DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
CESO **Washington, D.C. 20314**

Regulation
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Safety
SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS FOR HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) ACTIVITIES

1. Purpose. This regulation identifies the safety and occupational health documents and procedures required to be developed and implemented by USACE commands and their contractors responsible for executing HTRW response actions, including investigation, design, pilot studies, construction, treatment process operations and maintenance (O&M), and other related activities at HTRW sites. In addition, this regulation defines the systematic execution, review, and approval responsibilities within USACE for the required safety and health documents.

2. Applicability

a. This regulation applies to HQUSACE, major subordinate commands, districts, laboratories, and field operating activities (to be referred to as USACE Commands) performing or contracting HTRW site work, to include Civil Works projects involving HTRW response actions.

b. This regulation does not include the health and safety requirements concerning Ordnance and Explosives (OE), explosive media or chemical agent contaminated media (CACM). Requirements for OE, explosive media and CACM are covered in ER 385-1-95. Projects with potential for containing HTRW and OE, explosive media or CACM require coordination with the USACE Ordnance and Explosives Mandatory Center of Expertise (OE MCX) and the Hazardous, Toxic and Radioactive Waste Mandatory Center of Expertise (HTRW MCX). Projects involving explosive media which are contaminated with explosives but do not present an explosion hazard are covered by the requirements of this ER. The definitions for OE, CACM and explosive media are in ER 385-1-95.

3. Distribution Statement. Approved for public release, distribution is unlimited.

4. References. See Appendix A.

5. Discussion. The most important consideration throughout all aspects of HTRW activities performed by USACE and its contractors is the safety and health of affected on-site personnel working in contaminated areas (for example, exclusion zone, contamination reduction zone) and potential off-site receptors who may be impacted by the work. Accordingly, detailed safety and health criteria, practices, and procedures shall be developed and implemented to provide proper

control of and protection against the unique safety, chemical, physical, radiological, or biological hazards associated with the on-site activities. The development and implementation of an Accident Prevention Plan (APP) with a Site Safety and Health Plan (SSHP) appendix is required for HTRW site operations to comply with the Occupational Safety and Health Administration's (OSHA) regulations, as published in Title 29 CFR 1910.120 (General Industry) for investigation, engineering design, and O&M or 29 CFR 1926.65 (Construction Industry) for remedial action construction and USACE requirements. The requirements are applicable to all USACE and contractor personnel engaged in on-site activities associated with DERP (Formerly Used Defense Sites [FUDS], Installation Restoration Program [IRP]), Base Realignment and Closure (BRAC), Formerly Utilized Sites Remedial Action Program (FUSRAP), Environmental Protection Agency (EPA) Superfund and Brownfields programs, HTRW response actions under Civil Works, Environmental Support for Others (ESFO), and other HTRW projects.

6. Policy. All USACE Commands shall comply with and specify contractor compliance with OSHA standards, especially 29 CFR 1910.120/29 CFR 1926.65, as well as all other applicable safety and occupational health regulations required by USACE and DA throughout all site investigation, engineering design, pilot study, remedial action, construction, and treatment process O&M phases of HTRW projects. Title 29 CFR 1910.120 and 29 CFR 1926.65 standards are essentially the same; 29 CFR 1910.120 applies to assessment, investigation, engineering, and design phases, whereas 29 CFR 1926.65 applies to the actual construction phase of the project. As a minimum, the safety and health documents and procedures required by this regulation shall comply with the regulations and appropriate guidance publications referenced above, and other applicable Federal, state, and local government safety and health requirements.

7. Definitions and Acronyms. See Appendix B.

8. Responsibilities.

a. HQUSACE.

(1) CESO has overall responsibility for the USACE Safety and Occupational Health Program to include HTRW safety and occupational health (SOH) policy, programs, procedures, and oversight. CESO will:

(*a*) Plan, develop, review and revise USACE-wide HTRW SOH requirements and guidance, including ERs, EMs and ECs. This shall be done in coordination with CEMP-R, for policy and programmatic HTRW SOH requirements, and CECW-E, the designated USACE HTRW technical criteria developer for HTRW SOH requirements.

(*b*) Coordinate with CEMP-R, CECW-E and with the HTRW MCX and the OE MCX, as applicable, on SOH technical assistance to be provided to the USACE Commands.

(*c*) Provide policy and program guidance and assistance to USACE staff elements and USACE Commands to ensure that established SOH requirements are met during investigation, design, construction, operation and maintenance (O&M), and other related activities at HTRW sites.

(*d*) Conduct SOH management evaluations of USACE Commands' execution of HTRW program activities with support from the HTRW MCX. Evaluations shall address the investigation, design, engineering, construction, and O&M portions of the program.

(*e*) Provide CECW with SOH technical review and guidance for any HTRW problems encountered in the civil works program, with support from the HTRW MCX.

(*f*) Serve as USACE focal point for overall resolution of SOH regulatory and technical issue within and outside the USACE.

(2) CEMP-R has responsibility for the overall management and direction of the USACE HTRW program (excluding Civil Works projects) making sure that the investigation, design, and engineering phases of HTRW projects are properly implemented and executed. As the HTRW program manager, CEMP-R will:

(*a*) Review USACE-wide SOH requirements and guidance (e.g., ERs, EMs, and ECs) developed by CESO to drive the site investigation, design engineering, construction, and O&M phases of HTRW projects.

(*b*) Provide management assistance to HQUSACE staff elements and USACE Commands to ensure that established SOH requirements are met during site investigation, design, and other engineering activities at HTRW sites, as needed.

