



SPRING VALLEY FORMERLY USED DEFENSE SITE PROJECT
RAB Meeting

September 12, 2017
7:00 – 8:30 p.m.

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

Agenda

- 7:00 p.m. I. Administrative Items**
Co-Chair Updates
 ▪ Introductions, Announcements
- 7:05 p.m. II. USACE Program Updates**
Site-Wide Remedial Design/Remedial Action
Groundwater Study
Summary of historic and current work at 4835 Glenbrook Road
4825 Glenbrook Road
- 8:00 p.m. III. Community Items**
- 8:10 p.m. IV. Open Discussion & Future RAB Agenda Development**
Upcoming Meeting Topics:
 ▪ (Suggestions?)

 *Next meeting: November 14, 2017
- 8:20 p.m. V. Public Comments**
- 8:30 p.m. VI. Adjourn**

**Note: The RAB meets every odd month.*

SPRING VALLEY FORMERLY USED DEFENSE SITE

Restoration Advisory Board Meeting 12 September 2017

“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.”

“The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.”



AGENDA REVIEW

Co-Chair Updates

- Introduction, Announcements

USACE Updates

- Site-Wide Decision Document
- Groundwater Study
- Summary of historic and current work at 4835 Glenbrook Rd
- 4825 Glenbrook Road

Community Items

Open Discussion & Future RAB Agenda Development

Public Comments





CO-CHAIR UPDATES

Introductions

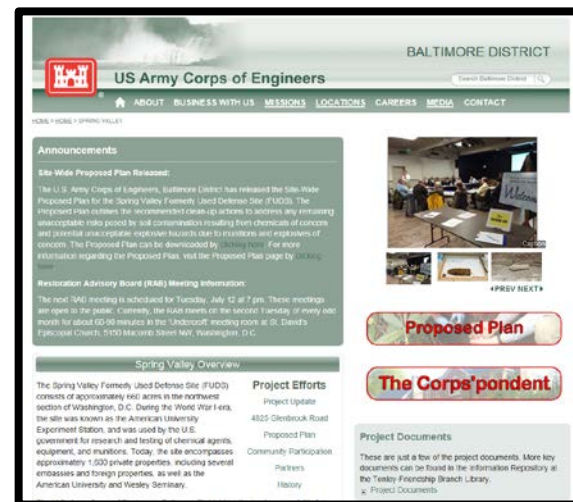


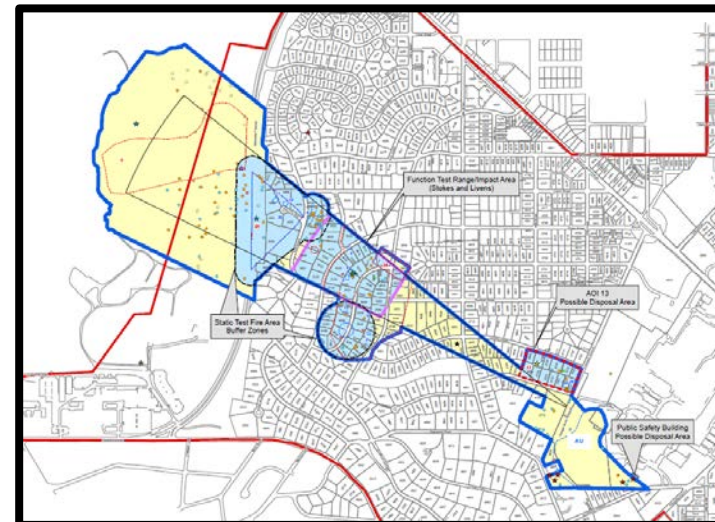
CO-CHAIR UPDATES

Announcements

– Website Updates:

- July and August Monthly Site-Wide Project Updates
- Weekly 4825 Glenbrook Rd Project Updates with photos
- July RAB meeting minutes
- June RAB conference call discussion summary
- Updated Project Overview Timeline





SITE-WIDE REMEDIAL DESIGN / REMEDIAL ACTION

USACE Updates



SITE-WIDE DECISION DOCUMENT

Our contractor team is drafting the Site-Wide Remedial Design Work Plans. These plans will develop the details of carrying out the selected remedial alternatives and will be reviewed by the Army Corps team and our Partners (EPA and DOEE).

Tentative Schedule

✓ June 15, 2017	Signed the Decision Document .
✓ June 30, 2017	Contract awarded.
July 2017	Begin Remedial Design .
~ Fall/Winter 2017-2020	Conduct Remedial Action field work, including at the former Public Safety Building site at AU.



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GROUNDWATER STUDY

USACE Updates



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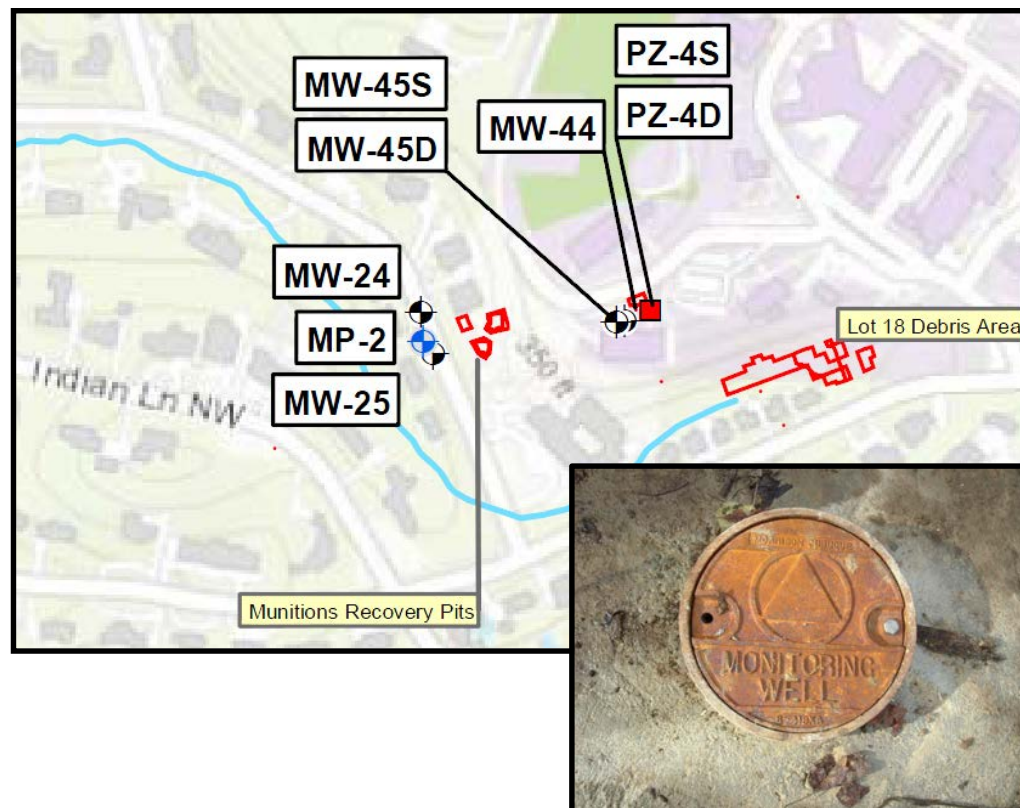
GROUNDWATER FEASIBILITY STUDY

The Army Corps received the regulatory Partners comments on the draft Groundwater Feasibility Study (FS) and continue to prepare responses.

Once the comments are addressed and the FS is finalized, the team will begin drafting the Groundwater Proposed Plan.

Tentative Schedule:

- Address Partner comments and finalize Feasibility Study - Fall 2017.
- Proposed Plan, public comment period, public meeting - Winter 2018.
- Finalize Decision Document - Summer 2018.



SUMMARY OF HISTORICAL AND CURRENT WORK AT 4835 GLENBROOK ROAD

USACE Updates

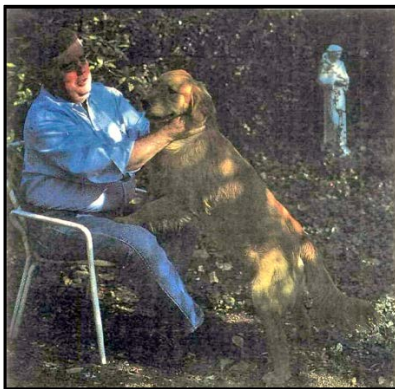


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4835 GLENBROOK ROAD

The 4825 and 4835 Glenbrook Road properties were both developed and under construction from spring of 1992 through fall of 1993. House construction occurred at both properties almost simultaneously, with 4825 Glenbrook Road being the first house footprint to be excavated and cement poured.

The initial soil excavations at the Glenbrook Road parcel were reported to have been conducted by a site foreman and equipment operator, who had consistently worked at various MD/VA/DC projects for the real estate developer. This effort was occasionally observed by an AU employee and a nearby resident.



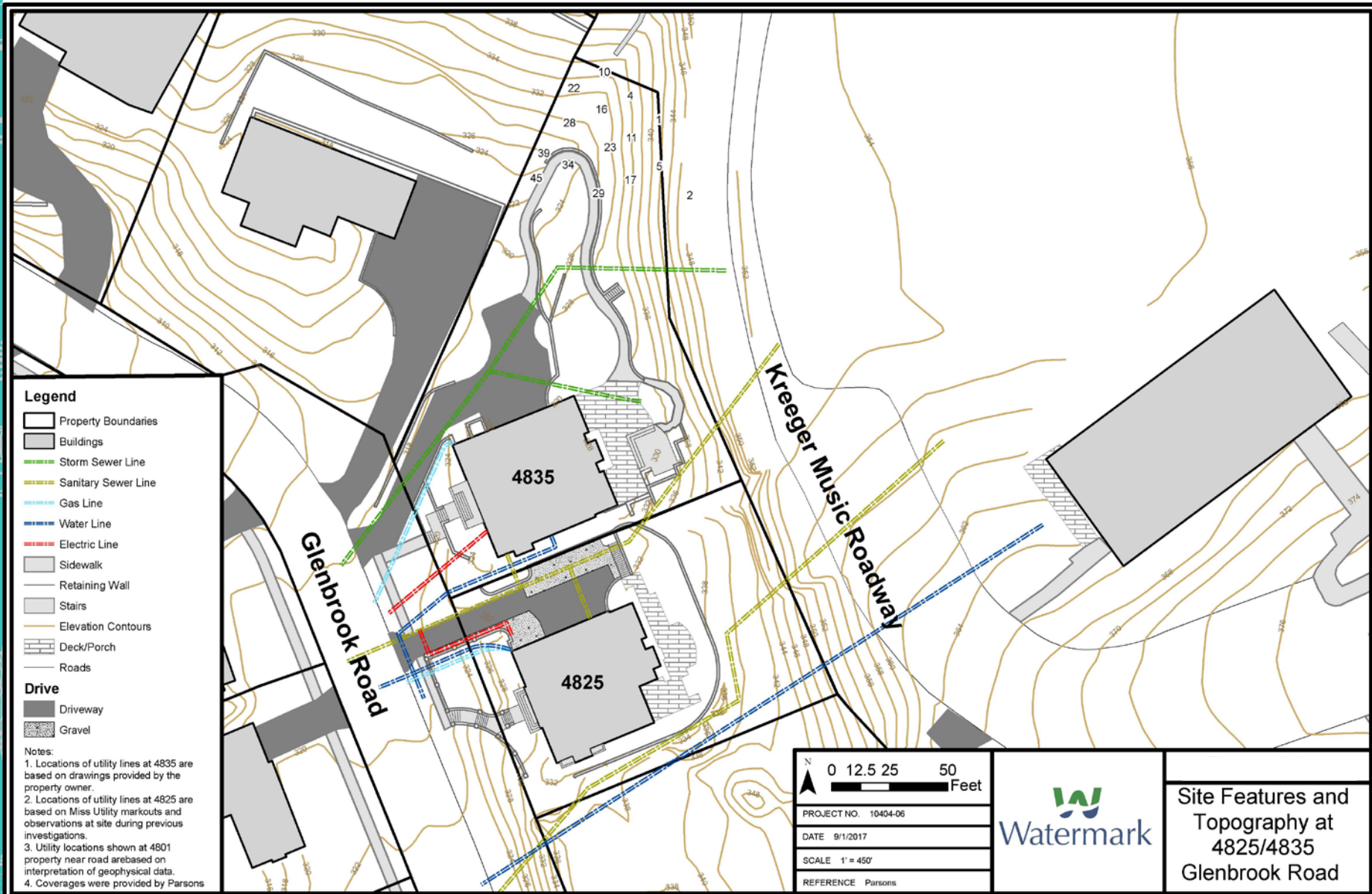
Some of the house construction workers and tradesmen were local and others were from West Virginia. They worked onsite to build the exterior and interior of the two homes, and the hardscape elements in both yards.



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SITE FEATURES AND TOPOGRAPHY

11



Overlay of Historical AU Features (1918) with Present-Day Features (1999)

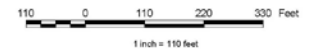
Spring Valley Operable Unit 3
Washington D.C.

Legend

- Rails, 1918
- Roads, 1918
- Roads, 1999
- Fence and Property Line, 1918
- Fence, 1999
- Buildings, 1918
- Buildings, 1999

1918 Buildings

1. History Building
2. Ohio Hall Building
3. Pharmacological Laboratory Annex
4. Dog Kennel
5. Physiological Laboratory
6. Old Man Test Building
7. Machine Shop
8. Storage shed
9. Man Test House
10. Smoke Lab #1
11. Smoke Lab #2
12. Incinerator Lab
13. Special Photographic Lab
14. Shell Storage Pit
15. Liven's Gun Pit
16. Shell Loading Plant
17. Chemical Research Laboratory
18. Observation Station
19. Original Bomb Pit
20. T.O. P. House
21. Chemical Engine Shed
22. Reclamation Office
23. Reclamation Building
24. Explosive Lab
25. Fireworks Storage
26. General Storage
27. Dish Washing Shack
28. Toxic Storage Shed
29. Toxic Storage Shed
30. Canteen Laboratory
31. General Storehouse
32. Safety Building
33. Bacteriological Lab
34. Mechanical Building
35. Dispensary Shed #2
36. Dispensary Lab #1
37. Pharmacological Lab
38. Explosive Magazine
39. Wire House
40. Shack No. 1
41. Volatile Inflammable Building
42. Chemical Engine Shed #3
43. Warehouse and Office
44. Organic Research Shack #1
45. Organic Research Shack #2
46. Dangerous Explosives Lab #1
47. Dangerous Explosives Lab #2
48. Ice House
49. T. Refrigerating Plant
50. Acetylene Plant
51. Gas Meter
52. Furnace Shed
53. Tank
54. Sheds #6
55. Lead Burners Shop
56. Boiler House
57. Sheds #9
58. Smoke House
59. Lumber Storage Shed
60. Motor Storage Shed
61. Explosive Warehouse
62. Concrete Gun Pit
63. Fragmentation Box
64. Load Furnace House(?)
65. Mustard Laundry
66. Machine Gun House
67. Major Tolman Bomb Pit
68. Capt. Burrell Bomb Pit
69. Shed
70. Observation Tower
71. Explosive Tank Shelter
72. Range Officer's House
73. Powder Magazine No. 2
74. Detonator Storage Pit
75. Fire and Flame Lab
76. Oil Storage Shed
77. Colored Man Latrine
78. White Men Latrine
79. Horse Stable
80. Blacksmith Shop
81. Goat Shed and Corral
82. Concrete Storage Pit
83. Electrical Lab
84. Forge Shop
85. Gas Generator
86. Dog Test House
87. Dog Old Blanket House
88. Watchman's House
89. Open Shed
90. Shaving Storage
91. Inventory Lab shed
92. Detonator Shed
93. Bomb Filling Shed
94. Concrete Pit Explosives Lab
95. Oil Storage Shed



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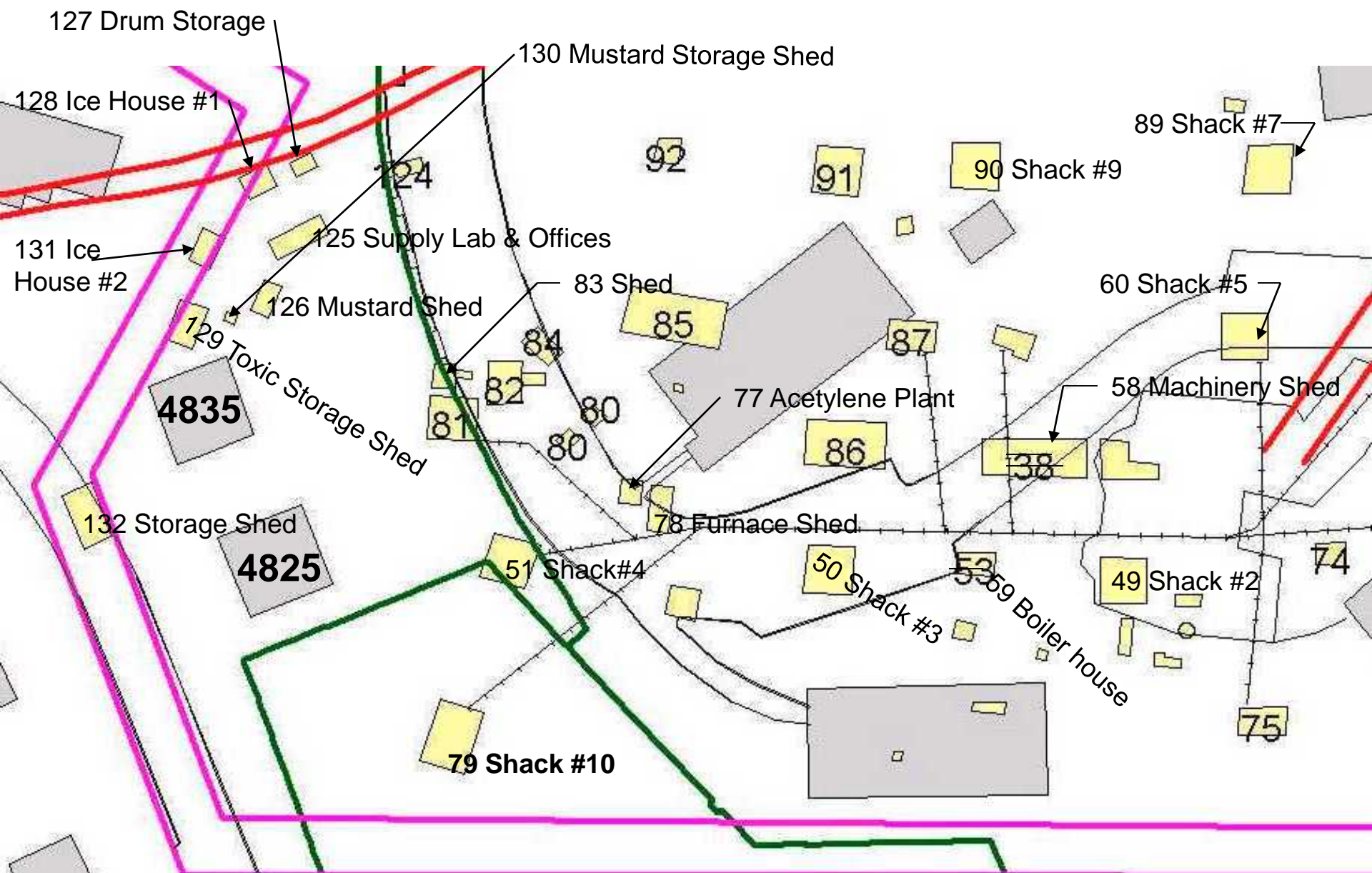
4835 Glenbrook Road NW



