SPRING VALLEY FORMERLY USED DEFENSE SITE PROJECT
Monthly RAB Meeting

May 8, 2012
7:00 – 8:35 p.m.

BASEMENT MEETING ROOM
ST. DAVID'S EPISCOPAL CHURCH
5150 MACOMB ST NW, WASHINGTON, DC

Agenda

7:00 p.m. **I.** **Administrative Items**

Co-Chair Updates
- Announcements, Introductions

Task Group Updates

7:10 p.m. **II.** **USACE Program Updates**

Site-Wide Investigations: Areas of Interest
4825 Glenbrook Road
- Decision Document – Status Report
- Draft Remedial Design & Remedial Action Work Plan- Overview

7:30 p.m. **III.** **Community Items**

National Park Service Right-of-Entry Constraints
Presented by Jon Owens, USACE Legal Counsel

Risk and Biology of Arsenic
Presented by Dr. Lee Monsein, RAB Member

8:05 p.m. **IV.** **Open Discussion & Future RAB Agenda Development**

Possible Upcoming Meeting Topics*:
- Evaluation of Remaining Site-Wide Sampling Requirements
- Spring Valley Follow-On Health Study Update (Johns Hopkins University)
- 4825 Glenbrook Road Health Consultation Update

8:20 p.m. **V.** **Public Comments**

8:35 p.m. **VI.** **Adjourn**

**** RAB meetings are not held in August or December***

Spring Valley
Formerly Used Defense Site

Restoration Advisory Board Meeting

May 8, 2012

"The USACE Mission in Spring Valley is to identify, investigate and remove or remediate threats to human health, safety or to the environment resulting from past Department of Defense activities in the area."

US Army Corps of Engineers
BUILDING STRONG®

Agenda Review

- Co-Chair Updates
  - Introductions, Announcements
- USACE Updates
  - Site-Wide Investigations: Areas of Interest
  - 4825 Glenbrook Road NW
- Community Items
  - National Park Service Right-of-Entry Constraints
  - Risk and Biology of Arsenic
- Open Discussion & Agenda Development
- Public Comments

Co-Chair Updates

Introductions

Co-Chair Updates

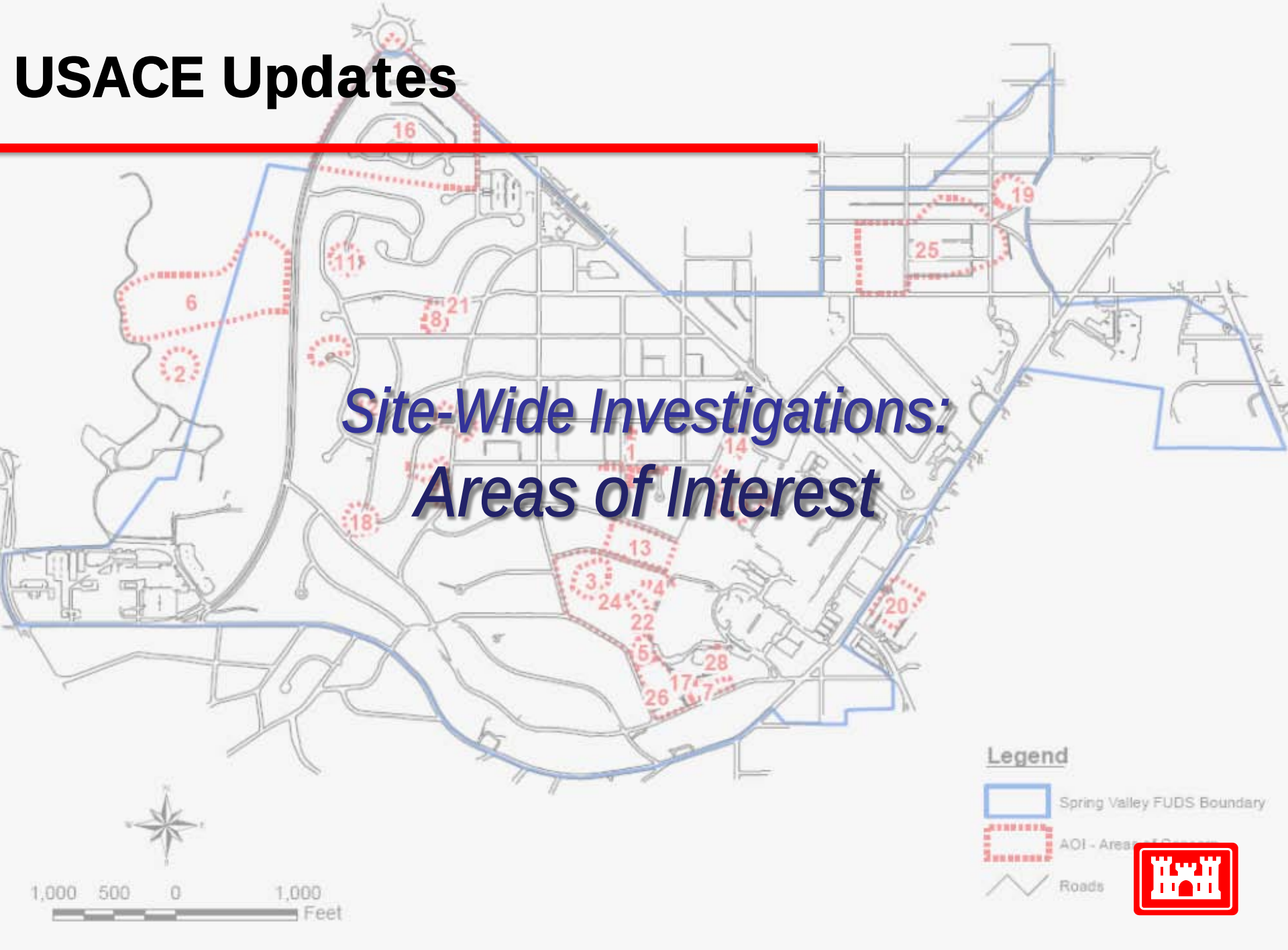
Announcements

- **Website Updates:**
  - ✓ **March 2012 RAB meeting materials (agenda, presentation, minutes)**
  - ✓ **April 2012 Monthly Project Summary**

Task Group Updates

- **Membership Committee**
  - **One RAB member position still open**

USACE Updates

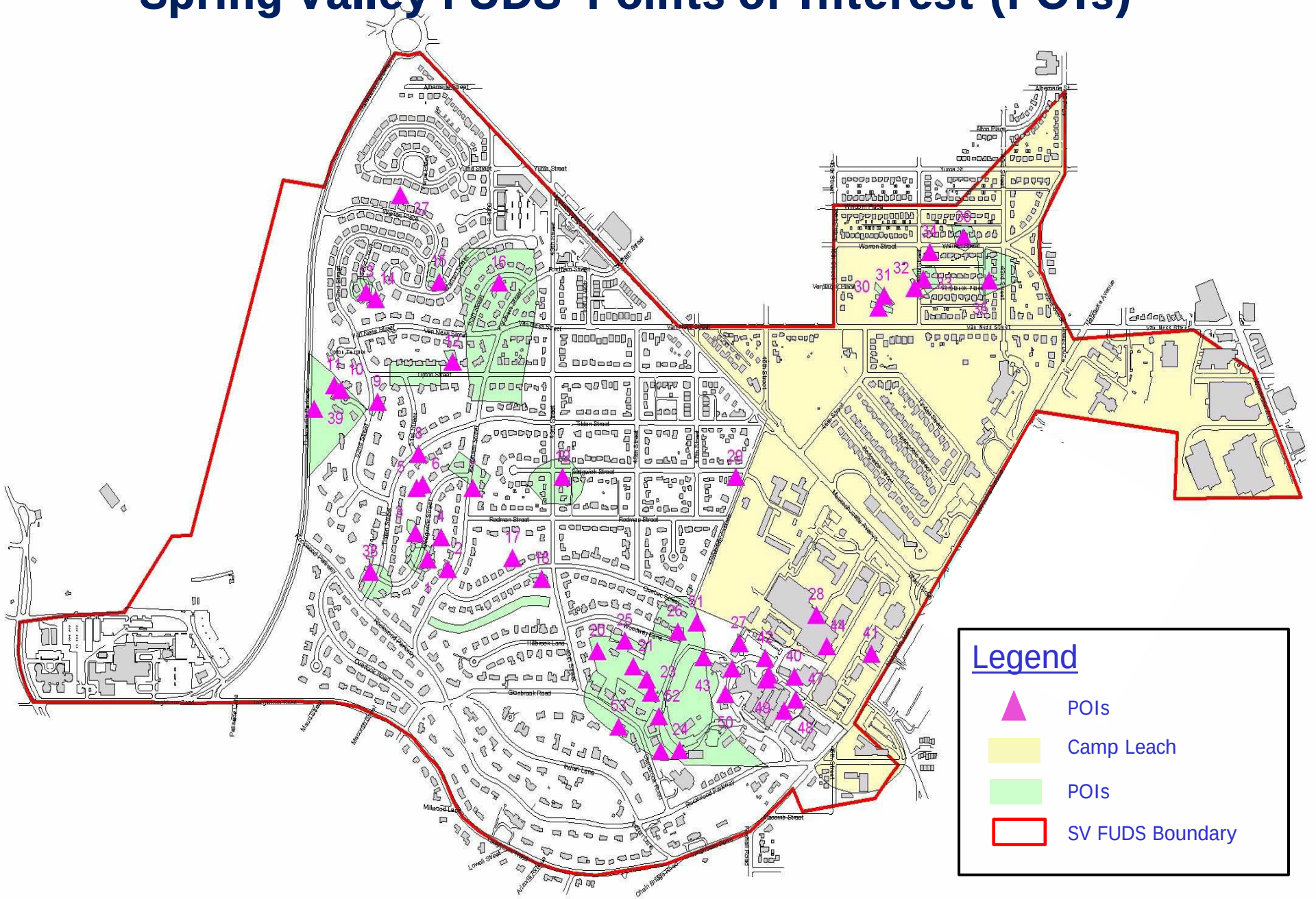


Site-Wide Investigations
Areas of Interest

Background:

- **54 Points of Interest (POIs) identified during the 1993 *Operation Safe Removal Remedial Investigation***
  - **Based on review of historical 1918 aerial photograph, documents, and photographs from the American University Experiment Station and Camp Leach**

Spring Valley FUDS Points of Interest (POIs)

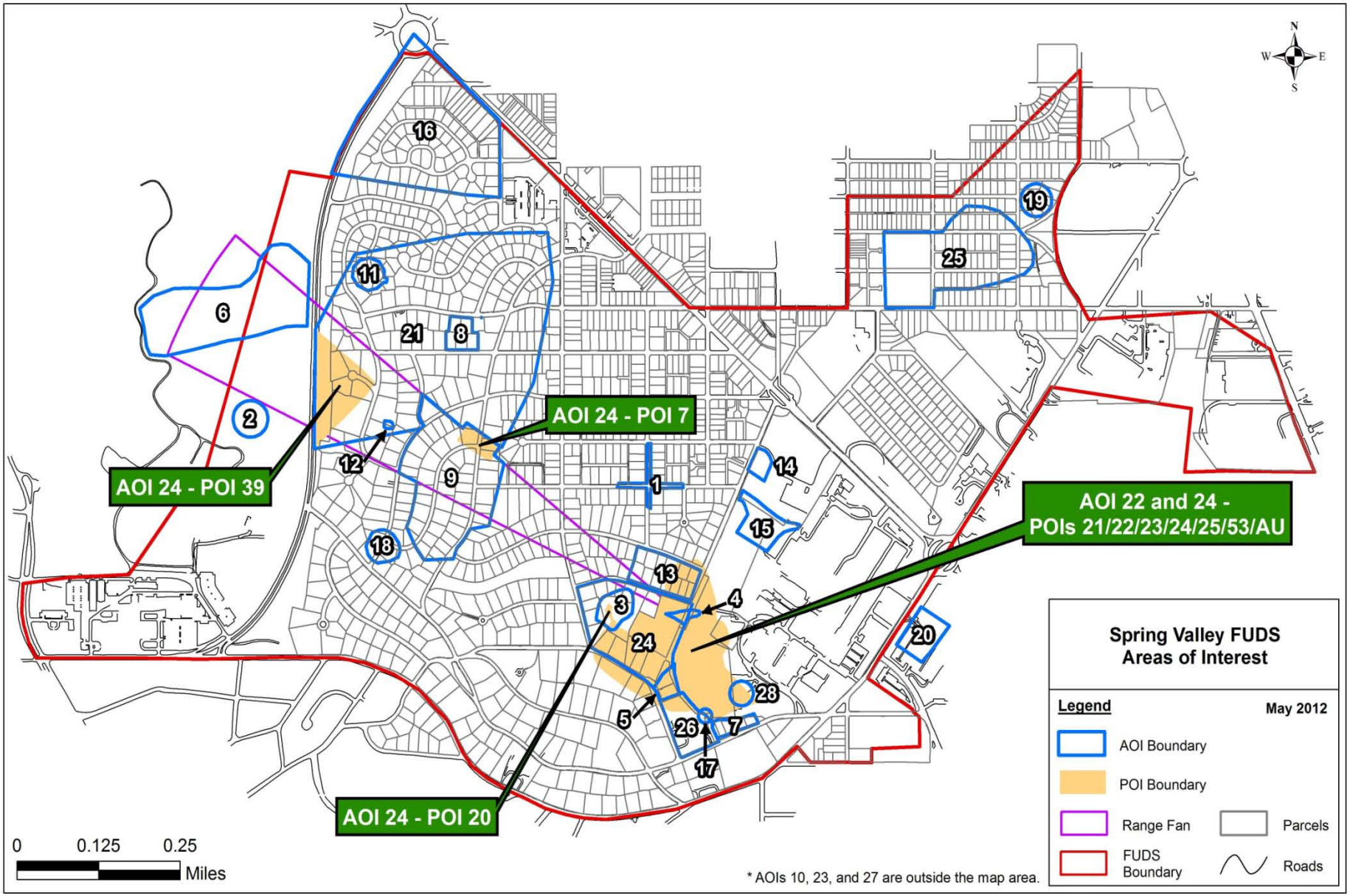


Site-Wide Investigations
Areas of Interest*

Background:

