



## **4825 Glenbrook Road Decision Document**

### ***Overview:***

The project site is a residential property located at 4825 Glenbrook Road N.W. within the Spring Valley Formerly Used Defense Site (FUDS) in Northwest Washington, D.C. During the World War I era, the property was part of a larger area known as the American University Experiment Station (AUES), where the U.S. government researched and tested chemical agents, equipment and munitions. AUES related waste, including more than 500 munition items, 400 pounds of laboratory glassware and 100 tons of contaminated soil have been recovered and safely removed from the property during investigations from 2000-2002 and then again from 2007-2010. In August 2010, several agencies within the Department of Defense as well as the regulatory partners, the U.S. Environmental Protection Agency and District of Columbia Department of the Environment,



4825 Glenbrook Road Property

made the decision to separate the 4825 Glenbrook Road property from the Spring Valley neighborhood site to expedite the cleanup process. This decision was based on the nature and extent of the AUES related items found on the property, and the determination that these items were distributed across the property during the construction of the house in the early 1990s. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process guides the selection and implementation of the remaining cleanup activities to achieve closure at the 4825 Glenbrook Road site.

### ***What is the Decision Document?***

The Decision Document formally selects the cleanup alternative to address any contamination and risks potentially remaining at 4825 Glenbrook Road. The Decision Document was prepared using information developed during the Remedial Investigation, Feasibility Study, and Proposed Plan phases of the CERCLA process. Community input was also taken into consideration during the Decision Document process. Several offices within the U.S. Army Corps of Engineers, the Department of Army, and the interagency regulatory partners reviewed, and then finalized this Decision Document for 4825 Glenbrook Road. The Decision Document was approved in early July 2012 upon joint signature by the Deputy Assistant Secretary of the Army for Environmental, Safety, and Occupational Health and the Army's Assistant Chief of Staff for Installation Management.

### ***How will the property be cleaned up?***

The U.S. Army Corps of Engineers will remove the house, cleanup, and restore the property to residential standards, providing for unrestricted future use of the property. This approach was presented as Alternative 5 in the Proposed Plan, and is the most effective and protective of human health and the environment. This provides the best long-term solution by minimizing future risk at 4825 Glenbrook Road and providing maximum flexibility in future land use.

**NEXT STEPS...*****When will cleanup activities begin?***

Environmental cleanup activities will begin once the house is removed and the Remedial Design and Remedial Action Work Plan is approved and finalized. This work plan outlines how the property will be cleaned up and includes excavating the site, including the area beneath the house, to competent saprolite or bedrock. Updates on the 4825 Glenbrook Road project will be presented at the monthly Restoration Advisory Board meetings, and an informational community meeting on the Remedial Design and Remedial Action Work Plan will be held prior to beginning cleanup activities. The tentative schedule leading to the complete restoration of the property includes:

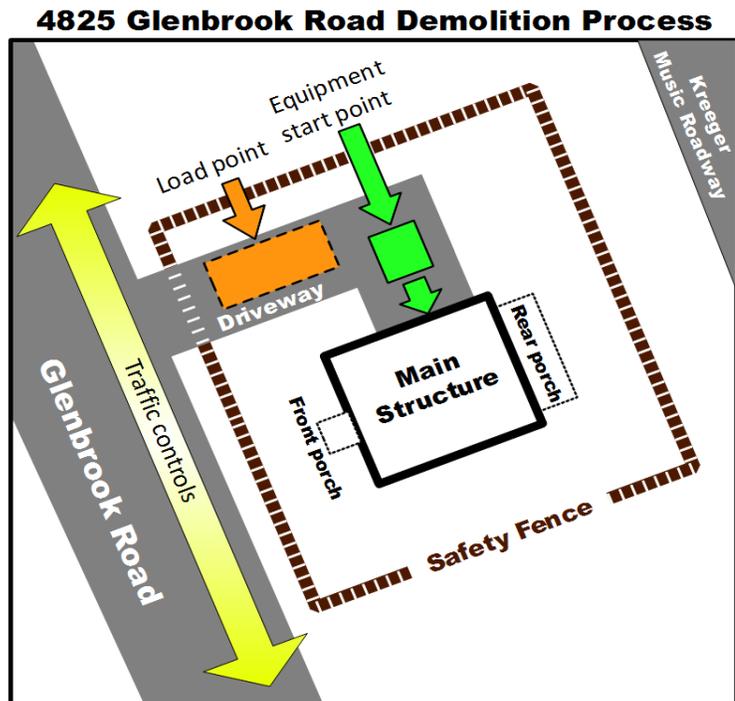
- Final House Demolition and Disposal Plan – Released July 2012
- Joint Restoration Advisory Board/Community Meeting – July 17, 2012
- Draft Final Remedial Design and Remedial Action Work Plan for the property – August 2012
- \*Removal of House
- Final Remedial Design and Remedial Action Work Plan – October 2012
- Community Meeting – Fall 2012
- \*Site Cleanup

*\*Schedule tentative pending coordination with the property owner*

**A demolition plan has been developed to remove the house at 4825 Glenbrook Road.** The house will be removed in accordance with the approved Demolition and Disposal Plan. Details of the plan include using an excavator to systematically dismantle the interior and exterior of the house from top to bottom. To ensure the safety of the workers and the community, any part of the house that comes into contact with subsurface soils, including the basement slab and exterior basement walls, will remain in place and will be removed as part of the environmental cleanup action.

House removal will take approximately two weeks, with activities Monday-Friday from 8 a.m. to 5 p.m. During removal activities, personnel will direct traffic on the 4800 block of Glenbrook Road to ensure the safety of all vehicles and passersby. Construction traffic will be minimal, 1-3 truck loads with construction debris per day.

No traffic detours or lane closures are anticipated. Access to 4825 Glenbrook Road will be restricted by a safety fence. All access points will remain secured after hours and on weekends. All debris will be either recycled or disposed of off-site in accordance with local, state, and federal guidelines.

***Where can I learn more?***

*The CERCLA related documents for the 4825 Glenbrook Road N.W. site, including the Demolition and Disposal Plan, are posted on USACE's Spring Valley website (see below). Also posted are additional summary materials discussing the **Overview, Remedial Investigation Report, Feasibility Study, and Proposed Plan.** To learn more, call our Community Outreach Office at 410-962-0157.*

# **FINAL DECISION DOCUMENT FOR 4825 GLENBROOK ROAD**

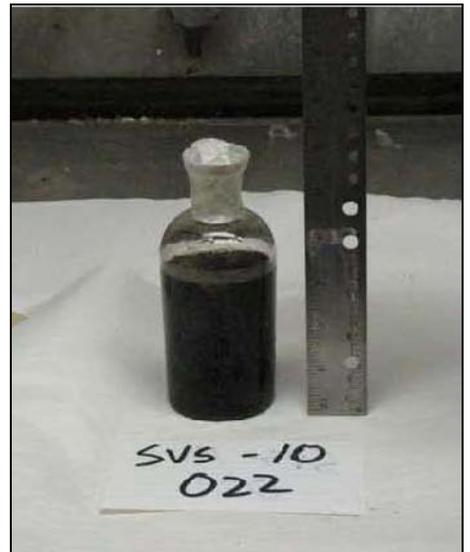
## **SPRING VALLEY FORMERLY USED DEFENSE SITE, OPERABLE UNIT 3, WASHINGTON, D.C.**



**PREPARED BY:**



**Baltimore District  
U.S. Army Corps of Engineers  
10 South Howard Street  
Baltimore, Maryland 21201-1715  
June 13, 2012**



## **DECLARATION FOR THE DECISION DOCUMENT**

### **SITE NAME AND LOCATION**

The subject of this Decision Document is the site at 4825 Glenbrook Road (herein referred to as “4825 Glenbrook Road” or the “Site”), which is located in the south central portion of the Spring Valley Formerly Used Defense Site (SVFUDS) within the Spring Valley residential community. This community is situated in the northwest section of Washington, D.C. 4825 Glenbrook Road is a private residential parcel of approximately 0.4 acres that includes a single family, detached residential dwelling (the house) owned by American University (AU).

### **STATEMENT OF BASIS AND PURPOSE**

This Decision Document presents the selected remedial action for 4825 Glenbrook Road. The United States (U.S.) Army is the lead federal agency under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for the Formerly Used Defense Site (FUDS) Program, including for the SVFUDS. The U.S. Army Corps of Engineers (USACE) executes the FUDS Program on behalf of the Army, including drafting Decision Documents and implementing selected remedial actions. The signature authority for the 4825 Glenbrook Road Decision Document includes the Department of the Army’s Assistant Chief of Staff for Installation Management (ACSIM) and the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (DASA-ESOH).

4825 Glenbrook Road was part of the American University Experiment Station (AUES), which the U.S. Government established to research the testing, production, development and effects of noxious gases, Chemical Warfare Materiel (CWM) (i.e., chemical munitions and chemical agent (CA) in other than a munitions’ configuration), antidotes and protective masks, during World War I.

The Army hereby selects the remedial action (also referred to as the selected remedy) for 4825 Glenbrook Road in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) [42 U.S.C. § 9601 et seq.], and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 CFR Part 300]. This decision is based on the Administrative Record for 4825 Glenbrook Road.

The District of Columbia Department of the Environment (DDOE) and Region III of the U.S. Environmental Protection Agency (USEPA) concur with the selected remedy.

## **ASSESSMENT OF THE SITE**

The remedial action selected is necessary to protect public health and the environment from actual or threatened releases of hazardous substances from past Department of Defense (DoD) operations and activities.

## **DESCRIPTION OF SELECTED REMEDY**

### **Background on the Selected Remedy**

4825 Glenbrook Road was part of the AUES, which the U.S. Government established to research the testing, production, development and effects of noxious gases, CWM, antidotes and protective masks. The remedy selected in this Decision Document is intended to address releases or threatened releases of hazardous substances that may be present at 4825 Glenbrook Road, at least in part, from past DoD operations and activities.

### **Selected Remedy**

The selected remedy for 4825 Glenbrook Road was identified by USACE as Alternative 5: Remove the house and remediate (cleanup) to residential standards, providing for the property's unrestricted future use as described in the Proposed Plan issued on September 30, 2011.

The selected remedy provides the best long-term solution for 4825 Glenbrook Road by minimizing potential for future risk at 4825 Glenbrook Road from past DoD operations and activities. DoD only has authority to conduct response actions for a release or threatened release of a hazardous substance, pollutant or contaminant that is present as a result of DoD operations and activities at the time the property was owned by the United States and/or under the jurisdiction of DoD. The remedial action selected will be focused on removing AUES-related material. This material includes military munitions including unexploded ordnance (UXO), discarded military munitions (DMM) and Chemical Warfare Materiel (CWM) (i.e., chemical munitions and chemical agent (CA) in other than a munitions configuration) (collectively referred to as munitions and explosives of concern (MEC)); munitions debris, including CWM-related debris; and soil contaminated by munitions constituents (e.g., explosives; CA, including CA breakdown products (ABP); heavy metals) originating from military munitions that are evaluated and determined to be a CERCLA hazardous substance, pollutant or contaminant. Other debris and environmental contaminants encountered during this remedial action will be evaluated to determine its explosives safety status and origin, and removed incidental to addressing AUES-related material that are CERCLA hazardous substances or pollutants and contaminants.

Figure 3 illustrates the initial excavation boundaries for the selected remedy.

Area A represents a portion of the 4825 Glenbrook Road's backyard. This portion of the backyard, which includes 10 feet behind the current retaining wall, represents the realistic practical extent of possible redistribution of burial pit contents during 4825 Glenbrook Road's development. The delineation of Area A takes into account the estimated area of disturbance by the developer to re-route the sanitary sewer line behind the backyard retaining wall. This delineation is based on the depth of the sanitary sewer line, which is 6 feet; the location of the sanitary sewer line, which is approximately 2 feet east of the retaining wall; and an assumption of an excavation approach consistent with industry standards using benching and sloping. Accordingly, the potentially disturbed area is approximately 10 feet behind the retaining wall. Additional excavation may be warranted if AUES-related material is encountered in Area A. In that case, USACE will remove AUES-related material from debris fields in accordance with the procedures outlined in the Remedial Design/Remedial Action Work Plan (to be prepared) until no additional AUES-related material is encountered, at which point the excavation of Area A would be considered complete.

Area B represents the flat section of the driveway and includes the retaining wall between 4825 Glenbrook Road and 4835 Glenbrook Road, plus various hardscapes (e.g., retaining walls, access steps to the backyard) that will be removed as part of the selected remedy.

Area C includes the area investigated as Burial Pit 3 and its associated extensions. Based on the extensive work performed previously within this area, USACE proposes no further action for Area C.

Area D is the flat terrain between the backyard's retaining wall and the house. This area includes the back porch patio, a portion of the backyard's retaining wall and various other hardscapes that will be removed as part of the selected remedy.

Area E represents the house and area beneath the house, plus some partial sections of retaining walls that connect to it.

Area F represents the front yard down to Glenbrook Road. This area includes all of the front yard's retaining walls, plus the front porch and stairs to access the front porch. All site features (retaining walls, patios, porches, steps, and the house) will be removed to accomplish the selected remedy.

To meet the remedial action objectives for 4825 Glenbrook Road, the depth of excavation for the aforementioned areas will generally be 2 feet below the bottom of retaining wall footers, the house's slabs and foundation, and/or to competent saprolite or bedrock.

Excavation and off-site disposal will be required for soils excavated in areas discussed above. Contaminated media will be segregated and then transported to an appropriate off-site disposal facility following characterization per specific procedures that USACE will detail in the Remedial Design/Remedial Action Work Plan for 4825 Glenbrook Road.

Most of the substances that USACE expects to remove from 4825 Glenbrook Road consist of contaminated media, primarily soil. However, given the Site's history, USACE cannot be certain this will be the case. Therefore, the selected remedy incorporates the selected removal action that the Army addressed in its February 2010 Action Memorandum (AM), Disposal of Discarded Military Munitions (DMM), Including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH) (hereinafter, February 2010 Action Memorandum) with regard to the disposal of DMM, RCWM, and material for which the explosive safety status is documented as, MDEH. Incorporation of this selected removal action is consistent with the 2009 Engineering Evaluation/Cost Analysis (EE/CA) for the Disposal of Discarded Military Munitions (DMM), including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH), section 1.1.4. (hereinafter, November 2009 EE/CA) (USACE 2009d). The November 2009 EE/CA indicates that subsequently discovered items (RCWM and conventional DMM/MDEH) appropriate for treatment by the applicable selected alternative will be treated in accordance with this Action Memorandum. All MEC, including CWM, and other AUES-related material recovered will be inspected to determine its explosive or CA safety status and disposed of in accordance with the February 2010 Action Memorandum. The selected response action for RCWM in the February 2010 Action Memorandum is onsite demilitarization using the Explosive Destruction System (EDS) at the federal property located within the SVFUDS. The selected response action for conventional DMM and MDEH is on-site demilitarization using contained destruction technologies at the federal property located within the SVFUDS. Furthermore, in the Proposed Plan for the remedial action for the 4825 Glenbrook Road, USACE proposed to incorporate the selected removal action from the February 2010 Action Memorandum into the remedial action for 4825 Glenbrook Road.

### **STATUTORY DETERMINATIONS**

The selected remedial action is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the hazardous substances that are the subject of this response action, is cost effective, and uses permanent solutions to the maximum extent possible. This remedial action does not satisfy the statutory preference for treatment as a principal element of the remedy because treatment of the contamination at 4825 Glenbrook Road is not feasible.

Upon completion of this remedy, the conditions at 4825 Glenbrook Road will allow for unlimited use and unrestricted exposure (UU/UE).

**DECISION DOCUMENT DATA CERTIFICATION CHECKLIST**

The following information is included in this Decision Document's Summary section:

- Risk associated with any AUES-related material present at 4825 Glenbrook Road
- Remediation (cleanup) levels established for 4825 Glenbrook Road and the basis for these levels
- Current and reasonable future land use assumptions used in the Human Health Risk Assessment and this Decision Document
- Potential land use that will be available at 4825 Glenbrook Road once the selected remedy is implemented
- Estimated capital, annual operation and maintenance (O&M), and total costs, discount rate, and the number of years over which the remedy-cost estimates are projected
- Key factors that led to the remedy selection; that is, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria

## AUTHORIZING SIGNATURES

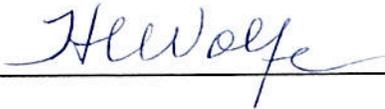
This Decision Document presents the selected remedy for 4825 Glenbrook Road in SVFUDS, which is located in the south central portion of the SVFUDS within the Spring Valley residential community. The SVFUDS is located in the northwest section of Washington, D.C. The Army is the lead federal agency under CERCLA and the Defense Environmental Restoration Program (DERP) for SVFUDS. The USACE executes the FUDS Program on behalf of the Army, including drafting Decision Documents and implementing selected remedial actions. USACE has developed this Decision Document consistent with CERCLA, as amended, and the NCP. This Decision Document will be incorporated into the larger Administrative Record file for the SVFUDS project, which is available for public view at the Tenley-Friendship Library Branch, located at 4450 Wisconsin Ave. N.W., Washington, DC 20016. This document, which presents a selected remedy with a present worth cost estimate of \$13,500,000, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, subject: Policies for Staffing and Approving Decision Documents, and to Engineer Regulation 200-3-1, Formerly Used Defense Sites Program Policy

APPROVED:



**Michael Ferriter**  
**Lieutenant General, US Army**  
**Assistant Chief of Staff**  
**for Installation Management**

**DATE**



**Hershell E. Wolfe**  
**Deputy Assistant Secretary of the Army**  
**for Environment, Safety and Occupational Health**

**DATE**

**Table of Contents**

Declaration for the Decision Document.....2

Authorizing Signatures.....7

Decision Summary.....13

1. Site Name, Location, and Description ..... 13

    1.1. Regulatory Oversight And Enforcement ..... 13

    1.2. Site and Vicinity Land Use ..... 14

    1.3. Zoning And Future Land Use ..... 14

    1.4. Site Overview ..... 15

2. Site History and Investigations ..... 15

3. Highlights of Community Participation..... 18

4. Scope and Role of the Remedial Action ..... 20

    4.1. Applicable or Relevant and Appropriate Requirement..... 23

        4.1.1. ARARs as Defined in CERCLA..... 23

        4.1.2. ARARs Selected for the 4825 Glenbrook Road Site Remediation..... 24

        Table 4.1. Summary of ARARs..... 25

    4.2. Remediation Goals for the 4825 Glenbrook Road Site ..... 25

    4.3. Remedial Action Objectives for the 4825 Glenbrook Road Site ..... 26

5. Summary of Site Characterization ..... 26

    5.1. Environmental Management Systems (EMS) – 1992..... 26

    5.2. Surface Soil Sampling – 1994..... 26

    5.3. USACE Geophysical Investigation – 1999..... 27

    5.4. X-Ray Fluorescence Sampling Event – 1999 ..... 27

    5.5. Surface and Subsurface Soil Sampling Event – 1999..... 27

    5.6. Grid and Driveway Soil Sampling – 2000-2001..... 27

    5.7. Arsenic Soil Removal – 2000-2001 ..... 27

    5.8. Test Pit Investigations – 2001..... 28

    5.9. 4825 Test Pit Investigation (Test Pit 23) – 2001-2002 ..... 28

    5.10. Temporary Backfill of Test Pit 23 – 2002 ..... 28

    5.11. Soil Gas Investigation – 2007 ..... 28

5.12. 4825 Glenbrook Road Current Investigation Activities .....	29
5.12.1. 4825 Burial Pit 3 Investigation (2007 – 2009).....	29
5.12.2. Low and High Probability Test Pit Investigations and Additional Aresenic Removal (2009 to 2010) .....	30
6. Summary of Site Risks .....	31
6.1. Human Health Risk Assessment.....	31
6.2. Munitions and Explosives of Concern Hazard Assessment (MEC HA) .....	34
Table 6.2. Hazard Level (Scoring) Ranking .....	34
6.3. Chemical Warfare Materiel (CWM) Hazard Assessment .....	35
6.4. Summary of Risk Assessments.....	36
7. Description of Remedial Alternatives.....	36
8. Summary of Comparative Analysis of Alternatives .....	41
8.1. Evaluation Criteria .....	42
8.2. Alternative Comparison .....	43
Table 8.1. Summary of Detailed Analysis of Remaining Alternative .....	47
9. Summary of the Selected Remedy.....	48
Table 9.1. Cost Summary for the Selected Remedy: Alternative 5 .....	50
10. Statutory Determinations .....	53
10.1. Protection of Human Health and the Environment.....	53
10.2. Attainment of ARARs .....	54
10.3. Cost Effectiveness .....	54
10.4. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Possible .....	55
10.4.1. Soil .....	56
10.4.2. Water .....	56
10.4.3. MD and Non-munitions, Non-AUES Scrap .....	56
10.4.4. MEC, DMM, RCWM, and MDEH.....	57
10.5. Determination Summary .....	57
Glossary of Terms .....	58
References .....	63

- APPENDIX A: Responsiveness Summary
- APPENDIX B: Transcript – Public Meeting (October 26, 2011)
- APPENDIX C: Concurrence Letters
- APPENDIX D: Figures

## **ACRONYMS and ABBREVIATIONS**

ACSIM	Department of the Army's Assistant Chief of Staff for Installation Management
ARARS	Applicable or Relevant and Appropriate Requirements
AsCl <sub>3</sub>	Arsenic Trichloride
ABP	Agent Breakdown Product
AU	American University
AUES	American University Experiment Station
Bgs	Below Ground Surface
USACE	U.S. Army Corps of Engineers, Baltimore District
CA	Chemical Agent
CAFS	Chemical Agent Filtration System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Contaminant of Potential Concern
CWM	Chemical Warfare Materiel
CT	Central Tendency
CSM	Conceptual Site Model
CY	Cubic Yards
DA	Department of the Army
DASA-ESOH	Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health
DDOE	District of Columbia Department of the Environment
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
ECBC	U.S. Army Edgewood Chemical Biological Center
ECS	Engineering Control Structure
EE/CA	Engineering Evaluation/Cost Analysis
EPC	Exposure Point Concentration
FS	Feasibility Study
Ft	Feet
FUDS	Formerly Used Defense Site
H	Mustard
HI	Hazard Index
HTW	Hazardous and Toxic Waste
HHRA	Human Health Risk Assessment
L	Lewisite
LUC	Land Use Control
MD	Munitions Debris
MDEH	Material Documented as an Explosive Hazard
MEC	Munitions and Explosives of Concern
MEC HA	MEC Hazard Assessment
MRS	Munitions Response Site
NCP	National Contingency Plan

NTCRA	Non-Time Critical Removal Action
NW	Northwest
OU	Operable Unit
Partners	Spring Valley Regulatory Partners (EPA and DDOE)
RAB	Restoration Advisory Board
RCWM	Recovered Chemical Warfare Materiel
RAO	Remedial Action Objective
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RCRA	Resource Conservation and Recovery Act
RME	Reasonable Maximum Exposure
SVFUDS	Spring Valley Formerly Used Defense Site
SVOC	Semivolatile Organic compound
TAL	Target Analyte List
TIC	Tentatively Identified Compound
TP	Test Pit
TSD	Treatment, Storage, or Disposal
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UU/UE	Unlimited Use / Unrestricted Exposure
VCS	Vapor Containment Structure
VOC	Volatile Organic Compound
XRF	X-ray Fluorescence

## **DECISION SUMMARY**

### **1. SITE NAME AND LOCATION**

4825 Glenbrook Road, NW, Washington, DC 20016

#### **1.1. REGULATORY OVERSIGHT AND ENFORCEMENT**

The U.S. Army is the lead agent for the FUDS Program. The U.S. Army Corps of Engineers (USACE) executes the FUDS Program on behalf of the Army, including drafting Decision Documents and implementing selected remedial actions. As such, USACE drafted the Decision Document for the remedial action for 4825 Glenbrook Road (hereinafter, “4825 Glenbrook Road” or the “Site”) for approval by the Assistant Chief of Staff for Installation Management (ACSIM) and the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (DASA-ESOH). This Decision Document describes the necessary and appropriate remedial action (also referred to as the selected remedy) selected to address releases or threatened releases of hazardous substances and pollutants or contaminants that may be present at the Site from past Department of Defense (DoD) operations and activities. The District of Columbia Department of the Environment (DDOE) and Region III of the U.S. Environmental Protection Agency (USEPA) are regulatory partners with USACE in this effort.