AUES, World War I

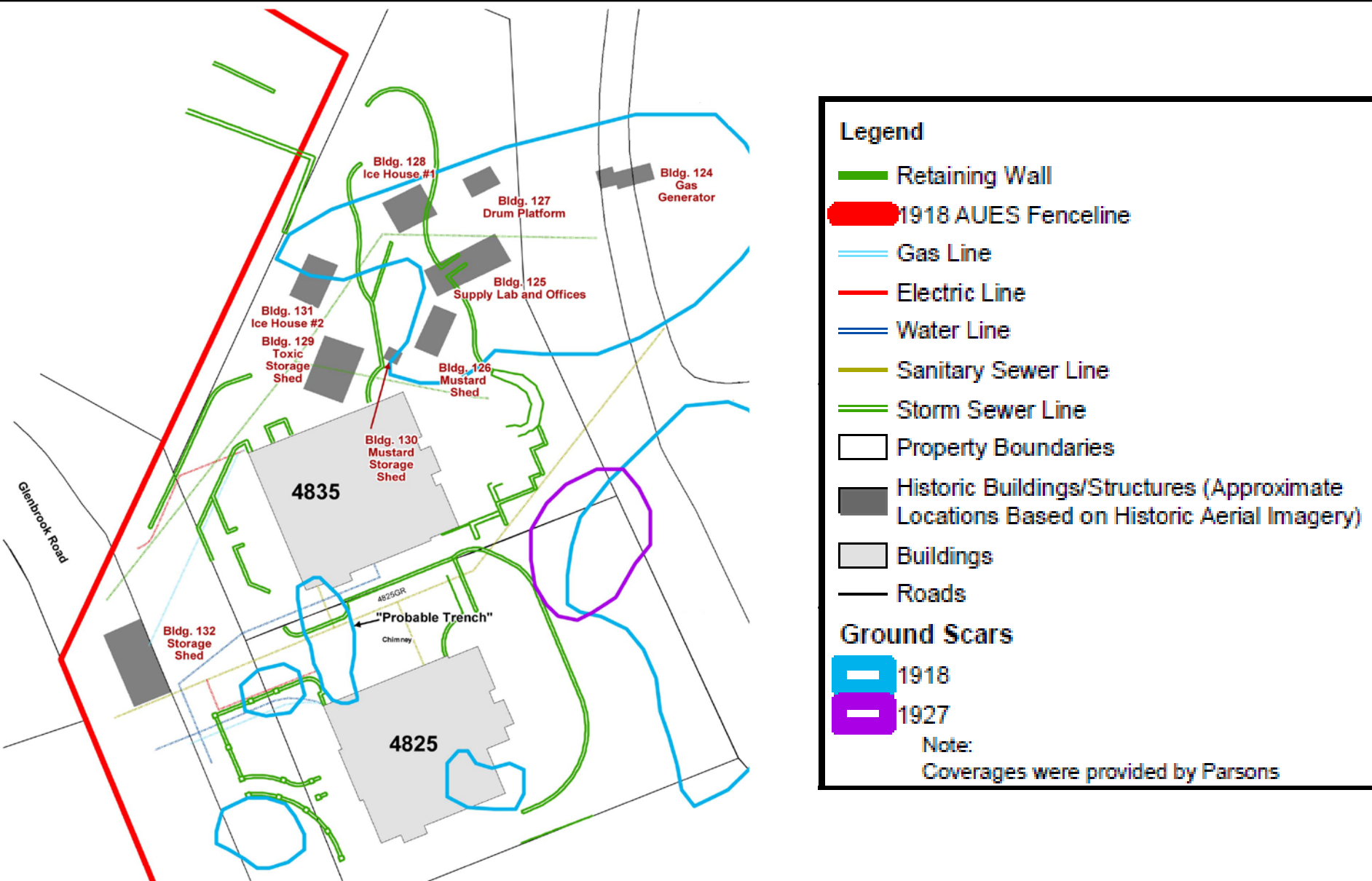
14





LOCATIONS OF HISTORIC BUILDINGS AND GROUND SCARS AT 4825 AND 4835 GLENBROOK ROAD

16



TIMELINE OF HISTORIC INVESTIGATIVE ACTIVITIES AT 4835 GLENBROOK ROAD

Activity	Date
Environmental Management Systems Investigation	1992
Apex Investigation	1996
USEPA Sampling Event	April 1999
Site Investigation of 4801, 4825, and 4835 Glenbrook Road	2000
Geophysical Survey	2002
Test Pit investigation and Arsenic Soil Removal	2007-2008
Soil Gas Gore-Sorber® Sampling (4825 Glenbrook Rd)	2007
Geotechnical Investigation	2009

ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS) 1992

While excavating the foundation for the house at 4825 Glenbrook, the developer's equipment operator complained of fumes and uncovering unusual debris. The developer stopped work and requested assistance from AU.

On May 8-9, 1992, AU asked EMS to investigate the situation. EMS reported that the worker had discovered lab jars, an empty 55-gallon drum, various pieces of lab equipment and ceramic materials. EMS conducted detailed investigations of the site including soil sampling and suspect contaminant samplings. Soil gas vapor probes revealed no presence of hydrocarbons. Further hand excavations were conducted to determine the extent of possible contamination.

"The investigation, subsequent samplings and laboratory analysis have determined that there are no hazardous, volatile or controlled substances present at the site."



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EMS 1992

On May 27, 1992 the developer notified AU that his on-site construction workers were experiencing irritation for the second time, to their eyes and faces when loading dirt into the dump trucks.

EMS inspected the site at 4825/4835 Glenbrook Road again, noticed white granular layers at the excavation site, and took additional soil samples. Their analysis showed this to be Silvex.

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ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-332-9047
FAX 410-788-8723

**PHASE
SEPARATION
SCIENCE,
INC.**

ANALYTICAL CHEMISTRY
ENVIRONMENTAL SCIENCE

CERTIFICATE OF ANALYSIS
No. 920527-06 006
Environmental Management Systems, Inc.
June 3, 1992

Analysis of: Soil Samples
Project: Glenbrook Site
Project Number: 41-262-34 (II)
Site Location: TAU Washington, DC
Analysis for Organochlorine Pesticides

Aldrin	<	100	ug/kg
a-BHC	<	100	ug/kg
B-BHC	<	100	ug/kg
g-BHC (Lindane)	<	100	ug/kg
d-BHC	<	1	ug/kg
Chlordane (Total)	<	1	ug/kg
4,4'-DDD	<	1	ug/kg
4,4'-DDE	<	1	ug/kg
4,4'-DDT	<	1	ug/kg
Dieldrin	<	1	ug/kg
Endosulfan I	<	1	ug/kg
Endosulfan II	<	1	ug/kg
Endosulfan Sulfate	<	1	ug/kg
Endrin	<	1	ug/kg
Endrin Ketone	<	1	ug/kg
Heptachlor	<	1	ug/kg
Heptachlor Epoxide	<	1	ug/kg

The above analysis was performed according to the following EPA methods:
EPA 8270: Semivolatile Organic Compounds

Reviewed by: _____

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**PHASE
SEPARATION
SCIENCE,
INC.**

ANALYTICAL CHEMISTRY
ENVIRONMENTAL SCIENCE

CERTIFICATE OF ANALYSIS
No. 920527-06 007
Environmental Management Systems, Inc., Inc.
June 3, 1992

Analysis of: Soil Sample 052692-1CM
Project: Glenbrook Site
Project Number: 41-262-34 (II)
Site Location: TAU Washington, DC
Analysis for Chlorinated Herbicides

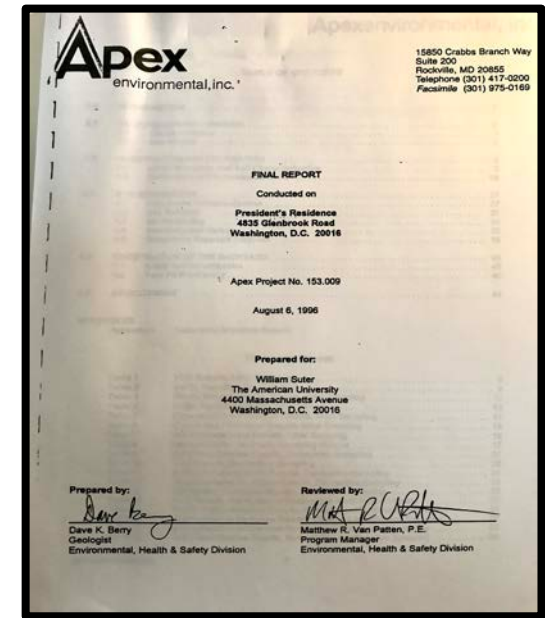
2,4-D	<	10	ug/kg
2,4,5-TP (Silvex)		13	ug/kg

The above analysis was performed according to procedures described in the following EPA methods:
EPA 8150: Chlorinated Herbicides

Reviewed by: _____
Quality Assurance Chemist

4835 GLENBROOK APEX REPORT

On June 7, 1996, American University landscape workers and contractor encountered unidentified chemical waste at 4835 Glenbrook Road after a soil plug was removed to plant a tree approximately eight feet from the southeast corner of the house. The workers were overcome by odors that burned their eyes and had to cease activity.



AU (as owner of the property) contracted Apex Environmental, Inc. to perform a preliminary emergency response, which was followed by an investigation of the property, and contaminated soil removal from the initial hole.

- The excavated pit was approximately six feet in diameter and four feet deep. There were numerous laboratory bottles and broken glass pieces recovered. After soil gas vapor probes and soil borings in the front yard, this pit was over-excavated to an approximate 12 ft. diameter and 6 ft. deep.



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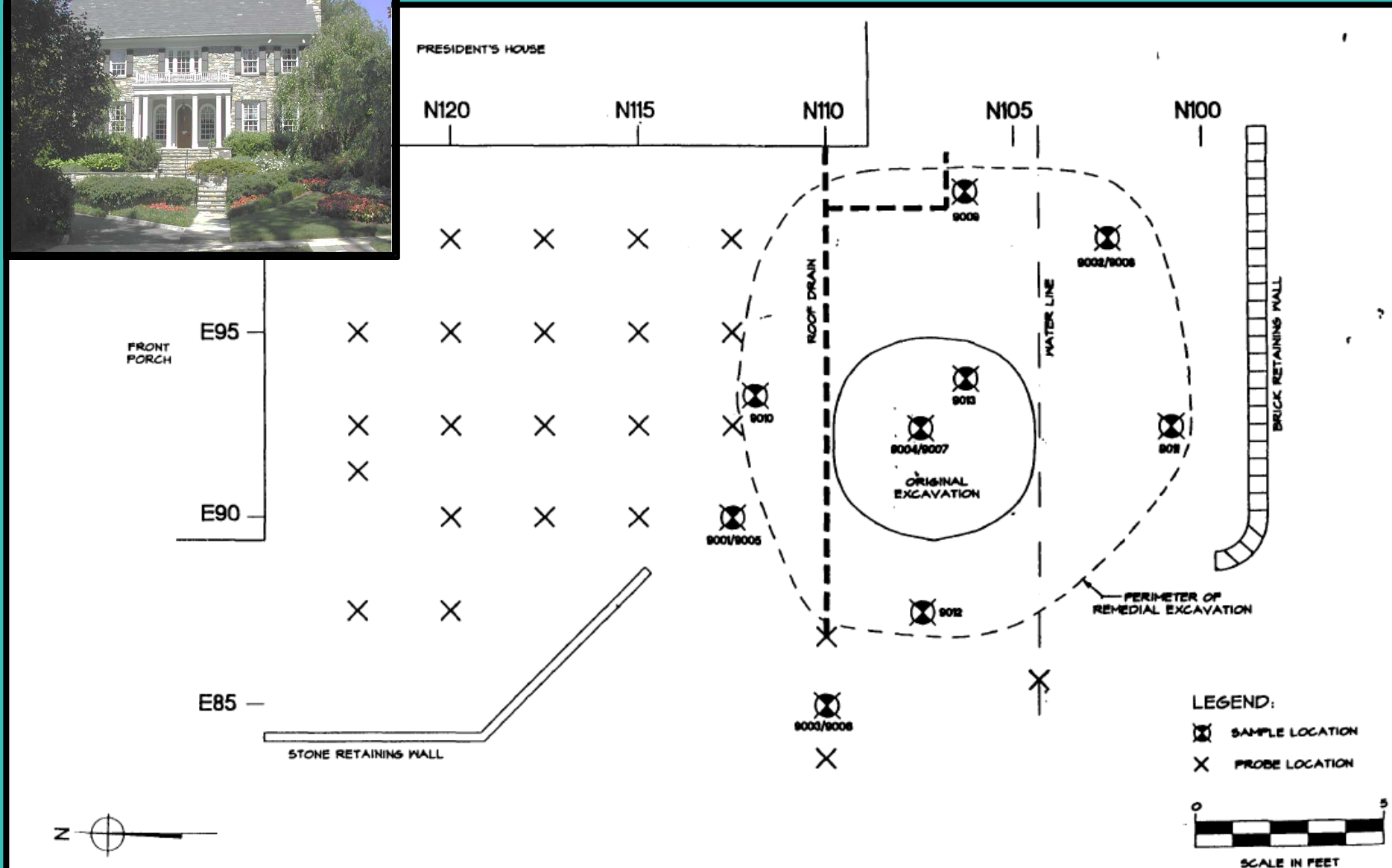


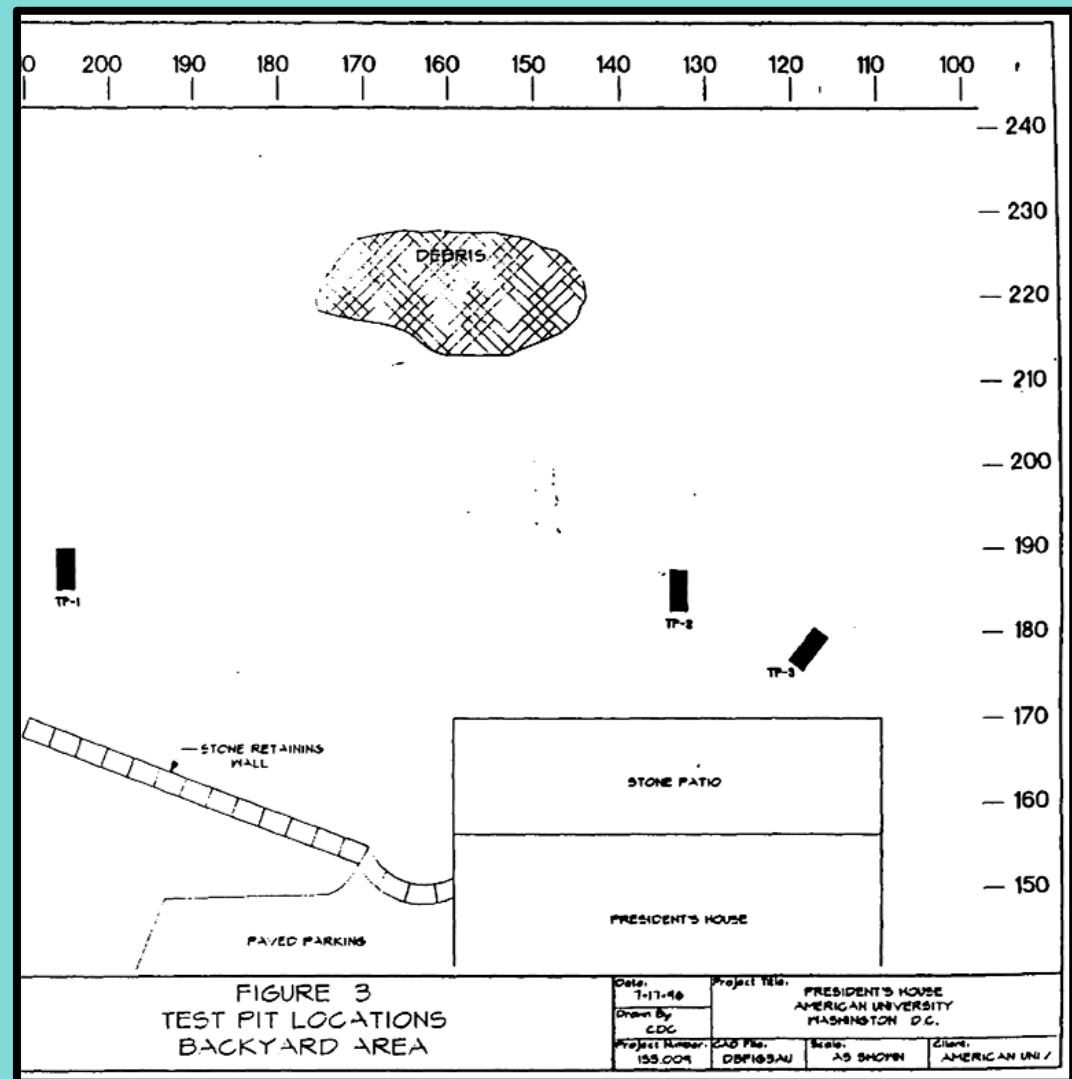
FIGURE 1
PROBE AND SAMPLE LOCATIONS
FRONT YARD AREA

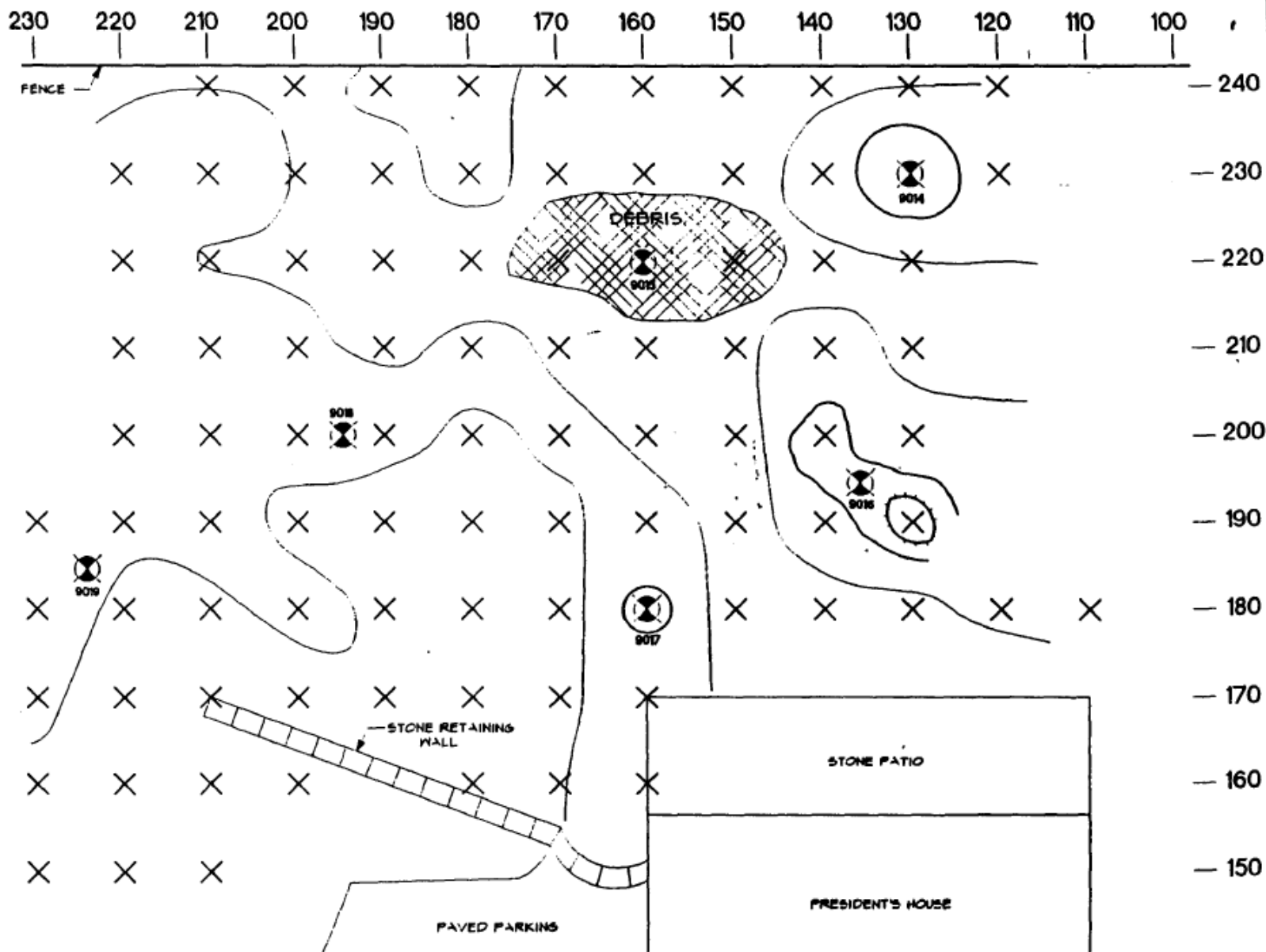
4835 GLENBROOK APEX REPORT

The back yard was also intrusively investigated by digging two test pits to a depth of 9 ft. and a third test pit to a depth of 7 ft.

A photoionization detector (PID) was used to screen the soils for VOCs. No elevated readings were detected in the air or soil during excavation of the three pits. Soil samples were analyzed for VOCs and metals. The results indicated no elevated concentrations of VOCs or metals in the soil.

Interior and exterior air samples were also collected. All of the levels were below the detection limits, except for a sample collected inside the house in the corner of the basement at the window nearest the excavation.





LEGEND:

⌚ SAMPLE LOCATION

X PROBE LOCATION

— 100 ppm

— 10 ppm

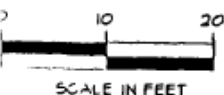


FIGURE 2
PROBE AND SAMPLE LOCATIONS
BACKYARD AREA

15850 CRABBS BRANCH WAY
SUITE 300
ROCKVILLE, MARYLAND 20855
TELEPHONE: (301) 417-0200
FACSIMILE: (301) 975-0169

Date: 7-12-96

Drawn By:
SJR

Project Number: 159.009

Project Title:

PRESIDENT'S HOUSE
AMERICAN UNIVERSITY
WASHINGTON, D.C.

