank trailers, holding ponds with capacity, pipes, pump stations, not collected, other – explain), industrial wastewater (wash racks, oil water separator (OWS), other – explain). Collection system design or sketch? How is it being disposed of? Discharge methods: subsurface (septic drain field, dry wells, seepage pits), land applied (ground discharge; infiltration or evaporation ponds, beds or fields, spray irrigation), stream discharge, trucked off site to known or unknown location – explain, piped off site to known or unknown location – explain. Determine the distribution system components for sanitary waste water treatment, the age and condition. Determine the number and location of OWSs, wash racks, and holding ponds. Describe every

discharge of liquid into a stream or ditch. Identify the existence and locations of septic systems and cesspools. How is storm water managed? Is the site grading adequate or inadequate, open ditches, storm ditches and underground piping, storm water collection in tanks detention or retention ponds. Is the storm water collection system collocated with sanitary water and/or the main water lines?

Lessons Learned – Water and Sewer Lines

It has been found, in contingency operating environments, that water and sewer lines may not buried at a sufficient depth to prevent breakage. Just having equipment drive over the lines may be enough to break the pipes. Consult existing plans or personnel familiar with the area and conduct surveys to determine presence of underground water/sewer lines. Knowing the location of these lines may help prevent later flooding and contamination of working and living areas. It would be beneficial to have this type of information prior to establishing base camps.

Step 6. Historical/Cultural resources: Understanding the basic geography and topography of the area is important to the identification of historical and cultural resources. In many places, seemingly natural features such as hills and mounds are archaeological sites containing ancient cities, fortresses or settlements. Take photos and note the location using grid coordinates/GPS. Note the areas of significance on the site sketch/map overlay. Describe the general surface appearance and disturbances such as irregular holes and trenches from vandalism/looting or regular emplacements from recent military or other use.

Note: If it is determined the historical/cultural resource must be protected to prevent damage or looting by "pot-hunters" or black market antiquities dealers, it is likely that documentation of the site should be annotated in Section 14 as classified information.

- Document historical buildings, monuments and artifacts on display in buildings or museums. Look for clues in the landscape regarding undocumented artifacts, ancient features, ruins, rock art and ancient writing/pictographs. Note the presence of artifacts in the ground or undisturbed as part of an archeological site, i.e. ancient pottery, stone tools or jewelry, decorative art or beads, carved bone or wood. Note earthen mounds that are not part of the natural topography, caves or rock shelters often containing archeological remains. Note ancient storage and trash pits. Note remnants of walls, floors and collapsed ceilings which will typically be constructed of mud-brick or stone as wood disintegrates in a few years in most environments. Note rock surfaces that are decorated with paint, pecked renderings or inscriptions.

- Anything that is significant to the local population is a cultural resource. Document individual burials, burial grounds and cemeteries which may be marked or unmarked. Document areas of religious significance. List and describe all known parks, forests and/or animal preserves, and recreational areas in or around the site. Interviews with the local nationals are imperative to this documentation.

- Assess impact level.

Note: For more information on historical and cultural resources refer to page 30.

Step 7. Identify all endangered species or sensitive habitats that could be in or around the site. This may be done through an internet search. Make note of any significant habits or species sensitivities that could be directly affected by the mission. During the site reconnaissance make note of and document the presence of habitation and species sightings. Document the presence of endangered species in the area that could be affected by the mission or occupation. Identify habitat areas using grid coordinates/GPS. Note the areas of significance on the site sketch/map overlay. Document the existence of any environmental controls or restrictions already in place. Make note of man-made damage or disturbance of the area and any

signs of previous occupation by military or civilian entities. Assess impact level.

Note: For more information on endangered species and sensitive habitats refer to page 35.

Step 8. Describe local disease and health factors.

- ♦ List prevalent diseases.
- ♦ Provide known causes and/or disease vectors (insects, animals, organisms) that carry the diseases present in the AO.
- ♦ Describe surveillance activities and favorable conditions for the vectors/pests. Are they present? Are the inhabitants carriers? Are there site conditions that are conducive to propagation of diseases and/or vectors?
- ♦ Describe countermeasures and/or pest control measures in place.
- ♦ Has an environmental health assessment been conducted?

Step 9. Radiological sources will only be documented for the EBS if the source is a waste material or there is significant impact to the environment. If radiological sources are suspected, contact CBRN resources for assistance.

Step 10. Document sources of noise. Identify the source (generator, industrial operations, air field, etc.) and provide an ambient noise level if possible. Document the existence of hospitals, nursing homes, tourism areas or sites, agricultural or animal husbandry operations, etc. Identify recommended/potential noise control solutions (i.e. avoidance, engineering controls such as barriers, keeping a specified distance from the noise sensitive activity, etc.) Identify noise controls in place.

Step 11. Describe sources that impact ambient air and/or introduce potential hazards. Provide locations. Survey landscape and note presence of storage tanks. Identify contents. Note all combustion sources that create exhaust, fumes or smoke, i.e. flares, incinerators, generators, burn pits/boxes, welding operations, idling vehicles or aircraft, etc. Note sources of

dust, such as concrete plants, mining operations, tank/convoy trails, roads/highways, helipads/runways, and agricultural fields/operations. Describe sources that produce odors such as a landfill, military painting operation and/ or solvent use, refueling points. Note any terrain/elevation differences between the camp and air sources. Is source affected by the season or weather? Is it weather dependent?

Step 12. Indoor air quality: Do occupants complain about dust, odor(s), stale air, or have symptoms of eye, throat, and nose irritation? Are generators placed near building openings? Note: Carbon monoxide and other combustion by-products should be controlled to as low as reasonably achievable. Is the presence of visible mold noted? Take photos. Do personnel occupy newly built structures? Does the ventilation system allow fresh, filtered, and conditioned air into the building or shelter?

Step 13. Water treatment: Describe the water treatment systems currently in place and their effectiveness (municipal water, well water, surface water, reverse osmosis water purification (ROWPU), bottled). Contractor or military operated? Is it a HN water source? Are there taps, faucets in buildings? Is the source water being tested for surface infiltration of pollutants? Identify non-potable water sources if it is used for dust suppression, construction, or other operations.

Step 14. Describe the location and general condition of existing dining facilities and provide a status. Take photos.

Step 15. Describe any other environmental concerns that don't fit in the above steps.

Step 16. Current and past uses of property.

- Describe any industrial facility/activity (vehicle/aircraft maintenance, power generation, waste incineration, POL distribution, etc.). These may have been identified during the planning process and records review or through map recons. Identify those operations that require additional investigation due to the level of threat to the base camp.

- Determine the type of emissions that could be released into the air or water. Provide information regarding the prevailing winds and whether the base camp is upwind or downwind. Common facilities include: hospitals, funeral homes, factories/buildings with smoke stacks, maintenance area/motor pools, power plants, and fuel stations/processing.

- Describe any agricultural activities and their longevity.

- Describe previous military occupation.

Step 17. Document sources of information gathered. Provide summaries of previous environmental sampling and studies, aerial photos, topographic maps, previous EBS or OEHSA referenced, base camp master plans and other documents reviewed. Document personnel interviewed by providing their name and contact information for verification, if necessary, as well as the name of the interpreter if one was used.

Step 18. Identify sampling requirements; why, where and what needs to be sampled. Provide 8-digit grid coordinates/GPS, a description and a photo, if possible, for all areas to be sampled. Samples for analysis will need to be taken from any areas where suspected releases have occurred to confirm the existence or determine the extent of contamination. Knowing the existing conditions or suspected materials used at the site can help determine where samples need to be collected. When developing the sampling plan, consider known or suspected activities, mission requirements, occupation duration, force protection, and sample transportation concerns. Document all potential and known areas of contamination. Determine the type of contaminants and their potential effects on force health and the environment. Environmental sampling will need to be coordinated with preventive medicine personnel or USAPHC. If a field test is conducted, document the test used and the results. Document and verify the calibration of field equipment before use. See Appendix E for sampling guidance and protocols.

Step 19. List limitations to the site reconnaissance such as physical obstructions, bodies of water, weather, uncooperative occupants, etc.

Step 20. Conduct steps 1 through 18 of the Environmental Site Characteristics and Reconnaissance for adjacent properties as well, if possible. Determine the possibility of the migration of contamination to or from adjacent properties.

Historic/Cultural Property Protection

An aspect of the site reconnaissance is documenting the existence of historical, archaeological and cultural resources. Damage to these resources caused by US operations can result in adverse relations with foreign populations and hinder the success of the mission. It is important to establish baseline conditions for the presence of these resources prior to base camp establishment to permit accurate assessment of US damages, if any, during occupation. www.cchag.org is a Department of Defense funded website containing cultural property protection information including educational and reference materials. This site links to all host nation heritage laws and contains information useful for AFRICOM, CENTCOM, and SOUTHCOM. Soldiers must recognize that safeguarding historic/cultural property while in theater is both a treaty obligation and a legal requirement. Learning about the cultural or archaeological past of the country and becoming familiar with the cultural sites and monuments is important for the success of the mission.

Historical resources are buildings, objects, landscapes or other artifacts of historical significance. These resources will likely be marked, listed or otherwise designated or displayed. There are international and national lists like UNESCO and host nation National Register of Historic Preservation equivalents, CIA Factbooks and country profiles. Examples are buildings, monuments, and artifacts on display in buildings or museums.

Figure 2-4: The Royal Monastery of Santa Maria de Guadalupe in the Provence of Caceres, Spain

Archaeological resources are material remains; or physical evidence of human habitation, occupation, use or activity including the site, location or context in which such evidence is found; of past human life or activities which are of archaeological interest; or capable of providing scientific or humanistic understanding of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled selection, analysis, interpretation and explanation. These resources will still be part of an archaeological site either being excavated or not yet discovered. There are country specific archaeological websites – key words would be the name of the country and archaeological survey or archaeological site. Examples include surface or subsurface structures, shelters, facilities, or features – bedrock mortars, cairns, earthworks, fortifications, graves, kilns, middens, borrow pits or canals; surface or subsurface artifact concentrations or scatters; whole or fragmentary tools, implements, containers, weapons and weapon projectiles, clothing, and ornaments like pottery, bone, stone, feathers, basketry, or bottles; byproducts, waste products, or debris resulting from manufacture or use of human-made or natural materials; rock carvings, rock paintings, intaglios, and other works of artistic or symbolic representation; all portions of shipwrecks, including but not limited to armaments, apparel, tackle, and cargo.

Figure 2-5: Archaeological dig unearths a Roman amphitheater at Portus, ancient Rome's Mediterranean harbor.

Cultural resources are anything significant to the local population. Historical and archaeological resources can be cultural resources; however, a cultural resource is not always a historical or archaeological resource. It may be something that is only significant to the local population and not recognized outside of an isolated area. There are country specific heritage websites – key words would be the name of the country and ministry of culture or cultural heritage; the US Department of State's Cultural Heritage Center; and the museum security network. There are also religious heritage inventories such as the Islamic Architectural Heritage Data Base at www.islamicarchitecturedatabase.org/ircica/index.php. Examples of cultural resources are individual burials, burial grounds and cemeteries which may be marked or unmarked, areas of religious significance, parks, forests, and/or animal preserves and recreational areas in or around the proposed base camp location. Interviews with local nationals are imperative to the documentation of cultural resources.

Figure 2-6: Sand and sawdust carpets in the streets of Tegucigalpa, Honduras for Semana Santa.

Figure 2-7: Marketplaces provide an excellent illustration of the importance of understanding the uses of community spaces and the schedule surrounding these activities. A village center can be a completely different place depending on market day.

Ask questions when you encounter a protected historical, archaeological or cultural resource or enter an area where they are known to exist. Identify the governmental institutions, authorities, and/or individuals

responsible for these resources. Ask about the value of the site to the host nation and local population. If possible, identify the local Civilian Affairs Officer.

Note the surface presence of:

- Artifacts: broken ancient pottery, stone tools, metal tools or jewelry, decorative art or beads, carved bone or wood.
- Features: ancient storage and trash pits, individual burials and cemeteries which may be marked may be simply evidenced by the presence of raised earth or soil disturbance.
- Ruins or standing architecture: remnants of walls, floors and collapsed ceilings which will typically be constructed of mud-brick or stone as wood disintegrates in a few years in most environments.
- Earthen mounds that are not part of the natural topography. These often represent the accumulated debris and soil of past settlements.
- Caves or rock shelters often containing archeological remains.
- Rock art/writing: flat rock surfaces are sometimes decorated with painted or pecked artistic renderings or inscriptions.

Describe the general surface appearance. If present, note existing site disturbances such as irregular holes and trenches from vandalism and looting or regular emplacements from recent military or other use. Document the results of the field survey and background searches.

Assess the level of impact that the mission and presence of personnel in the area will have using:

a. Level 1: no impact. There are no resources present or the proposed mission would avoid them if present.

b. Level 2: less than significant impact. Resources are present but proposed mission would only have minor effects without the need for mitigating actions.

c. Level 3: less than significant impact with mitigation incorporation. Resources are present but with implementation of mitigating actions effects can be minimized to an acceptable level, i.e. power lines to be installed can be routed around sensitive resource concentrations.

d. Level 4: potentially significant impact. The proposed action would likely cause a substantial adverse change in the significance of a historical or archeological resource, disturb a known religious, traditional or cultural resource or disturb any human remains, including those interred outside of formal cemeteries.

Identify the proper reachback or host nation authorities that must be contacted prior to the initiation of any type of construction. It is important during any operations that involve excavation or digging that Soldiers are aware of the possible existence of subsurface historical or archaeological resources in the area and are cognizant of the procedures to take if encountered.

Natural Resources and Endangered Species/Habitat Protection

Natural resources are defined by AR 200-1 as the viable and/or renewable products of nature and their environments of soil, air and water. Included are the plants and animals occurring on grasslands, rangelands, croplands, forests, bodies of water; and minerals. Our survival and quality of life is directly associated with the quality of our natural resources. Agriculture, farming and fishing provide our food. The waters of the earth are the basis of our drinking water, a mechanism of the transportation of goods and recreation. Our construction materials (wood, sod, clay, gravel, etc.) and fuel sources (forests/wooded areas, peat bogs, oil, natural gas, etc) come from natural resources. Conflict arises when natural resources become scarce or are damaged by military activities during a contingency operation. The destruction of agricultural crops or water sources will have a negative effect on the economy, well being and opinion of the local population in the area of contingency

operations and, thereby, can have a negative impact on the accomplishment of the mission.

Lessons Learned – Karez System in Afghanistan

For thousands of years, communities in Afghanistan have depended on ingenious systems called karez to move water for drinking and irrigation. A karez is a hand-dug underground tunnel that transports water from aquifers in the mountainous regions to the villages and communities down slope where it is brought into canals on the surface. Approximately every 50 feet there is a vertical shaft used to access the tunnel for maintenance. They are one of the oldest technologies on the planet for collecting and distributing water and can be easily identified in aerial photographs.

As the US began to expand a FOB in Afghanistan, members of the Taliban spread propaganda to the elders of surrounding villages stating the US was going to destroy their water supply. The water supply in question was being provided by a karez system that had been functioning for at least 2000 years and irrigated about 75% of the areas grape, wheat and almond crops. The FOB expansion absorbed neighboring farmland and vertical openings of the karez system. The ensuing construction damaged the karez. The resulting reduction in the water supply threatened to destroy the livelihood, survival and social fabric of the local communities. The Taliban were proven to be correct and they angered the very people the military hoped to win over through its troop surge. This event illustrates the importance of developing an ability to read the heritage landscapes and the need to maintain relationships with the local populace.

Figure 2-8: The Great Barrier Reef, Australia

Figure 2-9: Yellowstone National Park, Wyoming, and Yosemite National Park, California, USA

Figure 2-10: An olive grove and a commercial fishery.

Identify all endangered species or sensitive habitat that could be in or around the proposed base camp site. A good resource to use in identifying endangered species is the Red List at www.redlist.org. During the site reconnaissance, make special note of any endangered species or sensitive habitats that could be directly impacted by the mission. Document the sightings of endangered species and habitats by taking photos, grid coordinates/GPS, and mapping them on sketches or map overlays. Document the existence of environmental controls or restrictions that are already in place. Make note of man-made damage or disturbance of the area and signs of previous occupation by military or civilian entities. Make and document an assessment of the level of impact the mission and presence of personnel will have on the endangered species and sensitive habitats present:

a. Level 1: no impact. There are no endangered species present or the proposed mission would avoid them if present.

b. Level 2: less than significant impact. Resources are present but proposed mission would only have minor effects without the need for mitigating actions.

c. Level 3: less than significant impact with mitigation incorporation. Resources are present but with the implementation of mitigating actions effects can be minimized to an acceptable level.

d. Level 4: potentially significant impact. The proposed action would likely cause a substantial adverse impact to an endangered species or their habitat.

Figure 2-11: A collage of endangered species; the giant panda, the gray wolf, the kola, the Siberian tiger, the African elephant, the rhinoceros, the snow leopard, the orangutan, and the arctic seal.

Figure 2-12: The Geranium multiflorum in Waikaloi Preserve, Hawaii, and the Queen Alexandra Birdwing Butterfly.

Refer to Appendix A for a checklist to assist with the EBS data collection process.

Analyze the Data and Information Gathered

The information gathered through site reconnaissance, records review, and interviews, will be used to determine site acceptability or will suggest necessary precautions for continued use. This data will act as the basis for documenting the existing conditions. To protect personnel and prevent possible mission impact and future liability for cleanup of existing

contamination, it is necessary to include environmental issues in the planning processes. All significant findings need to be fully investigated and documented in support of the conclusions that will be generated through the analysis of all of the information gathered.

