



SPRING VALLEY FORMERLY USED DEFENSE SITE PROJECT
RAB Meeting

**March 13, 2018
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
Task Group Updates
 ▪ RAB Membership
- 7:15 p.m. II. USACE Program Updates**
Groundwater Study
Site-Wide Remedial Action
Board of Investigation
Glenbrook Road
- 8:05 p.m. III. Community Items**
- 8:10 p.m. IV. Open Discussion & Future RAB Agenda Development**
Upcoming Meeting Topics:
 ▪ (Suggestions?)
 ▪ Policy issues between USACE and EPA concerning Groundwater restoration at CERCLA sites.
- *Next meeting: May 8, 2018
- 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 13 March 2018

“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

Task Group Updates

- RAB Membership

USACE Updates

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

Community Items

Open Discussion & Future RAB Agenda Development

Public Comments



CO-CHAIR UPDATES

Introductions



CO-CHAIR UPDATES

Announcements

Website Updates:

- January and February Monthly Site-Wide Project Updates
- Weekly 4825 Glenbrook Rd Project Updates with photos
- January RAB meeting minutes
- December Partner meeting minutes
- Updated Project Timeline
- Remedial Action Q&A

The screenshot shows the US Army Corps of Engineers Baltimore District website. The header includes the Corps logo, the text "US Army Corps of Engineers", and "BALTIMORE DISTRICT". Navigation links include HOME, ABOUT, BUSINESS WITH US, MISSIONS, LOCATIONS, CAREERS, MEDIA, and CONTACT. A search bar is also present.

Announcements

Next Restoration Advisory Board Meeting - January 9, 2017
 The next RAB meeting will be held on **Tuesday, January 9 at 7 pm**. These meetings are open to the public. Currently, the RAB meets every other month for 60-90 minutes in the "Undercroft" meeting room at St. David's Episcopal Church, 5150 Macomb Street NW, D.C.

Restoration Advisory Board Seeks New Member:
 With one long-time community member retiring and moving to the south, there is currently an opening for a community member to join the Restoration Advisory Board. If you live and/or work within the project area and are interested in serving on the RAB, please complete an application and mail it to the U.S. Army Corps of Engineers. Residents can obtain an application by calling the Community Outreach Team at 410-962-0157 or by visiting [http://www.rab.usace.army.mil/Home/Spring-Valley/Community-Participation/](#). To learn more about volunteering, please contact Malcolm Pritzker, RAB membership chair, at malpritz@aol.com.

Click here to visit the Community Participation section of the Spring Valley page where more information about the RAB can be found, including applications for those interested in joining.

Final Site-Wide Decision Document Now Available:
 The Final Site-Wide Decision Document is complete and is now available at the Information Repository and for download here on our site. The Decision Document outlines the selected remedies to address both unacceptable risks posed by soil contamination and unacceptable explosive hazards posed by the possible presence of munitions and explosives of concern (MEC). Click here to visit the Site-Wide section of the Spring Valley page where the Final Site-Wide Decision Document can be downloaded.

Spring Valley Overview

The Spring Valley Formerly Used Defense Site (FUDS) consists of approximately 660 acres in the northwest section of Washington, D.C. During the World War I-era, the site was known as the American University Experiment Station, and was used by the U.S. government for research and testing of chemical agents, equipment, and munitions. Today, the site encompasses approximately 1,600 private properties, including several

Project Efforts

Project Update
4825 Glenbrook Road
Site-Wide
Groundwater
Munitions Destruction

Site-Wide

The Corps'pondent

Project Documents

These are just a few of the project documents. More key documents can be found in the Information Repository at the Tenley-Friendship Branch Library.

Associated Organizations



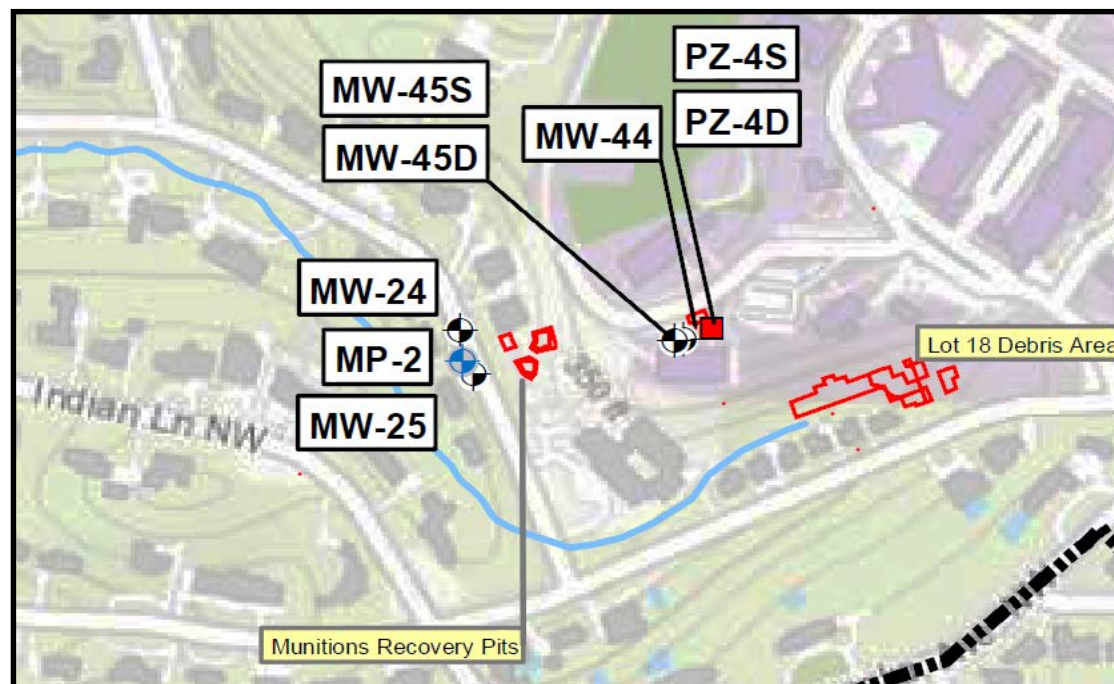
TASK GROUP UPDATES

RAB Membership



GROUNDWATER STUDY

USACE Updates



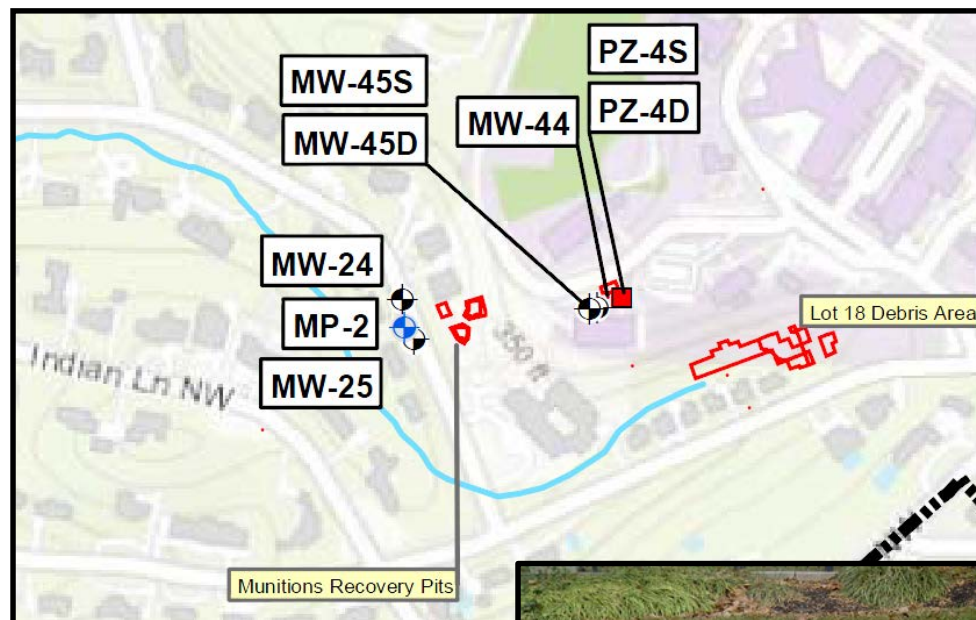
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GROUNDWATER FEASIBILITY STUDY (FS)

7

The Army Corps and their regulatory Partners have different preferred options and unresolved comments regarding groundwater cleanup requirements. The Army Corps is coordinating with Army HQ to determine how to proceed.

In addition to working towards finalizing the FS, the team began drafting a Groundwater Proposed Plan and consulting with the Army on a preferred remedy.

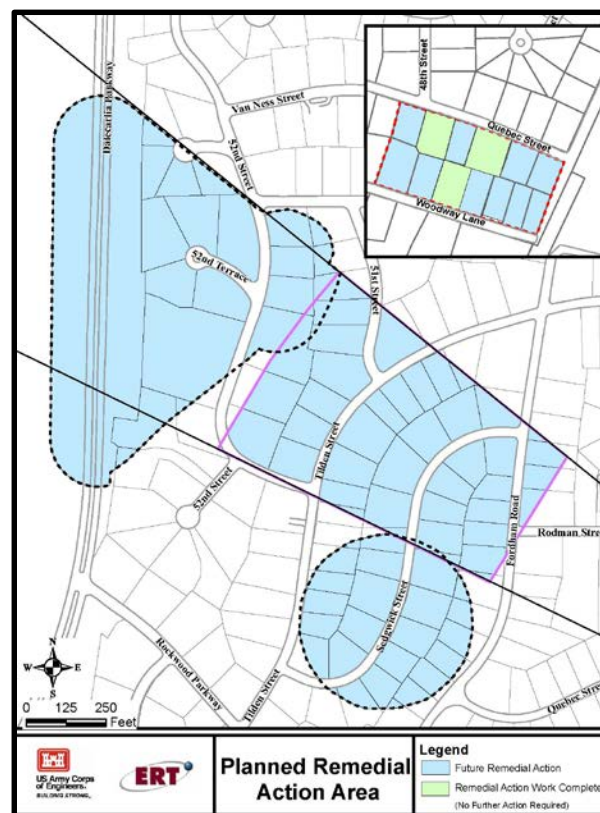


Crew conducting monitoring well maintenance.



SITE-WIDE REMEDIAL ACTION (RA)

USACE Updates



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SITE-WIDE REMEDIAL ACTION

Our contractor team continues to work on the planning documents for the Remedial Action field work.

These plans will develop the details for carrying out the selected remedial actions:

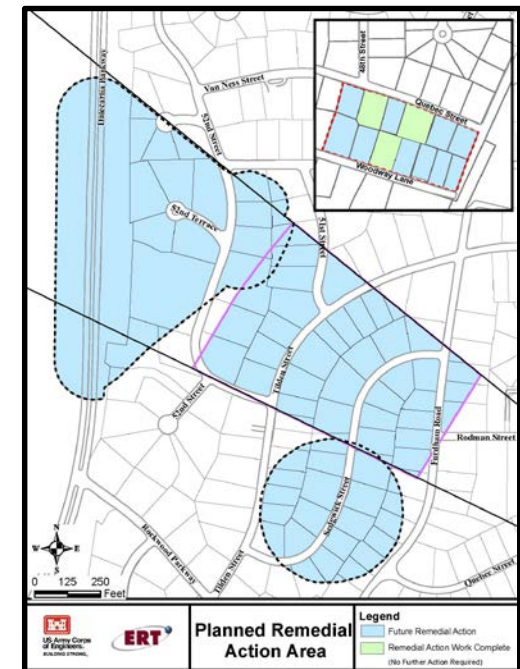
- Prepare and Implement the Land Use Control Implementation Plan (LUCIP)
- Conduct the final survey effort at 91 residential properties and 13 Federal/City Lots
- Removal of contaminated soil at small areas in the southern portion of AU campus and at one residential property
- Excavate under the foundation of AU's former Public Safety Building



**Foundation slab of AU's former
Public Safety Building**

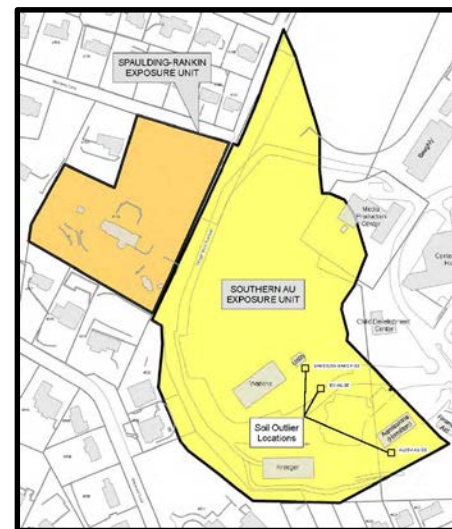
SITE-WIDE REMEDIAL ACTION

- Munition Education and Awareness (the LUCIP):** Continue with the 3Rs of the Explosive Safety Education Program (*Recognize, Retreat, Report*), and 5-year reviews to ensure that human health and the environment continue to be protected. Prepare an Information Packet to distribute to the Community once the LUCIP is finalized; currently being reviewed by the Spring Valley Partners.
 - Final survey effort at 91 residential properties and 13 Federal/City Lots:** Finalize the quality assurance and safety plans, obtain Right-of-Entries for the first group, and conduct:
 - Civil and landscape surveys, landscape plan and arborist appraisal.
 - Conduct a site walk with owners, document site conditions, review and receive approval of the landscape plan from the property owners.
 - Landscape trimming/tie back/temporary removal.
 - Start field work with the two instruments, the MPV and G-858 magnetometer.
-



SITE-WIDE REMEDIAL ACTION

- **Hot spot soil removal at one residential property and the Southern AU campus exposure units:**
 - Complete civil and landscape surveys, landscape plan & appraisal.
 - Conduct a Site walk with owners, document site conditions, review and receive approval of the landscape plan from owners.
 - Start field work (Summer 2018) – Begin with pre-excavation delineation soil sampling.
- **Excavate under the foundation of AU's former Public Safety Building (PSB):**
 - Complete civil survey, utility marking and document site conditions.
 - Set up construction site compound and facilities.
 - Shut off and temporarily relocate utility lines near PSB.
 - Start field work - Conduct sub-slab pre-characterization soil boring sampling.