Scale:

AS SHOWN

Client:

AMERICAN UNI.

EPA SAMPLING EVENT



To address the DOEE's concerns that an adequate investigation was conducted, the USEPA collected soil samples in April 1999 at 4835 Glenbrook Road to supplement their Human Health Risk Assessment.

On April 20 1999, USEPA collected surface soil samples (0-6 inches below ground surface) from 4835 Glenbrook Rd.

On June 9 1999, USEPA collected additional surface, subsurface samples from borings (0-6 inches, 3-4 feet, 6-7 feet and 9-10 feet). The samples were analyzed for inorganics (metals), VOCs, SVOCs, pesticides, and PCBs. Except for arsenic, all results were non-detect or below the USEPA Region III risk-based concentrations.

One location at 4835 Glenbrook Rd. had arsenic concentrations greater than 20 ppm (26.7 ppm).



USACE SITE INVESTIGATION

Based on the results of this sampling, USACE performed a site investigation in 2000 to support the EE/CA:

- Surface soil samples were collected for the mustard ABPs dithiane, oxathiane, and thiodiglycol.
- Grid located soil samples collected for arsenic analyses were also conducted to identify areas for soil removal.

A risk assessment, based on samples results obtained through October 2000, indicated that exposure to soils at 4835 Glenbrook Road did not exceed USEPA's target cancer risk range and there were no exceedances of the non-cancer risk criteria.



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GEOPHYSICS AND TEST PITTING

Geophysical surveys were performed at 4835 Glenbrook Road in 2002. The results of the surveys were not conclusive due to the presence of landscape and cultural features, as well as fill material. Therefore, USACE, along with our partner regulatory agencies, determined that a test pit investigation was warranted. The test pit investigations and arsenic contaminated soil removal occurred between August 2007 and December 2008.

Approximately 539 cubic yards of arsenic-impacted soil was removed and disposed off-site.

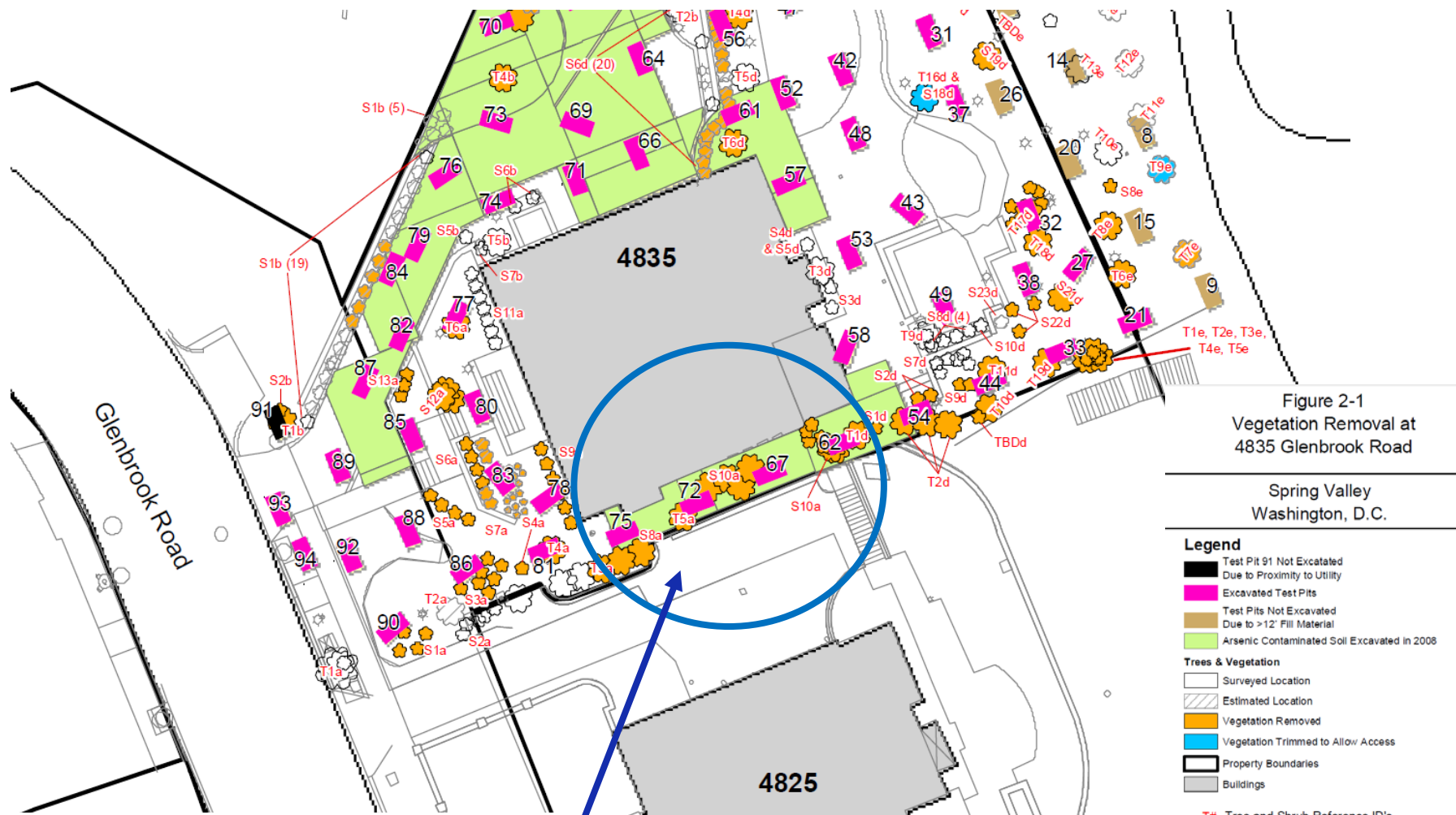


Of the 76 (3ft. x 6ft.) test pits excavated (to 12ft. bgs or bedrock), AUES-related lab ware component fragments (glass tubing, stoppers, glass fragments, etc.) were recovered from 13 of the test pits and a Livens projectile was recovered from one test pit. At eight of the test pits modern cultural debris was observed at the same depth or below the depth of the AUES-related lab ware or the Livens projectile.



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4835 GLENBROOK ROAD



Nine 35' Leyland Cypress trees.



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EXTENSIVE TEST PITTING AND CONTAMINATED SOIL REMOVAL AT 4835 GLENBROOK ROAD 2007-2008

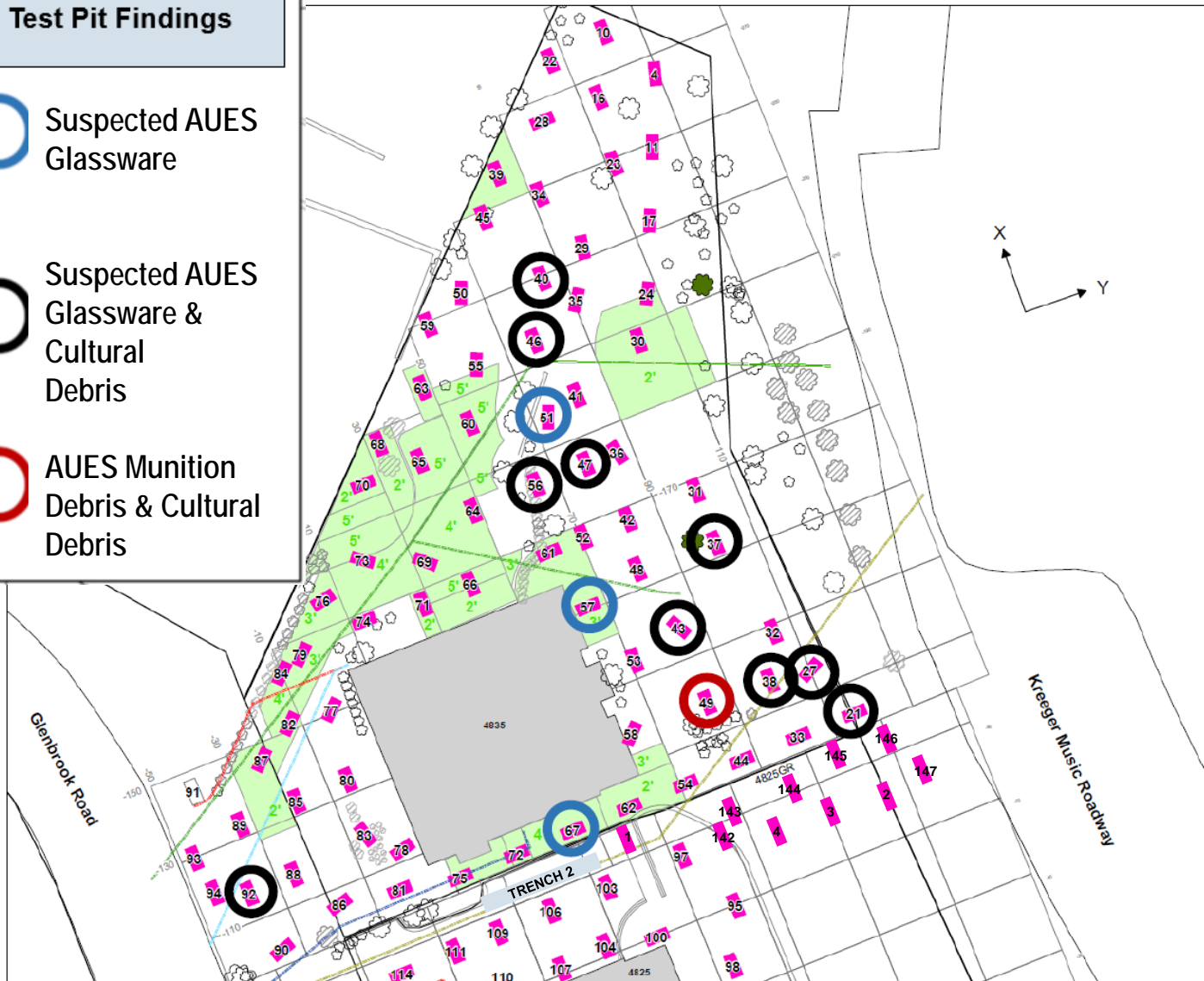
28



4835 GLENBROOK ROAD

4835 Glenbrook Road Test Pit Findings
















-  Suspected AUES Glassware
-  Suspected AUES Glassware & Cultural Debris
-  AUES Munition Debris & Cultural Debris



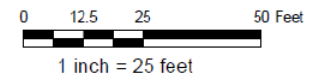
Working Map-Extents
Driveway Arsenic
4835 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

-  Arsenic Grid Excavated 2008
-  Excavated Test Pits
-  Unexcavated Test Pit Due to Proximity to Utilities
-  Property Boundaries
-  Buildings
-  20' Grid
-  Gas Line
-  Electric Line
-  Water Line
-  Sanitary Sewer Line
-  Storm Sewer Line
-  Trees & Vegetation
-  Surveyed Location
-  Estimated Location
-  Vegetation Trimmed to Allow Access

Note: The grid systems at 4825 & 4835 Glenbrook Road are slightly offset from each other (east to west) as shown.



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Date: 5/21/2009
Figure Number:
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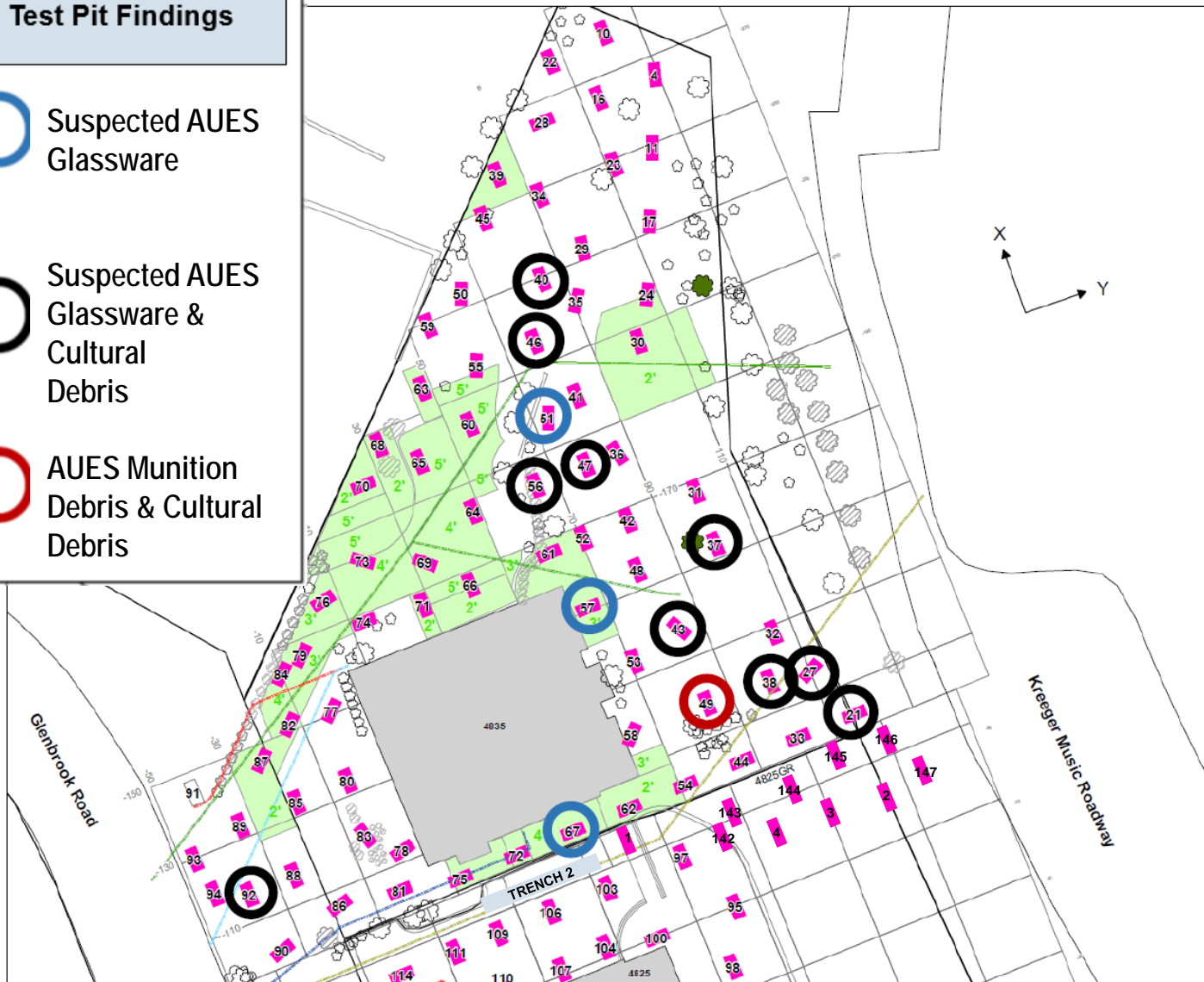
PARSONS



4835 GLENBROOK ROAD

4835 Glenbrook Road Test Pit Findings















-  Suspected AUES Glassware
-  Suspected AUES Glassware & Cultural Debris
-  AUES Munition Debris & Cultural Debris



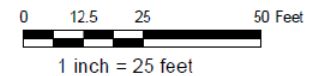
Working Map-Extents
Driveway Arsenic
4835 Glenbrook Road

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-  Arsenic Grid Excavated 2008
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 -  Buildings
 -  20' Grid
 -  Gas Line
 -  Electric Line
 -  Water Line
 -  Sanitary Sewer Line
 -  Storm Sewer Line
- ### Trees & Vegetation
-  Surveyed Location
 -  Estimated Location
 -  Vegetation Trimmed to Allow Access

Note: The grid systems at 4825 & 4835 Glenbrook Road are slightly offset from each other (east to west) as shown.



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Date: 5/21/2009
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PARSONS



4835 GLENBROOK ROAD

In 2008, USACE recovered suspected AUES-related items in two test pits at 4835 Glenbrook near the current excavation area, and both cleared headspace.

- Test Pit 67 – Small glass pipette at 6 ft. deep (bgs)
- Test Pit 92 – Broken glass stopper at 1.5 ft. deep (bgs)

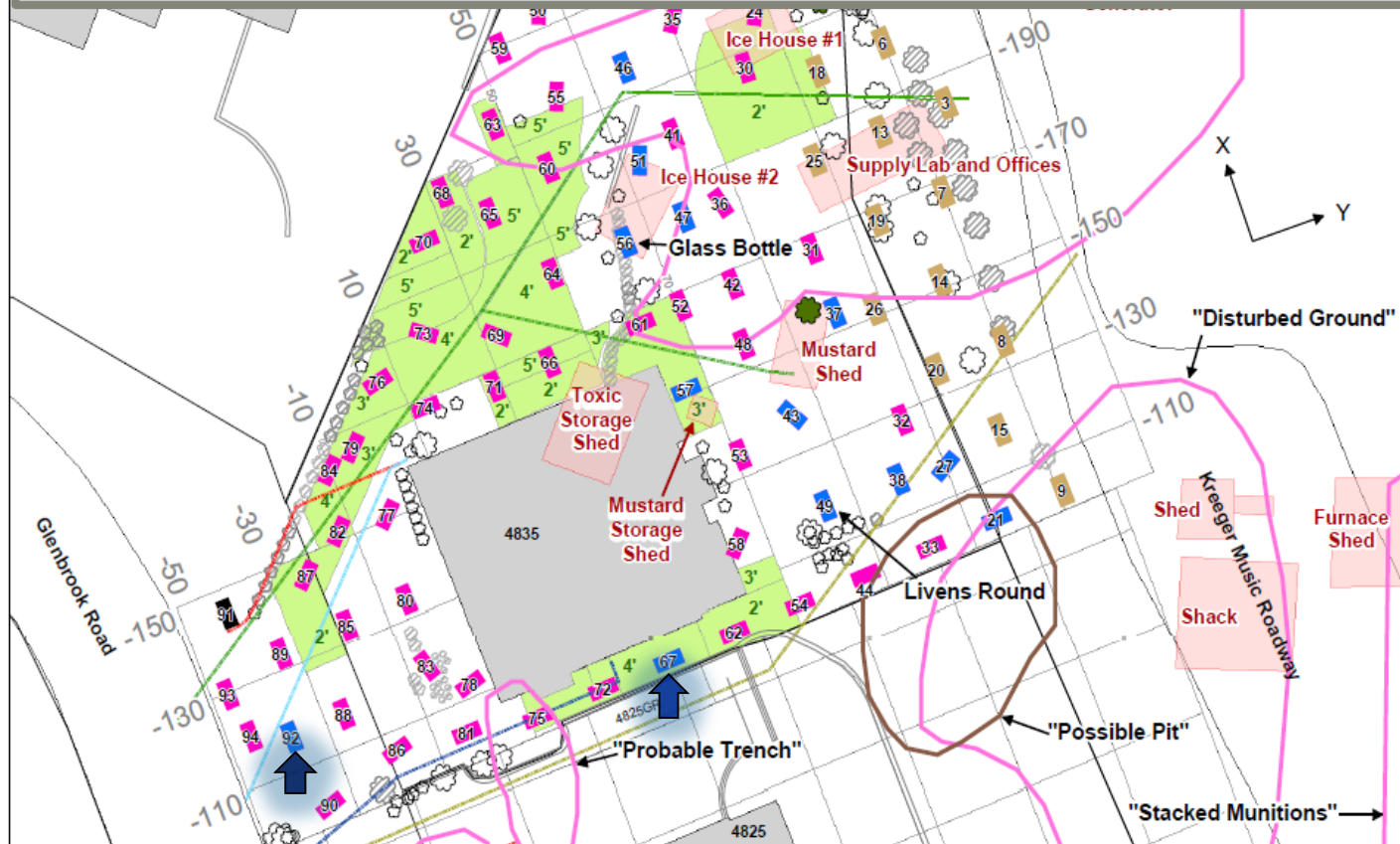


Figure 2-2
Locations of the Test Pits and
Areas of Arsenic-Impacted Soil
4835 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Test Pits Containing Possible AUES Related Items
- Test Pit 91 Not Excavated Due to Proximity to Utility
- Excavated Test Pits
- Test Pits Not Excavated Due to >12' Fill Material
- Arsenic Contaminated Soil Excavated in 2008

- Property Boundaries
- Buildings
- 20' Grid
- Gas Line
- Electric Line
- Water Line
- Sanitary Sewer Line
- Storm Sewer Line