- In 2002, the Area of Interest Task Force (AOITF) was a subcommittee of the Spring Valley Partners that looked at some POIs and additional locations to determine areas potentially needing further investigation
  - Made recommendations to the Partners based on review of additional historical and anecdotal information, as well reports on completed or ongoing investigations
  - AOITF completed their work in 2007

[**Additional investigation areas referred to as* ***Areas of Interest*** or ***AOIs****]*

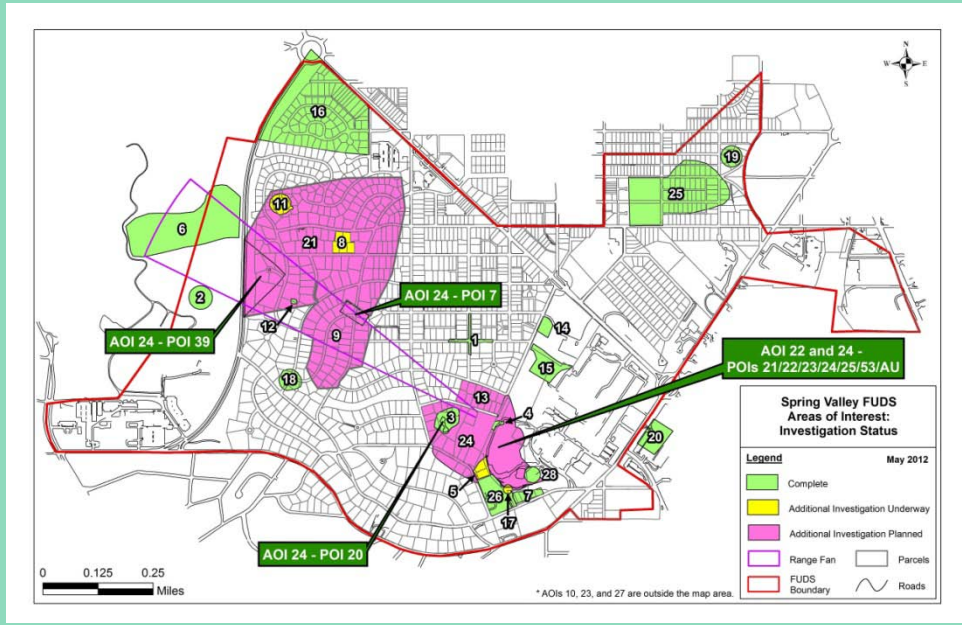

AOI 24 - POI 39
AOI 24 - POI 7
AOI 22 and 24 - POIs 21/22/23/24/25/53/AU
AOI 24 - POI 20
N
W
E
S
0
0.125
0.25
Miles
* AOIs 10, 23, and 27 are outside the map area.
Spring Valley FUDS Areas of Interest
Legend
May 2012
AOI Boundary
POI Boundary
Range Fan
Parcels
FUDS Boundary
Roads

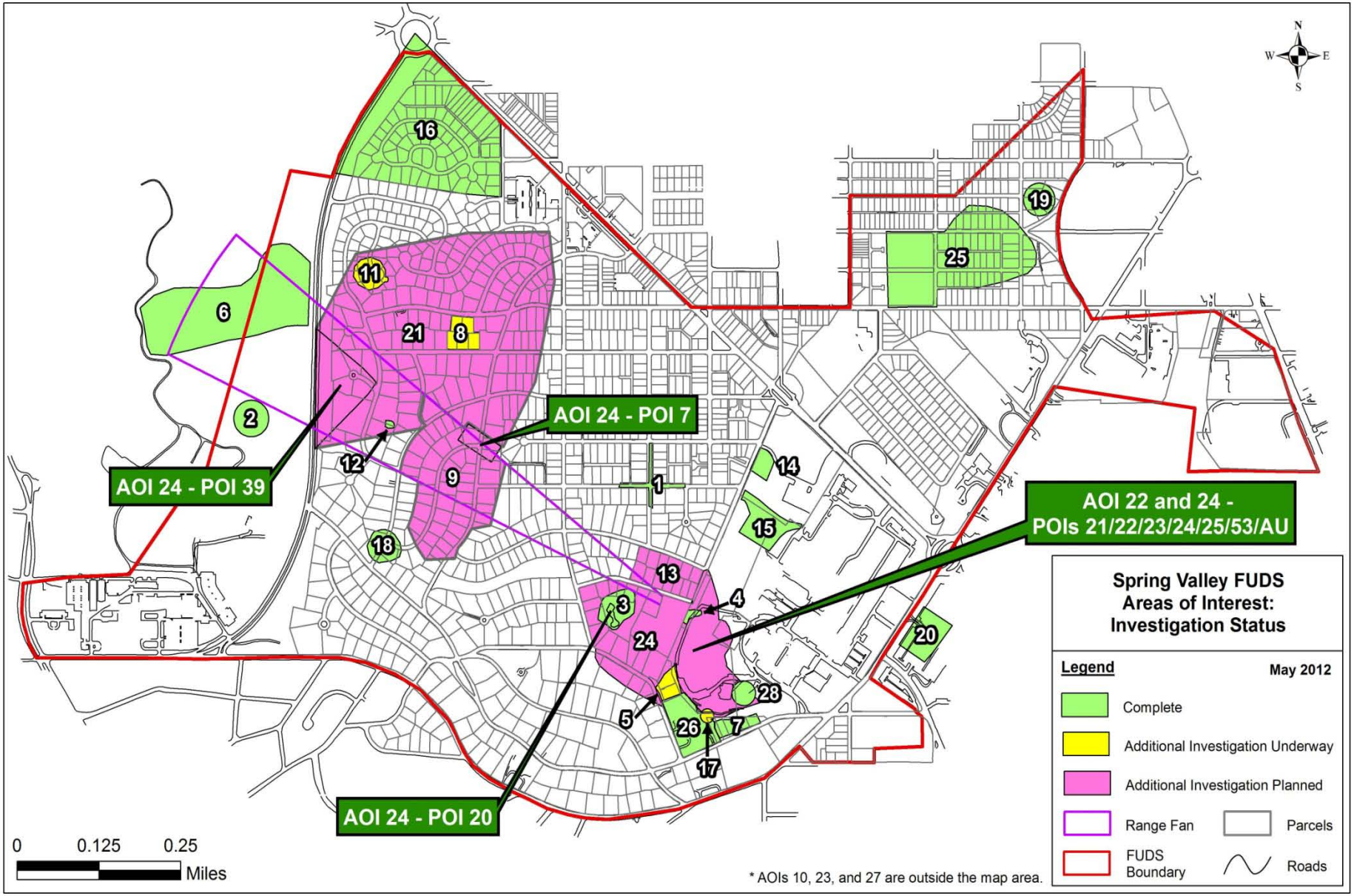
Site-Wide Investigations
Areas of Interest

28 AOIs have been identified.

Investigation Status:

- **Completed: 19**
- **Underway: 4**
- **Planned: 5**




N
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19
25
11
6
21
8
2
AOI 24 - POI 7
AOI 24 - POI 39
12
9
1
14
AOI 22 and 24 -
POIs 21/22/23/24/25/53/AU
15
18
13
4
3
24
20
28
5
26
7
17
AOI 24 - POI 20
0
0.125
0.25
Miles
* AOIs 10, 23, and 27 are outside the map area.
Spring Valley FUDS
Areas of Interest:
Investigation Status
Legend
May 2012
Complete
Additional Investigation Underway
Additional Investigation Planned
Range Fan
Parcels
FUDS
Boundary
Roads

Site-Wide Investigations

Areas of Interest

- **AOI 1 -** The "X" Feature
- **AOI 2 -** Rick Woods Burial Pit
- **AOI 3 -** Gunpowder Magazine Area
- **AOI 4 -** Liven's Gun Pit
- **AOI 5 - 4825/4835 Glenbrook Rd**
- **AOI 6 -** Dalecarlia Impact Area
- **AOI 7 -** Rockwood Six
- **AOI 8 - Possible Graded Area**
- **AOI 9 - Sedgwick Ground Scars**
- **AOI 10 -** Westmoreland Recreation Center
- **AOI 11 - 52nd Court Pit and Trenches**
- **AOI 12 -** Liven's Battery Impact Area
- **AOI 13 - Quebec/Woodway 13**
- **AOI 14 -** Sharpe Bunker on Seminary
- **AOI 15 -** Dog Wallows
- **AOI 16 -** Westmoreland Circle Impact Area
- **AOI 17 - $800,000 Burial Site**
- **AOI 18 -** Major Tolman's Field
- **AOI 19 -** Tenleytown Station
- **AOI 20 -** Slonecker-Johnson Trenches
- **AOI 21 - Weaver Farm**
- **AOI 22 - Mercury Detection Areas**
- **AOI 23 -** Railroad Sidings
- **AOI 24 - Antimony Detection Areas**
- **AOI 25 -** Camp Leach Trenches
- **AOI 26 -** 4801 Glenbrook Road Pit
- **AOI 27 -** Third Circular Trench
- **AOI 28 -** Hamilton Hall Burial Pit

Site-Wide Investigations
Areas of Interest

Additional Investigation Underway:

- AOI 5 – 4825/4835 Glenbrook Road
  - To be addressed during upcoming remedial action at 4825 Glenbrook Road
- AOI 8 – Possible Graded Area
  - Evaluate AUES chemical list sampling results
- AOI 11 – 52nd Court Pit and Trenches
  - Evaluate AUES chemical list sampling results
- AOI 17 – $800,000 Burial Site
  - Location unknown, may be linked to other known burial pits
  - Continue to monitor groundwater

Site-Wide Investigations
Areas of Interest

Additional Investigation Planned:

- AOI 9 – Sedgwick Ground Scars
  - Additional soil sampling/evaluation
- AOI 13 – Quebec/Woodway 13
  - Additional soil sampling/evaluation
- AOI 21 – Weaver Farm
  - Additional soil sampling/evaluation
- AOI 22 – Mercury Detection Areas
  - Additional soil sampling/evaluation
- AOI 24 – Antimony Detection Areas
  - Additional soil sampling/evaluation

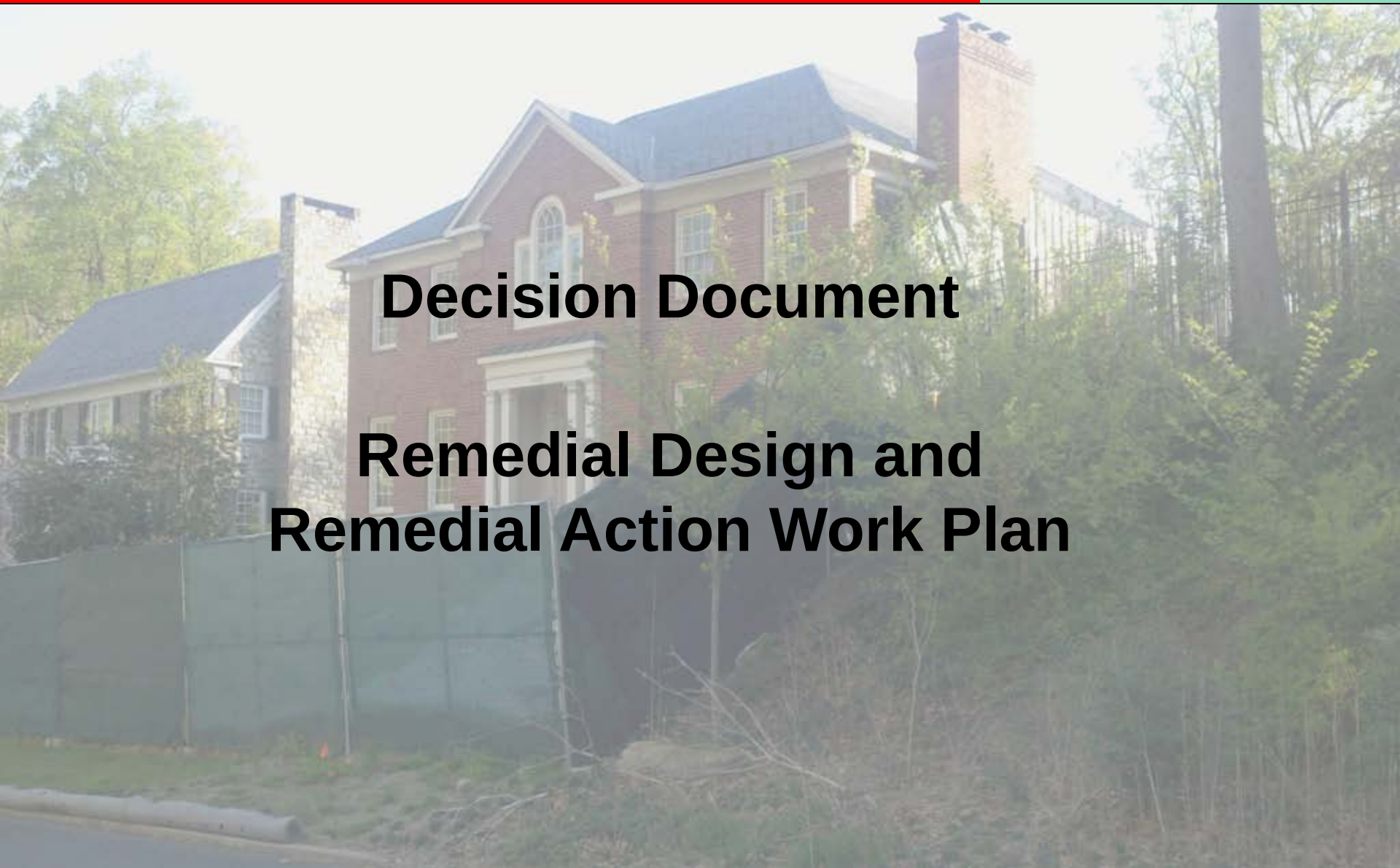
Site-Wide Investigations
Areas of Interest