To date, the CERCLA response actions at 4825 Glenbrook Road have been removal actions. These actions have included investigations and limited-scope removal (cleanup) activities. Pursuant to CERCLA, USACE is now transitioning to a remedial action at the Site. The USACE Baltimore District will conduct the remedial action at the Site to address the potential threat to human health and the environment posed by the presence of AUES-related material. This material includes military munitions including unexploded ordnance (UXO), discarded military munitions (DMM), and Chemical Warfare Materiel (CWM) (i.e., chemical munitions and chemical agent (CA) in other than a munitions configuration) (collectively referred to as munitions and explosives of concern (MEC)); munitions debris, including CWM-related debris; and soil contaminated by munitions constituents (e.g., explosives; CA, including CA breakdown products (ABP); heavy metals) originating from military munitions at the Site that are evaluated and determined to be a CERCLA hazardous substance, pollutant or contaminant. Other debris or environmental contaminants encountered during this remedial action will be evaluated to determine its explosive safety status and origin, and addressed incidental to addressing AUES-related material that are CERCLA hazardous substances or pollutants and contaminants. USACE will implement the selected remedy under the Formerly Used Defense Sites (FUDS) Program.

The Army initially identified the Spring Valley Formerly Used Defense Site (SVFUDS) in January 1993, after a contractor digging a utility trench encountered buried military munitions.

In February 1993, the Army initiated an emergency response during which 141 items (43 suspect CWM) were removed and subsequently initiated a Remedial Investigation of the entire SVFUDS. This investigation focused on specific areas of concern that were determined to have the potential for the presence of AUES-related material. After two years of investigation, which included taking 260 soil samples, USACE recovered 4 military munitions, none of which were CWM. In 1995, the Army signed a No Further Action Decision Document, while acknowledging responsibility for follow-up response actions, if needed. In 1998, the Army returned to SVFUDS to investigate the residence of the South Korean Ambassador for the presence of military munitions burial pits. This investigation yielded three burial pits containing military munitions, many of which were determined to be CWM. As a result, USACE expanded its investigation to include every property located within the SVFUDS boundary. The Army, by agreement, has recently separated the remedial action for 4825 Glenbrook Road from the overall SVFUDS project. The Army took this action based on the complexity of the SVFUDS and specific concerns (e.g., the presence of Burial Pit 3, CWM, glassware, and related debris) with 4825 Glenbrook Road. (See Appendix D, Figure 1, which depicts the SVFUDS boundary and Figure 2, which depicts the location of 4825 Glenbrook Road.)

## **1.2. SITE AND VICINITY LAND USE**

4825 Glenbrook Road is located in the south central portion of the SVFUDS within the Spring Valley residential community. This community is situated in the northwest section of Washington, D.C. (see Appendix D, Figure 1). 4825 Glenbrook Road, which includes a single family, detached residential dwelling owned by American University (AU), is a private residential parcel of approximately 0.4 acres. Appendix D, Figure 2, provides 4825 Glenbrook Road's layout.)

4825 Glenbrook Road is located in a low-density residential area (three to four dwelling units per acre) that is west of American University's campus. The residence of the South Korean Ambassador (4801 Glenbrook Road) is adjacent and south of 4825 Glenbrook Road, and AU's president's house (4835 Glenbrook Road) is adjacent to its north. Residential homes are also located across Glenbrook Road to the west. To the east of 4825 Glenbrook Road is AU's campus; specifically, Kreeger Music Roadway.

## **1.3. ZONING AND FUTURE LAND USE**

Currently, 4825 Glenbrook Road is zoned for residential use. The selected remedy will remediate (cleanup) this Site to residential standards.

## **1.4. SITE OVERVIEW**

This Decision Document identifies the selected remedy for 4825 Glenbrook Road, which at one time was presumably part of the American University Experiment Station (AUES). The U.S. Government established AUES to research the testing, production, development and effects of noxious gases, CWM, antidotes and protective masks. Additional information pertaining to the Site is provided at the following public information repositories:

### Administrative Record:

U.S. Army Corps of Engineers,  
Baltimore District (10200-C)  
10 South Howard Street  
Baltimore, MD 21201  
Attn: Spring Valley Outreach Team  
410-962-0157

### Information Repository:

D.C. Public Library, Reference Desk  
Tenley-Friendship Library Branch  
4450 Wisconsin Ave. N.W.  
Washington, DC 20016  
202-727-1488

## **2. AUES's AND 4825 GLENBROOK ROAD'S HISTORY AND INVESTIGATIONS**

During World War I, the U.S. Government established AUES to investigate the testing, production, and effects of noxious gases, antidotes and protective masks. AUES, which was located on the grounds of the AU's campus, used additional property in its vicinity to conduct research and develop CWM, including mustard (H) and lewisite (L) CAs, and other chemical-based munitions fills including adamsite, irritants and smokes. After the war, the DoD transferred these activities to other locations, and AUES was demobilized, with the property returned to its owners.

USACE determined the Chemicals of Potential Concern (COPCs) based on historical records, investigations within the SVFUDS, and the results of sampling. Based on this information, USACE concluded that AUES-related material was disposed at 4825 Glenbrook Road and that the COPCs should include the below. The soil samples were analyzed for the following compound classes:

- Mustard (H), lewisite (L), and ABPs (thiodiglycol, oxathiane, and dithiane)
- Explosives
- Volatile Organic Compounds (VOCs)

- Semi-Volatile Organic Compounds (SVOCs)
- Metals
- Total Cyanide
- Fluoride
- Iodine
- Perchlorate

USACE has performed numerous response actions at 4825 Glenbrook Road. A description of the response actions performed includes mobilization, intrusive investigations, disposal, site restoration and demobilization. These investigation activities were performed in accordance with the site-specific work plans (SSWPs) for each of the investigations listed below.

- Arsenic Sampling and Removal (2000 – 2001)
- Test Pits and Trenches Investigation (2001 – 2002)
- 4825 Test Pit (Test Pit 23) Investigation (May 2001 – March 2002)
- Soil Gas and Driveway Boring ABP Soil Sampling (March – June 2007)
- Burial Pit 3 Investigation and Extensions (October 2007 – March 2009)
- Low-Probability Test Pit Investigation (March – August 2009)
- Arsenic Sampling and Removal in the Driveway (May – July 2009)
- High-Probability Test Pits Investigation (November 2009 – April 2010)
- Geotechnical Soil Boring and Backyard Soil Sampling (August 2010)

During the most recent (2007 – 2009) high- and low-probability investigations at Burial Pit 3, which is located on 4825 Glenbrook Road, 84 closed cavity items were recovered. These included 75mm projectiles, 2-inch and 3-inch pipes with end caps, 4.7-inch projectiles and intact glassware. Analytical results for 11 test pit characterization and 13 confirmation samples show that metals, including aluminum, arsenic, cobalt, iron, magnesium, manganese, thallium and vanadium, exceeded the accepted comparison levels in some of the samples.

USACE investigated an additional 41 low-probability test pits. Only one test pit contained suspect AUES-related material glassware at 6 feet (ft) below ground surface (bgs). An additional seven low-probability test pits still require investigation. USACE removed all arsenic-impacted soil exceeding 20 milligrams/kilogram (mg/kg) (the SVFUDS remediation level for arsenic) at the Site, with the exceptions of a small area in the driveway adjacent to 4835 Glenbrook Road and a small area near the back porch of 4825 Glenbrook Road. The remaining low-probability test pits and arsenic removal will be completed with the selected remedy. These areas were previously inaccessible due to the conditions at the Site, such as retaining walls, access steps, etc.

USACE investigated High-Probability Test Pits 120, 134 and 138 from November 2009 through April 2010. Of the AUES-related material recovered, including closed and open cavity items (i.e., glass bottles, glass vials, glass test tubes, glass jars, metal bottles, and 75mm projectiles), 26 were determined to be recovered CWM (RCWM), 2 were determined to be DMM (a closed cavity 75mm projectile and a 75 mm unfuzed, unfired shrapnel round), and 3 were determined to be Munitions Debris (MD) (two open cavity 75mm projectiles and a 75mm unfuzed projectile with a hexagonal plug) that did not pose an explosive or CA hazard. The remaining AUES-related material was evaluated and determined to be non-hazardous debris.

CA and ABPs were detected in intact containers and soil uncovered in the vicinity of the excavation of Test Pits 120, 134 and 138. Other industrial chemicals (e.g., chloroacetophenone, diphenylchloroarsine, and arsenic trichloride ( $\text{AsCl}_3$ )) were also detected in the intact containers. The intact containers were transported to and destroyed by the Army's Edgewood Chemical Biological Center (ECBC), located in Edgewood, MD, after analysis.

CA- and ABPs-impacted soil that USACE excavated during the removal action was placed in drums and disposed in a manner consistent with applicable regulations. Metals detected in CA and ABPs-cleared grab samples that exceeded the accepted comparison levels included aluminum, arsenic, iron, magnesium and thallium. Sample results showed that soil exceeding the accepted comparison levels still remained within the Site.

For AUES-related material that were determined to be military munitions, including RCWM, or closed cavity material (e.g., pipes) determined to contain explosives or CA, the selected response action, as indicated in the February 2010 Action Memorandum, was onsite demilitarization using the Explosive Destruction System (EDS)) at the federal property located within the SVFUDS. The selected response action for recovered conventional military munitions or material determined to pose an explosive hazard (MDEH) was on-site demilitarization using contained destruction technologies at the federal property located within the SVFUDS. As noted previously, USACE is incorporating the February 2010 Action Memorandum into the selected remedial action for 4825 Glenbrook Road.

USACE stopped the investigation of Test Pits 120, 134 and 138 due to a detection of arsenic trichloride ( $\text{AsCl}_3$ ) in a vapor and solid sample. Analysis of the ability of the existing safety control measures to adequately contain and filter the unanticipated chemical was needed as arsenic trichloride had not previously been found at the SVFUDS. USACE ceased its response actions to perform the required safety analysis. When USACE temporarily ceased its operations, it backfilled and secured the Site.

USACE will remobilize once the Army approves this Decision Document. USACE has completed its analysis of the ability of the existing safety control measures to adequately contain and filter the unanticipated chemical encountered. The analysis indicated that the existing Chemical Agent Filtration System (CAFS) is capable of handling arsenic trichloride.

Additional information on the history of AUES operations is provided in the Remedial Investigation (RI) Report (USACE, 1995), the Remedial Investigation Report for 4825 Glenbrook Road (USACE 2011a) (RI Report), the Feasibility Study for 4825 Glenbrook Road (FS Report) (USACE 2011b) and the Proposed Plan for 4825 Glenbrook Road (USACE 2011c).

### **3. HIGHLIGHTS OF COMMUNITY PARTICIPATION**

USACE encouraged and sought public input to ensure that the remedy selected for 4825 Glenbrook Road would both meet the needs of the local community and be an effective solution. Highlights of community involvement activities include:

- USACE provided monthly project updates on the 4825 Glenbrook Road Remedial Investigation, Feasibility Study, and Proposed Plan, in addition to other Spring Valley project-wide efforts, that were posted to the SVFUDS website and local community groups LISTSERV®; and emailed to interested stakeholders, including residents, elected officials, Restoration Advisory Board (RAB) members, agency stakeholders, and other interested individuals.
- USACE issued the final versions of the RI/FS in July 2011 and September 2011, respectively. These documents were placed in the Information Repository located at Tenley-Friendship Library, the Spring Valley project website and the Administrative Record for the site.
- USACE presented routine progress updates on the 4825 Glenbrook Road RI/FS at monthly RAB meetings. USACE provided an overview of the Proposed Plan at the September 2011 RAB meeting.
- USACE attended the local Advisory Neighborhood Council (ANC) meeting and presented an overview of the Proposed Plan on September 7, 2011.
- The Proposed Plan for 4825 Glenbrook Road was released on September 30, 2011. Copies of the Proposed Plan were made available online at the Spring Valley project website and in the Spring Valley information repository at the Tenley-Friendship Branch Library.
- A notice of availability for the Proposed Plan was published in the Washington Post and the Northwest Current on October 3, 2011. A media advisory announcing the public comment period was issued, and the notice of availability was also posted on the Spring Valley project website, local community group LISTSERV®, and emailed to

interested stakeholders, including residents, elected officials, RAB members, agency stakeholders, and other interested individuals.

- The public comment period on the Proposed Plan ran from October 3, 2011 through November 12, 2011. No extensions of the Public Comment Period were requested.
- A special issue of the *Corps' pondent* quarterly newsletter was mailed to all SVFUDS residents. The newsletter provided an overview of the Proposed Plan, notified the community of the public comment period, announced the date and time of the public meeting and open house, and included a detachable Proposed Plan comment form that could be mailed back to USACE.
- In addition to including the public meeting and open house date in the notice of availability, announcements were issued as a media advisory, emailed to interested stakeholders and posted to local community group LISTSERV<sup>®</sup>. The public meeting and open house was also announced at the monthly RAB meeting.
- On October 26, 2011, USACE held a public meeting and open house at the Tenley-Friendship Branch Library in Washington, DC. Representatives from USACE, USEPA and DDOE were in attendance. USACE provided an overview of the alternatives and a rationale for USACE's preferred alternative, followed by a question and answer session. Members of the public could submit oral comments during this part of the meeting. Oral and written comments could be submitted before, during and after the formal public meeting in an adjoining room to the meeting room. Written comments could also be submitted via a comment box in the meeting room. Posters and fact sheets outlining each alternative were available during the open house.
- USACE conducted extensive community involvement concerning the February 2010 Action Memorandum that provided the selected non-time-critical removal action (NTCRA) for the disposal of DMM, including both conventional and chemical munitions, and MDEH. USACE's action included:
  - Publication on November 30, 2009 of a notice of availability for the November 2009 EE/CA in the Washington Post, and on December 2, 2009, in the Northwest Current. USACE also posted the November 2009 EE/CA on the Spring Valley web site for easy public access.
  - Holding an informational open house on December 8, 2009 at the Metropolitan Memorial United Methodist Church meeting room at 3401 Nebraska Avenue, NW. Informational displays featured the disposal options for munitions, and the SVFUDS project team was available to answer questions about the November 2009 EE/CA.

- Notifying the public of the Army’s proposal to incorporate the selected NTCRA for the disposal of military munitions in the selected remedy for 4825 Glenbrook Road.

Appendix A, provides a summary of the significant comments received during the public comment period, USACE’s responses, and a copy of the notice of availability. Appendix B provides a complete transcript of the public meeting.

#### **4. SCOPE AND ROLE OF THE REMEDIAL ACTION**

The selected remedy for 4825 Glenbrook Road is to remove the house and remediate (cleanup) the Site to residential standards allowing for its unrestricted future use.

Based on the findings of investigations at the Site, the Site’s relatively small footprint, and the uncertainty about the potential AUES-related material to be present, USACE recommends the July 2011 RI Report’s soil contamination rationale for determining excavation depths be supplemented by administrative and practical considerations. USACE based the original conceptual site model (CSM) on historical information and photographic interpretation. Based on the original CSM, USACE assumed burial pits could be located and remediated. However, it became clear, particularly during Burial Pit 3’s investigation, that during the Site’s development the contents of the original pits were disturbed, with their contents distributed across the Site. The DMM discovered in the pits were neatly stacked, but materials around the house appeared scattered, indicating their potential movement during the Site’s development. Consequently, there is a potential for AUES-related material to be located in areas not completely excavated to bedrock or competent saprolite.

Based on the investigation’s results, USACE determined that areas (e.g., near and possibly contained in or under the house’s foundation, slightly beyond the backyard’s retaining wall) where there is a high probability that AUES-related material may be encountered should be excavated to the depth of bedrock or competent saprolite. Based on previous investigations USACE believes the depth to bedrock or competent saprolite will range from 5 feet in the front of the Site to up to 10 feet in its backyard.

Saprolite is thoroughly decomposed rock formed by in-place chemical weathering. It retains characteristics (e.g., cross-stratification) that were present in the original rock from which it formed, thus providing a strong indication that man-made activities have not impacted the layer. For this reason, saprolite has been used during previous SVFUDS investigations to represent the limits of past intrusive activities. For this remedial action, competent saprolite is defined as saprolite that cannot be excavated by hand tools, but can be excavated by powered

equipment. For engineering and estimating purposes, excavation depth calculations for the Site conservatively assumed a one-foot layer of competent saprolite overlying bedrock.

Digging to bedrock or competent saprolite will result in an over-excavation of the soil relative to the remediation (cleanup) goals based on soil contamination alone. However, the proposed excavation depth would also accomplish the goals of removing military munitions allowing the remedial action to result in UU/UE conditions at the Site.

The selected remedy provides the best long-term solution for 4825 Glenbrook Road by minimizing the potential for future risk at 4825 Glenbrook Road from past DoD operations and activities.

Figure 3 illustrates the initial excavation boundaries for the selected remedy.

Area A represents a portion of the 4825 Glenbrook Road backyard. This portion of the backyard, which includes 10 feet behind the current retaining wall, represents the realistic practical extent of possible redistribution of burial pit contents during 4825 Glenbrook Road's development. The delineation of Area A takes into account the estimated area of disturbance by the developer to re-route the sanitary sewer line behind the backyard retaining wall. This delineation is based on the depth of the sanitary sewer line, which is 6 feet; the location of the sanitary sewer line, which is approximately 2 feet east of the retaining wall; and an assumption of an excavation approach using benching and sloping. Accordingly, the potentially disturbed area is approximately 9 feet behind the retaining wall. Additional excavation may be warranted if AUES-related material is encountered in Area A. In that case, USACE will remove AUES-related material from debris fields in accordance with the procedures outlined in the Remedial Design/Remedial Action Work Plan (to be prepared) until no additional AUES-related material is encountered, at which point the excavation of Area A would be considered complete.

Area B represents the flat section of the driveway and includes the retaining wall between 4825 Glenbrook Road and 4835 Glenbrook Road, plus various hardscapes (e.g., retaining walls, access steps to the backyard) that will be removed as part of the selected remedy.

Area C includes the area investigated as Burial Pit 3 [TP-23] and its associated extensions. Based on the extensive work performed previously within this area, USACE proposes no further action for Area C.

Area D is the flat terrain between the backyard's retaining wall and the house. This area includes the back porch patio, a portion of the backyard's retaining wall and various other hardscapes that will be removed as part of the selected remedy.

Area E represents the house and area beneath the house, plus some partial sections of retaining walls that connect to it.

Area F represents the front yard down to Glenbrook Road. This area includes all of the front yard's retaining walls, plus the front porch and stairs to access the front porch. All site features (retaining walls, patios, porches, steps, and the house) will be removed to accomplish the selected remedy.

To meet the remedial action objectives for 4825 Glenbrook Road, the depth of excavation for each of the aforementioned areas will be approximately two feet below the bottom of retaining wall footers, the house's slabs and foundation, and/or to competent saprolite or bedrock. Excavation and off-site disposal will be required for soils excavated in areas discussed above. Contaminated soil will be segregated and then transported to an appropriate off-site disposal facility following characterization per specific procedures that USACE will detail in the Remedial Design/Remedial Action Work Plan for 4825 Glenbrook Road.

As noted previously, the selected remedy for 4825 Glenbrook Road incorporates the selected NTCRA for the disposal of DMM, including both conventional and chemical munitions, and MDEH. Any AUES-related material recovered will be inspected to determine its explosive or CA safety status and disposed of in accordance with the February 2010 Action Memorandum. The selected response action for RCWM in the February 2010 Action Memorandum is onsite demilitarization using the EDS at the federal property located within the SVFUDS. The selected response action for conventional DMM and MDEH is onsite demilitarization using contained destruction technologies at the federal property located within the SVFUDS.

The selected remedy is expected to meet the Remedial Action Objective (RAOs) and be the final CERCLA response action under the FUDS Program for 4825 Glenbrook Road. The remainder of SVFUDS, including potential groundwater issues, will be discussed in separate response action determinations.

The selected remedy provides for remaining soils to meet residential standards, as this is the foreseeable future use for the land at 4825 Glenbrook Road. As part of the closure process for the remedial action, the level of residual contamination in soil shall be evaluated to ensure the resultant levels meet the residential use criteria established by the applicable or relevant and appropriate requirements (ARARs).

CERCLA provides that remedial actions are to comply with ARARs. Accordingly, the RAOs for the remedy are consistent with the ARARs. Descriptions of the ARARs and the RAOs established for 4825 Glenbrook Road are summarized in the following sections. The scope of the remedial action required to meet the RAOs is also discussed below.

#### **4.1. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)**

As required by CERCLA, USACE identified prospective ARARs during the development of the remedial alternatives for the Site. ARARs include federal and/or state promulgated standards, requirements, criteria, and limitations. Chemical-, location-, and action-specific ARARs are identified. Pursuant to CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 C.F.R. part 300), compliance with ARARs is a threshold requirement that a remedial alternative must meet in order to be eligible for selection (unless the ARAR is waived).