- Historic Buildings/Structures

- Ground Scars

- 1927
- 1918

- Trees & Vegetation

- Surveyed Location
- Estimated Location
- Vegetation Trimmed to Allow Access

- 0 12.5 25 50 Feet

- 1 inch = 25 feet

- Scale: 1:300

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- File: 20101216 4835 Glenbrook-Driveway Arsenic Extent.mxd

- Date: 12/16/2010

- Figure Number: 2-2

- Page Number: 2-5

PARSONS

4835 GLENBROOK ROAD – TEST PIT 62



Figure D-185 Test Pit 62 prior to excavation



Figure D-186 Test Pit 62 excavation complete

Digsheet
Low Probability Test Pit Investigations at 4825 and 4835 Glenbrook Road

Test Pit ID 4835-62 Start Date 21/NOV/08 Completion Date 21/NOV/08
 Arsenic Grid _____

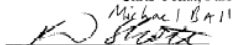
TEST PIT DESCRIPTION				
Dimensions in feet (W/L/D)	3' x 6' x 9'			
Depth to saprolite or bedrock				
Soil Description	CLAY W/ SANDY LOAM			
Magnetometer Clearance	<input checked="" type="checkbox"/> N	Comments:		
AIR MONITORING	Task performed?	Alarms?	Comments	
MINICAMS	<input checked="" type="checkbox"/> N	Y <input checked="" type="checkbox"/>		
ARSINE	<input checked="" type="checkbox"/> N	Y <input checked="" type="checkbox"/>		
PID	<input checked="" type="checkbox"/> N	Y <input checked="" type="checkbox"/>		
Dust monitoring	<input checked="" type="checkbox"/> N	Y <input checked="" type="checkbox"/>		
Dust samples ID				
SAMPLING				
Samples Collected	Y <input checked="" type="checkbox"/>			
Sample Description				
Sample ID				
ITEMS FOUND				
Type (cultural debris, glassware, MD, etc.)	Depth Found	Item ID	Photograph #	Size, Weight and Description
CULTURAL	2'	REBAR Y2	N/A	Y2 REBAR 2' IN LENGTH

FINAL CLEARANCE

Recommended by

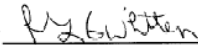

 Chris Yonai, Parsons Site Manager

Concurred by


 Michael Ball

USAESCH Safety Specialist

Concurred by


 Ryan G. Witten

CENAB Site Operations Officer

4835 GLENBROOK ROAD – TEST PIT 62



Figure D-187 Test Pit 62 backfill complete

4835 GLENBROOK ROAD – TEST PIT 67



Figure D-200 Test Pit 67 prior to excavation



Figure D-202 Test Pit 67 backfill complete

Digsheet
Low Probability Test Pit Investigations at 4825 and 4835 Glenbrook Road

Test Pit ID 4835 - 67 Start Date 25 Nov 08 Completion Date 21 Dec 08
 Arsenic Grid _____

TEST PIT DESCRIPTION			
Dimensions in feet (W/L/D)	<u>3' x 6' x 10' BGS</u>		
Depth to saprolite or bedrock			
Soil Description	<u>Clay w/ sandy loam</u>		
Magnetometer Clearance	<u>0 / N</u>	Comments:	
AIR MONITORING			
	Task performed?	Alarms?	Comments
MINICAMS	<u>0 / N</u>	<u>Y / 0</u>	
ARSINE	<u>0 / N</u>	<u>Y / 0</u>	
PID	<u>0 / N</u>	<u>Y / 0</u>	
Dust monitoring	<u>0 / N</u>	<u>Y / 0</u>	
Dust samples ID			
SAMPLING			
Samples Collected	<u>Y / N</u>		
Sample Description			
Sample ID			
ITEMS FOUND			
Type (cultural debris, glassware, MD, etc.)	Depth Found	Item ID	Size, Weight and Description
<u>2 LBS GLASS / 1 LB 4 OZ</u>	<u>2'</u>	<u>P149356819</u>	<u>3" x 1/2" GLASS TUBES</u>

FINAL CLEARANCE

Recommended by

Chris Yonak, Parsons Site Manager

Concurred by

Michael Davis
 USAESCH Safety Specialist

Concurred by

Dy. G. W. Smith
 CENAB Site Operations Officer

4835 GLENBROOK ROAD – TEST PIT 67



Figure D-201 Test Pit 67 excavation complete

Digsheet
Low Probability Test Pit Investigations at 4825 and 4835 Glenbrook Road

Test Pit ID 4835- 72 Start Date 02 DEC 08 Completion Date 02 DEC 08
 Arsenic Grid _____

TEST PIT DESCRIPTION				
Dimensions in feet (W/L/D)	3' x 6' x 10'			
Depth to saprolite or bedrock				
Soil Description	SANDY CLAY			
Magnetometer Clearance	<input checked="" type="checkbox"/> N	Comments:		
AIR MONITORING				
	Task performed?	Alarms?	Comments	
MINICAMS	<input checked="" type="checkbox"/> N	Y / <input checked="" type="checkbox"/>		
ARSINE	<input checked="" type="checkbox"/> N	Y / <input checked="" type="checkbox"/>		
PID	<input checked="" type="checkbox"/> N	Y / <input checked="" type="checkbox"/>		
Dust monitoring	<input checked="" type="checkbox"/> N	Y / <input checked="" type="checkbox"/>		
Dust samples ID				
SAMPLING				
Samples Collected	Y / N			
Sample Description				
Sample ID				
ITEMS FOUND				
Type (cultural debris, glassware, MD, etc.)	Depth Found	Item ID	Photograph #	Size, Weight and Description

FINAL CLEARANCE

Recommended by

Chris Vonn, Parsons Site Manager
Michael Ball

Concurred by

[Signature]
 USAESCH Safety Specialist

Concurred by

[Signature]
 CENAB Site Operations Officer

4835 GLENBROOK ROAD – TEST PIT 72



Figure D-215 Test Pit 72 excavation complete

Digsheet
 Low Probability Test Pit Investigations at 4825 and 4835 Glenbrook Road

Test Pit ID 4835-75 Start Date 02 DEC 08 Completion Date 02 DEC 08
 Arsenic Grid _____

TEST PIT DESCRIPTION				
Dimensions in feet (W/L/D)	<u>3' x 6' x 11'</u>			
Depth to saprolite or bedrock				
Soil Description	<u>SANDY CLAY</u>			
Magnetometer Clearance	<input checked="" type="radio"/> Y <input type="radio"/> N	Comments:		
AIR MONITORING	Task performed?	Alarms?	Comments	
MINICAMS	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N		
ARSINE	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N		
PID	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N		
Dust monitoring	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N		
Dust samples ID				
SAMPLING				
Samples Collected	<u>Y / N</u>			
Sample Description				
Sample ID				
ITEMS FOUND				
Type (cultural debris, glassware, MD, etc.)	Depth Found	Item ID	Photograph #	Size, Weight and Description

FINAL CLEARANCE

Recommended by

Chris Yonak, Parsons Site Manager
Michael Ball

Concurred by

W. Scott

USAESCH Safety Specialist

Concurred by

Ry. G. W. H. H.

CENAB Site Operations Officer

4835 GLENBROOK ROAD – TEST PIT 75



Figure D-223 Test Pit 75 excavation complete

Items found on 4835
Glenbrook Rd:

One Livens projectile
(munitions debris)



Livens projectile found at 5 ft bgs.



Test Pit 49
(Approximately 29 ft NE of NE building wall)

Livens projectile found at 5 ft bgs (subsequently fell to floor of excavation).

Items found on 4835
Glenbrook Rd:

Scrap metal, cultural
debris.



Cultural debris consisting of PVC tubing, metal pipe, and metal debris present from 0 to 1 ft bgs and from 4 to 5 ft bgs.

Test Pit 49 (continued)
(Approximately 29 ft NE of NE building wall)



Suspect scrap item found at 5 ft bgs. Metal cylinder 5-6 ft long by 12 inches in diameter.

Items found on 4835
Glenbrook Rd:

Glassware, cultural
debris.



Cultural debris present as follows: root basket, bricks (1 ft bgs); metal, plastic, soda bottles, piping, golf ball (4 to 11 ft bgs).

Test Pit 56 (Continued)
(Approximately 25 ft NNW of N building corner)



Suspect AUES glassware recovered from 9.5 ft bgs.

Test Pit 27
(Approximately 47 ft NE of NE building wall)



Suspect AUES glassware. One of several items recovered from 1, 6, and 8 ft bgs.

Test Pit 27 (continued)
(Approximately 47 ft NE of NE building wall)



Suspect AUES glassware. One of several items recovered from 1, 6, and 8 ft bgs.



Suspect AUES glassware. One of several items recovered from 1, 6, and 8 ft bgs.



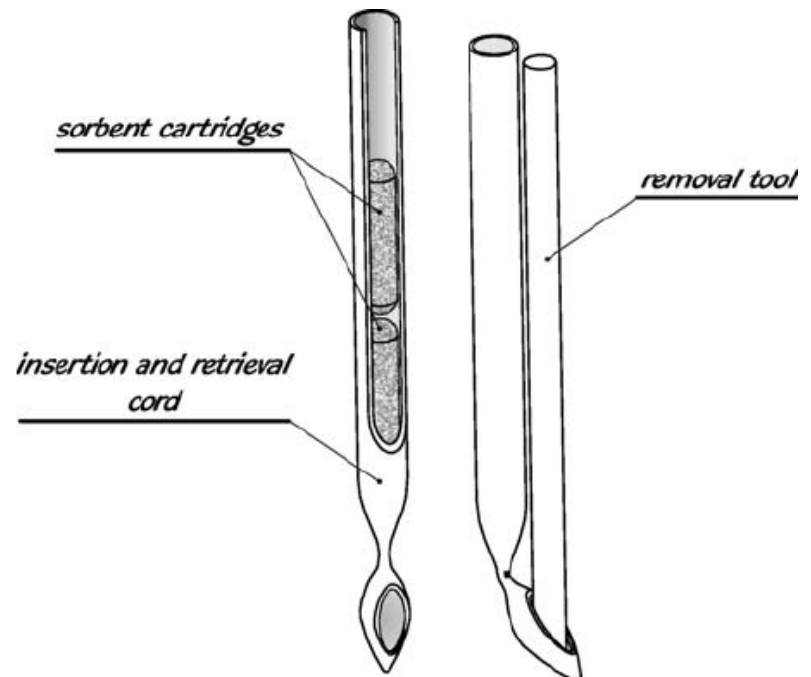
Cultural debris consisting primarily of construction debris with bricks, metal, insulation, wire, terracotta pipe, pulley, wire rope, soda bottle fragments, chicken wire, and porcelain, was recovered from depths between 4 and 12 ft bgs.

SOIL GAS GORE-SORBER® SAMPLING (4825 GLENBROOK RD)

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In 2007, USACE collected soil gas samples which were analyzed for select VOCs and semi-volatile organic compounds (SVOCs), select explosives, and select Agent Breakdown Products.

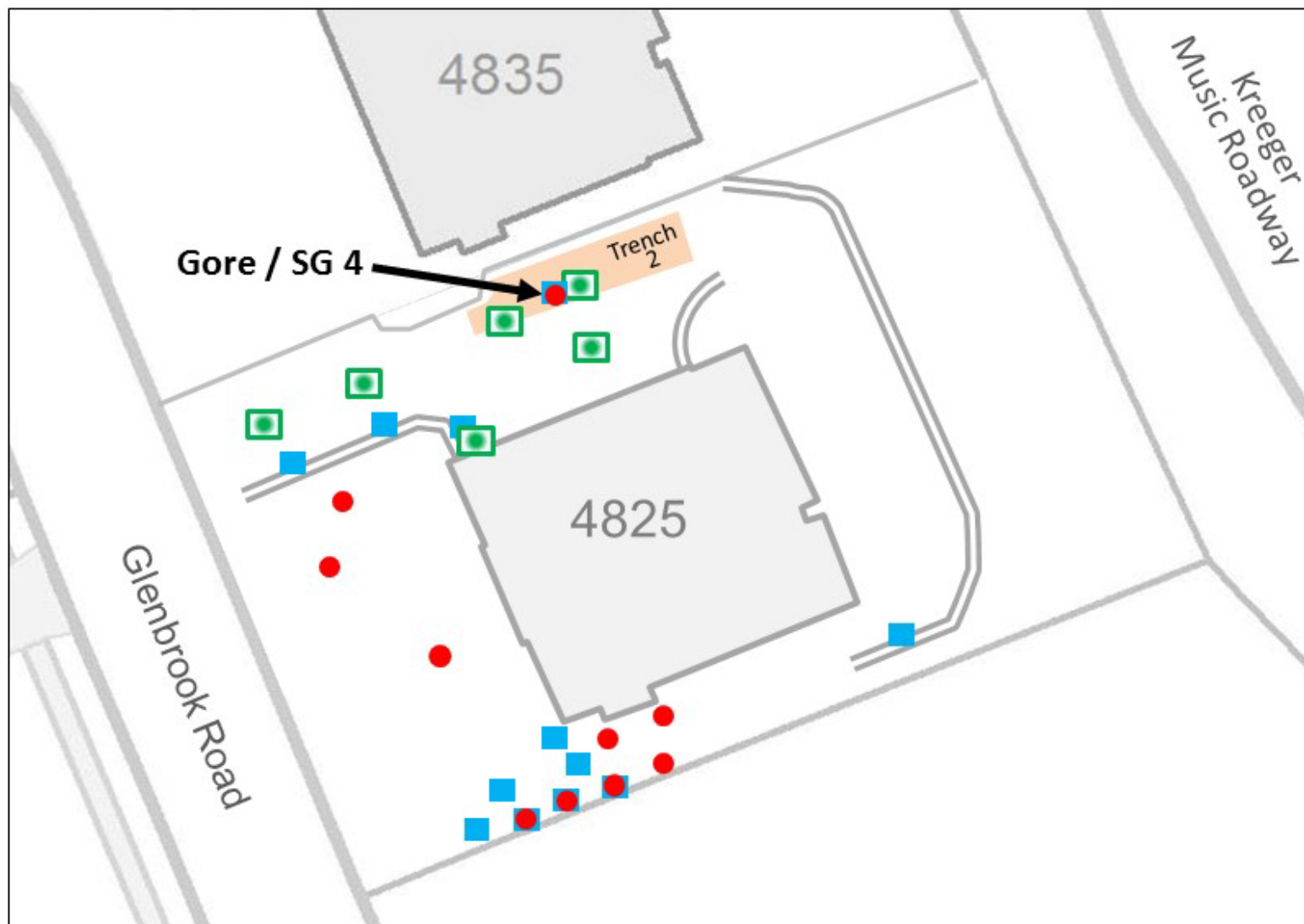
The Mustard breakdown products 1,4-dithiane and 1,4-oxathiane, were detected in one sample (Gore/SG-4 (2')).



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SOIL GAS GORE-SORBER® SAMPLING

43



Gore Sorbers



Soil Gas Probes



ABP Samples



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SOIL BORINGS

A geotechnical soil boring investigation was conducted in December 2009.

Five geotechnical borings were completed to investigate the geological condition beneath the building, determine soil stratigraphy, define depth to the saprolite bedrock, and complete soil sampling.

Four borings were located off each corner of the house and one was located inside the garage. Continuous soil samples were collected until saprolite was reached.

There were no AUES-related materials found in any of the samples.



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SOIL BORINGS

The samples were also analyzed for agent/ABPs, VOC, SVOCs, explosives, metals, cyanide, iodine, fluoride, and perchlorate (2009).

Four metals (aluminum, cobalt, thallium, and vanadium) were detected at concentrations exceeding the Spring Valley comparison levels.

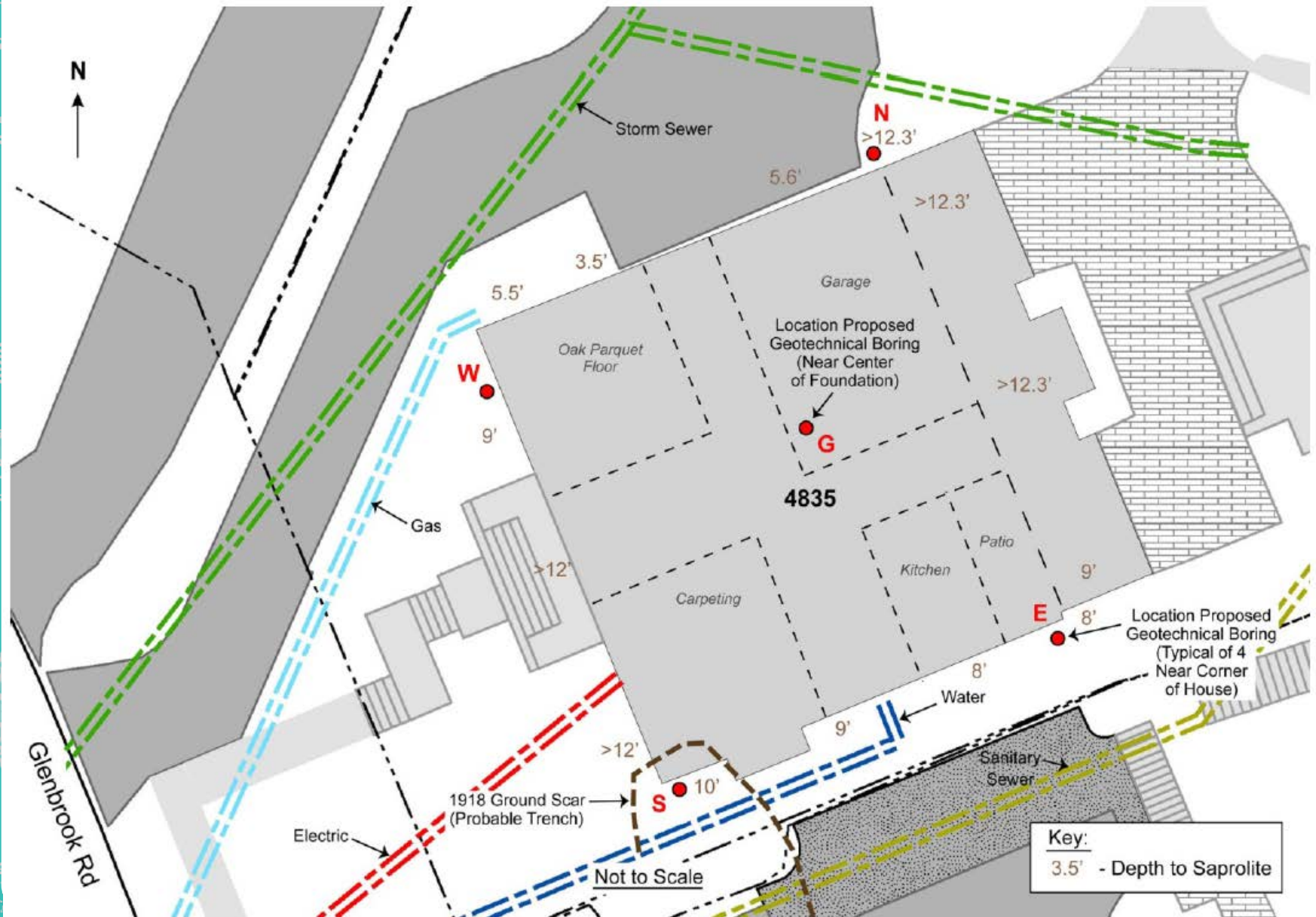
VOCs, SVOCs, explosives, and other analyzed compounds were either not detected or detected at concentrations below the Spring Valley comparison levels.

Based on the HHRA and the results and conclusions of the investigations, no further investigations were recommended in the site-specific investigation report finalized in 2013.



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Geotechnical Boring Locations Map



INTERVIEW TRANSCRIPTS

Five transcripts of independent interviews with some of the Glenbrook Road workers have been shared with USACE. The first three interviews are dated November 1993, while two additional interviews were dated March 2013 and January 2014.

A majority of the transcripts are discussions about private medical issues. The sections that relate to contamination at the 4825/4835 Glenbrook Road properties will be discussed.



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WORKER INTERVIEWS – NOVEMBER 1993

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Question: Well, [Name] how would you describe where the bottles were? And if the bottles were buried in a place, was it behind the house close? Talk about whether it was the house close to the Korean Embassy or the one away.

Answer: It was the house up close to the Korean Embassy property. It's where the most of the trash was.

Question: Do you all think that there's still stuff in there? I know I asked you that again.

Answer: Yeah

Question: Where do you think? And I'd like to get an answer from each one of you. You know, where and how much.

Answer 1: My personal opinion, the land behind the houses that borders the American University fence and the strip of land between the first house we built and the fence which connects to the Korean property because those are basically the areas that were untouched.

Answer 2: The dirt that's behind that retaining wall, they brought a lot of that in.

WORKER INTERVIEWS – NOVEMBER 1993

Question: So where do you think the stuff still could be? In a short sentence.