Upcoming:

- **Evaluation of Remaining Sampling Requirements document to be finalized**
  - **Includes Work Plan details of the remaining areas requiring additional soil sampling**

Evaluation of Remaining Sampling Requirements document is scheduled to be presented at an upcoming RAB meeting

4825 Glenbrook Road



Decision Document

Remedial Design and Remedial Action Work Plan

4825 Glenbrook Road
Decision Document

Final expected in May 2012

Awaiting final approval and signature

- **From the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health**

4825 Glenbrook Road
Work Plan

Purpose

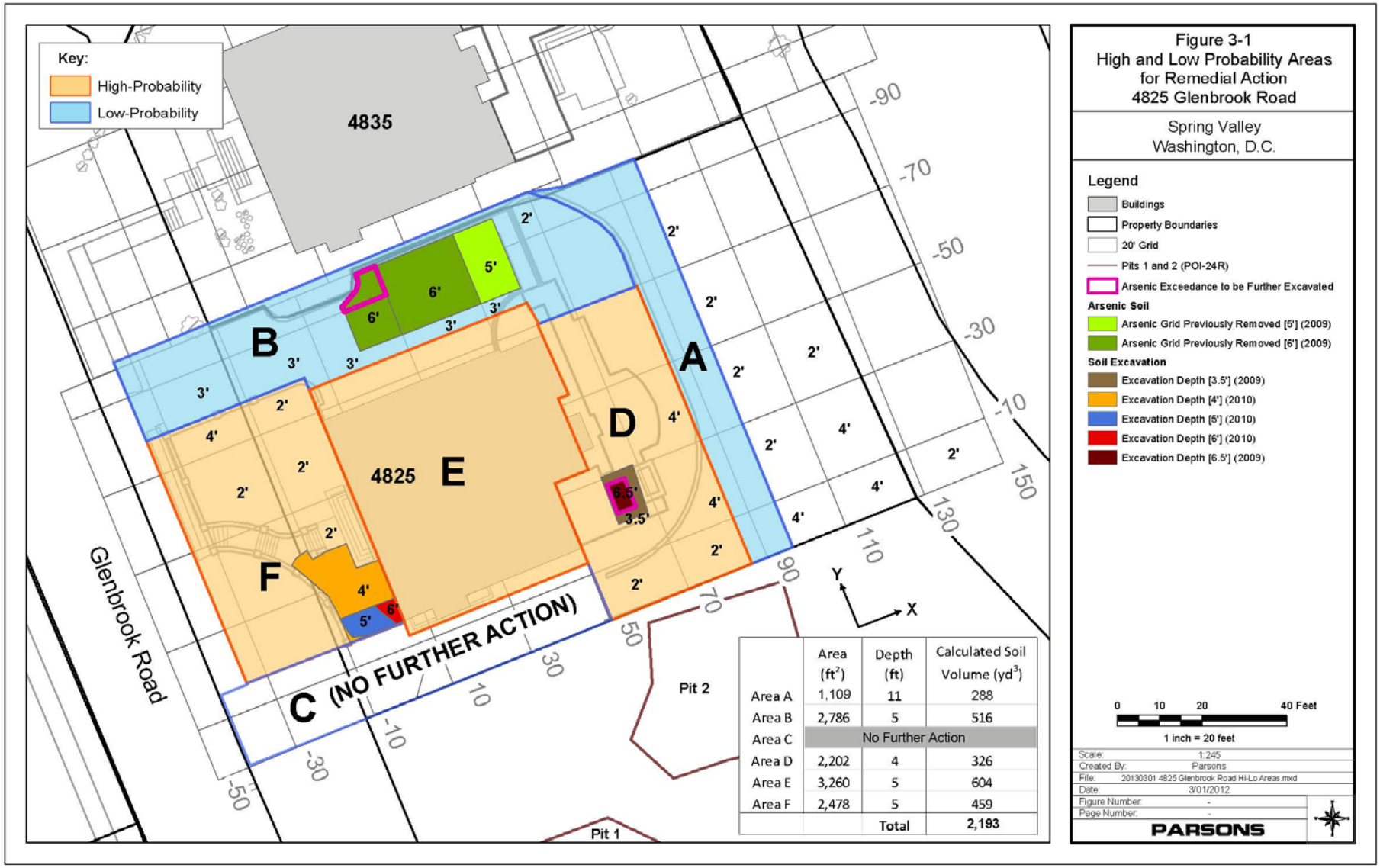
- **Detail the *plans* and *schedule* to achieve the remedial objectives**
  - **Prevent direct contact with arsenic-contaminated and/or agent-contaminated soil, and**
  - **Reduce potential to encounter military munition items, containerized chemical warfare materiel (e.g. glass bottles containing mustard agent), and other AUES-related items**

4825 Glenbrook Road
Work Plan

Scope

- Define low and high probability protocols to remove, assess, and dispose of soil and any potential AUES-related items remaining at 4825 Glenbrook Road
- Present the approach to restoring the site after completion of cleanup activities, including:
  - Backfilling the area with clean soil
  - Seeding the area
  - Stabilizing and reinstalling fencing at the property boundaries

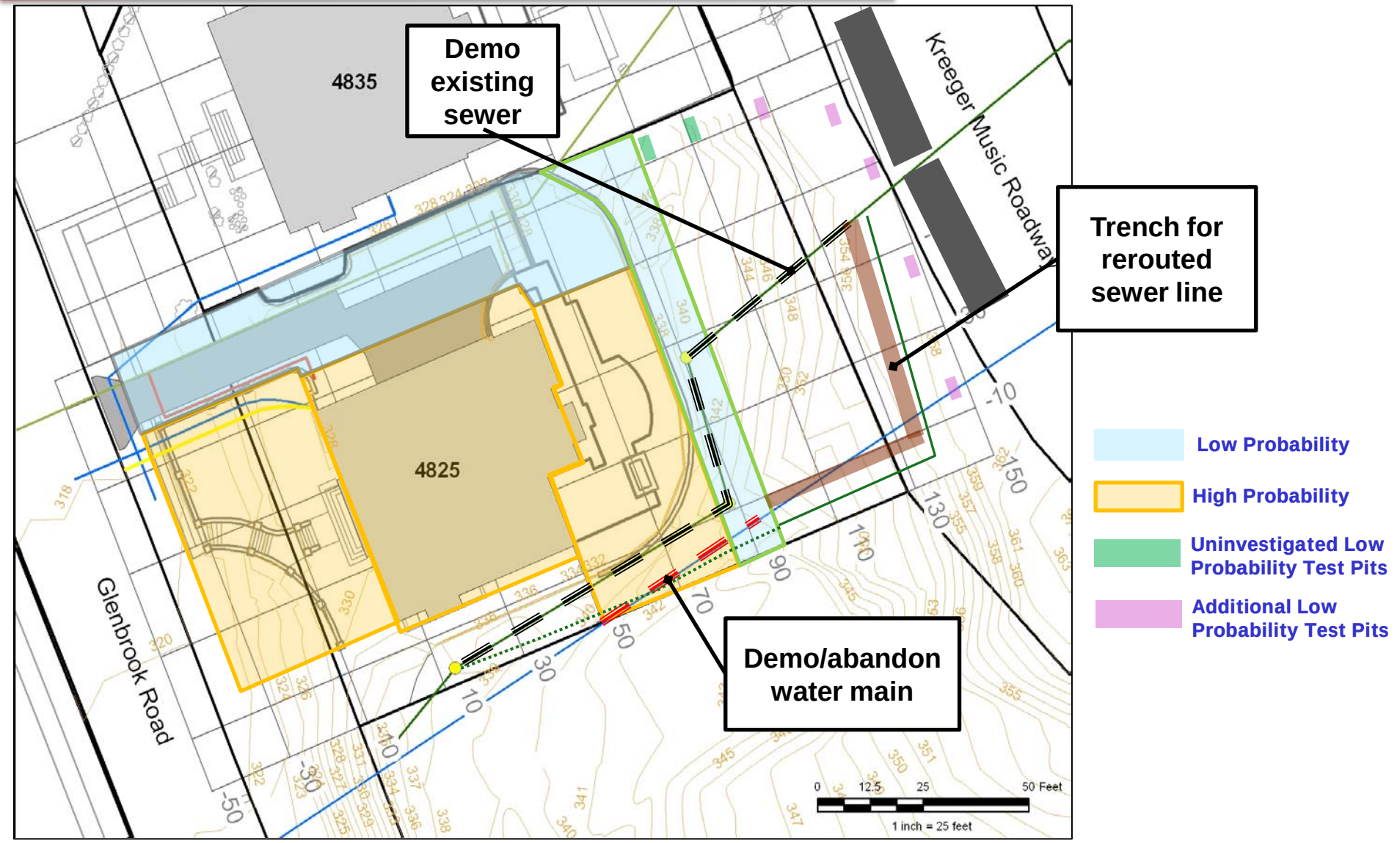
High and Low Probability
Remedial Action Areas



	Area (ft^2)	Depth (ft)	Calculated Soil Volume (yd^3)
Area A	1,109	11	288
Area B	2,786	5	516
Area C	No Further Action		
Area D	2,202	4	326
Area E	3,260	5	604
Area F	2,478	5	459
		Total	2,193

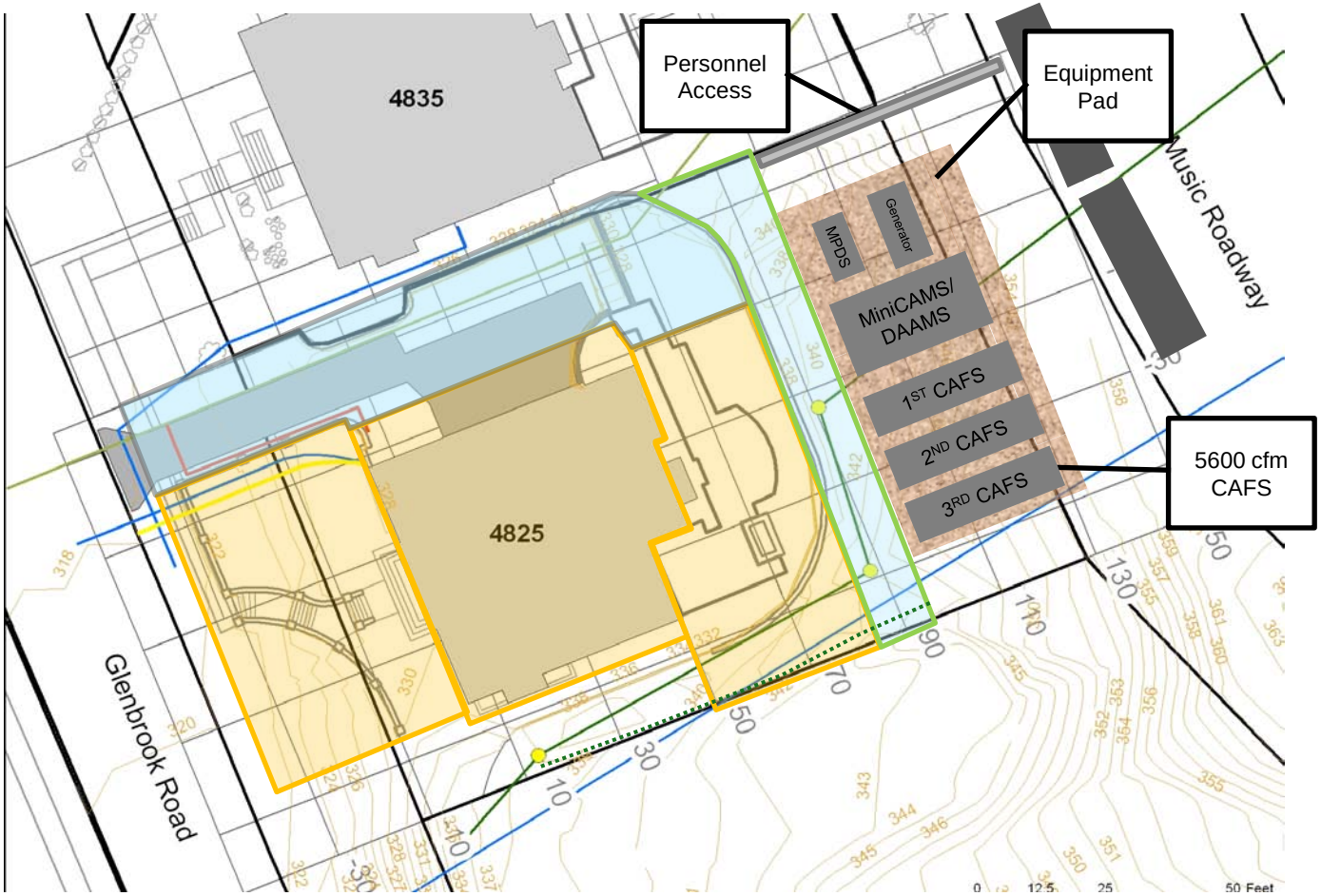
Initial Low Probability Removal Actions

Backyard Test Pits and Re-Route Sewer Line



High Probability Removal Actions

Setup Equipment Area



Prepare Equipment Area:
- **Connect CAFS**
- **ECS supporting systems (MPDS, Generator, and MINICAMS)**
- **Noise control**

Investigation of low probability test pits in backyard completed prior to preparing equipment area