The ARAR analysis is directed at substantive, promulgated regulations with regard to onsite remedial activities (CERCLA § 121(d), 42 U.S.C. § 9621(d); NCP, 40 C.F.R. § 300.5). Furthermore, CERCLA response actions, per CERCLA/NCP, are exempt from permits and similar procedural requirements with regard to onsite activities (42 U.S.C. § 9621(e)(1); 40 C.F.R. § 300.400(e)(1)). 4825 Glenbrook Road is "onsite" for purposes of CERCLA and the NCP (as are other areas related to the SVFUDS, such as the Interim Holding Facility). As for off-site activities (e.g., transportation), compliance is required for applicable substantive and procedural requirements (NCP, 40 C.F.R. § 300.400(e)(2)). Such off-site activities are not part of the ARAR analysis, but rather may be discussed during the implementability analysis for each alternative -- to the extent they pose challenges for certain alternatives.

The following sections define ARARs and describe the ARARs adopted by USACE for the selected remedy for 4825 Glenbrook Road.

##### **4.1.1. ARARS AS DEFINED IN CERCLA**

Pursuant to the NCP, 40 C.F.R. § 300.5, a regulation may qualify as an ARAR if it meets the definition of being either "applicable" or "relevant and appropriate." Each of these components is discussed below.

"Applicable" requirements means those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

"Relevant and appropriate" requirements means those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at

a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site. Only those state standards that are promulgated, are identified by a state in a timely manner, and are more stringent than federal requirements may be relevant and appropriate.

Pursuant to the NCP, the term “State” includes the District of Columbia (DC) (40 C.F.R. § 300.5).

Whether or not a requirement is appropriate (in addition to being relevant) will vary depending on factors such as the existence of wetlands or endangered species on or near the site, the duration of the response action, the form or concentration of the chemicals present, the nature of the release, the availability of other standards that more directly match the circumstances at the site, and other factors. In some cases only a portion of the requirement may be relevant and appropriate. The identification of relevant and appropriate requirements is a two-step process; only those requirements that are considered both relevant and appropriate must be addressed at CERCLA sites.

In addition to ARARs, advisories, criteria, or guidance may be identified as to be considered (TBC) information for a particular scenario. TBC information may be developed by USEPA, other Federal agencies, or states. TBCs are typically considered only if no promulgated requirements exist that are either applicable or relevant and appropriate. There were no TBCs identified for the selected remedy.

#### **4.1.2. ARARS SELECTED FOR THE 4825 GLENBROOK ROAD REMEDIATION**

Because of their site-specific nature, identification of ARARs calls for evaluation of federal and state environmental and facility siting laws regarding contaminants of concern, site characteristics, and proposed remedial alternatives. Requirements that pertain to the remedial response at a CERCLA site can be categorized into three different categories:

Chemical-specific ARARs set health- or risk-based concentration limits in various environmental media for specific hazardous substances, pollutants, or contaminants. These ARARs establish either protective cleanup levels for the COPCs in the designated media or indicate the appropriate level of concern.

Location-specific ARARs protect against damage to unique or sensitive areas such as floodplains, wetlands, and fragile ecosystems. They also restrict activities that may be harmful as a result of the characteristics of the site or the immediate environment.

Action-specific ARARs set controls or restrictions on specific removal/remedial activities at a site. They specify performance levels, actions, or technologies, as well as specific levels for discharges or residual chemicals.

Table 4.1 lists the federal and state chemical-, location-, and action-specific ARARs for the remedial action selected for 4825 Glenbrook Road.

Because implementation of the selected remedy will not impact endangered species or wetlands, there are no location-specific ARARs associated with the protection of endangered species or wetlands. 4825 Glenbrook Road was developed with few large contiguous wooded areas, and it provides very little habitat for rare, threatened, or endangered species. According to the U.S. Fish and Wildlife Service, “Except for occasional transient individuals, no proposed or federally listed endangered or threatened species are known to exist within the Spring Valley site [SVFUDS]” (U.S. Department of the Interior, 2003). There is a small intermittent stream near the Site that is not expected to be impacted by contaminants from 4825 Glenbrook Road. 4825 Glenbrook Road does not use groundwater as a public water supply, nor does the surrounding residential area. Municipal water is provided to this residential area.

All appropriate control measures will be in place to prevent impacts to local air and water during 4825 Glenbrook Road’s remediation. The selected remedial action will comply with all applicable substantive and procedural construction management and hazardous waste transportation requirements, in regards to contaminated soils that require excavation and removal to an off-site location. In particular, all applicable Resource Conservation and Recovery Act (RCRA) and other hazardous waste identification and transportation requirements, both substantive and procedural, will be complied with for off-site activities.

**Table 4.1: Summary of ARARs**

Requirement	Citation	Status	Synopsis
<b>Action-Specific:</b>			
U.S. Chemical and Biological Warfare Program	50 United States Code (U.S.C.) §1518	ARAR	No chemical or biological warfare agent shall be disposed “unless such agent has been detoxified or made harmless to man and his environment” (unless immediate disposal is clearly necessary, in an emergency, to safeguard human life).

DDOE identified regulations that it wishes to ensure are complied with during the remedial action. Although some of the provisions identified do not satisfy the technical definition of ARARs, USACE recognizes their importance and will operate in a manner consistent with the substantive requirements of 20 DCMR § 605.1, 20 DCMR § 606, 20 DCMR § 2803, 20 DCMR § 2804, 21 DCMR § 542.3, and 20 DCMR § 700.

#### **4.2. REMEDIATION GOALS FOR 4825 GLENBROOK ROAD**

Based on the HHRA, the remediation goal is 20 mg/kg for arsenic. The Spring Valley Partners proposed the 20 mg/kg SVFUDS remediation goal for arsenic as the soil arsenic

concentration above which remediation will be recommended. The Scientific Advisory Panel, established to assist the community in understanding the overall approach to technical issues affecting the SVFUDS, recommended adoption of this remediation goal (Scientific Advisory Panel Report, May 29, 2002 Meeting). This remediation goal was formalized in the Action Memorandum for the 2003 EE/CA addressing OU-4 and OU-5 (an SVFUDS site-wide analysis of technologies to address arsenic in soil).

#### **4.3. REMEDIAL ACTION OBJECTIVES FOR 4825 GLENBROOK ROAD**

The remedial action objectives for the Site include:

- Prevent direct contact with soil having a noncarcinogenic Hazard Index (HI) exceeding 1 (HI in excess of 1 indicates the potential for non-cancer effects (USEPA 1989a))
- Prevent direct contact with soil having a cancer risk in excess of  $1 \times 10^{-4}$
- Remove military munitions from the Site, allowing for UU/UE

### **5. SUMMARY OF SITE CHARACTERIZATION**

USACE has conducted a number of investigations over the years to characterize soil contamination and determine whether AUES-related material are present. Descriptions of previous investigations are summarized briefly below. More detailed descriptions of these investigations can be found in the RI Report for 4825 Glenbrook Road.

#### **5.1. Environmental Management Systems (EMS) – 1992**

In 1992, AU contracted EMS to investigate conditions discovered during construction activities in the vicinity of what would become 4825 and 4835 Glenbrook Road. At that time, these properties were under construction. As a result the EMS letter reports from May and June 1992 (EMS 1992) are not detailed sufficiently to determine the exact locations of the incidents described or the sampling performed. Workers reportedly experienced eye and respiratory irritation during construction activities. A rusted drum, laboratory glassware, and a white granular material were reportedly encountered. EMS conducted soil gas probes, hand excavations around the drum, and collected various samples, including the white powder.

#### **5.2. Surface Soil Sampling – 1994**

In support of the 1995 Operation Safe Removal (OSR) FUDS RI Report (USACE 1995), USACE collected a soil sample (SV-Baker-10) from 4825 Glenbrook Road in March 1994 as part of the Baker Valley Point of Interest (POI). Also, as part of the OU-3 investigations, USEPA Region III collected seven surface soil samples in and around 4801, 4825, and 4835 Glenbrook Road to supplement its risk assessment (USEPA Region 3 1999).

### **5.3. USACE Geophysical Investigation – 1999**

In 1999, USACE performed a geophysical investigation at 4825 Glenbrook Road. This investigation was concurrent with USACE's reacquisition of Burial Pits 1 and 2 at the adjacent 4801 Glenbrook Road. The results of the investigation were inconclusive; therefore, USACE determined that a test pit investigation was warranted.

### **5.4. X-Ray Fluorescence Sampling Event – 1999**

In April 1999, USACE contractor Parsons completed X-Ray fluorescence (XRF) arsenic screening on a soil sample collected from a soil boring at 4825 Glenbrook Road. A soil sample was collected and the analytical results showed that the arsenic concentration was below the accepted comparison level.

### **5.5. Surface and Subsurface Soil Sampling Event – 1999**

In June 1999, USEPA Region III collected six surface soil samples, and surface and subsurface soil samples from three borings. Results this sampling indicated that the soil at these properties could have been affected by AUES-related activities in the vicinity of Burial Pits 1 and 2 at 4801 Glenbrook Road. Consequently, USACE performed an Engineering Evaluation/Cost Analysis (EE/CA) for the three OU-3 properties (USACE 2000). The OU-3 EE/CA and baseline risk assessments for 4801, 4825, and 4835 Glenbrook Road addressed the potential hazard associated with arsenic contamination in the soil. The EE/CA was conducted to recommend and justify the preferred alternative to address arsenic soil contamination. The conclusion of USACE's risk assessment was that there was unacceptable risk with regard to exposure to arsenic in the surface soil. The preferred alternative was excavation and off-site disposal of the soil.

### **5.6. Grid and Driveway Soil Sampling – 2000-2001**

In September 2000, Parsons collected arsenic grid surface soil samples at 4825 Glenbrook Road. In January 2001, Parsons collected six driveway soil borings at 4825 Glenbrook Road for arsenic analysis in response to a District of Columbia Department of the Environment (DDOE) request.

### **5.7. Arsenic Soil Removal – 2000-2001**

From December 2000 to March 2001, arsenic-contaminated soil from 25 grids at the 4825 Glenbrook Road was excavated for USACE under an NTCRA that was based on the OU-3 EE/CA (USACE 2000). While the area now identified as the Burial Pit 3 south extension was sampled during this EE/CA, USACE did not detect elevated arsenic concentrations there.

### **5.8. Test Pit Investigations – 2001**

In May 2001, a test pit investigation began in the backyard of 4825 Glenbrook Road due to inconclusive geophysical results and the elevated arsenic concentrations in soil. USACE excavated 23 test pits and 2 trenches at 4825 Glenbrook Road. There were no significant findings in any of the test pits, except for Test Pit (TP) 23.

### **5.9. 4825 Glenbrook Road Test Pit Investigation (Test Pit 23) – 2001-2002**

A Vapor Containment Structure (VCS) was used as an Engineering Control Structure (ECS) during the investigation of TP 23 after MEC was discovered. USACE investigated all the other test pits and trenches under a VCS. All the test pits were excavated to a depth of approximately 6 feet (ft) below the historic 1918 ground surface or the maximum depth achievable by equipment. Other than TP 23, the maximum depth reached during the test pits investigations was 12 ft below the existing ground surface. Although USACE encountered significant quantities of AUES-related material in Test pit 23, it did encounter such quantities in any of the other pits.

During the investigation of TP 23, USACE recovered a total of 18 CWM-related items and 406 munitions-related items. There were 11 headspace samples that were positive for H and/or L. All the RCWM were safely demilitarized in 2003. Various types of glassware, artifacts, and general debris also were recovered from TP 23 and evaluated to determine their explosives safety status. Some of the glassware was determined to contain unknown liquids, with others determined to contain H and L ABPs. Other debris, which was observed beneath a retaining wall near the foundation of the house, was also removed.

### **5.10. Temporary Backfill of 4825 Glenbrook Road Test Pit 23 – 2002**

USACE excavated the southern portion of TP 23 removing all AUES-related material encountered. In March 2002, USACE temporarily backfilled TP 23's northern portion, including covering some AUES-related material observed under a retaining wall in close proximity to 4825 Glenbrook Road's house foundation. USACE took this action because issues arose with USACE's right-of-entry (ROE). For the purpose of further investigations, USACE referred to TP 23 as Burial Pit 3.

### **5.11. Soil Gas Investigation – 2007**

In 2007, USACE performed a soil gas investigation to assess the driveway and the remaining contents of TP 23 [Burial Pit 3] (USACE 2009a). Soil gas samples were collected using active soil gas sampling with summa canisters and passive soil gas sampling using Gore-Sorber® modules. Due to the detections of the H ABPs 1,4-oxathiane and 1,4-dithiane in one co-located Summa and Gore-Sorber® sample, USACE collected six ABP confirmation soil samples from the driveway. However, USACE did not detect ABPs in any of the six confirmation soil samples.

## **5.12. 4825 Glenbrook Road Current Investigation Activities**

### **5.12.1. Burial Pit 3 Investigation (2007-2009)**

In October 2007, USACE began a high probability investigation at Burial Pit 3 (formerly referred to as TP 23) at 4825 Glenbrook Road. USACE's primary goal of this investigation was to remove all potential AUES-related material from the suspect disposal area. USACE conducted all intrusive operations inside a negative pressure ECS with ECBC performing air monitoring for CA. During this period, USACE excavated and removed all AUES-related material and any other debris encountered from the original 50 ft by 16 ft proposed investigation area.

Between April 28 and July 24, 2008, USACE conducted an investigation of the east extension of Burial Pit 3. USACE extended Burial Pit 3's excavation to the east after finding evidence that AUES-related material remained in the soil. To conduct this investigation, USACE extended the ECS by addition of a 17 ft by 16 ft structure to the original ECS. Between October 20 and 28, 2008, USACE investigated the south extension excavating 19 single-item anomalies and one exploratory trench. During the investigation, USACE did not find AUES-related material. Between January 12 and March 12, 2009, USACE investigated a second eastern extension of Burial Pit 3. USACE began this investigation after finding more targets east of the first eastern extension. During this investigation, USACE did not find any AUES-related material.

During USACE's investigation of Burial Pit 3, USACE recovered AUES-related material. After evaluation, USACE categorized the 108 military munitions-related items as 28 MEC, of which 22 were determined to be conventional munitions and 6 were determined to be RCWM; and 80 MD items. The AUES-related material recovered included 75mm projectiles, 2-inch and 3-inch pipes with end caps, 4.7-inch projectiles, and an intact glass container. The conventional military munitions recovered included 75mm projectiles and a 4.7-inch projectile. Of the RCWM, one intact glass vial recovered, which was determined to contain CA, was destroyed by ECBC, with the five chemical munitions (75mm projectiles) recovered destroyed in the EDS in 2011. A total of 80 MD items and 37 non-munitions scrap items were also recovered. USACE evaluated this material determining it did not pose an explosive or CA hazard. USACE disposed of the MD per applicable regulations, disposing of the non-munitions scrap in a landfill.

In June and July 2009, USACE collected additional confirmation samples from Burial Pit 3. Based on the results of this sampling, USACE removed additional soil.

### **5.12.2. Low and High Probability Test Pits Investigations and Additional Arsenic Removal (2009 to 2010)**

Upon completion of the Burial Pit 3 investigation, USACE proposed investigation of an additional 39 test pits (TPs 95 through 133) at 4825 Glenbrook Road (USACE 2008). USACE believed investigation of these test pits would provide a 95% confidence that any other burial pits or trenches with dimensions of not less than 10 ft by 20 ft that were present within 4825 Glenbrook Road would be located. Later, USACE added 12 more test pits (TPs 134 through 145). In total, USACE planned to investigate 51 test pits within 4825 Glenbrook Road. On March 24, 2009, USACE began investigation of the 51 test pits. USACE completed its investigation of the original 39 test pits (TP 95 through 133) on July 17, 2009, with the exception of TP 120. USACE detected an elevated concentration of arsenic in a grab sample associated with discolored soil collected from test pit 120.

USACE identified three grids on the driveway of 4825 Glenbrook Road with arsenic concentrations higher than the SVFUDS remediation level of 20 mg/kg. Concurrent with the investigation of the TPs along the driveway, USACE excavated the arsenic-contaminated grids. USACE removed arsenic-impacted soil that exceeded 20 mg/kg, with the exception of an area north of TP 109 near the 4835 Glenbrook Road's retaining wall. USACE did not excavate this area because it is near where the wall curves around the end of the driveway and further excavation might have undermined the retaining wall. The area north of TP 109 was excavated to 6 ft bgs; however, two samples of in-place soil still contain concentrations exceeding the remediation level of 20 mg/kg (596 mg/kg and 597 mg/kg).

In July 2009, USACE began intrusive investigations of the 12 additional test pits (TPs 134 through 145). These investigations continued until August 4, 2009, at which time USACE, after a confirmed detection of H and L ABPs were reported for a substance inside of a glassware flask from TP 138 and H and L CA and ABPs were detected in white powdery soils encountered in TP 120, temporarily terminated its investigation.

In November 2009, USACE began a high probability investigation of TP 138, detecting CA and ABPs in intact containers and the TP's soil. In January 2010, USACE began its high probability investigation of TPs 120 and 134, detecting CA and ABPs in intact containers and the TPs' soil. Samples collected from intact containers were analyzed for CA, ABPs and unknown compounds. In April 2010, USACE ceased its high probability test pit investigations after detecting arsenic trichloride ( $AsCl_3$ ) in one closed cavity container.

In August 2010, geotechnical borings and backyard samples were completed at 4825 Glenbrook Road. For the backyard samples, USACE selected 15 soil sample locations (27 samples) in a grid pattern to investigate for CA and ABPs. In two of these samples, L was detected; the remaining samples were cleared for CA and ABPs. Of the 27 samples, 3 were

randomly selected for further HTW analysis. Of these, two, which were cleared for CA and ABPs, were further analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, and 12 AU-requested metals. The results for aluminum, manganese, and vanadium exceeded the accepted comparison levels. USACE collected six geotechnical boring samples (GS-01 through GS-07) inside of the house boring through the basement foundation. These boring soil samples, which were cleared for CA and ABPs, were further analyzed for VOCs and tentatively identified compounds (TICs), SVOCs, explosives, metals, and other individual parameters. Analytical results did not detect any exceedances in GS-01 and GS-02. Metals, including aluminum and vanadium, were detected at concentrations exceeding the accepted comparison levels in GS-03. Aluminum concentrations exceeded the comparison level in GS-04 through GS-06. Other compounds, including VOCs, SVOCs, explosives, remaining metals, total cyanide, fluoride, iodide, and perchlorate, were either not detected or detected at concentrations below the accepted comparison levels.

## **6. SUMMARY OF POTENTIAL RISKS AT 4825 GLENBROOK ROAD**

USACE performed a variety of risk assessments as a part of the RI for 4825 Glenbrook Road. These assessments evaluated for the presence of AUES-related material (e.g., MEC, including CWM, and ABPs) and assessed the potential risks to the general public if 4825 Glenbrook Road continued to be used in its current condition.

### **6.1. Human Health Risk Assessment (HHRA)**

USACE performed an HHRA to estimate the potential risks and/or hazards to current and future receptors from the presence of AUES-related material, particularly soil contamination by either CA, ABP and or HTRW at 4825 Glenbrook Road. USACE estimated the type and magnitude of potential exposures to COPCs; identified potential exposure pathways, receptors, and exposure scenarios; and quantified potential exposures.

The HHRA's objective was to conduct a site-specific quantitative risk assessment for human receptors at 4825 Glenbrook Road. Following USEPA guidance, USACE evaluated previously collected data to determine whether it was acceptable for use in a risk assessment. USACE only considered data for use in the HHRA after validation by the laboratories analyzing and evaluating the data. USACE used validated data to identify and screen COPCs. For the receptors present at 4825 Glenbrook Road, USACE's risk assessment estimated the magnitude of assumed exposure to COPCs and identified potential exposure pathways. This information and toxicity information for the COPCs helped USACE determine whether the potential risks to human health that are associated with exposure to any chemical-contaminated soil remaining at 4825 Glenbrook Road were acceptable.

USACE's HHRA estimates the "baseline risk," which is an estimate of the likelihood of health problems occurring if an environmental response (cleanup) is not taken at a site. The steps used to analyze these risks consist of a four-step process:

- data evaluation
- exposure assessment
- toxicity assessment
- risk characterization

In the data evaluation step, relevant site data is compiled to characterize the COPCs. During the exposure assessment step, actual or potential COPCs release pathways are analyzed, potentially exposed human populations and exposure pathways are identified, COPCs concentrations at potential points of human exposure are determined, and COPCs intakes are estimated. In the toxicity assessment step, qualitative and quantitative toxicity data for each COPCs are identified. Next, the likelihood and magnitude of adverse health risks are estimated in the risk characterization step. Potential receptors at 4825 Glenbrook Road include outdoor workers, future residents and future recreational green space users. The exposure pathways evaluated for all receptors include incidental soil ingestion, dermal contact with soil and inhalation of particulates. In addition, the ingestion of homegrown vegetables and inhalation of volatile compounds in indoor air were evaluated for residents as part of the HHRA completed by USACE.

The carcinogenic risks estimated individually for future adult residents, child residents, child recreational green space users, and outdoor workers, are within the USEPA acceptable risk range of  $1 \times 10^{-6}$  and  $1 \times 10^{-4}$ . This was found by USACE to be true regardless of depth interval (i.e., 0-2 vs. 0-12 ft bgs, or 0-0.5 ft bgs for child recreational green space users) to which the potential future receptors were assumed to be exposed, or the assumed exposure scenario (i.e., Reasonable Maximum Exposure (RME) or Central Tendency (CT)).<sup>1</sup> This indicates that assumed future exposures to COPCs at 4825 Glenbrook Road are unlikely to result in unacceptable carcinogenic risks for the receptors evaluated. However, the cumulative cancer risk estimate of  $2 \times 10^{-4}$  for residents (combined adult and child exposure periods) exposed to arsenic in mixed soil (0-12 ft bgs) for the RME scenario exceeds  $1 \times 10^{-4}$ . Elevated arsenic concentrations were identified by USACE in two areas of the driveway and the TP 138 location. These elevated arsenic concentrations (in TP 138 and in the driveway) are driving the overall risk to the residential receptor above the acceptable risk threshold.

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<sup>1</sup> CT refers to individuals who have average or typical intake of environmental media. RME refers to people who are at the high end of the exposure distribution (approximately the 95<sup>th</sup> percentile).

Additional risk evaluations were performed to determine the impact on remaining risks when these elevated arsenic areas are removed. The 0-12 ft exposure point concentrations were recalculated by removing the three highest arsenic samples located in the driveway and in TP 138. The exposure point concentrations for the RME and CT scenarios were 7 mg/kg and 6.2 mg/kg, respectively, which are approximately 8.7 times and 3.5 times lower than Exposure Point Concentration (EPCs) used in the risk assessment for the 0-12 ft depth interval. Both recalculated EPCs are below the site wide SVFUDS-specific background level of 12.6 mg/kg for arsenic. Therefore, the cancer risk and hazard level for a resident are expected to be acceptable after removing the elevated arsenic concentrations.

