# SPRING VALLEY FORMERLY USED DEFENSE SITE PROJECT
## RAB Meeting

**March 8, 2016**
**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

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

Point of Interest (POI) 2, Fordham Road
Feasibility Study
Pilot Study
Glenbrook Road
Introduction to the Groundwater RI Document

**8:00 p.m.** **III.** **Community Items**

**8:10 p.m.** **IV.** **Open Discussion & Future RAB Agenda Development**

Upcoming Meeting Topics:
- 4825 Glenbrook Road ATSDR Health Consultation Update (May)
- Site-Wide Proposed Plan
- Suggestions?
  - Real Estate Attorney
  - Invite new Director of DOEE to address the RAB

*Next meeting: May 10, 2016

**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

March 8, 2016

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

US Army Corps of Engineers

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# Agenda Review

- Co-Chair Updates
  - Introductions, Announcements
- USACE Updates
  - POI 2, Fordham Road
  - Feasibility Study
  - Pilot Project
  - Glenbrook Road
  - Intro to Groundwater Remedial Investigation Report
- 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**
  - **Site-Wide Feasibility Study**

- **ATSDR is scheduled to present their 4825 Glenbrook Road Health Consultation update during the May 10th RAB meeting.**

# Task Group Updates

# Task Group Updates
## Questions

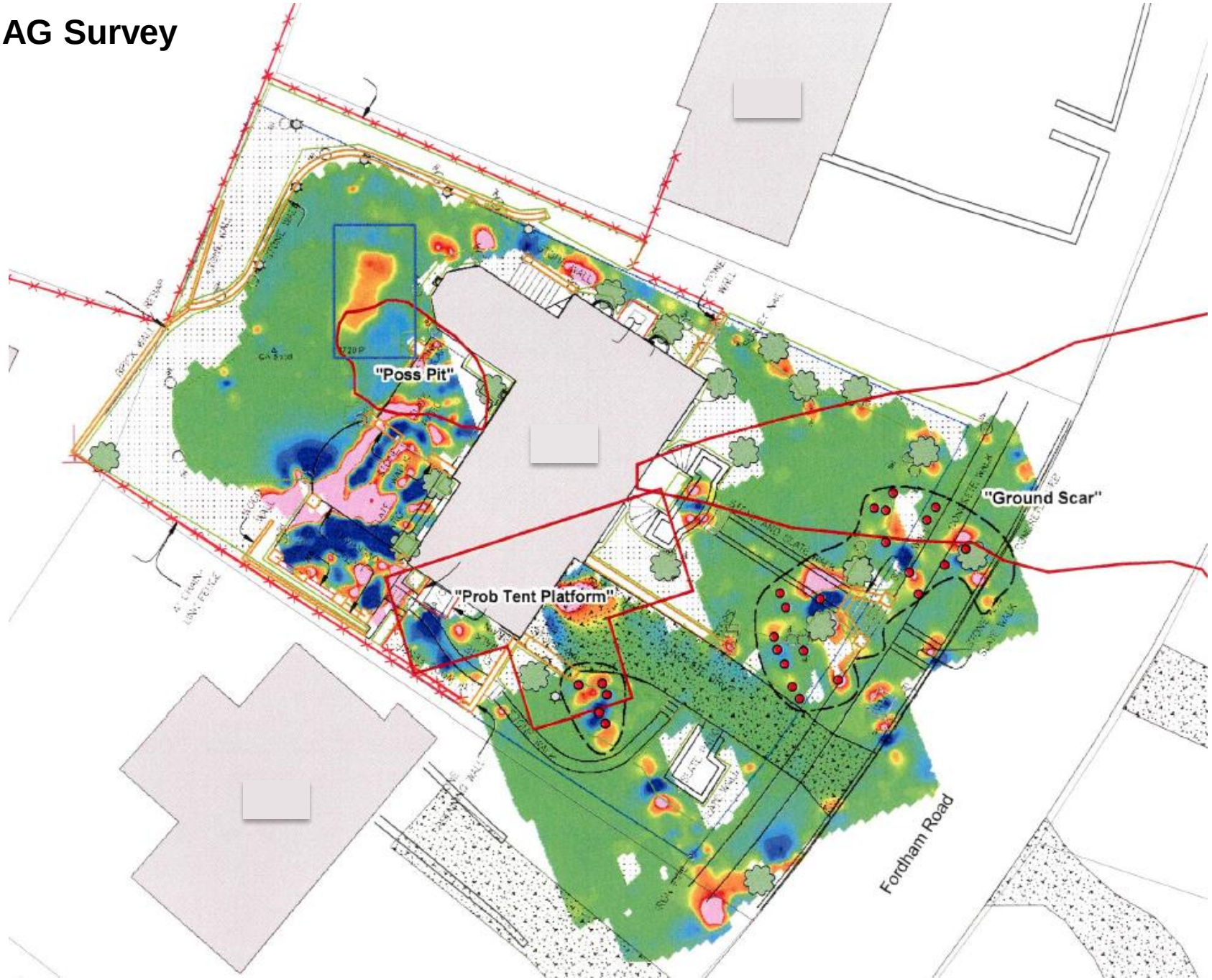
**As discussed in January, we are inviting the RAB and concerned community members to submit questions with respect to real estate disclosures.**

