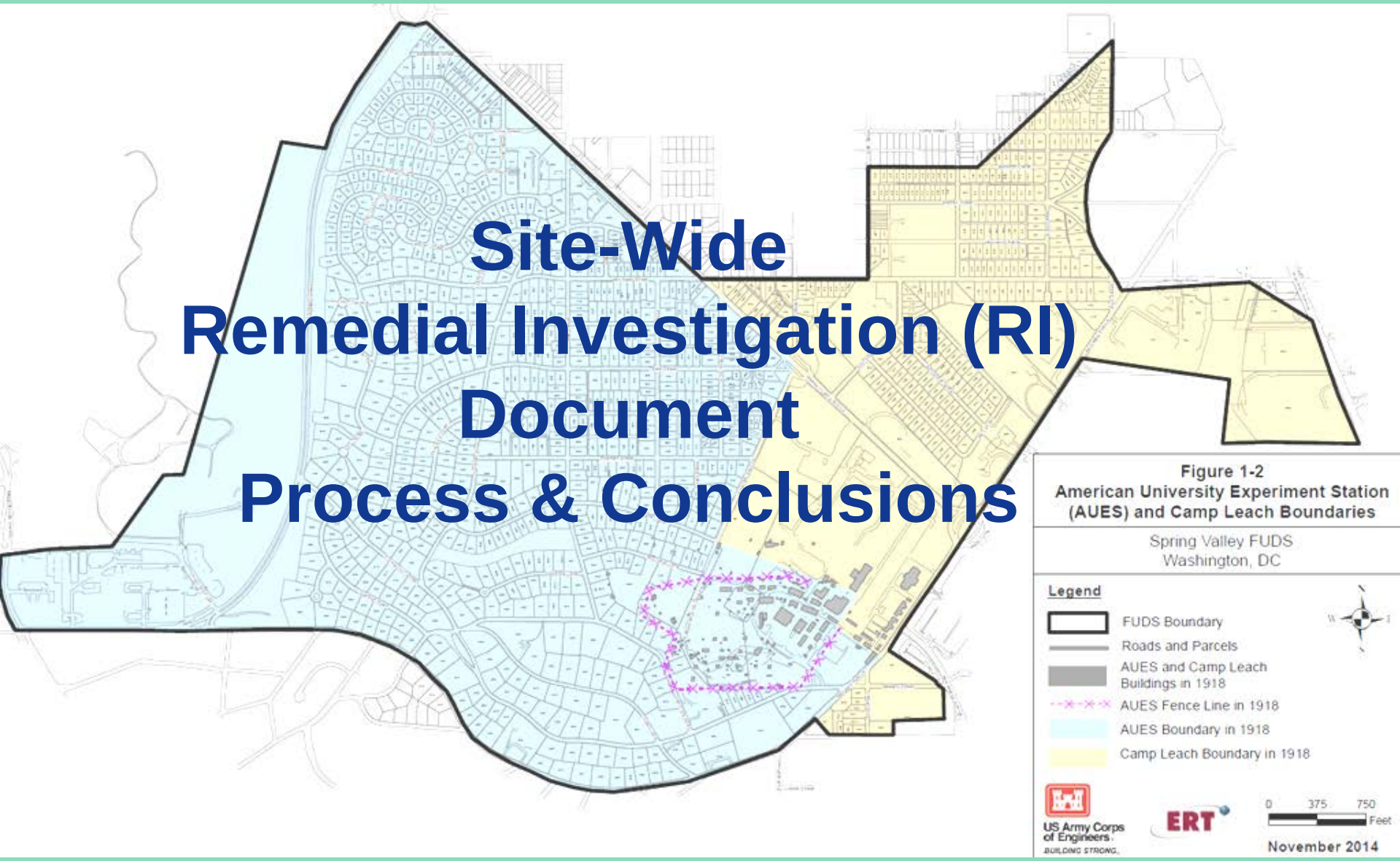
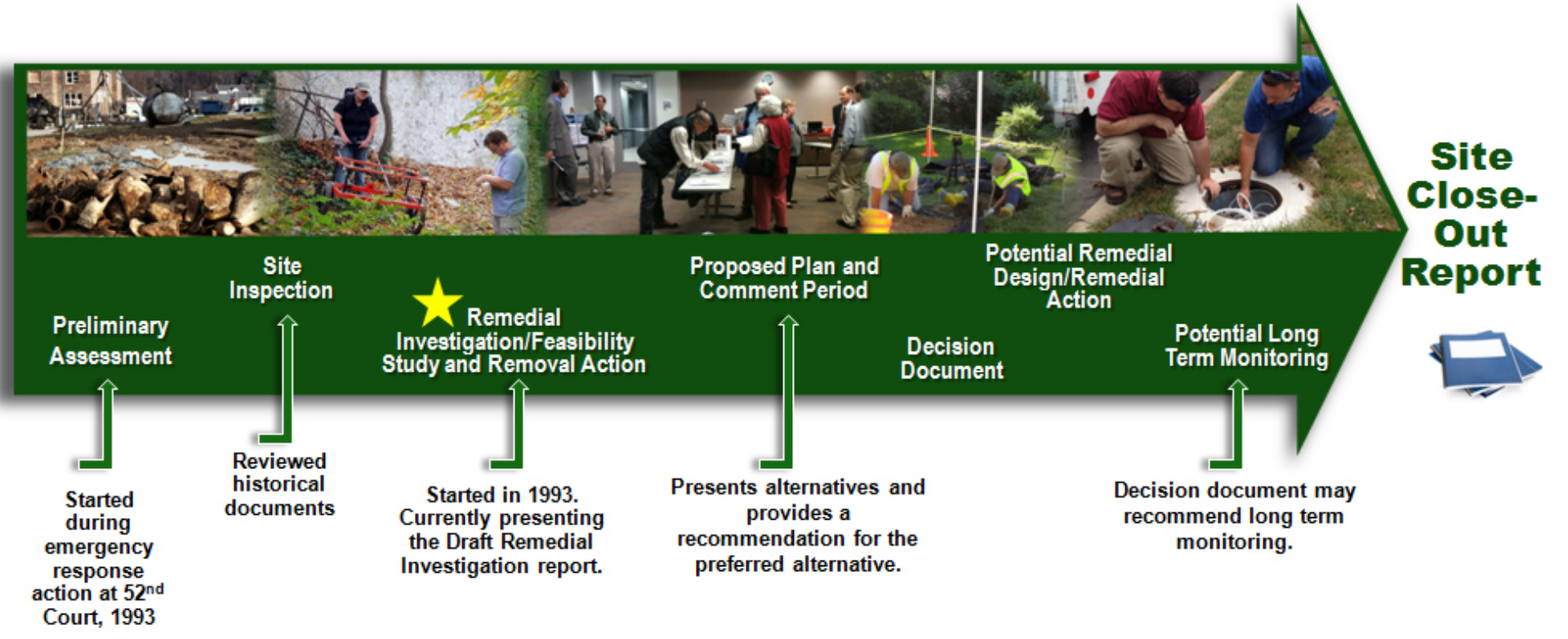
USACE Updates