The HI estimated for adult residents, child recreational green space users, and outdoor workers potentially exposed to surface soil (i.e., 0-0.5 ft or 0-2 ft bgs) or mixed soil (0-12 ft bgs) in the future was below the HI benchmark of 1 for noncarcinogenic effects (under both the RME and CT scenarios). Thus, unacceptable hazards to these future receptors at 4825 Glenbrook Road are not expected from assumed exposures to COPCs in soil. However, the HI estimated for potential future child residents exposed to mixed soil (0-12 ft bgs) at 4825 Glenbrook Road exceeds the benchmark of 1 under the RME scenario due to arsenic. This indicates that the assumed exposures to arsenic in mixed soils at 4825 Glenbrook Road could result in adverse noncarcinogenic health effects for this receptor. Removal of the arsenic-contaminated soil as described above would similarly reduce the noncarcinogenic HI to an acceptable level.

The remaining carcinogenic and non-carcinogenic risks, both due to arsenic, are summarized as follows:

- Combined carcinogenic risk to residents (adult and child) exposed to mixed soil exceeds  $1 \times 10^{-4}$
- Non-carcinogenic HI for child resident (RME) exposed to mixed soil exceeds 1

Mustard (H) and ABPs were not selected by USACE as the COPCs in the HHRA because they were not detected in any of the in-place soil samples; therefore, they were not evaluated by USACE in the HHRA. However, Lewisite (L) was selected by USACE as a COPC because it was detected in two of the in-place soil samples (near TP 138) at concentrations exceeding the residential screening level, and was quantitatively evaluated in the HHRA. The HHRA concluded that the HI from L is less than 1; therefore, noncarcinogenic health effects are not expected from this potential exposure. USACE did not complete the TPs 120 and 134 investigations due to discovery of arsenic trichloride. Therefore, it is not known whether CA or ABP contaminated soil extends beyond the boundaries of the excavation footprint.

Based on finding AUES-related material (i.e., 27 MEC, including 25 CWM; 2 MD; and AUES-related glassware) during its investigation of TPs 120 and 134, USACE's HHRA

concluded that there is a potential risk of encountering AUES-related material, particularly ABPs-contaminated soil and HTW-contaminated soil in the uninvestigated areas of TPs 120 and 134.

Groundwater will be investigated by USACE as a separate project as part of the site-wide documentation for SVFUDS.

**6.2. Munitions and Explosives of Concern Hazard Assessment (MEC HA)**

Using available Site-specific information, USACE applied the MEC HA to 4825 Glenbrook Road. The MEC HA evaluates the potential risk of injury or death from any explosive hazards present. (It should be noted that EPA’s MEC HA does not consider the presence of CWM.) Hazard Levels range from 1 to 4, with a Hazard Level of 1 indicating the highest potential explosive hazard conditions and 4 indicating the lowest potential explosives hazard conditions (see Table 6.2).

**Table 6.2: Hazards Level (Scoring) Ranking**

<b>Hazard Level</b>	<b>Maximum MEC HA Score</b>	<b>Minimum MEC HA Score</b>	<b>Associated Relative Explosive Hazard</b>
1	1,000	840	Highest potential explosive conditions
2	835	725	High potential explosive conditions
3	720	530	Moderate potential explosive conditions
4	525	125	Low potential explosive conditions

The qualitative baseline evaluation of potential MEC hazards was conducted using the USEPA MEC HA method. Historical and field investigation data was used to determine the appropriate inputs and assumptions for the MEC HA. Additionally, although the contents of all burial pits identified at 4825 Glenbrook Road to date have been removed, for the purposes of the MEC HA, USACE assumed that one or more burial pits potentially remain at 4825 Glenbrook Road.

USACE evaluated two baseline-condition scenarios using the MEC HA. These were current site conditions (no residential use or subsurface removal) and a no action (residential use, no subsurface clearance (removal)) scenario. Both scenarios evaluated for the MEC HA are specific to the MEC HA analysis process and are not to be confused with the remedial alternatives discussed later in Sections 7 and 8. The 4825 Glenbrook Road Munitions Response Site (MRS) has a total baseline MEC HA score of 615 based on current site conditions, which equates to a Hazard Level of 3. Under the no action (residential use, no subsurface clearance) scenario, the MRS has a total baseline MEC HA score of 640, which also equates to a Hazard

Level of 3. These hazard levels both indicate an MRS with “moderate potential explosive hazard conditions.”

USACE designed and then evaluated three remedial scenarios in the MEC HA: (a) Subsurface Clearance (Removal), Future Residential Use; (b) Subsurface Clearance (, Land Use Controls (LUCs), Future Recreational Use; and (c) No Subsurface Clearance, LUCs. These remedial scenarios are specific to evaluation of the potential hazards associated with MEC at 4825 Glenbrook Road. These remedial scenarios are not the proposed remedial alternatives for the SVFUDS. The first two MEC HA remedial scenarios analyzed reduced the MEC HA scores to 355 (Residential Use) and 360 (Recreational Use), respectively, both reducing 4825 Glenbrook Road to a Hazard Level 4 (low potential explosive hazard conditions). The final remedial scenario analyzed, which does not include a subsurface removal, would lower the MEC HA score to 565, but the Hazard Level 3 would not be reduced.

### **6.3. Chemical Warfare Materiel (CWM) Hazard Assessment**

The initial CSM developed by USACE for 4825 Glenbrook Road was based on historical information and photographic interpretation. Based on historical data, the CSM assumed burial pits could be located by excavating a series of TPs strategically located throughout 4825 Glenbrook Road. The investigation results show that CWM was found in TP 138, which is near the house’s back porch, and TP 134, which is near its front door. Both test pits and Burial Pit 3 were located beside or around the house. The investigations conducted at 4825 Glenbrook Road indicate that the developer most likely disturbed the original burial pits. The AUES-related material encountered in portions of Burial Pit 3 (formerly TP 23) was neatly stacked, while other AUES-related material surrounding the house appear scattered, indicating that the latter materials were most likely moved during 4825 Glenbrook Road’s development.

Mustard, lewisite, and ABPs were detected in the vicinity of test pit 138. Mustard, lewisite and ABPs were also detected by USACE in TPs 120 and 134. USACE removed and disposed of CA-contaminated soil detected in the vicinity of TP 138 at a permitted incineration facility. TP 138 was also cleared by USACE of containerized CA and ABP. USACE did not detect CA or ABPs in the sidewall or floor soil confirmation samples for TP 138. However, USACE did not remove MEC, including CWM, or CA- or ABP-impacted soil from TPs 120 and 134 nor did it collect soil confirmation samples because it ceased its investigation when arsenic trichloride was discovered in AUES-related glassware during the excavation. Therefore, it is unknown by USACE whether such AUES-related material extend beyond the boundaries of the excavation for TPs 120 and 134. Therefore, there is a potential risk for AUES-related material to be present in the uninvestigated area of TPs 120 and 134.

The widespread distribution of contaminants, especially AUES-related glassware, suggests a potential for other AUES-related material, specifically MEC, including CWM, to be present outside the specific test pit excavations and the contaminated soil grids that USACE removed.

During the sewer line restoration work completed in January 2011, an intact closed-cavity AUES-related glass flask with a dirt or cork plug that contained a small quantity of brown solids was uncovered in an area adjacent to a previously excavated area in 2001. Lewisite was detected in the solid sample collected from the flask. This discovery further indicates a potential risk in uninvestigated areas 4825 Glenbrook Road even though test pits were successfully investigated throughout 4825 Glenbrook Road.

#### **6.4. Summary of Risk Assessments**

Based on the sampling results and future human health risk associated with 4825 Glenbrook Road, USACE has determined that active measures are necessary to protect human health and the environment from actual or potential releases of hazardous substances, pollutants or contaminants into the environment. Specifically, there are unacceptable risks for plausible future human receptors due to potential exposure to AUES-related material (e.g., MEC, including CWM, and ABP (arsenic) in soils) at 4825 Glenbrook Road. Based on sampling results and the potential risks associated with 4825 Glenbrook Road, the remedial action selected is necessary to protect human health and the environment from actual or threatened releases of hazardous substances.

### **7. DESCRIPTION OF REMEDIAL ALTERNATIVES**

The five remedial alternatives for 4825 Glenbrook Road are:

- Alternative 1: No Further Action
- Alternative 2: Land Use Controls (LUCs)
- Alternative 3: Remediate (cleanup) to residential standards without removing the house; restricted future use (LUCs)
- Alternative 4: Remove the house and remediate (cleanup) to recreational standards; restricted future use (LUCs)
- Alternative 5: Remove the house and remediate (cleanup) to residential standards; unrestricted future use

Note: For Alternatives 3, 4 and 5, the remedial action is defined to be a thorough excavation and off-site disposal of soil. These remedial alternatives also incorporate the process specified in the February 2010 Action Memorandum, Disposal of Discarded Military Munitions (DMM), including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH) (hereinafter, February 2010 Action Memorandum) (USACE 2010b).

A summary discussion of each alternative, with estimated cost and construction timeframe for Alternatives 3, 4, and 5, is included below. Additional detail can be found in the FS.

### **Alternative 1: No Further Action**

The National Contingency Plan (NCP) requires that a no further action alternative be developed for an FS. The no further action alternative would involve leaving 4825 Glenbrook Road in its current condition. This alternative provides a comparative baseline against which other alternatives can be evaluated. Under this alternative, no remedial action will be taken, and any AUES-related material present would be left "as is," without any further investigation, containment, removal, treatment, or other protective actions. Additionally, this alternative neither provides for monitoring of soil nor does it provide for either active (e.g., physical barriers) or passive land use controls (e.g., deed restrictions) to reduce the potential for exposure.

### **Alternative 2: Land Use Controls (LUCs)**

The "LUCs" alternative would limit access to all or portions of 4825 Glenbrook Road and call for environmental covenants and other controls. Access could be limited in a variety of ways. The success of access limitations would depend on the portions of 4825 Glenbrook Road involved and the effectiveness of LUC implementation, including the cooperation of regulators, government employees, stakeholders, and current and future property owners.

Options for limiting access include fencing specific areas (e.g., areas known or suspected to contain AUES-related material); covering areas with concrete or bricks (e.g., restricting the areas' use to use as a patio or sitting area); or planting groundcover plants that do not require routine maintenance. With regard to contaminated soil, options, like covering areas with concrete, would prevent physical contact with contaminated soil. Additionally, such options should reduce or eliminate runoff from contaminated surface soil; thereby, reducing the potential spread of contamination. With regard to other AUES-related material (e.g., MEC, including CWM), this option would also limit potential encounters by preventing people from digging in areas where such materials may be present.

In coordination with the District of Columbia, the LUCs alternative could also include development of environmental covenants that would legally bind current and future owners to established access and use restrictions. Such covenants would prohibit routine landscaping activities in specified areas. Finally, USACE, in coordination with its SVFUDS partners and property owners, would develop a LUC plan that would include delineation of enforcement and maintenance responsibilities for the LUC implemented.

Periodic reviews (commonly referred to as "5-year reviews") would also be part of this alternative. Such reviews are generally required by CERCLA when there is a potential for CERCLA hazardous substances, pollutants, or contaminants to remain on a site above levels that permit unlimited use and unrestricted exposure (UU/UE). Periodic reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it

remains protective of human health and the environment. The objective is to ensure that the Army is aware of and responds to new information or data that affects the selected response action. A periodic review plan would be prepared describing periodic site visits and stakeholder interviews to determine whether the level of risk has changed. If the level of risk should change, the recommended response alternative would be reviewed to determine if it is still protective.

**Alternative 3: Remediate (Cleanup) to Residential Standards without Removing the House; Restricted Future Use (LUCs)**

- **Estimated Cost: \$8.5 million**
- **Estimated Timeframe: 29 weeks**

Alternative 3 entails restoring 4825 Glenbrook Road to residential standards to eliminate unacceptable risk to human health and the environment, without removing the house. LUCs to prevent contact with AUES-related material that may be present beneath the house would limit any subsurface intrusive activities, including excavations in or around the foundation or through the basement slab of the house. These LUCs would prevent physical contact with AUES-related material that may be present beneath the house. The development of environmental covenants to legally bind current and future property owners to the established access and use restrictions would also be addressed.

This alternative would include the excavation of potentially contaminated soil and the removal of any AUES-related material encountered from locations around the house, including patios, stairs, and hardscapes, up to the building foundation. Shoring and stabilization techniques would be used, as required, to ensure the structural integrity of the adjacent property boundaries and other fences, when excavating close to these structures. With this alternative, 4825 Glenbrook Road would be available for residential use.

To meet residential standards and eliminate unacceptable risk to human health and the environment, only areas where arsenic-contaminated soils are present would need to be removed. However, to address other AUES-related material (e.g., MEC, including CWM) additional excavation would be required, with debris fields containing AUES-related material fully excavated and any AUES-related material encountered removed. This approach would allow USACE to achieve the remedial goals for the Site. As mentioned previously, AUES-related material encountered will be evaluated to determine its explosive or CA safety status and disposed of per the February 2010 Action Memorandum, with contaminated soils disposed of per applicable regulations. Under this alternative, the excavation depth would be controlled by the depth of bedrock or competent saprolite, rather than determined just by the presence of any AUES-related material. Although this proposal means over-excavation will occur, the proposed excavation depth would also accomplish the goals of removing all AUES-related material from areas excavated at 4825 Glenbrook Road, with the exception of from under the house. Implementing this alternative achieves a MEC Hazard Level 4 (low potential for explosive

hazard conditions). The MEC HA evaluated a similar scenario for 4825 Glenbrook Road that recommended subsurface removal of AUSE-related material to a minimum depth of 12 ft bgs throughout 4825 Glenbrook Road, a depth assumed to be sufficient to address any remaining burial pits or trenches potentially present at 4825 Glenbrook Road. Excavating to bedrock or competent saprolite exceeds that recommended depth (where bedrock is deeper than 12 ft bgs). Following excavation, 4825 Glenbrook Road would be backfilled to approximate original contours, achieving a residential standard for the soil.

Periodic reviews would be implemented as part of this alternative to help ensure USACE is aware of and responds to new information or data that affects the protectiveness of the selected alternative. USACE would prepare a periodic review plan describing periodic site visits, including stakeholder interviews, to determine whether the remedy remains protective. If the selected remedy is determined to no longer be protective, the remedy would be reviewed to determine the actions required to re-establish its protectiveness.

**Alternative 4: Remove the House and Remediate (Cleanup) to Recreational Standards; Restricted Future Use (LUCs)**

- **Estimated Cost: \$12.5 million**
- **Estimated Timeframe: 37 weeks**

Alternative 4 entails removing the house at 4825 Glenbrook Road and restoring it to a recreational standard allowing its use as a non-residential property (e.g., green space). This alternative, which would incorporate LUCs, would allow for restricted future use of 4825 Glenbrook Road.

Implementation of this alternative would include removing the house completely, including its foundation; excavating the Site and removing any AUES-related material encountered from 4825 Glenbrook Road to a depth determined by the recreational standard. Additionally, any remaining arsenic-hot spots would also be removed. Using clean backfill, 4825 Glenbrook Road would be landscaped and made available for non-residential use.

Per the HHRA's results, there is no potential risk for recreational receptors under this alternative. Further, USACE used the MEC HA to evaluate a similar scenario that, recommended removal of AUES-related material to a minimum depth of 3 ft bgs, but to a depth assumed to be sufficient for recreational use. Therefore, for this alternative, USACE proposes to remove soil to a depth of 4 ft bgs. This depth is sufficient to achieve a MEC Hazard Level 4 (low potential for explosive hazard conditions).

USACE believes removal to 4 ft bgs would also be sufficient to address most utility repair needs. However, utility corridors known to exceed 4 bgs would be excavated to a depth at least one foot below the utility corridor. There are also two remaining areas of soil with arsenic

exceeding the 20 mg/kg remediation level that are greater than 4 ft bgs; under this alternative, these arsenic soil areas would also be excavated to the depths necessary for removal.

After implementation, LUCs would be implemented to limit intrusive activities to no deeper than 4 ft bgs, with the exception of utility repair work. Under this alternative, activities at 4825 Glenbrook Road would be limited to non-residential activities and landscape maintenance (e.g., grounds keeping). With such LUCs in effect, fencing would not be necessary.

Because this alternative does not allow for UU/UE, periodic reviews would also be implemented to determine whether the remedy remains protective. USACE would prepare a periodic review plan describing procedures, including stakeholder interviews, to be used during periodic site visits. If the selected remedy is determined not to be protective, the remedy would be reviewed to determine the action required to re-establish its protectiveness.

**Alternative 5: Remove the House and Remediate (Cleanup) to Residential Standards; Unrestricted Future Use**

- **Estimated Cost \$13.5 million**
- **Estimated Timeframe: 42 weeks**

Alternative 5 entails removing the house completely and remediating 4825 Glenbrook Road to residential standards to eliminate unacceptable risk to human health and the environment. Following excavation, 4825 Glenbrook Road would be backfilled and landscaped, resulting in a sloped, grassy lot suitable for future residential use.

Implementation of this alternative would include removing the house, including the house's foundation, excavating the Site, and removing any AUES-related material encountered. Shoring and stabilization techniques would be used, as required, to ensure the structural integrity of adjacent property (e.g., foundations, retaining walls, fences) when excavating close to such structures. With this alternative, 4825 Glenbrook Road would be available for residential use.

To meet residential standards and eliminate unacceptable risk to human health and the environment, only areas where arsenic-contaminated soils are present would need to be removed. However, to address other AUES-related material (e.g., MEC, including CWM) additional excavation would be required, with debris fields containing AUES-related fully excavated and any AUES-related material encountered removed. This expanded excavation approach will allow USACE to achieve the remedial goals for this Site. As mentioned previously, AUES-related material encountered will be evaluated to determine its explosive or CA safety status and disposed of per applicable regulations.

However, as described in Alternative 3, under this alternative the excavation depth would be controlled by the depth of bedrock or competent saprolite, rather than determined just by the

presence of any AUES-related material. Although there will be an over-excavation of soil relative to remediation (cleanup) goals based on soil contamination alone, the proposed excavation depth would also accomplish the goal of removing any AUES-related material present, achieving a MEC Hazard Level 4 (low potential for explosive hazard conditions). Under this alternative, LUCs would not be needed.

Periodic review would not be needed for this alternative, because the remedy would allow for UU/UE.

## **8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES**

USACE evaluated all of the defined alternatives against the short- and long-term aspects of three broad criteria: effectiveness, implementability, and cost. The purpose of the broad screening evaluation was to reduce the number of alternatives that would undergo a more thorough and detailed analysis against USEPA's nine criteria to address CERCLA requirements.

The remedial alternatives were screened against the following broad criteria which are defined as follows:

### **Effectiveness**

This criterion is evaluated with respect to effectiveness in protecting human health and the environment, and providing reduction in toxicity, mobility and volume. The short-term components (construction and implementation period) and long-term components (effective period after the remedial action is complete) are also evaluated.

### **Implementability**

This criterion is evaluated as a measure of both the technical and administrative feasibility of constructing, operating and maintaining a remedial alternative. Technical feasibility is the ability to construct, reliably operate and maintain (as required) an alternative, while administrative feasibility refers to the ability to obtain approvals from regulatory agencies, and the availability of required goods and services.

### **Cost**

The cost of each alternative is also evaluated. For the broad screening, it was not necessary to define the cost with the same level of detail or accuracy required for the detailed analysis (Section 6.). Prior estimates, sound engineering judgment, and most importantly, real-world site cost experience, are sufficient to help evaluate one alternative against another. USACE's Remedial Action Cost Engineering and Requirements software (RACERTM), version 10.4, was used as necessary to supplement these costs.

Alternative 1 - No Action and Alternative 2 – Land Use Controls, did not pass the broad criteria screening and were not retained for further evaluation. Because Alternatives 1 and 2 did not pass the broad criteria screening, USACE did not develop detailed cost estimates or estimated schedules for their completion. The remaining three remedial alternatives were examined in a detailed analysis that was intended to allow decision makers to select the most appropriate remedial action.

During the detailed analysis, each alternative was assessed against the evaluation criteria described below. The results compare the alternatives and identify the key tradeoffs among them. This approach was designed to provide decision makers with sufficient information to adequately compare the alternatives, select the appropriate remedy for the site, and demonstrate satisfaction of the CERCLA remedy selection requirements.

USEPA developed the nine evaluation criteria to address CERCLA requirements and technical and policy considerations that have proven to be important when selecting remedial alternatives. These criteria serve as the basis for analyzing proposed remedial alternatives to determine the most appropriate alternatives to address remediation. The nine criteria are divided into three categories: threshold, balancing and modifying.

## **8.1. EVALUATION CRITERIA**

The following two criteria are threshold criteria that must be met.

- Overall Protectiveness of Human Health and the Environment - The selected alternative must eliminate, reduce, or control threats to public health and the environment through treatment, engineering controls or institutional controls.
- Compliance with ARARs - The selected alternative must meet identified Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or a waiver must be justified.

The following five criteria are balancing criteria.

- Long-Term Effectiveness and Permanence - considers the ability of an alternative to maintain protection of human health and the environment over time once cleanup goals have been met.
- Reduction in Toxicity, Mobility, or Volume through Treatment - evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

- Implementability - considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
- Short-Term Effectiveness - considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
- Cost - considers the estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of plus or minus 50 percent.

The following two criteria are modifying criteria.

- State/Support Agency Acceptance- considers the acceptance of the state or support agency of the preferred alternative.
- Community Acceptance- considers the acceptance of the community of the preferred alternative.

## 8.2. ALTERNATIVE COMPARISON

The alternative comparison was used in the FS process to help select the preferred alternative by rating the remaining alternatives on how each compare to the first seven criteria. The results of this comparison are summarized in the following sections. A summary of USACE's evaluation is provided in Table 8-1. In addition, the last two modifying criteria are discussed below.

### **Threshold Criteria**

#### *Overall Protection of Human Health and the Environment*

The most important evaluation is against the threshold criteria, as these must be met. All three alternatives were considered protective of human health and the environment. However, Alternative 5 was the most protective of human health and the environment because the majority of the Site would be excavated down to bedrock or competent saprolite with any AUES-related material encountered removed.

*Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and to be considered (TBC) Guidance*

Alternatives 3, 4, and 5 would comply with ARARs, which USACE discussed in detail in the Feasibility Study.