Answer: The majority of it in the ground behind the houses between the American University and the houses on the bank side. Like the little hill there, behind the houses.

Question: But what about still being some in the ground where the houses are?

Answer: You're not going to rip down a two million dollar home to dig in the dirt and not find anything.

Answer: Plus, for all we know, they may have took a foot of dirt below where American University started dumping. The ground could have been here and they started dumping and from something they dug they could have taken an extra foot out, we don't know how deep the ground was when they started dumping, we don't know how far below they dug out, if they ever dug all the load at the bottom. We don't know all that stuff.

WORKER INTERVIEWS – NOVEMBER 1993

50

Question: Again, to sum- again, how many bottles would you say total you all saw or heard about, and do you and where were they specifically?

Answer: They were just in the dirt, in various different places.

Answer: (pointing at layout) Well, probably the most that would still be in the ground would probably be somewhere behind this retainer wall. On this section up here back into the Korean Embassy property.

Answer: I don't really know where they were going but the most of what came out came out from this number one house. And at one point the bottle that [Name] had referred to as being busted was approximately right here which would be in the driveway that went in between the two houses for the garage to go to this house.

Answer: And then they took the remaining part of the dirt that they had left there which they referred to as clean dirt and filled this in here which is that retaining wall which is all here up this driveway...

WORKER INTERVIEWS – NOVEMBER 1993

51

Question: So, again, do your pencil where the bottles are, or where they still could be.

Answer: There still could be, possibly be, some of it in this area here between the retainer wall and American Univers-ah, Korean Embassy. Or there's a possibility that there could be some right along in here.

Question: [Name], why don't you show where the bottles were again. (new camera angle)

Answer: OK. Approximately, there could possibly still be some of the stuff in the ground in
behin -this is the retaining wall right here-there could possibly be some of it in the ground on
Mr. Brandt's property here or on the Korean Embassy right here or maybe possibly in behind
these lines here because this has all been dug out up to this point here, and probably I would say
maybe three to four feet behind this retaining wall was dug out six, seven feet deep, so there
could still be something from that point up back to the property line of American University. I
don't really know.

WORKER INTERVIEWS – MARCH 2013

Question: OK I am gonna be recording this now and let me see, and today is March 13, 2013 and basically the first thing you said to me that stood out was that you didn't see any way to do this except to tear down 4835 Glenbrook Road.

Answer: Right, you gotta tear em both down.

Question: OK. Now would say this stuff is fragments, glass and metal, or what?

Answer: Oh its its some kind of liquid stuff inside of bottles.

Question: But now, did you build the house on top of them?

Answer: Yeah. We built on top of both of them. The houses were on top of that stuff.

WORKER INTERVIEWS – MARCH 2013

53

Question: OK. And do you think that there are still bottles underneath the basement floor?

Answer: I think there is.

Question: OK. Now is there any other information that you could give me that they should know about to save time and money when they are cleaning it up. But to do it right they have to tear the house down.

Answer: To do it right I think they have to tear the house down. It was under both houses.

WORKER INTERVIEWS – JANUARY 2014

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Question: I want to confirm what you said before. You think that there is stuff under the house on Glenbrook road to the left, standing on the street?

Answer: “I am pretty sure”. “Almost 100% sure because there was stuff in the??? ground?”

“I am 99% sure that there are some kinds of chemicals and bottles.”

Question: Regarding stuff being buried under the whole house, they say that it is “industry practice not to bury under houses.” Is there stuff buried under the whole house?

Answer: “Regarding your quote, I’d say, [expletive].”

“As much stuff under it (the AU President’s house) as the other one. When they got to a certain point, they would compact the ground down, pour concrete. They never went to the bottom of it. They stopped where the grade he wanted it to be”.

We asked [Name] 100 times and he said to [Name], [Name], and [Name], “nothing here”.

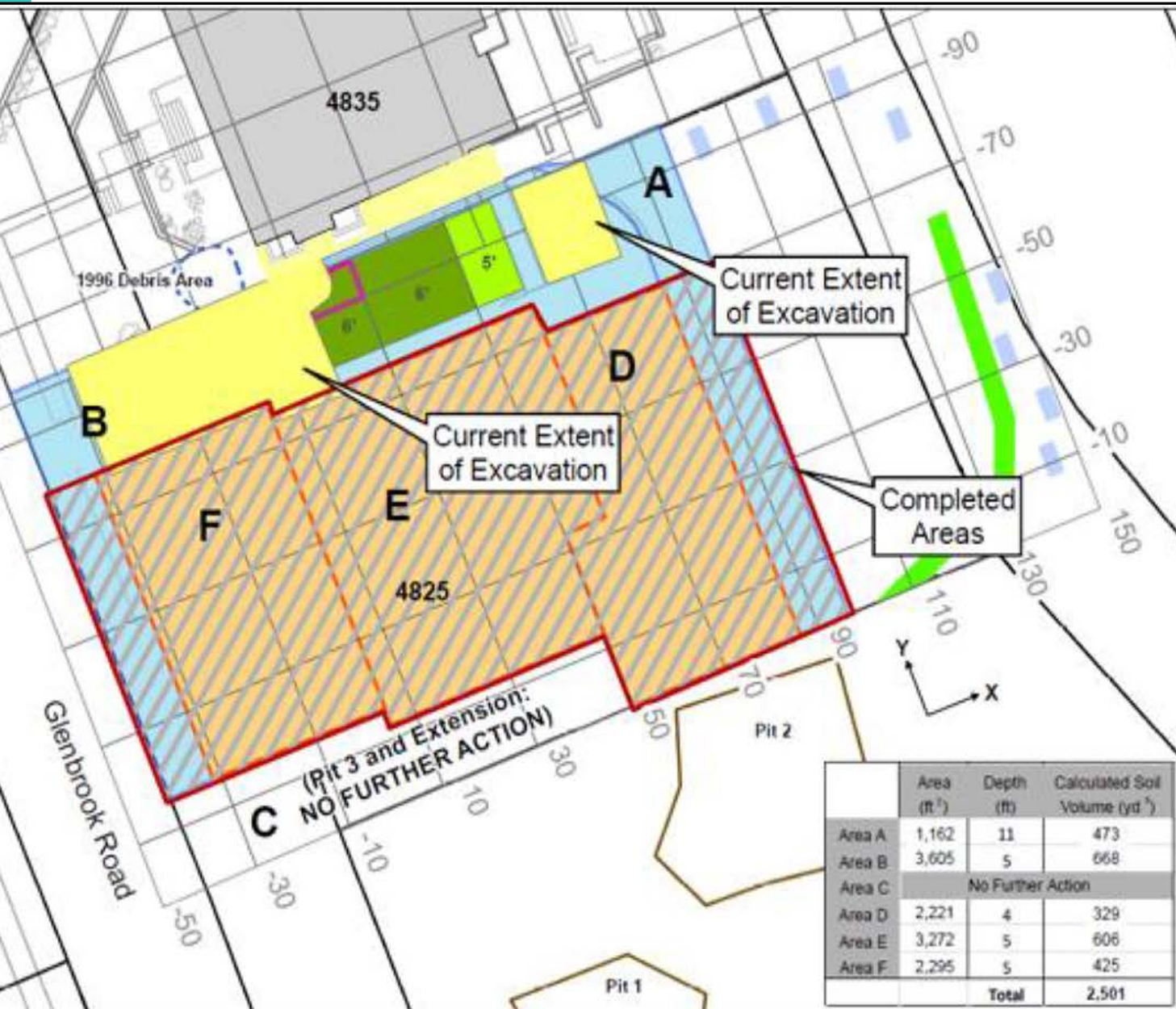
4825 GLENBROOK ROAD

USACE Updates



CURRENT EXCAVATIONS ON SHARED PROPERTY LINE

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	Area (ft ²)	Depth (ft)	Calculated Soil Volume (yd ³)
Area A	1,162	11	473
Area B	3,605	5	668
Area C	No Further Action		
Area D	2,221	4	329
Area E	3,272	5	606
Area F	2,295	5	425
	Total		2,501

Current Excavation Status
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Buildings
- Property Boundaries
- 20' Grid
- Pits 1 and 2
- Excavation Area**
 - High-Probability
 - Low-Probability
- Additional Low Probability Investigation**
 - Test Pits
 - Trench for Rerouted Sewer Line
- Arsenic Soil**
 - Arsenic Grid Previously Removed [5] (2009)
 - Arsenic Grid Previously Removed [5] (2009)
 - 1996 APEX Tree Removal (Debris Area) Perimeter

Notes:
1. Excavation depths shown from previous arsenic removal.

0 10 20 40 Feet
1 inch = 20 feet

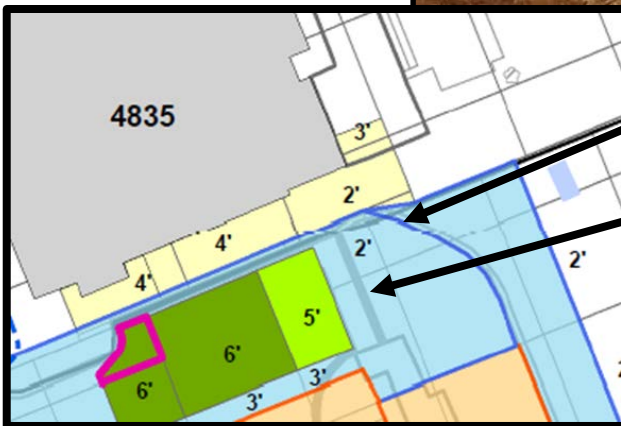
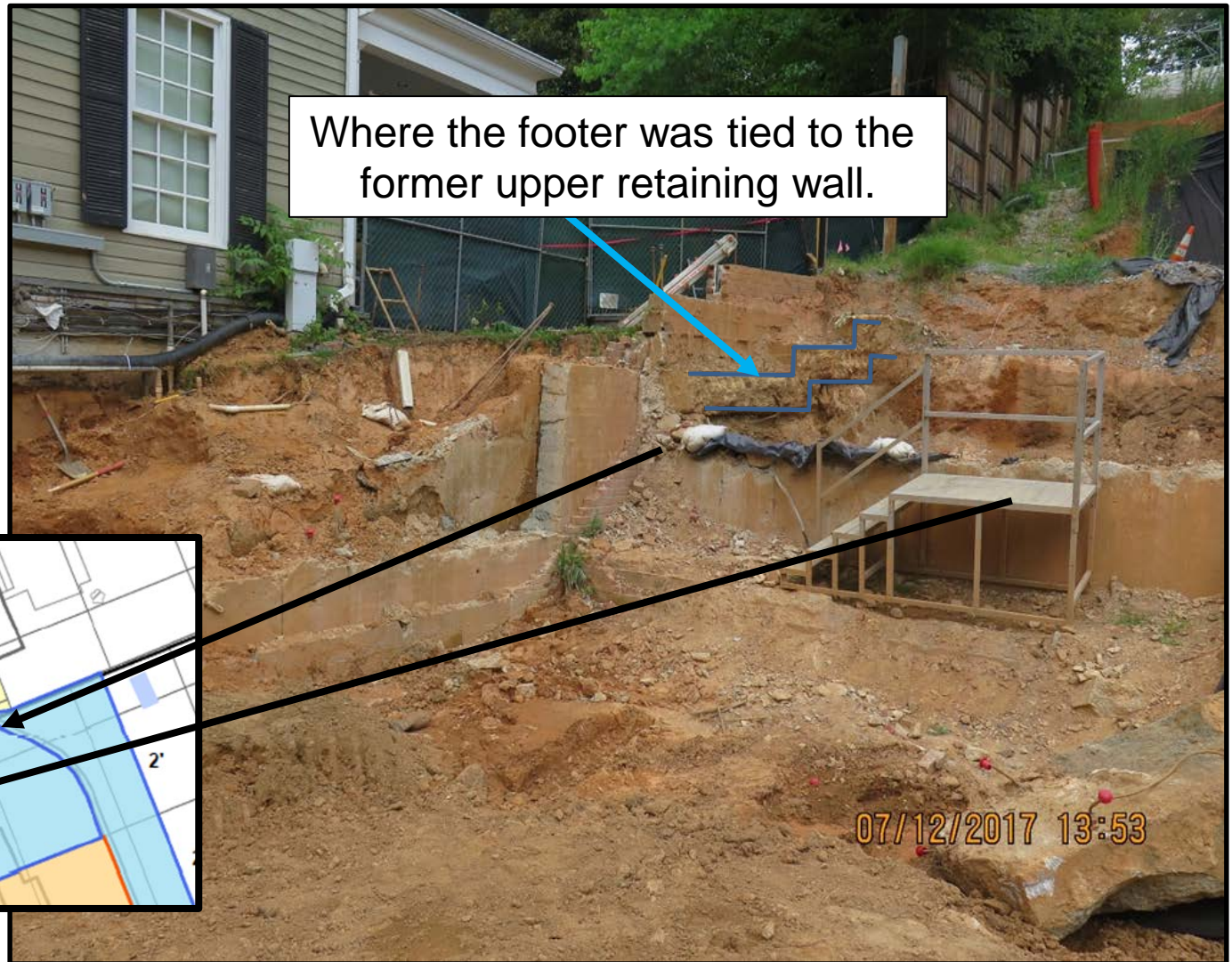
Scale: 1"=20'
Created By: Parsons
File: 2010004 4825 Current Excavation Status.mxd
Date: 9/4/2017
Figure Number: -
Page Number: -

PARSONS

LOW PROBABILITY ACTIVITIES

By July 12th a good portion of the retaining wall had been removed.

The work of removing soil along the shared property line was then continued.



PUMPING WATER DUE TO HEAVY RAINS AT THE SITE



July 31, 2017





08/15/2017 11:46

SAFETY INCIDENT – AUG 9, 2017

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- Two downrange teams experienced symptoms that could indicate potential exposure to an unknown chemical.
- The excavation area and all stockpiled soils were mitigated with plastic within 30 minutes of the incident.
- All intrusive work at the site was halted until further notice.
- USACE convened a formal Board of Investigation to investigate the incident and issue a Finding Report.
- The Board began their investigation on August 22nd and anticipates completion of the report by the end of October.



BOARD OF INVESTIGATION UNDERWAY

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■ Board includes the following voting members:

- **President** – USACE Baltimore - Gary Schilling
- **EPA Region III** – Steve Hirsh
- **DOEE** – James Sweeney
- **ECBC** – Chemist
- **Public Health Command** – Occupational Health Doctor



■ Non-voting members/Technical Experts:

- **USACE Huntsville** – Safety Specialist
- **Public Health Command** – Industrial Hygienist and other specialty medical experts
- **USACE Baltimore** – Legal Advisor



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SAMPLING EFFORT FOR INVESTIGATIVE PURPOSES

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Phase I

- Performed DAAMS tube sampling on the mitigated spoils pile and the mitigated excavation in Level B Personal Protective Equipment (PPE).

DAAMS tube analysis:

- DAAMS tubes were sent to Edgewood for full MS analysis for HD, L, agent breakdown products and other chemicals. The DAAMS tubes were impacted by excessive moisture and only one tube was able to be analyzed. That analysis reported no detections for agent or agent breakdown products.

Phase II

- Performed soil sampling from the excavation area and the soils stockpile area.

Soil Sampling analysis:

- The initial soil samples cleared for agent and agent breakdown products. Further, the mass spectrometry results did not indicate any contaminants of concern. Parsons has sent the samples to a commercial lab for further analysis for other Spring Valley related constituents, and collected additional soil samples last week. Awaiting further results.

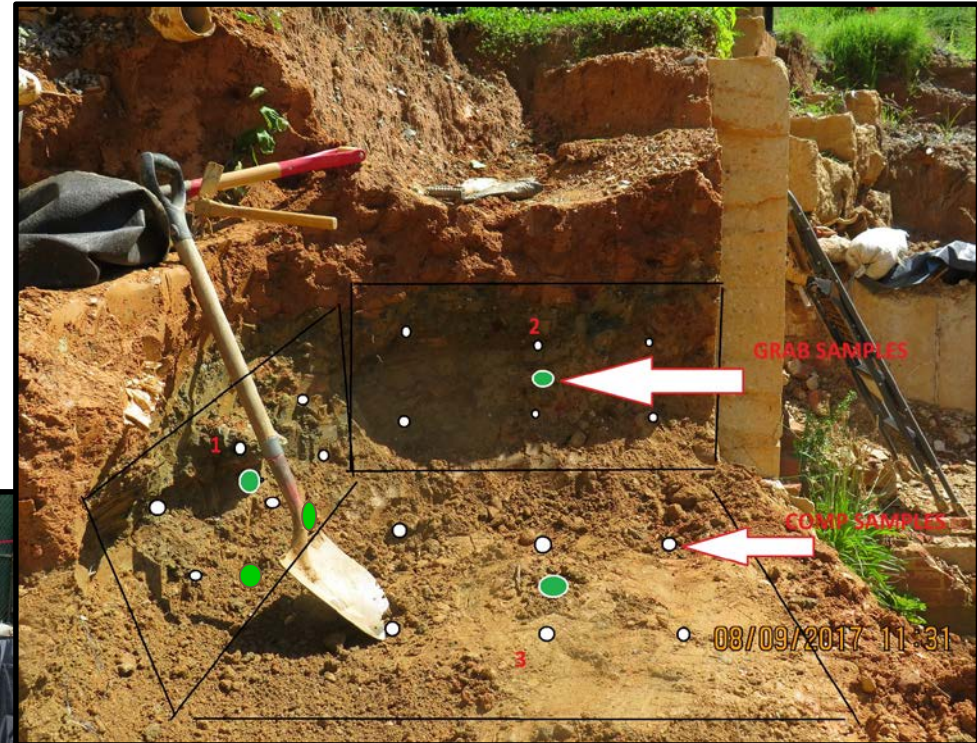


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SAMPLING EFFORT FOR INVESTIGATIVE PURPOSES

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The team sampled the excavation area and the soils stockpile on August 25th.



Sampling was completed by a Level B team. Mitigation remained in place for the sampling effort to ensure the safety of the public.



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INVESTIGATIVE PROCESS

- The Board has interviewed the following project staff:
 - All of the employees that experienced symptoms
 - USACE Project Managers (Baltimore & Huntsville)
 - USACE Ordnance Personnel (Baltimore & Huntsville)
 - Parsons' Project Manager
 - Parsons' Site Manager
 - Parsons' Site Safety and Health Officer
 - Parsons' Certified Industrial Hygienist (Lead Safety)
 - George Washington Hospital Staff
- The Board is reviewing all project data for the day of the incident.
- The Board is reviewing all project work plans, procedures, and safety protocols.



4835 Glenbrook Road

Test Pit Findings



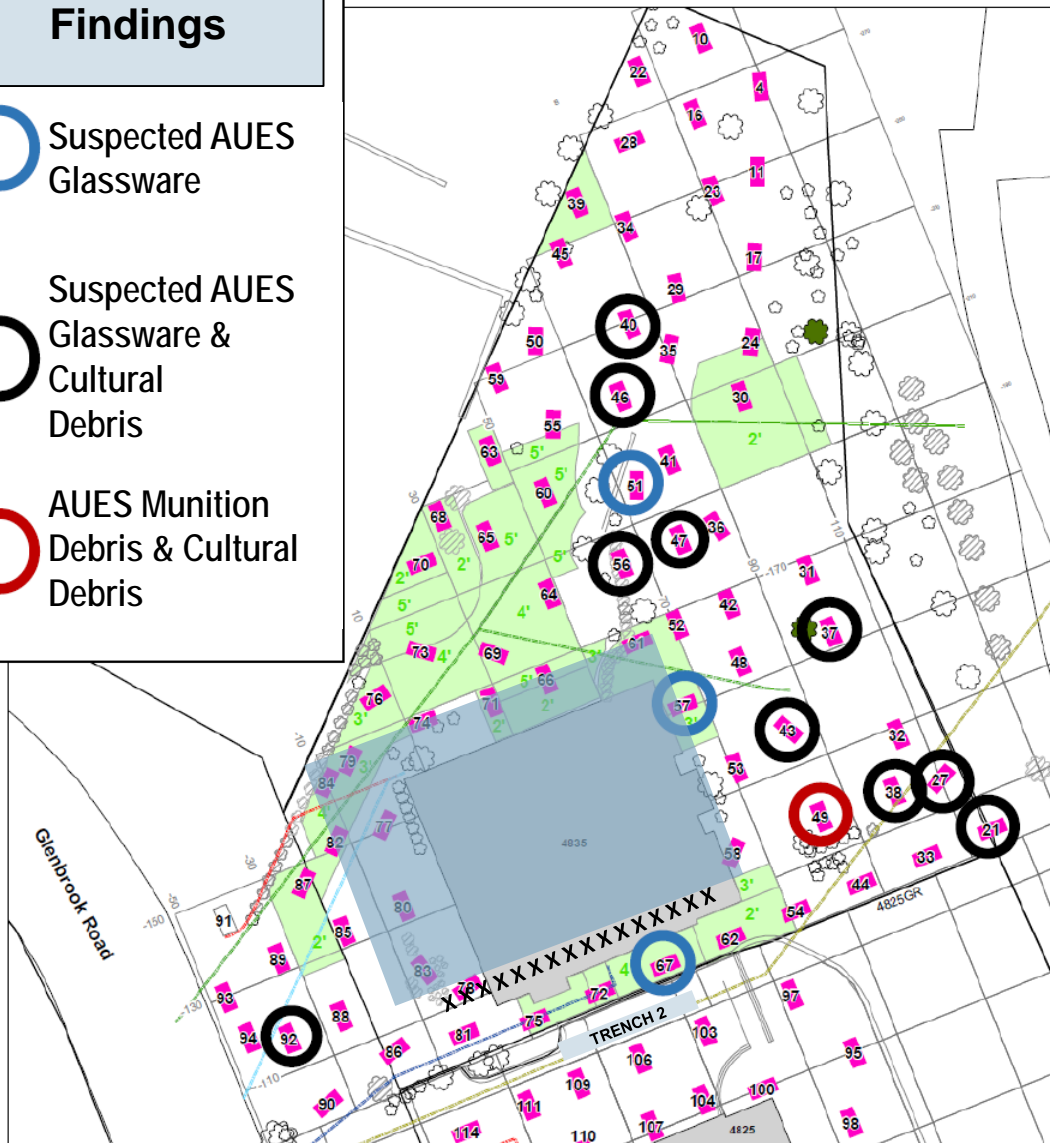
Suspected AUES
Glassware



Suspected AUES
Glassware &
Cultural
Debris



AUES Munition
Debris & Cultural
Debris



USACE proposes the following:

- A single row of samples will be completed first
 - Samples in the front yard.
 - Samples through the basement floor into the subgrade below the house.
- Sample the exposed concrete foundation wall along the shared property line.