(3) CECW-E manages all engineering design, construction, and O&M technical aspects of military and CW projects and has responsibility to ensure that appropriate SOH criteria and procedures are included and properly carried out on HTRW projects. CECW-E:

(*a*) Serves as the USACE HTRW technical criteria developer and has responsibility to ensure that safety and occupational health criteria and actions necessary to the execution of the USACE HTRW program are included in published policy and guidance. These technical criteria include engineering and design as well as remedial action and construction. CECW-E has delegated proponency to CESO for all HTRW SOH technical documents.

(*b*) Serves as the USACE HTRW construction manager and has responsibility to ensure that safety and health criteria and actions needed to execute remedial action construction on HTRW sites are followed properly. Engineer Pamphlet (EP) 415-1-266, *Resident Engineer Management Guide (REMG) for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects,*

provides further details concerning remedial action and construction requirements. CECW-E will:

- In coordination with CESO, provide technical assistance to USACE Commands involved in HTRW construction activities.

- In coordination with CESO, assist in conducting HTRW construction program oversight and management evaluations concerning SOH, as needed.

- Provide for standardized review, comment, and acceptance procedures of HTRW contractor SOH submittals prior to commencement of on-site work.

(4) CEPR serves as the USACE HTRW program contracting manager and has responsibility to provide USACE Commands guidance regarding appropriate contracting actions to include provision for SOH contracting clause language. CEPR will:

(*a*) Coordinate with CESO to provide contracting policy, program, and procedures guidance to USACE Commands to ensure that appropriate Federal Acquisition Regulations (FAR) SOH requirements and special clauses are incorporated into HTRW contracts.

(*b*) Periodically review and evaluate USACE Command's contracting implementation and execution procedures and practices for SOH aspects of HTRW contracts.

b. HTRW Mandatory Center of Expertise (HTRW MCX). The HTRW MCX, in coordination with CESO, CEMP-R and CECW-E, has primary responsibility for maintaining and providing state-of-the-art technical SOH expertise concerning execution of HTRW projects. The HTRW MCX:

(1) Participates on Project Delivery Teams (PDTs) and performs independent technical review of SOH aspects of key HTRW documents. Documents include:

(*a*) SOH-related contract management procedures and advanced agreements developed under cost reimbursable contracts.

(*b*) Scopes of work for the following HTRW engineering and design tasks:

- Field pilot studies estimated to exceed $100,000 cost.

- Remedial action design for projects where remedial action construction costs are estimated to exceed $2,000,000.

- HTRW treatment process operation and maintenance activities where costs are estimated to exceed $100,000 annually.

(*c*) Scopes of work for cost reimbursable contractors to perform remedial action on projects where construction costs are estimated to exceed $2,000,000.

(*d*) SOH related aspects of work plans developed by cost reimbursable contractors for remedial action construction work estimated to exceed $2,000,000 or HTRW treatment process O&M activities where costs are estimated to exceed $100,000 annually.

(*e*) Accident Prevention Plans/Site Safety and Health Plan Appendix (APP/SSHP) for HTRW treatment process O&M activities associated with remedial action construction work estimated to exceed $2,000,000 or where operation and maintenance costs are estimated to exceed $150,000 annually.

(f) Concept designs (30% designs) for remedial action construction. For safety and health purposes concept designs shall include Unified Facilities Guide Specification (UFGS) 01351 edited to meet project specific requirements and the supporting health and safety design analysis (HSDA).

(*g*) Any other documents selected by the PDT because of special SOH concerns, unusual hazards, or SOH complexity.

(2) Participates on PDTs and provides technical assistance and support to MSC and district commands regarding SOH requirements and procedures for HTRW site investigation, engineering design, remedial action construction, and HTRW treatment process O&M activities. This may also include USACE technical assistance oversight of state lead or PRP lead projects performed under the EPA Superfund program.

(3) Identifies and recommends technical SOH policy and guidance needs, and develops SOH guidance for HTRW site investigations, engineering design, remedial action construction, and HTRW treatment process O&M activities.

(4) Provides SOH technical expertise concerning the HTRW aspects of projects involving or suspected to involve HTRW and OE, explosive media or CACM in accordance with ER 385-1-95 and this ER.

c. OE MCX. OE MCX provides SOH technical expertise concerning the OE, explosive media and CACM aspects of the project involving or suspected to involve HTRW and OE, explosive media or CACM in accordance with ER 385-1-95 and this ER.

d. Major Subordinate Commands (MSCs)/Regional Business Center (RBC). The MSC/RBC will perform the following tasks to assure SOH quality in HTRW programs:

(1) Promote and coordinate sharing of health and safety staff resources located at the districts and HTRW-MCX to assure that PDTs for HTRW projects are appropriately staffed.

(2) Coordinate resolution of all disputed SOH technical review comments provided by HTRW MCX and the Geographic District Command to the HTRW Design District. Assure that all safety and health comments are resolved satisfactorily and retain final acceptance authority if there is a conflict.

(3) Conduct annual HTRW SOH management evaluations of the Major Subordinate Command HTRW program execution and implementation of SOH requirements.

e. HTRW Design District Commands. These are responsible for site investigations and engineering design and construction planning phases of HTRW projects. HTRW Design districts will:

(1) Ensure technically qualified USACE SOH staff are included on HTRW PDTs to do the following:

(*a*) Perform technical analysis of HTRW contract and project objectives to assure that SOH requirements are managed correctly during HTRW site investigations, engineering design, field pilot studies, remedial action construction, and HTRW treatment process O&M phases. Radiation safety support can be obtained from the USACE Radiation Safety Support Team (RSST) if in-house health physics personnel are not available. Support from the RSST is available by contacting the HTRW MCX.