### **Primary Balancing Criteria**

#### *Long-Term Effectiveness and Permanence*

With regard to the balancing criteria, Alternative 3 and Alternative 4 were only moderately effective in the long term because residual risk could remain beneath the house. Alternative 5 was the most effective in the long term because it is a permanent remedy, it does not require LUCs, and it leaves the least amount of residual risk at 4825 Glenbrook Road. Implementation of this alternative allows for UU/UE.

#### *Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment*

All three alternatives were ranked as moderately favorable with regard to reducing toxicity, mobility and volume of contaminants because excavation and off-site disposal (assuming landfill disposal) does not treat soil contaminants, but transfers them to a proper landfill. In each, other AUES-related material (e.g., MEC, including CWM) would be evaluated and destroyed per the February 2010 Action Memorandum. As assessed by reduction of toxicity, mobility and volume of contaminants as well as the removal of explosive and CA safety hazards posed by military munitions present at Site, Alternative 5 is the most favorable because the majority of the Site is excavated to bedrock or competent saprolite with any AUES-related material encountered removed.

#### *Short-Term Effectiveness*

All three alternatives were ranked favorably with regard to short-term effectiveness as protection of workers and the community, using standard good engineering practices, has been previously achieved for the excavation and disposal of AUES-related material at the Site.

#### *Implementability*

Alternative 3 was moderately favorable for the implementability criterion because significant shoring would be required as excavation nears the house's foundation, presenting challenges to the technical feasibility sub-criterion. The administrative feasibility sub-criterion is also moderately favorable in that it will require extensive coordination with 4825 Glenbrook Road's owner, regulatory agencies and surrounding community members. Alternatives 4 and 5 were ranked as favorable overall for the implementability sub-criteria of technical feasibility and availability of materials and services. The feasibility and availability are well established for excavation and disposal of AUES-related material at the SVFUDS; however, Alternative 4 was only moderately favorable for the sub-criterion of administrative feasibility because of the

coordination requirements with 4825 Glenbrook Road's owner and supporting agencies to obtain approval as green space or a neighborhood park. With regard to the implementability of LUCs and/or negotiating access terms for the real estate, the difficulty level for Alternatives 3, 4 and 5 are relatively equivalent to each other.

### *Cost*

Costs generally are a function of volume of soil to be removed and the procedure (i.e., low or high-probability) required to perform the excavation. Excavation under high-probability protocols is more costly than low-probability protocols. While all three alternatives include both low and high-probability excavation, Alternative 5 is the most costly of the three based on the total volume of excavation and removal of both soil and the house. Alternative 3 was the least costly, differing from Alternative 5 in the cost of the house's removal and excavation of soil beneath the house. Alternative 3 would require excavation of approximately one-half the high-probability soil volume required by Alternative 5. Additionally, the technical feasibility, which affects the costs, of Alternative 3 is more difficult than either Alternatives 4 or 5. Finally, there would be long-term costs and an administrative burden to maintain and comply with LUCs associated with Alternative 3. Alternative 4 falls between the other two alternatives with regard cost, but is relatively close to Alternative 5's cost because the high-probability soil volume to be excavated under Alternative 4 is just slightly less than for Alternative 5. The cost differential between Alternative 4 and 5 was approximately \$1,000,000; however, the long-term benefits Alternative 5 provides helps justify its selection as the selected remedy even though it is the most costly alternative. Alternative 5 was the most effective in the long term because it is a permanent remedy, it does not require LUCs, and it leaves the least amount of residual risk at 4825 Glenbrook Road. Implementation of this alternative allows for UU/UE.

### **Modifying Criteria**

#### *State/Support Agency Acceptance*

DDOE is the State regulatory agency and USEPA Region III (USEPA) is the Federal regulatory agency, providing oversight of and support for the Army/USACE at SVFUDS. DDOE and USEPA reviewed USACE's Draft Final Proposed Plan (August 19, 2011) and provided their comments. USACE made revisions to the Proposed Plan to address the comments provided by the regulators on the Draft Final Proposed Plan. DDOE and the USEPA did not provide comments on the Proposed Plan during the public review and comment period.

#### *Community Acceptance*

USACE evaluated community acceptance of the preferred alternative based on comments received during the public comment period (October 3, 2011 through November 12, 2011). USACE responded to all comments, we describe the comments and our responses are described

and responded to in the Responsiveness Summary, which is provided in Appendix A. In general, the public comments support the selection of Alternative 5 as the final remedy for 4825 Glenbrook Road.

**Table 8.1 - Summary of Detailed Analysis of Remaining Alternatives**

	Screening Criterion	Alternative 3: Remediate to <u>Residential</u> Standards Without Removing the House; LUCs	Alternative 4: Remove the House and Remediate to <u>Recreational</u> Standards; LUCs	Alternative 5: Remove the House and Remediate to <u>Residential</u> Standards; Unrestricted Use
Threshold	Overall Protection of Human Health and Environment	●	●	●
	Compliance with ARARs	●	●	●
Balancing	Long-Term Effectiveness	◐	◐	●
	Reduction of Toxicity, Mobility and Volume Through Treatment <sup>1</sup>	◐	◐	◐
	Short-Term Effectiveness	●	●	●
	Implementability	◐	●	●
	Technical Feasibility	◐	●	●
	Administrative Feasibility	◐	◐	●
	Availability of Materials and Services	●	●	●
	Cost <sup>2</sup>	<b>\$6.5-\$8.5 million</b>	<b>\$10.5-\$12.5 million</b>	<b>\$11.5-\$13.5 million</b>
Modifying <sup>3</sup>	Regulator Acceptance	○	○	●
	Community Acceptance	○	○	●
	<b>Recommended</b>			●

- Favorable ('YES' for threshold criteria)
- ◐ Moderately Favorable
- Not Favorable ('NO' for threshold criteria)

1 – While excavation and landfill disposal reduce toxicity, mobility, and volume at the Site, the statutory preference is permanent reduction through treatment; therefore, this criterion is not assessed as 'Favorable', even where excavation goes to bedrock or competent saprolite.

2 - Costs are detailed in Appendix B of the Feasibility Study. Specific Costs for the Selected Remedy are provided in Table 9-1 below.

## **9. SUMMARY OF THE SELECTED REMEDY**

The selected remedy is Alternative 5: **Remove the House and Remediate (Cleanup) to Residential Standards; Unrestricted Future Use.**

The selected remedy provides the best long-term solution for 4825 Glenbrook Road by minimizing potential for future risk at 4825 Glenbrook Road from past DoD operations and activities.

Figure 3 illustrates the initial excavation boundaries for the selected remedy.

Area A represents a portion of the backyard, which includes 10 feet behind the current retaining wall, representing a realistic practical extent of possible redistribution of burial pit contents during 4825 Glenbrook Road's development. The delineation of Area A takes into account the estimated area of disturbance by the developer to re-route the sanitary sewer line behind the backyard retaining wall. This delineation is based on the depth of the sanitary sewer line, which is 6 feet; the location of the sanitary sewer line, which is approximately 2 feet east of the retaining wall; and an assumption of an excavation approach using benching and sloping. Accordingly, the potentially disturbed area is approximately 9 feet behind the retaining wall. Additional excavation may be warranted if AUES-related material or credible indicators of the presence of such material (e.g., munitions debris) is encountered in Area A. USACE will remove AUES-related material from debris fields in accordance with the procedures outlined in the Remedial Design/Remedial Action Work Plan (to be prepared) until no additional AUES-related material is encountered, at which point the excavation of Area A would be considered complete.

Area B represents the flat section of the driveway and includes the retaining wall between 4825 Glenbrook Road and 4835 Glenbrook Road, plus various hardscapes (e.g., retaining walls, access steps to the backyard) that will be removed as part of the selected remedy.

Area C includes the area investigated as Burial Pit 3 [TP-23] and its associated extensions. Based on the extensive work performed previously within this area, USACE proposes no further action for Area C.

Area D is the flat terrain between the backyard's retaining wall and the house. This area includes the back porch patio, a portion of the backyard's retaining wall and various other hardscapes that will be removed as part of the selected remedy.

Area E represents the house and the soil beneath the house, plus some partial sections of retaining walls that connect to it.

Area F represents the front yard down to Glenbrook Road. This area includes all of the front yard's retaining walls, plus the front porch and stairs to access the front porch. All site features (retaining walls, patios, porches, steps, and the house) will be removed to accomplish the selected remedy.

To meet the remedial action objectives for 4825 Glenbrook Road, the depth of excavation for the aforementioned areas will generally be 2 feet below the bottom of retaining wall footers, the house's slabs and foundation, and/or to competent saprolite or bedrock. Excavation and off-site disposal will be required for soils excavated in areas discussed above. Contaminated media will be segregated and then transported to an appropriate off-site disposal facility following characterization per specific procedures that USACE will detail in the Remedial Design/Remedial Action Work Plan for 4825 Glenbrook Road

Excavation and off-site disposal will be required for soils excavated in areas discussed above. Contaminated media will be segregated and then transported to an appropriate off-site disposal facility following characterization per specific procedures that USACE will detail in the Remedial Design/Remedial Action Work Plan for 4825 Glenbrook Road. As noted previously, the selected remedial action remedy for 4825 Glenbrook Road incorporates the selected removal action from the February 2010 Action Memorandum. All MEC, CWM or AUES-related recovered will be inspected to determine its explosive or CA safety status and disposed of in accordance with the February 2010 Action Memorandum. The selected response action for RCWM in the February 2010 Action Memorandum is onsite demilitarization using the EDS at the federal property located within the SVFUDS. The selected response action for conventional DMM and MDEH is on-site demilitarization using contained destruction technologies at the federal property located within the SVFUDS.

Currently, 4825 Glenbrook Road is zoned for residential use. The selected remedy will remediate 4825 Glenbrook Road to UU/UE, which achieves residential standards. Accordingly, this selected remedy will satisfy a residential use scenario.

The selected remedy (Alternative 5) provides protection to workers, the public, and the environment during remediation. Any potential short-term risk during remediation (cleanup) shall be minimized by using approved and appropriate protective measures. The selected remedy poses no adverse long-term impacts to the environment.

The total cost for implementing Alternative 5, as outlined in the FS, is estimated at \$13,500,000. Included in this cost are costs related to the house's removal. The estimated time to complete remediation, assuming no funding constraints, is approximately 42 weeks. Of note, the time to complete this alternative or any of the alternatives is dependent on the availability of funding, which is appropriated annually from Congress. If the selected remedy can be implemented sooner, overall costs may be reduced. Conversely, if the schedule is extended, the

overall costs may increase. USACE will develop a detailed schedule and cost estimate during the remedial design phase of the action.

The selected remedy (Alternative 5) provides a reasonable balance among the alternatives identified in the FS. While the most expensive alternative, this alternative was ranked as favorable in seven out of the nine criteria evaluated. The other two alternatives (Alternatives 3 and 4) carried over for the detailed analysis have fewer criteria ranked as favorable. Only Alternative 5 was ranked as favorable for the critical long-term effectiveness criterion because it is a permanent remedy, it does not require LUCs, and it leaves the least amount of residual risk at 4825 Glenbrook Road. Implementation of this alternative is protective of human health and the environment and addresses the community's concern by removing AUES-related material from 4825 Glenbrook Road. Additionally, its implementation allows for UU/UE of 4825 Glenbrook Road by future residents. Finally, USACE does not anticipate long-term costs or administrative burdens because there are no LUCs required for this selected remedy.

**Table 9-1 – Cost Summary for the Selected Remedy: Alternative 5**

	<b>Task/Subtask</b>	<b>Item</b>	<b>Subtotal</b>
<b>A</b>	<b>PLANNING</b>		
	-Remediation Work Plan <i>Plans include Chemical Safety Submission and Remedial Action Work Plans required to address all site activities</i>	Plans	\$ 75,000
		CENAB Review	\$ 120,000
		CEHNC Review	\$ 120,000
		TE Review	\$ 120,000
		ECBC Review	\$ 120,000
		<b>SUBTOTAL A</b>	<b>\$ 555,000</b>
<b>B</b>	<b>ADMINISTRATION</b>		
	- Misc		\$ 90,750
		<b>SUBTOTAL B</b>	<b>\$ 90,750</b>
<b>C</b>	<b>IMPLEMENTATION</b>		
	- Construction team Mob/Demob		\$ 5,000
	- Surveying		\$ 5,000
	- House Demolition		\$ 60,826
	- Shoring/stabilization		\$ 15,000
	- Erosion/Sediment Control	Silt Fence	\$ 2,000
		Hay Bales	\$ 6,400
		Remove Hay Bales	\$ 1,200
	- Fencing	Installing as Temporary	\$ 20,000
		Fence Material Allowance	\$ 10,000
		Reinstall Fence (Labor Only)	\$ 8,000
	- Sample Soil	Analytical Costs	\$ 12,500
	- Construction Management	Subcontractor's overhead	\$ 81,215
	- Miscellaneous Equipment Contingencies		\$ 10,000

Task/Subtask	Item	Subtotal
<b>LOW PROBABILITY</b> <b>- Soil Excavation</b>		
Areas A+B = 804 cubic yards (CY) 50 CY/day (five 10 CY trucks/day)	\$5000/day includes 4 man team plus per diem plus \$1000/day equipment	\$ 80,000
- ECBC onsite		\$ 90,000
- Contractor Management		\$ 30,000
- CENAB Management		\$ 45,000
- CEHNC Management		\$ 135,000
<b>HIGH PROBABILITY</b> <b>- Soil Excavation</b>		
Areas D+E+F = 1,389 CY assumes 10 CY/day	\$15,000/day includes 3 4-man teams including per diem and equipment	\$ 2,085,000
- TE onsite		\$ 1,960,000
- ECBC onsite		\$ 1,400,000
- Contractor Management		\$ 1,260,000
- CENAB Management		\$ 420,000
- CEHNC Management		\$ 1,260,000
- Engineering Control Structure	Specifics TBD (see assumption)	\$ 200,000
- Preparation/Set-up/Demobilization		
- TE onsite	This is 4 weeks on the front end and 4 weeks on the back end for these parties at the low probability weekly rate	\$ 360,000
- ECBC onsite		\$ 240,000
- Contractor Management		\$ 80,000
- CENAB Management		\$ 120,000
- CEHNC Management		\$ 360,000
2,193 CY total to excavate, low + high	<b>SUBTOTAL C</b>	<b>\$ 10,362,141</b>
<b>D MATERIAL TRANSPORT and DISPOSAL</b>		
- Non-Hazardous Soil to Landfill (1645 CY)	\$18/ton disp and \$25/ton transp	\$ 106,124
- Hazardous Soil to Landfill (548 CY)	\$90/ton disp and \$50/ton transp	\$ 115,080
- 2193 total CY, assume 75% non-haz and 25% hazardous		
	<b>SUBTOTAL D</b>	<b>\$ 221,204</b>

Task/Subtask		Item	Subtotal
<b>E</b>	<b>SITE RESTORATION</b>		
		- Backfill Material	\$ 28,944
		- Labor (assumes 140 CY/day)	\$ 90,000
		<b>SUBTOTAL E</b>	<b>\$ 118,944</b>
<b>F</b>	<b>POST REMEDIATION REPORT</b>		
		-Closure Report	\$ 10,000
		PM	\$ 7,500
		Sr Engineer	\$ 3,000
		GIS	\$ 800
	<b>SUBTOTAL F</b>	<b>\$ 21,300</b>	

\* Note: Total costs detailed in Table 9.1 above do not include the costs associated with destruction of the house, which cannot be determined at this time. Total estimated project costs range from \$11,500,000 to \$13,500,000.

TOTAL COST SUMMARY	
Task	Total per Task
A. PLANNING	\$ 555,000
B. ADMINISTRATION	\$90,750
C. IMPLEMENTATION	\$10,362,141
D. MATERIAL TRANSPORT/DISPOSAL	\$221,204
E. SITE RESTORATION	\$ 118,944
F. POST REMEDIATION REPORT	\$ 21,300
<b>TOTAL</b>	<b>\$11,369,339*</b>

**COST ASSUMPTIONS**

<b>A.</b>	<b>PLANNING</b>	- Assumes a new Chemical Safety Submission will be required.
<b>B.</b>	<b>ADMINISTRATION</b>	- The cost of destruction of the house is not included in these totals.
<b>C.</b>	<b>IMPLEMENTATION</b>	- Assumes a 1.5 factor for the soil conversion of CY to TON.
		- Day rate is for 4 man team (3 diggers and one safety). \$3000 for 10 hr day, \$1000 per diem, \$1000 equipment/gas.
		- House demolition detail included in RACER House Demo tab.
		- Shoring stabilization primarily involved with supporting neighboring facilities; specific engineering procedures to be determined.

<b>C.</b>	<b>IMPLEMENTATION (continued)</b>	
		- 50 CY/day soil removed under LOW-PROBABILITY and 10 CY/day soil removed under HIGH-PROBABILITY
		- High probability operations will require some type of ECS, details to be determined.
		- Sampling assumes 50 TAL metals or TCLP samples at \$225/sample.
		- Construction Management Costs: 20% markup on non-labor costs.
<b>D.</b>	<b>MATERIAL TRANSPORT and DISPOSAL</b>	- Assumes 75% of soil will be nonhazardous soil and 25% will be hazardous.
		- Assumes trucks rather than roll-offs.
<b>E.</b>	<b>SITE RESTORATION</b>	- Assumes 10% more soil required from backfill to allow for compaction. Assumes 140 CY/day.
<b>F.</b>	<b>POST REMEDIATION ACTIVITIES</b>	- Assumes a basic closure report that simply describes the activities conducted.

**10. STATUTORY DETERMINATIONS**

The selected remedy, Alternative 5, satisfies the statutory requirements of CERCLA, Section 121, which are:

- The remedy must be protective of human health and the environment
- The remedy must attain ARARs (or justify a waiver)
- The remedy must be cost effective
- The remedy must use permanent solutions and alternative treatment technologies to the maximum extent possible

CERCLA also expresses a statutory preference for treatment as a principal element of the remedy. Per CERCLA, USACE has provided its rationale for the reasons treatment is or is not practicable. (*See Section 10.4, infra.*)

The manner in which the selected alternative satisfies each of these requirements is discussed in the following sections.

**10.1. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**

The selected remedy (Alternative 5) is fully protective of human health and the environment. During implementation, USACE will use approved engineering controls, as required, and maintain environmental monitoring and surveillance activities to help ensure members of the public are not exposed to potential contamination. Because USACE expects to

meet the designated RAOs, it has determined that implementation of LUCs will not be necessary for this alternative. Implementation of this alternative will allow the Site's planned future use as a residential site.

## **10.2. ATTAINMENT OF ARARS**

As discussed previously, ARARs are directed at substantive, promulgated regulations with regard to onsite activities. CERCLA § 121(d), 42 U.S.C. § 9621(d); NCP, 40 C.F.R. § 300.5. Furthermore, CERCLA response actions, per CERCLA/NCP, are exempt from permits and similar procedural requirements with regard to onsite activities. 42 U.S.C. § 9621(e)(1); 40 C.F.R. § 300.400(e)(1). 4825 Glenbrook Road is "onsite" for purposes of CERCLA and the NCP (as are other areas related to the SVFUDS, such as the Interim Holding Facility). As for off-site activities (e.g., transportation), compliance is required for applicable substantive and procedural requirements. NCP, 40 C.F.R. § 300.400(e)(2).

The selected remedy is compliant with ARARs.

## **10.3. COST EFFECTIVENESS**

Cost effectiveness is evaluated by comparing the total life cycle costs estimated for each of the three remaining alternatives (Alternatives 3, 4, and 5) developed for 4825 Glenbrook Road, and then determining which alternative provides the best balance of the balancing criteria. Costs generally are a function of volume of soil to be removed and the procedure (i.e., low or high-probability) required to perform the excavation. Excavation under high-probability protocols is more costly than under low-probability. While all three alternatives include both low- and high-probability excavation, Alternative 5 is the most costly of the three alternatives on the total volume of on the total volume of excavation and removal of both soil and the house. Alternative 3 was the least costly, differing from Alternative 5 in the cost of the house's removal and excavation of soil beneath the house. Alternative 3 would require excavation of approximately one-half the high-probability soil volume as Alternative 5. Additionally, the technical feasibility, which affects the costs, of Alternative 3 is more difficult than either Alternatives 4 or 5. Finally, there would be long-term costs and an administrative burden to maintain and comply with LUCs associated with Alternative 3. Alternative 4 falls between the other two alternatives with regard to cost, but is relatively close to Alternative 5 because the high-probability soil volume to be excavated under Alternative 4 is just slightly less than for Alternative 5. The cost differential between Alternative 4 and 5 was approximately \$1,000,000; however, the long-term benefits provided by Alternative 5 help justify its selection as the selected remedy even though it is the most costly alternative. Because it is a permanent remedy, it does not require LUCs, and it leaves the least amount of residual risk at 4825 Glenbrook Road. Additionally, implementation of Alternative 5 allows for UU/UE.

#### **10.4. USE OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT POSSIBLE**

The selected remedy for 4825 Glenbrook Road provides a permanent solution to contamination that currently exists at 4825 Glenbrook Road through excavation and off-site disposal of contaminated media. None of the practicable alternatives developed for 4825 Glenbrook Road provide for onsite treatment of contaminated soil to be removed. The selected remedy is assessed as only moderately favorable in reducing toxicity, mobility and volume of contaminants because although virtually all the material is excavated and properly disposed off site, the preference to permanently and significantly reduce contaminants through treatment may not be met (assuming landfill disposal), as contaminants in the soils will simply transfer to a landfill.

Most of the substances that USACE expects to remove from 4825 Glenbrook Road consist of contaminated media, primarily soil. However, this selected remedy also incorporates the selected removal action that the Army addressed in its February 2010 Action Memorandum. As noted in the Proposed Plan for 4825 Glenbrook Road, all MEC, including CWM, and other AUES-related material recovered will be inspected to determine its explosive or CA safety status and disposed of in accordance with the February 2010 Action Memorandum. The selected response action for RCWM in the February 2010 Action Memorandum is onsite demilitarization using the EDS at the federal property located within the SVFUDS. The selected response action for conventional DMM and MDEH is onsite demilitarization using contained destruction technologies at the federal property located within the SVFUDS. Accordingly, for the remedial action for 4825 Glenbrook Road, USACE adopts those same remedies with regard to RCWM, DMM, and MDEH.

The remedy for 4825 Glenbrook Road is protective of human health and the environment. It will remove contaminated soil from 4825 Glenbrook Road to an off-site location, and remove and destroy other AUES-related material (i.e., MEC, including CWM, DDM and MDEH) per the February 2010 Action Memorandum. Collectively, these actions will eliminate the potential mobility of such materials and reduce the toxicity and volume of contaminated soil at this Site. The selected remedy will not use treatment on site to reduce toxicity, mobility, or volume of the contaminated soil to be addressed in this remedial action. However, all MEC, including CWM, and other AUES-related material recovered will be inspected to determine its explosive or CA safety status and disposed of onsite per the February 2010 Action Memorandum. (Note: For the purposes of CERCLA, the term “onsite” includes not only the 4825 Glenbrook Road, but also includes other areas of the FUDS, including the federal property.)