**RAB Member Bill Krebs, has offered to investigate and report back. To date, no questions submitted.**


Arsenic Removal and
Anomaly Investigation
Efforts at
POI 2 on the 3700 Block of
Fordham Road

# EM Survey

# MAG Survey



# 3700 Block of Fordham Road

## Initial Investigation

**On February 8th, team performed initial scanning for anomalies using Schoenstadt and a Vallon All Metals Detector.**

# 3700 Block of Fordham Road

## Finds

During the initial anomaly investigation in February, the team found a 75 mm munition debris (MD) item.

Triple-bagged the MD for removal.

# 3700 Block of Fordham Road

## Intrusive Investigation of POI 2

**On Wednesday, March 2nd, the team intrusively investigated Point of Interest (POI) 2, considered a potential disposal area. No AUES related items were found, only "hot" soil.**

# 3700 Block of Fordham Road

## Investigating Single Point Anomalies

The team intrusively investigated about 66 single point anomalies located in both the front and back yard. No AUES-related items were found.

Metal rebar

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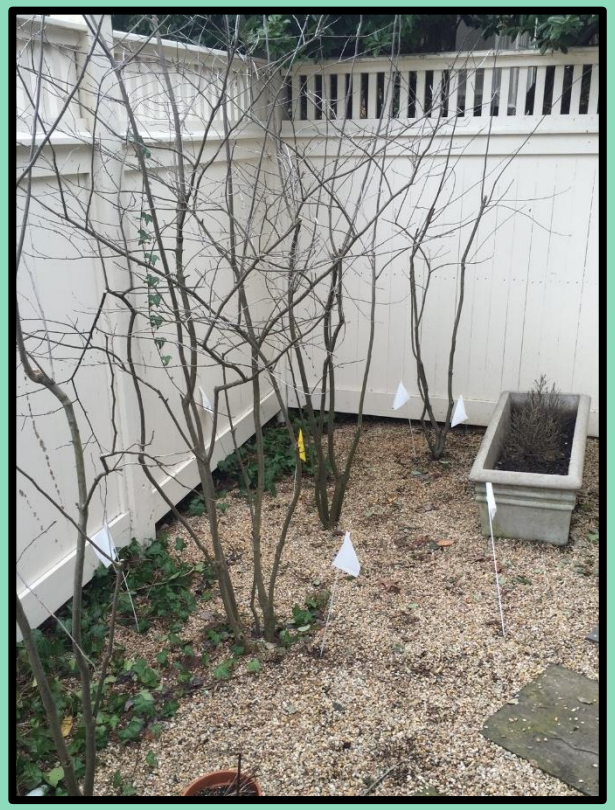
# 3700 Block of Fordham Road