Site-Wide Remedial Investigation (RI) Document Process & Conclusions

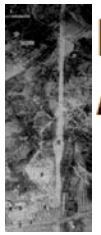


CERCLA Process

(The Comprehensive Environmental Response, Compensation, and Liability Act)



The CERCLA Process



Preliminary Assessment

Site Inspection

Remedial Investigation

General Purpose: Collect data to characterize site conditions; determine the nature of the waste; assess risk to human health and the environment; & evaluate treatment options.

Feasibility Study

General Purpose: To develop, screen, and evaluate of alternatives for clean-up.

The RI and FS are conducted concurrently.
Information gathered as part of the RI influences the development of the FS which, in turn, may require further data collection and field investigations.

At the Spring Valley FUDS, any munitions or contaminants recovered as part of the RI/FS phase are disposed of as necessary. A report is produced for the RI/FS phase.

Decision Document

General Purpose: Select the alternative as well as provide an overview of the project. This would include site history, previous and current investigations, and characterization of contamination.

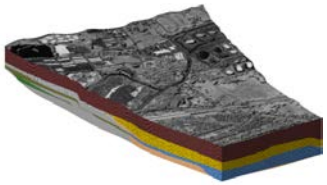
Proposed Plan

General Purpose: Presents the evaluation of clean-up alternatives and provides a recommendation for the preferred alternative.

This document is made available for public review and comment.

Removal Action

General Purpose: If prompt action is deemed appropriate prior to the completion of the RI/FS process, begin removal of contaminants of concern.



Remedial Design/ Remedial Action

General Purpose: Implementation of the action determined in the Decision Document.

Long Term Monitoring

General Purpose: To conduct any long term monitoring necessary and conduct five year reviews of the Formerly Used Defense Site.

Spring Valley FUDS
Site-Wide RI Introduction

This RI is notably different from traditional RIs because no singular set of objectives or work plan was established.

- **While typical RIs follow the CERCLA sequence of events, this RI is an extremely complex site involving several ongoing and concurrent activities over many years, focusing on different potential hazards and/or investigation types or locations, as well as time-critical and non-time critical removal actions.**
- **Each of these ongoing and concurrent activities resulted in completed standalone reports documenting the findings.**

SPRING VALLEY FUDS TIMELINE 1993 – 2015

Munitions | Glenbrook Rd. | Groundwater | Soil | Documents | Munitions Destruction | Health

Spring Valley Military History

CIVIL WAR

Ft. Gaines & other forts located near SV area during Civil War era.

WWI

American University Experiment Station (AUES) 1917-1919, Built for CWM development & testing

WWI

Camp Leach, 1917-1919, Built for troop training

WWII

Navy Bomb Disposal School 1942-1946, on AU campus for research & education

January 5, 1993

Buried WWI munitions found in utility trench on 52nd Ct.