Excavation and off-site disposal is effective in the long-term, as the soils with elevated chemical concentrations will be removed from 4825 Glenbrook Road, significantly reducing any residual risk at the site. This also provides short-term effectiveness as the remedial action objectives can be achieved in a short period of time and no further treatability or feasibility studies are required. The materials and services required to implement this technology are also readily available. DDOE, USEPA, the property owner, and the community provide overall support for the selected remedy. For further reading on this topic, see the Responsiveness Summary in Appendix A of this Decision Document, which shows comments from the public.

The specific waste streams that are expected to be encountered at 4825 Glenbrook Road and the off-site disposal methods that are likely to be used, which are based on USACE's experience at this and other sites throughout the SVFUDS, are presented below. Depending on final off-site disposal, some level of treatment (incineration, soil stabilization, etc.) may be performed off-site for specific waste streams.

#### **10.4.1. Soil**

Contaminated soil will be disposed of, consistent with 40 CFR § 300.440, in a treatment, storage, or disposal (TSD) facility permitted to receive such material. If the excavated soils are characterized as RCRA hazardous, such soils will be stabilized by the RCRA Subtitle C hazardous waste treatment facility and then deposited in the landfill. If such soils are not characterized as RCRA hazardous, it will be disposed of directly into a sanitary landfill. Note: USACE's extensive previous experience at the SVFUDS suggests that the vast majority of the soil excavated will be characterized as non-hazardous.

Excavated soils characterized as being CA-contaminated will be disposed of in an incineration facility, with the ash ultimately placed in a Subtitle C landfill.

#### **10.4.2. Water**

Aqueous investigation-derived waste, primarily water from equipment or personnel decontamination, will similarly be characterized as RCRA hazardous or non-hazardous, and disposed accordingly. Non-hazardous wastes will be disposed of at a sanitary landfill; if a waste is characterized as hazardous, it will be disposed of at a RCRA Subtitle C permitted facility.

#### **10.4.3. MD and Non-munitions, Non-AUES Scrap**

MD that has been evaluated and documented as safe from the SVFUDS has historically been incinerated prior to landfill disposal. More recently, such MD has been disposed at a metal smelter facility. All non-munitions, non-AUES related debris (other debris) will be evaluated to determine its explosive safety status and disposed of per applicable regulations, normally in a nonhazardous waste landfill. Because non-munitions, non-AUES related debris is normally

commingled with AUES-related material, it must be removed to satisfy the RAOs established for the selected remedy. As noted previously, such material is removed incidental to required responses to the release or threatened release of CERCLA hazardous substances, pollutants and contaminants.)

#### **10.4.4. MEC, DMM, RCWM, and MDEH**

MEC, Discarded Military Munitions (DMM), including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH) that are recovered by USACE during the remedial action will be disposed of per USACE's February 2010 Action Memorandum (USACE 2010b). (The selected response action for RCWM in the Action Memorandum is Onsite Demilitarization using the EDS at the federal property that is located within the SVFUDS. The selected response action for conventional DMM/MDEH is Onsite Demilitarization using Contained Destruction Technologies at the federal property that is located within the SVFUDS.)

#### **10.5. DETERMINATION SUMMARY**

Alternative 5, **Remove the House and Remediate (Cleanup) to Residential Standards; Unrestricted Future Use**, is the selected remedy. This alternative provides a reasonable balance among the alternatives. It is protective of human health and the environment, highly implementable, addresses community concerns by removing AUES-related material from 4825 Glenbrook Road, and allows for its unrestricted use for residential purposes. The selected remedy provides the best long-term solution for 4825 Glenbrook Road by minimizing potential for future risk at 4825 Glenbrook Road from past DoD operations and activities. The time and cost to implement the selected remedy are reasonable, and the comments received from the public and state<sup>2</sup> and federal agencies are supportive of the selected remedy.

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<sup>2</sup> Pursuant to the NCP, the term "State" includes the District of Columbia. 40 C.F.R. § 300.5.

## GLOSSARY OF TERMS

**Agent Breakdown Product** (ABPs): Those chemicals resulting from partial decomposition or chemical breakdown of chemical agents. For SVFUDS, these include:

- Dithiane, oxathiane, and thiodiglycol, which are ABPs of mustard.
- Chlorovinylarsenous oxide (CVAO) and chlorovinylarsenous acid (CVAA), which are ABPs of lewisite.

**Administrative Record**: A collection of documents containing all the information and reports generated during the entire phase of investigation and cleanup at a site, which are used to make a decision on the selection of a response action under CERCLA. This file is to be available for public review and a copy maintained near the site at the Tenley-Friendship Branch Library.

### **Applicable or Relevant and Appropriate Requirements (ARARs):**

Pursuant to the NCP, 40 C.F.R. § 300.5, a regulation may qualify as an ARAR if it meets the definition of being either “applicable” or “relevant and appropriate.” Each of these components is discussed below.

“Applicable” requirements means those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

“Relevant and appropriate” requirements means those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site. Only those state standards that are promulgated, are identified by a state in a timely manner, and are more stringent than federal requirements may be relevant and appropriate.

(Pursuant to the NCP, the term “State” includes the District of Columbia (DC). 40 C.F.R. § 300.5.)

**Chemical Agent (CA) Safety**: A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of a mishap involving chemical warfare material (CWM) and CA in other than munitions configurations.

## GLOSSARY OF TERMS (Continued)

**Chemicals of Potential Concern (COPCs):** Chemicals identified through the risk assessment process as the primary chemicals that may cause unacceptable human health and/or ecological risk.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA) that concerns hazardous substances.

**Chemical Warfare Materiel:** Items generally configured as a munition containing a chemical compound that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. CWM includes V- and G-series nerve agents or H-series (mustard) and L-series (lewisite) blister agents in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogen chloride (CK), or carbonyl dichloride (called phosgene or CG)) configured as a military munition. Due to their hazards, prevalence, and military-unique application, CA identification sets are also considered CWM. CWM does not include: riot control devices; chemical defoliants and herbicides; industrial chemicals (e.g., AC, CK, or CG) not configured as a munition; smoke and other obscuration producing items; flame and incendiary producing items; or soil, water, debris or other media contaminated with low concentrations of chemical agents where no CA hazards exist.

**Decision Document (DD):** A public document that describes the remedial action (a.k.a. “remedy”) selected for a site, the basis for the choice of that remedy, and responds to public comments. The DD is based on information and technical analysis generated during the RI/FS.

**Disposal Pits:** See Military Munitions Burial Site.

**Discarded Military Munitions (DMM):** Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2))

**Explosive Safety.** A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving DoD military munitions or other encumbering explosives or munitions.

**Exposure Pathway:** Describes the course a chemical or physical agent takes from the source to the exposed individual. Elements of the exposure pathway are: (1) the source of the released chemical or physical agent; (2) the contaminated medium (e.g., soil); (3) a point of contact with the contaminated medium; and (4) an exposure route (e.g., ingestion, inhalation) at a contact point.

## GLOSSARY OF TERMS (Continued)

**Feasibility Study (FS):** The FS serves as the mechanism for the development, screening, and detailed evaluation of alternative remedial actions.

**Hazardous and Toxic Waste:** A term in general use by the U.S. Army Corps of Engineers; it generally refers to any waste in the environment that could pose a hazard to human health or the environment. Often there are federal or state regulations that will address this waste, but not always.

**Land Use Controls (LUCs):** Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment.

**Material Documented as Safe (MDAS):** MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH.

**Material Documented as an Explosive Hazard (MDEH):** MPPEH that cannot be documented as MDAS, that has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH.

**Material Potentially Presenting an Explosive Hazard (MPPEH).** Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or potentially contains a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within the DoD established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.

**Military Munitions Burial Site.** A site, regardless of location, where military munitions or CA, regardless of configuration, were intentionally buried, with the intent to abandon or discard. This term includes burial sites used to dispose of military munitions or CA, regardless of configuration, in a manner consistent with applicable environmental laws and regulations or the national practice at the time of burial. It does not include sites where munitions were intentionally covered with earth during authorized destruction by detonation, or where in situ capping is implemented as an engineered remedy under an authorized response action.

**Munitions Debris (MD):** Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization or disposal.

## GLOSSARY OF TERMS (Continued)

**Munitions and Explosives of Concern (MEC):** This term distinguishes specific categories of military munitions that may pose unique explosive safety risks, including:

- UXO, as defined in 10 U.S.C., Sections 101 and 2710
- DMM, as defined in 10 U.S.C., Sections 101 and 2710
- Munitions constituents (e.g., TNT, cyclotrimethylenetrinitramine (RDX)), as defined in 10 U.S.C., Sections 101 and 2710, present in high enough concentrations to pose an explosive hazard.

**Other Debris:** This category of material includes debris that is not necessarily related to DoD-military munitions-related operations, but may be encountered, evaluated to determine their explosives safety status and origin, and removed during munitions responses and other environmental responses to facilitate the conduct of a response.

**Proposed Plan:** The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration and to participate in the selection of a remedial action at a site.

**Recovered Chemical Warfare Materiel (RCWM):** CWM used for its intended purpose or previously disposed of as waste, which has been discovered during a CWM response or by chance (e.g., accidental discovery by a member of the public), that DoD has either secured in place or placed under DoD control, normally in a DDESB-approved storage location or interim holding facility, pending final disposition.

**Remedial Action:**

Those actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health, welfare or the environment.

**Remedial Action Objective (RAO):** Objectives established for remedial actions to guide the development of alternatives and focus the comparison of acceptable remedial action alternatives, if warranted. RAOs also assist in clarifying the goal of minimizing risk and achieving an acceptable level of protection for human health and the environment.

**Remedial Investigation (RI):** A study of a site that provides information supporting the evaluation for the need for a remedy and/or selection of a remedy for a site where hazardous substances have been disposed of. The RI identifies the nature and extent of contamination at the facility.

**GLOSSARY OF TERMS  
(Continued)**

**Removal Action:** The cleanup or removal of released hazardous substances from the environment. Such actions may be taken in the event of the threat of release of hazardous substances into the environment, as these actions may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed material. Taking other actions may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release.

**Restoration Advisory Board (RAB):**

A Restoration Advisory Board (RAB) is a forum for the discussion and exchange of information between the affected community, representatives of the Department of Defense (DoD), regulators, state, local governments, and tribal governments. RABs provide an opportunity for stakeholders to have a voice and actively participate in the review of technical documents, to review restoration progress, and to provide individual advice to decision makers regarding restoration activities at FUDS Properties and Projects.

## REFERENCES

- EMS 1992. *Letter Report for Glenbrook Site, Environmental Management Systems*, May 21 and June 4, 1992.
- USACE 1995. *Remedial Investigation Report for the Operation Safe Removal Formerly Used Defense Site, Washington, D.C.* Parsons Engineering Science, Inc., June 1, 1995.
- USACE 1999. *Geophysical Investigation Report, 4825 Glenbrook Road, Spring Valley Operable Unit 3, Washington, D.C.* prepared for USACE by Parsons, May 1999.
- USACE 2000. *Engineering Evaluation/Cost Analysis for 4801, 4825 and 4835 Glenbrook Road, Washington, D.C.* Parsons Engineering Science, Inc., October 30, 2000.
- SAP 2002. Scientific Advisory Panel Report, May 29, 2002 Meeting.
- USACE 2003. *Engineering Evaluation/Cost Analysis for Arsenic in Soil, OU-4 and OU-5 Washington, D.C.* Parsons, December 17, 2003.
- USACE 2006. *Engineering Control Evaluation for 4825 Glenbrook Road, Washington D.C., (ECS Evaluation).* December 2006.
- USACE 2008. *Final Chemical Safety Submission Annex for Investigation of Burial Pit 3 4825 Glenbrook Road, Amendment 1, SVFUDS, Washington D.C., January 28, 2008.* Prepared for U.S. Army Engineering and Support Center, Huntsville and U.S. Army Corps of Engineers, Baltimore District by Parsons.
- USACE, 2009a. *Soil Gas and Driveway ABP Soil Sampling Report, 4825 Glenbrook Road, Spring Valley Formerly Used Defense Site (SVFUDS) Operable Unit 3 (OU-3), Washington, D.C.* Parsons, April 15, 2009.
- USACE 2009b. *Final Site-Specific Work Plan for the Test Pit Investigations at 4825 and 4835 Glenbrook Road Properties, Amendment 3, SVFUDS, Operable Unit 3, Washington D.C., October 23, 2008.* Prepared for U.S. Army Engineering and Support Center, Huntsville and U.S. Army Corps of Engineers, Baltimore District by Parsons.
- USACE 2009c. *US Army Munitions Response RI/FS Guidance.* November 2009.
- USACE 2009d. *Engineering Evaluation /Cost Anaylsis (EE/CA) for the Disposal of Discarded Military Munitions (DMM), including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH), Spring Valley Formerly Used Defense Site, Washington, D.C.* Prepared by the U.S. Army Corps of Engineers, Baltimore District.
- USACE 2010a. *Final Site-Specific Work Plan for the Test Pit Investigations at 4825 and 4835 Glenbrook Road Properties, Amendment 4, SVFUDS, Operable Unit 3, Washington D.C.,*

July 29, 2010. Prepared for U.S. Army Engineering and Support Center, Huntsville and U.S. Army Corps of Engineers, Baltimore District by Parsons.

USACE 2010b. *Action Memorandum, Disposal of Discarded Military Munitions (DMM), including Recovered Chemical Warfare Materiel (RCWM), Conventional DMM, and Material Documented as an Explosive Hazard (MDEH), Spring Valley Formerly Used Defense Site, Washington, D.C.* Prepared by the U.S. Army Corps of Engineers, Baltimore District.

USACE 2011a. *Remedial Investigation Report for 4825 Glenbrook Road, SVFUDS, Operable Unit 3, Washington D.C., July 29, 2011.* Prepared for U.S. Army Engineering and Support Center, Huntsville and U.S. Army Corps of Engineers, Baltimore District by Parsons.

USACE 2011b. *Feasibility Study for 4825 Glenbrook Road, SVFUDS, Operable Unit 3, Washington D.C., September 26, 2011.* Prepared for U.S. Army Corps of Engineers, Baltimore District by ERT.

USACE 2011c. *Proposed Plan for 4825 Glenbrook Road, SVFUDS, Operable Unit 3, Washington D.C., September 30, 2011.* Prepared by the U.S. Army Corps of Engineers, Baltimore District.

USEPA 1988. *USEPA Guidance for Conducting RI/FS Studies Under CERCLA*, October 1988.

USEPA Region 3. 1999. *Interim Trip Report #1 – Appendix 1, Spring Valley, OU-3, Washington, D.C.* Weston, August 10, 1999.

**APPENDIX A  
RESPONSIVENESS SUMMARY**

## **APPENDIX A**

### **Responsiveness Summary**

The purpose of the Responsiveness Summary is to provide a summary of the significant comments and questions about the 4825 Glenbrook Road Proposed Plan submitted during the public comment period, and provide the U.S. Army Corps of Engineers' (USACE) responses to submitted comments.

During the comment period, which started on October 3, 2011 and ended on November 12, 2011, 48 written comments were received by USACE. A public meeting was held on October 26, 2011 to formally present the Proposed Plan, answer questions, and receive oral and written comments. The meeting transcript is included in Appendix B and is part of the administrative record for the site. All comments and concerns summarized below have been considered by the USACE in selecting the preferred alternative for cleanup at 4825 Glenbrook Road.

This responsiveness summary is divided into the following sections:

A.1. Overview.

A.2. Background on community involvement.

A.3. Summary of comments received during the public comment period and the USACE's responses.

A.4. Formal Public Notice announcing the public comment period and the public meeting.

#### **A.1. OVERVIEW**

At the time of the public comment period, USACE proposed Alternative 5 as the preferred alternative for remediation (cleanup) of 4825 Glenbrook Road. The preferred remedial alternative consisted of removal of 4825 Glenbrook Road's house and remediation of 4825 Glenbrook Road to residential standards. Based on submitted public comments, the community generally supports the selection of Alternative 5. Several commenters, while supporting Alternative 5, had comments relating to the specific implementation of Alternative 5 in the Remedial Design Work Plan.

#### **A.2. BACKGROUND ON COMMUNITY INVOLVEMENT**

Community interest in 4825 Glenbrook Road has remained high since May 2001, when USACE discovered Burial Pit. USACE has maintained an active community involvement program at the Spring Valley Formerly Used Defense Site (SVFUDS), continuing this

throughout the Remedial Investigation (RI)/Feasibility Study (FS), and planning process at 4825 Glenbrook Road. Highlights of community outreach activities relating to the Proposed Plan are as follows:

- USACE provided monthly project updates on the 4825 Glenbrook Road Remedial Investigation, Feasibility Study, and Proposed Plan, in addition to other Spring Valley project-wide efforts, that were posted to the Spring Valley project website and local community groups LISTSERV<sup>®</sup>; and emailed to interested stakeholders, including residents, elected officials, Restoration Advisory Board (RAB) members, agency stakeholders, and other interested individuals.
- USACE issued the final versions of the RI/FS in July 2011 and September 2011, respectively, and placed it in the Information Repository located at Tenley-Friendship Branch Library, the Spring Valley project website and the Administrative Record for the site.
- USACE presented routine progress updates on the 4825 Glenbrook Road RI/FS and subsequently the Proposed Plan at monthly RAB meetings and provided an overview of the Proposed Plan at the September 2011 RAB meeting.
- USACE attended the local Advisory Neighborhood Council (ANC) meeting and presented an overview of the Proposed Plan on September 7, 2011.
- USACE released the Proposed Plan for 4825 Glenbrook Road on October 3, 2011. Copies of the Proposed Plan were made available online at the Spring Valley project website and in the Spring Valley information repository at the Tenley-Friendship Branch Library.
- USACE published a notice of availability for the Proposed Plan in the Washington Post and the Northwest Current. A media advisory announcing the public comment period was issued, and the notice of availability was also posted on the Spring Valley project website, local community group LISTSERV<sup>®</sup>, and emailed to interested stakeholders, including residents, elected officials, RAB members, agency stakeholders, and other interested individuals.
- USACE conducted the public comment period on the Proposed Plan from October 3, 2011 through November 12, 2011.
- A special issue of the *Corps' pondent* quarterly newsletter was mailed to all Spring Valley project residents. This newsletter provided an overview of the Proposed Plan, notified the community of the public comment period, announced the date and time of the public meeting and open house, and included a detachable Proposed Plan comment form that could be mailed back to USACE.
- In addition to including the public meeting and open house date in the notice of availability, USACE issued announcements as a media advisory, emailed announcements

to interested stakeholders, and posted them to local community group LISTSERV®.

USACE also announced the public meeting and open house at the monthly RAB meeting.

- On October 26, 2011, USACE held a public meeting and open house at the Tenley-Friendship Library in Washington, DC. Representatives from the USACE, USEPA Region III and the District of Columbia Department of the Environment were in attendance. USACE provided an overview of the alternatives and a rationale for selection of USACE's preferred alternative, followed by a question and answer session. Members of the public could submit oral comments during this part of the meeting. Oral and written comments could be submitted before, during and after the formal public meeting in an adjoining room to the meeting room. Written comments could also be submitted via a comment box in the meeting room. Posters and fact sheets outlining each alternative were available during the open house.

### **A.3. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND USACE'S RESPONSES**

USACE received comment submissions from 24 individuals and groups. A total of 48 comments were included in these submissions. A total of 19 individuals and groups were in favor of the Preferred Alternative, Alternative 5: Remove the house and remediate (cleanup) to residential standards with unrestricted future use. One individual favored Alternative 4: Remove the house and cleanup to recreational standards; restricted future use (LUCs). One individual did not favor any of the alternatives and requested that additional research be completed prior to selection of any alternative. One individual would only support Alternative 5 if it was modified to include additional conditions. Two individuals provided general comments with no specific support of the Alternative mentioned.

#### **3.1. Comments submitted in favor of the Preferred Alternative, Alternative 5.**

**COMMENT 1:**        **While supporting the Preferred Alternative, three individuals/groups requested review of the Remedial Design Work Plan, which includes a public protection plan, to ensure maximum public protection during cleanup.**

**USACE RESPONSE:** The RAB will continue to be briefed on the progress at 4825 Glenbrook Road. These briefings will include discussions/review of the Remedial Design Work Plan and the Public Protection Plan. Additionally, once these documents are finalized, USACE will hold an informational meeting to present and discuss the work plans and removal activities planned for at 4825 Glenbrook Road.

**COMMENT 2:** While supporting the Preferred Alternative, one individual requested weekly website updates of the 4825 remedial action including: progress on cleanup activities, items recovered, any unexpected discoveries, updates on the project schedule, and any schedule delays.

USACE RESPONSE: Weekly briefings will be provided on the USACE Spring Valley Project website. Information regarding progress at the site, items being recovered and any issues of concern can be noted in these briefings. Additionally, briefings will continue to be provided at the monthly RAB meetings, the *Corps'ponent*, monthly project updates and other correspondence methods as needed.

**COMMENT 3:** While supporting the Preferred Alternative, one individual expressed concern about the funding allocations for the 4825 remedial action and requested monthly updates on the budget.

USACE RESPONSE: The contract for the remedial action at 4825 Glenbrook Road was awarded in FY2011 to the selected contractor, which is Parsons. That contract was funded for \$7.8 million dollars. Additional funding has been allocated by Congress in the Fiscal Year 2012 and 2013 budget to supplement the original contract award. If additional funding would be required to complete implementation of the remedy, USACE will request the funds, which have historically been provided by Congress.

**COMMENT 4:** While supporting the Preferred Alternative, two groups emphasized that USACE should work expeditiously to negotiate terms of access to the site and compensation for house demolition with the current property owner, American University, in order to implement the remedial action as soon a possible.

USACE RESPONSE: USACE and AU will jointly negotiate the cost for destruction of the house at 4825 Glenbrook Road. Based on our past relationship with AU, USACE anticipates the negotiations will proceed in a timely fashion without delay to the schedule.

**COMMENT 5:** While supporting the Preferred Alternative, one individual and one group noted that American University has a responsibility to the community to quickly pursue an agreement with USACE to allow the remedial action to begin as soon as possible.

USACE RESPONSE: USACE and AU will jointly negotiate the cost for destruction of the house at 4825 Glenbrook Road. Based on our past relationship with AU, USACE anticipates the negotiations will proceed in a timely fashion without delay to the schedule.