Low Probability

High Probability

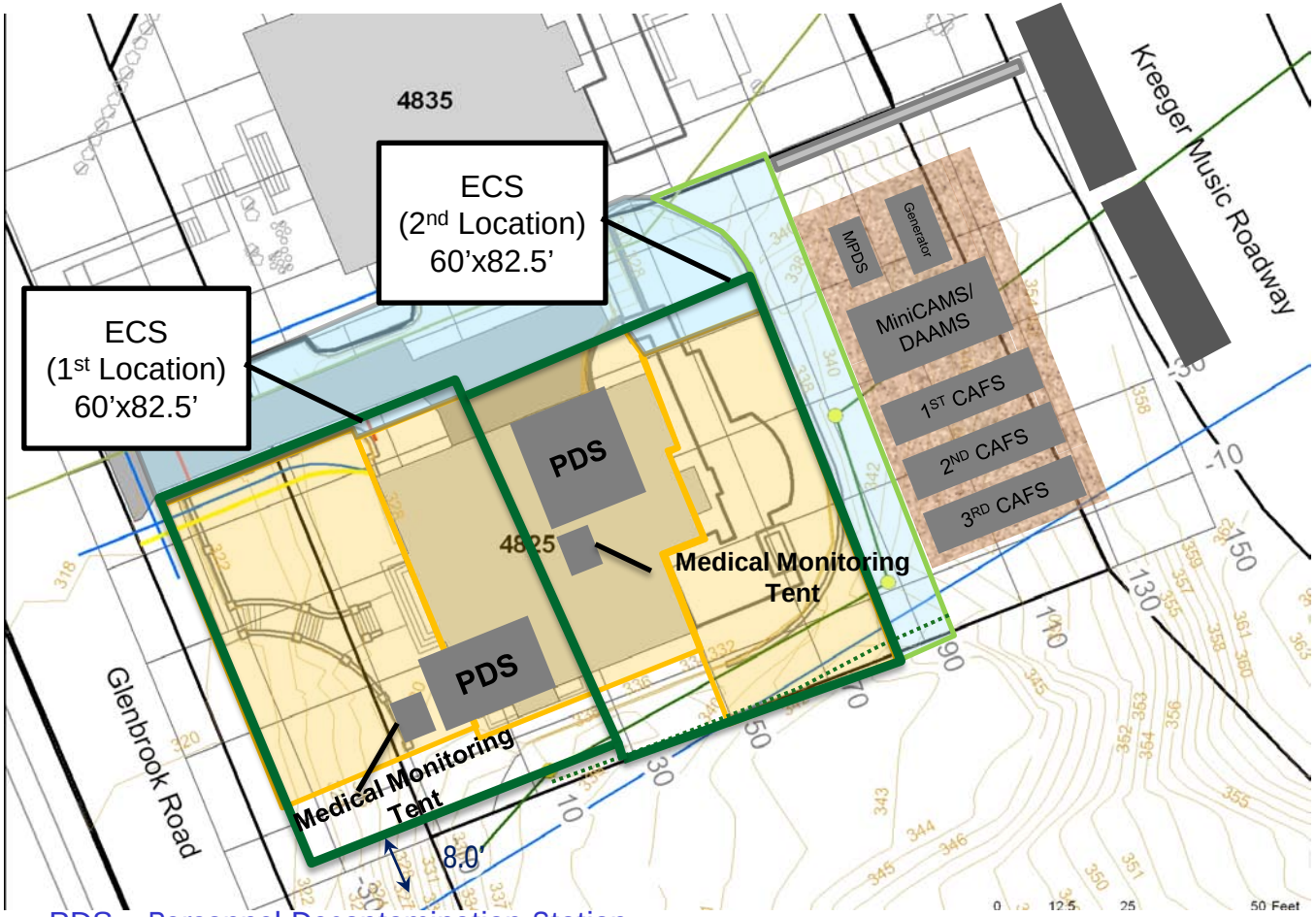
CAFS – Chemical Agent Filtration System (Pre-Filter/HEPA/Carbon ASZM-TEDA/Carbon ASZM-TEDA/HEPA)
MiniCAMS – Miniature Continuous Air Monitoring System
MPDS – Medical Personnel Decontamination Station (for emergency situations only)

4825 Glenbrook Road
Work Plan

Noise Control

- Enclosure panels and silencers on the CAFS fans and generator will be used to reduce noise within D.C. limits at all properties
- CAFS to be turned off every week night and on weekends

High Probability Removal Actions



Ducts running from equipment area to the engineering control structure (ECS) to remove the air from the ECS and pass it through the filters

Engineering Control Structure (ECS) Location

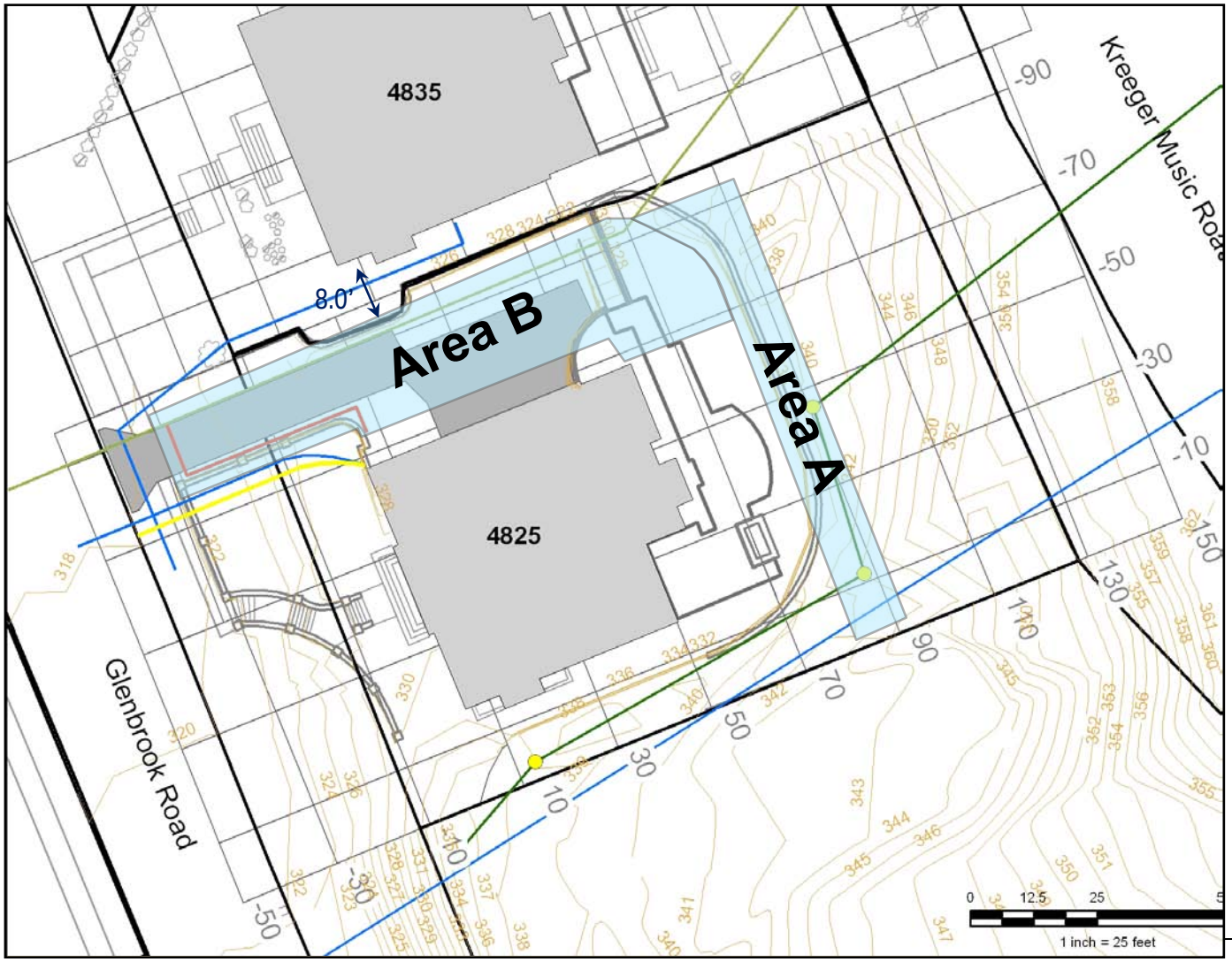
Low Probability

High Probability

PDS – Personnel Decontamination Station
CAFS – Chemical Agent Filtration System (Pre-Filter/HEPA/Carbon ASZM-TEDA/Carbon ASZM-TEDA/HEPA)
MiniCAMS – Miniature Continuous Air Monitoring System
MPDS – Medical Personnel Decontamination Station (for emergency situations only)

Final Low Probability Removal Actions

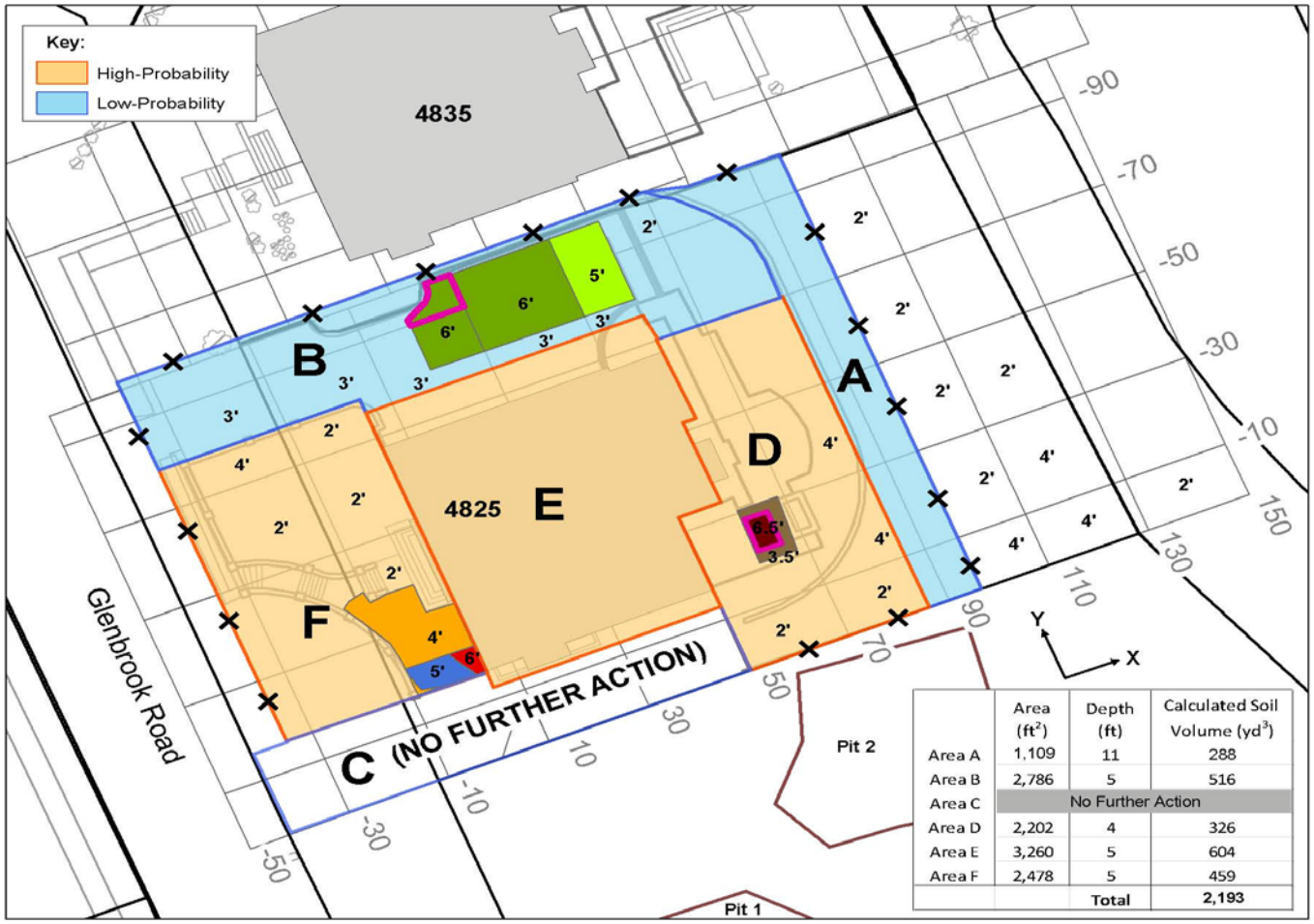
Area A and Area B



Retaining wall along 4825/4835 property boundary to be removed and approved system will be used to stabilize the soil

Low Probability

Proposed Confirmation Sampling



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		Total	2,193

Figure 3-4
Proposed Confirmation Soil Sample Locations
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend
- Buildings
- Property Boundaries
- 20' Grid
- Pits 1 and 2 (POI-24R)
- Arsenic Exceedance to be Further Excavated

Arsenic Soil
- Arsenic Grid Previously Removed [5'] (2009)
- Arsenic Grid Previously Removed [6'] (2009)

Soil Excavation
- Excavation Depth [3.5'] (2009)
- Excavation Depth [4'] (2010)
- Excavation Depth [5'] (2010)
- Excavation Depth [6'] (2010)
- Excavation Depth [6.5'] (2009)
- Sidewall Confirmation Sample Location

0 10 20 40 Feet
1 inch = 20 feet

Scale: 1:245
Created By: Parsons
File: 20120305 4825 Glenbrook Road Confirmation Sxs.mxd
Date: 3/05/2012
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PARSONS

- Surface sample – 0 to 6” below ground surface or below the backfill materials
- Subsurface sample – 6” above the excavation bottom
-Mid-point sample if the excavation depth > 5’.