1998
Search for revised POI 24 location begins

1993
Army leads Operation Safe Removal (OSR) as an Emergency Response Action

Feb. 1993
OSR Phase I completed

1994 – 1996
Spaulding & Capt. Rankin Area Investigation

1993 – 1995
OSR Phase II Remedial Investigation conducted

Mar. 1999 – Mar. 2001
Intrusive investigation of Pits 1 & 2

1999
4825 Glenbrook Rd. surveyed adjacent to Pits 1 & 2

May 2001 – Mar. 2002
High prob. investigation of Test Pit 23 *(aka: Pit 3)*

2002
Sedgwick Trench Investigation completed

2000 – 2011 Munitions investigations conducted on 90 Spring Valley properties

2001 – 2006
AU Small Disposal Area & AU Lot 18 investigated

2003
Containers of CWM, (including Lewisite), found at Lot 18

2003
Recovered chemical & conventional munitions destroyed

2008 – 2010
AU Public Safety Bldg. area excavated

Oct. 2007 – Mar. 2009
High prob. investigation of Pit 3 resumes & is completed

2009 – 2011
FUDS western boundary near Dalecarlia Pkwy & Woods investigated

2009 – 2010
4825 High Prob. Test Pits

Sept. 2011
4825 RI & FS Reports released

Aug. 2010
4825 becomes separate CERCLA project site to expedite cleanup

2007 – 2008
4835 Glenbrook Test Pits

2010
Recovered chemical munitions destroyed

2011 & 2012
Recovered conventional munitions destroyed

Fall 2012 –
4825 Proposed Plan accepted. Remedial Action: Demolition & cleanup begins

Winter 2012 –
4825 & AU areas PRP Investigation begins

1993 – 2015

1993
AUES Historical Report issued & 54 Points of Interest (POIs) established

June 1995
Remedial Investigation Report issued

June 1995
No Further Action Record of Decision released, never finalized

July 1996
DC Dept. of Health report critical of USACE investigation released

January 2000
Soil investigation of 9 properties & several lots on AU, including the Child Dev. Center - munitions investigations conducted

2001
Child Dev. Center soil remediation completed

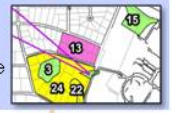
2000
Extensive soil sampling at 4825

1999 – 2001
Pits 1 & 2 area soil removal

2001 – 2012 Site-wide arsenic sampling & removal at 1,600 Spring Valley properties / lots

2004 – Ongoing groundwater study begins, 80+ site-wide & surrounding locations sampled

2002 – 2007
Areas of Interests Task Force (AOITF) find 28 areas (AOIs) to be addressed in addition to 54 POIs



March 2008
AUES Chemical Parameters Report Released

June 2011 –
USACE begins drafting Site Wide Remedial Investigation Report & follow-on CERCLA documents

April 2004 Formation of Spring Valley Partnership

2005
Elevated perchlorate found in groundwater near Sibley Hospital & AU Kreeger Hall

2012
SV perchlorate determined to be from Chilean source

Fall 2012
AOI Sampling completed

Mar. 2015 Site Wide RI Report Released

March 2001 RAB established

2006
Johns Hopkins Univ. (JHU) study finds SV resident health very good overall

2011 – 2013
JHU follow-on health study

2002
Two ATSDR studies consider potential health risks from SV arsenic concentrations

2005
ATSDR Study determines munitions pits from former SV military activities are public health hazards

2011 –
ATSDR Study of 4825 initiated

Rev. 1/26/2015

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Spring Valley FUDS
Site-Wide RI Report Organization

Table of Contents:

- **Executive Summary**
- **Section 1** – Introduction
- **Section 2** – Physical Characteristics
- **Section 3** – RI Objectives and Conceptual Site Models (CSMs)
- **Section 4** – Field Activities
- **Section 5** – Investigation Results
- **Section 6** – Contaminant Fate and Transport
- **Section 7** – Risk Assessment
- **Section 8** – Summary and Conclusions *

  * Dr. Peter DeFur will present his evaluation of the RI and its conclusions next.
- **Appendices** – A through G

Spring Valley FUDS
Section 8 Summary and Conclusions

The conclusions of the Spring Valley RI are:

- **Certain areas will proceed to the Feasibility Study (FS) due to potential concerns with risks identified in the Human Health Risk Assessment (HHRA).**
  - **Southern American University Exposure Unit, and the Spaulding and Captain Rankin Area (SCRA).**

- **Certain areas will proceed to the Feasibility Study (FS) due to potential concerns with hazards identified in the Munition and Explosives of Concern Hazard Assessment (MEC HA)**
  - **Function Test Range, Static Test Fire Area, Area of Interest (AOI) 13, and the Public Safety Building.**