Dependent upon the results of the first round of sampling the following additional sampling may be performed:

- Additional sampling along the exterior foundation walls along the front of the house and the side by the driveway/garage.
- Complete sampling of the basement floor into the subgrade below the house.

Site Conditions as of September 12, 2017



FUTURE ACTIVITIES

- Board of Investigation: Report and recommendations due by the end of October.
- Initial sampling effort at 4835 Glenbrook Road to help determine next steps.
- The USACE Team will review the Board's Report and the results of the sampling effort to prepare a 'return to work' plan.
 - Regulatory Concurrence
 - AU Concurrence



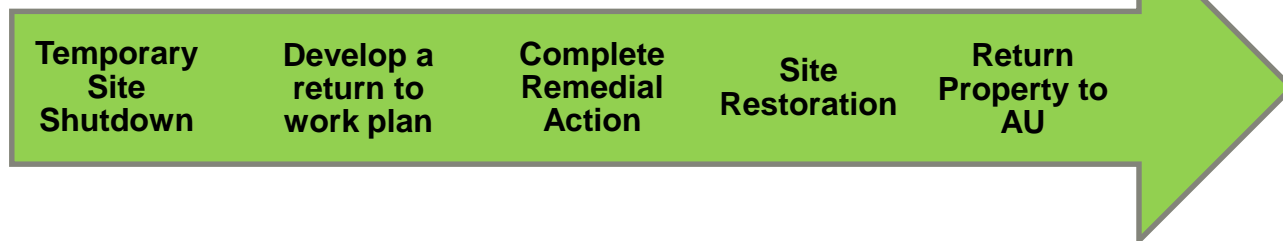
TENTATIVE SCHEDULE

- ✓ December 2012 through May 2013
Site Preparation/ Initial Low Probability Work
- ✓ May 2013 through September 2013
ECS Set Up, High Probability training, & Pre-Operational Exercises
- ✓ September 2013 through June 2016
High Probability Excavation (Shelter-in-Place program ended May 27)
- ✓ Summer 2016
Tent Demobilization & Site Preparation for Final Low Probability Excavation
- ➡ September 2016 through Winter 2017/18
Final Low Probability Excavation
- Spring 2018
Site Restoration



Note: This was the schedule announced prior to the current safety site shutdown. The schedule will be reassessed once we develop our plan to return to work.

Way Forward – Timing to be determined



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SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

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Community Items



SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

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Reminders:

- The next RAB meeting will be
Tuesday, **November 14th**

Upcoming Agenda Items:

- Suggestions?



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SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

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Public Comments

Wrap-Up



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**U.S. Army Corps of Engineers
Spring Valley Restoration Advisory Board
St. David's Episcopal Church
Minutes of the September 2017 Meeting**

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING	
Dan Noble	Military Co-Chair/ USACE, Spring Valley Program Manager
Greg Beumel	Community Co-Chair
Mary Bresnahan	Community Member
Ralph Cantral	Community Member
Mary Douglas	Community Member
Paul Dueffert	Community Member
Lawrence Miller	Community Member
Malcolm Pritzker	Community Member
Tom Smith	Community Member
George Vassiliou	Community Member
John Wheeler	Community Member
Linda Argo	At Large Representative - American University
Alma Gates	At Large Representative - Horace Mann Elementary School
Dr. Peter deFur or representative	Environmental Stewardship Concepts/RAB TAPP Consultant
Steve Hirsh	Agency Representative - US Environmental Protection Agency, Region III
James Sweeney	Agency Representative – District Department of Energy & Environment
RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING	
Kathleen Connell	Community Member
William Krebs	Community Member
Lee Monsein	Community Member
ATTENDING PROJECT PERSONNEL	
Brenda Barber	USACE, Glenbrook Road Project Manager
Alex Zahl	USACE, Spring Valley Technical Manager
Chris Gardner	USACE, Public Affairs Specialist
Carlos Lazo	USACE, Government Affairs Officer

Holly Hostetler	Meeting Support - ERT, Inc.
Carrie Johnston	Spring Valley Community Outreach Team
Rebecca Yahiel	Spring Valley Community Outreach Team

HANDOUTS FROM THE MEETING

- I. Final Agenda for the September 12, 2017 RAB Meeting
- II. Army Corps of Engineers Presentation
- III. August 2017 Monthly Project Summary
- IV. Site Features and Topography Map
- V. Locations of Historic Buildings and Ground scars at 4825 and 4835 Glenbrook Road Map
- VI. Spring Valley FUDS Timeline 1993-2017

AGENDA

Starting Time: The September 2017 Restoration Advisory Board (RAB) meeting began at 7:10 PM.

I. Administrative Items

A. Co-Chair Updates

Dan Noble, Military Co-Chair/USACE, welcomed everyone and opened the meeting.

1. Introductions

D. Noble introduced Officer Tony McElwee of the District of Columbia Metropolitan Police Department (MPD) 2nd District. Officer T. McElwee offered to answer any questions or address any concerns of the RAB. He noted that he will attend the November 14 RAB meeting. He thanked the group for having him and turned the meeting back over to D. Noble.

Chris Gardner, USACE Baltimore District Public Affairs Officer, introduced the visiting Army Corps employees who were observing this meeting: Carlos Lazo, Government Affairs Officer Baltimore District, and Jenn Miller from the USACE Headquarters Public Affairs Office.

2. General Announcements

D. Noble reviewed the project website updates which included the July and August monthly project update, the weekly 4825 Glenbrook Road updates and photos, July RAB meeting minutes, June RAB Conference Call discussion summary, and the updated project overview timeline, which was recently updated through 2017.

Comment from Allen Hengst, Audience Member – I found two errors in the Partnering meeting minutes in July on page 7. It says “In response to a question from EPA Region III, AU confirmed that the new AU President will live at 4835 Glenbrook Road. The AU representative added that the previous AU President lived at the house throughout his term.” He did not live there throughout his term. In the October 2009 RAB minutes Penny Pagano reported that Neil Kerwin was moving back into the house after being gone for two years. From October 2007 to November 2009, no one was living at 4835 Glenbrook Road. It is also incorrect to say that the new AU president is moving into the house as B. Barber said at the end of July. I would like to know why the new President is not moving into the house.

D. Noble asked A. Hengst to send his corrections to the minutes to be reviewed. He also noted that even though the Partnering meeting minutes from several weeks ago say one thing, and that thing doesn’t come to pass, it doesn’t mean we should correct the document, recording what was said at that time. Also, we

will discuss the current situation on Glenbrook Road later during this RAB meeting.

II. USACE Program Updates

A. Site-Wide Remedial Design/Remedial Action (RD/RA)

D. Noble briefly reviewed the Site-Wide Remedial Design/Remedial Action.

The Decision Document (DD) was signed on June 15. We were able to award a contract at the end of June. The RD is underway. Our goal is to get the fieldwork underway in the fall/winter timeframe of 2017 and carry out the actions called for in the DD. In the next few months, the plan is to reach out to some of the first homeowners about having work done at their properties. We will invite them to a meeting where we can discuss general issues of what the process is going to entail, including outlining the steps involving the field team coming onto their property and conducting the remedial action; i.e. the details on the Rights-of-Entry and what they should expect as we carry out the activities.

B. Groundwater Feasibility Study

D. Noble provided a brief status update on the Groundwater Feasibility Study (FS).

In early September, USACE had a conference call with the Partners to discuss the draft Groundwater FS, including the issues needing to be addressed before the document is finalized.

USACE anticipates the Groundwater FS will be finalized this fall. Once the Groundwater FS is complete, USACE will begin to develop the Groundwater Proposed Plan (PP) and will hold a public meeting/public comment period on the Groundwater PP, which is likely to be scheduled in early winter 2017-2018. Then the Groundwater Decision Document (DD) will be finalized in summer 2018.

Question from ESC/RAB TAPP Consultant – When does USACE anticipate collecting more sample data after the PP and DD?

D. Noble confirmed that after the DD is signed more sampling would be needed to determine the current groundwater situation.

C. Summary of Historical and Current Work at 4835 Glenbrook Road

D. Noble, Military Co-Chair/USACE, provided a detailed review of 4835 Glenbrook Road per the request of the RAB. In the Site-Wide DD there is no remedial action called for at 4835 Glenbrook Road (GR). There have been discussions at past RAB meetings whether this decision is appropriate. The RAB asked for a summary of what has been done at this house in the past and what we know about the house. USACE provided a detailed and lengthy presentation documenting what has been done at this property in the past.

Both 4825 and 4835 GR were developed simultaneously around spring 1992 through the fall of 1993. We believe that 4825 GR was the first house that had its foundation excavated and built. During excavation and construction, neighbors witnessed the site's development while living and/or working nearby, and regularly walked by the job site. One of the gentlemen, pictured on the presentation slide, was Mr. Feeney and his dog. This old photo was taken for a magazine, article that included an interview with him about what he remembered about the construction of the houses.

There were local construction workers and tradesmen who worked on the houses, as well as construction workers who came from West Virginia (WV). Over the years, people have referenced the WV workers and what they experienced at the properties while they were building the houses and some things that they have said about the houses.

They were built by the Brandt Development Corporation. The houses fronted to GR and backed up to the American University (AU) campus. The two lots were sold by AU to the builder. 4835 GR, became the home for the AU President, and 4825 GR was sold as a residential property to a family. Mr. Brandt owned the house after the family moved out and transferred it back to him, and later ownership

transferred back to AU. Both homes are currently owned by AU.

There is a steep slope from the homes to the AU campus, so the houses were built on terraces that were excavated out of the hillside. Retaining walls were placed around the homes; especially at 4825 GR.

Immediately to the south of 4825 GR is the 4801 GR property. This is a large embassy property with the house at the most southern portion of the lot, the northern portion of this property is adjacent to 4825 GR, and is a fenced in and landscaped yard area. About half of the embassy yard area, from 4825 GR property line to almost halfway through the 4801 GR yard, was sold as a lot by AU to the 4801 GR property homeowners.

Question from Tom Smith, Community Member - Did you say what year they were turned over to AU? Was it after the initial discovery of munitions?

D. Noble explained that AU took possession of 4825 GR after the initial discovery of munitions. Sometime around 1993 AU would have owned 4835 GR and sometime around early 2000's they took possession of 4825 GR.

B. Barber clarified that it was 2003 when 4825 GR became an AU property again.

There are quite a bit of utilities that run through the two properties. They service these homes and the AU campus area. There is a large waterline that helps with the irrigation at Jacob's field; a sanitary sewer that runs from campus to the main on GR; and another sanitary sewer line that runs from campus and down to the driveway of 4825 GR, in which both 4835 and 4825 GR have their sanitary sewer lines hooked; there is also a water supply that goes to both houses. The other major feature that has been dealt with over the years of working at the property is a storm water sewer that also comes down from the campus and then runs down the driveway of 4835 GR, and goes to the storm sewer on GR. These are part of the challenges of working at the Glenbrook project site.

The first map shows the location of the GR houses of interest, and the others are light gray colored modern buildings. The brighter cover overlay and the buildings highlighted in yellow were there during WWI. This was the American University Experiment Station (AUES). It was headquartered on campus at McKinnley Hall, which is still standing.

In WWI, there was a security fence that went around the facility. The research that was being done there was considered top secret, important military research, so there was an emphasis on security. There was a main gate that faced Nebraska Avenue. If you came through that main gate you would be at the headquarters building. There were also two back gates that went out through the fence. These gates led to dirt roads that went towards Weaver Farm at the time, which were leased by the Army, along with other properties. This area was basically the test range. The AUES soldiers and scientists could go along these dirt roads and head out towards the test range if needed. There were no residential buildings within the experiment station, so the soldiers had to come and go every day. This map also shows some of the internal roads that were inside the experiment station area, and provides insight to how soldiers and equipment moved at the experiment station.

The contours of the land were such that there were two ridges and a swale or valley between the two ridges. Along that valley there was a road that went out through the gate to the test ranges. The buildings were built along the ridges and faced inwards towards the service roads. The buildings had their backs to the 4835/4825 GR area, so it was really an out-of-the-way corner of the experiment station. There were no buildings or structures there, so when it came time for the Army to choose an area within the fence line for a disposal area, this was a candidate presenting itself as a good location for disposal. This area also remained wooded during its use during WWI.

Question from John Wheeler, Community Member – This area was downhill?

D. Noble confirmed this. It was downhill and probably would have been muddy in bad weather. It would not be an attractive area for doing many activities on, but certainly an attractive area for throwing things

away. Secure but unused. When the photo analysis was done on the 1918 aerial photograph, some features were called out in what is now the GR area that look like disposal features. They are called out as “Probable Trench” and “Probable Pit” which is believed to be the Sgt. Maurer Pit. They also note “Stacked Munitions” but those were up against a building, so probably not being thrown away.

Question from George Vassiliou, Community Member - Where is 4835 GR in this aerial photo?

D. Noble explained that 4835 GR would be up against the cluster of buildings by the back gate.

If you look at the development of the buildings along the south ridge line, and look at the cluster of buildings at the back gate, the disposal area is off the photo but it is behind all of these buildings, and still inside the fence down a steep slope. This is just another example of how the area was inaccessible and presented itself as a good disposal area.

Question from Mary Bresnahan, Community Member - (Looking at Slide 14) Do you know what that big building (in the foreground) was used for?

D. Noble explained that this building was one of a series of three buildings that were shell pits. They were testing areas where they had in ground concrete bunkers that they could explode shells in, and test the chemical concentrations in a fixed volume atmosphere. These were built on a Woodway Lane property. This piece of the experiment station was not AU campus, but a different property owner at the time.

The positioning of the two Glenbrook Rd houses are noted with respect to what was there during WWI. The 4835 GR property was close to that cluster of buildings along the road that went out the back gate. These buildings faced the road and had their backs to the disposal features. There were two miscellaneous storage sheds in this area that may not have been used a lot. If you want to dig a pit and put things in it that smelled bad and might be dangerous, you would obviously want to try to get away from the office buildings. Then, the security fence would have to be patrolled day and night, so you wouldn't want to have your disposal features right up against the fence. A good spot for disposal is within the area that is now 4825 GR.

We also had information about the ground scars. These features are labeled “Probable Pit” and “Probable Trench” and other features that were noted as disposal features. There was a general larger disturbed area where these buildings were located. This makes sense because people walking around these buildings would show as stress on the landscape, and an aerial photo of the area would show it as a ground scar. One scar is from 1927. It may have been related to the experiment station, but we know that it was shut down by 1920, so we don't know if that scar is pertinent or not. It shows a cluster of scarring that indicates a possible disposal. Today we know where there were pits on 4801 GR and 4825 GR. We presume that the Sgt. Maurer pit was in this area and was disturbed by the construction of the 4825 GR house.

We have looked at the “Probable Trench” several different ways over the years and have never come to a conclusion as to if it really was a disposal trench or not, as some of the information suggests it could have been. If it was, then it was unlike the other three pits we found, and not how we imagine the Sgt. Maurer pit.

There are a series of investigative efforts that have occurred over the years at 4835 GR with respect to potential environmental contamination that may have come from the experiment station. In 1992 and 1996, there were two investigations; one was conducted by Environmental Management Systems and another by APEX, which were firms hired by AU to respond to incidents that occurred at the 4835 GR property. This was before the Army's involvement.

In 1999, there was a USEPA sampling event at 4835 GR. The first in-depth look at this property by the Army occurred in 2000, as a part of the site investigation conducted at 4835, 4825, and 4801 GR. A geophysical survey was performed at 4835 GR in 2002. This survey was less successful because of interference issues due to landscaping and retaining walls that have a lot of metal rebar. It was very noisy

in terms of picking up geophysical signals, and not a lot could be discerned from that survey. Based on these results, the Army proposed to get an idea of the subsurface through a test pit investigation. During that test pit investigation, the Army took the opportunity to remove high arsenic in 2007-2008.

In 2007, a soil gas sampling effort was conducted on 4825 GR, and some of the samples came close to the 4835 GR property and yielded data at the time that is interesting now. In 2009, as the test pit investigation was concluding, there was interest in understanding how both houses were constructed with respect to the bottom of the basements, and the location of the foundation and the footers with respect to bedrock and the soil profile at the sites. The question being, are these houses sitting on bedrock or are they sitting on soil and bedrock. If there is soil underneath the houses we could conclude that there could still be burials underneath the houses, but if the houses are sitting directly on top of bedrock it would be unlikely that there would still be burials underneath a home.

1. Environmental Management Systems Investigation

In May 1992, the Environmental Management System (EMS) investigation took place because during the 1992 excavation and construction of 4825 GR there were some complaints about fumes and recovering unusual debris. In May of 1992, an EMS report indicated that there had been laboratory jars, an empty 55 gallon drum, what looked like lab equipment and other ceramic materials. They did soil sampling, soil gas vapor probes, and a general assessment of the property. Their conclusion in 1992 was that they didn't notice an obvious problem.

After their initial visit, they were called back after another incident involving the construction workers and were asked to look again. During this second visit, they looked at both house construction areas, and noticed an area with white granular layers in the soil that they thought could have been deposited or dumped there. They took samples of the material and analyzed it. One result was the finding of a low level of a banned herbicide, Silvex. No one during these early investigations was looking for chemical warfare materiel (CWM), so they weren't testing for the presence of chemical agents. They were looking for volatiles, semi-volatiles, metals, and other more traditional environmental contaminants.

2. APEX Investigation

In 1996, there was a landscape team working at the 4835 GR property, digging a hole in the front yard to plant a tree. They uncovered what looked to be some glassware and laboratory waste. An odor came out of the ground and they reported that their eyes burned to the extent that they had to back off the excavation and stop their efforts. AU brought in APEX to look into the incident. APEX did soil sampling and soil borings in the front yard, and soil gas vapor probes. The pit that was dug by the landscaper was off the front right corner of the house and was over excavated by APEX to roughly double the size.

APEX also did test pitting in the backyard to see if they could find any more buried debris. The map in their report shows the backyard excavation locations and also notates a debris area. However, this debris area was not the area that the worker was originally complaining about, nor debris from AUES. We believe it's a debris area from the landscaping project, representing 1990-era construction debris.

In addition, APEX did more soil samples and soil gas probes in the backyard area. They did not find anything that stuck out as a problem at the house.

Question from Davis Kennedy, Northwest Current Reporter - What is a VOC?

D. Noble explained that VOC stands for volatile organic compound or contaminant. It is a whole class of compounds that would be considered contaminants, and they can volatilize. It is a list of about 100 different compounds. There is an EPA test that you can do that looks for all 100 compounds at once.