Sampling of those areas identified during the EBS site reconnaissance and all water sources that are to be used to support the base camp should be conducted prior to the start of construction, if possible. A written summary of the sampling results will be significant in the analysis of data and information gathered and will be included in the EBS report. If a field test was conducted, document the test used and the results. Verify and document the calibration of field testing equipment. This will provide support to the validity of the sampling analysis results received.

Lessons Learned – Existing Contamination

Areas of existing environmental contamination have been found in theaters of operations. Contaminants or unknown substances have been uncovered during excavation; seen on water surfaces, or in puddles on the ground. Initially, Commanders have often ignored these issues and continued with camp construction activities without regard for potential health hazards only to have to adjust, react to or address them at a later time.

Determine the Environmental Status of the Area

Based on the records review, interviews conducted, the environmental site characteristics, reconnaissance completed and the sampling results, the environmental condition of the site can be determined and conclusions drawn concerning suitability of the site for use as a base camp. All conclusions must be fully documented and realistic. Conclusions will need to be satisfactorily supported by the findings to stand up to and answer questions when the EBS report is briefed to the commander. Conclusions will be used to generate recommendations, the biggest of which is whether or not the proposed base camp location is suitable for occupation by US forces and will support the focus of the mission to be completed.

It should also be possible from the information provided to recommend controls to reduce identified environmental risk.

Prepare the EBS Report

After all information has been gathered from available sources, analyzed, conclusions drawn and recommendations formulated, the EBS report will be generated. Due to the operational environment, sample analysis results may be received after the initial report is completed. The EBS cannot be finalized until the sampling results have been received because the results may seriously impact the conclusions drawn regarding the environmental condition of the site. A draft report may be issued or briefed with preliminary results and conclusions. Once the analytical report has been received, the EBS can be finalized, adjustments made to the conclusions, if necessary, and a finalized EBS report can be issued.

The Executive Summary of the EBS report is a bottom line up front synopsis of the significant findings from the data gathered, the conclusions drawn from the analysis of the data gathered and the recommendations being made based on the conclusions. The most important aspect of the Executive Summary is the recommendation to use or not use a proposed location for a base camp and the primary reasons for this recommendation. This section should also outline specific courses of action that need be taken to allow the site to be used. Every conclusion and recommendation must be supported by information provided in the rest of the report.

The report needs to include sufficient information to make decisions concerning potential occupation of the surveyed property. This report needs to contain specific information to stand as a record of environmental conditions prior to occupation. Present information to decision makers prior to base camp construction, if possible. If not possible, make sure command staff and personnel are aware of areas of concern.

The EBS will document all areas of concern with supporting analytical reports. This information becomes the record of conditions at the time of the survey. Report information can be documented using the format this

handbook provides in Appendix B. Include tables with analytical results in the final report.

Areas where unknowns still exist should be avoided for base camp construction. In some instances, the proposed site will be indentified as unsuitable for base camp construction. Should this be the case, be prepared to begin the process again and find a new site or location.

Section 14 of the report is for all classified information. This section can be used as an addendum to the report that can be removed if the report must be submitted to personnel who do not have the appropriate security clearance to be privy to the classified information, but have a legitimate need for the unclassified information contained within.

The finalized report will be maintained on site, a copy will be forwarded to the next higher headquarters for both informational purposes as well as to be archived in the environmental repository as specified by the theater command. If current occupants of a base camp are re-deploying home, it is imperative that a copy of the EBS be maintained with the unit, and a copy provided to the follow on force replacing them. A copy may be forwarded to the USAPHC Environmental Surveillance Integration Program, Military Environmental Surveillance Library (MESL) at oehs@apg.amedd.army.mil or, if classified oehs@usaphc.army.smil.mil The EBS Report format and instructions for completion are included in Appendix B, along with additional contact information for USAPHC.

Update the EBS Report

Review the environmental conditions as additional information becomes available, or incidents occur that change the environmental baseline, i.e. a POL spill or the cleanup of an area of existing environmental contamination, and update the EBS as necessary. The Environmental Conditions Report, as described in Chapter 3, will be used to update the EBS. Personnel are also required to conduct an Environmental Site Closure Survey, after being notified of impending base camp closure, to document conditions existing at the time operations cease and to note any changes or variations in site conditions since the EBS. Refer to Chapter 4 for more information.

Chapter 3: Environmental Conditions Report

The Environmental Conditions Report (ECR) is used to update the EBS with any incident or occurrence that changes the environmental conditions of a base camp during occupation. At the very least, an ECR will be completed when something happens to alter the environmental conditions of an AO, i.e. a spill of hazardous materials, the discovery of a previously unidentified cultural/historical resource, establishment or movement of a waste management area, new mission, major changes in base population or an area identified as contaminated is cleaned up. There may be a requirement, based on ASCC or COCOM guidance, to conduct periodic environmental inspections of specific operations or activities to ensure that environmental considerations are actively incorporated. These inspections may engender an ECR, but they are not in and of themselves an ECR, and will be documented separately or in conjunction with the ECR. The ECR is included in the Electronic Message formats (see Appendix F). However, check your Theater Command regulations or contact them for site-specific guidance or format requirements.

The ECRs will be maintained with the EBS for the base camp, submitted to the next higher headquarters for information and archived using the same procedures established for the EBS. As with the EBS, copies of ECRs must be maintained by a re-deploying force and handed off to the follow on force during the exchange of control of a base camp.

Chapter 4: Environmental Site Closure Survey and Report

When notification of base transfer or closure is received, the Environmental Site Closure Survey (ESCS) is conducted to identify environmental concerns that will need to be addressed before the base camp can be transferred to another entity or returned to the control of the host nation. The ESCS documents any changes/variations in conditions from the EBS; provides information to determine closure actions required to meet the negotiated standards for transfer or closure; and facilitates the development of an Environmental Corrective Action Plan (ECAP) and the request for resources. The ECAP tracks the completion of environmental tasks necessary for proper transfer/closure of a base camp. The Environmental Site Closure Report (ESCR) will document the final environmental condition of the base camp at closure. The ESCS, ECAP, and ESCR will be archived with the EBS and ECRs using the Theater Support Group (TSG) or Major Subordinate Command (MSC) established procedure and data repository.

A sample format for an ESCS and an ESCR are included at Appendices H and I of this handbook. Check your higher staff regulations or contact your TSG or MSC Environmental Staff for site-specific guidance or format. The example ESCS is set up to accommodate three levels of the survey:

- An initial survey conducted by the base camp or closing unit's environmental staff
- A preliminary survey conducted by the TSG/MSC environmental staff
- A final survey conducted by the TSG/MSC environmental staff as part of the overall site clearance process

When the base camp or unit environmental staff receives notification of the pending base transfer or closure, they will conduct an initial ESCS to identify environmental concerns that will need to be addressed before the base camp can be transferred to another entity or returned to the control of the host nation. This initial ESCS will help to identify actions that can be completed with local resources (personnel, equipment, and funding) and actions that need Theater Support Group or Major Subordinate Command Environmental Staff support, resources, and/or contracting. The EBS and all ECRs completed during occupation will be used to help

determine the changes in environmental condition of the site prior to establishment or occupancy and the current environmental conditions. The base camp or unit environmental staff should coordinate with the TSG/MSC staff to develop the ECAP to either return the site to pre-occupancy conditions or to the standards negotiated with the receiving agency or host nation. The ECAP should identify the standards that must be met; any pre-action and post-action sampling requirements; closure actions required to meet negotiated transfer/closure standards; the resources needed for each action; roles and responsibilities for local staff, higher staff, supporting activities, and contractors; a schedule with milestones, and quality assurance/evaluation measures/monitoring. Base camp/unit environmental staff must communicate and coordinate with the TSG/MSC to obtain resources needed for closure actions and ensure milestones and standards are met. The information from the ESCS and the ECAP will be used to develop the ESCR. Staff responsible for the ESCR should begin compiling it in conjunction with the ECAP to ensure the ESCR can be completed when final transfer or closure is granted.

The preliminary survey level of the ESCS is conducted by the TSG/MSC environmental staff no later than 30 days prior to site closure or turn-over. The preliminary survey identifies any remaining actions that must be completed prior to the base camp/unit being granted final clearance.

The final survey level of the ESCS is also conducted by the TSG/MSC environmental staff to ensure any findings from the preliminary survey are corrected. The base camp/unit must pass this survey before they are granted final clearance.

The ESCR will document the final environmental condition of the base camp at closure. The ESCS and ESCR will be archived with the EBS and ECRs using the TSG/MSG established procedure and data repository.

Appendix A: EBS Checklist

Enter Classification

NOTE: Do not leave blanks empty. If they do not apply to the current site, enter NA or Nothing Significant to Report (NSTR) to show the section has been investigated.			
1. Administrative Data			
Location Name:	Official name and legal address of the area being surveyed. Name of country, city, township, or area of operation for the site location.		
Location Aliases:	Other names the area is currently or was previously known as.		
Start Date and Time:	Applicable to survey completion.	**End Date:**	
Organization Conducting Survey:	Name of the unit or activity conducting the survey.		
Surveyor's Name, Rank/Grade/Title:			
Surveyor's Phone:			
Surveyor's Email:			
Geographic location: ***Note: If this information is classified, enter it in section 14 of this checklist.*** The 8-digit military grid coordinates and/or GPS are mandatory for the site using the center of the camp for reference. Coordinates may also be taken from outside corners of the site to provide site boundaries. **The 8-digit military grid coordinates will always include the 3 character zone designator and the 2 character grid square identifier.**			
Coordinate 1:		Coordinate 2:	
Coordinate 3:		Coordinate 4:	
Notes:	Enter notes associated with the geographic location, i.e. the datum associated with the location, map type, map number, GPS used, etc.		

2. Executive Summary

Completed after information gathered is analyzed and recommendations developed. This is a synopsis of significant findings, conclusions and recommendations based on the data analysis with the ultimate recommendation being to use or not use the site.

3. Introduction

Limitations of Assessment:

Enter the physical obstructions, limiting conditions (such as weather), mission restrictions, lack of equipment/supplies encountered during the assessment.

General Data Gaps:

Enter data that was either not obtainable at the time of the survey or that will be received in the future, i.e. awaiting analytical data, personnel not available to be interviewed, locations of key facilities may be unknown or may move before occupation.

4. Site Characteristics

Attach site maps and photographs to the survey. **Take photos, a good rule of thumb is at least one picture per section or area of concern. Photos can be used to document conditions before and after occupation. Create a photo log that documents date, time, location and a brief description of each photo.**

Units and Detachments/Teams/Elements Present: ***Note: If this information is classified, enter it in section 14 of this checklist.***

Include as much detail as possible and include all Services.		

Camp Fixed Population: ***Note: If this information is classified, enter it in section 14.***	Enter the population of the location, if known. Separate by military and civilian categories.
Rotation Schedule: ***Note: If this information is classified, enter it in section 14.***	What is the unit rotation schedule (months, years, etc.).
Number of U.S. Troops, if not U.S. Camp: ***Note: If this information is classified, enter it in section 14.***	
Physical Setting:	
Provide a description of the general geography, topography, geology, hydrology, vegetation, raw materials, natural resources, urban and rural settings. Make note of any obvious damage caused be natural events such as earthquakes, flooding, tornadoes, hurricanes, tsunamis, etc. Also make note of damage that may have occurred due to man-made activities such as mining.	
Climatic / Weather:	
Provide information regarding the climate and weather in the area, i.e. temperature range, predominate wind direction, normal rain fall, etc. Identify if the area is prone to natural storm events such as hurricanes, tornadoes, tsunamis, monsoons, etc. Document if seasonal. Acquire historical meteorological data for the past 5 years, if possible, in an electronic format. Note the source of the data and obtain a POC for future information.	
Soil:	
Note the types, permeability, drainage ditches, low lying areas (standing water), unusual/out-of-place mounds, disturbed areas, discolored soil, areas unusually devoid of vegetation, etc. Is the area prone to sink holes? Provide 8-digit military grid coordinates/GPS.	
Groundwater:	

Groundwater is any water source present beneath the surface of the ground. What is the depth of the groundwater and in what general direction does it flow?
Surface Water:
What surface water is present on the site; lakes, ponds, rivers or streams? What is the direction of flow for surface water and drainage? Indicate direction of surface drainage on graphics or site map. Note any standing (non-flowing or sluggish) water.
Wetlands, Flood Zones, Costal Zones:
Is the site located in or near a wetland, flood zone or coastal zone, i.e. swamp, marsh, bog, areas prone to flooding, etc.? Include the location of wetlands and flood zones on graphics or site maps. Note any areas that are flooded, show evidence of past flooding or flash flooding, any potential wadis, washes, dry creek beds, etc.
5. Detailed Site /Adjacent Property Description Make a detailed sketch or map overlay of the site, noting the areas of significance including the date, the surveyor's name and unit, a north arrow, scale and legend. Take photos, include grid coordinates/GPS and description of both the area and reason for taking the photo. **Note: Everything examined in this section for the site must also be examined for all adjacent property and documented in Section 7 below.**
Description of Structures:

Describe structures and their use: housing, maintenance, or office space. (Include Heating/ Ventilation Systems and Potential for Radon) Note condition of materials that may contain asbestos, i.e. roof shingles, floor tiles, or pipe insulation. These may release hazardous fibers if damaged. Look for electrical hazards and structural damage. Determine current and prior usage of structures. Document water and sewer capability. Look for evidence of previous spills, hazardous materials or waste storage. Note any chemical-type or strange odors. Look for evidence of pest infestation.

Tents ___ (soft-sided structure)
Semi-Permanent ___ (hard buildings without permanent below surface foundations)
Permanent ___ (hard buildings with permanent below surface foundations)

Notes:	

Description of Roads / Hardstand:

Describe the road conditions: paved, gravel, or dirt. Are there problems with dust generated from vehicle traffic? Is there a parking lot? What kind of parking lot is it: paved, gravel or dirt? Attach a map, sketch or photos.

Description of Power Generation:

Describe how power is supplied to the camp: individual and/or bulk generators or grid power. (Include Potential Electrical Hazards and Sources of PCB's) Note transformers, substations, and power lines present. Document leaking transformers, 8-digit military grid coordinates/GPS and take photos.

Tactical Generators ___
Commercial Generators ___
Municipal/Local Grid ___

Notes:	

Contractor Services:

What services are contractors performing at the site? (Include contractors, sub-contractor, or HN contracts with POC/company information and the initiating agency.)

Food: ___ Vector Control: ___ Solid Waste:___
Power: ___ Ranges:___ Hazardous Waste: ___
Water: ___ Medical Waste: ___ HM Spill Response / Remediation: ___
Laundry: ___ Water Waste: ___ Fire Fighting / Suppression: ___

Notes:

Hazardous Materials

Storage Containers: Describe the type, number, contents, volume and coordinates of all storage containers. Is there secondary containment? What is done with water that accumulates in the secondary containment? Note the condition of the containers. Determine if they are currently leaking or have leaked in the past. Look for soil discoloration, stains, rust and any containment of spill residue. Are materials stored inside or outside? Take photos.

Individual Storage Containers

Location Description	Container Type	Size	Age	Above / Below Ground	Contents
Where is it? Inside or under cover?	Plastic, metal, single or double walled, etc.			Above___ Below___	

Notes: *Size*: is there a labeled volume or the dimensions of the container. *Contents*: what has been stored, what is currently being stored and what will be stored in the future?
Notes: Condition of container, labeled with contents?

				Above___ Below___	
Notes:					
				Above___ Below___	
Notes:					

General Notes:

Are shelf-life requirements being met? List any occurrences of spills. Are Safety Data Sheets (SDSs) available? Are containers properly labeled?

Petroleum Distribution Points (POL): Are there any existing or former fuel points? Take photos.

Individual Distribution Points

Location Description	Container	Fuel Type	Contractor Operated
Where is it?	Type, single- or double-walled, size in volume or dimension, age or installer, above or below ground, and number of containers. If more than one describe all.	Gas ___ Diesel ___ JP__ ___	Yes ___ No ___
Notes:	Include information related to the specific distribution point, i.e. availability of spill response/prevention equipment, PPE, posted Spill Plan/Procedures, use of drip pans, alarm systems, protective measure. Annotate signs of obvious ground contamination.		

		Gas ___ Diesel ___ JP__ ___	Yes ___ No ___

Notes:	

General Notes:

Add notes related to POL distribution in general.

Past Releases:

Annotate any information concerning past releases of POL products. Describe the details of those past spills if known: location (8-digit military grid coordinates/GPS), date, type of spill, amount spilled or size of the resulting stain, and any remedial actions taken. If unknown, state "Unknown." Take photos.

Potential Releases:

Discuss areas where the potential for releases to occur is likely. This may include: refueling operations, storage facilities, pipelines, fuel transfer points, or other fuel handling operations.

Hazardous / Unidentified Substances:

Hazardous and unidentified substances are anything other than POL. This may also include past use industries that have contaminated the area prior to US occupation. Identify the hazardous substance, location.

Hazardous Material Storage: Describe storage sites and controls, i.e. engineering, administrative, personal protective equipment, etc. Take photos.

Individual Hazardous Material Storage Sites

Location Description	Material Type	Material Amount	Date Noted

Where is it? Inside or under cover?	What is stored, i.e. corrosives, batteries, ammunition, asbestos, etc.?	How much is currently stored? What is the most that will be stored?	
Notes:	Add notes related to the specific hazardous material storage site.		
Notes:			
General Notes:			
Add notes related to hazardous material storage in general.			