Soil Excavation Areas



Foundation slab of AU's former Public Safety Building

SITE-WIDE REMEDIAL ACTION

Tentative Schedule

March 2018	Finalize work plan after Partner review.
April 2018	Obtain Rights-of-Entry from the first group of homeowners; from AU for the former Public Safety Building and soil removals; and from the Spaulding-Captain Rankin property owner.
May 2018	Begin Remedial Action field work
~ 2018-2020	Continue Remedial Action through 2020. Distribute the Munitions Education and Awareness packet.



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GLENBROOK ROAD

USACE UPDATES



4825 GLENBROOK ROAD - RETURN TO WORK

4835 GLENBROOK ROAD - SAMPLING EFFORT



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RECENT ACTIVITIES – 4835 GLENBROOK SAMPLING

14

With the completion of Borehole 18 under the covered patio on January 29th, all of the planned soil borings along the property line were completed.

Several pieces of potential AUES glassware were recovered from Soil Boring (SB) 7 at ~4.5' from the top of concrete. They were cleared (headspaced negative) for chemical agent.



RECENT ACTIVITIES – 4825 GLENBROOK SAMPLING

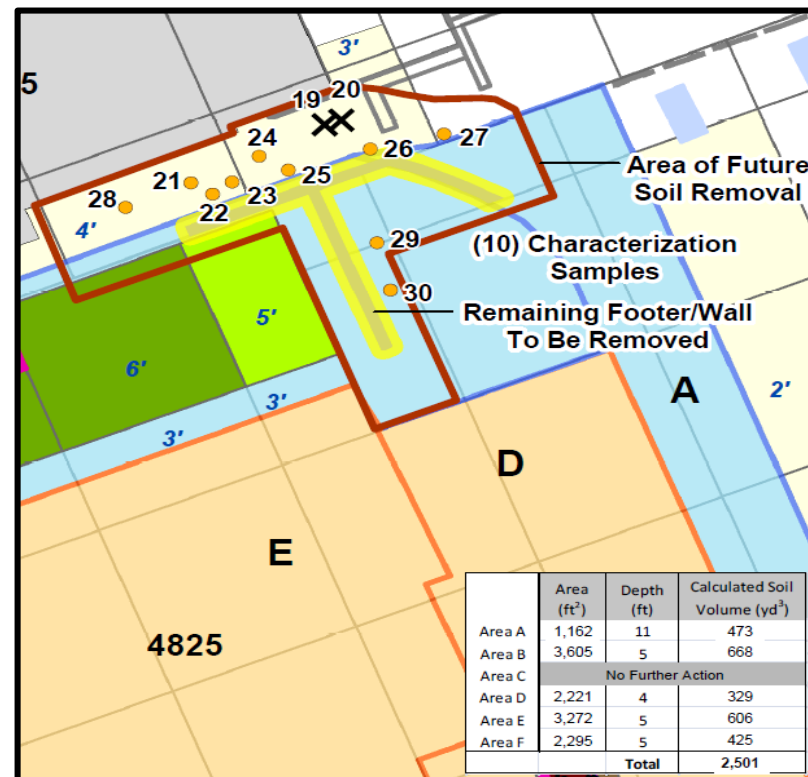
16

On January 18th, Parsons began a second set of borings in the areas yet to be fully excavated, in an attempt to identify the compound associated with the worker exposure incident.

- An additional 10 Boreholes (BH) were advanced down into competent saprolite and/or to refusal.

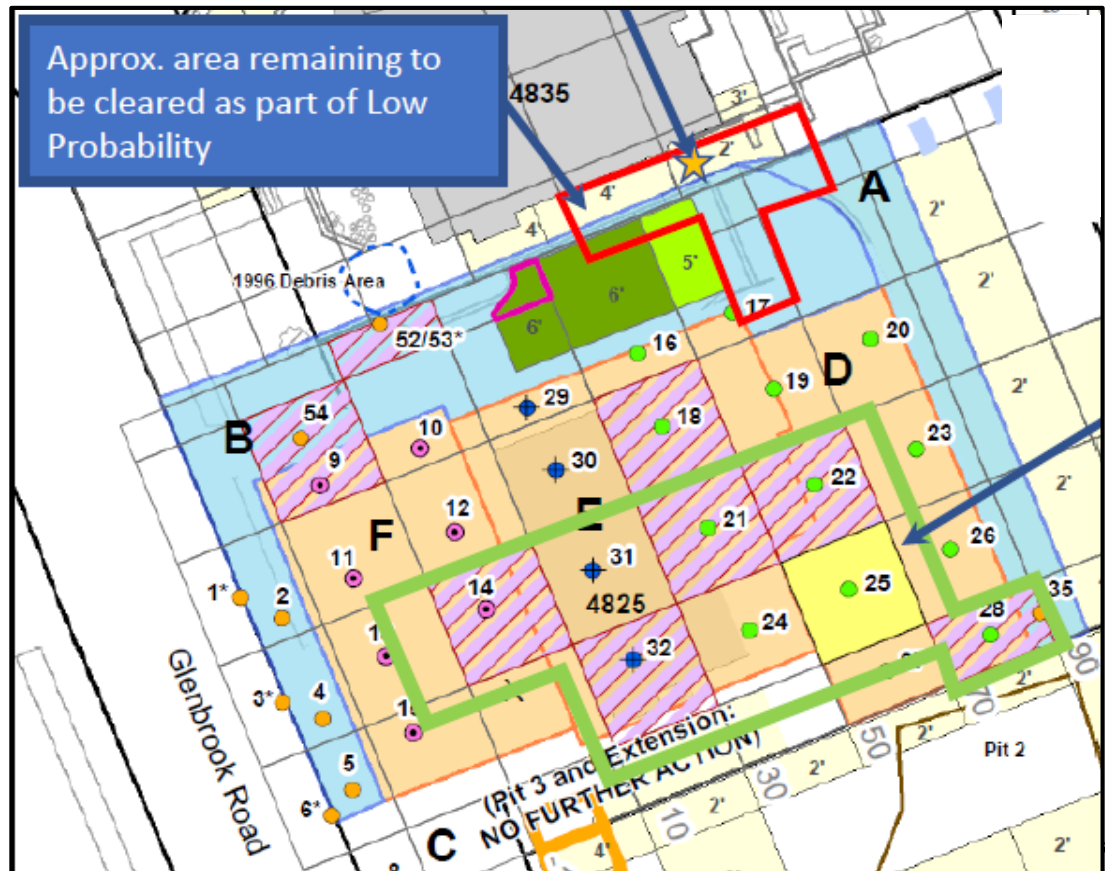
Preliminary Results

- BH-28 (0-2') Mustard breakdown products were detected.
- Al, Co, V, Sb, Mn, Ti, As, and Ethylbenzene were detected above the 4825 Glenbrook Rd RD/RA Comparison Values.
- No other compounds were detected at concentrations that would explain the exposure symptoms exhibited by the two teams.
 - This would include chemicals such as adamsite that have the possibility of being detected as Tentatively Identified Compounds (TICS).



FUTURE ACTIVITIES – 4825 GLENBROOK RD

- Remove wood lagging, and install cement lagging in the soldier piles at the retaining wall along the 4801 Glenbrook Road property line.
- Further excavate areas of metals contamination (mainly arsenic) in portions of the former high probability areas.
- The retaining wall stabilization, and the excavation of arsenic contaminated soil in the former high probability areas will be ongoing through June 2018.
- The remainder of the work is dependent on the 'return to work' plan.



FUTURE ACTIVITIES – 4825 GLENBROOK RD

Approx. location of exposure incident

Key:

- High-Probability
- Low-Probability

Approx. area remaining to be cleared as part of Low Probability

Sample ID Key					Exceedance	
Sample Number	Sample ID(s)	Date Collected	General Location	Analyte	Result (mg/kg)	
14	RA-4825GR-FL(-10,-30)-01-10.5	7/31/14	Tent 1	Arsenic	66	
18	RA-4825GR-FL(-30,-50)-01-0.0	10/19/15	Tent 2	Arsenic	25	
21	RA-4825GR-FL(-30,-50)-01-5.0	10/19/15	Tent 2	Arsenic	22	
22	RA-4825GR-FL(-50,-70)-01-10.0	10/19/15	Tent 2	Arsenic	47	
25	RA-4825GR-FL(-50,-70)-01-15.0	10/19/15	Tent 2	Arsenic	310	
32	RA-4825GR-FL(-10,-10)-01-3.6	5/18/16	Tent 3	Arsenic	26	
35	RA-4825GR-AREA A-E(-70,10)-01-0.5	10/17/10	Area A	Arsenic	22	
52	RA-4825GR-AREA B-N(-10,-90)-02-4.1	03/02/16	Area B (-10,-90)	Arsenic	24	
53	RA-4825GR-AREA B-N(-10,-90)-03-0.8	03/02/16	Area B (-10,-90)	Arsenic	43	
54	RA-4825GR-FL(-30,-70)-01-6.4	03/02/16	Area B (-30,-70)	Arsenic	27	















*Indicates multiple sampling depths.

Area for planned arsenic removal while developing a path forward.

Confirmation Soil Samples
Collected as of 8/31/2016
4825 Glenbrook Road

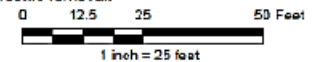
Spring Valley
Washington, D.C.

Legend

- Completed Samples under Low Probability (Area A and B)
- Completed Samples under Tent Location 1
- Completed Samples under Tent Location 2
- ◆ Completed Samples under Tent Location 3
- X No Sample due to Bedrock Refusal
-  Buildings
-  Property Boundaries
-  20' Grid
-  Pits 1 and 2
-  Test Pit 23 (Burial Pit 3)
-  Arsenic Exceedance to be Further Excavated
-  Grid with Arsenic Exceedance
-  Grid with Arsenic Exceedance Deeper than 12 feet
- Additional Low Probability Investigation**
 -  Test Pits
 -  Trench for Rerouted Sewer Line
- Arsenic Soil**
 -  Arsenic Grid Previously Removed [5] (2009)
 -  Arsenic Grid Previously Removed [8] (2009)
 -  1996 APEX Tree Removal (Debris Area) Perimeter
 -  Previously Excavated Arsenic: Adjacent Properties

Notes:

- Excavation depths shown from previous arsenic removal.



Scale: 1"=300'
Created By: Parsons
File: 20171128 4825 Glenbrook Arsenic Exceedances.mxd
Date: 11/28/2017
Figure Number:
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PARSONS

	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

4835 GLENBROOK ROAD SAMPLING, EXECUTION BY ECBC

USACE and the Edgewood Chemical Biological Center (ECBC) prepared a Standard Operating Procedure to allow ECBC to implement the additional sampling required at 4835 Glenbrook Road.