* No floor samples are proposed because the excavation will reach bedrock or competent saprolite

4825 Glenbrook Road
Work Plan

Schedule

- July 2012 – *Final Remedial Design and Remedial Action Work Plan*
- Summer 2012 – Open House/Community Meeting
- July 2012 – *Demolition*
- August-September 2012 – *Initial Low Probability Work*
  - Test pits in backyard and re-locating sewer line
- October 2012 – *Site Set-Up for High Probability Work*
- through June 2013 – *High Probability Removal Actions*
- July-Sept. 2013 – *Final Low Probability Removal Actions*
  - Areas A and B
- October-November 2013 – *Restoration*

Spring Valley FUDS
Restoration Advisory Board

Community Items

National Park Service
Right-of-Entry Constraints

Presented by: Jon Owens, USACE Legal Counsel

Spring Valley FUDS
Restoration Advisory Board

Community Items

Risk and Biology of Arsenic

Presented by: Dr. Lee Monsein, RAB Member

Spring Valley FUDS
Restoration Advisory Board

- **Open Discussion**

- **Upcoming Agenda Items**
  - **Evaluation of Remaining Site-Wide Sampling Requirements**
  - **4825 Glenbrook Road ATSDR Health Consultation Update**
  - **Spring Valley JHU Follow-On Health Study Update**
  - **??**

Spring Valley FUDS
Restoration Advisory Board

- **Public Comments**
- **Wrap-Up**

U.S. Army Corps of Engineers
Spring Valley Restoration Advisory Board Meeting
St. David's Episcopal Church
Minutes of the May 8, 2012 RAB Meeting

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING	
Dan Noble	Military Co-Chair/USACE, Spring Valley MMRP Manager
Greg Beumel	Community Co-Chair
Kathleen Connell	Community Member
Dr. Peter deFur (represented by Laura Williams)	Environmental Stewardship Concepts/RAB TAPP Consultant
Paul Dueffert	Community Member
Mary Douglas	Community Member
Lawrence Miller	Community Member
Lee Monsein	Community Member
Penny Pagano	At Large Representative – American University
Malcolm Pritzker	Community Member
James Sweeney	Agency Representative – District Department of the Environment
George Vassiliou	Community Member
John Wheeler	Community Member
RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING	
Mario Aguilar	Community Member
Mary Bresnahan	Community Member
Alma Gates	At Large Representative – Horace Mann Elementary School
Steve Hirsh	Agency Representative- US Environmental Protection Agency Region III
William Krebs	Community Member
ATTENDING PROJECT PERSONNEL	
Todd Beckwith	USACE, Spring Valley Project Manager
Brenda Barber	USACE, Spring Valley Project Manager
Lan Reeser	USACE, Technical Manager
John Owens	USACE, Legal Counsel
Clem Gaines	USACE, Public Affairs

Andrea Takash	USACE, Public Affairs
Carrie Johnston	Spring Valley Community Outreach Program Manager
Betsey Hutton	Spring Valley Community Outreach Program
Jessica Bruland	ERT
HANDOUTS FROM THE MEETING	
I. Final Agenda for the May 8, 2012 RAB Meeting II. Army Corps of Engineers Presentation III. AOI Status Maps IV. U.S. Department of the Interior (National Park Service) Special Use Permit	

AGENDA

Starting Time: The May 8, 2012 RAB meeting began at 7:05 PM.

I. Administrative Items

A. Co-Chair Updates

Greg Beumel, Community Co-Chair, opened the meeting.

Dan Noble, Spring Valley Project Manager and Military Co-Chair, welcomed the group and reviewed the evening's agenda.

B. Introduce Guests

Officer McElwee of the District of Columbia Metropolitan Police Department 2nd District and Sergeant Jackson of the Special Operations Division (SOD) briefly attended the meeting. They mentioned that the 2nd District will assist with traffic control as needed during upcoming 4825 Glenbrook Road remedial efforts.

Laura Williams of Environmental Stewardship Concepts represented Dr. Peter deFur, RAB TAPP Consultant, at the meeting.

C. General Announcements

D. Noble announced that recent website updates include the March 2012 RAB minutes and associated materials, along with the April 2012 monthly project summary. A Partnering meeting was not held in February or March 2012, but the April 2012 Partnering minutes are currently under review and will be posted on the website in June 2012.

D. Task Group Updates

One open RAB membership position is still available for interested members of the Spring Valley community.

II. USACE Updates

L. Reeser, USACE Technical Manager, provided an update on the status of Areas of Interest (AOIs), focusing on soil sampling efforts that are currently underway or planned.

Minutes of May 8, 2012 RAB Meeting

Brenda Barber, Spring Valley Project Manager, provided a brief status update on the Decision Document for 4825 Glenbrook Road and the associated Remedial Design and Remedial Action Work Plan.

A. Site-Wide Investigations: Areas of Interest (AOIs)

The Site-Wide Remedial Investigation (RI) report for the Spring Valley FUDS is currently in the early stages of preparation. In order to complete the **Remedial Investigation** there must be sufficient data to characterize discrete areas throughout the Spring Valley project area and to make human health and ecological risk determinations. In order to ensure that sufficient data exists, additional soil sampling is proposed at several Areas of Interest (AOIs). The locations and current investigation status of all AOIs within the Spring Valley FUDS were reviewed.

Background: A total of 54 Points of Interest (POIs) were identified during the 1993-1995 Remedial Investigation. These POIs refer to areas believed to have been impacted during the World War I era, and were identified based on reviews of historical 1918 aerial photographs, documents, and WWI-era photographs from the American University Experiment Station (AUES) and Camp Leach.

The Area of Interest Task Force (AOITF) was a subcommittee of the Spring Valley Partners, consisting of representatives from the EPA, DDOE, USACE, and the RAB technical consultant who was a non-voting member. The AOITF was formed in 2002 for the purpose of reviewing POIs and additional locations of interest, which were referred to as AOIs, to determine which areas potentially needed further investigation because they were not addressed in ongoing investigations or the presence of data gaps. During their efforts, the AOITF made recommendations to the Partners based on their reviews of POIs and AOIs, additional historical and anecdotal information, and reports for completed or ongoing project investigations. The AOITF completed their work and consequently dissolved their subcommittee in 2007.

Status of AOIs: A total of 28 AOIs were identified by the AOITF. Investigations have been completed for 19 of these AOIs, including 3 that are located outside of the FUDS boundary (AOI 10, Westmoreland Recreation Center; AOI 23, Railroad Sidings; and AOI 27, Third Circular Trench). Additional soil sampling is currently underway at 4 AOIs and planned at the remaining 5 AOIs that have not been addressed to date.

Additional Investigation Underway: Sampling is currently underway at the following AOIs.

- **AOI 5 (4825/4835 Glenbrook Road)** will be addressed during the upcoming remedial action at 4825 Glenbrook Road.
- **AOI 8 (Possible Graded Area) and AOI 11 (52nd Court Pit and Trenches)** were recently sampled under an approved work plan, and analytical results for the full AUES parameter list were received. A formal risk evaluation for both AOIs is pending.
- **AOI 17 ($800,000 Burial Site)** will be addressed via ongoing groundwater monitoring on the southern portion of AU's campus. The location of this AOI is believed to be associated with a nearby burial pit that has already been investigated.

Additional Investigation Planned: Additional soil sampling and evaluation are planned at a total of 5 AOIs. These include **AOI 9 (Sedgwick Ground Scars)**, **AOI 13 (Quebec/Woodway 13)**, **AOI 21 (Weaver Farm)**, **AOI 22 (Mercury Detection Areas)**, and **AOI 24 (Antimony Detection Areas)**.

Tentative Document Schedule: The final site-wide evaluation document, called the ***Evaluation of Remaining Sampling Requirements*** document, provides work plan details of the remaining areas that require additional soil sampling. The document's contents will be presented at an upcoming RAB meeting. Supplemental soil sampling is planned for late Summer 2012.

Question from Paul Dueffert, RAB Member – How did the $800,000 Burial Site get that name?

L. Reeser replied that this name was derived from a 1921 American University (AU) Courier newsletter article written by William Osborne. Mr. Osborne makes reference to $800,000 worth of leftover munitions and chemical agent was buried in the back woods of AU after World War I ended and the AUES was closed.

Comment from Ginny Durrin, Audience Member – It sounds like you are informing us that a third of the Spring Valley FUDS will be re-sampled as part of this additional sampling effort? Also, AOI 17 is shown as the possible location of the $800,000 burial pit. I always wondered why a high fence encloses this area, and why it has not been investigated until now.

L. Reeser clarified that the precise location of AOI 17 is unknown, and the location depicted on the map (behind Kreeger Hall) represents the most recent possible location identified by the AOITF. The possible location of AOI 17 shifted over the years, and it is a coincidence that it is co-located with a fenced area.

L. Reeser added that the AOI status map is deceiving with respect to the amount of the Spring Valley FUDS requiring additional sampling; while certain areas are quite large, only portions of those areas need sampling. For example, AOI 21 (Weaver Farm) is a very large area that is color-coded on the map, but only a small portion of the AOI (POI 7/7R) will be sampled.

Question from G. Durrin, Audience Member – I am immensely curious about the ongoing investigation associated with AOI 17 ($800,000 Burial Pit). What are you looking for at AOI 17 and whose property is it located on?

L. Reeser explained that this AOI location has already been investigated via geophysical anomaly investigations and arsenic soil removal, and an associated burial pit was not found. Continued groundwater monitoring is currently the best option for addressing this AOI.

A. Hengst, Audience Member, asked for clarification on whether the AOI 17 location is co-located with the grassy hill between the 4825 Glenbrook Road property boundary and the Kreeger Music Roadway on AU's campus, where test pits are planned as part of the 4825 Glenbrook Road remedial action and where T. Slonecker identified a possible pit in the December 2000 EPIC report.

L. Reeser clarified that the current position of AOI 17 is located directly behind Kreeger Hall.

Question from G. Durrin, Audience Member – Do you think that AOI 17 is further uphill from the groundwater monitoring well in that location?

L. Reeser clarified that USACE feels that AOI 17 was addressed by the nearby known burial pits that previously were fully investigated on 4801 and 4825 Glenbrook Road.

Question from A. Hengst, Audience Member – Do you think that the small fenced area behind Kreeger Hall is associated with arsenic contamination?

L. Reeser and D. Noble clarified that the fenced area is private property with no known associated contamination. The reason for the fencing is unknown but it is located near residential property boundaries.

Question from G. Durrin, Audience Member – How long have you known that you would conduct this sampling, and what led you to plan this sampling effort?

L. Reeser replied that after the AOITF disbanded in 2007, and the Spring Valley Partners reviewed the AOI reports and recommendations over the subsequent years. During this time, the Spring Valley Partners used this information to identify areas where supplemental sampling was needed to further characterize the soils in certain areas to be able to make human health and ecological risk determinations.

G. Durrin asked why it took so long to plan the additional sampling.

D. Noble explained that the process leading up to actually planning and performing the additional soil sampling was thorough and required many different steps and multi-agency review and coordination. The

AOITF review process alone took approximately 5 years. The members reviewed information, identified AOIs, discussed each AOI at meetings, and completed a report for each AOI that was forwarded to the Spring Valley Partners. During a series of Partnering meeting presentations, the Spring Valley Partners discussed and reached a consensus on the status of each AOI- whether adequate data existed to make human health and ecological risk determinations or if additional data was needed. Recently, final AOI consensus memos were produced and signed by the Partners. Each AOI memo established the most appropriate next steps and summarized the information that will be required to properly evaluate each area. The ultimate goal of the supplemental soil sampling is to collect additional investigation data that will be evaluated and summarized in the site-wide RI report.

Question from Malcolm Pritzker, RAB Member – Do you have a sense of how long it will take to complete these additional sampling efforts?

L. Reeser replied that all supplemental sampling is planned for Summer 2012. Sampling will be followed by data analysis, risk screening to evaluate each compound against the appropriate comparison criteria, and if needed a risk assessment for any AOI where potential health risks are identified will be performed. The entire sampling and risk evaluation process for these AOIs may take approximately 1 year or longer to complete.

D. Noble emphasized that the field work portion will tentatively be completed within the next few months, pending discussions with homeowners and receipt of right-of-entries.

Question from Mary Douglas, RAB Member – Will you use magnetometers as well as collecting soil samples?

L. Reeser clarified that the upcoming field work consists only of soil sampling. In a few locations where subsurface soil samples are required, anomaly avoidance will be conducted for safety purposes, but geophysical surveys to locate additional anomalies will not be conducted.

Question from Nan Wells, ANC3D Commissioner – How deep will the soil samples be collected?

L. Reeser replied that the sample depth varies depending on the AOI. Most samples will consist of surface soil (0-6 inches below ground surface), while subsurface samples may extend as deep as 5 to 7 feet. These details will be presented at the June 2012 RAB meeting.

Suggestion from Kathleen Connell, RAB Member – It would be helpful for the community to add street names and more detailed boundary information to these maps, so that they are less confusing and cause less anxiety for the public. Would this be possible?

D. Noble agreed that street names will be added to the AOI status maps prior to the associated presentation at the June 2012 RAB meeting.

Question from M. Pritzker, RAB Member – Do you anticipate that the work plan will be presented at the next RAB meeting?

D. Noble confirmed that the work plan details, including all individual soil sample locations, will be presented at the June 2012 RAB meeting.

Question from P. Dueffert, RAB Member – Are you sampling for arsenic, perchlorate, or anything else in particular?

L. Reeser replied that soil samples will be analyzed for a wide range of parameters including metals, such as antimony and nickel. Arsenic has already been extensively sampled for in the soils in the Spring Valley project area (at over 1,600 properties).

P. Dueffert asked whether these metals are of interest because preliminary sampling indicated the possible presence of those metals.

L. Reeser explained that these supplemental sampling decisions were primarily based on the data collected during the 1993-1995 RI timeframe, which was analyzed within the 1999 EPA Human Health Risk Assessment (HHRA). This document identified a few POIs where elevated metals risks were apparent, but some technical considerations within the document could potentially discount those identified risks. The Spring Valley Partners decided to conduct supplemental sampling to verify whether the previous HHRA risk conclusions were still useful.

Question from P. Dueffert, RAB Member – Will the background data be explained in the work plan that you intend to present at an upcoming RAB meeting?