Spills

What	Where	When	Quantity
Notes:	What caused the spill? Who responded to it? Was a spill plan on site? Was it followed? Is spill response equipment on site? Are there established evacuation routes? How was it cleaned up? How was the waste material handled? Who was notified?		
General Notes:			
What	Where	When	Quantity

Notes:	

General Notes:

Waste Management

Solid/Hazardous Waste: General description of solid and hazardous waste disposal practices. Describe whether burn pits, composting, landfills, or incinerators are used. Note any signs of dumping and determine what might have been dumped. Take photos.

Individual Solid and Hazardous Waste Descriptions

Hazardous Waste:

Type of Waste	Source of Waste	Disposal Method	Contractor Operated
Residential, industrial, agricultural, explosive ordnance, etc.?	Dining facility, housing, office, construction debris, etc.?	Open dumping, incineration, open burning, landfill, composting, etc.?	DRMO __ US __ Local __

Notes:	Add notes related to specific types of waste. Include contractor information, HN/local company POC and phone number, the name of the individual who picks it up, the method of pickup, the frequency of pickups, where it goes, the location with grid coordinates/GPS and how long it remains on site. How is it stored? Take photos.

			DRMO __ US __ Local __
Notes:			
			DRMO __ US __ Local __
Notes:			
			DRMO __ US __ Local __
Notes:			

General Notes:

Include contractor/sub-contractor information, POC, phone number, storage locations, quantities, and frequency of removal. Who is responsible for removal? Methods used to remove, i.e. dumpsters, trucks, etc. If disposal is by burn pit, are wastes segregated? What is the frequency of burning in the pit? How far away is the nearest occupied area? Who lives/works in the area and is there any record of complaints or concerns associated with the burn pits? Take photos.

Non-hazardous Waste:

Reuse/Recycling/Compaction Facilities

Location: Where is it located, distance from living areas. Provide grid coordinates/GPS	

Materials / Volume Managed: Types and quantity of materials reused and recycled. Document procedures for collection, management and disposition.	
Equipment Utilized: List all equipment and containers used.	
Operator: Name/contact info	
General Notes:	
Make note of any problems or issues that exist with the current process/procedures.	

Landfills	
Location	Where in the camp is it located? Note distance from living areas and nearest airfield. Provide 8-digit military grid coordinates/GPS.
Material Disposed	Types of material disposed.
Disposal Volume/Day	In weight or volume, obtain from the landfill coordinator.
Operator	Name and contact info.
Daily Cover	Is daily cover applied?
Description:	General size, how long in use, materials excluded, i.e. medical waste, batteries, POL, tires, etc. Monitoring wells for gas or leachate? Describe the landfill construction.

Incinerators / Burn Pits	
Location	Incinerator ___ Burn pit ___ Where in the camp is it located and distance from living areas. Provide grid coordinates/GPS and prevailing wind direction.
Materials Disposed	Types of material disposed.
Disposal Rate/Day	In weight or volume, obtain from the incinerator / burn pit operator. For incinerators, note unit's capacity from spec plate on unit.
Operator	Name and contact info.
Manufacture of Unit	Obtain from spec plate on unit. Describe the unit.
Hours of Operation/Day	Obtain from operator.
Frequency of Burning	Days per week, hours per day, time of day.
Supplemental Fuel	Diesel, propane, waste oil, etc.
General Notes:	
Document type of incinerator, i.e. hazardous or non-hazardous waste. Are there scrubbers in place? What are procedures for ash disposal? Are the incinerators dual chambered?	
Composting / Landfarming	
Location	Where is it located, distance from living areas. Provide grid coordinates/GPS.

Materials Disposed	Types of material disposed.
Disposal Rate/Day	In weight or volume, obtain from composting operator.
Operator	Name and contact info

General Notes:

Note the date the operation began. Document the turning schedule. Is the turn conducted by hand or by mechanical means? How is the composted material used? If landfarming, what microbes are being used?

Medical Waste:

Individual Medical Waste Description

Type of Waste	Source of Waste	Disposal Method	Contractor Operated
Red bag (gloves, dressings, tubing, cultures, etc.), pathological (body parts), or Sharps?	Clinic, humanitarian assistance, etc?	Incineration, open burning, landfill, etc?	DRMO __ US __ Local __

Notes:	Add notes related to the specific types of waste. Include contractor/sub-contractor information, POC, phone number, how the medical waste is managed, collected, stored and disposed. Is there a medical waste incinerator? Has the waste buried and marked for future removal? Provide the location of disposal facilities, grid coordinates/GPS. Refer to the information collected above for landfills and ensure that information is collected here.

			DRMO __ US __ Local __
Notes:			
General Notes:			
Add notes related to medical waste in general.			

Medical Waste Incinerators	
ID	
Location	Where is it located, and distance from living areas. Provide grid coordinates/GPS.
Materials Disposed	Types of material disposed.
Disposal Volume/Day	In weight or volume, obtain from the incinerator / burn pit operator. For incinerators, note unit's capacity from spec plate on unit.
Operator	Name and contact info.
Manufacture of Unit	Obtain from spec plate on unit.
Hours of Operation/Day	Obtain from operator.
Supplemental Fuel	Diesel, propane, waste oil, etc.
General Notes:	

Add notes related to medical waste incineration in general. Document type of incinerator, i.e. hazardous or non-hazardous waste. Scrubbers in place? How is ash disposed of? Dual chambers?	
Waste Water: What are the sources/types? How is it collected, treated, discharged or disposed?	
Individual Waste Water Descriptions	
Source / Type of Wastewater	Black water (latrines, urinals, kitchen, other – explain), grey water (showers, hand washing, laundry, brine from reverse osmosis water purification unit (ROWPU), other – explain), industrial wastewater (wash racks, oil water separators (OWS), other – explain). Volumes.
Collection Method	Black water – burn-out latrines, portable / chemical toilets, tank trailers / holding tanks or ponds (capacity), pipes / pump stations. Grey water – not collected, tank trailers / holding ponds (capacity), pipes / pump stations. Collection system design or sketch?
Disposal Method	How is it being disposed of? Discharge methods: subsurface (septic drain field, dry wells, seepage pits), land applied (ground discharge, infiltration / evaporation ponds / beds / fields, spray irrigation), stream discharge, trucked off site to known / unk location – explain, piped off site to known / unk location – explain.
Contractor Operated	DRMO __ US __ Local __
General Notes:	
Enter general notes regarding wastewater activities.	
Treatment methods	

Is wastewater treated or untreated; on site/offsite, upwind/downwind of troop areas? Methods: burn-out latrines, septic systems (solids settling tank/drainfield), package (portable/modular), wastewater treatment facility (WWTF), constructed WWTF. If lagoon/pond: # of ponds, # of cells/pond, surface area, depth, freeboard (above water level), aerated, discharge, provide sketch, inlet/outlets. If package WWTF: type (activated sludge (AS), other – explain). If other constructed treatment plant: type (trickling filter (TF), AS, other. If constructed WWTF: describe unit process, flow equalization (none, storage tank, pond), preliminary treatment (none, screening, grit removal, other), tertiary (i.e. after secondary) treatment (none, filtration, membrane, other), disinfection (none, liquid chlorine, sodium hypochlorite – liquid bleach, calcium hypochlorite – dry / liquid, UV or other. Treatment design: gallons/day, obtain designs/plans/reports, add sketch. If more than one exists, use separate blocks to identify treatment methods
General Notes:
Gather available wastewater treatment monitoring data, i.e., flow and physical/chemical data. Include contractor/sub-contractor, POC, phone number, and method of collection. Is it dumped on site, or removed from property? Include location of dump site. Is it characterized as grey water and removed by sanitation personnel in honey buckets or grey water pumpers? Is it taken out the gate, dumped and found running back on the property? If collecting on site, is it treated and used as a dust abatement source or other? Military operation or contractor? Influent/effluent data: Biochemical oxygen demand (BOD), chemical oxygen demand (COD), Total Suspended Solids (TSS), fecal coliform, total residual chlorine, pH, other (include unit of measure, i.e. mg/L, obtain data and monitoring frequency, if available. Also note if data is not being collected or not available.
How is storm water managed?

Managed ___ Not managed ___

Is the site grading adequate or inadequate, open ditches, storm ditches and underground piping, storm water collection in detention/retention ponds or tanks. Is the storm water collection system collocated with sanitary water and/or the main water lines?

Obtain storm water system designs if available, Is it treated or untreated? If untreated, is it characterized as black/grey water? Is it reused? If it is reused, how, i.e. dust control, vehicle washing, crop irrigation, construction uses – explain, i.e. toilet flushing, laundry, showers, other.

Is wastewater or storm water reused for beneficial purposes? If yes, explain.

Historical/Cultural Resources

Take photos and note the location using grid coordinates/GPS. Note the areas of significance on the site sketch/map overlay. Describe the general surface appearance and disturbances such as irregular holes and trenches from vandalism/looting or regular emplacements from recent military or other use. **Note: If it is determined that the historical/cultural resource must be protected to prevent damage or looting by "pot-hunters" or black market antiquities dealers, it is likely that documentation of the site should be annotated in Section 14 as classified information.**

Historical Resources:

Document historical buildings, monuments and artifacts on display in buildings or museums. Look for clues in the landscape regarding undocumented artifacts, ancient features, ruins, rock art and ancient writing/pictographs. Note the presence of artifacts in the ground or undisturbed as part of an archeological site, i.e. ancient pottery, stone tools or jewelry, decorative art or beads, carved bone or wood. Note earthen mounds that are not part of the natural topography, caves or rock shelters often containing archeological remains. Note ancient storage and trash pits. Note remnants of walls, floors and collapsed ceilings which will typically be constructed of mud-brick or stone as wood disintegrates in a few years in most environments. Note rock surfaces that are decorated with paint, pecked renderings or inscriptions.

Cultural Resources:	
Anything that is significant to the local population is a cultural resource. Document individual burials, burial grounds and cemeteries which may be marked or unmarked. Document areas of religious significance. List and describe all known parks, forests and/or animal preserves, and recreational areas in or around the site. Interviews with the local nationals are imperative to this documentation.	
Assess Impact Level:	Level 1: no impact. There are no resources present or the proposed mission would avoid them if present. Level 2: less than significant impact. Resources are present but proposed mission would only have minor effects without the need for mitigating actions. Level 3: less than significant impact with mitigation incorporation. Resources are present but with the implementation of mitigating actions effects can be minimized to an acceptable level, i.e. power lines to be installed can be routed around sensitive resource concentrations. Level 4: potentially significant impact. The proposed action would likely cause a substantial adverse change in the significance of a historical or archeological resource, disturb a known religious, traditional or cultural resource or disturb any human remains, including those interred outside of formal cemeteries.
General Notes:	
Enter general notes regarding historical/cultural resources. List any host nation or local SME/POC information for cultural properties or resources (from academia, museums, government agencies, local citizens, etc.).	

Endangered Species / Habitats

Identify all endangered species or sensitive habitat that could be in or around the site. This may be done through an internet search. Make note of any significant habits or species sensitivities that could be directly affected by the mission. During the site reconnaissance make note of and document the presence of habitation and species sightings. Document the presence of endangered species in the area that could be affected by the mission or occupation. Identify habitat areas using grid coordinates/GPS. Note the areas of significance on the site sketch/map overlay. Document the existence of any environmental controls or restrictions already in place. Make note of man-made damage or disturbance of the area and any signs of previous occupation by military or civilian entities.	
Assess Impact Level:	Level 1: no impact. There are no endangered species present or the proposed mission would avoid them if present. Level 2: less than significant impact. Resources are present but proposed mission would only have minor effects without the need for mitigating actions. Level 3: less than significant impact with mitigation incorporation. Resources are present but with the implementation of mitigating actions effects can be minimized to an acceptable level. Level 4: potentially significant impact. The proposed action would likely cause a substantial adverse impact to an endangered species or their habitat.
General Notes:	
Enter general notes regarding endangered species or habitat. List any host nation or local SME/POC information for cultural properties or resources (from academia, museums, government agencies, local citizens, etc.).	
Local Disease and Health Factors	
Disease Threats:	
List diseases prevalent.	

Causes / Vectors of Disease:	
Enter known causes and/or vectors (i.e. insects, animals or organisms) that carry the diseases known to be present in the AO.	
Vectors Present:	Is surveillance for the vectors of these diseases being conducted? If yes, describe what is being done and what has been found. Are conditions favorable for vectors/pests? If yes, describe. Are Soldiers being bitten by vectors/pests? If yes, list and describe what is being done about it. Do Soldiers report seeing other pests? If yes, list. Are disease vectors present? If yes, complete specifics below if possible. Are conditions favorable for breeding vectors/pests? Is standing water present on the site? Describe location and condition. Are habitat(s) of disease vectors and carriers such as mosquitoes, rodents, sand flies, ticks present? Specify and explain. Are potential vectors/pests such as filth flies, rodents, stray dogs or cats, snakes, scorpions present? Specify and explain. Are seasonality/weather conditions favorable for breeding pests? Are there locations where wastes have been disposed of incorrectly and which may attract pests? Is the deployment site drainage adequate? Have personnel seen other pests, i.e., rodents, spiders, snakes?
Environmental Health Assessment:	Are living/work facilities pest proof? If no, describe. Is waste being handled in environmentally sound manner that protects human health and does not provide breeding for pests? If no, describe. Are uniforms properly worn? Are individuals practicing good personal/unit area sanitation? Is education on avoidance of pests and pest habitats provided? Is personal information distributed to Soldiers, i.e. tick and rodent cards, staying healthy guides?

Field Sanitation Assessment:	Is human waste disposed of in an environmentally sound manner and in a manner that protects human health? Are laundry services provided or planned? Are adequate food storage facilities provided? Is liquid kitchen waste disposed of in an environmentally sound manner that protects human health?
Countermeasures / Pest Management Control:	Are personal protective countermeasures appropriate to the threats? Describe. Have action thresholds been established to guide initiation of pest control measures? Is there a control program for disease vectors? Are integrated pest management (IPM) procedures being used? Does the IPM include reduction to food sources and breeding habitats? Are pest management operations being conducted? If yes, describe. Include who (contractor, medical personnel) and what (vector, pest). Are pesticides being used? If so, list. Are they properly stored and do they have SDSs on hand?

Pesticide Use:

Attach copies of DD Form 1532-1 (or equivalent). What chemical is being used and how much is being applied? Are records being kept? When is application conducted?

Radiological Hazards

Radiological sources will only be identified for the EBS if the source is a waste material or there is a significant impact to the environment. If radiological sources are suspected, contact CBRN resources for assistance.

Noise

Noise Sources: Are noise sources present? If so, describe sources. Take photos.	Present: ___ Absent: ___

Noise Sources		
Location Description	Source	Noise Level
Where is it?	Generator, industrial operations, air field, etc.	Ambient noise level obtained from a noise meter measured in decibels.
Notes:	Add notes related to the specific noise source.	
Notes:		
Are there noise sensitive activities present that may be negatively impacted my military operational noise?		
Document the existence of hospitals, nursing homes, tourism areas or sites, agricultural or animal husbandry operations, etc. Identify recommended/potential noise control solutions (i.e. avoidance, engineering controls such as barriers, keeping a specified distance from the noise sensitive activity, etc.)		
General Notes:		
Add notes related to noises in general.		
Noise Controls: Are noise controls present?	Present: ___ Absent: ___	
Noise Controls		
Location	Description	Control Type

Where is it?	What is it?	Provide examples.
Notes:		
Notes:		

General Notes:

Add notes related to noise controls in general.

Air Quality

Ambient (Outside) Air Quality:

Describe sources that impact ambient air and/or introduce potential hazards. Provide locations. Survey landscape and note presence of storage tanks. Identify contents. Note all combustion sources that create exhaust, fumes or smoke, i.e. flares, incinerators, generators, burn pits/boxes, welding operations, idling vehicles or aircraft, etc. Note sources of dust, such as concrete plants, mining operations, tank/convoy trails, roads/highways, helipads/runways, and agricultural fields/operations. Describe sources that produce odors such as a landfill, military painting operation and/ or solvent use, refueling points. Note any terrain/elevation differences between the camp and air sources. Is source affected by the season or weather? Is it weather dependent?

Indoor Air Quality (IAQ):

Do occupants complain about dust, odor(s), stale air, or have symptoms of eye, throat, and nose irritation?
Are generators placed near building openings? Note: Carbon monoxide and other combustion by-products should be controlled to as low as reasonably achievable.
Is the presence of visible mold noted? Take photos.
Do personnel occupy newly built structures?
Does the ventilation system allow fresh, filtered, and conditioned air into the building or shelter?
Is the presence of friable asbestos noted? Take photos.

Water

Water Treatment

Describe the water treatment systems in place and their effectiveness. Contractor or military operated? Is it a HN water source, taps, faucets in buildings? Is the source water being tested for surface infiltration of pollutants?

Municipal Water

ID	Municipal Name	Treatment Methods	Distribution Point Description
Unique ID usually obtained from the engineers.	Name of the municipality supplying the water.	Method used to treat the water.	Describe the distribution points, i.e. water trailer, water blivet, pre-existing plumbing, etc.

Notes:	How is the water from this source used?		