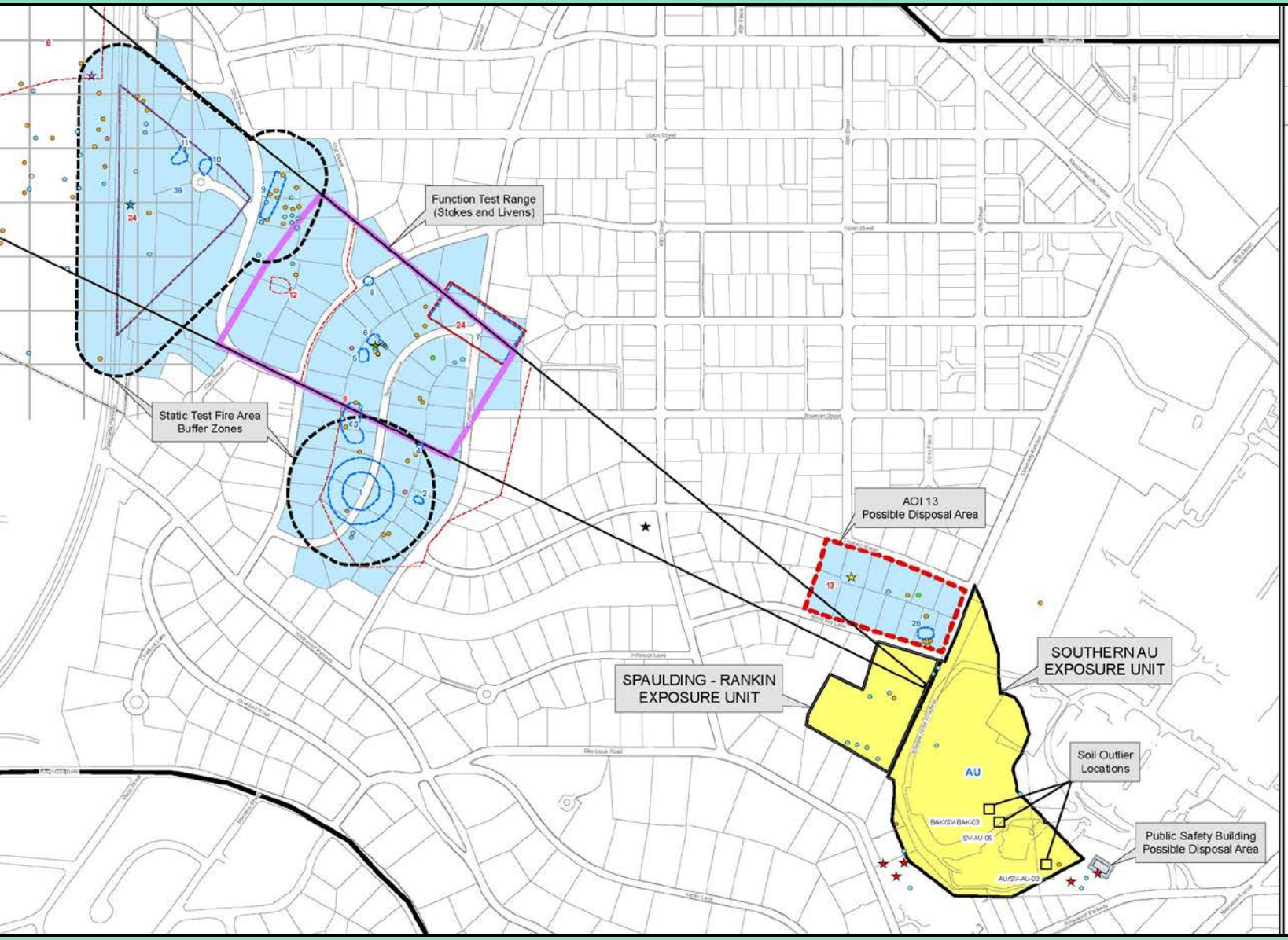

Figure 8-1
Areas for Evaluation in the FS

Spring Valley FUDS
Washington, DC

Legend

- Areas of Potential Explosive Hazard for Evaluation in the FS
- Areas of Potential Carcinogenic / Non-Carcinogenic Risk for Evaluation in the FS
- Buffer Zone (150 FT) of Statically Fired Testing Areas
- Function Test Range (Stokes and Livens)
- Area of Interest (AOI)
- Point of Interest (POI)
- Range Fan
- Parcels
- FUDS Boundary

Items

- Livens Projectile (MEC)
- Stokes Mortar (MEC)
- 75 mm Projectile (MEC)
- Thermite Grenade (MEC)
- Pipe with Explosives (MEC)
- Disposal Area (MEC/CWM)
- 75 mm MD
- Livens MD
- Stokes Mortar MD
- MD (miscellaneous)
- Non-AUES MD

N
W E
S

0 250 500 Feet

February 2015

US Army Corps of Engineers
BUILDING STRONG

ERT

Spring Valley FUDS
Tentative Schedule for Site-Wide RI Report

March 10	USACE and Dr. Peter DeFur brief the RI conclusions at the RAB meeting.
Early-April	Tentative start of the formal 45-day public comment period.
Late-April	Community meeting to brief the community on the RI document's content and conclusions.
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Next Steps	• Feasibility Study to be conducted to evaluate alternatives for addressing any unacceptable risks or hazards identified in the Final RI Report in Fall 2015. • Prepare the Proposed Plan and start public comment period in Winter 2015/2016. • Prepare and sign the Decision Document in Summer 2016 • Begin remedial design/remedial action plan/conduct clean-up action from ~2017-2020

Spring Valley FUDS
Restoration Advisory Board

Community Items:

Site-Wide Remedial Investigation Document

by Peter deFur, Technical Consultant under the Technical Assistance for Public Participation Program (TAPP)