## Arsenic Contaminated Soil Removal



**Flagged areas for arsenic removal.**

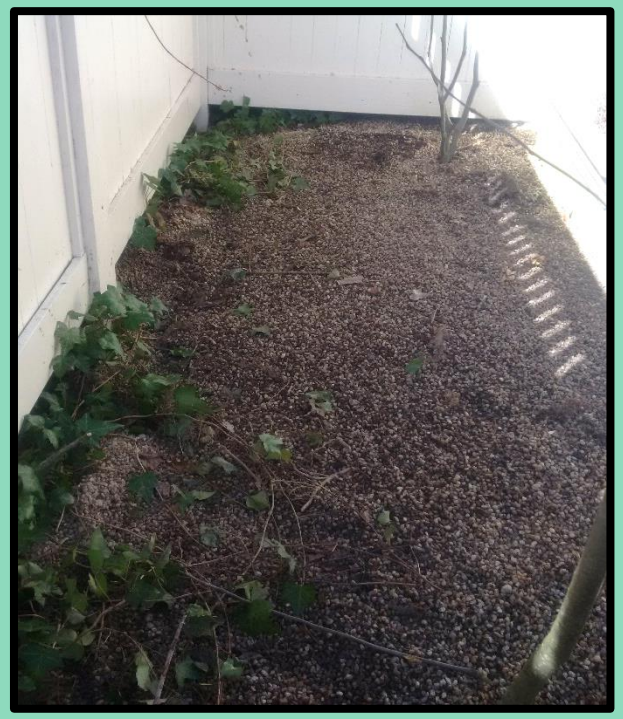
# 3700 Block of Fordham Road

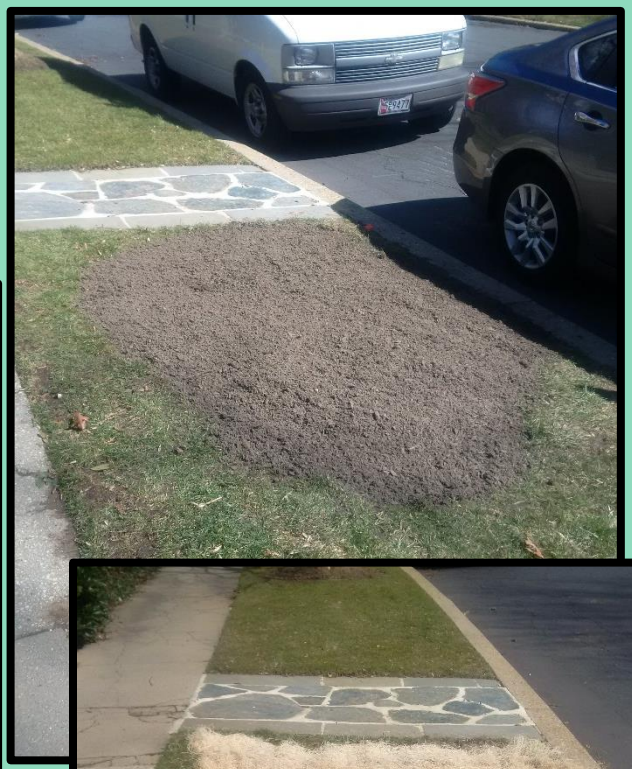
## Arsenic Contaminated Soil Removal

**Arsenic contaminated soil removed.**

# 3700 Block of Fordham Road

## Arsenic Contaminated Soil Removal

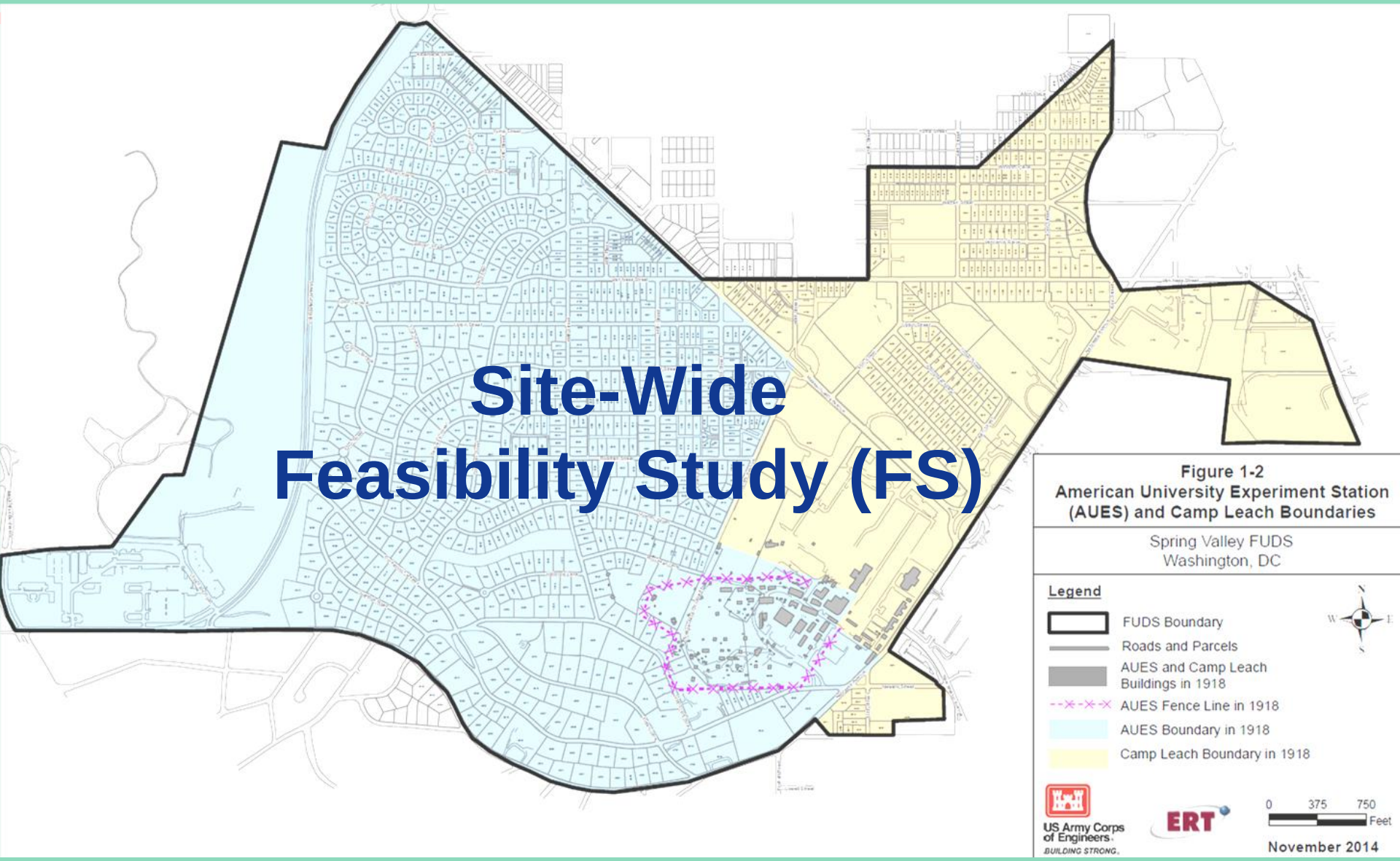




**The holes were filled with clean back soil and remediated.**

**Soil erosion control measures until grass is replaced.**

# USACE Updates



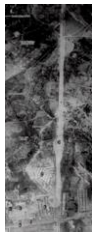
# Feasibility Study
## Finalized

- **In January, the team received final approval from the regulatory Partners and finalized the Feasibility Study (FS).**
  - The Final FS was sent out to the stakeholder **email** list on January 29th and placed on our **project website**.

- **USACE is composing the Draft Final Proposed Plan (PP). It is currently being internally reviewed by the Center of Expertise before it is reviewed by the regulatory Partners. The PP will select the preferred alternative as a result of the FS analysis.**
  - A formal **public comment period** will be held to allow the community an opportunity to review and comment on the PP before it is finalized.

# The CERCLA Process

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



## Preliminary Assessment

## Site Inspection

## Remedial Investigation

General Purpose: Collect data to characterize site conditions: Determine the nature of the waste; Assess risk to human health and the environment; & Evaluate treatment options.