L. Reeser clarified that these background details are described in AOI consensus memos signed by the Spring Valley Partners and will also be summarized in the work plan. The AOI consensus memos can be shared with the RAB.

Question from Audience Member – Do you need to obtain homeowners' permission in order to conduct this sampling effort?

L. Reeser confirmed that rights-of-entry are required in order to conduct planned soil sampling.

The audience member asked how USACE will address properties where the residents do not provide right-of-entry.

D. Noble explained that sampling will not be conducted at properties where right-of-entry is not granted. Some areas may be large enough to select alternate sampling locations that are accessible, but ideally the planned additional samples will be collected in the same areas where the original 1993-1995 samples were collected.

Question from K. Slowinski, Audience Member – Are the AOI reports available at the information repository at the Tenley-Friendship Branch Library?

Audience and RAB members noted that these documents are missing.

C. Johnston confirmed that several documents have been taken from the information repository (IR), including the AOI binder. Community Outreach will update the IR with new copies of the final AOI reports and signed consensus memoranda, as well as the Evaluation of Remaining Sampling Requirements document once it is finalized.

Question from K. Connell, RAB Member – Why was there a substantial delay between the original 1993 sampling effort and the planned supplemental sampling, considering that these POIs were already identified as properties of interest for sampling purposes?

D. Noble explained that the Spring Valley project requirements were prioritized each year based on discussion with the Spring Valley Partners, with the highest-priority efforts completed first... This supplemental sampling effort is a lower-priority effort designed to collect additional soil data and further address potential concerns that were identified in the 1999 EPA HHRA; these soils do not pose an immediate threat to human health or the environment. This soil sampling data is solely being collected for characterization purposes.

Question from K. Connell, RAB Member – Are there any other properties of interest that are considered lower-priority and will be presented to the RAB for consideration at a later date?

D. Noble replied that this is the last group of areas where additional sampling is proposed. All AOI consensus memos have been approved and signed by the Spring Valley Partners. The supplemental sampling effort will conclude all planned field work efforts, aside from ongoing groundwater monitoring and the 4825 Glenbrook Road remedial action, and all data will be included in the site-wide RI report and reviewed and discussed as part of the site-wide CERCLA process.

K. Connell emphasized the importance of informing the public of the supplemental sampling effort, to alleviate any concerns associated with identifying additional properties for soil sampling.

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B. Military Munitions Response Program

4825 Glenbrook Road (Decision Document; Remedial Design and Remedial Action Work Plan)

Tentative Document Schedule

Previously finalized 4825 Glenbrook Road CERCLA-related documents are posted on the Spring Valley Project website and are also available at the Information Repository at the Tenley-Friendship Branch Library. (Details of finalized documents were provided at the October 2011 and previous RAB meetings).

Decision Document (DD) authorization is expected by July 2012. (Details of the approval and concurrence process were provided at the April 2011 RAB meeting). The DD is currently under review by the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health.

Upon final signature, the DD will be made available electronically on the Spring Valley project website and in hard copy format at the Tenley-Friendship Branch Library. The DD formally selects Alternative 5 (removal of the house and cleanup to residential standards providing for unrestricted future use of the property) as the cleanup alternative for the 4825 Glenbrook Road site and includes the transcript of the October 2011 Proposed Plan public meeting and the Responsiveness Summary containing USACE's responses to all comments received during the public comment period. A fact sheet will also be provided electronically on the Spring Valley website and at the local library, to explain the key elements (purpose, organization, and contents) of the DD as well as the next steps prior to cleaning up the property. Similar fact sheets were prepared previously for other finalized 4825 Glenbrook Road CERCLA-related documents.

The Demolition and Disposal Plan (for removing and disposing of the 4825 Glenbrook Road house) was finalized in February 2012. The details of this plan were presented at the March 2012 RAB meeting. This document will be made available on the Spring Valley project website and at the Tenley-Friendship Branch Library once the Decision Document is finalized.

Preparation of the final Remedial Design and Remedial Action Work Plan (which details how the selected cleanup alternative will be implemented) is underway. The work plan will be supported by Site Safety and Public Protection Plans. Regulatory partner review of the work plan is currently underway, with finalization anticipated in July 2012. An informational community meeting is tentatively planned for Summer 2012, prior to house removal.

Remedial Design and Remedial Action Work Plan

Purpose: The 4825 Glenbrook Road remedial design and remedial action work plan provides the anticipated schedule and details of planned intrusive activities designed to achieve the remedial objectives and achieve closure at the site. These objectives include preventing direct contact with arsenic-contaminated soil and/or agent-contaminated soil, as well as reducing the potential to encounter AUES-related items (including but not limited to military munitions and containerized chemical warfare materiel (CWM), such as glass bottles containing mustard agent).

Scope: The work plan defines the low probability and high probability protocols to remove, assess, and dispose of soil and any potential AUES-related items remaining at the site. The work plan also presents the approach to site restoration once all remedial activities are completed. Restoration activities include but are not limited to clean soil backfill, seeding the property, and stabilizing and/or reinstalling property boundary fences.

Excavation Areas: The site was divided into five excavation areas, reflecting two low probability areas (A/B) and three high probability areas (D/E/F). Area C encompasses the burial pit 3 area where No Further Action (NFA) was approved, as this area was previously excavated to bedrock and backfilled with clean soil. These excavation areas are described in the final DD.

Demolition: Details of the Demolition and Disposal plan (for removing and disposing of the 4825 Glenbrook Road house) were presented at the March 2012 RAB meeting.

Initial Low-Probability Removal Actions: After demolition of the house is completed, low probability site preparations will include abandoning the existing water utility line and rerouting the sewer line via an L-shaped trench, so that these utilities do not interfere with soil excavation efforts. Seven low probability test pits in the backyard will be excavated concurrently, including five additional test pits between the property boundary and the Kreeger Music Roadway on AU's campus, to ensure that any potential AUES-related items in the backyard have been identified and removed. These low probability efforts will provide additional investigation data for the backyard, which was test pitted extensively during previous investigation efforts.

High-Probability Removal Actions: Site preparations for high-probability efforts will begin once the initial low probability removal actions are completed, and include leveling a portion of the backyard and setting up the chemical agent filtration system (CAFS), air monitoring equipment, and other support equipment. The protective engineering control structure (ECS) will be constructed for use during soil excavation, and will be repositioned at least once during the high probability effort due to space constraints at the site. The specific ECS design is currently under review by the Spring Valley partners, and will be supported by filtration and air monitoring systems stationed in the backyard of the property.

Noise Control: Noise levels from the CAFS and the emergency generator were evaluated to ensure that they will not exceed regulatory noise limitations (established by the District of Columbia) at the property boundaries during high probability operations. Baseline noise measurements were completed at the 4825 Glenbrook Road site, and the CAFS and generator noise levels were tested at ECBC at Aberdeen Proving Ground for comparison purposes. Noise control measures will include the use of enclosure panels and fan silencers to reduce noise levels to acceptable levels, and the CAFS will be turned off at night and during weekends. Noise levels will be within DC limits at all property boundaries during the cleanup process.

Final Low Probability Removal Actions: Soil removal for the remaining low-probability Areas A/B will be conducted using open-air protocols and air monitoring at the dig locations and the perimeter of the site, after all high probability excavations have been completed. During this effort, the retaining wall separating the 4825 and 4835 Glenbrook Road properties will be removed and an approved soil stabilization system will be used to protect the neighboring property structure.

Confirmation Sampling: Following completion of all soil excavation, confirmation sampling will be performed across the property. At the excavation perimeter, sidewall samples will be taken at the mid-point of each 20 foot grid or partial grid to ensure that all contamination has been removed at the property boundaries. These sidewall samples will include surface samples (0-6 inches bgs or below previous backfill materials) and subsurface samples (6 inches above the excavation floor), along with mid-point samples for all excavations that exceed a depth of 5 feet. Floor samples will be taken in the center of each 20 foot grid once undisturbed saprolite or bedrock is encountered where possible (if there is no refusal from the sampling equipment).

Tentative Remedial Action Schedule: As described at the April 2012 RAB meeting, remedial action will tentatively begin in Summer 2012 and continue through late 2013. The length of the cleanup process depends on the remediation methodologies outlined in the Remedial Design and Remedial Action Work Plan. Site access logistics and right-of-entry negotiations are in progress.

House demolition is anticipated to begin in August 2012 prior to beginning cleanup activities, followed by initial low probability efforts in late Summer 2012 (including backyard test pits and trenches and

utility rerouting). High probability site preparations and soil removal will tentatively begin in October 2012, with completion anticipated in Summer 2013, barring additional delays. The remaining low probability soil removal actions for Areas A/B will be conducted in late 2013, followed by site restoration. The remediated property will be returned to AU as early as December 2013.

Question from P. Dueffert, RAB Member – What is the difference between high probability and low probability areas?

B. Barber replied that high probability and low probability areas describe the different technical and safety protocols for approaching the excavation areas. These designations are based on review of historical information and field data collected during previous investigations at the site, with high probability excavation areas requiring additional protective measures due to a greater likelihood that AUES-related items could potentially be encountered in these areas.

Comment from N. Wells, ANC3D Commissioner – I am concerned about scheduling the planned informational community meeting in July 2012, as many residents will be on vacation during that time frame.

B. Barber replied that the community meeting will ideally be scheduled for late June, but several items must be confirmed internally within USACE before the meeting date can be selected.

N. Wells added that it is very important to hold the community meeting prior to house demolition.

B. Barber agreed.

G. Beumel expressed the opinion that it is important to demolish the house during the July time frame, even if the community meeting cannot be held beforehand.

N. Wells replied that the community meeting should share details of the demolition process.

B. Barber explained that details of the demolition process (as described at the March 2012 RAB meeting) and any additional resolved and approved work plan details will be presented at the community meeting.

Question from K. Connell, RAB Member – What aspect of the Decision Document final signature is delaying the demolition process?

B. Barber explained that the final approval and signature from the Deputy Assistant Secretary of the Army is only a portion of the schedule delay. The other portion is associated with property access negotiations with AU.

Question from K. Connell, RAB Member – When do you expect the negotiations with AU to be completed?

B. Barber explained that the time frame is uncertain due to an outstanding issue that requires resolution. However, AU prefers the right-of-entry to be signed and the demolition completed prior to the upcoming academic year (which begins mid-August). USACE is working diligently with AU to ensure that is feasible, but an exact date cannot be provided at this time.

Question from K. Slowinski, Audience Member – Have USACE and AU reached an agreement on the reimbursement value of the house?

B. Barber replied that the house reimbursement value is still under negotiation.

K. Slowinski asked how far off USACE's proposed value is compared to AU's preferred value.

B. Barber explained that AU feels that the proposed value is fair.

Question from M. Douglas, RAB Member – When you presented details of the demolition plan, you mentioned that the demolition process is divided into two phases: removal of the outer house walls,

followed by removal of the basement slab within the high probability excavation area. Will both of these phases be conducted in Summer 2012?

B. Barber clarified that the Summer 2012 portion of the house demolition will include removal of the top two house stories and the interior walls of the basement. Removal of the basement slab and exterior basement walls will be conducted as part of the high probability remedial effort beginning in late Fall 2012.

Question from L. Monsein, RAB Member – Has AU discussed their future plans or possibilities for the 4825 Glenbrook Road property?

P. Pagano replied that AU has not made any final decisions, but the property will be capable of residential use after the cleanup even if another house is not built at the site.

Question from K. Slowinski, Audience Member – Does the university president plan to move out of the neighboring 4835 Glenbrook Road house during the cleanup effort?

B. Barber replied that USACE is coordinating with AU President Kerwin to address his concerns regarding the remedial action work. Impacts from the high probability effort are not anticipated, aside from the proximity of the properties. Low probability excavations will require encroachment onto the 4835 Glenbrook Road property, and USACE is working with AU to minimize this impact.

Question from K. Slowinski, Audience Member – Do you plan to encroach on the 4835 Glenbrook Road property in order to clean up arsenic-contaminated grids?

B. Barber explained that the retaining wall that is situated along the 4825/4835 property line will be removed for the purpose of excavating a small amount of arsenic-contaminated soil, in order to meet the remedial work plan objectives.

K. Slowinski noted that when he asked about this issue at a previous RAB meeting, he was told that all arsenic soil contamination had already been removed.

B. Barber clarified that a remaining hotspot of arsenic is situated underneath the retaining wall along the property boundary, as described in the Decision Document. This small area of soil was not previously excavated because the retaining wall could not be removed at that time.

K. Slowinski asked whether this hotspot extends onto the neighboring 4835 Glenbrook Road property.

B. Barber replied that the extent of the arsenic hotspot is unknown and will be delineated during soil removal and confirmation sampling.

Comment from D. Noble, Military Co-Chair – Keep in mind that Spring Valley project efforts are incredibly complex undertakings and often take significantly longer than anticipated. For example, the burial pit 3 effort was originally planned to take 16 weeks, and due to unexpected property findings and multi-agency safety reviews, the investigation took approximately 2.5 years. New information including potential unknowns at the 4825 Glenbrook Road site must be properly assessed each time they are encountered, and work efforts must be placed on hold until it is deemed safe to resume work.

III. Community Items

A. National Park Service Right-of-Entry Constraints

Jon Owens, USACE-Baltimore Legal Counsel, presented information on USACE's rationale for not signing the NPS Special Use Permit for sampling at Glover-Archbold Park. This issue was briefly discussed at the April 2012 and prior RAB meetings.

Issue: Property access was not granted for arsenic sampling at 9 federal lots at Glover-Archbold Park, which is situated at the eastern edge of the Spring Valley FUDS, due to an ongoing legal constraint

between USACE Headquarters and the National Park Service (NPS) Headquarters. USACE legal counsel's position is that USACE cannot sign the Special Use Permit required by NPS.

J. Owens noted that this is a nationwide issue and is not specific to Spring Valley. The Department of Defense (which oversees USACE) and the Department of the Interior (which oversees NPS) are attempting to create an agreement between their agencies. This nationwide agreement would provide general right-of-entry for NPS properties for the purpose of completing DOD investigations, instead of requiring individual property access agreements at the local level for each DOD investigation.