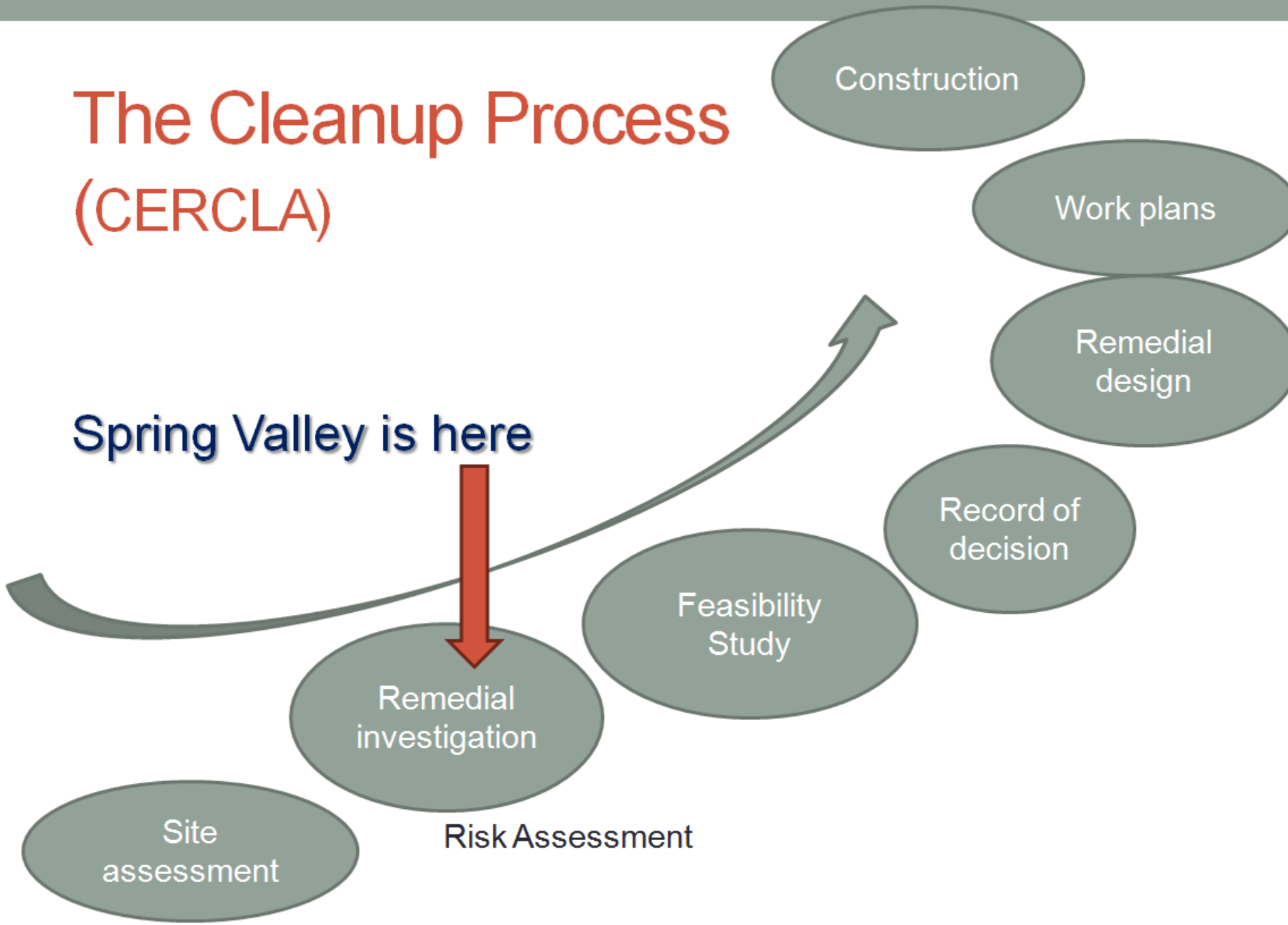
SPRING VALLEY: Site Wide Remedial Investigation Report March 2015

Dr. Peter deFur

President, Environmental Stewardship Concepts, LLC

Henrico, VA

The Cleanup Process (CERCLA)



Remedial Investigation/Feasibility Study

- **Nature and extent of the problem**
  - Soil sampling
  - Water sampling
  - Geophysical surveys

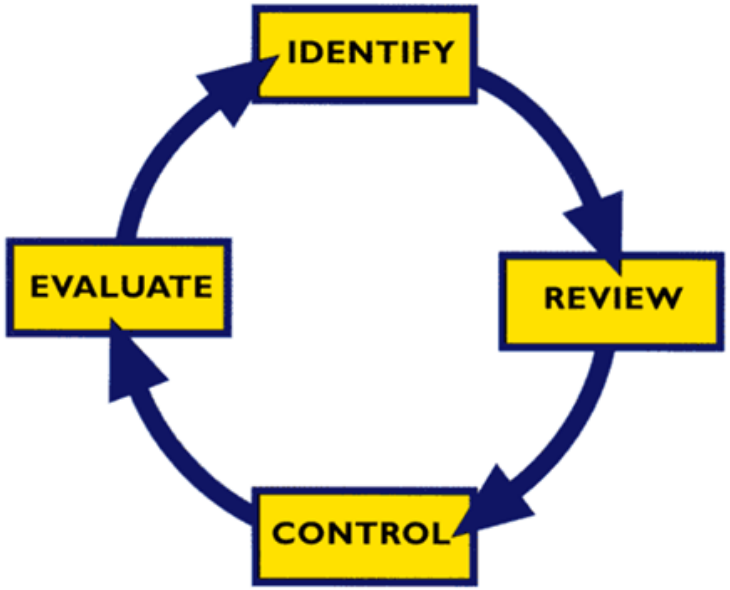
Photo from USGS web

- **What can be done?**

- Treat
- Remove
- Cover to isolate
- Institutional Controls

What is risk assessment?