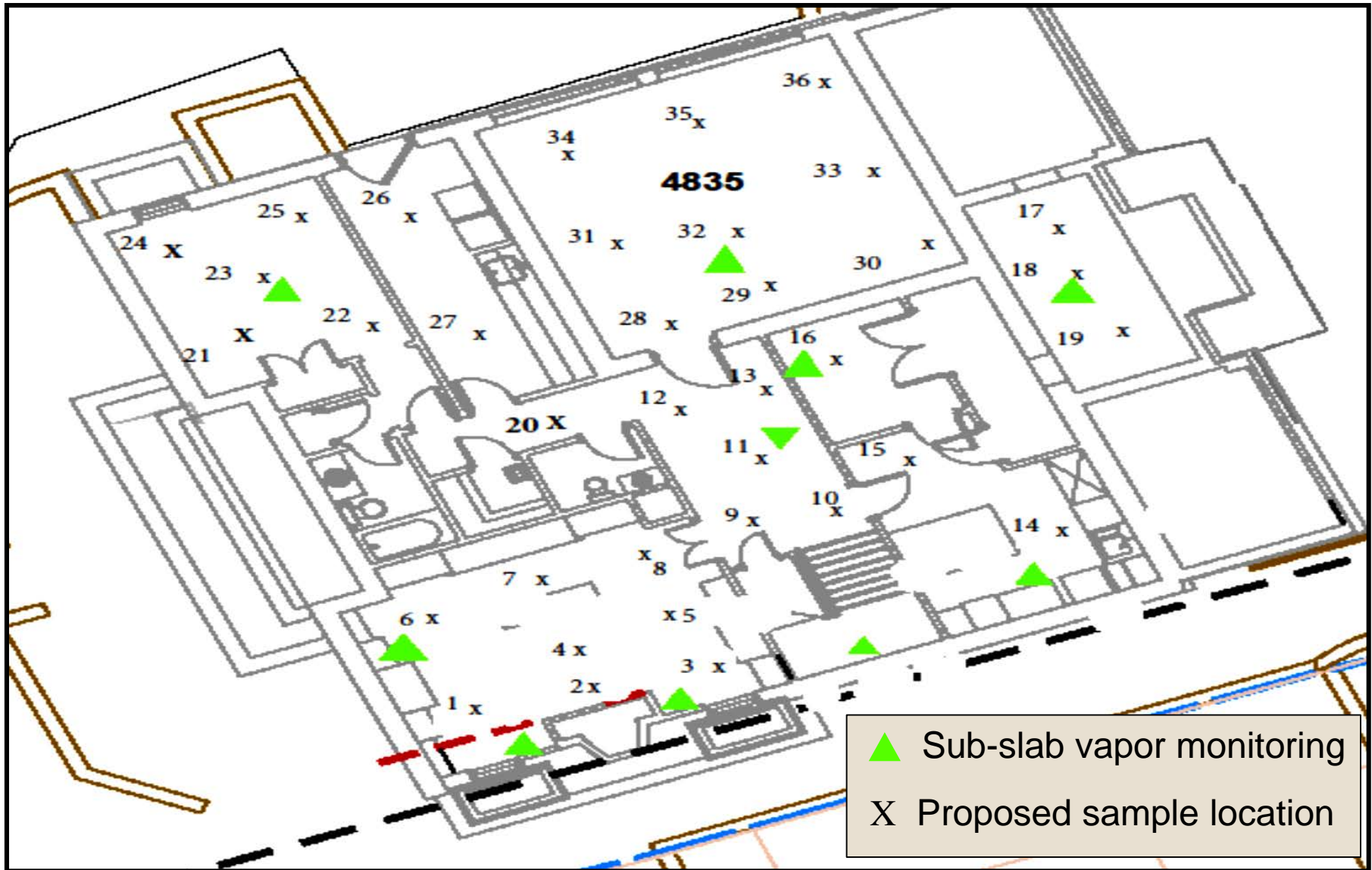
- The approach and methodology for the sampling is consistent with the first round of sampling completed by Parsons.
- A total of 36 additional boring locations have been selected to adequately sample beneath the remaining portions of the basement, including the crawlspace area.
- Six of the sample locations have been selected for additional measures in the event future sub-slab vapor monitoring will be required.
- We anticipate collecting anywhere from 1-3 samples per borehole dependent upon the depth to saprolite.
- All samples will be run for low level agent; a full mass spec will be run if agent or agent breakdown products are detected. Arsenic will also be run on all samples that test positive for agent/agent breakdown products (ABPs).
- If the samples are clear for agent, the samples will be sent to a commercial lab for a full suite analysis.
- The Site Operating Plan (SOP) was presented to the Partner's for review and concurrence.



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SAMPLING LOCATIONS:

BASEMENT CONFIRMATION SAMPLES FROM 4835 GLENBROOK ROAD



4835 GLENBROOK ROAD SAMPLING SCHEDULE

- Edgewood Chemical Biological Center (ECBC) mobilized equipment and supplies to the site beginning on March 5, 2018.
- Sampling should take 4-6 weeks to complete.
- Chemical agent results will be provided weekly for all samples – all chemical agent results should be available by the end of April if sampling proceeds as planned.
- Commercial lab analysis requires a longer duration.
- Team anticipates receiving validated commercial analytical results by June/July.
- Review results and brief leadership on path forward for 4835 Glenbrook Road.



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SUMMARY OF BOARD OF INVESTIGATION REPORT IMPACTS ON EFFORTS AT 4825 GLENBROOK ROAD

Board of Investigation Report will require the Team to address the following:

- Workers will require greater respiratory protection than previously utilized, or the team must be able to monitor worker breathing zones.
- Workers will require retraining in odor awareness and recognition, along with reporting requirements for unknown odors/presence of odors.
- Site procedures will need to mandate required communication between successive dig teams, and between dig teams and the contractor's Site Safety Officer.
- Digging in the presence of chemical agent contamination in the soil will require onsite emergency medical service (EMS) support, and a formal Memorandum of Agreement (MOA) with the designated emergency medical facility (hospital) – regardless if efforts are considered low probability or high probability.



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CONCEPTUAL MODEL OF EVENTS OF AUGUST 9 - BASED ON FINDINGS OF BOARD OF INVESTIGATION

- Workers were in an area of known contamination, that potentially included mustard, mustard agent breakdown products, and Lewisite. CACM was present in small quantities. Possibility that additional unknown volatile/semi-volatile compounds were present is likely.
- Workers were impacted by inhalation of contaminant. Dermal adsorption or oral ingestion was unlikely as the exposure route.
- Weather conditions were poor – high temperature, stable atmosphere (little to no wind).
- Geometry of the dig site was less than ideal. On three sides, workers were surrounded in the working area by soil walls or the partial retaining wall that remained which resulted in an enclosed space situation. The dig location was also the lowest point in the enclosed space. Since many of the AUES compounds are known to be heavier than air, they have a tendency to settle so the lower elevation of the digging location contributed to the situation.
- Per standard protocols, workers were hand-digging due to glass debris present in the soil. This meant their breathing zones were very close to the area of disturbed soil.
- The BOI found that only the workers hand digging were exposed; those supporting the dig a few feet away did not experience symptoms.



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LOW PROBABILITY COMPLETED AT THE SITE

Under low probability, open air operations, the team has completed the following:

Area	Expected Soil Volume (cy)	Actual Soil Volume Excavated to Date
A	473	168
% Complete		35%
B	668	661
% Complete		98%
Totals for Area A & B	1,141	829
% Complete		73%

- Team has 312 cubic yards of soils to excavate at this point to complete the remedial action.
- In addition to the soils, the team has to remove the remaining portions of the retaining wall in the backyard area and along the shared property line.



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OPTIONS TO RESUME WORK AT 4825 GLENBROOK RD

Option #1

- Resume work with workers in Level B respiratory protection with no additional engineering controls (open air excavation).

Option #2

- Resume work with workers in Level B respiratory protection and engineering controls, to include a tent and chemical agent filtration (CAFS) unit.



Level B Personal Protective Equipment (PPE)



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OPTION #1 – LEVEL B, OPEN AIR

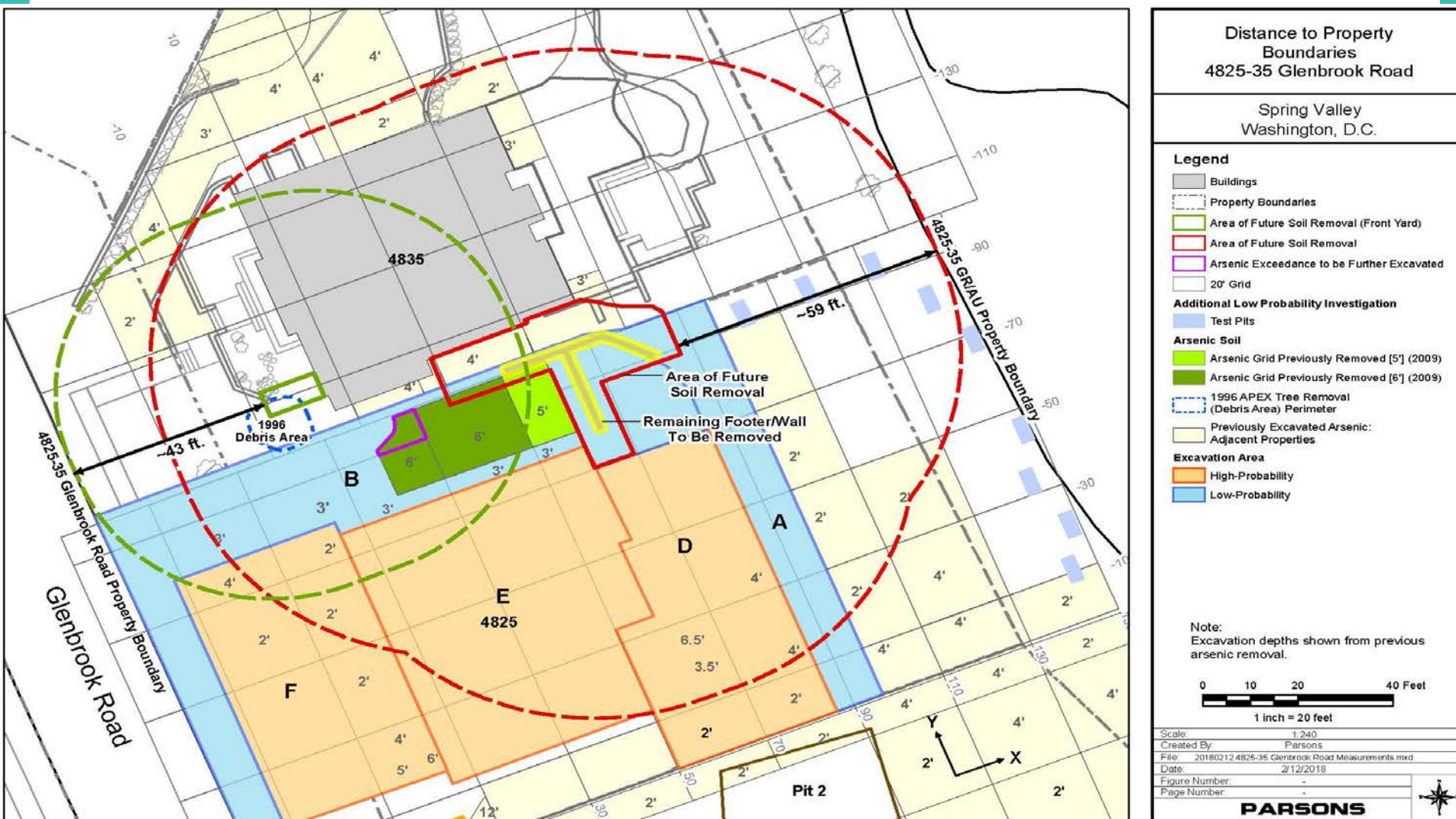
To address the conceptual model, the team proposes the following:

- Upgrade worker breathing protection to Level B, as monitoring of breathing zones is not practical.
- Establish a worksite exclusion zone via use of air modeling. Air modeling will require the identification of appropriate additional compounds and assumptions on the concentration of compounds in the soil, plus the estimation of the largest amount of soil handled in a manner which could cause a release.
- Through the use of an appropriate set of conservative assumptions regarding other possible chemicals present, the team will establish an exclusion zone.
- “High Probability” is a formal determination of the likelihood of encountering CWM or MEC – this determination remains “seldom or unlikely,” thus site operations will remain Low Probability. The team will prepare an update to the Probability Assessment to justify this position.
- Will provide onsite EMS support during Level B operations, and a formal MOA with GW Hospital will be established.