Well Water			
ID	Well Construction	Pump Specifications	Potential Sources of Contamination
	Provide examples. Note evidence of ancient infrastructure used to access groundwater (i.e. karez, foggaras, qanat)	Obtain from the engineers or spec plate on the pump.	Evaluation of potential source of contamination, i.e. storm water runoff, vector access, etc. Provide examples.
Notes:	How is water from this source treated/used?		
Notes:			

Surface Water			
ID	River or Lake Name	Treatment Method	Potential Sources of Contamination
		Is the surface water treated, i.e. filtration, chlorination, etc.	Evaluation of potential source of contamination, i.e. agricultural waste water discharge, dead animals, industrial operations, etc.

Notes:	How is water from this source used?		
Notes:			
Reverse Osmosis Water Purification Unit (ROWPU) / Ultraviolet (UV) Tactical Water Purification System(TWPS) / Lightweight Water Purifier (LWP)			
ID	Water Source Name	Size	Operating Unit or Contractor
Unique ID obtained from the operator.		Daily or hourly production capacity	Name and contact info of unit or contractor operating the system.
Notes:			
Notes:			
Water Distribution System:			
Describe the water distribution system. How is water transported around the camp: tactical water distribution system (TWDS), water trucks, trailers, existing distribution system, or constructed distribution system? Are the sanitary system pipes together with the water distribution pipes. Is there possible cross contamination? Is the water tested for possible infiltration of sanitary water? How is water stored?			
Water Storage Tanks: Describe the water storage areas on the property, materials of tanks / containers, amount of storage tanks, general condition of these tanks?			

ID	Tank Type	Size	Type of Water Stored
	Metal, fiberglass, fabric, etc.		Potable, non-potable, raw water, disinfected, fresh or brine, grey water, etc.

Bottled Water: Describe the sources of bottled water and whether it is used as the primary source for drinking water, are brands VETCOM approve? Note if bottles are recycled.

ID	Brand	Bottle Size	Notes
	Dasani, Ice Mountain, etc.		

Non-Potable Water:

Complete this section if non-potable water is used for dust abatement, construction, or other operations

General Sanitation

General Facilities: Describe the type, location, status of facility, etc. Take photos.

Type	Building Number	Notes:

Gymnasium, barber shops, laundry, detainee facility, etc.		Describe contractor/military operated; POC, how long they've been at this location.

General Notes:

Add notes related to sanitation in general.

Dining Facilities: Describe the location and general condition of the facility, status of facility, etc. Take photos.

Building Number	Contractor Operated	Notes:
	Yes __ No __	Add notes specific to the dining facility, i.e. contractor, population served, meals served, etc.
	Yes __ No __	
	Yes __ No __	
	Yes __ No __	

General Notes:

Add notes related to sanitation in general. Who inspects the DFAC? What is the inspection interval/frequency? Are there any current food vulnerability concerns? Does review of the DFAC inspections reports reveal any continuing concerns or food vulnerabilities?

Other Environmental Concerns:

Anything that does not fit in above sections.

6. Site Use

Proposed Site Usage:

What is the proposed usage of the site, especially if assessment is being conducted before usage determination or occupation?

Current and Past Uses of Property:

What was the past usage of the site; agricultural, industrial, military, etc. For what duration were these uses active?

Onsite Industrial Operations:

Are there any existing onsite industrial operations? Give info on scope of activities, size of facilities, who performs the operations, hazards present.

Vehicle Maintenance	___	Aircraft Maintenance	___
Power Generation	___	Petroleum Distribution	___
Waste Incineration	___	Other - Explain	___

Notes:

7. Adjacent Property Use

Current and Past Uses of Adjacent Property:

Describe the current and historical use of adjoining properties. Document agricultural activities (types of crops grown, pesticide application - insecticides/herbicides - water usage) and animal ranching/herding activities. Everything that was investigated for the proposed base camp location must also be investigated and documented for the adjacent properties.

North of Site:	
South of Site:	
East of Site:	
West of Site:	

Industrial Operations in Surrounding Area:
Describe nearby industrial operations (e.g., power plant, factories, etc.). What is approximate distance from camp boundary? What can be observed from camp; smoke, odors, etc? Include 8-digit grid coordinates/GPS of each facility, name of industry, type of industry, and active/inactive. Provide description of facility, processes are present, material used and stored, operating schedule and environmental impacts. Take photos.

North of Site:	
South of Site:	
East of Site:	
West of Site:	

Specific Nearby Industrial Facilities				
Location	Name	Type of Industry	Active	Description

8-digit grid coordinates/ GPS		i.e. power production, petrochemical, agricultural, etc.	Yes ____ No ____	Describe facility, processes present, material used/stored, operating schedule, environmental impacts, etc.

8. Information Sources/Supporting Documents

Document sources of information gathered. Provide summaries of environmental sampling and studies, aerial photos, topographic maps, previous EBS or OEHSA referenced, base camp master plans and other documents reviewed. Document personnel interviewed by providing their name and contact information for verification, if necessary, as well as the name of the interpreter if one was used.

Sources of Information

Who did you talk to/interview? How can they be contacted again? Attach interview notes.

Personnel Contacted

Name	Contact Information	Title	Location
	Address, phone, email, etc		

Other Sources of Information:
Document all source of information received. Provide enough information that the sources may be used by other to verify the information if necessary.
9. Site Reconnaissance Information Completed as part of the analysis of the information gathered during the site reconnaissance.
10. Environmental and Health Sampling Data
Identify sampling requirements; why, where and what needs to be sampled. Provide 8-digit grid coordinates/GPS, a description and a photo, if possible, for all areas to be sampled.
11. Findings and Conclusions Completed after information gathered is analyzed.
12. Justification/Discussion Completed after findings and conclusions have been developed.
13. Recommendations Completed after findings and conclusions have been developed..
14. Classified Data
Enter all classified information that is significant to the report. The classification must be added as a header and footer for EACH PAGE. All classified information will be added in this section as a separate addendum to the report with a reference to its appropriate section number. Classified data must be sent via SIPR net.
Enter classification

Appendix B: EBS Report Format with Instructions

Enter Classification			
NOTE: Do not leave blanks empty. If they do not apply to the current site, enter NA or Nothing Significant to Report (NSTR) to show the section has been investigated.			
1. Administrative Data *Classified information, such as military grid coordinates or details about the mission to be conducted, will be reflected in the body of the EBS report. The S-2/G-2 will determine the overall security classification of the operation, but at a minimum, the addition of grid coordinates make the report Confidential. The header and footer of EACH PAGE of the EBS report will reflect the overall classification of the document. If the information is classified, enter it in Section 14.*			
Location Name:	Official name of the area being surveyed. Name of country, city, township, or area of operation for the site location.		
Location Aliases:	Other names the area is currently or was previously known as.		
Start Date and Time:	Applicable to survey completion.	End Date:	
Organization Conducting Survey:	Organization or activity with responsibility for conducting the EBS.		
Surveyor's Name, Rank/Grade/Title:			
Surveyor's Phone:			
Surveyor's Email:			

Geographic location:

The 8-digit military grid coordinates and/or GPS are mandatory for the site using the center of the camp for reference. Coordinates may also be taken from outside corners of the site to provide site boundaries. ***The 8-digit grid coordinates will always include the 3 character zone designator and the 2 character grid square identifier.***

Note: this information may be classified. Enter classified information in section 14 only.

Coordinate 1:		Coordinate 2:	
Coordinate 3:		Coordinate 4:	
Notes:	Enter notes associated with the geographic location, i.e. the datum associated with the location, map type, map number, GPS used, etc.		

2. Executive Summary

Provide a broad overview of the findings regarding the location where the survey was conducted. Make general recommendations to be considered regarding controls or actions that should be addressed. Support these recommendations with survey findings. Highlight key findings, areas that are off limits and areas that require further testing. Include general comments regarding sampling, additional testing conducted and related items considered as recommendations were developed. This is a synopsis of significant findings, conclusions and recommendations based on the data analysis with the ultimate recommendation being to use or not use the site.

3. Introduction

Provide the scope of the mission, the purpose of the survey, references used to prepare the survey and report, describe any limitations that were experienced during the execution of the EBS and any assumptions used.

4. Site Characteristics

Location:	Provide a general description of the site that includes a detailed description of the site location, organization designated to occupy the site, population and rotation information if not classified,

	and the location's 8-digit military grid coordinates/GPS. Include supporting information.
Site and Vicinity Characteristics:	Provide a description of the physical setting, topography, geology, weather/climate, soil types, vegetation, groundwater, surface water, hydrology, wetlands, flood zones, coastal zones, and available raw materials.
5.Detailed Site Description *Make a detailed sketch or map overlay of the site, noting the areas of significance including the date, the surveyor's name and unit, a north arrow, scale and legend. Take photos; include grid coordinates/GPS and description of both the area and reason for taking the photo.* ***Note: Everything examined in this section for the site must also be examined for all adjacent property and documented in Section 7 below.***	
Infrastructure:	Describe structures: their use (current/past), HVAC, building materials, condition/damage, electrical, water and sewer capability. Note any chemical-type or strange odors, evidence of HM or spills, evidence of pest infestation. Describe the roads and parking areas: paved, gravel, or dirt. Describe power generation/electrical hazards. Note transformers, substations, and power lines present. Document leaking transformers, grid coordinates/GPS. Attach a map or sketch and photos.
Contractor Services:	What services are currently available? Evidence of past services?
Drinking Water Sources:	Describe water sources on site: municipal, wells, surface water. Describe water treatment and distribution systems.
Hazardous Materials:	Describe storage areas and containers (number, size, volume, condition, contents, secondary containment), POL distribution points, areas where spills may have occurred.
Solid Waste:	General description of solid waste disposal practices. Describe whether burn pits, recycling, composting, landfills, or incinerators are used. Note any signs of dumping and determine what might have been dumped. Take photos, grid coordinates/GPS.

Hazardous Waste:	General description of hazardous waste disposal practices. Note any signs of dumping and determine what might have been dumped. Take photos, grid coordinates/GPS.
Medical Waste:	Document the type and source of medical waste and disposal methods used. Provide contractor information if available.
Wastewater:	What are the sources/types? How is it collected, treated, discharged or disposed?
Radiological Waste:	Document suspected radiological waste sources.
Historic/Cultural Resources:	Take photos and note the location using grid coordinates/GPS. Note the areas of significance on the site sketch or map overlay. Describe the general surface appearance and disturbances such as irregular holes and trenches from vandalism/looting or regular emplacements from recent military or other use. Provide impact assessment from checklist criteria. Also identify parks, forest or animal preserves and recreational areas on or near the site. **Note: If it is determined that the historical/cultural resource must be protected to prevent damage or looting by "pot-hunters" or black market antiquities dealers, it is likely that documentation of the site should be annotated in Section 14 as classified information.**
Endangered Species / Habitats:	Identify all endangered species or sensitive habitats that could be in or around the site. Document the presence of endangered species in the area that could be affected by the mission or occupation. Identify habitat areas using grid coordinates/GPS. Note the areas of significance on the site sketch or map overlay. Document the existence of any environmental controls or restrictions already in place. Provide impact assessment from checklist criteria.
Noise:	Document sources of noise that have an environmental impact.

Air Quality:	Document sources that impact either ambient or indoor air quality.
Local Disease / Health Factors:	List diseases prevalent in the area with known causes and/or vectors. Describe pest management and field sanitation measures.
Other Environmental Concerns:	Anything that does not fit in the above sections.

6.Site Use

Describe the current and historical use of the site.

7. Adjacent Property Use

Describe the current and historical use of adjoining properties. Document agricultural (types of crops grown, pesticide application, water usage), animal ranching/herding and industrial activities. Everything that was investigated for the proposed base camp location must also be investigated and documented for the adjacent properties.

8. Information Sources/Supporting Documents

Document all sources of information used even if they reveal no findings. Include reference material generated through the records review, interviews and satellite imagery or aerial photographs, etc. Note the source used, the date the information was last updated, names of persons interviewed, the interpreter if one was used and any other information needed to validate sources.

9. Site Reconnaissance Information

Background:	Provide background information of location selected for occupation, the mission to be conducted and why the site was selected.
Detailed Site Analysis:	Provide detailed analysis of information gathered which includes but is not limited to: the presence of animals and insects; potential radioactive sources both past and present; hazards and health risks identified on and offsite; environmental hazards identified on and offsite;

	waste disposal activities both current and historical with any plans for improvements or changes; agricultural implications specific to the site and adjacent property; identified environmental and health hazards, current, historical and the potential future; site assessment to include a detailed walk through with building and infrastructure assessments.
Digital Photos Taken:	List photos taken during the site reconnaissance; include dates, locations, a description of the contents of the photos and the appropriate section of the report in which they are cited.

10. Environmental and Health Sampling Data

Sampling and Analysis:	Identify sampling requirements; why, where and what needs to be sampled. Provide grid coordinates/GPS, a description of the area and photos for all areas to be sampled.
Sampling Results and Tables:	The EBS report will remain in DRAFT format until sampling results have been received as they may affect the Findings, Conclusions and Recommendations. Attach the sampling results analysis report with a summary table of sampling results when it is received to finalize the EBS.

11. Findings and Conclusions

Findings are the facts uncovered during the course of the assessment. Identify environmental conditions that have the potential for significant impact to health or the mission. Identify risks and contamination, the existence of any natural resources, historical/cultural resources, endangered species or sensitive habitat that will be adversely affected by personnel, the mission or occupancy of the area and the extent of the impact.

The report shall include conclusions developed based on the findings with the logic and reasoning used to evaluate the information gathered.

12. Discussion/Justification *(Optional)*

The report may include a discussion section to describe or justify the impact of conclusions based on data collected during the survey.
13. Recommendations
Recommend using or not using the site in question. Recommend courses of action for reducing, mitigating and/or eliminating the potential for environmental threat or health risks. Recommend further investigation and additional assessments required to fully address identified concerns. Identify and recommend controls that can be instituted to address identified concerns where applicable. List and describe any assumptions used with supporting rationale.
14. Classified Information
All classified information will be added in this section as a separate addendum to the report with a reference to its appropriate section number. The classification will be entered as a header and footer to EACH PAGE. This section will be handled with appropriate confidentiality according to its classification.
Enter Classification

Properly conducted, an EBS will document risks and contamination present at sites proposed for base camp construction. Commanders or base planners can make decisions for using the property based on the known risks. The EBS will also document the condition of the property prior to use by US forces and thereby limit US liability for damage or contamination that was not due to US operations. The thorough investigation of the property's current and past use will identify areas needing further investigation. A sampling plan will detail the areas sampled for more in-depth study and determine the extent of contamination. The EBS must be updated using the Environmental Conditions Report as circumstances change, i.e. the camp grows or shrinks, new environmental concerns are identified or previously identified areas of concern are further investigated/cleaned up. An Environmental Site Closure Survey and Report must be complete prior base camp closure. The Environmental Site Closure Report is just as important as the EBS because it documents the environmental condition of the site at base closure and shows any changes from since the EBS.

The EBS and OEHSA are snapshots in time of the conditions of the piece of property under consideration for occupation. Make sure the picture is clear and complete. Appendix D contains a list of points of contact (POCs) for more information concerning these surveys. This list will also help you coordinate efforts to prevent redundancy during actual surveys.

The completed EBS shall be maintained on site, a copy shall be forwarded to the next higher headquarters for both informational purposes and to be archived in the database for environmental information, as determined by the Theater Command. A copy may be uploaded for archival to the USAPHC Military Environmental Surveillance Library (MESL) at:

NIPRNET Web: https://mesl.apgea.army.mil/mesl/
SIPRNET Web: https://mesl.csd.disa.smil.mil/mesl/

Or emailed to:

Unclassified –oehs.data@us.army.mil

Classified – oehs@usaphc.army.smil.mil

Uploading documents to the website is the preferred method of submission, however, this requires an account to access. Emailing the documents does not require an account.

Unclassified			
1. Administrative Data			
Location Name:	Desert Location #1		
Location Aliases:	None.		
Start Date and Time:	June 6, 2003, 0800	End Date:	June 11, 2003
Organization Conducting Survey:	251 RAOC		
Surveyor's Name, Rank/Grade/Title:	1LT John Doe		
Surveyor's Phone:	555-1111		
Surveyor's Email:	john.doe@us.army.mil		
Geographic location: **All grid coordinates have been removed from this example.**			
Coordinate 1:	See section 14.	Coordinate 2:	UNK
Coordinate 3:	UNK	Coordinate 4:	UNK
Notes:	Coordinates taken from center point of camp.		
2. Executive Summary			

This site was previously used as a Desert air base. The buildings and infrastructure are in good shape and can be safely used by troops. Past waste disposal/storage areas are not heavily contaminated. Areas of POL spills should be addressed within a reasonable amount of time after occupation. Unexploded ordnance (UXO) removal is a priority and one building contains an unidentified radiation source. It is currently shielded and the building is off limits and guarded. This will need proper disposal by trained personnel. Amounts of lead paint or asbestos containing material (ACM) in existing buildings is unknown. The waste water sewage treatment plant is on line, but if power is lost, wastewater floods a nearby wadi. Alternative plans should be in place should power be lost to contain wastewater.

Overall, the site is suitable for use by personnel. Continued monitoring and clean up will be required.

3. Introduction

This site will act as a major base for the Third Armored Cavalry Regiment and attached units. In addition, forward elements of the 142 CSB are staged at the base. Use of the base will include: aviation operations and maintenance, medical, supply, maintenance, and engineering missions.