3. USEPA Sampling Event

In 1999, the EPA collected surface soil samples at 4835 GR in April, and came back in June 1999 to collect additional surface and subsurface soil samples, which they ran through a large spectrum of

analysis. They discovered elevated levels of arsenic in one location. USACE has used this EPA data over the years. It was summarized in the Site-Wide Remedial Investigation report and our risk assessments, both for the property and for the Spring Valley FUDS.

4. Site Investigation of 4801, 4825, and 4835 Glenbrook Road by USACE

Shortly after EPA's analysis was completed, USACE began to take a closer look at the 4835 GR property as part of the effort to look at all three properties: 4801/4825/4835 GR. This is the first time that soil samples begin to be analyzed for specific chemical agent compounds. We were looking for mustard (HD) and agent breakdown products (ABPs) related to arsenicals. Grid samples were placed all over the property to look for arsenic. Based on the 1999 data from EPA and the 2009 data from the Army, there was an Army report that ran a risk assessment for the property. This risk assessment determined that there were no cancer or non-cancer concerns based on the collected sample data.

5. Geophysical Survey, Test Pit Investigation and Arsenic Soil Removal

There was a concern about buried debris in this area as well, so geophysical surveys were conducted in 2002. This was not fruitful because of the interference at the property, and therefore a test pitting effort was planned. From August 2007-December 2008, a test pit investigation was conducted. These test pits were 3 ft. x 6 ft. in size. They extended 2 ft. to 12 ft. in depth, which was the reach of the excavation equipment at the time, or until bedrock was encountered. There were 76 test pits all over the 4835 GR property placed in a grid pattern. The primary objective of this test pitting investigation was to look for disposal features of a certain size. The disposal area found by the landscaper in 1996 wouldn't have been big enough to locate with confidence. You had to have a certain size disposal area, about 15ft. x 20 ft., in order for this investigation to locate it with 95% confidence, based on the methodology that we used.

Most of the proposed test pits were completed unless utilities were in the way or there was at least 12 ft. of fill. We wouldn't expect there to be any AUES debris in fill, and we wanted to get down to the 1918 soil horizon depth in order to see debris potentially left behind by the experiment station. It was agreed with our Partners, EPA and DOEE, that USACE would not dig those test pits unless something of interest was being found in the other test pits going up the hill, which did not occur.

Between the soil sampling, arsenic soil removal, and the test pit investigation, it was an aggressive disturbance at the property and landscaping. The grids that were removed because of arsenic contamination were dug 5-6ft. while others were 2 ft. Every grid was dug at least two ft., and then the soil at the base of the grid was tested again. If the soil was clean, the grid would be filled back in with clean soil. If it was still contaminated, we would dig another foot and sample again and keep going until the results were clean.

There was much effort taken during the 2007-2009 timeframe to dig all the test pits in these areas to try to understand if there was debris or anything of concern buried in the ground. The investigation was a visual inspection of the subsurface. The test pit would be dug; the workers would look for anything that appeared to be or looked like debris. If they found anything, it was dug out to determine if it was AUES debris. If any soil odors came from the holes or if the workers noticed visually stained soil or if something looked odd, a soil sample would be taken. Not every pit had a soil sample.

There were some test pits that had materials we believe were related to Army activity during WWI. There was one test pit that had a munition debris item. There were other test pits that had some suspect AUES glassware or a mixture of glassware and modern day cultural debris. While we did notice the presence of AUES related material in 14 test pits, it was not extensive. In some of the pits, the find was a single piece of broken glass that we could say it was probably AUES lab related. However, it was in a test pit 3 ft. x 6 ft. x 8 ft. deep and in that entire column of soil, we only found this one lone piece of glass. These finds were interesting, and it was noted as part of the results of the report, but these kinds of finds do not indicate a major disposal area.

Question from Mary Douglas, Community Member – There is a notation that says that you were constrained in some of your test pit decision because of utilities. So there was the disposal, installation of utilities, and then the investigation?

D. Noble explained that the idea was to have a perfect grid pattern for the test pits, but the location had to be adjusted for what was there. If there was a major utility or something that had been dug and placed, then there was no point to set the test pit right there because that soil would have been disturbed by whomever installed the utility. Some test pit locations were adjusted a few feet.

M. Douglas asked if there were any records of the workers who installed the gas line having any health problems.

D. Noble explained that to his knowledge, it was only the workers who built the house and the AU landscape team. There were two reported times that the workers who built the house complained, but it represents that single time frame. And the landscape team was a few years later while they attempted to plant the tree and came across the small disposal area.

There was an AUES-related item found in one of the test pits that was along the property line between 4835 GR and 4825 GR. These previously investigated test pits were near the current area, and where we began encountering the chemical agent containing media (CACM) and bits of glass earlier this year, which was originally found in the bump-out of the retaining wall on the 4825 GR side of the property line. As we continued to excavate along the side of the house removing the retaining wall, we had to dig on both sides of the retaining wall in order to remove it safely. The team noticed a layer of clean fill that had been placed there after the arsenic contamination removal and test pitting in this area. Our workers then noticed a layer with pieces of glass and bits of CACM. We tested the soil and saw low levels of mustard and lewisite. None of this was observed during the test pit investigation that occurred in 2007/2008. It puzzles us why our workers didn't notice these irregularities in 2007/2008, considering that our workers noticed it right away in 2017. As our workers went below that 4 ft. level, we can see the soil that was probably put behind the retaining wall by the builder of the homes. It is a very distinct horizon where we stopped digging in 2007/2008 and where we started seeing the CACM and bits of glass in 2017.

Test Pit 62 in this area is troubling to us. The arsenic contaminated soil had been removed in this area. We had a company, Severson, who removed arsenic contaminated soil at the Spring Valley FUDS for about a decade. However, at this property it was Parsons, who are our munitions contractor. The workers who did this work were trained in explosives and recognizing old mustard and chemical agent in soil. We did not have a different kind of worker in 2007 than we have now – both then and now they have the same specialty training in explosives and chemical agents.

Going back to the photos that were taken of the test pits along the shared property line, we looked to see if there was any CACM that had gone unnoticed. CACM usually stands out because it looks like chunks of black charcoal in beige soil. There doesn't appear to be obvious CACM in the photo, but a photo is never going to do the justice that standing over a hole and looking into it does. Dig sheets were also filled out for each pit. For Test Pit 62, in November 2008, there was nothing unusual noted.

Test Pit 67, arsenic was dug out deeper in this area, about 4-5 ft. in 2008. And again, no problems encountered by our workers. Note that this pit was dug in a cold November. The workers were in 30-40 degrees while they were doing this excavation. The workers who were working in this same area this year were working in August on a 90-degree day. This is a massive ambient temperature difference when these excavations were occurring. Again, the methods, equipment, the training of the workers, and the personal protection equipment were the same.

Looking at photos of Test Pit 67, there doesn't appear to be black chunks that are obvious in the soil. A single piece of AUES-related glassware was found in this test pit; a three-inch by quarter-inch piece of a glass tube. In the description of the soil, they reported clay with sandy loam. We can assume they didn't see any black substance. In Test Pit 72, there is a piece of black geotextile cloth shown in the photo, and

it's obvious that it was laid down by us or the workers before us. The 2008 dig sheet report for this test pit was also very routine. Test Pit 75 also had a very routine dig sheet, and is in the area where we are noticing some of the issues today. There is some geotextile cloth and some dark soil, but it was not marked as unusual. There is some dark soil near the top of the hole, and that could be topsoil which has a rich black organic look.

Other AUES-related items were found at 4835 GR. In Test Pit 49, there was a large metal reactor vessel and a piece of munition debris, or scrap, which was found. The munitions debris, an intact Livens, was full of liquid the day it was found. Upon close examination, we found there was a pin hole in the device. When the liquid was subsequently analyzed, we found out it was water. These were the two significant finds in the test pit operation at 4835 GR. Other modern items found were like rusted steel beer cans and PVC tubing, which were categorized as 'cultural debris,' not from AUES.

Test Pit 27 had three items, but if you note the size of the items relative to the size of the test pit, it does not indicate a disposal area. It just means you are seeing scraps of material in the ground from an area that was heavily used during WWI.

6. Soil Gas Gore-Sorber® Sampling (4825 Glenbrook Road)

In 2007, USACE collected soil gas samples via a soil gas Gore-Sorber. The Gore-Sorber is made from the same material as a gortex jacket. The sorbent material is sewn into the middle of a gortex sleeve and sealed. It can be buried in the ground and works just like gortex does; vapors can pass through gortex but liquids cannot, so water in the soil does not go in the Gore-Sorber, but if there are vapors in the soil, they do go into the Gore-Sorber and are captured by the sorbent material.

Typically, Gore-Sorbers are buried into the ground for a few days so that any soil gasses would be captured by the Sorber. Then the samples would be analyzed to see if anything in the soil is off-gassing. This was done on the 4825 GR property, not at 4835 GR. However, one Gore-Sorber at the 4825 GR driveway, up against the retaining wall, did come back positive for two mustard-specific breakdown products. Right behind this retaining wall is where we are finding all the CACM today. The chemical agent that is in the CACM is mainly mustard and mustard breakdown products. In 2007, when we found this result in the driveway, our attention was on the 4825 GR property as we were getting ready to dig at Pit 3. We knew that Pit 3 was a concentrated area of buried material from WWI. If we pick up a signature of vapor that may be coming off that disposal feature, this might indicate there was a burial in that other area as well, if it has the same vapor signature. Before we dug up Pit 3, we wanted to run this experiment to see if we could come up with a way of using a tool like the Gore-Sorber to see if we could locate other disposal areas. When the hit came up for mustard in the driveway, we were focused on 4825 GR, and we knew about the trench ground scar that went right across the 4825 GR driveway. We came back to take soil samples with the idea that if the mustard breakdown products were coming from something buried in the soil, it could be something in the driveway. However, the later excavation of the soil from under and along the driveway was all clean. In 2007, we wondered why there is dithiane and oxathiane in the soil gas of the driveway when the soil there is clean. Now, there is a lot of dithiane and oxathiane associated with the CACM material behind the retaining wall, so the vapors were probably travelling underneath the wall and under the driveway where it was detected by the Gore-Sorber.

7. Geotechnical Investigation

The geotechnical investigation was to determine if the houses were sitting on soil or bedrock; in the later case it would be unlikely that something would be buried under the homes. The 5 borings were placed in the inside corners and one in the center of each house. We included 4835 GR in this investigation because of the concerns at 4825 GR. By 2009, we had not found a lot of debris at 4835 GR, and in fact, the test pit investigation on 4835 GR had shown only a few random items. The four corner borings were placed right on the outside of the house to give us the bedrock profile without causing more damage to the house.

We tested the soils from the geotechnical borings. We ran these soils for agent and agent breakdown

products, and other experiment station chemicals. There were multiple soil samples taken from the five bore holes, but four metals (aluminum cobalt, thallium, and vanadium) were found at concentrations that exceed the comparison levels. Low level exceedance of these standards under the house or at these depths would not be of concern because these metals are not volatile compounds that could travel, and would stay in place in the dirt.

The center boring at 4835 GR was located in the back part of the garage. The boring on the south front corner was purposely placed within the ground scar disposal feature to get soil quality data about that boring location. The results came back clean. This is also the area of the retaining wall bump out where we recently found the CACM and low levels of mustard in the soil.

The conclusion of the geotechnical investigation was that there is a contiguous soil layer underneath the 4835 GR house. And the 4825 GR house sits on mostly bedrock. However, bedrock is not uniform. The bedrock waves under 4835 GR, and there was also soil underneath 4825 GR.

Question from Allen Hengst, Audience Member - What is the diameter of one of the borings?

D. Noble explained that the borings wouldn't be more than about two inches.

A. Hengst asked how you can conclude from a two-inch boring that there is nothing under the house. You did one boring underneath the footprint of the house that's about two inches wide in about a 2,500 square feet or 50x50 foot area.

D. Noble explained that the primary purpose of the investigation was to try and establish the geotechnical profile, not a chemical profile of what might be in the soil or whether there is debris in the soil. A small hand augured probe is not how to look for debris. However, it brings soil up from underneath the home, and affords us the ability to test the soil.

This investigation does not tell you if there is debris under the houses or not. This information is combined with the test pitting investigation, which didn't show significant disposal of debris items around the 4835 GR house. During the test pit investigation at 4825 GR, we found so much AUES material and AUES contamination that we had to shut down the rest of the investigation and proceed to a high probability operation.

A. Hengst asked if the garage is on the basement level.

D. Noble confirmed that part of the basement is taken up by the garage.

Question from G. Vassiliou, Community Member – How accurate are the pictures matched to the aerial photo?

D. Noble explained that we think it is fairly accurate. It is not the best method if you had modern day technology, like digital GPS equipment. We believe the images are within 15-20 feet. For instance, if the photo is warped or wrinkled over the years, it becomes more problematic. Some features we were able to line up exactly using the aerial photo and modern day maps. Other features don't line up quite as well.

8. Worker Interviews Transcripts

The last items to discuss, because it has been brought up over the years, are the interviews that were done with some of the workers who built the two homes. These interview transcripts were all the material USACE had with respect to what the workers had to say. Last year, some of the workers spoke at a RAB meeting and made statements about their experiences while working construction at the site. I do not know for sure that these transcripts were the same people that came to our recent RAB meetings.

Comment from Ginny Durrin, Audience Member - They are, I did the interviews.

D. Noble acknowledged her comment.

D. Noble presented excerpts from the transcripts with information about the contamination, how much

contamination, and where the contamination was either found or where it might still be located. These excerpts represent the raw information in the written transcripts that maybe informative as we conduct this project. We had these transcripts and knew what was in them when we signed the Site-Wide Decision Document, which does not recommend further action at 4835 GR.

We do a good job collecting and interpreting the data, but the law says we are to share the raw data with the impacted community to make their own independent determinations and conclusions. Until those gentlemen came here recently, these five transcripts helped the project team to make the decision whether or not further action was needed at either 4825 or 4835 GR. These excerpts pertain to those pieces of information about contamination.

There are three transcripts that came from November 1993. There was a fourth transcript that came in March 2013, and another final brief transcript that came in January 2014. A lot of the first three 1993 transcripts relate to the gentlemen's medical conditions and what they feel their medical issues are from the site, which is information we would not release. There is a discussion of this information in the ATSDR consult that was done for 4825 GR. There is an appendix in the ATSDR report about the medical issues described in the transcripts that were analyzed by a medical doctor.

While these excerpts might be brief, these were the obvious statements that were made about the location of materials on the properties.

These first excerpts from November 1993 were made from three workers immediately after finishing construction of the homes. Their memories of what the site conditions were like and where things might have been on the site would be the most fresh. Perhaps these are slightly more accurate descriptions of what was going on at these two houses as they were working. The question was asked by the interviewer, and answered by the different gentlemen speaking at different times.

The first direct question asks: "...how would you describe where the bottles were? And if the bottles were buried in a place, was it behind the house close?" I am assuming that means 'close behind the house.' Then, "Talk about whether it was the house close to the Korean Embassy or the one away." The 'Korean Embassy' is the 4801 GR property, and so the house close to this property would be 4825 GR and the one away would be 4835 GR. The first response given were that no, the bottles were "up close to the Korean Ambassador's property. It's where most of the trash was." We believe this gentleman is referring to 4825 GR, which makes sense because this is what our investigation showed. We found a lot of stuff at 4825 GR, we didn't find a lot of stuff at 4835 GR. He seems to be saying the same thing here.

Then the question is asked, "Do you all think there's still stuff in there?" And the answer is "Yeah." Then the question is asked, "Where...? I'd like to get an answer from each one of you."

The interviewee proceeds to talk about the "land behind the houses that borders the American University fence and the strip of land between the first house we built and the fence, which connects to the Korean property..." I believe they are talking about two locations. He believes there is stuff in the land behind the houses, and between the first house built and the fence along the 4801/4825 GR property line

Question from Greg Beumel, RAB Co-Chair – When 4825 GR was built, was the property line there? You spoke earlier about it being a quarter lot, so was the fence somewhere different than present day when they build the properties?

D. Noble explained that the property boundaries were defined as they are now.

The second interviewee says, "The dirt that's behind that retaining wall, they brought a lot of that in." This last phrase is a little confusing because it is unclear why he thought that dirt that was brought in would have been contaminated. In general, I think he is confirming what the first gentleman says; he is talking about the dirt that is behind the retaining wall [between 4801 and 4825 GR].

Question from G. Vassiliou, Community Member – Is it possible they filled?

D. Noble and G. Durrin confirmed this.

The workers were asked again, this open-ended question, “Where do you think the stuff still could be?” The answer was, “The majority of it is in the ground behind the houses between the American University and the houses on the bank side. Like the little hill there, behind the houses.” This mention describes the area behind the houses, towards AU, but does not mention towards 4801 GR.

The next question is interesting because it is the only time in the transcripts that they are directly asked “what about still being some in the ground where the houses are?” This can be interpreted as asking about underneath or up against the houses. The answer doesn’t come back with a firm yes, or no. The answer is “You’re not going to rip down a two million dollar home to dig in the dirt...” If he had stopped there, he really is not answering the question. It can be interpreted as meaning it doesn’t matter if there is something underneath the house, you’re not going to tear down a \$2M house to get at it now; you already built the house. However, he does go on to say, “...and not find anything.” You can interpret this in two different ways: either there isn’t anything underneath the house, and if you tear down a \$2M house and not find anything you will be mad at yourself; or you are not going to take the risk taking down a \$2M home and not finding anything. If he thinks something is in the ground or not, the question is pointless because nobody is going to look there anyway. The answer goes on further with a more lengthy explanation. I think he is saying that he does not know if there definitely isn’t something underneath the homes; when he says, “Plus, for all we know, they may have took a foot of dirt below where American University started dumping...” (American University means the Army). I think what he is saying is that they were not there when the holes were dug and the foundations were laid, so they don’t really know.

The next question asks, “...how many bottles would you say total you all saw or heard about, and ... where were they specifically?” His answer was general, “They were just in the dirt, in various different places.” A conclusion cannot be drawn from that statement. Then, during the interview, a map of the houses was brought out and they were asked to point to where stuff is located. Without the video, it is hard to absolutely know what they are talking about. The interviewee responds, “Well, probably the most that would still be in the ground would probably be somewhere behind this retainer wall. On this section up here back into the Korean Embassy property.” It seems that this statement is referring to the retaining wall and property line between 4825 GR and 4801 GR. And then he says, “...at one point the bottle that [Name] had referred to as being busted was approximately right here which would be in the driveway that went in between the two houses for the garage to go to this house.” This is a clear reference to the driveway between the two homes (4825 and 4835 GR). He is saying there may be something there because something happened around that driveway area – they busted a bottle.

In this last statement, “And then they took the remaining part of the dirt that they had left there which referred to as clean dirt and filled this in here which is that retaining wall which is all here up this driveway.” They are talking about a retaining wall that goes along a driveway and they are saying maybe there is something behind that retaining wall that goes along that driveway. There is a major retaining wall along the 4825 GR driveway. This is interesting because it seems to be referring to areas that could be on 4825 GR, but also could be referring to an area on 4835 GR. That dirt that they thought had debris in it was placed behind a retaining wall.

The final question in this transcript asks, “...do you know where the bottles are, or where they still could be.” And again the answer is still, “possibly...some in this area here between the retaining wall and American University, Korean Embassy. Or there is a possibility that there could be some right along in here.” When he corrects himself and refers to the Korean Embassy, it seems he is talking about the retaining wall between 4801 GR and 4825 GR. It is unclear how to analyze the second sentence.

Comment from G. Durrin, Audience Member – The first reference was between that house and 4801 GR. The second reference was to the retaining wall that curved around and faced American University up the hill.

D. Noble acknowledged her comment.

The workers were asked again, "...why don't you show where the bottles were again." They respond, "...behind this retaining wall here, there could possibly be some of it in the ground on Mr. Brandt's property here or on the Korean Embassy right here or maybe possibly in behind these lines here ... and ... maybe three or four feet behind this retaining wall was dug out six, seven feet deep, so there could still be something from that point up back to the property line of American University." It appears they are focusing on the significant retaining walls on 4825 GR. These retaining walls were as deep and tall as the worker explained.

Question from G. Vassiliou, Community Member – You have sampled into the 4801 GR property?

D. Noble explained that major excavations were done on the 4801 GR property in that whole back yard area. Two pits were found there; massive over-excavation occurred for environmental contaminants; and Pit 3 was first found on the 4801 GR property and then it was found to extend onto 4825 GR. So the worker was correct, there was a lot of stuff behind that retaining wall towards the 4801 GR property.