(*b*) Develop SOH aspects of request for proposals and aid in selecting contractors.

(*c*) Ensure that contract management procedures and advanced agreements require that contractors involve SOH personnel on project delivery orders, that appropriate SOH technical analysis is done, and that appropriate SOH documents are developed.

(*d*) Ensure that cost reimbursable contractors cost effectively account for SOH requirements when developing work plans under cost reimbursable contracts.

(*e*) Incorporate SOH technical requirements into delivery order scopes of work.

(2) Develop, through in-house or contracted resources, SOH documents that are appropriate to project phase and contract type. SOH documents include:

(*a*) APP/SSHP for investigations, predesign, and pilot studies.

(*b*) APP/SSHP for remedial action construction.

(*c*) APP/SSHP for HTRW Treatment Process O&M.

(*d*) CEGS 01351, *Safety, Health and Emergency Response (HTRW/UST)*, edited to meet project-specific circumstances.

(*e*) Health and Safety Design Analysis (HSDA) to support project specifications.

(3) Coordinate preparation of APP/SSHP developed for in-house investigations, predesign, and pilot study activities with the geographic district command safety office.

(4) Provide technical review of construction APP/SSHP when requested by the geographic construction district.

(5) Comprehensively review of HTRW project designs (especially treatment process designs) to assure that the project can be safely constructed and operated.

(6) Submit SOH related documents to the HTRW MCX per the requirements of this ER. (See HTRW MCX responsibilities.)

(7) Ensure that all HTRW designs, cost and technical proposals, work plans, specifications, and APP/SSHPs for remedial action construction and HTRW treatment process O&M activities are provided to the SOH Office at the geographic district command for review and input.

(8) Coordinate with the OE MCX for projects where the potential to encounter OE, explosive media or CACM exists, and proceed according to ER 385-1-95 requirements.

f. Geographic District Command. The Geographic District Command is responsible for assuring that SOH requirements are implemented during execution of HTRW response actions. The geographic district will:

(1) Provide qualified USACE SOH staff to participate on HTRW project delivery teams assembled by the HTRW design district. If necessary, use the MSC/RBC to coordinate SOH staff support from other MSC districts or the HTRW-MCX. Radiation safety support can be obtained from the USACE Radiation Safety Support Team (RSST) if in-house health physics personnel are not available. Support from the RSST is available by contacting the HTRW MCX.

(2) Identify local SOH issues to be incorporated into project specifications and remedial action work plans by the HTRW design district.

(3) Review and accept APP/SSHPs for remedial action construction and HTRW treatment process O&M.

(4) Oversee remedial action construction and HTRW treatment process O&M to assure compliance with the accepted APP/SSHP, project specifications, and the SOH aspects of contract management procedures and advanced agreements.

(5) Actively participate in negotiations to modify APP/SSHPs when changes are proposed by contractors.

(6) Submit APP/SSHPs for HTRW Treatment Process O&M to the HTRW MCX for review.

(7) Assist the HTRW design district in preparing APP/SSHPs developed for in-house investigations, predesign activities, and pilot studies.

(8) Ensure that USACE personnel involved in on-site activities have received appropriate training, medical surveillance, and personal protective equipment required by the APP/SSHP, contract specifications, OSHA regulations, and USACE policies.

(9) Coordinate with the OE MCX when OE, explosive media or CACM is encountered and proceed according to ER 385-1-95 requirements.

9. Documents. All contracted and in-house HTRW activities shall require development of the following documents, as appropriate to project phase (i.e., site investigation, engineering design, pilot studies, remedial action construction, and HTRW treatment process O&M).

a. *Site Safety and Health Plan Appendix to the Accident Prevention Plan (APP/SSHP).*

(1) All contractors (Fixed Price and Cost Reimbursable) shall develop and implement a Site Safety and Health Plan (SSHP) that shall be attached to the APP as an appendix. The APP/SSHP shall address all occupational safety and health hazards (traditional construction as well as contaminant related hazards) associated with HTRW activities. The APP/SSHP shall cover each SSHP element in Appendix C of this ER and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Appendix C of this ER and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP, provided each SOH issue receives adequate attention and detail and is adequately documented in the APP/SSHP. In-house activities (performed by government personnel) do not require development of an APP, but do require development and implementation of an SSHP

covering each element in Appendix C of this ER and must comply with local district policies for in-house work.

(2) The SSHP shall be developed under the direct supervision of a qualified Safety and Health Manager (SHM). (See the definitions section of this ER for SHM qualifications.)

(3) On-site implementation and enforcement of the SSHP shall be managed by a qualified Site Safety and Health Officer(SSHO). (See the definition section of this ER for SSHO qualifications.)

(4) Projects that are anticipated to involve both HTRW and OE, explosive media or CACM shall have an APP/SSHP developed per the requirements of this regulation and shall incorporate the additional requirements specified by ER 385-1-95. This APP/SSHP must be coordinated with both the OE MCX and HTRW MCX before on-site work begins.

b. Health and Safety Design Analysis.

(1) All designs for remedial action construction and HTRW treatment process O&M shall include a Health and Safety Design Analysis (HSDA) as a chapter of the project design analysis. The HSDA shall address each element in Appendix C of this ER and any other design aspect affecting the safe construction or operation of the project. This HSDA shall justify the SOH requirements to be specified in the remedial action or HTRW treatment process O&M project specifications.