**COMMENT 6: One individual supported the Preferred Alternative, provided that Area A is remediated under “high probability” conditions instead of the currently proposed “low probability” approach to address concerns raised in relation to a video recording of 4825 Glenbrook Road construction workers saying munitions were buried behind the retaining wall in this location, and to ensure maximum public protection.**

USACE RESPONSE: At this stage, excavations are categorized by USACE as high versus low probability scenarios for cost estimating purposes only. The Remedial Design/Remedial Action Work Plan will contain the details on how the remedy will be implemented, including low vs. high probability excavation. USACE and our regulatory partners at DDOE and USEPA will take into consideration all data available for Area A and the remainder of 4825 Glenbrook Road prior to finalizing the remedial design/remedial action work plan. In addition to arsenic soil removal up to a depth of 4 feet in the backyard, several test pits and soil samples have been taken behind the back yard retaining wall. The data from the soil samples, and the results of the test pit operations behind the retaining wall did not reveal data that indicates contamination or the presence of a burial pit.

**COMMENT 7: One individual supported the Preferred Alternative, provided that background arsenic concentration of 12.6-12.8 parts per million (ppm), instead of the site-wide cleanup level of 20 ppm, be used as the cleanup level for arsenic during the 4825 Glenbrook Road remedial action, as previously requested by American University.**

USACE RESPONSE: The remediation goal of 20 ppm, which was agreed upon by USACE, EPA, and DDOE), also met with the approval of the Washington, D.C. Mayor's Scientific Advisory Board and the Spring Valley RAB. The remediation goal was established based on achieving a level determined to be very protective against long-term cancer and other non-cancer risks for both children and adults. This remediation goal also considered the natural background level found in the soils within the Washington, DC area. AU has provided comments regarding the remediation (cleanup) goals for arsenic at 4825 Glenbrook Road as well as other AU-owned properties. USACE in consultation with our partners - EPA, and DDOE - has decided to continue to use the established remediation goal for arsenic. As part of any necessary CERCLA periodic reviews for the overall SVFUDS project, the remediation goal will

be reviewed to determine if there are regulatory changes that require a re-evaluation of the cleanup throughout the SVFUDS project boundary.

**COMMENT 8:**        **While supporting the Preferred Alternative, two groups called on the parties involved with the remedial action to move forward expeditiously to complete the house demolition, cleanup and restoration process, in light of the impact such work has had over the last 10 years on neighborhood residents.**

USACE RESPONSE: At this point, USACE has maintained a very aggressive schedule for 4825 Glenbrook Road and will continue to monitor the schedule closely. USACE is committed to completing the remedial action at the site as expeditiously as possible.

**COMMENT 9:**        **While supporting the Preferred Alternative, one group requested that the property restoration include re-establishment of a buffer of foliage and fencing along the back portion of the 4825 Glenbrook Road property directly adjacent to the American University campus to screen the neighborhood from campus activities and buildings.**

USACE RESPONSE: AU is the property owner for 4825 Glenbrook Road. Since 4825 Glenbrook Road will be remediated to residential standards with no restrictions on use, decisions regarding future use of 4825 Glenbrook Road will be made by AU.

**COMMENT 10:**      **One individual commented that USACE should, in implementing the Preferred Alternative, “chase the evidence” and fully remediate all areas, even through extensions onto neighboring properties if necessary.**

USACE RESPONSE: The selected remedy is specific to 4825 Glenbrook Road. The remedy will be implemented as documented in the Decision Document. If contamination is discovered at the property line of 4825 Glenbrook Road, it will be documented for future potential remediation efforts and evaluated in the Site Wide Remedial Investigation Report and Human Health Risk Assessment.

**COMMENT 11:**      **While supporting the Preferred Alternative, one individual noted that one possible burial pit remains to be investigated in the neighborhood due to denied access by the property owner. The commenter requested that USACE exercise its authority to enter the property without owner consent under 104 (e)(1) of the Superfund**

**Amendments and Reauthorization Act of 1986 to determine the need for response and satisfy the community's right to know whether a condition posing danger to the neighborhood exists on the property.**

USACE RESPONSE: This comment is related to work at a different location in the SVFUDS. USACE notes the comment for future work within the SVFUDS.

**COMMENT 12: One individual, in her comment submission in favor of the Preferred Alternative, requested that USACE advocate to make historical American University Experiment Station (AUES) documents currently located at Fort Leonard Wood available to the public, with the exception of any documents containing technically sensitive materials.**

USACE RESPONSE: The documents located at Fort Leonard Wood have been reviewed and researched by USACE, EPA, and DDOE as part of this project. USACE does have copies of some of the documentation. The documents remaining at Fort Leonard Wood are under the command authority of the U.S. Army Chemical, Biological, Radiological, and Nuclear School. That command authority will make determinations regarding the release of documents.

**COMMENT 13: One group noted in its comment favoring the Preferred Alternative that it expects to receive continuing updates on the progress of the remediation, and will be interested in how the Remedial Design Work Plan addresses the issues of lateral extent of the excavation, high vs. low probability excavations, and reporting of progress.**

USACE RESPONSE: USACE will continue to provide briefings on the progress at 4825 Glenbrook Road to the RAB and public at the monthly RAB meetings. These briefings will include discussions/review of the Remedial Design Work Plan and the Public Protection Plan, Probability Assessments, etc. Additionally, once these documents are finalized, USACE will hold an informational meeting to present and discuss the work plans and removal activities planned for 4825 Glenbrook Road. Once intrusive field efforts begin, USACE will post weekly updates to the Spring Valley website.

### **3.2. Comments Submitted in Favor of Alternative 4**

**COMMENT 14:**      **One individual favored Alternative 4. The individual would have preferred the house be removed and a dog park be constructed at the property. This individual did not want to see another residential house built at the site.**

USACE RESPONSE: Alternative 4 was not the selected remedy due to the potential remaining risk at 4825 Glenbrook Road and long-term potential for additional impacts to the environment and human health. As discussed in detail in the Decision Document, the selected remedy – Alternative 5 - provides the most appropriate and reasonable balance among the alternatives evaluated. It is protective of human health and the environment, highly implementable, addresses community concerns by removing hazardous materials from 4825 Glenbrook Road, and allows for 4825 Glenbrook Road’s unrestricted use for residential purposes. The selected remedy provides the best long term solution for the project by minimizing potential for future risk at 4825 Glenbrook Road from past DoD operations and activities.

### **3.3. Comments Submitted in Favor of No Alternatives Listed in the Proposed Plan**

**COMMENT 15:**      **One individual requested that USACE develop a thorough and efficient Proposed Plan which includes investigating the cleaning up of burial pits and contamination that likely extend onto adjacent properties.**

USACE RESPONSE: The selected remedy for this particular Decision Document is specific to 4825 Glenbrook Road. The remedy will be implemented as documented in the Decision Document. If contamination is discovered at 4825 Glenbrook Road’s property line, it will be documented for future potential remediation efforts. USACE plans to discuss areas other than 4825 Glenbrook Road in its forthcoming documents concerning the remainder of the SVFUDS.

**COMMENT 16:**      **One individual requested that Area A be investigated under “high probability” protocols to protect public health and safety.**

USACE RESPONSE: At this stage, excavations are categorized as high- versus low-probability scenarios for cost estimating purposes only. The Remedial Design/Remedial Action Work Plan will contain the details on how the remedy will be implemented, including low vs. high probability excavation. USACE and our regulatory partners at DDOE and USEPA

will take into consideration all data available for Area A and the remainder of 4825 Glenbrook Road prior to finalizing the Remedial Design/Remedial Action Work Plan. In addition to arsenic soil removal up to a depth of 4 feet in the backyard, several test pits and soil samples have been taken by USACE behind the back yard retaining wall. The data from the soil samples, and the results of the test pit operations behind the 4825 Glenbrook Road's retaining wall did not reveal any data that indicated contamination or the presence of a burial pit.

**COMMENT 17: One individual requested that Area C be investigated to bedrock, to remove buried munitions, chemical warfare agents and contaminated soils.**

USACE RESPONSE: Area C, which represents the limits of the Burial Pit 3 operations, is being designated as a no further action area because the area was previously excavated to saprolite, bedrock, or native, undisturbed soil. As indicated in section 2.6.0.8 of the Remedial Investigation Report for 4825 Glenbrook Road, "Burial Pit 3 was excavated until the excavation was cleared. The excavation was considered cleared if: 1) it no longer contained suspect AUES-related items, and 2) the Parson's geologist (USACE contractor) and USACE equivalent individual determined that the excavation has reached undisturbed soil. Evidence of undisturbed soil was determined based on the presence of saprolite (weathered bedrock), bedrock, or other indications that the soil was native and undisturbed. Additionally, cone penetrometer tests were performed to confirm that excavation reached bedrock. The saprolite depth in the Burial Pit 3 area ranges from 1 feet bgs to 13 feet bgs." Because these criteria were achieved for Burial Pit 3, USACE determines, based on the presently-available information, that no further action is required in this area. However, as excavations proceed under the 4825 Glenbrook Road's house, there will always be the option to extend the excavation laterally into the Burial Pit 3 area (Area C), if the evidence presents itself.

**COMMENT 18: One individual requested that USACE locate the contaminated soil excavated from Glenbrook Road during the construction of the property to better understand what remains buried at the property.**

USACE RESPONSE: USACE and its partner agencies (USEPA and DDOE) have attempted to locate the disposal sites for the material derived from 4825 Glenbrook Road's development. Nevertheless, locating and testing of the soils removed from 4825 Glenbrook Road during development does not impede USACE's thorough analysis of the alternatives and selection of the remedy. USACE has an extensive amount of data from our several years of investigative work completed to date at 4825 Glenbrook Road. This data will be used to assess remaining contamination for implementation planning purposes.

**COMMENT 19:**      **One individual requested that the AUES files be transferred from Fort Leonard Wood to the College Park National Archives so that a more thorough historical research, investigation, and cleanup can be conducted.**

USACE RESPONSE: The documents located at Fort Leonard Wood have been reviewed and researched by USACE, EPA, and DDOE as part of this project. USACE does have copies of some of the documentation. The documents remaining at Fort Leonard Wood are under the command authority of the U.S. Army Chemical, Biological, Radiological, and Nuclear School. That command authority will make determinations regarding the release of documents.

**COMMENT 20:**      **One individual requested that USACE revisit the existing arsenic cleanup level and consider cleaning up to background levels, taking into account the synergistic effects of the chemicals detected on the property and that the USEPA is expected to release stricter arsenic standards during the course of the cleanup.**

USACE RESPONSE: The remediation goal of 20 ppm was agreed upon by USACE, EPA, and DDOE, and also met with the approval of the Washington, D.C. Mayor's Scientific Advisory Board and the Spring Valley RAB. The remediation goal was established based on achieving a level determined to be very protective against long-term cancer and other non-cancer risks for both children and adults. This remediation goal also considered the natural background level found in the soils within the Washington, DC area. AU has provided comments regarding the remediation goals for arsenic at 4825 Glenbrook Road and other AU-owned properties. USACE in consultation with its partners - EPA and DDOE - has decided to continue to use the established remediation goal for arsenic. As part of any necessary CERCLA periodic reviews for the overall SVFUDS project, the remediation goal will be reviewed to determine if there are regulatory changes that require a re-evaluation of the cleanup throughout the SVFUDS project boundary.

**COMMENT 21:**      **One individual requested that USACE provide a daily Glenbrook Road update on the USACE Spring Valley website, as has been done in the past, including all AUES items recovered, and chemicals detected, along with weekly updates on the schedule and progress of the investigation.**

USACE RESPONSE: Weekly briefings will be provided on USACE Spring Valley website. Information regarding progress at the site, items being recovered and any issues of

concerns will be noted in these briefings. Additionally, briefings will continue to be provided at the monthly RAB meetings, the *Corps' ondent*, monthly project updates, and other correspondence methods as needed.

## A.4 FORMAL PUBLIC NOTICE ANNOUNCING THE PUBLIC COMMENT PERIOD AND THE PUBLIC MEETING



### **PUBLIC NOTICE**

#### **Spring Valley Formerly Used Defense Site 4825 Glenbrook Road Proposed Plan Available for Public Review**

The US Army Corps of Engineers (USACE), Baltimore District has completed its Proposed Plan for the cleanup of 4825 Glenbrook Road, NW, in Washington DC. The property is part of the Spring Valley Formerly Used Defense Site (SVFUDS). USACE, in consultation with the District Department of the Environment and U.S. Environmental Protection Agency Region III, proposes a remedy to address the cleanup created by the presence of chemical warfare materiel, agent breakdown products, munitions and explosive of concern, and hazardous and toxic waste-impacted soil found at the 4825 Glenbrook Road site.

During World War I, the US Government established the American University Experiment Station (AUES) to research the testing, production, development and effects of noxious gases, chemical warfare materiel, antidotes and protective masks. Mustard (H) and lewisite (L) agents, adamsite, irritants and smokes were among the chemicals researched and tested. The SVFUDS includes property occupied by the former AUES from 1917-1920, as well as an area adjacent to the AUES, named Camp Leach, which was established and used for staging, training, and billeting troops during World War I. SVFUDS consists of approximately 661 acres in the Northwest section of Washington, DC. Today, the Spring Valley neighborhood encompasses approximately 1,600 private homes, including several embassies, as well as American University and Wesley Seminary. SVFUDS is part of the Department of Defense Environmental Restoration Program (DERP). DERP FUDS is administered in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act and the National Contingency Plan that includes requirements for community involvement in the cleanup process.

**This Notice serves as formal notification of the availability of the 4825 Glenbrook Road Proposed Plan for review, and the commencement of the 30-day public comment period. The 30-day public comment period will commence on Oct. 3 and end on Nov. 12, 2011.** The 4825 Glenbrook Road Proposed Plan is available for public review as of Oct. 3, 2011 on the U.S. Army Corps of Engineers' Spring Valley Project website: <http://www.nab.usace.army.mil/Projects/Spring%20Valley/>, as well as at the DC Public Library: Tenley-Friendship Branch located at 4450 Wisconsin Ave. NW, in Washington, DC.

Only comments received prior to the end of the public comment period will be considered. Written comments should be mailed to Brenda Barber at the address below and must be postmarked by Nov. 12, 2011 to be considered. Attendees at the public meeting may provide oral comments or bring written comments to the Meeting Recorder, who will be in an area reserved for this purpose. Comments will be summarized and responses provided in the responsiveness summary section of the Decision Document.

#### **PUBLIC MEETING**

Wednesday, October 26, 2011

6:30 - 8 p.m.

DC Public Library: Tenley-Friendship Library Branch  
4450 Wisconsin Ave. NW, Washington, DC 20016

#### **OPEN HOUSE**

Wednesday, October 26, 2011

4 - 5 p.m. and 8 - 9 pm

DC Public Library: Tenley-Friendship Library Branch  
4450 Wisconsin Ave. NW, Washington, DC 20016

For more information contact:

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**APPENDIX B  
PUBLIC MEETING TRANSCRIPT**

**U.S. Army Corps of Engineers  
 Spring Valley Public Meeting: Proposed Plan for 4825 Glenbrook Road  
 Tenley-Friendship Branch Library  
 Minutes of the October 26, 2011 Public Meeting**

<b>SPRING VALLEY PROJECT PERSONNEL PRESENT AT THIS MEETING</b>	
Colonel David E. Anderson	USACE, Baltimore District Commander
Dan Noble	USACE, Spring Valley Project Manager / Spring Valley Restoration Advisory Board Military Co-Chair
Steven Hirsh	U.S. Environmental Protection Agency Region III / Institutional Spring Valley Restoration Advisory Board Member
James Sweeney	District of Columbia Department of the Environment / Institutional Spring Valley Restoration Advisory Board Member
Brenda Barber	USACE, Spring Valley Project Manager
Lan Reeser	USACE, Technical Manager
Ed Hughes	USACE, FUDS Program Manager
Christopher Augsburger	USACE, Chief of Public Affairs
Clem Gaines	USACE, Public Affairs
Carrie Johnston	Spring Valley Community Outreach Program Manager
Maya Werner	Spring Valley Community Outreach Program
Betsey Hutton	Spring Valley Community Outreach Program
Lattie Smart	Spring Valley Community Outreach Program
Jessica Bruland	ERT
<b>STATE/DISTRICT ELECTED OFFICIALS PRESENT AT THIS MEETING</b>	
Congresswoman Eleanor Holmes Norton	Congresswoman for the District of Columbia / Ranking Member of House Subcommittee on Economic Development, Public Buildings, and Emergency Management
Councilmember Mary M. Cheh (Represented by Matt Orkins, Legislative Counsel)	Council of the District of Columbia, Ward 3
<b>LOCAL ELECTED OFFICIALS PRESENT AT THIS MEETING</b>	
W. Philip Thomas	ANC3D-06 Commissioner
Nan Wells	ANC3D-03 Commissioner
Tom Smith	ANC3D-02 Commissioner / Chair of ANC3D
Kent Slowinski	ANC3D-01 Commissioner

<b>RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING</b>	
Greg Beumel	Spring Valley Restoration Advisory Board Community Co-Chair
Kathleen Connell	Spring Valley Restoration Advisory Board Member
Mary Stewart Douglas	Spring Valley Restoration Advisory Board Member
Dr. Peter deFur	Environmental Stewardship Concepts / Spring Valley Restoration Advisory Board TAPP Consultant
Alma Gates	Spring Valley Restoration Advisory Board At Large Representative – Horace Mann Elementary School
William Krebs	Spring Valley Restoration Advisory Board Member
Lawrence Miller	Spring Valley Restoration Advisory Board Member
John Wheeler	Spring Valley Restoration Advisory Board Member
Penny Pagano	At Large Representative – American University
<b>HANDOUTS FROM THE MEETING</b>	
I. Final Agenda for the October 26, 2011 Public Meeting: Proposed Plan for 4825 Glenbrook Road II. Army Corps of Engineers Presentation of 4825 Glenbrook Road Proposed Plan IV. Handouts for the 4825 Glenbrook Road Proposed Plan Comment Period (Public Notice, Fact Sheets, Citizen Summaries, and Public Comment Form)	

**AGENDA**

**Starting Time:** The October 26, 2011 Proposed Plan public meeting began at 6:46 PM.

**I. Welcome and Introductions**

**A. Welcome**

**Dan Noble:** Good evening, everyone. I would like to welcome you all. My name is Dan Noble, and I am the Project Manager for the U.S. Army Corps of Engineers Baltimore District Spring Valley Formerly Used Defense Site (FUDS). Tonight we are here to talk about 4825 Glenbrook Rd, which is the focus of the meeting this evening.

**D. Noble:** Before I go further, I want to thank Tenley-Friendship Branch Library for hosting us this evening. The branch and the staff have been very gracious and accommodating, and I want to thank them for hosting this event.

**D. Noble:** I want to give a few brief introductions, and briefly discuss the agenda, and then we'll go ahead and start the meeting.

**B. Introductions**

**D. Noble:** First of all, I would like to welcome Congresswoman Eleanor Holmes Norton to the meeting this evening. I have been the Project Manager for the Spring Valley project for about five years, and I can say that the Congresswoman's concern for this issue is genuine and her

interest in the site is thorough. The project staff have met with her on several occasions over the years and given her informational briefings, discussed progress, and answered her questions, and she has visited the site on a number of occasions to see for herself how the project is going. We are very happy that this evening she could make time in her schedule and join us. Welcome, and thank you for coming.

**D. Noble:** We also have Colonel Dave Anderson, who is the Commander of the Baltimore District. In his role as the Commander, the Colonel is responsible for the Spring Valley FUDS, which is within his area of responsibility. We are pleased that the Colonel is here this evening.

**D. Noble:** There has been a lot of interest in the site. The Advisory Neighborhood Council commissions have followed the site closely over the years, and we do have three ANC Commissioners in the audience tonight. I would like to recognize Commissioner Nan Wells, who is the Commissioner for ANC3D-03; Commissioner Kent Slowinski, who is the Commissioner for ANC3D-01; and Commissioner Tom Smith, who is the Commissioner for ANC3D-02 as well as the Chair for 3D. We welcome all the ANC commissioners.

**D. Noble:** From DC government (the DC city council), Councilmember Mary Cheh has also had an active interest in our site over the years. Representing her office is Matt Orlins, and we welcome him.

**D. Noble:** The U.S. Army Corps of Engineers has a Restoration Advisory Board (RAB) that we meet with on a monthly basis here in the Spring Valley community and exchange information on a wide variety of topics. I am not going to point them out individually, but I see many of the RAB members in the audience tonight, so thank you for coming as well.

**D. Noble:** Finally, you cannot have an environmental project without environmental regulators. Our environmental Regulatory Partners are here this evening: Mr. Steve Hirsh from the U.S. Environmental Protection Agency (USEPA) Region III, and Mr. Jim Sweeney from the District Department of the Environment (DDOE).

**D. Noble:** We welcome you all. We are going to have some brief opening remarks. The major presentation this evening will be given by Brenda Barber, USACE Spring Valley Project Manager for the 4825 Glenbrook Road site, and then we will open the floor for comments and questions. I would now like to turn the floor over to Colonel Anderson.

## **II. Opening Remarks**

### **A. Opening Remarks from Colonel Anderson**

**Colonel Anderson:** Thank you. It is good to be here, everyone. My name is Colonel Dave Anderson. I have seen many of you over the last couple of years, and it is good to see familiar faces. I appreciate your interest and taking your personal time to come out and hear what we have to say tonight.

**Col. Anderson:** The main reason we are here is to hear about a Proposed Plan for 4825 Glenbrook Road. This Proposed Plan is a milestone in this project and it is a big deal to us. Brenda Barber will give you the details of the Proposed Plan, and I look forward to sharing that with you. From our perspective, this is all about being transparent, letting the public know everything that we are doing and letting you know that you have a voice in the cleanup effort,

and then working with our Regulatory Partners and stakeholders to reach a final decision and chart a way ahead.

**Col. Anderson:** The 4825 Glenbrook Road property has been a particularly vexing part of this very challenging project. Approximately 500 munition items, 400 pounds of laboratory glassware, and over 100 tons of contaminated soil have been removed to date. All of that has been part of the Remedial Investigation / Feasibility Study (RI/FS) phase of this project, and we are taking that property data and associated data analyses and we are moving on. Tonight you will hear about five remedial alternatives, one of which is the preferred alternative. As you will hear shortly, the proposed plan for 4825 Glenbrook Road is to remove the house, clean the property to residential standards, and leave it with no restrictions on future use. That is a very aggressive approach to cleaning up this property. We look forward to hearing your voice and your opinions about this plan.

**Col. Anderson:** Our objective is to consult with our Spring Valley Partners and the public on this Proposed Plan, and tonight's public meeting is an important part of that. Once we reach a consensus, you have my commitment that we will move forward aggressively to implement the Proposed Plan that, once and for all, will remove the risks to human health and the environment at 4825 Glenbrook Road.