4. Site Characteristics

Location:	Desert location #1 was in use as an air base prior to hostilities in January 2003. The site includes over 200 buildings (housing, workshops, infrastructure areas, hangars, ammunition supply points (ASP), and recreational facilities). The base is centered on grid (grid coordinates). Over 80% of the base has power and water. The

	buildings require some maintenance but are structurally sound. There was wide scale vandalism and petty theft after property seizure by coalition forces. There are currently no designated training areas. The adjacent property is almost entirely vacant desert. To the north of the fence line there appears to be the remains of a battalion infantry fighting position. To the west and south, there are two quarries and a sand quarry. None are in use. To the east-northeast lies the basin of the desert wadi, which has sparse vegetation and is used as grazing land for sheep. The Third Armored Cavalry Regiment and attached units will be housed on the base. Currently the 4th Squadron (AVN) and the Support Squadron plus elements of the 122 Engineer Battalion is onsite. The forward elements of the 142 CSB are staged at the base, too.
Site and Vicinity Characteristics:	The airbase is located in the desert. The surrounding area is mostly desert with many deeply cut wadis running west to east. The soils are sandy and two former sand quarries are located to the west and south. Sedimentary rock is found in the area. A topographic map is attached to this report. There is sparse vegetation used for grazing in the basin of the Al Asad wadi. The land is rugged and barren for the most part. Grazing areas to the east are in good shape and not subject to over grazing any time soon. The wadis fill during the rains, but no other surface water is located near the air base and no past flooding is noted. A fresh water stream was noted at (grid coordinates) during the site

	reconnaissance.
5. Detailed Site Description	
Infrastructure:	Various types of structures are present on the site. These include aircraft hangers, ASPs, maintenance facilities, industrial, administrative, and housing. i. Aircraft Hangers: Metal frame construction with a few hardened concrete shelters. They are generally in good condition and include some internal maintenance facilities. Most of the supporting light, water, and HVAC systems are intact and require minimal repair effort. There is no evidence of asbestos, but there are POL and solvent spills and some POL storage. One hardened shelter was destroyed and there is explosive and aircraft fuel residue remaining on the site. PCBs may be a hazard in the electrical systems. ii. Ammunition Storage Bunkers: There are multiple above ground storage bunkers. Several of these were damaged or destroyed and there is a large quantity of UXO in the area. This area should be secured and access limited to prevent injury. The bunkers were not closely inspected due to the UXO presence. iii. Maintenance Facilities: Present for aircraft and vehicle services. Most of the facilities are in good structural condition. However, they were heavily looted. Lighting, water, and HVAC equipment will need to be replaced. There is evidence of POL spills. POL and cleaning

	solvents are stored onsite. Some storage barrels are in poor condition and there are multiple unmarked waste barrels. In some buildings, the electrical wires are frayed and exposed. This will present shock hazards. One wash rack was discovered and is still operational, however, there is no oil/water separator. iv. Industrial Sites: Sites servicing the air base are generally in good condition. The waste water plant appears to be operational once power can be restored. Electrical transmission systems are largely intact and the base power station is still in good condition. Electrical distribution systems have been looted, and many power lines have been left hanging. There are power transformers lying on the ground. The physical integrity of the buildings is generally good and there were few environmental hazards noted. v. Administrative/Housing Areas: These areas were heavily looted. Water and electrical systems are questionable. Some housing areas still have functioning shower and toilet facilities. The buildings do not appear to have any HM. One dining facility shows rodent infestation and there is a large quantity of spoiled food in the freezer units. Non-functioning ventilation systems may present a health hazard in some structures. Possible cleaning solvents were located in some storage rooms. Most of the structures did not appear to be damaged. The damage noted was limited to some hangers and ammunition storage bunkers. There was extensive looting to many structures, in particular to the administrative and housing buildings. This damage presents some safety hazards, but is generally manageable and does

	not present any significant environmental hazards. The fuel storage and distribution facilities appear to be in good condition with little evidence of leakage. HVAC Systems: The heating system uses hot water (not steam) and the power source is fuel oil. Throughout the base, the roads are paved and in generally good condition. There are traffic circles located on the base to control some intersections. Most other intersections are not marked, so traffic control for safety will need to be established. Roads are narrow and may not support heavy or tracked vehicles for extended periods of time. The external perimeter roads are largely gravel and there is some evidence of POL being used for dust suppression.
Contractor Services:	None apparent.
Drinking Water Sources:	A water treatment facility is located outside the base perimeter. Water supply lines were repaired after a Mujahadeen attack. The piping is 10" ductile steel pipes without any lead joints. No significant rust was noted. Water samples have been taken and results are attached to this report.
Hazardous Materials:	Several storage sites were found on the base. A gas plant (compressor and separator for compressed air) is located at (grid coordinates) and has 200-300 bottles onsite plus a storage tower for oxygen and a nitrogen tank. Five tanks for aviation gas storage and processing estimated to hold 10,000 gallons each are onsite. Six above ground tanks are located onsite (grid coordinates) and nine USTs (grid coordinates) holding diesel fuel and benzene. One Class III bulk site 10-20k gallon fuel tank was also found (grid coordinates).

	Drum storage was also located on the base. Eight drums of lube oil and hydraulic fluid were located in a maintenance area (grid coordinates) and 200-300 drums of lube oil, hydraulic fluid, and antifreeze were in Class III storage area (grid coordinates). There was no indication of pesticide/herbicide use. Potential PCB in electrical equipment. Some indicators of spills were found at the water treatment plant (oily waste in basins) (grid coordinates), the aviation gas substation (grid coordinates) has a control valve that will not shut completely so there is an ongoing “trickle” leak. Small spills were noted at the maintenance area (grid coordinates), benzene tanks (grid coordinates), and the power bunker fuel area (grid coordinates).
Solid Waste:	A dump area was identified at (grid coordinates). The dump was covered so the types of solid waste contained could not be determined.
Hazardous Waste:	No areas where HW was stored were noted during this survey.
Medical Waste:	None Identified.
Wastewater:	A treatment facility is functional and operating. The sewage plant is located at grid location (grid coordinates). Processed sewage or overflow (when the plant is not operating) empties into the Al Asad wadi. Two sumps, three catch basins, and four dry wells are in use.
Radiological Waste:	A radiation hazard was noted at (grid coordinates) showing a level of 104 micro-grays on the dosimeter outside of shielding. The shielding was not opened and will not be until trained personnel and PPE are available to determine material

	contained in the shielded container.
Historic/Cultural Resources:	A mosque (grid coordinates) and graveyard (grid coordinates) were located on the base.
Endangered Species / Habitats:	No endangered species or sensitive habitats were noted on the site.
Noise:	No environmental noise was identified. The area was previously used as an airbase and no endangered species or sensitive habitats were noted that could be affected.
Air Quality:	It is a desert environment. No problems were noted with ambient air quality outside of the buildings during the site reconnaissance. The indoor air quality will be determined by preventive medicine personnel who were conducting the OEHSA as the EBS was being conducted.
Local Disease / Health Factors:	There are poisonous spiders and snakes in the area.
Other Environmental Concerns:	None Identified.

6. Site Use

The site's current and past use was as an air base. All structures were constructed for this purpose and the buildings appear to be used for their original purposes. The only noted exception was one hanger that appears to be used for POL and waste material storage.

7. Adjacent Property Use

Two quarries are located to the west and south of the base. These quarries are estimated to have been used in support of construction of the base. The roads between the base and the quarries are in good condition and appear to be able to support the use of heavy equipment during wet weather. Neither of the quarries is currently in use. The remainder is desert.

8. Information Sources/Supporting Documents

Several Desert technicians/engineers were employed to get power, water, and water treatment facilities operational. They were interviewed for information about the air base and past operations. The names, addresses and job titles of these locals are as follows:

a: Xxx

b: Xxx

c: Xxx

d: Xxx

e: Xxx

Further information was obtained from partial records found onsite. Some records had been destroyed, but receipts of products used onsite were found, indicating the types and quantities used in the past.

9. Site Reconnaissance Information

Background:	The occupation site was selected based on location and prior use. The site was previously used as an airbase by the Desert Air Force. Currently, coalition forces are using the site for staging of forces and aviation operations/maintenance. Future use may include desert training.
Detailed Site Analysis:	Presence of Animals: Animals present on the site include: rodents, feral dogs and cats, pit vipers (poisonous), camel spiders, unidentified large lizards, and bats. Radiological Sources: A potential source of radiation was found in building XX. A source of some sort was found in protective shielding and the readings outside this shielding suggest high levels of radiation. Outside the shielding container dosimeter readings indicated 104 micro-grays continuous dose. The building is closed to personnel using concertina wire and an armed guard. Analysis by specially trained personnel is pending. No other areas of concern were found. Hazards and Health Risks: Location of proposed bed-down areas has been chosen to ensure personnel are not in contact with any areas of concern. Most areas where past spills occurred contained minimal material and does not pose an immediate hazard to personnel or equipment. The building containing the unidentified radioactive source has been secured. Water sources have been and continue to be tested. Areas of HM storage have been secured. A trash dump was located onsite and is posted. No indications of HM storage were found onsite. PCBs are assumed but no leaks have been detected. There appears to be no ACM onsite, but care will be taken with any removal of floor tiles, roofing

	materials, or pipe insulation. Air quality concerns are the power bunker which uses diesel generators and trash burning at the dump site. No other industrial sites are nearby that impact air quality. The quarries located offsite are no longer in use. Environmental Hazards: Main hazards identified include some areas of past spills of POL, the existing trash dump, wastewater disposal if sewage plant is not operational (past spillage in the wadi), gas plant storage, UXO, and earthen revetments containing armored vehicles pose a fuel/oil spill risk. Some areas indicate POL has been used as a dust suppressant. Waste Disposal: A covered solid waste trash dump is located onsite. Currently, trash is being burned at this site. There was no evidence of HM storage onsite and records indicate HM were removed by a contractor for reuse or proper disposal if determined to be a HW. Current occupation has benefited the environment, since many dangers have been eliminated and forces have repaired critical waste handling infrastructures. Agricultural Implications: No agricultural activities occur onsite or nearby other than some livestock grazing in the wadi areas. No evidence of pesticide/herbicide use was found. Identified Environmental/Health Hazards: Historical hazards identified include spilled POL in maintenance areas, sewage overflow in the wadis, waste and debris throughout the base, and unknown material disposed of in the trash dump. Past use of POL as a dust suppressant is also indicated in some areas. Current risks include all the historical risks plus: the unknown radioactive material in building XX; UXO; abandoned vehicles and aircraft that still contain fuel and present a spill risk; possible PCBs; possible ACM; animals; air

	quality in and around the power bunker and trash dump. The water plant is located outside the base perimeter and, therefore, is a potential target for chemical or biological contamination. Site Assessment Walk Through: See attached map for building locations and cross reference for building identification. 1. Building XX: Contains an unidentified radioactive source. This building is secured with a guard in place. 2. Aircraft Hangar: The building was destroyed and explosive and aircraft fuel residue remain onsite. 3. Ammunition Storage Bunkers 1, 2, & 3 have limited access and are secured to prevent injury. 4. Housing: Barracks #5 was damaged during looting. Building appears to be approximately 20 years old. ACM is assumed to be present but has not been analytically verified. 5. Maintenance: Area 10 has evidence of POL spills and storage of HM onsite. Electrical wiring was frayed and exposed. Structural integrity appears sound. Unknown age of building. 6. Damages: A road in the northwest quadrant will need repairs. Most roads will not handle the weight of heavy equipment or tracked vehicles. Roads are very narrow with no traffic control for safety.
Digital Photos	A list of the photos with identifying markings is attached.

Taken:	

10. Environmental and Health Sampling Data

Sampling and Analysis:	Careful coordination with USAPHC medical personnel was conducted prior to site occupation. Water, air, and soil samples were taken by medical personnel for analysis and a copy of the lab results are attached to this report. Drinking water is currently adequate for personnel. No areas where spills were evident indicated high levels of contamination. No surface water is onsite currently (during rains the wadis will have water flowing through). Air monitoring indicated workers near the power bunker or trash burn area will require respiratory protection immediately. No sampling analysis plan was required due to coordination with USAPHC. A copy of their sampling plan is included in this report.
Sampling Results and Tables:	The USAPHC report is attached.

11. Findings and Conclusions

Overall, the site is in good condition. The existing infrastructure is in good shape and past waste disposal/storage areas do not indicate excessive contamination. UXO removal addressing the radioactive source in building XX is a priority. Areas of POL spills should be addressed within a reasonable amount of time after occupation. Buildings are currently suitable for use by personnel although care should be taken if any construction/remodeling occur due to unknown hazards such as ACM or lead paint. Alternative plans should be developed for waste removal if the sewage treatment plant is off line for any length of time.

12. Discussion/Justification *(Optional)*

None.

13. Recommendations

The site is currently being used for staging and aviation operations. This site is a former Desert air base and is suitable for use by troops. Further investigation will be needed to identify and properly dispose of the radioactive source in building XX. Additional work may be required to maintain the sewage treatment plant. Continuous monitoring of the water supply will also be required as the plant is outside the perimeter of the existing base. Testing for the presence of asbestos containing material and lead-based paint should be conducted before any construction or building modification is completed to reduce worker exposure. All electrical transformers should be tested for the presence of PCBs before maintenance or repair is conducted. Air monitoring at the power bunker and burn pit should be regularly conducted to ensure a safe environment for personnel working in these areas and determine the need for PPE or engineering controls. Potential future risks can be minimized by proper clean up and disposal of past spills and waste and continued control and maintenance of current HM/HW. Risks from animals and pests will need to be addressed.

14. Classified Information

Grid coordinates have been redacted.

Unclassified

Appendix D: Points of Contact

The following points of contact can provide more information expert advice and support:

- Convention on International Trade in Endangered Species of Wild Flora and Fauna, www.cites.org
- Theater Army Medical Lab (TAML) now Area Medical Lab (AML), http://www.armymedicine.army.mil/about/tl/95-factstamlab.htm,
- US Army Corps of Engineers, USACE, www.usace.army.mil 202-528-4285.
- US Army Public Health Command (USAPHC), http://phc.amedd.army.mil/Pages/default.aspx 800-222-9698.
- US Army Chemical Biological, Radiological and Nuclear School, USACBRNS, www.wood.army.mil/usacmls 573-563-6126.
- Construction Engineering Research Laboratory, CERL, www.cecer.army.mil 800-872-2375, ext. 6729.
- Engineer Research and Development Center, ERDC, www.erdc.usace.army.mil 202-528-4285.
- US Army Engineer School, Directorate of Environmental Integration, www.wood.army.mil/usaes/DEI.html 573-563-3816.

Appendix E: Sampling Protocols and Equipment Needed

Selecting sampling parameters to focus the study is a significant step in developing the sampling action plan (SAP). The plan will define where the samples will be taken, how many are to be taken, the method of sampling to be used, it will determine the substrate to be sampled, i.e. air, water, soil, etc. and specifically for what the samples will be analyzed. The sampling plan should provide justification for the number, type, and location of samples needed. If performing an initial survey and records do not indicate specific types of material concerns, testing will need to be performed for a broad list of compounds. If the records review or the site reconnaissance provides documentation of the use of HM or existing contamination, the sampling and analysis will focus on these compounds. Coordinate with the USAPHC Deployment Environmental Surveillance Program (DESP) or Preventative Medicine (PM) personnel to ensure that sampling equipment will be available in the area of operations (AO). If proper coordination is conducted with PM personnel or USAPHC, they will develop the sampling plan, collect the samples, conduct the analyses and provide the results. Sharing information will reduce duplication of effort and cost. USAPHC has developed environmental sampling kits to be used during deployment. USAPHC TG 317 outlines sampling methods and provides a SAP Worksheet at Appendix C.

Sampling activities need to be documented. The required documentation shall include a SAP; sampling data, laboratory analyses and results; site maps and drawings showing where samples were taken; and the documentation of the sampling data evaluation as described in Chapter 4 of TG 317. All of these documents will be required as supporting documentation for the EBS. Additional documentation that may be needed as reference material are photographs, log books, military service-specific sampling data forms, instrumentation calibration logs, instrument maintenance records and the lab generated sample analysis results that are the basis of the sampling data evaluation.

Determine the sampling locations based on existing site conditions or suspected material use and consider the following:

- Potential exposure to deployed forces. Choose locations with the highest probability of exposure.

- Size of the area to be sampled.
- Number of sampling locations from which samples will be required to determine the site condition.
- Sampling scheme to be used – simple random, systematic random, judgment sampling, or a combination of all the schemes.
- The total number of samples that will need to be taken.

Determine if sampling has already been performed by PM or USAPHCM personnel. Mapping the geographical locations where samples are taken is required for survey documentation. Use the 8-digit military grid coordinates including the zone designator and square identifier and/or GPS. As a part of the water sampling, coordination will need to be conducted with the Reverse Osmosis Water Purification Unit (ROWPU) operator.

PM personnel may have sampling kits to identify contaminants in different media. If medical personnel have sampled the media, use their data in the EBS. If industrial facility emissions or other concerns exist that could produce respiratory risk for personnel onsite or located near the proposed site, air sampling may be required. Determine what personal protective equipment (PPE) is necessary for the sampling based on the initial review of the site and area to be sampled. This chapter contains a list of equipment needed.

Personal Protective Equipment

The following supplies are necessary for personnel collecting samples:

- Nitrile gloves
- Eye protection (safety glasses and/or goggles)
- Tyvek suits- disposable
- Spill kits

- Respirators/dust masks (provide both but respirators must be fit tested to ensure they will protect personnel prior to use)

- Hearing protection

For information regarding PPE and nuclear, biological and chemical (NBC) protection during warfighter operations, refer to FM 3-11.4, Multiservice Tactics, Techniques and Procedures for NBC Protection.