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- During digging, distance to the public will vary depending on the location.
- Air modeling was done to ensure there is no exposure release outside of the areas circled in the map below.



OPTION #1 – LEVEL B, OPEN AIR (continued...)

Air modeling was completed to ensure that a release of contaminants would not occur outside of the established distances to the public. The team considered the following when running the models:

- Utilized the same assumptions used when modeling for high probability operations (weather, type of air modeling, toxicology standards, etc.)
- Modeled for Mustard and Lewisite (plus agent breakdown products) since they are known to be present.
- Prepared a list of other possible chemicals to model, to potentially account for the unknown described by the Board of Investigation.



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OPTION #1 – LEVEL B, OPEN AIR (continued...)

- Modeled the following compounds to determine mass of the compound that may affect the public at the previously mentioned distances.
 - Chloropicrin
 - Arsine
 - Cyanogen Chloride
 - Arsenic Trichloride
 - Adamsite
- Used the more conservative modeling data to calculate an equivalent concentration required to be present in the soil to achieve that mass generated during the modeling.
- Compared that concentration to concentrations observed for Mustard and Lewisite and 1,4 Dithiane.

Agent or Agent Breakdown Product	Mustard	Lewisite	1,4 Dithiane
Comparison Concentrations – Low Probability	360 µg/kg	72 µg/kg	24,000 µg/kg
Comparison Concentrations – High Probability	130 µg/kg	4,700 µg/kg	1,600 µg/kg

- The comparison concentrations represent the maximum concentrations of agent or agent breakdown encountered during our operations under low and high probability to date at the site.



GUIDELINES CONCERNING PUBLIC EXPOSURE

Guidelines for public exposure are intended to predict how members of the general public would be affected (that is, the severity of the hazard) if they are exposed to a particular hazardous chemical in an emergency response situation.

The common public exposure guidelines we've used are:

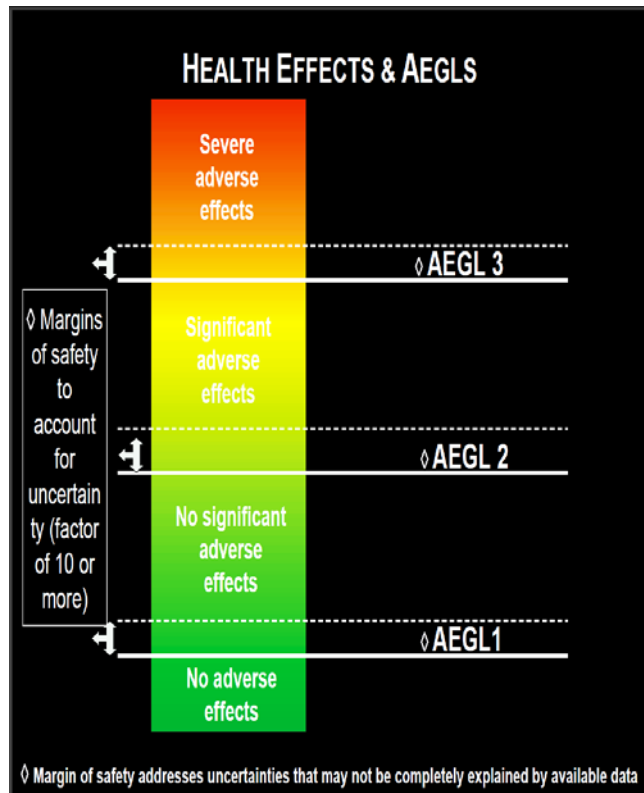
- AEGLs (Acute Exposure Guideline Levels)
- TEELs (Temporary Emergency Exposure Limits)



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ACUTE EXPOSURE LEVEL GUIDELINES (AEGL)

Used by emergency planners and responders worldwide as guidance in dealing with rare, usually accidental, releases of chemicals into the air. AEGLs are expressed as specific concentrations of airborne chemicals at which health effects may occur. They are designed to protect the elderly and children, and other individuals who may be susceptible.



Level 1

- Notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

Level 2*

- Irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

Level 3

- Life-threatening health effects or death.

**We propose to use AEGL 2 when appropriate.*

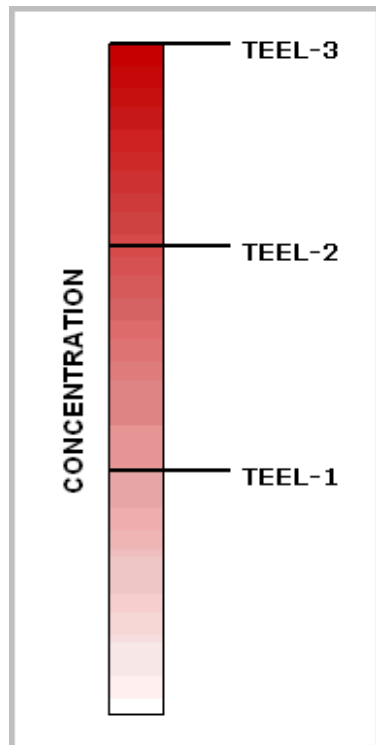


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TEMPORARY EMERGENCY EXPOSURE LIMIT (TEEL) 32

TEELs estimate the concentrations at which most people will begin to experience health effects if they are exposed to a hazardous airborne chemical for a given duration. TEELs are used in similar situations as the 60-minute AEGLs.

A chemical may have up to three TEEL values, each of which corresponds to a specific tier of health effects. **The three TEEL tiers are defined as follows:**



TEEL-3 is the airborne concentration (expressed as ppm [parts per million] or mg/m^3 [milligrams per cubic meter]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening adverse health effects or death.

TEEL-2 is the airborne concentration (expressed as ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting, adverse health effects or an impaired ability to escape.

***TEEL-1** is the airborne concentration (expressed as ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, non-sensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure.

**We propose to use TEEL 1 when appropriate.*



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OPTION #1 – LEVEL B, OPEN AIR - KEY ASSUMPTIONS FOR AIR MODELING

- Modeling was completed using criteria that represent worse case scenarios at the site
- We assumed a modeling temperature of 95 degrees although we typically stop excavation work at 72 degrees due to heat stress concerns
- We assumed a 60 minute evaporative release, but we typically work in 15 minute cycles due to heat stress
- We modeled that concentrations based on a full 55-gallon drum (we could use a 30-gallon)



OPTION #1 – LEVEL B, OPEN AIR

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L	
	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)
Feet				
43	605	1,792,593	280	829,630
59	915	2,711,111	468	1,386,667

Assumes a 60 minute continuous evaporative release, with Atmospheric Stability of D, 1 m/s wind speed and a maximum temperature of 95 degrees F.

Notes

1. Concentrations (µg/kg) are based on 1 full 55-gallon drum of soil weighing 742.5 lbs. (337.5 kg)
2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
3. Highest Concentration of L 72 µg/kg found previously along the shared property line
4. Highest Concentration of 1,4 Dithiane 24,000 µg/kg found previously along the shared property line



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OPTION #1 - COMPARISON CHARTS

35

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L		Chloropicrin	
	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)
Feet						
43	605	1,792,593	280	829,630	9.5	28,148
59	915	2,711,111	468	1,386,667	17.0	50,370

Assumes a 60 minute continuous evaporative release, with Atmospheric Stability of D, 1 m/s wind speed and a maximum temperature of 95 degrees F.

Notes

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2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
3. Highest Concentration of L 72 µg/kg found previously along the shared property line
4. Highest Concentration of 1,4 Dithiane 24,000 µg/kg found previously along the shared property line



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OPTION #1 - COMPARISON CHARTS

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L		Cyanogen Chloride	
	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)	TEEL-1 (g)	Conc ¹ (µg/kg)
Feet 43	605	1,792,593	280	829,630	8.1	24,000.0
59	915	2,711,111	468	1,386,667	16.0	47,407.4

Assumes a 60 minute continuous evaporative release, with Atmospheric Stability of D, 1 m/s wind speed and a maximum temperature of 95 degrees F.

Notes

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2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
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OPTION #1 - COMPARISON CHARTS

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L		Arsine	
Feet	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)
43	605	1,792,593	280	829,630	8.30	24,592.59
59	915	2,711,111	468	1,386,667	12.90	38,222.22

**Assumes a 60 minute continuous evaporative release, with
Atmospheric Stability of D, 1 m/s wind speed and a maximum
temperature of 95 degrees F.**

Notes

1. Concentrations (µg/kg) are based on 1 full 55-gallon drum of soil weighing 742.5 lbs. (337.5 kg)
2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
3. Highest Concentration of L 72 µg/kg found previously along the shared property line
4. Highest Concentration of 1,4 Dithiane 24,000 µg/kg found previously along the shared property line



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OPTION #1 - COMPARISON CHARTS

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L		Arsenic Trichloride	
	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)	TEEL-1 (g)	Conc ¹ (µg/kg)
Feet 43	605	1,792,593	280	829,630	155	459,259
59	915	2,711,111	468	1,386,667	330	977,778

**Assumes a 60 minute continuous evaporative release, with
Atmospheric Stability of D, 1 m/s wind speed and a maximum
temperature of 95 degrees F.**

Notes

1. Concentrations (µg/kg) are based on 1 full 55-gallon drum of soil weighing 742.5 lbs. (337.5 kg)
2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
3. Highest Concentration of L 72 µg/kg found previously along the shared property line
4. Highest Concentration of 1,4 Dithiane 24,000 µg/kg found previously along the shared property line



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OPTION #1 - COMPARISON CHARTS

Mass and Concentrations Required to Achieve Hazard Distances at Referenced Distance

Distance to Potential Public Receptors	HD		L		Adamsite	
	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)	AEGL-2 (g)	Conc ¹ (µg/kg)
Feet 43	605	1,792,593	280	829,630	1,100	3,259,259
59	915	2,711,111	468	1,386,667	1,950	5,777,778

Assumes a 60 minute continuous evaporative release, with Atmospheric Stability of D, 1 m/s wind speed and a maximum temperature of 95 degrees F.

Notes

1. Concentrations (µg/kg) are based on 1 full 55-gallon drum of soil weighing 742.5 lbs. (337.5 kg)
2. Highest Concentration of HD 360 µg/kg found previously along the shared property line
3. Highest Concentration of L 72 µg/kg found previously along the shared property line
4. Highest Concentration of 1,4 Dithiane 24,000 µg/kg found previously along the shared property line



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OPTION #1 – LEVEL B, OPEN AIR

Positive Aspect of Option #1:

- Worker protection is achieved through the use of Level B PPE.
- Timeline to resume work is relatively simple.
- Work at the site can be completed in 6-8 months
- Option #1 appropriately responds to the conditions observed on August 9th.
- Option #1 allows the team the greatest flexibility in configuring the site to achieve progress during digging.

Negative Aspect of Option #1:

- Public protection is based on complex air modeling and a unique set of conservative assumptions.
- Stand-in chemicals are used to model for the potential unknown at the site.
- The USACE team has no ability to monitor for and understand when an unknown might volatilize from the soil. Detection of odor is not possible in Level B PPE, and the team will need to continue to rely on our air monitoring program for detection of contaminants.

OPTION #2 – LEVEL B WITH ENGINEERING CONTROLS

To address the conceptual model, the team would propose the following:

- Upgrade worker breathing protection to Level B, as monitoring of breathing zones is not practical.
- Establish engineering controls, to include an engineering control structure (tent) and a CAFS system, plus additional air monitoring support (MINICAMS trailer).
- This approach is similar to the safety approach for a high probability operation.
- “High Probability” is a formal determination of the likelihood of encountering CWM or MEC – this determination remains “Seldom or Unlikely,” thus the site operations will remain Low Probability. The team will prepare an update to the Probability Assessment to justify this position.
- Will adjust work plans and SOPs to reflect revised working conditions to include an engineering control structure and CAFS system.
- Will provide onsite EMS support during Level B operations, and a formal MOA with GW Hospital will be established.



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OPTION #2 – LEVEL B WITH ENGINEERING CONTROLS (continued...)

42

If Option #2 is selected, USACE needs to fully evaluate the potential for further action at 4835 Glenbrook Road before proceeding with implementation, since the resultant implementation will likely require the same controls and could be implemented more cost efficiently across both properties.