## Feasibility Study

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

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

## Decision Document

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

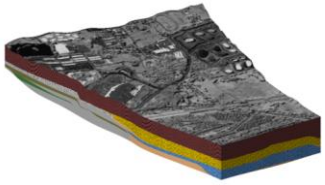
## Proposed Plan

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

**This document is made available for public review and comment.**

## Removal Action

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



## Remedial Design/ Remedial Action

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

## Long Term Monitoring

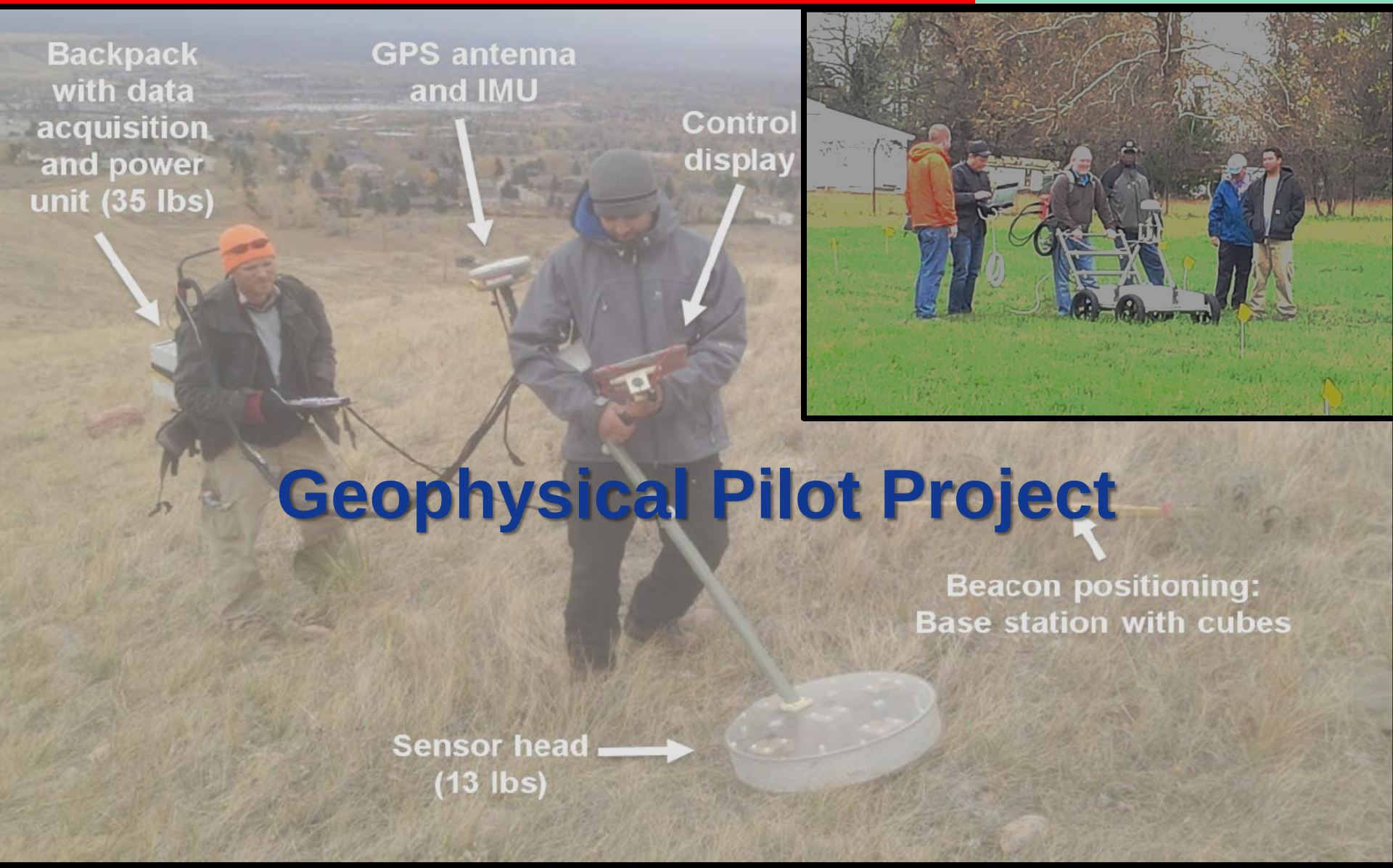
General Purpose: To conduct any long term monitoring necessary and conduct five year reviews of the Formerly Used Defense Site.