(2) The HSDA shall be developed under the direct supervision of a qualified Safety and Health Manager (SHM). (See the definitions section of this ER for SHM qualifications).

c. SOH project specifications.

(1) All plans and specifications for remedial action construction and HTRW treatment process O&M shall contain a section that delineates minimum safety, health, and emergency response requirements to which the remedial action construction or HTRW treatment process O&M contractors shall adhere. SOH requirements shall be justified in the HSDA and incorporated into the project design package by use of Unified Facility Guide Specification (UFGS) 01351 or by editing other appropriate project specification sections. The site-specific, task-specific, and hazard-specific procedures, precautions, and equipment necessary for the protection of SOH shall be clearly biddable and enforceable.

(2) The SOH project specifications shall be developed under the direct supervision of a qualified Safety and Health Manager (SHM). (See the definitions section of this ER for SHM qualifications.)

(UFGS) 01351 or by editing other appropriate project specification sections. The site-specific, task-specific, and hazard-specific procedures, precautions, and equipment necessary for the protection of SOH shall be clearly biddable and enforceable.

(2) The SOH project specifications shall be developed under the direct supervision of a qualified Safety and Health Manager (SHM). (See the definitions section of this ER for SHM qualifications.)

10. Unanticipated Discovery of Ordnance and Explosives. If, during the course of any HTRW response action (site investigation, removal action, or remediation activity), an unanticipated or unplanned discovery of OE, explosive media or Chemical Agent Contaminated Media (CACM) occurs, all work shall cease, personnel shall withdraw from the affected area, and the OE MCX shall be contacted for further information and direction. See ER 385-1-95 for specific details.

FOR THE COMMANDER:

MICHAEL J. WALSH
Colonel, Corps of Engineers
Chief of Staff

4 Appendices
APP A – References
APP B – Definitions and Acronyms
APP C – Safety and Health Elements for HTRW Activities
APP D – HAZWOPER Training and Medical Surveillance Exemption Criteria

APPENDIX A
References

a. PL 96-510, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

b. PL 98-212, DOD Appropriation Act, Environmental Restoration.

c. PL 99-190, DOD Appropriation Act, Environmental Restoration.

d. PL 99-499, Superfund Amendments and Reauthorization Act (SARA).

e. 10 CFR 19 - 171, Nuclear Regulatory Commission.

f. 29 CFR 1910, Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standards.

g. 29 CFR 1910.120, OSHA, Hazardous Waste Site Operations and Emergency Response.

h. 29 CFR 1926, OSHA, Safety and Health Regulations for Construction.

i. 29 CFR 1926.65, OSHA, Hazardous Waste Site Operations and Emergency Response.

j. 29 CFR 1960, OSHA, Federal Employee Safety and Health Programs.

k. 49 CFR Subpart C, Department of Transportation (DOT), Hazardous Materials Regulations.

l. NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

m. FAR 52.236-13, Accident Prevention.

n. AR 40 series.

o. AR 200-1, Environmental Quality, Environmental Protection and Enhancement.

p. AR 385 series.

q. ER 385 series.

r. ER 385-1-95, Health and Safety Requirements for Ordnance and Explosive Operations.

s. ER 1110-1-8158, Corps-Wide Centers of Expertise Program

t. ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects

u. EP 415-1-266, Resident Engineer Management Guide (REMG) for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects

v. EM 385-1-1, USACE, Safety and Health Requirements Manual

w. CEMP-RT Memorandum, subject: Environmental Cleanup and Protection Management Plan for Military Programs, dated 17 January 1996

x. CEMP-RT Memorandum, subject: Changes in HTRW Technical Roles and Responsibilities Due to Division Laboratory Closures, dated 24 July 1996

y. CESO-I Memorandum, subject: HTRW Medical Surveillance Program Inclusion and Frequency Criteria, dated 29 September 1999

APPENDIX B
Definitions and Acronyms

B-1. Definitions. The following definitions are provided to help users fully understand the various requirements of this regulation. In addition, considering the large number of acronyms used herein, a roster of acronyms has been provided.

a. HTRW Activities. HTRW activities include those activities undertaken for the Defense Environmental Restoration Program (DERP), including Formerly Used Defense Sites (FUDS) and Installation Restoration Program sites at active DOD facilities, Formerly Utilized Sites Remedial Action Program (FUSRAP), Environmental Protection Agency's (EPA) Superfund program, HTRW actions associated with Civil Works projects, and any other mission or non-mission work done for others at HTRW sites. Such activities include, but are not limited to, Preliminary Assessments/Site Inspections (PA/SI), Remedial Investigations (RI), Feasibility Studies (FS), Engineering Evaluations/Cost Analyses (EE/CA), RCRA Facility Investigations/Corrective Measures Studies/Corrective Measures Implementations/Closure Plans/Part B Permits, or any other investigations, design activities, remedial construction or HTRW treatment process O&M at known, suspected, or potential HTRW sites. HTRW site activities shall also include those conducted at "Containerized" HTRW sites, such as leaking Polychlorinated Biphenyls (PCB) transformers, leaking or suspected leaking Underground Storage Tanks (USTs), that contain hazardous substances, hazardous wastes, or hazardous materials as defined by 29 CFR 1910.120(a)(3)/29 CFR 1926.65(a)(3).

b. Safety and Health Manager (SHM). This is a safety and occupational health professional meeting one of the three definitions below, with 3 years SOH management experience in hazardous waste site cleanup activities, and with the knowledge and skills to assure that on-site work is safely conducted. SHM credentials must reflect an ability to control and manage the primary contaminant related hazards (CIH for chemical hazards, CSP for safety hazards, CHP for ionizing radiation hazards) on the project. Projects with multiple contaminant related hazards (chemical, ionizing radiation, and safety) require the SHM to seek assistance from SOH professionals with appropriate credentials, knowledge, and skills to address secondary hazards. In-house operations do not require the SHM to have or seek support from certified SOH professionals.