There is not a strong statement made immediately after the construction of the houses that there is stuff under the houses. There is a lot of focus on areas behind retaining walls. They thought the broken bottle around the driveway was interesting. However, if there was stuff buried under the houses and they knew it, I would have thought a mention would've been made. In March of 2013, about 20 years from the building of the homes, another transcript was provided to the USACE team. Some questions were asked specifically about what's underneath the houses and does 4835 GR need to come down. The first statement from the interviewer says, "...basically the first thing you said to me that stood out was that you didn't see any way to do this except to tear down 4835 Glenbrook Road." His response to being asked about 4835 GR was, "Right, you gotta tear em both down." The answer seems to mean there is stuff under both houses. The interview asks what is the kind of stuff under the house, and he response, "...its some kind of liquid stuff inside of bottles." And then again he is asked, "...did you build the house on top of them?" And he says again, "Yeah. We built on top of both of them. The houses were on top of that stuff." Again, he is asked specifically about a house, and he responds about both houses; that they were both built on debris.

Question from D. Kennedy, Northwest Current Reporter – Are these the same people that were interviewed earlier?

G. Durrin confirmed this.

D. Noble has no real way of knowing, but he is assuming they are the same workers that were interviewed in 1993. This interview is occurring 20 years later.

The workers are asked again, "...do you think that there are still bottles underneath the basement floor?" He answered, "I think there is." Then he is asked, "Now is there any other information you can give me that they should know about to save time and money when they are cleaning it up. But to do it right they have to tear the house down." The worker responds, "To do it right, they have to tear the house down. It was under both houses." This statement reiterates the idea that there is stuff under both houses.

Interestingly, he is asked 3 different times about *a* house (the 4835 GR house) and his answer is *both* houses. Both are on top of that stuff, both are problems; you need to look into both of them. As you know, we looked under the 4825 GR house and didn't find anything. In this case, his statements about both houses are problems because it is not backed up with what we saw at 4825 GR. There were certainly problems all around 4825 GR, but we didn't find much of anything under 4825 GR; no debris, contaminated soil, munitions, or bottles with liquid.

USACE was provided a final transcript in January 2014. The interviewer asks, "You think there is stuff under the house on Glenbrook Road to the left, standing on the street?" That is a clear reference to 4835 GR. When the answers are transcribed back, they say "I am pretty sure. Almost 100% sure because there

was stuff in the??? ground? I am 99% sure that there are some kinds of chemicals and bottles.”

We had previously made statements at the RAB that we find the idea of large scale burials by a builder under a house a little troubling because it is not the smart way to build a house. You would not want to build on debris because you would be insuring future problems at the house, like cracked foundations and slabs. You would want to build on compacted soil or solid bedrock that will not continue to compress when you put the weight of a heavy house on it. The interviewer asks the workers their opinion pertaining to those statements, and they disagreed saying, “Regarding your quote, I’d say [expletive].” This is a man who builds houses for a living, so despite what we as engineers think is a good way to build a house, he is saying we are wrong. He continues to say, “As much stuff under it (the AU President’s house) as the other one. When they got to a certain point, they would compact the ground down, pour concrete. They never went to the bottom of it. They stopped where the grade he wanted it to be. We asked [Name] 100 times and he said to [Name], [Name], and [Name], ‘nothing here’.” This seems to be a reference to the workers asking the builder if there could be something in the ground, and the builder says “nothing here.” It still appears that he thinks there is something under both of the houses.

Question from D. Kennedy, Northwest Current Reporter – You didn’t find anything under the house at 4825 GR?

D. Noble confirmed this. We have taken the 4825 GR slab up and there was nothing underneath the slab or foundations.

Question from G. Durrin, Audience Member – You dug down to bedrock under 4825 GR?

D. Noble confirmed this.

G. Durrin commented that there was more dirt under 4835 GR and the bedrock is much deeper.

D. Noble agreed.

G. Durrin got the idea that the workers were told to pour concrete on top of dirt, but they didn’t know what was underneath that dirt. They asked their boss if he was sure they wanted to do this, and he said yeah.

D. Noble agreed; that is consistent with their last statement.

D. 4825 Glenbrook Road

Brenda Barber, Spring Valley Project Manager, provided an update of the 4835 Glenbrook Road project.

During the July RAB, we reported that we were having slower progress than anticipated due to the amount of contamination that we were encountering along the shared property line. We saw low levels of mustard and agent breakdown products in the soils behind the curved retaining wall in late February/early March 2017. We continued to work along the shared property line and moving utilities that were all over this area. A majority of this work was done by hand because of the debris. With the summer heat, and the personal protective equipment (PPE), it was a very slow effort for us. Right after the July RAB, we had removed a majority of the retaining wall. The next major effort was to remove the soils from behind the retaining wall.

Another thing that was hindering our progress at the site, as we continued to dig we had areas of depression that collected an excessive amount of storm water in July and August. None of this rain water ever left the site. We had a robust storm water system at the perimeter of the property. Every time it rained, we had to stop excavation work to pump and containerize the storm water. And then we would have to wait for materials to dry until we could begin our efforts again.

The major issue that we are addressing today occurred on August 9th, when we had two downrange teams, approximately 7 people in total, experience some minor symptoms that indicated a potential exposure. They had some eye irritation and other minor symptoms that subsided within an hour, before they left the

site and were transported to the hospital. They were medically cleared that evening and given a release to return to work the next day, which all of the team members did do. The excavation area that they were working in at the time was behind a small piece of retaining wall that was left in place. Once we realized that both teams were experiencing some symptoms, we sent a down range team behind them in an upgraded level of PPE. They mitigated the entire excavation area with plastic. There was also a small stockpile of soil on site that was mitigated.

Since the August incident, the team halted all intrusive work at the site, and has only been performing non-intrusive work including site maintenance. We convened a formal Board of Investigation on August 22nd that has been tasked with investigating the incident to determine the root cause and issue a report.

The Board anticipates they will issue a final report by the end of October. They cannot share anything with us; they are completely independent. They are made up of a board president from USACE Baltimore District, a former Spring Valley project manager, Gary Schilling; Steve Hirsh (EPA) and Jim Sweeney (DOEE); a representative from Edgewood (ECBC) who is a chemist able to provide the air monitoring and other sampling information; and an occupational health doctor from the Public Health Command. These are all voting members who have to vote and concur on the final report. There are several non-voting members who are technical experts. There is a safety specialist from USACE Huntsville, which is our center of expertise for chemical warfare materiel. There are several industrial hygienists and other medical experts from the Public Health Command and a legal advisor from USACE Baltimore.

Question from Paul Dueffert, Community Member - The excavation was on the actual 4835 GR property?

B. Barber confirmed this. We are generally in the area behind the retaining wall, adjacent to the foundation of the 4835 GR home.

Question from Tom Smith, Community Member - Were you required to establish this Board of Investigation?

B. Barber explained that we were not required per our regulation. We chose to do this in an abundance of safety and to determine the root cause of this incident.

D. Noble explained that our Commander decided to, and then we were required to do so.

B. Barber explained that per our regulation, it was at the Commander's discretion.

Question from G. Durrin, Audience Member - Is everyone on this Board paid by the military except for James Sweeney?

B. Barber explained that we are covering some of EPA's expenses, but S. Hirsh works for EPA. And J. Sweeney works for DOEE, so we are not paying him. They are independent, we cannot sway them. Our intent was to have people on the Board who are outside of the Army chain of command.

Question from M. Douglas, Community Member - It just says to investigate the incident, clearly trying to determine what were the substances that caused discomfort for the workers. What else? Is the Board trying to discover where these substances emanated from and the extent of it?

B. Barber explained that the Board is solely focused on root cause and then they will issue a recommendation as part of their report. They are looking at everything we have done; every work plan, every procedure, sampling data for that day, weather conditions. They are also stepping back to look at the bigger picture to see how we are approaching the work, how we did our risk assessment, what went into our thought process, so that they can make recommendations about how to safely return to work.

There were no air monitoring results for that day, and none of our MINCAMS detected anything in the air during the incident. All of our DAAMS tubes came back clear with no detections for any agent; we didn't get any results from any of our hand held equipment. From a data perspective, nothing occurred that would have caused the symptoms that these employees had seen. One of the first things that the Board tasked us with doing was collecting some additional sampling information so that they could better idea

of what could've caused this incident. We initially tried to do DAAMS tubes again under the plastic mitigation. Unfortunately, a majority of the DAAMS tubes were impacted by excessive moisture on the sorbent tube. We quickly moved to a second phase of sampling. On August 25th, a sampling team in Level B PPE with supplied air cut small openings in the plastic mitigation to gather the soil samples in both the excavation area and the soil stockpile. Once the sampling was complete, we mitigated the area again to ensure the safety of the public. All of the soil samples were cleared for agent and agent breakdown products. Parsons was tasked to send those samples off-site to a commercial lab.

The Board interviewed all of the employees who exhibited symptoms; B. Barber and D. Noble; the project manager from Huntsville; our ordinance personnel on site from both USACE districts; all of Parsons' on site team; and the staff from George Washington Hospital who treated the employees. They are reviewing all the data from the day of the incident, as well as all the work plans, procedures, safety protocols, etc.

1. 4835 Glenbrook Road Sampling Effort

Prior to this incident in August, we had approached AU after the August 3rd Partners meeting, and requested permission to do some additional subsurface sampling in the basement of 4835 GR because what we were finding in the soil on the property line was causing us some concern. In July, we were working closely with AU to try to get the President's house ready, but it did not come to fruition.

Question from A. Hengst, Audience Member – Because of this testing?

B. Barber explained that the President's move did not come to fruition because of this testing, not because of the August 9th incident.

A. Hengst asked when is [the new AU President] moving back?

B. Barber explained that we are negotiating with AU to take control of the property to sample through the basement floor, which means we are basically going to destroy the basement, driveway and garage. The house will not be habitable during that effort.

A. Hengst asked if the rest of the house will stand?

B. Barber confirmed this.

Question from T. Smith, Community Member – What is it about the discovery of the chemical compounds that has made you decide to sample the basement when you have done the test pits previously? Help me understand the progression.

B. Barber explained that we are back in an area previously investigated and are now seeing low levels of contamination. On August 4th, we got our first result back for small amounts of Lewisite in the soil. We want to do our due diligence to make sure that this contamination does not proceed under the house at this time. The team did not have this information before the July RAB meeting. Up until then, we were seeing low levels of mustard and ABPs, and the CACM was dissipating. We went from seeing football sizes to golf ball size pieces of CACM. Now we are seeing both CACM and Lewisite.

Question from M. Douglas, Community Member - What is CACM?

B. Barber explained that CACM stands for Chemical Agent Contaminated Media, or small amounts of chemical agent mixed in soil. D. Noble explained that it could be in any media that could be contaminated by chemical agent. In this case, it is a black charcoal like material. B. Barber clarified that it is not hard like charcoal, but pliable.

M. Douglas asked if this the first time you've seen this stuff?

B. Barber confirmed this.

D. Noble added that we did not see it when we previously put test pits in that very same area. Either the

CACM is very hit or miss, or for some reason we didn't notice it in 2008.

Comment/Question from RAB TAPP Consultant - Mary, throughout the entire investigation they have been on the lookout for discoloration or anything abnormal or different in the soil. How far downrange were the workers?

B. Barber explained that they were basically in the area that corresponds to the test pit where we found that one small piece of glassware debris. [Test Pit 67]

RAB TAPP Consultant asked if they were in the immediate area?

B. Barber explained that the workers were hand excavating because of debris in the area. The first team just had some mild eye irritation. Unfortunately, they chalked it up to seasonal allergies. When they exited, they did not tell the inbound team. The next inbound team had similar symptoms, a little more pronounced. Our management then noticed the issue and immediately moved to mitigate and process the employees for their health and welfare.

RAB TAPP Consultant asked if the hygienist on the Board will be asking about the relationship between those symptoms and other things going on at the site? Because I know there are a variety of volatile gaseous materials that cause the same sort of symptoms.

B. Barber explained that the communication with the Board is not two ways. When we get the Board's report, we will share that, but right now it's completely independent.

Question from G. Durrin, Audience Member – Do you recall, you were standing here talking to one of the workers after the RAB and I was standing there too. You asked him how far should we dig under the basement floor of 4835 GR and what was his answer?

B. Barber clarified that his story was that when they poured the floor of 4835 GR, that particular day, they dug a pit and dumped everything in and poured concrete.

G. Durrin recalled that he said you should go down two feet.

B. Barber explained that her recollection was that he claims they dug a pit.

G. Durrin asked I thought you asked him how far you should drill down to get to anything.

B. Barber explained that these samples are going to be drilled through the floor to bedrock.

G. Durrin said that's great.

Question from T. Smith, Community Member - When will this work be done?

B. Barber explained that USACE is negotiating terms and conditions with AU because our work is going to be preventing the AU President from using the house. Our goal right now is to start in late September or October.

T. Smith asked if UASCE had to wait until this Board is done.

B. Barber said no, because they are two independent tasks at this time.

Question from G. Vassiliou, Community Member - There was a precedent of that nature when you dug at 4825 GR, where it seemed that someone had stacked some of the munitions you found there next to each other, correct?

B. Barber explained that there was an intact portion of burial Pit 3 and then there was scattered debris that appears was moved around by the developer and used as backfill up against the foundation of the 4825 GR home.

Question from T. Smith, Community Member - Does USACE have to negotiate an arrangement with AU?

B. Barber explained that we just met with the AU President and her staff, so we do not know that at this time.

D. Noble added that in the past, when we take over properties, we lease them.

At this time, this will be a single row of 12-15 borings inside the basement against the southern foundation wall. We also plan to put 2-3 borings in the front yard, just outside the foundation. We will put 2-3 borings under the back patio as well. Depending on the results of these borings, we may step out and do additional sampling across the entire basement area until we are competent that we have done our due diligence.

At the site, the large depressed area that had been collecting storm water has been backfilled. We laid geotextile and placed crushed stone over the site in anticipation of the high likelihood that we will go into an operational pause mode. We will perform the sampling efforts as described, but it is likely that all operations will be paused by the next RAB meeting. During any site shutdown, we will maintain a limited staff who will continue to provide security.

2. Future Activities

The Board of Investigation anticipates completing their report by end of October. That report will hopefully consist of identification of the root cause and recommendations to take into account prior to returning to work.

3. Tentative schedule

We have the initial sampling effort plan for 4835 GR. Both of those combined efforts will assist our team in trying to develop a robust return-to-work plan. Once the plan is vetted with USACE, we will seek regulatory and AU concurrence. The plan will be presented to the RAB before we return to work.

This has had significant impact on our schedule. At the July RAB we had noted that we had seen some schedule slippage, and we were targeting a spring of 2018 completion of work. This was prior to the safety shut down at the site. At this point, we are going to move into a temporary site shutdown, estimated to be around 4 months. We will develop our return-to-work plan, complete the Remedial Action, move into site restoration and return the property to AU.

Comment from Christine Dieterich, Audience Member - We live right opposite of 4825 GR. My concern all along has been that the Corps does not have a clue what is underneath. We never believed your assurances that our family and my children playing in the front yard are safe. During this time of high probability, we rented an apartment at our own expense to have the kids out of the house because the Corps kept brushing off our concerns. The RAB in 2008 endorsed our request for relocation. You have been digging in an area of low probability and we brought the kids back to the house. You screwed up the assessment between low probability and high probability. In what you called low probability work, things blew up into the workers face. This is proof that there can be exposure to agents and all your engineering gimmicks didn't make a beep. How is this going to continue? Now you will start digging up 4835 GR. Is this going to continue another 5 years? And pretending that we are safe? It is tough to believe.

B. Barber explained that USACE had ample information from 4835 GR to make our risk assessment. Unfortunately there were still some risks and we have to shut down work along the property line to reassess safety because safety is important to us. It is important that we are protecting the community. I cannot guarantee that I can plan and implement a project with absolutely no risk to the community. But we have done everything within our power to eliminate or control those risks to the best of our ability. There were no indications along this area that we were going to run into this problem.

C. Dieterich asked then how can you tell me that my children are safe? When digging test pits for 25 years, things blew up into your face.

B. Barber explained that nothing blew up in the workers faces. They are hand digging with garden

trowels. They are very close to the excavation area. This particular area, there is still a small section of retaining wall up that we have not removed. They were in a very small confined area. There are ventilation issues and it was a warmer afternoon that day. So they were exposed right at the face of the excavation. There was no release, no cloud or blow up of any type of material.

C. Dieterich asked if there was no release.

G. Beumel said I understand your pain as a parent; we all appreciate the issue, which is why we voted that hopefully the Army would relocate you. When we are done, I would encourage you to come up here and talk to USACE and me. The answer is what you already stated, they do not know right now. How are they going to protect your kids when they go back in, because they don't know what it is that the workers were exposed to? Until they know that, they cannot come up with a plan to proceed.

Question from Audience Member 2 - Can we talk about the background that led to the start of exploring the PSB? D. Noble explained that the Public Safety Building (PSB) is part of the site-wide Decision Document. There are actions called for at the PSB. There was another disposal feature associated with AUES, which is Lot 18. For the most part, the Lot 18 disposal area has been completely removed. What is known? Is there remaining debris from that disposal feature underneath the PSB?

D. Noble explained that it is our intent to remove the slab of the PSB. The building has been taken down by AU. They left the foundation and slab in place for the Army to remove those remaining features, look for, find and remove remaining debris from the Lot 18 disposal area.

Audience Member 2 asked what the time frame is for that work.

D. Noble explained that the contractor is currently working on the work plans. We need to get the approvals and permits in place; potentially start in January.

Audience Member 2 asked if this will occur while students are on campus.

D. Noble confirmed this. When Lot 18 was originally excavated, it was excavated to about 25 feet from the PSB where we stopped. There was concern about getting too close to the structure, so we devised a light foot print approach to excavate the remaining 25 feet up to the building in 2009 to 2011. We excavated right up to the PSB and around the front of the building. We also removed tons of debris from the Lot 18 disposal area and that subsequent effort close to the PSB, all with students on campus.

Question from Jeff Stern, Audience Member – I have been a Glenbrook Road neighbor for many years. If the test borings on 4835 GR show something that is a problem, this may be premature, but is there a scenario where you would have to take down 4835 GR.

B. Barber agreed that this is a premature discussion, but that scenario will be dependent on the sampling results that are analyzed as a team. We are going to phase that work. For example, if that first row comes back clean, it is likely that we will expand that effort across the entire basement to make sure that everything under that house comes back clean. If we see sampling results that say otherwise, then that is an assessment we will have to make at that time.

D. Noble added that what is driving the concern and why we are sampling the soil between that retaining wall and the foundation of 4835 GR is that we saw low levels of mustard and occasionally Lewisite. If the results from underneath the house show the same thing, it seems to me that there is only one path forward at that point. If there is chemical agent under the house, we are not going to leave it there.

J. Stern asked if that is the path forward, are we are looking at another 4 or 5 year process? Once again, speculation, but help me out.

B. Barber explained that we have learned a lot from the 4825 GR property. The lessons and the opportunities we developed have enhanced productivity, I would anticipate it could be another 2 to 3 years. You have to take into account we have some documentation and regulatory requirements; we would need to open the 4825 GR DD to expand the remedy.

J. Stern remembers the process at 4825 GR, so it may take 6 or 8 months to get final approval.

B. Barber explained that the approval process would be significantly streamlined because of the engagement of leadership all the way up the Army. I don't think the approval process would take as long; it is just getting the documentation in place. That 4-6 month period would be looking over the plans.

D. Noble added that the already selected remedy would be expanded. We do not have to select a remedy again. That was all done in great detail.

J. Stern asked even though it is the other house?

D. Noble confirmed this.

B. Barber explained that we would duplicate the remedy that we already been actively implementing at 4825 GR at 4835 GR. Similar low and high probability phases, but we will make those determinations based on new information. We will then develop revised work plans.

J. Stern asked how long was it to do the work at 4825 GR?

B. Barber explained that the house was demolished in November 2012. We had some impacts due to the sequestration in 2013. We were under high probability from September 2013-July 2016. We had some significant challenges that we have learned from, which we can implement for any future activities we would take. This is an estimate at this time.

Question from G. Durrin, Audience Member – Earlier you said the workmen told you what was underneath the house.

B. Barber explained that the workers indicated they dug a hole under 4835 GR and right before they poured concrete over the hole, they threw debris in there. We found absolutely nothing under 4825 GR. In the transcripts, they consistently say it was under both houses. It was not under 4825 GR; it was pushed up against the foundation, but it was not under the floor slab anywhere; crawl space, basement floor, garage floor.

G. Durrin added that when he was referring to the crawl space he was only referring to 4835 GR.

III. Community Items

No community items were presented.

IV. Open Discussion and Future RAB Agenda Development

A. Upcoming Meeting Topics

- Groundwater Feasibility Study
- Site-Wide Remedial Action
- 4825 Glenbrook Road

B. Next RAB Meeting:

Tuesday, November 14, 2017

C. Open Discussion

V. Public Comments

No public comments were presented.

VI. Adjourn

The meeting was adjourned at 9:39 PM.