- Evaluation of the environmental and human health impacts that may result from exposure to contaminants
- Part of the remedial investigation



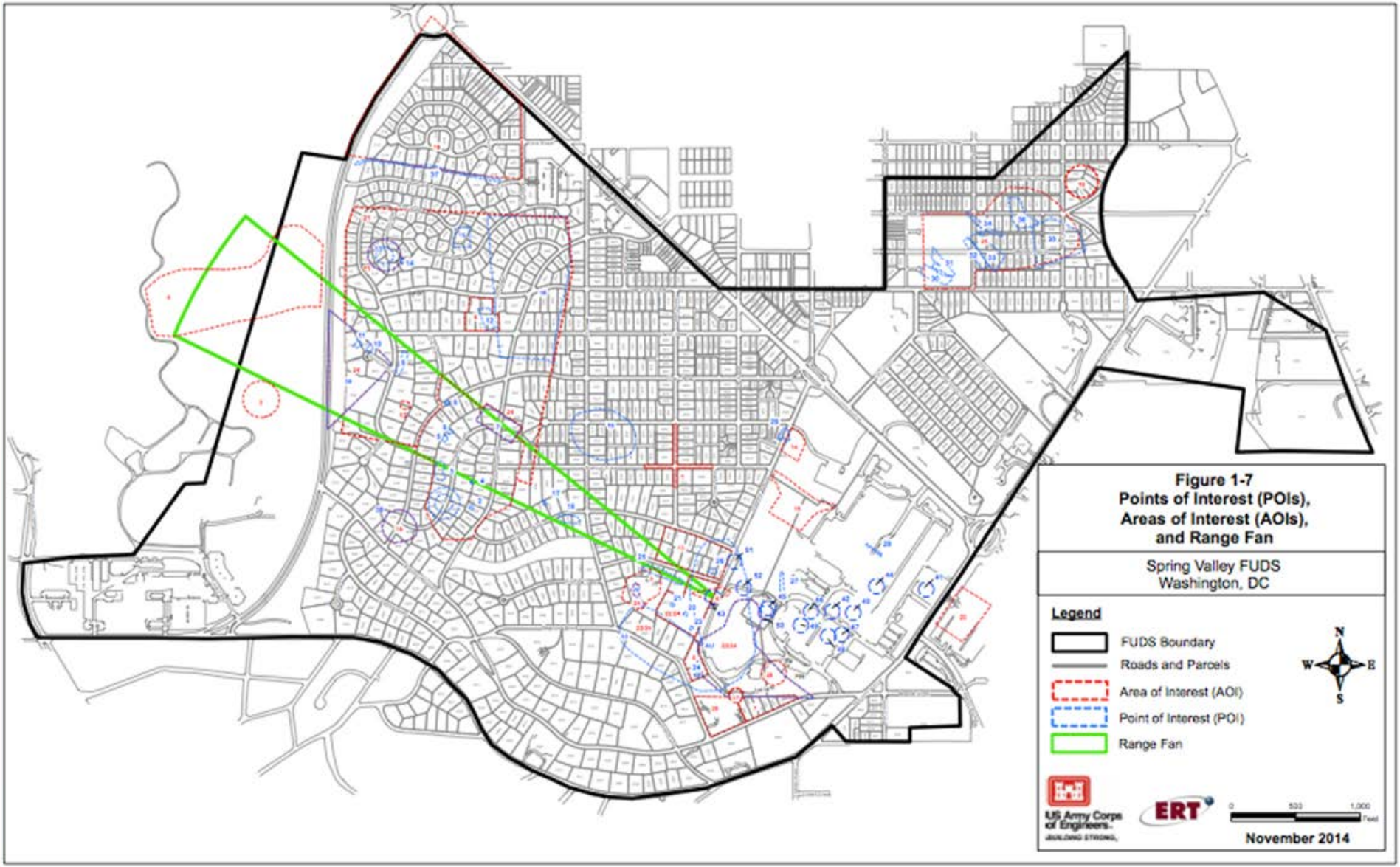
Spring Valley

- Soil investigation determined the nature and extent of soil contamination over >15 years
- 178 properties/lots identified for cleanup
  - Mostly arsenic contamination
- Cleanup activities completed at all properties/lots as of 2012, except Glenbrook Rd.
- Including Munitions and Explosives of Concern (MEC)
- Single items
- Pits and trenches