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OPTION #2 – LEVEL B WITH ENGINEERING CONTROLS

Positive Aspect of Option #2

- Worker protection is achieved through the use of Level B PPE.
- More comprehensive public protection can be achieved through the use of engineering controls.
- Minimal assumptions regarding public protection approach.
- Option #1 approach of using distance to protect the public still applies if Option #2 selected.

Negative Aspect of Option #2

- Dependent on potential actions at 4835 Glenbrook Road.
- Timeline to resume work will be lengthy, additionally, when work resumes it will be slow going as personnel inside the tent will be required to wear Level B at all times.
- Additional engineering may be required to install controls.
- Work at the site will take 10-12 months or longer.
- Slight risk that the Chemical Agent Filtration System may not fully treat a potential unknown. Option #2 relies on the assumption that the CAFS will work.
- The USACE team has limited ability to monitor for and understand when an unknown might volatilize from the soil. Detection of odor is not possible in Level B PPE, and the team will need to continue to rely on our air monitoring program for detection of contaminants.

TENTATIVE SCHEDULE: 4825 GLENBROOK RD

February	<u>February 27:</u> Presented conceptual approach to our regulatory Partners.
March/April	<u>March 13:</u> Present approach to the RAB. <u>March/April:</u> Complete sampling at 4835 Glenbrook Road. <u>End of April:</u> Receive and review all low level agent data for 4835 Glenbrook Road.
May	<u>May 1:</u> Next Partner's meeting (discuss findings at 4835 Glenbrook Road and discuss next steps to concurrence). <u>May 8:</u> Next RAB meeting (present findings from 4835 Glenbrook Road and discuss next steps to concurrence).
June/July	Obtain Partner and community concurrence on path forward.

Resume work date is dependent upon the Option selected:

Option #1 – Potential to resume work as early as *October 2018*.

Option #2 – Potential to resume work by *March 2019*.

(These dates are very fluid and dependent upon multiple variables)

SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

45

Community Items



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SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

Reminders:

- The next RAB meeting will be Tuesday, **May 8th, 2018**

Upcoming Agenda Items:

- Policy issues between USACE, EPA, and the D.C. DOEE concerning Groundwater restoration at CERCLA sites.
- Suggestions?



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SPRING VALLEY FUDS RESTORATION ADVISORY BOARD

AGENDA (continued...)

- Public Comments
- Wrap-Up



**U.S. Army Corps of Engineers
Spring Valley Restoration Advisory Board
St. David's Episcopal Church
Minutes of the March 2018 Meeting**

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING	
Greg Beumel	Community Co-Chair
Dr. Peter deFur or representative	Environmental Stewardship Concepts/RAB TAPP Consultant
George Vassiliou	Community Member
Dan Noble	Military Co-Chair/USACE, Spring Valley MMRP Manager
Steve Hirsh	Agency Representative - Environmental Protection Agency (EPA) Region III
Lawrence Miller	Community Member
Malcolm Pritzker	Community Member
RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING	
Alma Gates	At Large Representative - Horace Mann Elementary School
John Wheeler	Community Member
James Sweeney	Agency Representative - Department of Energy & Environment
Mary Bresnahan	Community Member
Tom Smith	Community Member
Paul Dueffert	Community Member
William Krebs	Community Member
Lee Monsein	Community Member
Mary Douglas	Community Member
Linda Argo	At Large Representative - American University
Kathleen Connell	Community Member
ATTENDING PROJECT PERSONNEL	
Brenda Barber	USACE, Spring Valley Project Manager
Alex Zahl	USACE, Spring Valley Technical Manager
Rebecca Yahiel	Spring Valley Community Outreach Program
Carrie Johnston	Spring Valley Community Outreach Program
Whitney Gross	Spring Valley Community Outreach Program

Holly Hostetler	ERT, Inc.
Chris Gardner	USACE, Corporate Communications Office
Carlos Lazo	USACE, Government Affairs Liaison

HANDOUTS FROM THE MEETING

- I. Final Agenda for the March 13, 2018 RAB Meeting
- II. Army Corps of Engineers Presentation
- III. February 2018 Monthly Project Summary
- IV. Spring Valley Formerly Used Defense Site Fact Sheet
- VI. December 2017 Corps'pendent
- VII. Spring Valley FUDS Timeline 1993-2018
- VIII. American University's former Public Safety Building Summary and Next Steps
- IX. Spring Valley FUDS Remedial Action Q&A Factsheet

AGENDA

Starting Time: The March 2018 Restoration Advisory Board (RAB) meeting began at 7:14 PM.

I. Administrative Items

A. Co-Chair Updates

Dan Noble, Military Co-Chair/U. S. Army Corps of Engineers (USACE), Spring Valley MMRP Manager, welcomed everyone and opened the meeting.

1. Introductions

None

2. General Announcements

D. Noble reviewed website updates which included the January and February monthly project updates, weekly 4825 Glenbrook Road updates and photos, January RAB meeting minutes, December Partner Meeting Minutes, updated FUDS Timeline, and FUDS Remedial Action Q&A Factsheet.

B. Task Group Updates

No Task Group Updates were presented.

II. USACE Program Updates

A. Groundwater Feasibility Study

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

Todd Beckwith, USACE Baltimore, has submitted the revised Groundwater FS and the Draft Groundwater Proposed Plan (PP) to USACE Headquarters (HQ). When any comments or concerns are received and addressed from Army HQ, the Groundwater FS will be submitted to the regulators; Steve Hirsh, Agency Representative - Environmental Protection Agency (EPA) Region III, James Sweeney, Agency Representative - Department of Energy & Environment (DOEE), as

well as Dr. Peter deFur, Environmental Stewardship Concepts/RAB TAPP Consultant. When the Groundwater FS is then finalized, the Groundwater PP will be completed and presented to the public.

Question from P. deFur - Will that be presented at a separate meeting or a RAB meeting?

D. Noble explained that there will be a separate meeting and public comment period for the Groundwater PP. The RAB will be fully briefed on the Groundwater PP as well.

Question from Allen Hengst, Audience Member - I have two quick questions about the Groundwater FS. It all comes from the December Partnering meeting minutes, this sentence: 'USACE Baltimore has been instructed by USACE Headquarters (HQ) to redraft the Groundwater FS to include 'Monitored Natural Attenuation' as an alternative.' Last month, or the last RAB meeting, I asked you if you had changed the Groundwater FS to address the objections of the partners and you said you had added an alternative. Is this the alternative that you are talking about, 'Monitored Natural Attenuation?'

D. Noble confirmed this.

Question from A. Hengst, Audience Member - The second question is, assuming you still have Land Use Controls (LUCs) as an alternative, how is Monitored Natural Attenuation (MNA) different from LUCs?

S. Hirsh explained that what is needed is some physical or chemical process that will eventually remediate the groundwater to the point where it could be used as drinking water. With LUCs, there is no physical or chemical process specified that would degrade the contaminant. If MNA were selected, the contaminant would be monitored over time to see if the concentration of contaminant is declining. If the contaminant is not declining, then at some point, usually every 5 years, a decision would be made whether to try a different approach.

Question from A. Hengst, Audience Member - It looks like S. Hirsh answered my third question; are the Partners going to accept MNA?

S. Hirsh explained that he had not seen the Groundwater FS yet. He added that USACE Baltimore has evaluated the alternatives but has not made a recommendation.

Question from A. Hengst, Audience Member - Is MNA something that would be acceptable to the Partners?

S. Hirsh replied that it could be.

B. Site-Wide Remedial Design/Remedial Action

D. Noble briefly reviewed the Site-Wide Remedial Design (RD)/Remedial Action (RA).

USACE Baltimore will prepare and implement a Land Use Control Implementation Plan (LUCIP). This Site-Wide Remedial Action is for the soils, which is separate from the Site-Wide Groundwater effort. USACE will conduct the final survey at 91 residential properties and 13 federal and city lots to search for any munitions left behind by the Army. There are contaminated soils in small areas on southern American University (AU) campus, one residential property next to campus, and potentially underneath the foundation of the former PSB, which is on AU campus. There are slides in the USACE Presentation handout that have more detail on how each of the 4 efforts is progressing.

1. Munition Education and Awareness

D. Noble described the Munition Education and Awareness portion of the LUCIP. USACE will periodically mail out a packet to all residents that live within the boundary of the Formerly Used Defense Site (FUDS). This packet will remind the residents that the area is a FUDS and will inform the residents about the Army's 3Rs of the Explosive Safety Education Program (Recognize, Retreat, Report). One of the important decisions to be made concerning the LUCIP is how often USACE will send out this packet. The packet may be sent out every 1, 2, 3, or 5 years; such as during the 5-year review. USACE seeks the RAB's assistance with determining how often to send out such information for community awareness without alarming the community by the frequency of these mailings. USACE also invites the RAB's review of the packet that Spring Valley homeowners would receive. Currently the draft LUCIP is with S. Hirsh, J. Sweeney, and P. deFur. When USACE receives the regulators' comments, the packet will be presented to the RAB for comment.

Question from A. Hengst, Audience Member - I looked at the Area of Interest Task Force report for Area of Interest 13, which is that block next to Wesley Seminary between Quebec and Woodway. I noticed that one of the addresses, I believe it was on the 4700 block of Woodway Lane, never had a geophysical survey because the homeowner refused the Army's request to investigate [ed. in 2010]. Assuming that address is on there again, are you going to approach this person again and try to get them to agree the second time?

D. Noble confirmed this.

Question from A. Hengst, Audience Member - Will they agree, do you know?

D. Noble explained that he did not know how the person will respond.

With 91 property owners, USACE expects there may be a small group of residents that refuse investigation and remediation on their properties.

Question from A. Hengst, Audience Member - So what will you do?

D. Noble explained that USACE will make the offer. If the property owners refuse, it is the right of the property owners to refuse.

Question from Mara Miller, Audience Member - What about the rights of the people that live downhill from them and are affected by whatever is in their yard?

D. Noble explained that the Site-Wide Remedial Action is a search for intact munitions and munitions are not expected to migrate.

Comment from M. Miller, Audience Member - Because downhill from there, there is premature death and disease all the way down. I mean, the side of Spring Valley I grew up on has not been included in either project, but we are directly downhill from that.

D. Noble explained that the Site-Wide Remedial Action is a search for intact items or physical objects on the 91 properties, and it is up to each property owner to say yes or no. If USACE receives a refusal from a lot of contiguous properties, then USACE will consult with the regulators about what to do. There is a possibility of refusal, but there is also the possibility that all 91 property owners might say yes.

Question from M. Miller, Audience Member - Given the numbers of people that are sick or have died young in that part of the neighborhood, have you ever entertained the idea that there may be

another burial pit over there? That the groundwater seeps through and every time it rains it gets into peoples' houses, more people are exposed?

D. Noble explained that the Remedial Investigation was a due diligence effort to locate disposal areas and search for things such as disposal pits and disposal trenches to the extent that USACE found evidence of those kinds of features. In the end, USACE identified 4 areas with residual concerns that were used in WWI and focused remediation efforts on the 91 properties in those areas.

Question from A. Hengst, Audience Member - I just want to point out that Area of Interest 13 is a possible disposal area, as is the area around the Sedgwick trenches. Those are the two areas in the 91 properties that are possible disposal areas.

D. Noble confirmed this.

Comment from M. Miller, Audience Member - I just wanted to say that I was not in Spring Valley, I did not return until 2007 and did not even know about the chemicals until 2012. So, I have not been on the inside of what you have done, but you have also not had the information I know that I can contribute to helping you to remediate. So, given that our family has been in the neighborhood since 1957, we have seen several generations grow up and we have seen people die. You know there is just a lot more that is going on than what you think right now.

D. Noble explained that USACE is following the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and what the law requires. USACE welcomes Ms. Miller or anyone else that wishes to share information. Contact phone numbers are available if anyone has information that may help the remediation effort. USACE will take that information in and consider the information as USACE begins these actions.

2. Board of Investigation (BOI)

The BOI that convened to investigate the August 9 incident has finalized the report. BOI president Gary Schilling, USACE Baltimore, continues to talk with USACE Baltimore Safety Office and Counsel concerning the request from the RAB to release the 14 specific findings and recommendations of the BOI. There is no resolution to that yet. There has been a formal Freedom of Information Act (FOIA) request for the report, so Counsel is reviewing that request as well. The report is considered a privileged document; any information that may be authorized by USACE Baltimore for release as a result of the formal FOIA request will be released to the RAB without a FOIA request. Currently a listing of the 14 findings is not available.