Figure E-1: Deployment Soil Sampling Kit

Soil Sampling

For more complete instructions regarding taking soil samples, refer to USAPHC TG 317. If using the USAPHC Environmental Sampling Kit, instructions are included. Avoid excavating or disturbing unknown substances where operationally possible and wear PPE if disturbance or excavation of a contaminated area is necessary.

At a minimum, the following equipment is needed to collect soil samples:

- 12oz. Teflon Jars (labeled) with lids sufficient for the number of samples to be collected
- Chain-of-custody seals (or use tape and write the date and sample type then place over sealed sample container opening)
- Nitrile gloves
- Permanent marker
- Stainless steel scoop
- Soil sampling stainless steel bowl (1-1/2 quart)
- Detergent for cleaning bowl and scoop
- Wipes/brush/plastic bags
- Soil Field Data Sheets
- Water (bottled or tap and de-ionized)
- Cooler for shipping samples
- Freezer packs
- Tape to seal cooler

Soil sample collection types fall into three categories: discrete, composite, and sampling for Volatile Organic Compounds (VOCs). Soil samples are generally taken at a sample interval of six inches in depth from the soil surface.

Soil Sample Definitions

Discrete	Collect this sample from a single point to characterize the soil conditions at a specific location. This type of sample should be collected from areas where a chemical spill has occurred and is isolated to a small area.

Composite This sample type is a mixture of multiple samples collected from a defined area. Composite samples are collected to characterize contaminants in soil in an area that may or may not be contaminated. Multiple composite samples are collected from the sampling location, mixed in a large stainless steel bowl, and combined into one sample.

Volatile Organic Compounds This type of sampling requires that coordination in advance with the laboratory to get special containers before samples are collected. Collect only discrete samples for VOC analysis. Place the sample directly into the appropriate sample container with minimum agitation, aeration, or mixing.

Note: Collect VOC samples from the bottom of the sample interval (e.g. 6 inches below ground).

Split Sample Collection Procedures

Split samples are QA/QC samples. They are typically collected between 5-10 percent of the total number of samples taken. As a rule of thumb, for every 15 samples collected from each sample grid, collect one split sample. If fewer than 15 samples are taken in a sample grid, collect at least one split sample for that area. This is a blind check of the laboratory. Make sure to record which samples are split samples both on the data sheet and in the logbook. Maintain the logbook with the EBS records.

Step 1. Identify the location to take split sample.

Step 2. Collect twice the volume of soil that would be collected for a normal sample and mix thoroughly.

Step 3. Fill two sample jars, seal tightly, label properly, and place on freezer packs in shipping cooler. **Note: The two samples will get two different sample numbers.**

Equipment Decontamination Procedures

Decontaminate equipment between each sample to limit cross contamination of samples.

Step 1. Use approximately one liter of bottled or tap water and ½ spoonful of detergent to make a cleaning solution in a five-gallon bucket. If a bucket is not available, fill a mixing bowl with one inch of water and ¼ spoonful of detergent.

Step 2. Knock off as much of the soil from the equipment to be decontaminated as possible.

Step 3. Clean with the detergent solution using a brush, if necessary, to remove particulate matter and surface films.

Step 4. Rinse thoroughly with bottled or tap water.

Step 5. Rinse thoroughly with de-ionized water.

For more information regarding decontamination procedures refer to FM 3-11.5, Multiservice Tactics, Techniques and Procedures for CBRN Decontamination.

Collection Procedures

Follow the protocol below to acquire soil samples for lab analysis.

Step 1. Identify the sample site.

Step 2. Remove the "Soil Field Data Sheet" that is provided with the USAPHC Sampling Kit.

Step 3. Record the following information on the data sheet:

- Sample ID - a unique number (maintain a sample number logbook to control the integrity of the sample ID's assigned and to match up results with the correct samples.)

- Sampling date

- Sampling time
- Collector's name
- Collector's contact information
- Temperature/weather conditions
- Sample type
- Collection type
- Sampling site map with 8-digit military grid coordinates including the zone designator and square identifier and/or GPS.

Step 4. Put on gloves and remove wipes from plastic bag.

Step 5. Unfold wipe and place sampling equipment on the wipe.

Step 6. Use sample scoop to collect soil. The sample will be taken no deeper than 6 inches from the surface. Remove pebbles, roots, etc. from the mixture as the sample is collected.

Step 7. Discrete samples should provide enough soil to fill the mixing bowl. **Note: If the discrete sample is for VOC, place the sample directly into the appropriate sample jar with minimum agitation, aeration, or mixing and proceed to Step 12.**

Composite samples are collected by placing equal amounts (or aliquots) of soil collected from multiple locations into the stainless steel mixing bowl.

Step 8. Once the bowl has been filled with the soil sample(s), mix the contents using the sampling scoop until completely homogenized. Remove any remaining pebbles, roots, organic material, etc.

Step 9. Fill the sample jar about a third full and compact the soil using the sampling scoop.

Step 10. Fill another third and compact again.

Step 11. Fill the remaining space in the jar with soil and compact. Leave no empty space at the top.

Step 12. Clean any soil from the threads at the top of the jar and secure the lid tightly.

Step 13. Complete the label on the sampling jar.

Step 14. Decontaminate the sampling equipment before collecting the next soil sample.

Step 15. Repeat the sample collection steps for additional samples and collect a split sample for every 15 soil samples.

Figure E-2: Soil Sample Collection

Packing Soil Samples

Step 1. Ensure all jars are labeled correctly and accurately and lids are tightly closed.

Step 2. Place the sample jars in foam insert, enclose in a large plastic bag and seal it with a tie. The samples should be maintained at a temperature of between 4-6 degrees Celsius. Put the samples in the cooler with frozen freezer packs. **Note: Do not use dry ice.** Include the Soil Field Data Sheet in the cooler with the samples in its own sealed plastic bag.

Step 3. Seal and secure the cooler with tape.

Step 4. Ship the samples to the lab conducting the analysis. Include a copy of the following permits and forms, available from USACHPPM, Dept. of Agriculture and Environmental Protection Agency (EPA), with the samples:

- Soil Importation Permit
- Soil Importation Compliance Agreement
- TSCA certification signed by sample collector
- Plant Protection and Quarantine Form 550

Note: These permits and the supporting documentation help the samples clear customs upon arrival into the US. They will be included with the USAPHC Sampling Kit. If USAPHC is not being used for the sampling analysis, the lab contracted to do the work will have their own procedures and will provide the appropriate paperwork and guidance.

Samples taken will only be viable for the lab to acquire accurate results for a specific period of time. These timeframes are referred to as holding times. Maintaining the temperature as well as adhering to the holding times is important; therefore, the samples must be transported from the field and sent as soon as possible to the labs conducting the analysis. Use commercial or military shipping arranged well in advance of the time the samples will need to be shipped.

Potable Water Sampling

More specialized equipment/sample containers will be required for water samples. Water sampling must be planned for prior to deployment or coordinated with USAPHC. Deployment kits are available and contain the correct number of sample containers.

Note: Deployment water sampling kits have a shelf life of six months. Return empty containers to USAPHC if not used within the 6 month timeframe.

ROWPU operators may also have data on water quality that can be included in the survey results. At a minimum, the following equipment is required:

- 16x40 ml glass containers Methylene-Blue active substances (MBAS), Tritium, Chloride, Fluoride, Sulfate, Total Organic Content (TOC), Nitrate/Nitrite, Semi-volatile organic compounds (SVOC), VOC, Cyanide, Ammonia, total phosphate, Diquat/Paraquat, Glyphosate/Carbamates, Herbicides, Insecticides, Ethylene dibromide (EDB)/Dibromochloropropane (DBCP), and Endothall
- 7x125 ml glass containers (Metals, Gross Alpha/Beta, Alkalinity, pH, Color, Conductivity, Total dissolved solids – (TDS)
- 4 Blanks-40 ml glass containers (SVOC, VOC, Diquat/Paraquat, EDB/DBCP)
- Sample vial configuration chart, if available
- Nitrile gloves and towelettes
- Pipettes
- Dropper bottle or ampule of hydrochloric acid (HCl)
- pH paper
- Permanent marker

- Sample pitcher
- Water Sampling Field Data Sheet in plastic sheet
- Cooler to ship samples
- Tape
- If needed, include supplementary radiation sampling bottle and preservative for the bottle

Water Source Definitions

Source Water	Raw water prior to any treatment (well water, surface water, etc.)
Treated Water	Water after it passes through a typical type of treatment such as reverse osmosis water purification unit prior to distribution.
Distribution System	A system for the collection, transmission, storage and movement of water from the source to consumers. Water will be collected at representative points in the distribution system. Representative points are locations in a process where specific conditions can be measured in a manner that accurately reflects the actual condition of the water. In a water distribution system this would be at locations where water is being disbursed, such as pipes, spigots, pumps and storage tanks. Do not sample at the dead end of a distribution line. This is where the waterline actually stops. Taking a sample here could provide false results due to sedimentation and stagnation.

Water Sample Collection Procedures

Sample for all regulated environmental contaminants. PM personnel usually conduct bacterial analysis onsite. There are two types of water sample point configurations: closed source and open source.

A closed water source (municipal system, etc.) is usually accessed through a utility spigot or faucet. To collect a sample, turn the spigot or faucet on and allow the water to run at a moderate flow for three to five minutes. This will clear out the water that has been standing in the plumbing system and allow a sample to be taken from the source or pipe main. To take a sample from the source or pipe main, monitor the temperature. Once the temperature has stabilized, samples can be taken. Collect the samples either in the bottles (if flow will not cause spillage) or in the pitcher for transfer to the bottles.

An open water source (lakes, ponds, rivers) requires only the pitcher be filled and transferred to the sample bottles.

For more complete instructions regarding taking water samples, refer to the Deployment Potable Water Sampling Kit instructions which are provided with the USAPHC Environmental Sampling Kit.

Step 1. Identify the sampling point.

Step 2. Record the required information on the Potable Water Field Data Sheet which is provided in the USAPHC Sampling Kit.

Step 3. Put on Nitrile gloves and remove wipes from the plastic bag.

Step 4. Determine the pH and record it on the Potable Water Field Data Sheet. If the equipment is available, record the temperature, conductivity, total dissolved solids and turbidity.

Step 5. Fill and label all empty containers from the water source. **Note: VOC, Endothall, and Glyphosates have special collection procedures.**

- Remove the sample jar from the foam insert and carefully unscrew the cap. Ensure the cap does not become contaminated by holding it or placing it carefully.

- Fill the sample jar slowly to avoid splashing. Use the sample pitcher or take it directly from the water source.

- Do not overfill the sample jar as this will expel required preservatives and can invalidate the sample.

For filling the VOC, Endothall, and Glyphosates containers, follow these additional steps:

- Collect these samples carefully to avoid the presence of air bubbles. Carefully add sample water to the sample jar until a rounded surface, called a reverse meniscus, is seen at the top, but do not overflow the jar.

  Note: For VOC sample jars ONLY, after the jar is partially filled, add five drops of HCl, then finish filling as stated above to obtain a reverse meniscus.

- Carefully replace the sample jar cap hand tightly. It is normal for some material to be expelled when the cap is tightened.

Step 6. Mix the preservative by inverting the sample jar several times. For the VOC, Endothall, and Glyphosate containers, ensure no air bubbles remain in the sample. To check this, turn the capped container upside down and tap the side lightly to force any bubbles to rise. If bubbles are present, remove the cap and add enough water to remove the headspace.

Step 7. Complete the container label using a permanent marker and allow marking to dry before packing in the shipping container.

Step 8. As part of the QA/QC procedures for the analysis control sample jars, called blanks, are included with the sampling kit. These jars are already set up with the proper chemical additives. Keep the blanks with the sample containers at all times. **Note: Do not open the blanks for any reason.**

Step 9. Package containers back into the cooler that transported them to the site. Make sure all are properly labeled and caps are secured.

Step 10. Place the Potable Water Field Data Sheet in a re-closable plastic bag and put in the cooler with the sample jars.

Step 11. Add freezer packs to cooler. **Note: Do not use dry ice or allow samples to freeze.** Generally samples should be maintained at 2-6 degrees Celsius until they reach the laboratory.

Step 12. Transport samples from the field as soon as possible to ensure holding times are met. Holding times can be as short as seven days. Use commercial or military shipping arranged well in advance of the time the samples will need to be shipped.

Step 13. Seal and secure the cooler with tape and ship to the laboratory.

Air Monitoring

Initially the determination will need to be made if air monitoring is required. Conduct air sampling in areas where odor is present, in buildings that could potentially be used for personnel, around ground surfaces that are discolored, and in areas where flora/fauna are visibly distressed. It is important to be aware that VOC can be affected by temperature. It may not be detected in an area that is cold but can become apparent when the same area is heated for troop billeting or use. If present, VOC can have adverse health effects on Soldiers. Once it is determined there is a need, the type of air monitoring and possible contaminants will dictate the equipment needed. There are many portable and easy to use air monitoring devices available for use during an EBS. Your supply chain should be able to assist with the acquisition of the necessary equipment.

To properly sample air in the area of the site under consideration for occupation, consider the situation and bring the necessary equipment. Personal air monitors may be needed to determine what Soldiers are in contact with during all activities, both on and off duty. Coordinate with PM units for support if individual air monitoring is required. Otherwise, perform general air monitoring of the area and more specific monitoring determined by initial air samples or due to site reconnaissance data.

At a minimum, a photoionization detector (PID) or colorimetric tubes will be needed. The PID is available commercially. Coordinate with USAPHC for sampling equipment or obtain any results medical personnel

may have gathered. A portable air sampler may be needed if particulate matter or total suspended particles is a concern.

Conduct sampling for radiation also. Any readings at 0.1 mR/hr above ground need further investigation including taking soil samples from the area. Use an AN/VDR2 or AN/PDR-77 with beta-gamma probe or equivalent to determine readings for any radioactivity. Also include a pancake Geiger-Mueller (G-M) to detect beta-gamma radiation. However, this instrument will not detect alpha particles. Alpha particles present an inhalation/ingestion problem but not an external exposure problem. If alpha radiation is suspected, use other means of measurement, such as a ZnS scintillator, which detects exclusively alpha contamination.

The following supplies are necessary for air sampling:

- PID with instructions for calibration/operation

- Colorimetric tubes with tubes capable of testing for suspected contaminates (will require assumptions based on available knowledge prior to deployment) and associated pumps

- Portable air sampling unit for particulate matter or total suspended particles if needed

Figure E-3: Example of a Portable PID

PID and Colorimetric Tubes

Most PIDs are portable and easy to use. Refer to the operations manuals for instructions on calibrating and taking readings with the specific PID being used. Generally, turn the machine on and allow it to calibrate to the surrounding air before monitoring areas of suspected contamination. Most PIDs also have extension devices so that readings may be obtained from a safe distance without requiring personnel to enter an area prior to monitoring. PIDs have limitations in identifying compounds. They detect organic vapors and gases and some inorganic gases. Depending on the types of materials identified during the records search, a careful analysis can be made to determine the types of air testing needed.

Colorimetric tubes are not as accurate as PIDs but will indicate if specific compounds are present. The drawback to using colorimetric tubes is that the user must have knowledge of the possible contaminants in the area. The tubes can be used most accurately to confirm the presence of a suspected material. When using colorimetric tubes, perform the following procedures:

Step 1. Select the tube for the specific chemical to be measured; check that the tube is not expired.

Step 2. Break the ends of the tube with the tool provided.

Step 3. Insert the tube into the pump.

Step 4. Pump the required number of times for tube used.

Step 5. If the chemical is present, the tube will change color. The length of the color stain can be read against the scale on the tube to determine concentration.

Temperature and humidity can affect the chemical reaction and some tubes may cross react with other chemicals therefore giving a false positive.

Refer to USAPHC TG 230, Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel or the National Institute for Occupational Safety and Health (NIOSH) pocket

guide for permissible limits once sampling has determined presence of and levels of contaminants.

Sample Shipping Requirements (Soil/Water)

Make sure all samples (soil/water) are labeled “Laboratory Samples (Generic)” and “Property of the US Government.” Some types of samples for specific types of analysis have short holding times so they must be shipped quickly. Generally, samples must be stored at 2-6° Celsius until they reach the laboratory.

Use coolers filled with freezer packs or similar items to maintain the appropriate temperature until the samples reach lab facilities. A military carrier can be used to transport samples from contingency operations. Shipments must comply with all applicable regulations under the Department of Transportation (DOT); therefore, personnel must have a general knowledge of labeling requirements. Shipping companies (i.e. FedEx, DHL) can often help determine the correct shipping name and label requirements.

Additional Equipment

- USAPHC TG 230, and/or the NIOSH guide with equipment to compare readings to permissible limits
- GPS/Geographic Information System (GIS) for documentation of locations and mapping
- Pancake G-M for detecting beta-gamma particles
- Camera (digital is preferred)
- USAPHC sampling backpack, service managed product, contact USAPHC, NSN 6545-00-949-400

Environmental Condition Report [ECR]
REPORT NUMBER: E035

GENERAL INSTRUCTIONS: Use to send periodic information (interim snapshots) of the environmental status of specific sites (assembly areas, base camps, logistical support areas, and medical facilities) where hazards are likely to occur, which can result in significant, immediate and/or long-term effects on the natural environment and/or health of friendly forces and noncombatants. Send IAW unit SOPs and commander's direction.