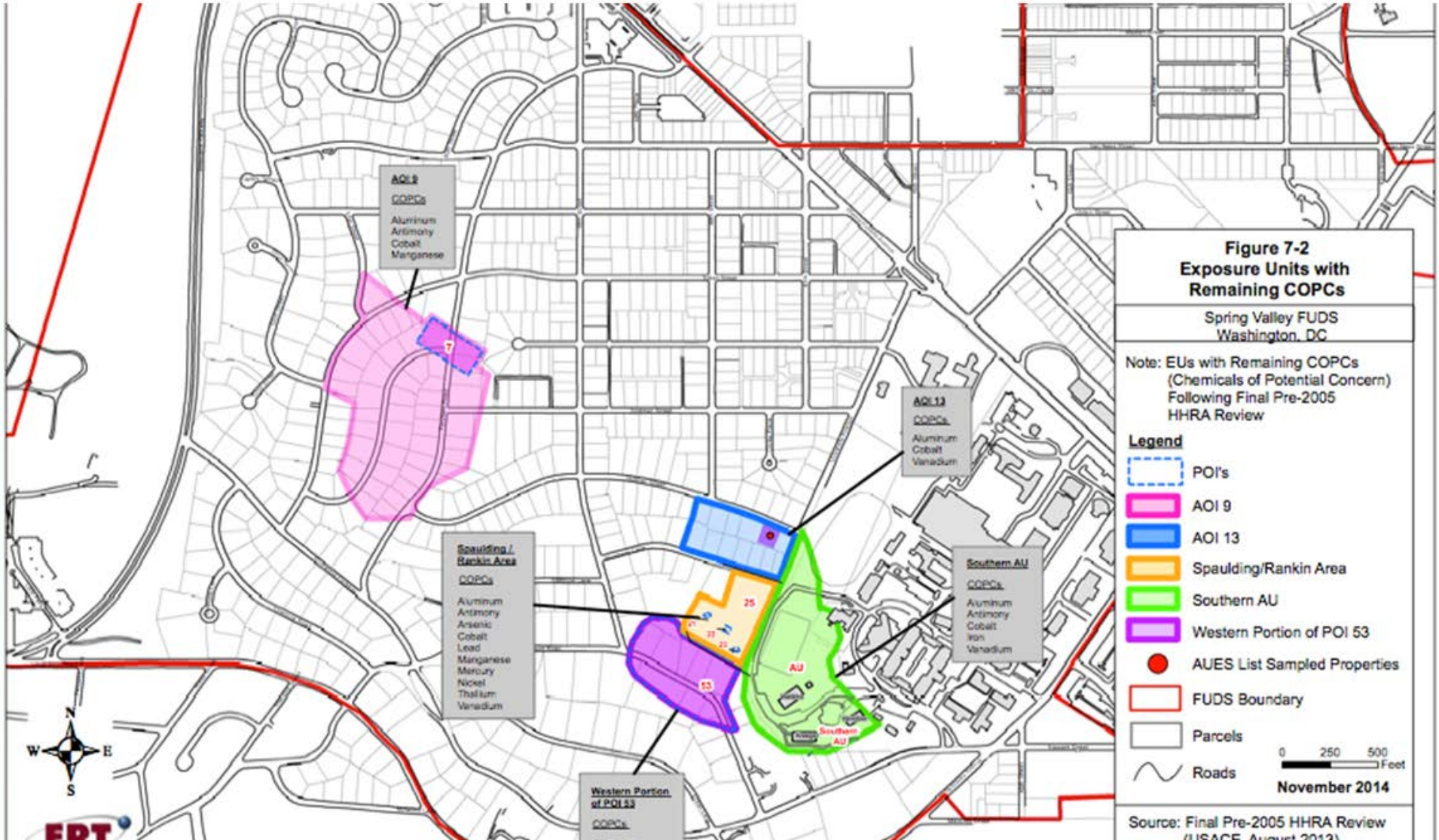
Remedial Investigation (RI)

- Nature and extent of contamination at the site
- Determines threats to human health and the environment
- **Remedial Investigation Report**
  - Summarizes field observations and analytical data collected from the site
  - Includes the Baseline Risk Assessment
    - Human Health Risk Assessment
    - Ecological Risk Assessment
- Reports, maps and photographs
- Began with Points of Interest (POI), then Areas of Interest (AOI)