# Spring Valley FUDS

## Tentative Schedule

| | |
|---|---|
| **Spring 2016** | Prepare the Proposed Plan and start public comment period. |
| **Summer 2016** | Prepare and sign the Decision Document. |
| **Fall/Winter 2016** | Contract acquisition. Begin remedial design/remedial action. |
| **~2017-2020** | Plan and conduct clean-up action. |

# USACE Updates

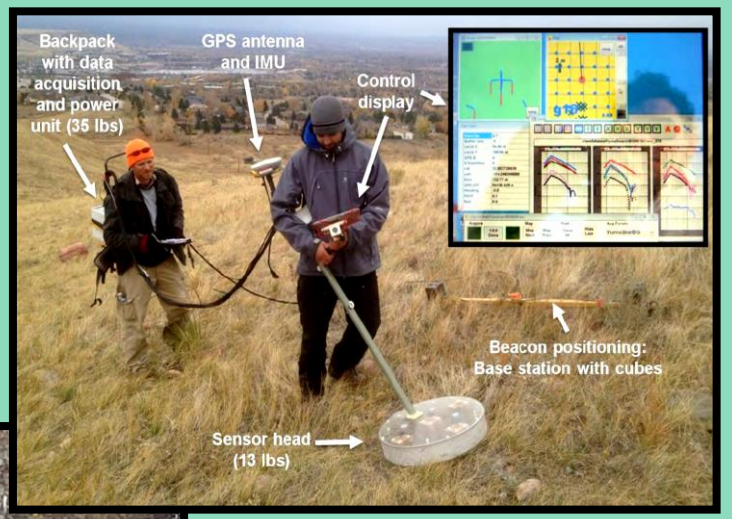


# Pilot Project
## Overview

**Purpose: To evaluate application of newly developed Advanced Classification (AC) equipment at 5 Spring Valley residential properties:**

A. Metal Mapper

B. Time-domain Electromagnetic Multi-sensor Towed Array Detection System (TEMTADS)




C. Man Portable Vector (MPV)

# Pilot Project
## Tentative Schedule

| | |
|---|---|
| **Spring 2016** | **Contract Acquisition.** |
| **Late Spring - Summer 2016** | **Field Work:** Initial Site inspection &landscape surveys; Geophysical Survey (NRL); Anomaly Excavation; Landscape Restoration. |
| **Fall 2016** | **Data Evaluation.** |
| **December 2016** | **Pilot Test Report.** |

# 4825 Glenbrook Road

# 4825 Glenbrook Road

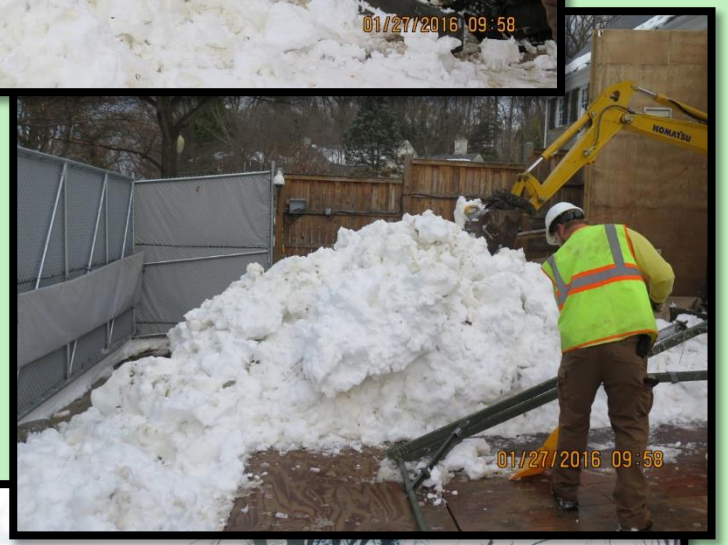
# Tent 3 Preparations Completed

- **Preparation activities included:**
  - ✓ Completed installation and maintenance of equipment in the tent, including lights, cameras, hoses, and excavator.
  - ✓ Re-aligned CAFS ducting.
  - ✓ Crews undergo refresher training on Site Safety and Sample Collection.
  - ✓ Shelter-in-Place alert system is fully installed and tested (site sirens, small mobile sirens, emails, ring-down calls and texts). Community refresher training completed.
  - ✓ Successful completion of the Smoke Test:

Tent & equipment preparations completed.

Due to the equipment used to perform the smoke test, the testing must be done at least at 32 degrees Fahrenheit and the humidity must be below 65%. The first available date with the necessary weather conditions was Friday, February 19th. The certification was received on Tuesday, February 23rd.