LINE 1 – DATE AND TIME	(DTG)
LINE 2 – UNIT	(Unit Making Report)
LINE 3 – LOCATION	(UTM or Six-Digit Grid Coordinate With MGRS Grid Zone Designator of Site/Incident)
LINE 4 – DESCRIPTION	(Description of Site/Incident)
LINE 5 – CHANGES	(Changes From Last ECR or EBS
LINE 6 – HAZARDS	(Hazards to Natural Environment, Friendly Forces and/or Civilian Personnel)
LINE 7 – ACTIONS	(Summary of Actions to Minimize Hazards/Remedial Effects)
LINE 8 – UNIT POC	(Reporting Unit Point of Contact)
LINE 9 – ASSISTANCE	(Assistance Required/Requested)
LINE 10 – REFERENCE	(Site-Specific EBS (if required))
LINE 11 – NARRATIVE	(Free Text for Additional Information Required for Clarification of Report)

ENVIRONMENTAL SITE CLOSURE SURVEY

I. Definitions:

a. *Initial Survey:* Any survey conducted by the closing base camp/unit's Environmental Officer and/or the Theater Support Group (TSG) or Major Subordinate Command (MSC) Environmental Staff to determine actions needed for transfer or closures. This survey needs to be completed sufficiently in advance of transfer/closure to allow the identified environmental follow-up items to be completed prior to the actual closure/transfer of the base.

b. *Preliminary Survey:* A survey conducted by the Theater Support Group (TSG) or Major Subordinate Command (MSC) Environmental Staff to identify all environmental closure actions that must be completed prior to the base camp/unit being granted final clearance. A Preliminary Survey is normally scheduled 30 days prior to site closure or transfer.

c. *Final Survey:* Final clearance survey conducted by Theater Support Group or MSC Environmental staff as part of the overall site clearance process.

II. References:

a. FM 21-10, Field Hygiene and Sanitation

b. Overseas Environmental Baseline Guidance Document (OEBGD)

c. Environmental Final Governing Standards (as applicable)

d. Annex L: Environmental to the governing OPLAN (as applicable)

e. Applicable negotiated standards with transfer entity/ receiving host nation.

III. Disposition: Completed surveys will be maintained at the TSG or MSC Environmental Staff for [insert number] years. Copies will be forwarded to the Theater Command Environmental Section NLT [insert number] days after site transfer or closure.

ENVIRONMENTAL SITE CLOSURE SURVEY FORM

1. Site Information

a. Site Name/Designation:

b. Site location (full MGRS or Lat/Long coordinates of site outline/boundary - NOT center of mass):

c. Site Use:

d. Previous Units Assigned to Base:

e. Map Sheet/Series/Edition/Scale:

f. Type of Survey - **I**nternal, **P**reliminary or **F**inal (**I / P / F**) (circle one)

g. Clearing Base Camp/Unit:

h. BaseCamp/Unit Environmental Officer (full name, rank and

duty position):

i. Phone Number:

j. DTG of Survey:

k. Name, Rank and Duty Position of Surveyor(s):

l. Unit/Organization Of Surveyor:

m. Final Environmental Clearance Granted? (Yes or No):

n. DTG Final Clearance Granted:

o. Signature Of Surveyor Granting Final Clearance:

Survey Item Checklist *(The checklist items for each level of the survey are indicated with an I for initial, P for preliminary, and F for final. Personnel conducting the survey should circle the appropriate letter for the level of survey they are completing.)*

2. Survey Items *(Surveyor(s) should be as descriptive as possible to ensure information is complete.)*

a. Unit Operations

(1) (**I/P/F**) List the name of the assigned unit/organization Environmental Officer.

(2) (**I/P**) Has the unit/organization prepared environmental records and documentation to include EBS, ECRs, turn-in documentation, and spill reports for archiving by the theater-level command?

(3) (**I/P/F**) Has the unit/organization worked with contracting officers to close out any environmental-related contracts or have plans in place to close out contracts?

(4) **(I/P/F)** Has the unit/organization provided training materials and manuals for any environmental-related equipment that will be left for the receiving organization/host nation?

(5) (**I/P/F**) Does the unit know the Environmental POCs at the TSG or MSC level?

b. Medical Waste

(1) (**I/P/F**) Does the unit/activity operate a medical treatment facility that generates or requires storage of medical waste? (If no, a Medical Waste Survey is not required.)

(2) (**I/P/F**) Do medical, personnel know the procedures for turn-in of medical waste and MSC or TSG turn-in POCs?

(3) (**I/P/F**) Has medical waste been red-bagged and prepared for turn-in?

(4) (**F**) Has all medical waste been removed from the site?

(5) (**P/F**) What are the grid coordinates for the Field Aid Station(s) or Combat Support Hospital?

(6) (**F**) Provide/attach post-clearance digital photographs of the site.

c. Hazardous Waste

(1) (**I/P/F**) Does the unit/activity conduct any activity that generates or requires storage of hazardous waste? (If no, a Hazardous Waste Survey is not required.)

(2) **(I/P/F)** Does the unit/activity have any hazardous waste tanks/drums? Are they in secondary containment?

(3) (**I/P/F**) Does the unit/activity have a working Spill Response Plan?

(4) (**I/P/F**) Are UN-approved containers being used for hazardous waste storage?

(5) (**I/P/F**) Are enough UN-approved containers on hand to meet actual and anticipated need?

If no, has unit ordered sufficient containers?

(6) (**I/P/F**) Are containers being properly labeled and prepared for turn-in?

(7) (**I/P/F**) Are placards on hand for marking vehicles during transportation of waste?

(8) (**I/P/F**) Has used (contaminated) spill response equipment been collected and containerized?

(9) (**I/P/F**) Does the unit know where bulk turn-in points are for used POL and anti-freeze?

(10) (**I/P/F**) Has a turn-in date and time been established? If yes, note date and time here:

(11) (**I/P/F**) Have all spills in the Hazardous Waste Storage Area (HWSA) been cleaned up?

(12) (**F**) Are the Hazardous Waste Accumulation Points (HWAP) locations clean and clear of all materials?

(13) (**F**) Is the Hazardous Waste Storage Area (HWSA) location clean and clear of all materials?

(14) (**I/P/F**) What are the grid coordinates for the HWAPs?

(15) (**I/P/F**) What are the grid coordinates for the HWSA?

(16) (**F**) Provide and attach post-clearance digital photographs of each HWAP and HWSA site.

d. Hazardous Materials

(1) (**I/P/F**) Does the unit/activity conduct any activity that requires storage or handling of hazardous materials? (If no, a Hazardous Materials Survey is not required.)

(2) (**I/P/F**) Does the unit/activity have hazardous material tanks/drums? Are they in secondary containment?

(3) (**I/P/F**) Do personnel know the procedures for storage, handling and turn-in of hazardous materials?

(4) (**I/P/F**) Are serviceable/originally packaged hazardous materials being prepared for turn-in to the supply system?

(5) (**I/P/F**) Are hazardous materials being identified for turn-in as hazardous waste? (e.g., expired shelf-life items, materials that are opened and contaminated, etc.)

(6) (**I/P/F**) What are the grid coordinates for the Hazardous Materials Storage Area(s)?

(7) (**F**) Provide and attach post-clearance digital photographs of each Hazardous Materials Storage Area.

e. Burn Pits

(1) (**I/P/F**) Did the unit/activity operate any burn pits on-site? (If no, a Burn Pit Survey is not required.)

(2) (**I/P/F**) Has all metal been removed from the burn pits and segregated for recycling?

(3) (**I/P**) Does the unit have a plan for closing the burn

pit(s)?

(4) (**F**) Have burn pits been covered with a 6" layer of soil?

(5) (**F**) Have burn pits been marked with a permanent sign? (Placard must say, "Burn Pit" and list the date closed and unit that closed it.)

(6) (**I/P/F**) What is the grid coordinates for all burn pits? P:(Grid taken from map center of mass)

(7) (**F**) Provide and attach post-clearance digital photographs of each burn pit.

f. Incinerators

(1) (**I/P/F**) Did the unit/activity operate any incinerators on-site? (If no, an Incinerator Survey is not required.)

(2) (**I/P/F**) Has all metal been removed from the incinerators and segregated for recycling?

(3) (**I/P/F**) Has all ash been removed, tested, and disposed of IAW SOPs or theater-level regulations?

(4) (**I/P**) Does the unit have a plan for transfer/closing/disposition of the incinerator(s)?

(5) (**F**) Have incinerator sites been marked with a permanent sign? (Placard must say, "Incinerator Site" and list the date closed and unit that closed it.)

(6) (**I/P/F**) What are the grid coordinates for all incinerators? P:(Grid taken from map center of mass)

(7) (**F**) Provide and attach post-clearance digital photographs of each incinerator.

g. Solid Waste Landfills

(1) (**I/P/F**) Does the unit/activity operate a solid waste landfill on-site? (If no, a Solid Waste Landfill Survey is not required.)

(2) (**P/F**) Has any blowing debris or litter been removed from the site?

(3) (**I/P**) Does the unit have a plan for closing the landfill?

(4) (**F**) Have solid waste landfills been covered or capped IAW theater-level guidance?

(5) (**F**) Have landfills been marked with a permanent sign? (Placard must say, "Landfill" and list the date closed and unit that closed it.)

(6) (**F**) What are the grid coordinates for the solid waste landfill?

(7) (**F**) Provide and attach post-clearance digital photographs of the landfill.

h. Latrines

(1) (**I/P/F**) Does the unit/activity operate latrines on-site? (If no, a Latrine Survey is not required.)

(2) (**I/P/F**) Does the unit have a plan for closing and removal of urine tubes and burn out latrines?

(3) (**I/P/F**) Does the unit have a plan for cleaning human waste that has been spilled on the ground?

(4) (**I/P/F**) Does the unit have a plan for removing trash from the latrine facility?

(5) (**F**) Has all trash and waste been removed from latrine facilities?

(6) (**F**) Have the urine pits been marked with a permanent sign? (Placard must say, "Latrine" and list the date closed and unit that closed it.)

(7) (**F**) What are the grid coordinates for the latrines and urine tubes?

(8) (**F**) Provide and attach post-clearance digital photographs of the latrine sites.

i. Maintenance Sites

(1) (**I/P/F**) Does the unit/activity have maintenance activities on-site? (If no, a Maintenance Site Survey is not required.)

(2) (**I/P/F**) Does the unit/activity have maintenance tanks/drums? Do they have secondary containment?

(3) (**I/P/F**) Has all hazardous waste been turned in?

(4) (**I/P/F**) Have all accumulation points been cleaned and closed?

(5) (**I/P/F**) Has all contaminated soil been collected for disposal?

(6) (**F**) What are the grid coordinates for the maintenance sites?

(7) (**F**) Provide and attach post-clearance digital photographs of the maintenance sites.

j. Generators

(1) (**I/P/F**) Does the unit/activity operate generators on-site? (If no, a Generator Survey is not required.)

(2) (**I/P/F**) Does the generator site tanks/drums have secondary containment?

(3) (**I/P/F**) Has contaminated soil (fuel spills, oil spills, etc.) around the generators been collected for disposal?

(4) (**I/P/F**) What are the grid coordinates for all generator sites?

(5) (**F**) Provide and attach post-clearance digital photographs of the locations of all generators 10 KW and up.

k. Fuel Storage Areas

(1) (**I/P/F**) Does the unit/activity conduct bulk refueling or transfer operations (bladder or tanker) on-site? (If no, a Fuel Storage Survey is not required.)

(2) (**I/P/F**) Do the fuel storage area tanks/drums have secondary containment?

(3) (**I/P/F**) Has contaminated soil around fuel tankers or bladders been collected and properly disposed of?

(4) (**I/P/F**) What are the grid coordinates for all bulk fuel storage sites?

(5) (**F**) Provide and attach post-clearance digital photographs of the locations of all bulk fuel storage sites.

l. Recycling/Reuse Areas (examples: metal, plastic, glass, paper, cardboard, tires, wood, used oil, etc.)

(1) (**I/P/F**) Does the unit/activity operate a recycling/reuse area on-site? (If no, a Recycling/Reuse Survey is not required.)

(2) **(I/P/F)** List all the materials that are recycled/reused at the site.

(3) (**I/P/F**) Have all recycled/reused materials been policed up from the site?

(4) (**I/P/F**) Does the unit/activity have a plan for closing

the Recycling/Reuse area?

(5) (**I/P/F**) What are the grid coordinates for the Recycling/Reuse area?

(6) (**F**) Provide and attach post-clearance digital photographs of the Recycling/Reuse area.

m. Water/wastewater/laundries

(1) (**I/P/F**) Does the unit/activity operate a water generation area on-site? If yes, describe.

(2) **(I/P/F**) Does the unit/activity operate a wastewater system on-site? If yes, describe.

(3) (**I/P/F**) Does the unit/activity operate any wash racks and/or oil water separators? If yes, describe.

(4) **(I/P/F**) Does the unit/activity operate a laundry system on-site? If yes, describe.

(5) (**I/P/F**) Does the unit/activity have a plan for closing the water generation area?

(6) (**I/P/F**) Does the unit/activity have a plan for closing the wastewater system?

(7) (**I/P/F**) Does the unit/activity have a plan for closing the wash racks and/or oil water separators?

(8) (**I/P/F**) Does the unit/activity have a plan for closing the laundry system?

(9) (**I/P/F**) What are the grid coordinates for the water generation area?

(10) (**I/P/F**) What are the grid coordinates for the wastewater system?

(11) (**I/P/F**) What are the grid coordinates for wash racks and/or oil water separators?

(12) (**I/P/F**) What are the grid coordinates for the laundry system?

(13) (**F**) Provide and attach post-clearance digital photographs of the water/wastewater/laundry areas/wash racks and/or oil water separators.

n. Pesticide Mixing/Storage

(1) (**I/P/F**) Does the unit/activity operate any pesticide mixing/storage areas on-site? (If no, a Pesticide Survey is not required.)

(2) (**I/P/F**) Do personnel know the procedures for storage, handling and turn-in of pesticides?

(3) (**I/P/F**) Are serviceable/originally packaged pesticide containers being prepared for turn-in to the supply system?

(4) (**I/P/F**) Are pesticides being identified as being waste prepared for turn-in? (e.g., expired shelf-life items, materials that are opened and contaminated, etc.)

(5) (**I/P/F**) Does the unit/activity have a plan for closing the pesticide mixing/storage area?

(6) (**I/P/F**) What are the grid coordinates for the pesticide mixing/storage area(s)?

(7) (**F**) Provide and attach post-clearance digital photographs of the pesticide mixing/storage area(s).

o. Dining Facility Food Waste Management

(1) (**I/P/F**) Does the unit/activity operate any food waste management areas on-site? (If no, a Food Waste Management Area Survey is not required.)

(2) (**I/P/F**) Does the unit/activity operate any grease traps on-site?

(3) (**I/P/F**) Does the unit/activity operate any soakage pits on-site?

(4) (**I/P/F**) Do personnel know the procedures for separation, storage, handling and disposal of food wastes (to include grease)?

(5) (**I/P/F**) Does the unit/activity have a plan for closing the food waste management area(s)?

(6) (**I/P/F**) Does the unit/activity have a plan for closing the grease traps?

(7) (**I/P/F**) Does the unit/activity have a plan for closing the soakage pits?

(8) (**I/P/F**) What are the grid coordinates for the food waste management area(s)?

(9) (**I/P/F**) What are the grid coordinates for the grease traps?

(10) (**I/P/F**) What are the grid coordinates for the soakage pits?

(11) (**F**) Provide and attach post-clearance digital photographs of the food waste management mixing/storage area(s).

(12) (**F**) Provide and attach post-clearance digital photographs of the grease traps.

(13) (**F**) Provide and attach post-clearance digital photographs of the soakage pits.

p. General

(1) (**I**) Has the unit/activity scheduled its Preliminary and Final Inspections?

(2) (**I/P/F**) Does the unit/activity need help to remediate any environmental spills? ? If so, describe.

(3) (**I/P/F**) Does the unit/activity need help coordinating hazardous waste turn-in?

(4) (**I/P**) Does the unit/activity need help in solving any environmental problems? If so, describe.

(5) (**I/P**) Are there any hazardous materials or waste on-site that are not covered by the survey categories above? If yes, describe type, location, and disposition.

3. Comments/Recommendations:

4. List of attachments: (maps, pictures, reports, diagrams, etc.)

Final Survey Results:

Base Camp/Unit is: Cleared Not Cleared
(circle one)

ENVIRONMENTAL SITE CLOSURE REPORT

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k Other Environmental Concerns (e.g. Radon, Asbestos, Lead-based Paint, Polychlorinated Biphenyls, etc.)

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a. Hazardous Material Management
b. Hazardous Waste Management
c. Medical Waste Management
d. Solid Waste Management
(1) Burn Pits
(2) Landfills
(3) Incinerators
(4) Recycling
e. Water Supply Management
f. Wastewater Management
g. Pesticide Management
h. Maintenance Activity Management
i. Fuel Storage/Generator Management
j. Spill Incidents and Response
k Other Environmental Concerns (e.g. Radon, Asbestos, Lead-based Paint, Polychlorinated Biphenyls, etc.)