(1) *Industrial Hygienists.* These are personnel meeting the Office of Personnel Management Standards for the Industrial Hygiene Series GS-0690-12, personnel certified by the American Board of Industrial Hygiene, and military personnel identified as being a qualified Industrial Hygienist by the Surgeon General. In addition, it is expected that these personnel, by

virtue of their education, special studies, and training, have acquired competence in the practice of Industrial Hygiene.

(2) *Health Physicists*. These are personnel meeting the Office of Personnel Management Standards for the Health Physicist Series GS-1306-12; personnel certified by the American Board of Health Physicists; and military personnel identified as being a qualified Health Physicist by DA. In addition, it is expected that these personnel, by virtue of their education, special studies, and training, have acquired competence in the practice of Health Physics.

(3) *Safety Professionals*. These are personnel meeting the Office of Personnel Management Standards for the Occupational Safety and Health Manager Series GS-0018-12 and personnel certified by the Board of Certified Safety Professionals. In addition, it is expected that these personnel, by virtue of their education, special studies, and training, have acquired competence in the practice of safety and occupational health

c. Site Safety and Health Officer. This is a person with a minimum of 1 year of experience implementing and enforcing SSHP requirements at hazardous waste site cleanup activities.

d. Ordnance and Explosives (OE). See definitions in ER 385-1-95

e. Explosive Media. See definitions in ER 385-1-95

B-2. Acronyms.

A/E	Architectural/Engineering
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
AR	Army Regulation
BRAC	Base Realignment and Closure
CA	Chemical Agent
CDR	Commander
CACM	Chemical Agent Contaminated Media
CECW	Corps of Engineers Civil Works
CEIM	Corps of Engineers Information Management
CEMP	Corps of Engineers Military Programs
CEPR	Corps of Engineers Assistant Principle Responsible for Contracting
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESO	Corps of Engineers Safety and Occupational Health Office, HQUSACE
CFR	Code of Federal Regulations
CACM	Chemical Agent Contaminated Media
CHP	Certified Health Physicist

CIH	Certified Industrial Hygienist
CO	Contracting Officer
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
CW	Civil Works
CWM	Chemical Warfare Materiel
DA	Department of the Army
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
EC	Engineering Circular
EE/CA	Engineering Evaluation/Cost Analysis
EM	Engineering Manual
EP	Engineering Pamphlet
EPA	Environmental Protection Agency
ER	Engineering Regulation
FAR	Federal Acquisition Regulation
FS	Feasibility Study
FUDS	Formerly Used Defense Site
FUSRAP	Formerly Utilized Sites Remedial Action Program
GS	General Schedule
HQUSACE	Headquarters U. S. Army Corps of Engineers
HSDA	Health and Safety Design Analysis
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
MOA	Memorandum of Agreement
MCX	Mandatory Center of Expertise
MSC	Major Subordinate Commands
NIOSH	National Institute for Occupational Safety and Health
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
OCE	Office of the Chief of Engineers
OE	Ordnance and Explosives
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PDT	Project Delivery Team
PL	Public Law
PPE	Personal Protective Equipment
PRP	Potentially Responsible Party
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act

RCWM	Recovered Chemical Warfare Materiel
RDTE	Research Development Test and Evaluation
RI	Remedial Investigation
RPO	Radiation Protection Officer
RSST	Radiation Safety Support Team
SCBA	Self-Contained Breathing Apparatus
SHP	Safety and Health Program
SI	Site Inspection
SOH	Safety and Occupational Health
SHM	Safety and Health Manager
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TWA	Time Weighted Average
USACE	U. S. Army Corps of Engineers
USCG	United States Coast Guard
UST	Underground Storage Tank

APPENDIX C
Safety and Health Elements For HTRW Documents (SSHPs/HSDAs)

C-1. Site Description and Contamination Characterization

a. Describe the site location, topography, approximate size, and the past uses of the site.

b. Compile a complete list of the contaminants found (or thought to be found) or known to be present in site areas on which worked will be done. Compilation of this listing shall be based on results of previous studies; or, if not available, select the likely contaminants based on site history and prior site uses and activities. Include, as applicable, the chemical names, radioisotopes, concentration ranges (and strength of radiation fields and levels of radioactive contamination if appropriate), media in which found, locations on site, and estimated quantities/volumes to be affected by site work.