C. Glenbrook Road

Brenda Barber provided a brief update on 4825 Glenbrook Road and 4835 Glenbrook Road.

1. Recent Activities – 4835 Glenbrook Road Sampling

USACE was authorized to conduct one row of sampling in the basement at 4835 Glenbrook Road. All the sampling, both indoor and outdoor along the property line, was completed by January 29. Several small pieces of potential American University Experiment Station (AUES) glassware were found in Soil Boring (SB) 7. The glassware was cleared (headspaced negative) for chemical agent. Sampling will progress to the rest of the basement.

Sampling results:

- No agent or agent breakdown products (ABPs) were detected in the first row of samples.

- The samples were then sent to a commercial lab which detected typical Spring Valley constituents: Aluminum (Al), Arsenic (As), Cobalt (Co), Vanadium (V), Manganese (Mn), Antimony (Sb), Copper (Cu), Aluminum Cyanide (CN) (only in Borehole 17, at 6-8 ft. depth), and Dieldrin were detected at concentrations above the 4825 Glenbrook Road RD/RA comparison values.

2. Recent Activities – 4825 Glenbrook Road

In response to the BOI report, Parsons began a second set of borings on January 18 in the areas yet to be fully excavated to attempt to identify the compound associated with the worker exposure incident. An additional 10 Boreholes (BH) were advanced down into competent saprolite and/or to refusal.

Preliminary Results:

- BH-28 (0-2') mustard (HD) breakdown products were detected.
- Al, As, Co, V, Mn, Sb, Titanium (Ti), and Ethylbenzene were detected above the 4825 Glenbrook Road RD/RA comparison values.
- No other compounds were detected at concentrations that would explain the exposure symptoms exhibited by the 2 teams.
- Validated data is still pending.

3. Future Activities – 4825 Glenbrook Road

- Remove the wood lagging and install cement lagging in the soldier piles at the retaining wall along the 4801 Glenbrook Road property line. The cement lagging has been ordered and is expected to be installed in the next few weeks.
- Further excavate arsenic hotspots. USACE is working with the contractor to develop a plan to remove the hotspots.
- The retaining wall stabilization and excavation of arsenic contaminated soil in the former high probability areas will be ongoing through June 2018.
- The remainder of the work is dependent on the 'return-to-work' plan.

4. 4835 Glenbrook Road Sampling by Edgewood Chemical Biological Center (ECBC)

USACE and ECBC prepared a Standard Operating Procedure to allow ECBC to implement the additional sampling required at 4835 Glenbrook Road.

- The approach and methodology for the sampling is consistent with the first row of sampling completed by Parsons, currently working at the 4825 Glenbrook Road site.
- A total of 36 additional boring locations have been selected to adequately sample beneath the remaining portions of the basement, including the crawlspace area.
- Six of the sample locations have been selected for additional measures in the event future sub-slab vapor monitoring is required.
- 1-3 samples per BH expected, dependent upon the depth to saprolite.
- All samples will be tested for low level agent; a full mass spec will be run if agent or ABPs are detected. Arsenic testing will also be run on all samples that test positive for agent/ABPs.
- If the samples are clear for agent, the samples will be sent to a commercial lab for a full suite analysis.
- The Site Operating Plan (SOP) was presented to the Partners for review and concurrence.

Question from Jerry Barton, Audience Member - You said BH-7 you found something, and then

you decided to do all these extra boreholes. Is that where the decision came from?

B. Barber explained that no chemical agent was found in the first row of samples, so for due diligence purposes the sampling investigation was expanded across the entire basement. Glassware was found in BH-7.

Question from J. Barton, Audience Member - But then you said there was a sample that was sent off, and they found...?

B. Barber explained that HD breakdown products were detected in BH-28 at 4825 Glenbrook Road.

Comment from J. Barton, Audience Member - No, it was on this one.

B. Barber confirmed that commercial lab results were obtained for BH-7.

Question from J. Barton, Audience Member - What was that?

B. Barber explained that the lab results for BH-7 were standard commercial parameters. Al, As, Co, V, Mn, Sb, Cu, CN, and Dieldrin were normal result parameters seen throughout Spring Valley. Those results did not trigger the additional sampling. Because no positive evidence of chemical agent was found in the first row of sampling, the sampling footprint was expanded to ensure nothing was missed.

B. Barber noted that if sub-slab vapor sampling is required, 6 additional vapor collection points will be installed. The vapor collection points are indicated as green triangles on Slide #20 on the USACE Presentation.

Question from A. Hengst, Audience Member - Are you worried, because of the reports about that crawlspace, of what you might encounter when you slam these bore holes down into the ground? How will you do that?

B. Barber explained that the basement proper is a concrete slab, so the team is core drilling the location and pulling the concrete and core out, leaving full access to the soils below. The sleeve is then pushed to refusal. Glassware in a 2-inch sleeve is unusual; normally if the sleeve hits any debris, that debris is pushed out of the way; the sleeve does not typically capture debris. The team is somewhat working in the blind so therefore not slamming the sleeve through the ground.

Question from A. Hengst, Audience Member - Would you say that you are going to be more careful in that area?

B. Barber explained that the project teams are always careful. She noted that she was not sure if any additional caution could be exercised. The site teams work with ECBC, and ECBC is aware of the potential concerns for not only the crawlspace but there is some evidence for concern in the middle of the basement area. The site teams are conducting full operations to plan and prepare for the sampling. The site teams are always cautious during any sub-surface work.

5. 4835 Glenbrook Road Sampling Schedule

- ECBC mobilized equipment and supplies to the site on March 5.
- Sampling should take ~4-6 weeks to complete, based on the production rates for past activities with Parsons.
- Low level clearance from ECBC will likely be completed quickly. All chemical agent results from ECBC should be available by the end of April.

- If there are no detections, all samples will be sent to an off-site off commercial lab that takes considerably longer for results.
- The team expects to receive the validated commercial analytical results by June or July.
- Review results, brief the Partners, brief leadership, and develop the path forward for 4835 Glenbrook Road.

6. Summary of BOI Report Impacts on Efforts at 4825 Glenbrook Road

Based on the report and USACE Baltimore's interpretation of the report, these are the items that will be addressed while planning the return-to-work:

- Increased level of respiratory protection for the workers.
- The workers will require retraining in odor awareness and making sure that the workers are reporting unknown odors or the presence of odors up the chain of command.
- Site procedures will need to mandate required communication between successive excavation teams, and between excavation teams and the contractor's Site Safety Officer.
- Excavating in the presence of chemical agent contaminated soils will require, even in low probability, onsite emergency medical service (EMS) support and a formal Memorandum of Agreement (MOA) with a local hospital.

7. Conceptual Model of Events of August 9

The team put together a conceptual idea of what happened on August 9, based on known information and what the BOI was able to discover during the BOI's in-depth investigative process.

- Workers were in an area of known contamination, that potentially included mustard (HD), ABPs, and Lewisite (L) along shared property line. Chemical agent contaminated media (CACM) was present in small quantities. There was the possibility that additional unknown volatile/semi-volatile compounds were present.
- The workers were impacted by an inhalation of a contaminant. Dermal or oral ingestion was not the likely exposure route.
- Weather conditions included high heat and very little wind at the site that caused ventilation issues.
- The excavation site where the workers were excavating was enclosed on 3 sides by either a soil face or the small section of the retaining wall that was left in place for this operation. Most of the AUES compounds are heavier than air and tend to settle, and the workers were excavating in the lowest part of that area.
- Workers were excavating with hand tools due to glass debris present in the soil, therefore the workers' breathing zones were very close to the area of the disturbed soil.
- Only the workers that were hand-digging were exposed. The workers who were several feet away in the 3-5' range were not impacted and did not experience symptoms.

8. Low Probability Completed at the Site

To date, 73% (829 cubic yards) of actual soil volume has been excavated in the 2 areas of open air low probability, Area A (the area behind the retaining wall) and Area B (primarily the driveway, front sidewalk area, and shared property line).

There are approximately 312 cubic yards of soils and the retaining wall to excavate to complete the remedial action.

9. Options to Resume Work at 4825 Glenbrook Road

The team has developed two potential options for return to work at the site. The two options have been discussed with the partners and the team seeks the RAB's input and feedback. An option has not yet been selected.

Option 1: Resume work with workers in Level B respiratory protection with no additional engineering controls (open air excavation).

Option 2: Resume work with workers in Level B respiratory protection with heightened engineering controls to include a tent and chemical agent filtration system (CAFS) unit.

a. Option 1 – Level B, Open Air

To conceptualize an open-air approach, the team proposes:

- Upgrade worker breathing protection to Level B, as monitoring the breathing zone is not practical. It would not be safe to place a breathing monitor in the workers' breathing zone during hand-excavation.
- Establish a worksite exclusion zone through the use of air modeling. Air modeling has been done previously at the site, particularly under high probability. Specific assumptions about compounds and concentrations of those compounds in the soils must be made, and an estimation of the largest amount of soil handled in a manner which could cause a release.
- Through the use of an appropriate set of conservative assumptions regarding other possible chemicals present, the team has established an exclusion zone at the site.
- 'High Probability' is a formal determination of the likelihood of encountering chemical warfare material (CWM) or munitions and explosives of concern (MEC). This determination remains 'seldom' or 'unlikely,' thus site operations will remain 'Low Probability.' The team will prepare an update to the Probability Assessment to justify this position.
- Provide onsite EMS during Level B operations and a formal MOA with George Washington University (GW) Hospital will be established.

There are two excavation locations at the site. The larger area is in the middle of the backyard with a distance to the public of 59' to the AU property line. The other area is a small area of debris at the front corner of the property with a distance of 43' to the property line. Air modeling was conducted to ensure that there is no exposure release outside of the two exclusion zone circles at the property.

Extensive air modeling was completed to ensure that a release of contaminants would not occur outside of the established distances to the public. The team considered the following when running the models:

- Used the same assumptions for modeling at the site under high probability operations to include weather, type of air modeling, toxicology standards, etc.
- HD, L, and ABPs known to be found at the site.
- A list of other possible chemicals to model to potentially account for the unknown described by the BOI.
- Modeled compounds that were used at the AUES. In addition to HD and L, the team also modeled for chloropicrin (PS), arsine (AsH₃), cyanogen chloride (CK), arsenic trichloride (AsCl₃), and adamsite (Y).
- The team used a very conservative approach to the modeling and developed a concentration that would need to be achieved in the soils to present a release to the public.

- The team compared the concentrations to all the known and observed levels of HD, L, and 1,4 Dithiane (the most prevalent ABP encountered at the site). The maximum concentrations during low probability of HD, L, and Dithiane are shown on slide #29 of the USACE Presentation. The team selected the max of 24,000 micrograms per kg, and for comparison purposes provided the concentrations that were seen during high probability. In this case there was a detection for L at 4,700 micrograms per kg in the back-patio area during high probability. The team is focusing on the 24,000 micrograms per kg as a comparison value to ensure there would be no release offsite.

a-1. Guidelines for Assessing Public Exposure

Guidelines for public exposure are intended to predict how members of the public would be affected (that is, the severity of the hazard) if the members of the public are exposed to a particular hazardous chemical in an emergency response situation. These guidelines are consistent with operations at the property to date and have been used in the past for modeling at the site.

AEGLs (Acute Exposure Guideline Levels) - used for emergency planning and response worldwide. At this site the team uses AEGL-2 and proposes to stay below the AEGL-2 threshold.

TEELs (Temporary Emergency Exposure Limits) - when an AEGL is not available for a particular chemical, TEELs are utilized. In this case the team recommends using TEEL-1 and to stay below the TEEL-1 value. This guideline has also been used at the site in the past.

a-2. Key Assumptions for Air Modeling

- Modeling was completed using the worst-case scenarios at the site.
- Modeled a temperature of 95 degrees. The team typically does not work beyond a temperature of 72 degrees due to heat stress concerns.
- A 60-minute evaporative release was assumed, but typically because of heat stress the team works in 15-minute cycles, so this assumption is very conservative.
- The concentrations were based on a full 55-gallon drum; however, the site can utilize smaller drums, significantly reducing concentrations.

a-3. Comparison Values

Mustard (HD) and Lewisite (L) – The two primary constituents modeled to distances of 43' exposure distance in the front yard and 59' exposure distance in the backyard. If an AEGL was available, that value was used; if there is no AEGL, the TEEL-1 value was used. The same assumptions were used, including evaporative release, very little wind, and maximum temperature of 95 degrees. For example, to have a release at the property line in the front yard there would have to be almost 1,800,000 micrograms per kg of HD in the soil; and for L, more than 800,000 micrograms per kg.