J. Owens described a similar situation, where the DOD and the Bureau of Land Management finalized a global property access agreement. This process took approximately 5 years. The resulting agreement is being used as a template for the DOD/NPS property access agreement that is currently under discussion.

Concerns with signing special use permit: Spring Valley project activities are conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, which was designed by Congress to streamline the cleanup process and shorten the time frame required for project completion. The NPS special use permit conflicts with provisions of CERCLA.

J. Owens provided examples of USACE's legal concerns associated with signing the NPS special use permit.

- The legal requirements of CERCLA do not allow the Spring Valley project to sign a special use permit. This presents a procedural challenge during property access negotiations with the NPS.
- The special use permit requires USACE to provide indemnification; in other words, USACE would be financially responsible for all physical damage or loss incurred during project activities on NPS property. This provision does not meet CERCLA legal requirements.
- Although all Spring Valley project contractors are required to have their own insurance, USACE would be required to compensate NPS for a similar level of contractor insurance. This type of compensation is unusual and potentially unacceptable.
- The special use permit would also require USACE to compensate NPS for project activities associated with hazardous substances. Current fiscal law does not allow USACE to provide reimbursement for hazardous substance cleanup efforts to another federal agency, thus creating a legal barrier. USACE is only allowed to spend their designated project funding on their own agency's cleanup efforts.
- The special use permit would provide NPS with the unilateral authority to halt the cleanup effort at any time. This provision would potentially prevent USACE from completing project activities on NPS property.

Status: J. Owens offered to pursue resolution of this property access agreement issue, and USACE Headquarters approved this request. J. Owens recently contacted the NPS Headquarters legal counsel to explain the USACE's concerns with signing the special use permit, and an official response from NPS is pending. An update on this issue will be provided at an upcoming RAB meeting.

J. Owens noted that based on preliminary feedback from NPS, he anticipates that although a nationwide agreement between USACE and NPS may be out of reach, a site-specific property access agreement containing language agreeable to both parties may be obtainable.

Question from Lee Monsein, RAB Member – The Spring Valley project soil sampling effort on NPS property seems quite different from the list of potential project activities listed on the special use permit. Most of the activities that require a permit are commercial in nature.

J. Owens agreed that this special use permit template is not well-suited for a hazardous substance cleanup such as the Spring Valley project, but at least NPS is willing to discuss these issues with USACE. The

typical right-of-entry agreements used by USACE would provide a better starting point for assuring NPS that all contractors will possess the appropriate insurance and that any damages to NPS property will be restored to original condition.

Question from J. Wheeler, RAB Member – Why is this particular special use permit under discussion considering that USACE already has an agreement with the BLM?

J. Owens replied that the BLM is a separate agency under the same federal department as NPS.

J. Wheeler noted that it would be interesting to review the contents of USACE's agreement with BLM, as the special use permit currently under discussion does not appear to be the appropriate template document. There should be a uniform approach for agreements with all federal landowners whose property is part of a FUDS, including the DOI.

J. Owens acknowledged that the BLM agreement is generally non-intrusive and ensures that any intrusive damages are corrected, which provides a good starting point for developing a new agreement with NPS. Discussions between USACE and BLM took approximately five years to reach the final agreement.

Question from J. Wheeler, RAB Member – CERCLA does not address situations where a FUDS is located on federal property?

J. Owens clarified that each federal agency has authority over their own property. NPS has their own methodology for cleaning up hazardous substances and USACE is willing to assist with contaminant remediation as appropriate, with a worst-case scenario of NPS conducting their own cleanups on FUDS property when legal issues prevent interagency cooperation.

J. Owens explained that CERCLA granted the President the authority to issue an executive order defining each federal agency's responsibilities. This guidance is less clear for situations where FUDS properties are co-located with properties belonging to other federal agencies. Typically, informal or formal property access agreements are made once the federal agency understands USACE's requests, because they understand that USACE has expertise in hazardous substance cleanups.

Question from N. Wells, ANC3D Commissioner – Does Congress play any role in this process?

J. Owens explained that Congress provides the cleanup funding to USACE, NPS, and other federal agencies.

Question from N. Wells, ANC3D Commissioner – Does Congress set specific conditions on the funding?

J. Owens confirmed that Congress divides up the funding among federal agencies, so that FUDS funding allotted to USACE must be spent on USACE projects and cannot be given to NPS to support their agency's cleanup efforts.

Question from K. Slowinski, Audience Member – How is sampling in Glover-Archbold Park different from the Naval Security Station's PCB spill cleanup effort on NPS property in the 1990s? Why can't the U.S. Army figure out what type of agreement the U.S. Navy made with NPS?

J. Owens replied that the USACE can inquire as to what type of agreement was made between the U.S. Navy and NPS, as an example for the current USACE discussion with NPS. He emphasized that USACE does not have unilateral authority to enter another federal agency's property, so reaching an appropriate agreement is important.

J. Sweeney mentioned that the U.S. Navy cleanup was not a FUDS project.

J. Wheeler agreed that this is a good example of obtaining access to NPS property. The Naval Security Station cleanup was far more intrusive than the soil sampling currently envisioned for the Spring Valley project.

Question from M. Pritzker, RAB Member – Can you confirm that you provide the RAB with a progress report at a future RAB meeting?

J. Owens confirmed that progress on this issue will be made at an upcoming RAB meeting, hopefully by the fall time frame.

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Question from Audience Member – Do you have any involvement with privately-owned residential properties that do not allow investigations on their property?

J. Owens explained that under CERCLA, the president delegated limited authority to USACE which consists of property cleanups where right-of-entry was granted. Other federal and state agencies provide oversight and direction, with a larger toolbox for accomplishing cleanups compared to USACE. If property access is not granted voluntarily, USACE makes several attempts to pursue right-of-entry, followed by a letter requesting regulatory partner assistance, and finally a "last chance" letter that warns the property owner of potential serious consequences of an unremediated property, such as the risk of endangering human health. This last chance letter also informs the property owner that USACE will no longer be pursuing right-of-entry at the property. Under serious circumstances, the regulators can apply their authority to address the property access issue.

Question from Audience Member – Are the regulatory agencies in a position to force property access?

J. Owens explained that the regulators have a broad authority associated with obtaining property access. Forcing access to a property depends on the specific circumstances, and this decision is deferred to the regulators. If the contamination situation at the property is serious enough, property access can be forced using CERCLA authority and the authority of some state laws.

Comment from L. Monsein, RAB Member – A major question over the years has been what level of contamination is considered serious enough to warrant forced entry. Soil containing 30 ppm arsenic would not be considered serious enough by most of us, as this contamination would have a negligible impact on human health compared to a military munition. Throughout the duration of the Spring Valley project, a few residential property owners have not allowed soil sampling or removal to prevent damage to landscaping or due to other unwanted disturbances A packet documenting the properties where arsenic soil sampling right-of-entries were refused and the attempts to contact the property owners (formally and informally) will be sent to USACE Headquarters to review the information and determine whether any further actions to obtain access to these properties is necessary.

Comment from D. Noble, Military Co-Chair – A similar packet has already been submitted to the U.S. Army Chain of Command specifically regarding a property on the 3700 block of Fordham Road where arsenic contaminated soil and a potential munitions pit were previously identified; the property owner did not grant access for the subsequent arsenic soil removal and intrusive anomaly investigation efforts. The U.S. Army chain-of-command is currently reviewing the packet to determine if any further actions to gain property access are necessary, because USACE has exhausted their efforts to obtain voluntary access. This property was discussed at the March 2012 RAB meeting.

J. Owens added that based on U.S. Army review of this property packet, USACE requested further assistance from the regulatory partners to obtain property access.

L. Miller emphasized information shared by Steve Hirsh, EPA Region III, at a previous RAB meeting. The regulatory agencies have a very high standard and a very careful process for asserting their authority to obtain forced property access, which is typically not warranted unless there is an imminent danger to human health. This extreme action seems unlikely for residential properties with moderately high arsenic concentrations.

J. Wheeler added that soil sampling is desired at the remaining few inaccessible properties for the purpose of project completeness rather than concern that hazardous soil remains at the properties. For example, one unsampled property is located in the far eastern portion of the FUDS.

Question from M. Douglas, RAB Member – How long do you think it will take to receive feedback from EPA and DDOE on help with gaining access to the Fordham Road property?

D. Noble replied that this depends on internal discussions and decisions made by the regulatory agencies. USACE Headquarters and the Deputy Secretary Assistant of the Army are currently waiting for a final response from the regulators.

M. Douglas noted that regulatory partner assistance would be good, and added that while EPA requires a situation with imminent danger, the CERCLA process does not set such high standards.

J. Owens added that he plans to discuss this topic with EPA's legal counsel, because federal agencies sometimes allow their policies and standards to take precedence over legal standards.

B. Risk and Biology of Arsenic

Dr. Lee Monsein, RAB Member, presented information on human health concerns and the risk analysis issues associated with arsenic-contaminated soil. This information was previously presented at the October 2008 RAB meeting, and was proposed as a current agenda topic for the purpose of sharing his perspective with the two relatively new RAB members who have not heard this information.

L. Monsein clarified that all information used in the presentation is based on his own research and reflects his own opinions. He noted that the overall message of the presentation is more important than the specific numbers.

Introduction: Arsenic is a ubiquitous and poisonous chemical that causes serious health effects depending on the specific type, amount, and route of exposure.

L. Monsein noted that there are several food sources that contain arsenic and are ingested daily. The highest arsenic concentrations have been detected in fish and other seafood, apple juice, mushrooms, and rice. Although there are nationwide concerns regarding arsenic levels in food and water, this presentation focuses on human health risks caused by ingesting arsenic in soil, and specifically whether cleaning up arsenic-contaminated soil in Spring Valley is worth the cost.

History: Historically, arsenic was used during production of decorative items made of bronze and other metals. Prior to the development of penicillin, arsenic was used as a medical treatment for syphilis, and was recently adopted for use in successfully treating patients with a specific type of leukemia. Arsenic was more recently used for industrial applications including making pesticides, electronics, glassware, alloys, wood preservatives, and livestock growth promoters. Residential properties voluntarily began using pressure-treated wood that was not treated with arsenic, and arsenic-treated wood was phased out. The United States stopped all raw arsenic production in 1985, but continues to import large quantities of arsenic from China for manufacturing purposes.

Chemical Structure: L. Monsein described the chemical structure of arsenic, with an atomic number of 33 and an atomic weight of 74.92. Arsenic is a heavy metal that is located in Group 15 of the periodic table. The behavior of arsenic in biological systems resembles the behavior of other Group 15 elements, such as antimony, phosphorous, and nitrogen. As a trace element, a tiny amount of arsenic is required by biological systems. Humans have been exposed since birth, and studies show that animals cannot thrive if arsenic is depleted from their systems. Arsenic exists in many forms and interacts with biological systems differently depending on the number of electrons it possesses. Organic forms of arsenic are considered less toxic than inorganic forms. Less toxic forms of arsenic have more chemical double bonds and high oxygen levels, which allow biological systems to dispense of it easily. Less-oxygenated forms of arsenic

(with fewer oxygen atoms bonded to it, and thus fewer double bonds) tend to be more potent. Arsine is a well-known example and is the most potent form of arsenic.

Measurements: Arsenic measurements are based on concentration and reveal the total amount of arsenic that is present. Parts per million (ppm) are equivalent to several other units of measurement, depending on the medium: 1 μg/g, 1 μg/ml, 1 mg/m^3, and 1000 mg/L. The proportion of non-toxic and toxic forms in a particular sample/measurement is unknown, and most of the arsenic that is present could be harmless. This makes it difficult to determine the true risk to human health and the environment posed by arsenic.

Arsenic in the environment: Arsenic is naturally present in soil, water and air. Other arsenic sources are man-made, including pesticides, feed materials for cattle and poultry, and ash residue from power plants.

Many complex interactions occur between arsenic and the environment. Arsenic from man-made materials can infiltrate air, soil and water, where it reacts with other elements and binds to soil particles. Plants can absorb arsenic, and it can be metabolized by organisms as small as microbes.

- Arsenic occurs naturally in the earth's crust and is associated with ores and minerals. Concentrations in the crust range from 2 to 5 ppm (which is the natural background level of arsenic), while concentrations in soil range from 1 to 40 ppm (with an average of 5 ppm). This naturally-occurring arsenic represents most of the arsenic found in soil, and probably explains most of the arsenic found in Spring Valley. Most arsenic present in soil actually binds to and stays bound to soil particles.
- Arsenic is present in groundwater and surface water due to natural weathering of soil and rocks as well as volcanic activity. Concentrations are typically higher in areas that naturally possess elevated arsenic soil levels. (Anthropogenic sources of arsenic in water include mining, smelting, waste water, and urban runoff.)
- Arsenic in air can result from volcanic activity and natural weathering of arsenic-rich soils.

Arsenic and human physiology: There are two types of arsenic, which interact very differently with biological systems. Organic arsenic is readily excreted and does not cause adverse effects. Inorganic arsenic is metabolized by the body and is not excreted, with the potential to cause health effects.

When inorganic arsenic enters the human body, it is absorbed by the lungs, nasal membranes and the GI tract, and can be metabolized and oxidized by the liver, followed by excretion primarily in urine but also via fast-growing tissues and sweat. Inorganic arsenic is also mentholated by the body, and these arsenic compounds can accumulate and cause damage to human physiology. The toxicity of inorganic arsenic has been examined via numerous human and animal studies.

In contrast, any absorption and accumulation of organic arsenic is miniscule. No studies have focused on organic arsenic exposure based on the assumption that is does not accumulate in the body.