C-2. Hazard/Risk Analysis. Develop an Activity Hazard Analysis (AHA) per EM 385-1-1 requirements for each task or operation to be performed. Identify the safety, chemical, physical, radiological, biological, and Ordnance and Explosives hazards/risks presented by each task and operation. The tasks and hazard/risk analyses shall be modified as needed to address changing work conditions. The Hazard/Risk Analysis shall address the following:

a. Safety. Evaluate the potential for injury from all site conditions and activities (e.g., confined space entry, excavations, slips, trips and falls, electricity, equipment, and machinery, etc.) Use EM 385-1-1 as a resource to define potential safety hazards on the project.

b. Chemical. List the chemical hazards that may be encountered during site activities and evaluate their chemical, physical, and toxicological properties. Describe the sources and pathways of employee exposure. Address Federal, state and local regulations or recommended exposure standards. Address hazards associated with treatment process chemicals used in HTRW treatment O&M activities and other hazardous substances bought on site for the execution of site activities.

c. Physical. Evaluate the potential for injury from physical agents such as noise, heat and cold stress, vibration, etc., that may be present.

d. Radiological. Evaluate the risk to human health caused by radioactive materials or ionizing radiation fields in the area where work is to be done. Consider the presence of radioactive isotopes and the type of ionizing radiation they emit. Describe the sources and

pathways of employee internal exposure, and anticipated on- and off-site internal and external levels. Address Federal, state and local regulations or recommended exposure standards.

e. Biological. Evaluate the potential for illness or injury attributable to biological agents (e.g., poisonous plants, animals, insects, microorganisms).

f. Ordnance and Explosives (OE). Evaluate the probability of encountering OE while doing on-site work. Follow the requirements of EP 75-1-2 and the OE MCX if there is a need to specify OE avoidance procedures while cleanup is being done.

C-3. Occupational Exposure Action Levels. Establish action levels for the following project-specific actions:

a. Implementation of engineering controls and work practices.

b. Upgrades/downgrades in levels of personal protective equipment.

c. Work stoppage or emergency evacuation of on-site personnel.

d. Prevention or minimization of public exposures to hazards created by site activities.

C-4. Staff Organization, Qualifications, and Responsibilities. Provide the following information:

a. Develop an organizational structure that establishes a SOH chain of command for the project and SOH responsibilities for all project personnel. Address roles and responsibilities for each of the following personnel and any other professional staff with responsibilities that directly affect project SOH procedures:

(1) Safety and Health Manager (SHM).

(2) Site Safety and Health Officer (SSHO).

(3) Safety and Health Technicians (if required).

(4) Site Workers.

(5) Subcontractors.

b. Fully trained and experienced technicians, responsible to the contractor and the SSHO, may be delegated to implement monitoring and calibration of instruments, and assist the SSHO in enforcing the SSHP.

c. At least two persons currently certified in First Aid/CPR by the American Red Cross or equivalent agency, according to EM 385-1-1, shall be present on-site at all times during operations.

C-5. Training. All personnel doing on-site work that will expose them to contaminant-related health and safety hazards must comply with training requirements in 29 CFR 1910.120/29 CFR 1926.65 and the following. Personnel or contractors who will not be exposed to contaminant-related hazards need not comply with this requirement.

a. Off-site Training.

(1) 40 hours HTRW health and safety training prior to on-site deployment.

(2) Three days of actual field experience under the direct supervision of a trained, experienced supervisor

(3) Eight hours of refresher training annually.

(4) Supervisors shall complete the above requirements and an additional 8-hour supervisor's course covering at least the following topics:

(*a*) The employer's safety and health program.

(*b*) Personal protective equipment program.

(*c*) Spill containment program.

(*d*) Health hazard monitoring techniques.

b. On-site Training. The SSHO shall conduct on-site training for employees and visitors.

(1) Training specific to OSHA standards in 29 CFR 1926 and 29 CFR 1910 that are applicable to site work and operations.

(2) Site- and facility-specific training covering all elements in the SSHP. Site-specific training shall be updated as site circumstances warrant.

(3) Radiation safety training per 10 CFR 20 requirements, if applicable. 10 CFR 20 requires that employees working with radiation receive training to the extent that they can safely perform their jobs. Training shall also comply with applicable OSHA, DOE, and Agreement State requirements (which may be more stringent). Employees shall be instructed in the following:

(*a*) Site-specific procedures for handling and storing radioactive materials.

(*b*) Health and safety hazards associated with exposure to the radioactive material that will be cleaned up or otherwise handled and the purpose and function of protective devices and precautions used to minimize exposure.

(*c*) Elements of the SSHP and company-specific procedures intended to provide protection from radiation exposure.

(*d*) Worker responsibility to report any unsafe acts or procedures that might result in exposure to ionizing radiation.

(*e*) Appropriate worker response procedures to on-site events and occurrences that may result in worker exposure.

(*f*) Worker rights and responsibilities with respect to ionizing radiation exposure.

c. Documentation. All safety and health training, including names of employees, duration, contents, and dates of training, shall be appended to the SSHP must be documented.

C-6. Personal Protective Equipment

a. A written Personal Protective Equipment (PPE) program in accordance with 29 CFR 1910.132, 29 CFR 1910.120(g)(5)/29 CFR 1926.65(g)(5) and the respiratory protection requirements of 29 CFR 1910.134 is required. When working with radioactive material, the respiratory protection requirements of 10 CFR 20 must be met.

b. Provide a detailed description of the minimum PPE and specific materials from which the PPE components are constructed for each site-specific task to be performed, based upon the hazard/risk analysis performed above. Levels of protection must be relevant to site-specific conditions, including potential heat stress and associated PPE safety hazards.

c. Provide site-specific procedures to determine PPE program effectiveness and for on-site fit-testing of respirators, proper cleaning, maintenance, inspection, and storage of all PPE.