The list of compounds was then compared to HD and L:

Chloropicrin (PS) – for a release at the site the values are very close to the concentration of Dithiane, which is 24,000 micrograms per kg. In this case if there were a concentration of ~28,000 micrograms per kg that value would be close to an exposure at that property line. However, the assumptions are very conservative, so the team believes open-air excavation is a safe approach.

Cyanogen Chloride (CK) - in this case no AEGL was available, so the TEEL-1 value was used. This concentration is 24,000 micrograms per kg, so it is at the maximum limit for comparison

values. The conservative value is built into the team's assumptions, so the team believes it is safe to proceed if the compound were present in the soil at that concentration.

Arsine (AsH₃) - does have an AEGL, so in this case the AEGL 2 is presented. The concentration for AsH₃ is ~24,500 micrograms per kg, which is very close to the comparison value. The team believes that even if this compound were present at that concentration, it would be safe to proceed. This compound is typically gaseous and not likely to be present in the soils.

Arsenic Trichloride (AsCl₃) - this compound was modeled because it was found in the front yard at 4825 in the past. The TEEL-1 value was used at ~450,000 micrograms per kg for a release, compared to the ~24,000 micrograms per kg that has been seen on-site to date for Diathiane.

Adamsite (Y) - this compound was modeled because it is a vomiting agent, and workers reported vomiting during the incident on August 9. The BOI does not believe that this compound was the cause of the vomiting and is confident that this would not be a concern at the site. The concentration value for an exposure release is over 3,000,000 micrograms per kg, so the team has a high confidence that this compound would not be a concern at the site.

Of all the chemicals that have been modeled and presented, the only chemical the team is not actively monitoring for is adamsite at the site. Onsite monitoring is capable of detecting all the other chemicals at the site.

a-4. Positive and Negative Aspects of Option 1

Positive

- Workers are protected with Level B respiratory protection.
- The timeline to resume work is relatively simple.
- Work at the site can be completed in 6-8 months.
- Option 1 appropriately responds to the conditions observed on August 9 and adequately addresses the issues identified in the BOI report.
- Creates the greatest flexibility and site configuration to finish excavation operations.

Negative

- Public protection is based on complex air modeling and conservative assumptions.
- Stand-in chemicals were used to potentially model what may have happened and anticipate what may happen in the future at the site.
- No ability to monitor for and understand when an unknown might volatilize from the soil. Detection of odor is not possible in Level B personal protective equipment (PPE).

Question from M. Miller, Audience Member - What kind of PPE were the workers wearing when this happened?

B. Barber explained that the workers were wearing Modified Level D PPE that included paper Tyvek suits, nitrile gloves, booties, and no respiratory protection. Each worker carried a slung rescue mask used for evacuation in the case of overwhelming odor and/or detection by air monitoring. Level B and Level C teams with respiratory protection were onsite for proper mitigation of the site if necessary.

Question from P. deFur - Thank you. All of this time frame assumes that it is going to be a while before all the paperwork gets done, so it would not get started until spring, right? And then it will be 6 to 8 months after that. And that accounts for the fact that we are going to see 95-degree days

in the summer and you have already put that into the calendar, right? So, we assume that from sometime near July 10 there is about a 6-week period where it regularly gets over 90 here.

B. Barber explained that the schedule slide will show that once the decision process is complete with Partner and community concurrence and the package is created for leadership to sign, it is unlikely that the team will be back to work, even under Option 1, until October.

Question from P. deFur - During the next level of this investigation, the workers will still be excavating by hand, right? Which is exactly what they have been doing before, and that involves shovels and trowels?

Brenda confirmed this and explained that once the excavation is no longer encountering glassware and debris, then mechanized excavation methods may be considered. There are concrete retaining walls that will have to be pulled down mechanically, so there will be a combination of methods used for excavation going forward.

Question from M. Miller, Audience Member - I am interested in understanding what you said about the chemical gasses being heavier than air and therefore lower to the ground. It is my assumption, I have heard before that arsine is actually lighter than air and so therefore would rise. What would be the effect of wind on any sort of emission from the site?

B. Barber explained that the air modeling takes into account the wind at 1 meter per second added to the concentrations and established exclusion zones. Those parameters are used at the site to determine whether work continues. If the weather station detects parameters outside of the modeling the team does not work. The USACE notes for accuracy that Arsine is heavier than air, and will tend to sink and gather in low areas.

b. Option 2

- Upgrade worker breathing protection to Level B, as monitoring the breathing zone is not practical.
- Establish engineering controls at the site, to include an engineering control structure (tent) and a CAFS unit, plus additional air monitoring support (miniature chemical agent monitoring system (MINICAMS) trailer).
- Very similar safety approach to a high probability operation.
- 'High Probability' is a formal determination of the likelihood of encountering chemical warfare materiel (CWM) or munitions and explosives of concern (MEC). This determination remains 'seldom' or 'unlikely,' thus site operations will remain 'Low Probability.' The team will prepare an update to the Probability Assessment to justify this position.
- Adjust all workplans and SOPs to reflect revised working conditions to include an engineering control structure and CAFS unit.
- Provide onsite EMS during Level B operations and a formal MOA with George Washington University (GW) Hospital will be established.

If Option 2 is selected, USACE needs to fully evaluate the potential for further action at 4835 Glenbrook Road before proceeding with implementation, since the resultant implementation will likely require the same controls and could be implemented more cost efficiently across both properties.

b-1. Positive and Negative Aspects of Option 2

Positive

- Worker protection is achieved with the use of Level B PPE.
- More comprehensive public protection can be achieved with engineering controls.
- Minimal assumptions regarding public protection approach.
- Option 1 approach of using distance to protect the public still applies if Option 2 is selected.

Negative

- This option is completely dependent on potential actions and results of sampling at 4835 Glenbrook Road.
- Timeline to resume work will be lengthy. When work resumes the project will be slow moving because personnel inside the tent will be required to wear Level B PPE at all times.
- Additional engineering may be required to install controls.
- Work at the site will likely take 10 to 12 months once the site is established, which does not include prepping and reconfiguring the site and installing engineering controls.
- There is still some slight risk that the CAFS may not fully treat a potential unknown. Option 2 relies on the assumption that the CAFS will work.
- Limited capability to monitor for an unknown that might volatilize from the soil. Detection of odor is not possible in Level B PPE, and the team will need to continue to rely on air monitoring for detection of contaminants.

10. Tentative schedule

February

- February 27 - presented conceptual approach to regulatory partners.

March and April

- March 13 - present approach to the RAB
- March/April - complete sampling at 4835 Glenbrook Road.
- End of April - receive and review all low level chemical agent data for 4835 Glenbrook Road.

May

- May 1 - next Partner's meeting (discuss findings at 4835 Glenbrook Road and discuss next steps to concurrence).
- May 8 – next RAB meeting (present findings from 4835 Glenbrook Road and discuss next steps to concurrence).

June/July

- Obtain Partner and community concurrence on path forward.

The resume work date is dependent on which Option is selected. If Option 1 is selected and all concurrences are obtained, work would likely resume in early October, with a 6-8-month implementation schedule. If Option 2 is selected, the earliest resume work date would be March 2019.

Question from Jennifer Baine, Audience Member - How did you decide AEGL-2 versus TEEL-1? They do not seem like they are equivalent.

B. Barber explained that not all chemicals have an AEGL value, and the AEGL process is a very intense and vetted approval process which requires public comment. If there was an AEGL available for any of the chemicals that were investigated, the AEGL-2 was selected.

Question from J. Baine, Audience Member - Why AEGL-2?

B. Barber explained that AEGL-2 was selected because there was no release off-site and very limited symptoms reported. The AEGL-2 is consistent with guidelines used previously and considered appropriate going forward.

Comment from J. Baine, Audience Member - The slide says AEGL-2 is irreversible.

B. Barber clarified that effects would be irreversible above an AEGL-2. The team is proposing to stay under the AEGL-2.

The team selected the TEEL-1 because TEELs are temporary, not vetted, and not approved through a formal process such as the AEGLs. The team uses the more conservative TEEL-1 and stays below the TEEL-1.

Question from Greg Beumel, Community Co-Chair - Peter is our resident consulting toxicologist. Do you want to comment on the appropriateness of that?

Comment from P. deFur - These are the appropriate things to do, and exactly as B. Barber said. You can go online and look up these numbers. There are a variety of chemicals for which you will not find any entries; there is no data, it does not occur in the AEGLs. The AEGL value is what is commonly used around the world to set atmospheric concentrations that are acceptable under various conditions. Those are the right ones to use. When you do not have basically the best standard, the AEGLs, then you have to decide on something to use, as opposed to doing nothing. Because there was a time when 'well, we do not have a standard, so we are not going to worry about it.' We now have the temporary standards.

D. Noble explained that there is formal army safety guidance that directs USACE to protect the public at the AEGL-2 level if the AEGL standard is available. USACE Baltimore is following that formal guidance for public protection and safety. Slide #31 of the presentation indicates that the concentrations need to stay down in the area that is highlighted in green, which is underneath the AEGL-2 level. In that level there are no significant adverse effects. This does not mean there will be no adverse effects, that is achieved under the AEGL-1 level. The effects that would be experienced between AEGL-1 and AEGL-2 are considered temporary and not permanently damaging; such as a person's eyes might water, a bad smell might be noticeable, or a person might cough. Those are adverse effects, but as soon as the person breathes fresh air, they would be fine; the effects go away and there is no permanent damage. Over the AEGL-2 level there may be significant adverse effects, where even after the person is brought out of the atmosphere that is causing the difficulty, that person continues to have the difficulty because they have received a dose that is harmful to the body. The safety literature states that in an unintended event, nobody wants to release a chemical out into the community, but if that happens, it is appropriate to protect people below the AEGL-2 level because that is the area where everyone will be safe and will recover even if someone receives an exposure. When the TEEL levels are used that are not vetted, then the more conservative level TEEL-1 is selected because not as much is known at a TEEL-2.

Comment from J. Baine, Audience Member - That was my question, why the difference between the two, and you are saying because there is less information about these chemicals that are under the TEELs, so that is more conservative.

P. deFur noted that the review and analytical processes are much more rigorous in setting an AEGL.

D. Noble added that there is greater confidence in the AEGL level. When the AEGL-2 level is selected, if the concentrations stay below that level people will not experience serious significant adverse effects.

P. deFur and D. Noble agreed that the AEGL is a 'Not to Exceed' level.

Question from Liza Finely, Audience Member - You were talking about a 24,000-comparison level. Was this the highest concentration that was measured out there?

B. Barber explained that the 24,000 micrograms per kg was selected as the comparison level because that was the maximum concentration of agent breakdown product that has been encountered under all operations to date. The next closest detection was for L at 4,700 micrograms per kg, encountered during high probability.

Question from M. Miller, Audience Member - If you wind up having a greater amount in the future, would you just shut everything down and recalculate what you need to do?

B. Barber explained that the problem encountered on August 9 was that the air monitoring did not detect an issue. USACE believes the contaminant was not detected because the contaminant was fast-acting at the source, and the air monitoring has specific detection limits. All the standard Site Operation Procedures (SOPs) in place now will continue to remain in place. If the air monitoring detects a chemical release, the team would immediately move into mitigation, stop work at the site, and convene a project delivery team (PDT) meeting to discuss what happened and next steps. The procedures would then need to be refined dependent upon options.

Question from M. Miller, Audience Member - Is there any way that you can add more of those air detection things, so you have got them, not one but maybe there is one in every corner?

B. Barber explained that there are perimeter air monitors on all four sides of the site. The team has discussed potentially adding additional perimeter air monitoring at an interim or mid-step between the excavation area and the perimeter. The team has also discussed how close the air monitoring equipment might be to the actual excavation face without interfering with the workers' safety. The team is having ongoing discussions but has not refined any of the detail until a specific option is selected. ECBC provides all the air monitoring, so there have been specific discussions with ECBC about how to enhance the air monitoring program. The challenge continues to be monitoring for an unknown, so the air monitoring is limited to contaminants that are known to be present at the site.

Comment from P. deFur - There is another protocol for the field crew whenever they get out there. If they encounter a situation or something that is not within the realm of what they are anticipating, they stop. We have been through this before, a couple times.