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APPENDIX C – AGREEMENT OF NEGOTIATED STANDARDS WITH RECEIVING ENTITY OR HOST NATION
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Glossary

Section I: Acroynms and Abbreviations

AAR	after action report
ACM	asbestos containing material
AO	area of operations
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATP	Army Tactics and Procedures
CBRN	chemical, biological, radiological and nuclear
COC	chemical of concern
CSM	conceptual site model
DBCP	dibromochloropropane
DOT	Department of Transportation
DSN	direct service number
EBS	environmental baseline survey
ECAP	environmental corrective action plan
ECR	environmental conditions report
ESCS	environmental site closure survey
EDB	ethylene dibromide
EHP	environment health professional
EHT	environmental health threat
EORA	entomological operational risk assessment
EPA	Environmental Protection Agency
FM	field manual (soon to be replaced by ATP)
GIS	geographic information system
G-M	Geiger-Mueller
GPS	global positioning system
HCl	hydrochloric acid
HM	hazardous materiel
HW	hazardous waste
HVAC	heating, ventilation, and air conditioning
HWAP	hazardous waste accumulation point
MBAS	methylene-blue active substances
MEG	military exposure guidelines
MGRS	military grid reference system
NIOSH	National Institute for Occupational Safety and Health

OEHSA	occupational and environmental health site assessment
PCB	polychlorinated biphenyls
PHA	preliminary health assessment
PID	photoionization detector
PM	project manager
POC	point of contact
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
QA/QC	quality assurance/control
ROWPU	reverse osmosis water purification unit
SAP	sampling and analysis plan
SDS	Safety Date Sheet (replaces MSDS)
SVOC	semi-volatile organic compounds
TDS	total dissolved solids
TG	technical guide
TOC	total organic content
TSP	training support package
TTP	tactics, techniques, and procedures
USAPHC	US Army Public Health Command
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compounds

Section II: Terms

accuracy

The measure of the correctness of data, as given by the difference between the measured value and the true or standard value.

area of concern (AOC)

Area in which the presence of an environmental chemical of concern is suspected or a potential release may occur.

bias

A systematic positive or negative deviation of the sample or estimated value from the true population value.

composite sample

A sample prepared by combining a series of discrete samples collected over a known area or time. A composite sample shows the average composition of the environmental medium.

critical habitat

A designated area declared essential for the survival of a protected species under authority of the Endangered Species Act.

dead end of a distribution line

This is where the waterline actually stops. Taking a sample here could provide false results due to sedimentation and stagnation.

deployment site

The geographic area of a military deployment covered by an EBS/OEHSA. The area known as the “deployment site” may contain multiple AOCs.

discharge

The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of a substance into or on any land or water.

discrete sample

An individual sample collected at a single place and time.

disposal (waste)

The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water. The act is such that the solid waste or hazardous waste, or any constituent thereof, may enter the environment or be emitted into the air or discharged into any waters, including groundwater.

distribution system

A system for the collection, transmission, storage and movement of water from the source to consumers. Water will be collected at representative points in the distribution system.

endangered species

Those species designated by the Secretary of the Interior that are in danger of extinction throughout all or a significant portion of their range.

endothall

An organic solid of white odorless crystals. Endothall is used as a defoliant for a wide range of crops and as a herbicide for both terrestrial and aquatic weeds. It is used as a desiccant on Lucerne and potato, for the defoliation of cotton, to control aquatic weeds, and as an aquatic algicide growth regulator. It has been used for sugar beets, turf, hops sucker suppression, alfalfa, clover desiccants, and potato vine killers.

entomology

The scientific study of insects, including their morphology, physiology and ecology. Insects are studied because of their importance as pollinators for fruit crops; as carriers of bacterial, viral, and fungal diseases; as parasites of humans or livestock; as destroyers of economically important plants; or as predators of other destructive insects. The role of insects in ecosystems and their control by insecticides or by biological methods are studied in ecology.

environmental area of interest

An environmentally sensitive area that may be deemed worthy of special consideration because of its unique and important qualities relative to adjacent areas (for example, the only forest within a large region) or the importance of its natural environment function (for example, a wetland, flood plains, permafrost area, or an endangered species critical habitat). The environmental area of interest includes man-made structures, such as wastewater treatment plants and dams.

environmental assessment

A study to determine if significant environmental impacts are expected from a proposed action.

environmental baseline survey (EBS)

(Army) An assessment or study done on an area of interest (a property) in order to define the environmental state or condition of that property prior to use by military forces. Used to determine the environmental impact of property use by military forces and the level of environmental restoration needed prior to returning the property upon their departure.

environmental corrective action plan (ECAP)

The plan developed from the initial ESCS that tracks the completion of environmental tasks necessary for proper transfer/closure of a base camp.

environmental compliance

The unconditional obeying of international, foreign nation, federal, state, and local environmental rules, regulations, and guidelines that affect current operations.

environmental conditions report (ECR)

A concise summary of environmental conditions at a base camp site, based on the EBS, supported by maps and backup documents, prepared by base camp commanders for each base camp. The environmental conditions report documents conditions at the site if claims or other legal challenges arise against the government.

environmental ethic

Taking care of the environment because it is the right thing to do. This ethic is the operating principle and value that governs individual Soldiers, units, and the Army.

environmental hazard

All activities that may pollute, create negative noise-related effects, degrade archaeological/cultural resources, or negatively affect threatened or endangered species habitats. They also include environmental health-related hazards.

environmental health professional (EHP)

Refers to trained preventative medicine personnel. EHPs are defined and designated by the military services as qualified by training and experience to perform OEHSA.

environmental health threat (EHT)

Any naturally occurring or man-made hazard (chemical, radiological, or biological) that can cause injury, illness, disease, adverse health conditions or depth in deployed personnel.

environmental impact statement

Detailed description of the effects, impacts, or consequences associated with designing, manufacturing, testing, operating, maintaining, and disposing of weapon systems or automated information systems. Under the National Environmental Policy Act, an environmental impact statement is required when cultural resources may be damaged or significantly adversely affected.

environmental noise

The outdoor noise environment consisting of all noise (including ambient noise) from all sources that extend beyond, but do not include, the workplace.

environmental planning

Efforts that consider the impact of operation, training, exercises, or weapon system introduction on the environment and, where necessary, allow decision makers to take early action to eliminate or mitigate those impacts.

environmental pollution

The condition resulting from the presence of chemical, mineral, radioactive, or biological substances that alter the natural environment or that adversely affect human health or the quality of life, biosystems, the environment, structures and equipment, recreational opportunities, aesthetics, or natural beauty.

environmental protection

The application of human ingenuity and resources, through the disciplines of science and engineering, as required by environmental protection laws, regulations, and policies, to protect the natural environment.

environmental protection level

The varying level of environmental protection that can reasonably be afforded at any particular time during military operations, given the absolute requirement that such a diversion of resources away from the mission at hand does not adversely affect that mission, any friendly personnel, or indigenous or refugee populations.

environmental reconnaissance

The systematic observation and recording of site or area data collected by visual or physical means, dealing specifically with environmental conditions as they exist, and identifying areas that are environmentally sensitive or of relative environmental concern, for information and decision making purposes.

environmental sampling

The collective actions required to gather environmental sampling data as part of the EHSA process using direct reading instruments, field analytical methods, as well as collection of field aliquots (samples) transported to off-site laboratories.

environmental sampling data

Environmental sampling data includes all recorded sampling data pertinent to the performance of the EBS/OEHSA. Environmental sampling data includes but are not limited to all information required by the target sampling quality objective (TSQO). For example, locations, GPS coordinates, dates, and descriptions of the sample gathering, shipment, onsite treatment, physical parameters, and any on-site analyses of air, water, soil. **Note:** All environmental sampling data shall be documented on field data sheets and/or field logbooks.

environmental services

The various combinations of scientific, technical, and advisory activities (including modification processes such as the influence of man-made and natural factors) required to acquire, produce, and supply information on the past, present, and future states of space, atmospheric, oceanographic, and terrestrial surroundings for use in military planning and decisionmaking processes or to modify those surroundings to enhance military operations.

environmental site closure report (ESCR)

The report completed from the ESCS that documents the final environmental conditon of the base camp at closure.

environmental site closure survey (ESCS)

The survey used to identify environmental concerns that will need to be addressed prior to transfer or closure of a base camp. It is completed 3 times between the receipt of closure notice and base camp closure; the initial ESCS is completed to establish necessary actions, develop the ECAP and obtain resources; the preliminary ESCS is completed 30 days prior to transfer or closure and identifies those actions remaining to be completed; and the final ESCS is completed to ensure all environmental concerns have been addressed and will grant final clearance once verified.

exposure

Human contact due to a completed exposure pathway with a hazardous or potentially hazardous chemical, physical, or biological agent. Exposure may be short-term, of intermediate duration, or long-term. Assessment of individual health risk is dependent on the exposure concentration (how much), the frequency and duration of exposure (how long), and the multiplicity of exposures with other similar exposure agents.

exposure point

A position in the environment where a chemical, physical, or biological agent of specific concentration contacts the outer boundary of a human (skin or openings of the body) or exchange boundary where absorption takes place (skin, lungs or gastrointestinal tract) over a specific interval of time.

exposure route

Process by which a chemical comes into direct contact with the body, tissues, or exchange boundaries of a human, for example, ingestion, inhalation, injection and dermal absorption.

field analytical methods

Methods or techniques that measure physical properties or chemical presence in soil, water, or air immediately or within a relatively short period of time to be used during a site assessment.

glyphosates
Herbicides.

grid coordinates
Refers to the military grid reference system (MGRS) coordinates required for the identification of a location and will include the 3 character zone identifier and the 2 character square identifier.

groundwater
A body of water, generally within the boundaries of a watershed, that exists in the internal passageways of porous geological formations (aquifers) and flows in response to gravitational forces.

hazard communication
The responsibility of leaders and supervisors concerning possible hazards in the workplace and notification of hazards and necessary precaution to their personnel. Also called HAZCOM.

hazardous material
Any material or substance which has a human health hazard associated with it. Special storage, use, handling, and shipment safety procedures and protocols must be followed to help protect against accidental exposure. Hazardous materials are specifically identified under federal law.

hazard probability
The likelihood of encountering a hazard.

hazard severity
A measure of the impact or consequences of the interaction of the hazard on the health of individuals and on the mission itself.

hazardous substance
Elements, compounds, mixtures, solutions, and substances that, when released into the environment, may present a substantial danger to public health and welfare or the environment.

hazardous waste

A solid waste that is either listed as such in federal law or exhibits any of the four hazardous characteristics— ignitability, corrosivity, reactivity, or toxicity.

hazardous waste accumulation point (HWAP)

A specially designated site for the temporary collection of hazardous wastes where no container may remain on-site for more than 90 days. The site, and containers within it, must be properly marked and certain safety and management procedures apply. There is no limitation on the quantity of wastes which may be kept on site.

health risk

The estimate of the probability and magnitude of adverse responses in persons exposed to physical, chemical, biological, or radiological insults conditions over time.

heterogeneous

All parts of the sample or population are not identical with respect to the characteristic of interest.

homogenous

All parts of the sample or population are identical with respect to the characteristic(s) of interest.

judgment sampling

A biased process that selects sampling location and sampling methodology based on a specific exposure pathway scenario defined by the CSM. It can be biased due to a variety of factors such as to obtain concentration information at a source, boundary confirmation location or a hypothetical exposure location.

medical waste

Any waste that is generated in the diagnosis, treatment, or immunization of human beings or animals.

midden

an old dump for domestic waste which may consist of animal bone, human excrement, botanical material, vermin, shells, sherds, lithics

(especially debitage) and other artifacts and ecofacts associated with past human occupation.

military environmental protection

The application and integration of all aspects of natural environmental considerations as they apply to the conduct of military operations.

military exposure guidelines (MEG)

Concentrations for chemicals in air, water, and soil that can be used to assist in assessing the potential health significance of exposures to EHT associated with COC during deployments. The MEGs are listed in USAPHC TG 230 (reference 7).

monitoring

(joint, NATO) 1. The act of listening, carrying out surveillance on, and/or recording the emissions of one's own or multinational forces for the purpose of maintaining and improving procedural standards and security, or for reference, as applicable. See FM 34-1. 2. The act of listening, carrying out surveillance on, and/or recording of enemy emissions for intelligence purposes. See FM 34-1. 3. The act of detecting the presence of radiation and the measurement thereof with radiation measuring instruments. Also called radiological monitoring. See FM 3-3-1. (Army) 1. An element of assessment: continuous observation of the common operational picture to identify indicators of opportunities for success, threats to the force, and gaps in information. (FM 6-0) 2. The assessment of emissions and ambient air quality conditions.

natural environment

The human ecosystem, including both the physical and biological systems that provide resources (clean air, clean water, healthy surroundings, and sufficient food), necessary to sustain productive human life. Included in the natural environment are man-made structures, such as water and wastewater treatment facilities and natural/cultural resources.

notice of violation

Formal written document provided to an installation by a regulatory agency as a result of environmental noncompliance. Also called NOV.

occupational and environmental health site assessment (OEHSA)

An iterative, scientifically defensible process used to identify complete or potentially complete exposure pathways that may affect the health of deployed personnel. OEHSA are conducted to facilitate risk-based recommendations for mitigation of EHT.

representative points

Locations in a process where specific conditions can be measured in a manner that accurately reflects the actual condition of the water. In a water distribution system this would be at locations where water is being disbursed, such as pipes, spigots, pumps and storage tanks.

restoration

The systematic removal of pollution or contaminants from the environment, especially from the soil or groundwater, by physical, chemical, or biological means. Also known as remediation or environmental cleanup.

risk level

The matrix in Table 1-1 defines the risk level, ranging from low to extremely high.

risk management

The Department of Defense process for identifying, assessing, and controlling risks as well as evaluating the effectiveness of risk control measures. Formerly known as operational risk management.

sampling and analysis plan

A detailed outline of which measurements will be taken at what times, on which material, in what manner and by whom. Sampling and analysis plans should be designed in such a way that the resulting data will contain a representative sample of the parameters of interest and allow for all questions, as stated in the goals, to be answered.

sampling scheme

A detailed description of what data will be obtained and how this will be done.

simple random sampling scheme

The simplest way of selecting sampling units where each unit has an equal probability of being chosen.

sampling strategies

The methods of selecting the locations and manner that samples are collected and handled to ensure resulting data are representative and usable for the intended purpose.

solid waste

Any material or substance (solid or liquid) that is inherently waste-like by being no longer suitable for its originally intended purpose.

source

Location from which a chemical or biological health threat originates; in the case of vector borne health threat the source may be a breeding site or harborage area.

source reduction

The decrease of hazardous waste generation at its sources. This reduction is to be achieved through product substitution, recycling, and inventory control, and by developing new industrial processes that use less hazardous materials, such as bead blasting rather than solvents to remove paint.

source water

Raw water prior to any treatment (well water, surface water, etc.)

spill

A generic term that encompasses the accidental and the deliberate but unpermitted discharge or release of a pollutant.

split samples

Quality assurance/quality control (QA/QC) samples. They are typically collected between 5-10 percent of the total number of samples taken.

surface water

All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, or estuaries) and all springs, wells, or other collectors directly influenced by surface water.

systematic random sampling scheme

This sampling procedure involves deciding what fraction of the target population is to be sampled and then compiling an ordered list of the target population. Then, starting at the beginning of the list, the initial sample unit is randomly selected from within the first *k* units, and thereafter every *kth* unit is sampled. Typically the integer *k* is estimated by dividing the size of the target population by the desired number of samples to be analyzed.

target population

Commonly used to refer to the group of people of entities to which the findings of the sample are to be generalized.

target sampling quality objectives (TSQO)

Specification of the amount and quality of data required to complete the environmental health site assessment. The minimum TSQO for the EHSA is to attain data that can be assigned the medium data quality descriptor.

testing area

A block, plot or transect located within the AOC where samples will be collected.

threatened species

Those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

toxic

Capable of producing illness, injury, or damage to humans, domestic livestock, wildlife, or other organisms through ingestion, inhalation, or absorption through any body surface.

treated water

Water after it passes through a typical type of treatment such as reverse osmosis water purification unit prior to distribution.

volatile organic compounds (VOC)

Gases emitted from certain solids or liquids. VOC include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by a wide array of products numbering in the thousands. Examples include: paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions.

waste

Any discarded material.

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Entomological Operational Risk Assessments (EORA): http://phc.amedd.army.mil/topics/envirohealth/epm/Pages/default.aspx

Red List: www.redlist.org

United States Environmental Protection Agency (EPA):
www.epa.gov

USAPHC: http://phc.amedd.army.mil/Pages/default.aspx

USAPHC – Environmental Surveillance Integration Program (ESIP),
Army Institute of Public Health
Attn: MCHB-IP-RDD
5158 Blackhawk Road (Bldg. E-1675)
Aberdeen Proving Ground, MD 21010-5403
Phone: 410-436-2430, DSN 312-584-4230
Secure phone: 410-436-4244, DSN 312-584-4244
Fax: 410-436-2407, DSN 312-584-2407
NIPRNET Web:
http://phc.amedd.army.mil/organization/institute/dhrm/Pages/ESIP.aspx
SIPRNET Web: https://phc.army.smil.mil
Or email to:
Unclassified –oehs@apg.amedd.army.mil
Classified – oehs@usaphc.army.smil.mil

USAPHC – ESIP, Military Exposure Surveillance Library
(MESL)
NIPRNET web: https://mesl.apgea.army.mil/mesl/
Email: oehs.data@us.army.mil
SIPRNET web: https://mesl.csd.disa.smil.mil/mesl/
Email: oehs@usaphc.army.smil.mil

USAPHC - Deployment Environmental Surveillance Program (DESP)
NIPRNET web:
http://usaphc.amedd.mil/topics/envirohealth/hrasm/Pages/DeploymentEnvironmentalSurveillance.aspx
Email: usarmy.apg.medcom-phc.list.desp-request@mail.mil
SIPRNET web: https://phc/army/smil.mil/pages/default.aspx
Phone: 410-436-6096, DSN 312-584-6096
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