C-7. Medical Surveillance

a. All personnel and contractors performing on-site work that will expose them to contaminant-related health and safety hazards must be enrolled in a medical surveillance program meeting OSHA's requirements in 29 CFR 1910.120 (f)/29 CFR 1926.65(f), ANSI Z-88.2 and 10 CFR 20 and the following: USACE personnel shall follow the requirements prescribed in EP 385-1-40, USACE Occupational Health Program and USACE Policy Memorandum, Subject: *HTRW Medical Surveillance Program Inclusion and Frequency Criteria*, dated 29 September 1999. Personnel or contractors who will not be exposed to contaminant-related hazards need not comply with this requirement.

b. In consultation with the Occupational Physician, determine the minimum content and frequencies of necessary medical examinations and tests. This determination shall be based upon probable site conditions, chemical-specific OSHA standards, potential occupational exposures, and required protective equipment.

c. Examinations shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine. Examination/test results shall be reviewed by the Occupational Physician.

d. Certification of employees' participation in the medical surveillance program shall be appended to the SSHP. This certification shall include the employee's name, the date of last examination, and name of reviewing occupational physician.

e. The written opinion from the occupational physician required by 29 CFR 1910.120(f)(7)/29 CFR 1926.65(f)(7) shall be made available upon request to the CO or approving authority for any site employee.

f. All personnel medical monitoring records shall be maintained in accordance with 29 CFR 1910.1020.

C-8. Radiation Dosimetry

a. All employees working within a radiologically restricted area shall receive appropriate dosimetry monitoring for radiation exposure.

b. Radiation dosimetry shall be evaluated by an individual holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP). Electronic dosimetry may be used to assign external dose if approved by the Qualified Health Physics personnel.

c. All employers (contractors and USACE elements) shall document employee exposure to external radiation. To do this, employers shall review each employee's radiation exposure history as per 10 CFR 20.2104 for compliance with exposure standards prior to allowing the employee access to a restricted area. If the employee has no exposure history, the employee shall provide a signed written statement to that effect.

d. When there exists the possibility of internal radioactive contamination, employers (contractors and USACE elements) shall estimate exposure with a bioassay program. The bioassay program will provide sampling of employee nasal passages, urine, or feces, or whole body counting, as appropriate to evaluate the suspected radionuclides. Air monitoring will be used to estimate inhalation exposure to suspected radionuclides.

e. Reports of *Exposure to Ionizing Radiation* will be furnished to each employee:

(1) Annually.

(2) Upon termination.

(3) Within 30 days of any personal request.

(4) To the Radiation Safety Officer (RSO) as soon as available.

C-9. Exposure Monitoring/Air Sampling Program

a. Where it has been determined that there may be potential employee exposures to hazardous concentrations of airborne substances, appropriate direct-reading (real-time) air monitoring and time-integrated (time-weighted average [TWA]) air sampling shall be conducted in accordance with applicable regulations (OSHA, EPA, NRC, State). Air monitoring and air sampling must accurately represent concentrations of airborne contaminants encountered on the site. When appropriate, air sampling shall be conducted to identify the radioactive isotopes and corresponding radiation (alpha, beta, gamma) in the workplace atmosphere. A record of exposure monitoring results shall be maintained by the SSHO and reviewed by the SHM for the duration of cleanup related activities.

b. Real-time screening for ionizing radiation and radioactive materials shall be conducted prior to and during on-site activities where ionizing radiation or radioactive materials may be encountered. When possible, determine the radiation (alpha, beta, gamma) and the exposure rate for each source of radiation.

c. Sampling and analytical methods following NIOSH criteria for on-site personnel and good practice as per 10 CFR 20 subparts C and F for airborne radioactive isotope sampling shall be appropriately used.

d. Personal exposure samples shall be taken if necessary to monitor employee exposure and to comply with chemical specific OSHA standards. Exposure samples shall be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory.

e. Noise monitoring shall be conducted as needed, depending on the hazard/risk analysis.

f. All monitoring/sampling results shall be evaluated and appropriate actions implemented based upon "action levels" established pursuant to paragraph C-3 above.

g. Exposure monitoring results shall be documented and the records maintained in accordance 29 CFR 1910.1020.

C-10. Heat/Cold Stress Monitoring and Management

a. A site-specific heat/cold stress monitoring procedure shall be developed. See 06.J.of EM 385-1-1.

b. Body fluids lost through sweating in hot work environments shall be replaced by drinking plain cool water. See 06.J. of EM 385-1-1.

c. In situations where heat stress may impact worker safety and health, worker acclimatization shall be assessed and work-rest regimens shall be established and monitored. See 06.J.of EM 385-1-1.

C-11. Standard Operating Safety Procedures, Engineering Controls, and Work Practices.

Address, as appropriate:

a. Site rules/prohibitions (buddy system, eating/drinking/ smoking restrictions, etc.).

b. Work permit requirements (e.g., radioactive work, excavation, hot work, confined space, etc.).

c. Material handling procedures (soils, liquids, radioactive materials).

d. Drum/container handling procedures and precautions (opening, sampling, overpacking).

e. Confined space entry procedures.

f. Hot work, sources of ignition, fire protection/prevention, and electrical safety (ground-fault protection, overhead power line avoidance, etc.).

g. Excavation and trench safety.

h. Guarding of machinery and equipment.

i. Lock-out/tag-out.

j. Fall protection.

k. Hazard communication.

l. Illumination.

m. Sanitation.

n. Engineering controls.

o. Process safety management.

p. Signs and labels.

q. Laboratory safety.

r. Hazardous material handling and storage.