**Col. Anderson:** Tonight our Project Manager, Brenda Barber, will provide you with a briefing on the details and the way ahead for 4825 Glenbrook Road. I look forward to hearing your thoughts on our course of action. I will now be followed by our honored guest, Congresswoman Holmes Norton. She has indeed been very actively involved in this project for many years, and we very deeply appreciate her continued support in our collective efforts to provide for a safer community and a safer environment.

### **B. Opening Remarks from Congresswoman Norton**

**Congresswoman Norton:** Thank you very much, Colonel Anderson. I can only sympathize with the ANC3D Commissioners here – Nan Wells, Kent Slowinski, and Tom Smith – because they spent a rather energetic evening yesterday with us here for a Ward 3 meeting.

My thanks to all of the district and federal agencies that will be involved in the cleaning and clearing of 4825 Glenbrook Road. This has become a notorious address in the Spring Valley neighborhood, and it will be wiped off the face of the map so that the site can be put to good use once again. Considering how long the Army Corps has been working in Spring Valley, I hope that we are finally looking at one of the last of the large pockets for contamination removal. It may not be; after all, most of my service in the Congress has been spent while the Army Corps has been conducting cleanups in Spring Valley, and these cleanups have not been the end of the project.

As the neighbors know, in 1992 contamination was accidentally discovered by construction workers who were digging a hole to install a utility pipe underneath a home. The Army Corps conducted investigations from 1993 to 1995 and thought that all Spring Valley contamination had been found, but in 1997 a historical map of the area was found, which made it clear that there were many more munition sites throughout Spring Valley. The Restoration Advisory Board (RAB) was constituted, and there has been deep involvement of this community ever since. Even though I have spent most of my Congressional service in the political minority, I was able to

schedule hearings when there were republican chairs of our committee, because they saw that the contamination in a residential area in an urban community was a non-partisan issue, if ever there was one. I have not been as fortunate with hearings with the current Congress, but we have had excellent cooperation and hard work from the Army Corps of Engineers.

Commissioner Kent Slowinski (ANC3D-01) asked me last night if I would say something about the status of an amendment I have introduced into the defense appropriation bill, to provide one million dollars to study the health effects of the Spring Valley FUDS site. I carefully worded this amendment so that it would not look like an earmark, and it addressed urban sites where one million dollars could be used, but it was also worded so that the funding would be used in Spring Valley. There was a flurry in the House of Representatives about whether it was an earmark or not. It was very interesting that the republican chair and my democratic colleagues (who were the ranking members) seemed genuinely interested and concerned. We made a deal that if I withdrew the amendment, they would work with me on the basis that the defense bill already includes 200 million dollars specifically allocated for cleanup of FUDS sites. I agreed, and they are presently, in good faith, working with me to obtain these funds. You may recall that Councilmember Mary Cheh convinced the DC government to set aside 250 thousand dollars for Spring Valley, but everyone agreed that this amount of funding is not enough to conduct a proper health study. I also wanted to make sure that there was no interruption in the flow of funding for the Spring Valley site cleanup, because one of the republican bills sought to wipe out a huge amount of funding for FUDS sites, but I have been assured that money has been set aside for Spring Valley.

An omnibus bill, which is a collection of issues instead of individual bills proposed one by one, is what will be proposed this time, with court language that essentially directs the Spring Valley health study to avoid the notion of an earmark. It looks like we are making progress on the notion of a health study, and there is real sympathy for the idea of a health study in the only known residential community that has experienced this level of contamination in our country.

Thank you, Colonel Anderson, for what you are doing tonight to inform and hear from my constituents.

### **III. Proposed Plan for 4825 Glenbrook Road**

**Brenda Barber:** Good evening, ladies and gentlemen. As Dan stated, I am Brenda Barber, the Project Manager for the 4825 Glenbrook Road project. I would like to thank everyone for coming out this evening to participate in our public meeting, and I would like to give special thanks to Colonel Anderson as well as Congresswoman Norton for attending this evening. Their support of this project has been very important to the success of the project.

#### **Background**

The U.S. Army Corps of Engineers mission statement for Spring Valley is to identify, investigate, and remove or remediate threats to human health or safety or to the environment resulting from past DoD operations and activities. Tonight I am excited to be able to present to you the Proposed Plan for 4825 Glenbrook Road, which will be the first step in accomplishing this mission at the site. I will be presenting a summary of the work at the site to date, and discussing the Proposed Plan during this brief presentation. We will then have an open forum for your questions and comments.

This is the Sergeant Maurer photograph. It was taken in 1918, and we acquired this photo from a relative of Sergeant Maurer. As you can see in the photo, it illustrates the disposal of chemicals and drums of materials at the site. Based on historical data and mapping, the U.S. Army Corps of Engineers is fairly confident that this burial pit is located on 4825 Glenbrook Road. The drums shown in the photo have been recovered under the footers of the retaining walls during Burial Pit 3 operations. In addition, some limited glassware and debris have been uncovered during the burial pit operations, primarily in the front yard of the property. In order to eliminate fears of the public concerning the Sergeant Maurer burial pit, we understand that we must finish the excavation at the site in order to eliminate potential concerns with this pit.

### **Keys to Success**

First and foremost, I want to recognize and thank all those involved in making this project a success to date. The RAB has been briefed on an ongoing basis on this issue since February 2011 and has provided valuable feedback throughout the process. Additionally, we received input from our local residents during a community meeting that we held earlier this summer, and we received input from AU at our Partnering meetings and during the document review process. We've gotten feedback from our elected officials, including ANC commissioners, when we presented this plan to them. Furthermore, I would like to recognize our Regulatory Partners (DDOE, Jim Sweeney, and USEPA, Steve Hirsh); they have been another key part of this team in what we've accomplished to date.

### **CERCLA Process Timetable**

This is a timeline of the CERCLA process, and we are following this process for this project site. [The CERCLA process was described in detail at the June and July 2011 RAB meetings and is reflected in the information presented below.] In accordance with the CERCLA process, there are several documents that we must complete to reach the final goal of cleanup.

Throughout the process, we have coordinated outreach programs and meetings to present the documents to the RAB as well as to the community. We completed the RI report and presented it to the RAB in May 2011. We prepared the FS report and provided a preview for the RAB in early June 2011. Finally, the Proposed Plan was presented to the RAB in September 2011. Additionally, we held various community meetings and briefed elected officials throughout that process.

The key item in this process is the Public Comment Period, which is important because we want your feedback. We want to know your opinions concerning the remedy and our path forward at the site. Once we move out of the Public Comment Period, we will prepare a Decision Document (DD), which will document the final remedy selected for the property. The final DD is anticipated in December 2011, followed by preparation of the Remedial Design and Remedial Action work plans which will provide the implementation for the work at the site.

### **Documents Completed To Date**

As I just reviewed with you, we are following the CERCLA process, and in accordance with this process we have completed several documents. These documents are available for public review as part of this process.

- The final Remedial Investigation (RI) report, which includes the Human Health Risk Assessment (HHRA), was completed in July 2011.
- The final Feasibility Study (FS) and the final Proposed Plan (PP) documents were completed in September 2011.
- The Public Comment Period began on October 3, 2011 and extends through November 12, 2011.

### **Map of Previously Completed Efforts**

This is a figure that is available in the RI report (Figure 1.3) for public review. The figure primarily highlights all of the investigative work that we have done at the property to date. The items highlighted in light green are all of the test pits that have been completed at the site. In addition, the items highlighted in blue, red, and black are soil samples that we have collected at the property, and grids highlighted in yellow are grids where we removed arsenic to various levels throughout the property. The blue boxes in the lower left corner of the figure illustrate the limits of the Burial Pit 3 operations that were completed in 2001-2002 and 2007-2010. We have done an extensive amount of investigative work in support of preparing the remedy that we are proposing this evening.

### **Remedial Investigation (First Step of CERCLA Process)**

The first step in the CERCLA process is to complete the Remedial Investigation. Recommendations from the final RI report were to prepare a Feasibility Study (FS) to address the following items:

- Arsenic in soil (two hotspots of arsenic in soil will be remediated as part of the final remedy)
- Potential for chemical warfare materiel (CWM) or American University Experiment Station (AUES)-related debris and glassware that remains at the property, including potentially underneath the house
- Potential munitions and explosives of concern (MEC) remaining at the property

### **Feasibility Study (Second Step of CERCLA Process)**

The next step in the CERCLA process is to complete the Feasibility Study. As part of the FS, we developed five alternatives for the 4825 Glenbrook Road site. These five alternatives are shown in the presentation and each will be reviewed individually.

- **Alternative 1** is a “No Further Action” alternative. Under this alternative, no further actions would be taken at the site, and it would be returned to the property owner in its current state.
- **Alternative 2** is a “Land Use Controls (LUCs)” alternative. Under this alternative, we would implement LUCs at the property in conjunction with the property owner and the regulatory agencies. Typical LUCs would involve vegetative cover and hardscape over the contamination left onsite, and we would implement long-term environmental covenants in conjunction with the property owner, restricting future use of the property.

- Under **Alternative 3**, we would cleanup to residential standards without removing the house, in which case we would implement LUCs for the house. We would excavate soil around the home, and then we would work with the property owner to establish LUCs for the future use of the house.
- Under **Alternative 4**, we would propose to remove the house and cleanup the site to recreational standards, with restricted future use. We would limit the use of the property to non-residential use, such as a park or ‘green space’ or another type of non-residential property.
- Under **Alternative 5**, we would propose to remove the house and cleanup the site to residential standards, with unrestricted future use of the property.

### **Detailed Analysis of Remedial Alternatives in the FS**

All five of these alternatives that we just discussed were developed and screened against broad criteria for effectiveness, implementability, and cost. As part of the broad screening, Alternative 1 and Alternative 2 fell out because they did not meet the broad criteria.

Alternative 3, Alternative 4, and Alternative 5 were screened using the USEPA’s nine criteria for remedial alternative evaluation. The primary criteria are the two *threshold criteria*, the five *balancing criteria*, and the two *modifying criteria*. The *modifying criteria* are not evaluated as part of the FS, and are evaluated after the Public Comment Period when we have received public feedback concerning the alternatives.

Alternative 5 was ranked as the most favorable in all of our criteria. We also conduct a cost estimate at this point in the process. Alternative 3 was estimated at \$6.5 to \$8.5 million, Alternative 4 was estimated at \$10.5 to \$12.5 million, and Alternative 5 was estimated at \$11.5 to \$13.5 million. Based on the screening criteria at this stage, Alternative 5 was the recommended alternative for the FS.

### **Proposed Plan (Third Step of CERCLA Process)**

Once the FS was completed, we moved into the next stage of the CERCLA process, which is the Proposed Plan. This is the document we are here to discuss this evening.

This document explains the history of the 4825 Glenbrook Road site, including the type and extent of contamination at the property; it summarizes the five remedial alternatives that we just discussed; and it encourages the public to participate in the cleanup process.

### **Preferred Remedial Alternative in Proposed Plan (Alternative 5)**

The preferred alternative (Alternative 5) is very similar to what the FS recommended. We are recommending removal of the house and cleaning up the site to residential standards.

Although Alternative 5 is the most expensive alternative, it was ranked the most favorably, and it is the only alternative that was ranked as favorable for long-term effectiveness. The cost is estimated at \$13.5 million dollars, which does include the cost of acquiring the real estate interests for the site. Currently, the estimated cleanup timeline is approximately 18 months.

### **Map of Response Action Areas**

This figure is from the Proposed Plan, and it illustrates the excavation limits of the preferred alternative. Two key areas that I want to point out are:

- **Area A** is the excavation limit that we have proposed for the backyard. Based on the investigative data and historical information, we feel that Area A will cover all soils that were disturbed during development of the property. However, if we find debris that extends beyond Area A as shown on the map, we would continue to chase the debris until we reach the property line.
- **Area C** illustrates the Burial Pit 3 excavation limit that was already excavated to bedrock, and we do not plan to conduct any additional action in Area C at this time.

### **Photographs of 4825 Glenbrook Road Site**

For anyone who isn't familiar with the site, these are photographs that illustrate the front and back yards of the 4825 Glenbrook Road property in its current state. We are currently maintaining the property on behalf of the property owner until we return to the site to perform the remedial action.

This photograph shows the front yard of the property, including the remaining hardscape. We began to excavate the front yard in this area, until we discovered arsenic trichloride and had to shut the site down in early 2010.

The next photograph shows the backyard retaining wall. Area A would include removal of the backyard plus an additional 10 feet behind the backyard retaining wall, with the caveat that if we find debris, we would continue to remove it until it is gone.

### **Decision Document (Next Steps of CERCLA Process)**

Once we finish the Proposed Plan, we need to complete a Decision Document (DD). The DD will state the final remedy selected for the site. It will also include a responsiveness summary, which will highlight all of the comments received during the Public Comment Period as well as our responses to those comments. Additionally, we plan to present all of the comments received to date to the RAB at the November 8<sup>th</sup> RAB meeting.

After the DD is completed, we will move into the next phase of the CERCLA process, which is the Remedial Design and Remedial Action (RD/RA). The RD/RA work plans are anticipated to be completed in February 2012. We plan to hold an informational meeting with the public to brief you on the implementation that we select for the remedy. We anticipate at this point that the remedial action may begin in the summer of 2012, and will hopefully be completed by the fall of 2013.

### **Public Participation**

How can you participate?

- First and foremost, we ask that you review the Proposed Plan. It is your right to know the remedial alternative being selected, as it affects the community.
- Please ask questions. There are various team members here from the Army Corps of Engineers tonight, and they will be available during and after the meeting to answer any

questions that you have on any of the documents or any of the information that we have presented.

- Finally, please submit your questions and comments. There are various ways you can submit these.
  - A comment mailer was sent to everyone in the local community, and we have received several of these to date.
  - You can submit them via your own letter to me at the following address: Brenda Barber, Project Manager, USACE Baltimore District, P.O. Box 1715, Baltimore, MD 21203-1715
  - Additionally, you can submit them to me via e-mail at the following address [Brenda.M.Barber@usace.army.mil](mailto:Brenda.M.Barber@usace.army.mil)
  - We have a meeting recorder here this evening, who will take your oral comments.
  - Written comments can be brought to the November 8<sup>th</sup> RAB meeting.

#### IV. Community Questions and Comments

**B. Barber:** We will now open the question and answer portion of the meeting. We ask that you please state your name prior to providing your question or comment. The transcript of the meeting is required for the Decision Document, so we want to make sure we understand who is providing the comments and questions.

##### Question and Comments

**Allen Hengst (Audience Member):** My name is Allen Hengst. Could you briefly explain the rationale behind going forward with the 20 ppm cleanup at 4825 Glenbrook Road for arsenic? I know that in the Feasibility Study, AU criticized that as inappropriate and a level that is too high, and that it should be lower. They cited the USEPA guidance of  $1 \times 10^{-6}$  for cancer with arsenic. I know that it was decided in 2002 that it would be 20 ppm, despite what the EPA thinks, but could you just briefly explain why it is 20 ppm in Spring Valley and 4825 Glenbrook Road, and not lower?

**B. Barber:** The 20 ppm was a remediation goal that was established for Spring Valley as a whole. I know that AU has challenged it in these rounds of documentation. We have consulted with the USEPA, and at this point we feel confident that we are going to maintain that remediation goal. As we move forward, if we need to modify that based on some of our long-term monitoring that will be completed for the site, we will review it at that time.

**A. Hengst:** Thank you.

**A. Hengst:** If Kent is not going to ask about the film, I will. We know that in the documentary, where they interviewed the construction workers, they said there are more munitions behind the retaining wall in Area A. You are going to investigate that as low-probability. I know you don't have the test results, the readings, to justify a high-probability dig there, but why aren't you taking into account the construction workers' testimony?

**B. Barber:** We currently do not have a copy of the video tape. We have transcripts from the video tape, and the transcripts that we have been provided do not indicate the level of

information that you have provided. The low-probability that was assigned to Area A was for estimation purposes only for the FS. Once we finalize the Decision Document and begin the Remedial Design and Remedial Action work plans, we will assess what areas need to be excavated as high-probability versus low-probability. That has not been decided yet and that has not been established as part of this Proposed Plan.

**William Krebs (RAB Member):** I am Bill Krebs, member of the RAB. As I understand it and my recollection is that in the excavation completed to date, you have not found the quantity of glassware that would be apparent in the Sergeant Maurer photograph. Is there a working hypothesis as to why that is the case?

**B. Barber:** We suspect that a large amount of the material, as you can see in the Sergeant Maurer photograph, was probably removed by the developer as part of the development of the site. We anticipate that we will continue to find debris and fragments from those containers, but we don't anticipate that we will find everything that you can see in the photo because of the vast amount of excavation that was done at that site as part of the development.

**Nan Wells (ANC3D Commissioner):** Brenda, I just want to thank Congresswoman Norton, both for the ongoing work that she has done for years, but also particularly for the health study work and her hearings that the Congress held. This has been an enormous undertaking, and she has really given a great deal of effort, as has her staff. We very much appreciate it in Spring Valley, so thank you. Councilmember Cheh was also responsible for hearings in the DC Council, and again, she and her staff have been extremely helpful, as someone pointed out earlier.

**N. Wells:** I want to thank the U.S. Army for selecting what seems to be the best alternative. I think everything I have heard from members of the community, some of whom are here tonight, is that this is the alternative that they would prefer. I was hoping that there would be a few more people here, as I am sure you were hoping as well, but we still have some time. I hope that we will hear more from the community, because I think that this has been a good decision on your part. Again, hopefully the demolition of the house is going to be something that will protect the health and safety of the residents.

**Jill Stern (Spring Valley Resident):** Hi, my name is Jill Stern. I live on the 4800 block of Glenbrook Road. I have spoken with all of the neighbors who live on that block, directly across from 4825 Glenbrook Road. They cannot be here tonight, but I am confident that I am speaking for all of them. I have spoken to everyone, and everyone is in favor of Alternative 5. We think it is imperative that the property be fully cleaned up so that there are no lingering questions about it. We plan to submit formal comments, and based on the ANC proceeding we appreciate the comments that the ANC filed. The big concern is that this be done as quickly as possible. We have been living through this for about ten years, on and off. We ourselves personally asked the Army Corps years ago to take the house down and get it over with, so we are delighted that it is finally going to happen. Even though we have been told that the risk has been mitigated to a large extent by all of your work, because of the questions we feel that the house has to come down so that there is never any question about it and the dirt is removed.

**J. Stern:** I have one question, which is: You laid out your timeline of when this will be done. I would like to know if you think that is going to be disrupted at all, because again, we have been living with this for a decade, or probably longer because we knew that when the property was

sold by AU and developed that there was an issue with the soil. The developer was there and there were fumes coming out of the soil, and that was probably in the early 1990s. I would like to hear what you think could slow down the process and make it go beyond fall of 2013.

**B. Barber:** At this point, we have maintained a very aggressive schedule. You can ask any of the team members here; we have pushed aggressively to maintain the schedule. We did have a slight delay early this summer in achieving some internal concurrence, but we have moved past that. The only other potential road block at this point would be the negotiations with AU in regard to property access. However, based on our past relationship with AU, we anticipate that it should be a fairly easy process, and there will be no additional impediments to beginning the cleanup work in the summer of 2012. The only other potential road block that could cause this cleanup effort to go beyond fall 2013 would obviously be what we find at the site. If there is an unknown there that we have not encountered to date, we would have to stop and re-evaluate our engineering controls to protect the safety of the workers and the community. Obviously, that would slow things down. Based on the investigative work that we have done, we hope that we don't find anything new at the site, and that we can move through and get this done as expeditiously as possible.

**J. Stern:** Well, given the fact that you've probably excavated 80 or 90 percent of the lot already, do you suspect that there will be totally unforeseen things that are going to slow the process down, or are you relatively confident that...?

**B. Barber:** We are relatively confident, but I can't guarantee you that we won't find something that will slow us down. To address your point, we have done an extreme amount of investigative work and we have done a lot of interim removal work, so I'm fairly confident that we have seen what there is to see at the site and we should be able to move in there and quickly implement this remedy.

**J. Stern:** I just have one last comment. It is everyone's understanding that there will be an opportunity to have input on the public protection plan and the work plan. I know that some of the neighbors on the 4800 block of Glenbrook Road want an opportunity to discuss the issues further. We understand that right now, the only discussion is about the alternative, and there will be an additional opportunity to be part of that process.

**B. Barber:** Correct. Once we have finalized the Decision Document, we will begin the remedial design and the remedial action work plans, in addition to the public protection plan. We will brief the RAB and solicit community input, and then we will hold an informational meeting in which we will present these items to the community for additional feedback.

**J. Stern:** Okay, I also want to thank the Army Corps. They have been extraordinary about communicating with the neighbors, and answering all of our questions, and we really appreciate that.

**W. Krebs:** Do you have the funding dedicated for the \$13.5 million dollars?

**B. Barber:** The contract was awarded in FY2011 to the selected contractor, which is Parsons. That contract was funded for \$7.8 million dollars. If additional funding would be required, we would request that and hopefully we would not have any trouble getting that funding.

**N. Wells:** Brenda, as a quick follow-up to the last RAB meeting, it was recommended that the Army regularly provide information to the community on the cleanup schedule, so that it is continuously clear that you all are on schedule. Also, it was recommended that any new finds, any significant finds, be brought to the attention of the community promptly. Thank you.

**Congresswoman Norton:** Could I just say a word? The question about the funds, which has been very important, is something we have kept track of. I hadn't heard the \$13.5 million dollar notion before. They have said that the Assistant Secretary had been briefed, but when the Assistant Secretary doesn't say "what?" in response, then you know you're in good standing. Let me say the most important thing about this project. We were assured adherence that this was the number one FUDS project in the country. True to form, we have never had any concern about the funds for this project. That has been very important to us, particularly when you consider what we were going through well before the tea party republicans came into power. There were times when we wondered whether or not concerns about the budget would have any effect on this project, and that is one worry I have never had about this project.

**B. Barber:** Does anyone have any additional comments or questions?

## **VI. Adjourn**

**D. Noble:** We would like to thank everyone for coming. I will let you know that we are going to stay after the meeting, and certainly talk with you individually and go over any questions you would like to ask one-on-one. Again, you are welcome to stay. Thank you.

The meeting was adjourned at 7:29 PM.

**APPENDIX C**

**CONCURRENCE LETTERS FROM DISTRICT DEPARTMENT OF THE  
ENVIRONMENT (DDOE)**

**AND**

**THE US ENVIRONMENTAL PROTECTION AGENCY (USEPA)**

**APPENDIX D**

**LIST OF FIGURES**

FIGURE 1

FIGURE 2

FIGURE 3