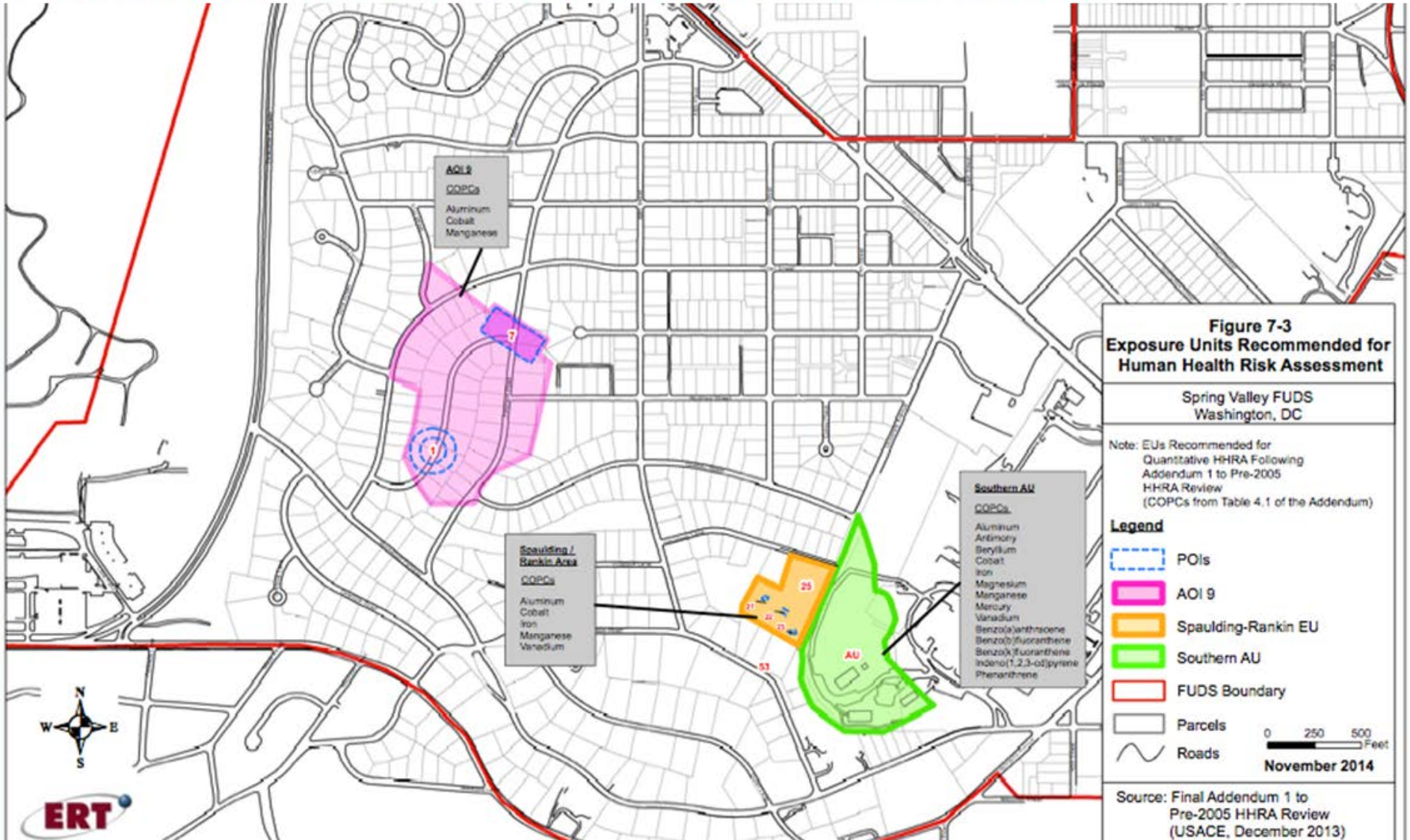
POIs, AOIs, and Range Fan



Exposure Units with Remaining COPCs
(Chemicals of Potential Concern)



Exposure Units Recommended for Human Health Risk Assessment



Human Health Risk Assessment (HHRA)

- Estimates the nature and probability of future health impacts to people who may be exposed to the contaminants at the site

Munitions and Explosives of Concern Hazard Assessment (MEC HA)

- Estimates threats to people from MEC (Munitions and Explosives of Concern)

Munitions and Explosives of Concern Hazard Assessment (MEC HA)

Explosive Hazard Component	Input Factor	Relationship to "Traditional" CSM Categories
Severity	Type of filler	Source Pathway
	Amount of filler	
	Proximity to Inhabited Buildings or Commonly Used Public Facilities	
	Proximity to Critical Infrastructure, Cultural Resources, or Ecological Resources	
Accessibility	Site accessibility	Pathway Receptor
	Frequency of entry	
	Amount of MEC	
	Minimum MEC depth/Maximum intrusive depth	
	Migration potential	
Sensitivity	MEC Category	Source Receptor
	Fuzing sensitivity	
	MEC portability	
	Intensity of Activity	

Conceptual site model (CSM)

Source: Hazard Assessment for Munitions and Explosives of Concern Concept Paper

Spring Valley MEC HA – Example:

Table 2-4. Input Factor Maximum Scores and Resulting Weights

Explosive Hazard Component	Input Factor	Maximum Scores	Weights
Severity	Energetic Material Type	100	10%
	Location of Additional Human Receptors	30	3%
	Component total	***130***	***13%***
Accessibility	Site Accessibility	80	8%
	Total Contact Hours	120	12%
	Amount of MEC	180	18%
	Minimum MEC Depth/Maximum Intrusive Depth	240	24%
	Migration Potential	30	3%
	Component total	***650***	***65%***
Sensitivity	MEC Classification	180	18%
	MEC Size	40	4%
	Component total	***220***	***22%***
	Total Score	**1,000**	**100%**

Source: Munitions and Explosives of Concern Hazard Assessment Methodology, by EPA, DoD, DoI

Table 7-23: MEC HA Scoring Summary Site-wide RI for SV 12/2014 (Draft Final)

	Safety Buffer Livens		Function Test Range Stokes Mortar		Function Test Range Livens		Generic Disposal Area	
	Hazard Level Category	Score	Hazard Level Category	Score	Hazard Level Category	Score	Hazard Level Category	Score
Current Use	4	505	3	710	3	640	3	670
Land Use Controls	4	440	3	645	3	575	3	605
Sub-surface Cleanup	4	345	4	435	4	300	4	405

Recommendations

- Conduct a Feasibility Study to address potential unacceptable risks from explosives:
  - Impact areas for Stokes and Livens
  - Buffer area around static fire area
  - Possible disposal

  AGREE
- Conduct Feasibility Study for soil contamination on American University in the region described as the southern AU exposure unit. *AGREE*
- On going discussions regarding residual soil contamination on Spaulding-Captain Rankin exposure unit. *IN PROCESS*

Questions?

Dr. Peter deFur
Environmental Stewardship Concepts, LLC
www.estewards.com

Spring Valley FUDS
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