C-12. Site Control Measures

a. Establish work zones and access points. Work zone delineation (Exclusion Zone, including restricted and regulated areas, Contamination Reduction Zone, Support Zone) shall be based upon the complexity of site operations and the hazard/risk analysis performed pursuant to paragraph C-2 above.

b. Include a site map delineating the zones established above.

c. On sites where ionizing radiation or radioactive material may be encountered, designate restricted areas (Radiation Areas, High Radiation Areas, and Airborne Radioactive Contamination Areas, as defined in 10 CFR 20).

d. Describe on-site and off-site communications.

e. Describe site security (physical and procedural).

f. Describe general site access.

C-13. Personal Hygiene and Decontamination

a. Specify necessary facilities and their locations.

b. Provide detailed standard operating procedures, frequencies, supplies, and materials to decontaminate site personnel.

C-14. Equipment Decontamination

a. Specify necessary facilities, equipment, and their locations.

b. Provide detailed procedures, frequencies, supplies, materials for decontamination, and methods to determine adequacy of decontamination of equipment used on site. For sites where radioactive contamination is present, include levels of removable and fixed contamination acceptable for release from the exclusion zone.

C-15. Emergency Equipment and First Aid Requirements. The following items, as appropriate, shall be immediately available for on-site use:

a. First aid equipment and supplies approved by the consulting physician.

b. Emergency eyewashes/showers (per ANSI Z-358.1).

c. Emergency-use respirators, (i.e., for escape: 5–15 minute emergency escape mask with air bottle; for rescue: positive pressure self-contained breathing apparatus [SCBA]).

d. Spill control materials and equipment.

e. Fire extinguishers (specify type, size, locations).

C-16. Emergency Response and Contingency Procedures (On-Site and Off-site)

a. Local fire/police/rescue authorities having jurisdiction and nearby medical facilities that would be utilized for emergency treatment of injured personnel shall be contacted to notify them

of upcoming site activities and potential emergency situations, to ascertain their response capabilities, and to obtain a response commitment.

b. An Emergency Response Plan, which complies with 29 CFR 1910.120(l)/29 CFR 1926.65(l), and which, as a minimum, addresses the following elements, shall be developed and implemented:

(1) Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposures, personal injuries, fires/explosions, environmental spills and releases, and discovery of radioactive materials.

(2) Personnel roles, lines of authority, communications.

(3) Posted instructions and list of emergency contacts: physician/nearby medical facility, fire and police departments, ambulance service, Federal/state/local environmental agencies, CIH/CSP/CHP, Contracting Officer, or approving authority for in-house activities.

(4) Emergency recognition and prevention.

(5) Site topography, layout, and prevailing weather conditions.

(6) Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security, and control).

(7) Specific procedures for decontamination and medical treatment of injured personnel.

(8) Route maps to nearest pre-notified medical facility.

(9) Criteria for initiating community alert program, contacts, and responsibilities.

(10) Critique of emergency responses and follow-up.

c. If all personnel will be evacuated from the site and not allowed to assist in handling the emergency, the emergency response plan listed in Paragraph C-15*b* may be replaced by an emergency action plan complying with 29 CFR 1910.38(a).

C-17. Accident Prevention

a. Daily safety and health inspections shall be conducted to ensure the effectiveness of the SSHP, and to determine if operations are being conducted in accordance with the SSHP, USACE, and OSHA regulations, and contract requirements.

b. In the event of an accident or incident, the CO (or approving authority for in-house USACE activities) shall be notified according to EM 385-1-1. Within two working days of any reportable accident, the contractor (or responsible USACE supervisor for in-house USACE activities) shall complete and submit required Accident Reports. If there is an accident involving radiation, the RPO for the USACE Geographic Command or the Radiation Protection Staff Officer (located at HQUSACE, CESO) shall be notified immediately.

C-18. Logs, Reports, and Recordkeeping

a. The following logs, reports, and records shall be developed, retained, and submitted to the CO (or approving authority for in-house activities):

(1) Training logs (site-specific and visitor), and records of radiological instructions and notices to workers.

(2) Daily safety inspection logs (may be part of the Daily QC Reports).

(3) Equipment maintenance logs.

(4) Employee/visitor register.

(5) Environmental and personal exposure monitoring and sampling results.

b. For work involving exposure to radiation, the following additional logs, reports, and records shall be developed, retained, and submitted to the CO (or approving authority for in-house activities):

(1) Records of radiation surveys, monitoring and disposal as per 10 CFR 20 subpart L.

(2) Reports of loss of licensed material as per 10 CFR 20.402.

(3) Notification of incidents as per 10 CFR 20 subpart M Reports.

(4) Reports of overexposure and excessive levels and concentrations as per 10 CFR 20.405.

(5) Notification and reports to individuals as per 10 CFR 20.409.

APPENDIX D
29 CFR 1910.120/29 CFR 1926.65 (HAZWOPER) Training and Medical Surveillance Exemption Criteria

D-1. Employee training and medical surveillance requirements in OSHA's HAZWOPER standard do not have to be applied to cleanup tasks that will not expose employees to contaminant-related hazards. For the purposes of this ER, this means:

a. Cleanup tasks where the task or operation creates a barrier eliminating employee exposure to contaminant-related hazards.

b. Cleanup tasks that can be managed, without the use of engineering controls or PPE, so that employees will not be exposed to contaminant-related hazards.

D-2. All decisions to exempt HAZWOPER training and medical surveillance requirements from cleanup tasks shall made by qualified SOH staff and shall be justified in the Health and Safety Design Analysis and specified in project specifications (fixed price contracts) or the project work plans (cost reimbursable contracts).