USACE invited feedback and requested that the RAB take the slides home and review the options. If the RAB has further questions or positive or negative feedback, USACE invites the members to contact USACE Baltimore. USACE Baltimore will then use that feedback to inform discussions about the options with the partners and develop a return-to-work plan.

D. Noble noted that both options are on the table and USACE believes both options are safe. There are trade-offs with each option. The big issue with each option is the potentially unknown chemical at the site and USACE is never going to be able to say anything concrete about an unknown chemical. Assumptions must be made with each option. USACE expects to be able to present the preferred option to the RAB at the May meeting, review the option with the RAB, and request

community buy-in to the adoption of the option. Once an option is selected, the team can begin the serious planning of getting back to work following the guidelines of the selected option.

D. Voting-In of New Members to the RAB

D. Noble and G. Beumel noted that the RAB did not have a quorum at this meeting, preventing any vote.

Comment from Malcolm Pritzker, Community Member - I think there is a procedure we might want to consider in accord with the membership procedures. I would just comment that in all the years that some of us have been on this committee, this is the first time we have not had a quorum that I recall. The community members of the RAB all received an email describing the results of conversations between myself, representing the nominating committee, and Rebecca Yahiel, Spring Valley Community Outreach Program, representing USACE Baltimore. We briefly described the qualifications of the two applicants to be added to the RAB. Both R. Yahiel and I felt that both of the applicants are very well-qualified to serve on the RAB. I am going to read the qualifications, but the reason I am reading them is that the membership procedures allow a secret ballot, and I quote, "Each community member will vote by secret ballot in person or by proxy." It is a reasonable procedure since all of the community members of the RAB have received this list of qualifications. We might consider just allowing the community members to vote by mail as to whether these two very well-qualified applicants should join the RAB. If you want to consider that procedure, I will be happy to read for the record what the qualifications are of both these people.

Comment from G. Beumel, Community Co-Chair - I look to Carrie as the expert on the by-laws. Does a proxy vote have to be cast during the meeting or can a proxy vote be late?

Carrie Johnston, Spring Valley Community Outreach Program, explained that the procedures for voting are flexible and could become more flexible as the by-laws are reviewed. She recommended that the protocols and operating procedures be updated and invited the RAB to review and consider updating the by-laws before the next meeting. Only one of the two potentially new members was present at the meeting, and it was up to the RAB whether to vote them in via mail or wait until there is a quorum at the next meeting. She recommended pausing the vote, so the applicants may introduce themselves to the RAB prior to voting. That would be a polite thing to do and give everyone an opportunity to meet each other.

Question from M. Pritzker, Community Member - Are you saying that we should not allow community members of the RAB, who again have gotten this list of qualifications, to vote by mail between now and the next meeting?

C. Johnston explained that she was not saying that, but pointed out that per the by-laws, the RAB should not vote someone in that has not attended a meeting. In this case one of the applicants was not present, so it would not be appropriate to vote in that person at that time.

Question from M. Pritzker, Community Member - One of the applicants is actually present. Could we follow that procedure with the one applicant?

C. Johnston confirmed this.

Comment from M. Pritzker, Community Member - Thank you. I had not spoken to Ms. Baine before this meeting, but I did speak to Paul Birmingham, who did say he was going to show up. Things happen. Let me just read what their qualifications are and again ask if we can have the

community members vote by email as to acceptance of the applicant who is here. Let me read it again for the record. This is part of the email that went to the RAB. It says: "On February 23 Malcolm Pritzker, representing the nominating committee, and Rebecca Yahiel, representing USACE, reviewed the applications of the two Spring Valley resident applicants to serve as Community Members of the RAB. We concluded that both applicants were very well-qualified to serve on the RAB. The two applicants are Jennifer Baine and Paul Birmingham. Jennifer Baine, M.D., grew up in Spring Valley, moved away, and returned to live in Spring Valley with her husband and four children 2.5 years ago. Paul Birmingham had been a resident of Spring Valley since 1999. He worked in senior executive positions at the World Bank, where his scope of work included working on social and environmental issues on international projects." If it is necessary and in accordance with our conversation, I would move that we solicit the community members of the RAB to vote on Mrs. Baine, who will show up at the next meeting and we will postpone voting on Mr. Birmingham until he does show up at the next meeting.

Comment from G. Beumel, Community Co-Chair - We will not vote on that because, again, we do not have a quorum, but I will ask the Outreach Team to send out an email to the members. Since we have a potential member here, do you have anything you would like to say?

Comment from J. Baine, Audience Member - I am Jennifer Baine. I did not grow up in Spring Valley, my husband grew up on Rodman Street, so I have been visiting Spring Valley since 2000, and then we moved back here two years ago. We have four children; five years old, three years old, two years old, and a five-month old. I am a physician, board certified in emergency medicine and sports medicine. I work as a physician advisor from the home right now. I am interested in being on this committee because I just want to get a little bit more involved in our community, specifically using my skills and background in terms of health and be an advocate for the community and community members, especially with children.

Question from George Vassiliou, Community Member - Are we voting?

G. Beumel explained that the RAB was not voting because there was no quorum. The RAB will vote by mail, and C. Johnston will send information to the members on how to vote.

III. Community Items

IV. Open Discussion and Future RAB Agenda Development

A. Upcoming Meeting Topics

- Groundwater FS Study/Policy Issues between USACE, EPA, and DOEE
- Site-Wide RD/RA
- 4825 Glenbrook Road/4835 Glenbrook Road
- Incident BOI

B. Next RAB Meeting:

Tuesday, May 8, 2018

C. Open Discussion

Question from A. Hengst, Audience Member - Is the Potentially Responsible Party (PRP) investigation over?

B. Barber explained that the report is being finalized and USACE Baltimore will be sharing information with the USACE Baltimore Commander about how to proceed. The report is not a

publicly releasable document.

Question from A. Hengst, Audience Member - But is it not conceivable that a FOIA request could be filed once it is completed?

B. Barber explained that the PRP document is not obtainable by FOIA. If a FOIA is filed, the FOIA will be denied. PRP reports are privileged. Action regarding the PRP will be taken if deemed necessary and appropriate.

Question from A. Hengst, Audience Member - So you are saying that you cannot say anything about it because you might be suing people?

B. Barber explained that she cannot give any information about the PRP at all.

Question from A. Hengst, Audience Member - But if you are not going to sue anybody, what would be the secret?

B. Barber explained that any PRP information still comes under attorney-client privilege. It is at the discretion of USACE and the Department of Justice whether to engage in any legal procedure.

V. Public Comments

Comment from M. Miller, Audience Member – I grew up on the 4700 block of Rodman Street. I am only one in my family that is sick with a rare immune deficiency. Our family lived in the Valley for fifty-seven years. There are about 10 friends we grew up with that are no longer alive because they died for one reason or another. I want to talk about something that actually maybe P. deFur could comment on. This particular issue with arsenic is that it is an epigenetic trigger, meaning any faulty genes you have get switched on and you get those diseases, maybe younger than your forebears did. It is also an endocrine disrupter and it disrupts things like estrogen and progesterone. An overproduction of Aldosterone [ed. an adrenal gland hormone, turned out to be one of my issues. In 2012, my Aldosterone level was 127. Normal range for Aldosterone was 0-30. What aldosterone does is it causes your body to retain sodium and waste potassium. You can wind up having a lethal heart arrhythmia with a low level of potassium. Twice in 2012 I wound up in the emergency room. Both times my blood results indicated hypokalemia, which is a low level of potassium. One hospital ER failed to diagnose what was wrong.

The endocrinologist and nephrologist ruled out idiopathic bilateral adrenal gland hyperplasia, because there were no signs of adrenal gland tumors, or of rogue adrenal gland cells producing aldosterone elsewhere in my body. Yet my blood pressure continued to be difficult to control, due to erratic spikes, so they kept me on an aldosterone blocker and on prescription strength potassium. The medication to block aldosterone over-production dried out my eyes. According to the Wilmer Eye Institute, they are dry all the way back, so I am having to risk changing medications. In the absence of a disorder or a disease, identifiable through the medical disease model, I can only conclude my hormone levels were disrupted due to exposure to arsenic or another endocrine disruptor. I have found in the course of my journey that I have to educate every doctor I see. Some of them have already had other Spring Valley patients and have been wonderful. Others that I have dealt with have been ignorant and cruel. There is a need for CEU training that can help local specialists understand the effects of WWI chemical warfare toxins on the human body. There is an incorrect assumption that just because you are in the Valley for a long time, you got your exposure as a child and that is why you have the diseases that you have. I was symptomatic of the rare immune deficiency, prior to returning to Spring Valley in 2007. I was not diagnosed until 2012, at which time I was very ill. All I can tell you is that I know I had another significant exposure

as an adult, in addition to more chronic exposure to multiple WWI chemical warfare toxins. Because we have no appropriate medical research and treatment program set up for Spring Valley Residents, at the National Institutes of Health Environmental Health Program Headquarters, many local physicians are unprepared to recognize and treat the Spring Valley Community, in a timely manner. I want to be open about my own situation so that you understand these things are happening. Exposure to arsenic or other WWI chemicals affected my estrogen level, as well as other hormones. I was diagnosed after biopsies in 2015 with a rare disease called Lichen Sclerosus which causes genital disfiguration in men, women, and children. I have still not received appropriate medical treatment for this disease, because it has progressed to such an advanced degree, no John Hopkins Priority Partners OB-GYN is specialized enough to treat me. I am willing to tell you how it is, so that you really hear me when I say, there have been people all over Spring Valley who have told me they are sick, then swore me to secrecy.

In the course of my journey I did wind up connecting with a soldier who worked for the U.S. Army in January and February of 1993. He also suffered an emission of gas and went on to serve in other places where he was exposed to chemical warfare toxins, so it is hard to say what was Spring Valley and what was not. He lost a lung last year. He can hardly walk because of peripheral neuropathy. He is younger than I am. These guys in the US Army Corps are heroes. They will not know until they are older, some of them, what they will wind up dealing with for health problems. I do not know what can be done about this. I once left a hospital ER without help, sicker than when I got there. When you have weird things happen to your body, people just do not understand. I remember talking to a previous investigator in Spring Valley who told me that the majority of people he saw who were sick who did nothing about their symptoms wound up dying, and the ones that did get help usually lived. He was encouraging me, and he showed me some of the things that he knew. I think it is really important to understand that what is happening is probably more systemic than just a matter of remediating chemical weapons. I have always wondered why we are not testing our sewer sediment for arsine, arsenic-related stuff. When arsenic comes in contact with anaerobic bacteria, the anaerobic bacteria emit arsine gas, which I understand is lighter than air, so floats out of the storm drains. In fact, other gases can form, depending on what is in the sewer sediment.

I really believe that even with as much as I know, there is a much bigger problem. If we work together we will be able to solve these problems. A non-profit of some sort or research program at National Institutes of Health (NIH) has to be set up which will protect people's health information; but will give the Army that information so that they can finally identify all disease clusters. There are so many people that will not report. I hope to be instrumental in some way. I just wanted to say these problems are not just from way back, these things are present and real. I am just the only one I know who is willing to speak up. I would not be quiet and let some other child or some ignorant innocent person and we are all ignorant, really, go through life wondering, 'what the heck, what is going on with my body?'

Comment from P. deFur - This is a list of what she has compiled in terms of how arsenic is considered. It is an endocrine disrupter and that has been in the literature increasingly for a number of years; that arsenic affects a variety of endocrine systems. Originally it was not clear exactly how that happens, but it interferes with normal receptor binding, which is how most hormones work on one level or another. It does, it has been identified one system to the next, so these principle ones are steroid.

Comment from M. Miller, Audience Member - This paper in his hand is my lab tests that shows my above average, my high level of aldosterone. My whole car is full of medical records. All of my kids spent summers at my dad's getting internships in D.C. I care about my children and my grandchildren. This affects everyone, and you just do not know how much. I am willing to be much more transparent if there is a constructive way I can help.

Comment from Lawrence Miller, Community Member - I just want to say thanks for sharing and the fortitude to share a deeply personal story that is relevant and that I cannot believe you are a grandmother. Thank you for this.

Comment from M. Miller, Audience Member - Thank you very much.

Comment from G. Beumel, Community Co-Chair - We will talk with P. deFur, we have had the Agency for Toxic Substances and Disease Registry (ATSDR) here a couple times and they did a terrible job, very superficial. I am not quite sure what the next motion will be. Thank you, and we will have to take that under advisement.

VI. Adjourn

The meeting was adjourned at 8:46 PM.