L. Monsein stated that the mechanism by which arsenic can cause health issues is not well understood. This is reflected in current EPA guidance documents, where regulators conservatively assume the worst case (that most or all arsenic is harmful, even though arsenic measurements/samples could contain a significant portion of non-toxic arsenic) because arsenic effects cannot be accurately modeled until the mechanism of action is better understood. As a result, cancer risks from high arsenic exposure levels are extrapolated to low level exposures, even though risks of low arsenic levels have not been proven.

L. Monsein noted that arsenic does not directly cause cancer, because it does not break down chromosomes and is not considered mutagenic. Arsenic probably indirectly promotes cancer by affecting proteins and enzymes and by interfering with the DNA repair mechanism, which normally fixes broken chromosomes caused by compounds such as medications and radiation. If the DNA repair mechanism fails, cancerous cells and tumors may develop.

Arsenic exposure in humans: Short-term arsenic exposure is measured by taking urine samples within a few days of exposure, as the half-life of arsenic in the human body is about 4 days. Long-term arsenic exposure can be measured from hair and fingernail samples. Blood samples are not effective because the half-life of arsenic in blood is 1 hour.

L. Monsein emphasized that the largest source of arsenic consumed by humans is in food. Seafood contributes approximately 75 percent to 95 percent of the inorganic arsenic consumed by adults and children, followed by soil for infants, water for adults and children, and air for adults and children. Occupational exposures (such as inhalation or inorganic arsenic) can be much higher.

The maximum allowable limits according to the FDA and the EPA are much higher than the concentration of inorganic arsenic that is normally ingested by humans. In order to ingest a harmful amount of arsenic from soil, a person must consume a small amount of arsenic-contaminated soil with a concentration of around 10,000 ppm, and this concentration is much higher than any contaminated soil in Spring Valley. In Spring Valley, the significant cost of arsenic remediation prevents an additional exposure of 4 ug/day. This amount of arsenic does not account for 20% absorption, and it poses very little risk to residents.

Arsenic remediation: L. Monsein noted that the primary focus of this presentation is to reflect on arsenic exposure levels at the residential level. Acceptable exposure levels vary depending on who defines the levels. In environmental cleanup scenarios, regulators conservatively assume that most or all arsenic is harmful.

Currently, the acceptable arsenic exposure level in drinking water is 10 ppb, which is much higher than actual arsenic intake, and which is much higher than arsenic levels detected in Spring Valley groundwater. The EPA is proposing a much lower acceptable exposure level for arsenic in drinking water, and it would be extremely expensive to remediate nationwide drinking water sources to meet the new requirement.

For soil, the 20 ppm arsenic cleanup goal for Spring Valley was originally calculated using the FDA's oral slope factor or cancer slope factor, which determines cancer risks associated with exposure. Remediating Spring Valley soil to a concentration of 20 ppm arsenic results in a risk of 1 in 10,000 people developing cancer. However, this does not account for only 20% absorption of inorganic arsenic within the digestive tract.

New EPA guidance proposed that the oral slope factor for arsenic in soil change from 1.5 to 2.5, which means that to reduce arsenic cancer risks to the same 1 in 10,000 people statistic all soil would need to be remediated to a concentration of 0.24 ppm arsenic. This would be extremely costly considering that worldwide background arsenic concentrations in soil range from 2 ppm to 5 ppm. Additionally, the oral slope factor is difficult to model because the mechanisms by which cancer is caused by arsenic are unknown, and the major arsenic exposure risks now appear to be associated with lung and bladder cancer instead of skin cancer.

Medical: Arsenic is a known carcinogen and is also blamed for a variety of other ailments. The published daily arsenic exposures that cause cancer and other ailments are much higher than the acceptable exposure limits. High-risk arsenic levels, which assume consistent daily exposure over many years, include 25,000 ug/day (lung cancer), 3000 ug/day (anemia), and 300 ug/day (neurological issues). The EPA Integrated Risk Management System (IRIS) provides two types of exposure levels: No Observable Adverse Effect Level (NOAEL) and Lowest Observable Adverse Effect Level (LOAEL). These levels are hundreds of ug/day above actual daily exposures in Spring Valley. Therefore, a large discrepancy exists between arsenic quantities actually ingested on a daily basis and arsenic quantities that cause severe health issues.

Relative Risks: L. Monsein shared information to put arsenic-related risks in perspective. In comparison to common causes of fatality, the risk of death caused by arsenic exposure is negligible. The relative risk for arsenic-related cancer deaths is far lower than the relative risk for fatalities caused by automobile accidents, fires and floods. Based on normal daily human exposure levels over a 30-year period, the

likelihood of an individual dying from arsenic-related cancer (1 in 10,000 people) is similar to the likelihood of an individual dying from a lightning strike or electrocution. Other similar risks over a 30-year period include smoking 4.6 cigarettes per year, drinking 1.6 liters of wine per year, or receiving 3 chest x-rays per year.

L. Monsein noted that the likelihood of an individual dying from arsenic-related cancer (1 in 10,000 people) is the risk that is addressed by remediating Spring Valley soil to the cleanup level of 20 ppm arsenic. This risk is based on the highly conservative assumption that children will consume 200 mg per day and that adults will consume 100 mg per day over a 30-year period.

Relative Cost: L. Monsein described his perspective on the relative cost per life-year saved. Relative cost per life-year saved is calculated using potential arsenic exposure risks and the cost of arsenic remediation on Spring Valley lots. In comparison, the relative cost of requiring shoulder seat belt usage or prenatal care is negligible. The prevention level for arsenic assumes that residents ingest arsenic-contaminated soil, 100% of ingested arsenic is absorbed into the human body, all arsenic in the soil is toxic, and residents will live in Spring Valley for at least 30 years. These assumptions are very conservative and present unlikely scenarios.

Summary: L. Monsein summarized his opinions on arsenic. It is ubiquitous and is found around the world in food, air, water, and soil. Human exposure is mostly via consumption of food and water. Health effects are likely caused by various complex reactions between arsenic, other heavy metals, and biological systems. Even moderate environmental arsenic levels do not necessarily lead to human exposure, and low-level exposure risks are almost non-existent. The link between arsenic and cancer is weak, as cancer risks have only been demonstrated at extremely high arsenic exposure levels, while low-level cancer risks are based only on linear extrapolation of data. The benefits of arsenic remediation do not outweigh the tremendous costs, and it is not the best use of monetary resources that could be used to benefit society as a whole.

Question from L. Miller, RAB Member – How much soil equates to a volume of 100 to 200 mg?

L. Monsein replied that a small vial would hold approximately 100 to 200 mg of soil.

Question from S. Rafferty, Audience Member – – There are currently models for lung cancer risk associated with arsenic for adults. What scientifically-validated studies have involved children, other than studies noting the suspected relationships between arsenic and the nervous system?

L. Monsein explained that there are not currently any good animal models for human cancers that are potentially associated with arsenic. Currently, the best model comes from direct infusions of inorganic arsenic in rats and mice, instead of using the organic arsenic that humans would be exposed to.

L. Monsein added that it is difficult to model arsenic exposure risks for children compared with adults because children have a different metabolism. For example, children excrete a different amount of methylated arsenic (which contributes to development of bladder tumors) compared with adults. There are no good epidemiological studies that examine the causes of adult versus child cancers due to exposure to low arsenic levels.

Comment from S. Rafferty, Audience Member – This is a matter of risk management. If thousands of children are exposed to an area of disrupted arsenic-contaminated soil over the years, wouldn't it be appropriate to focus on sampling and remediation concerns in that type of environment? For example, children have spent up to several years at a school where they ate vegetables from gardens, played in soil close to the ground, and inadvertently ingested soil.

L. Monsein noted that soil ingestion data is not available, and all of the presentation information is intuitive. The EPA conservatively assumes the worst case (daily ingestion of 200 mg of arsenic per child, with 100 percent absorption of the arsenic), but the actual values are lower (daily ingestion of roughly 50 mg arsenic with approximately 20 percent absorption). As a result, the question becomes whether

significant funding (trillions of dollars) should be spent on cleaning up arsenic-contaminated soil, or whether other health concerns such as prenatal care or lead abatement are more cost-effective and have greater social impact.

L. Monsein noted that the maximum permissible limit for arsenic in soil and water should be zero. Less arsenic contamination is always better. However, the exposure and health risks associated with low arsenic levels are very small and have not been scientifically proven, and the money spent on remediating soil to very low arsenic levels would be better spent elsewhere.

Question from P. Dueffert, RAB Member – Do you have a map of the District of Columbia that shows background arsenic levels in soil?

L. Monsein replied that there are overall maps showing background arsenic levels across the country. For example, portions of California, New Mexico, and Texas have native soil with background arsenic levels around 50 ppm, while the baseline arsenic concentration in the Mid-Atlantic area is approximately 3 to 5 ppm.

Question from P. Dueffert, RAB Member – Based on the new RAB member orientation, I'm under the impression that coal burning activities may have caused elevated arsenic levels in soil. Does that explanation make sense?

L. Monsein explained that the source of elevated arsenic levels exceeding 20 ppm has not been determined. The Army Corps chose to remediate arsenic levels in all soils throughout the Spring Valley project area without spending significant efforts on determining the original arsenic sources.

L. Monsein emphasized that background arsenic levels in the Spring Valley area are significantly lower than for many western states with smelting plants and similar arsenic sources.

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Question from K. Slowinski, Audience Member – What is the arsenic level above which you think that arsenic exposure is not safe?

L. Monsein explained that arsenic is considered dangerous at any level. Intuitively, individuals are probably at risk from concentrations exceeding 0 ppb arsenic. A more appropriate question is as follows: at what arsenic concentration is it practical to draw the line for remediation purposes? For example, if the FDA selected a remediation goal of 0.2 ppb arsenic in soil or groundwater, it would be an unreasonably strict requirement and the associated remediation cost would bankrupt the entire project.

Question from G. Durrin, Audience Member – Are you familiar with Superfund research conducted by Dr. Joshua Hamilton at Dartmouth College, which showed that arsenic is an endocrine disruptor that enables diseases to develop even though it is not the direct cause of illness?

L. Monsein confirmed that this information is reflected in his summarized list of disorders for which arsenic is a contributing factor, and also reflected in the graphs associated with arsenic exposure studies.

Comment from G. Durrin, Audience Member – I would urge the RAB and audience members to review research which shows that arsenic enables the development of diseases. Arsenic is the primary chemical of concern that presents a danger to the Spring Valley community.

L. Monsein noted that arsenic's final mode of action is unknown, based on information from the best scientific minds in the field of medicine as well as experts within government health agencies. There may be hundreds of ways in which arsenic can damage human biological systems, including acting as an endocrine disruptor.

G. Durrin mentioned that arsenic has been shown to disturb specific genes, and individuals can have their DNA tested to determine whether these genes have suffered damage.

L. Monsein acknowledged that this is one of many ways in which arsenic can affect human health.

G. Beumel added that during this discussion, L. Monsein emphasized that any arsenic level exceeding zero is dangerous. This presentation was prepared from a public health perspective, which examines the relative risks of costly arsenic soil remediation versus the use of seatbelts and other less costly methods for protecting human health. The costs are prohibitive for remediating arsenic in soil down to 0 ppb.

G. Durrin agreed that the most dangerous health concern should certainly be addressed first. However, other viewpoints on the biological effects of arsenic should also be presented, instead of relying solely on a medical professional's point of view. Academic perspectives should also be presented, such as the researcher from Dartmouth.

G. Beumel noted that a separate viewpoint is already provided by the regulatory partners (EPA and DDOE). As mentioned earlier, L. Monsein feels that the current remediation levels for arsenic in soil are higher than necessary and thus a waste of money and it will not be cost-effective to lower these remediation levels to an even stricter value.

Comment from S. Rafferty, Audience Member – Considering that millions of dollars have been spent on remediating the Spring Valley neighborhood, why did you not proactively inform the neighborhood that they should not use wooden fences that were pressure-treated with arsenic, which would have resulted in zero cost to the government? Now, years later, despite the U.S. Army having taken responsibility for cleaning up the soil contamination, you are saying that arsenic-treated wood fencing may have caused our soil contamination.

The audience member explained that Horace Mann Elementary School has conducted numerous renovations when it would have been inexpensive to sample existing soil prior to Astroturf installation. Why hasn't soil sampling been conducted to nearly the same level as sampling completed for residential areas adjacent to Spring Valley?

L. Monsein replied that he does not have information related to Horace Mann sampling. He emphasized points acknowledged in his summary of arsenic issues. Arsenic presents a danger to human health at any level above zero; arsenic contamination in soil is very expensive to remediate; and the primary question is what level the arsenic remediation threshold should be set at.

Comment from S. Rafferty, Audience Member – The arsenic cleanup level is not the primary concern. The problem is that the Spring Valley project is simultaneously ineffective and a ridiculous waste of money. The project has not addressed high impact areas such as Horace Mann, which should have received immediate attention at the beginning of the Spring Valley project, instead of spending significant time remediating arsenic-contaminated soil elsewhere within the FUDS. Only 30% of this property was sampled, followed by hardscape installation during renovations.

K. Connell thought that Horace Mann is not part of the Spring Valley FUDS and the arsenic sampling goals do not apply to that property.

The audience member clarified that Horace Mann is situated within the FUDS boundary.

Comment from G. Beumel, Community Co-chair – After the meeting, D. Noble can talk with you about the arsenic sampling completed at Horace Mann. This information has been presented at previous RAB meetings.

The RAB thanked Dr. Monsein for sharing his perspective on arsenic issues.

IV. Open Discussion and Agenda Development

A. Next Meeting: Tuesday, June 12, 2012

Upcoming meetings will be held in June and July 2012.

RAB meetings are not held in August or December.

Minutes of May 8, 2012 RAB Meeting

B. Future agenda topics

- Update on the ATSDR Health Consultation for 4825 Glenbrook Road
- Spring Valley Follow-On Health Study Update (Johns Hopkins University)
- Evaluation of Remaining Site-Wide Sampling Requirements

C. Open Discussion

No additional topics were discussed.

VI. Adjourn

The meeting was adjourned at 9:06 PM.