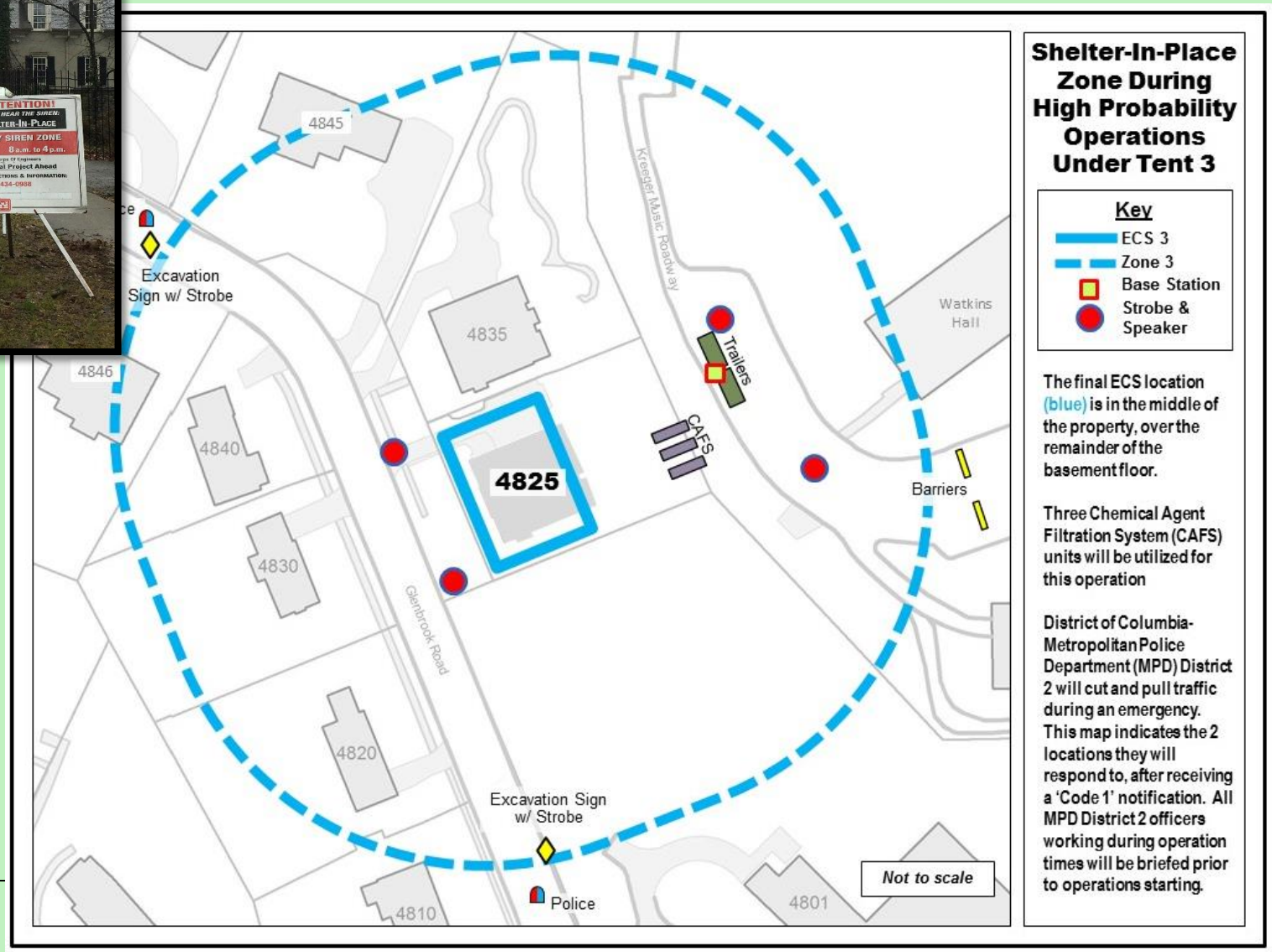
# Winter weather impacts high probability start date


January 26th, 2016: Our crews arrived on-site to start snow removal and assess any damages. They discovered minor damages due to the storm, and none to the tent.

# Refresher Training: Site Safety & Sample Collection


# 4825 Glenbrook Road
## Shelter-in-Place Zone Resumes

# 4825 Glenbrook Road

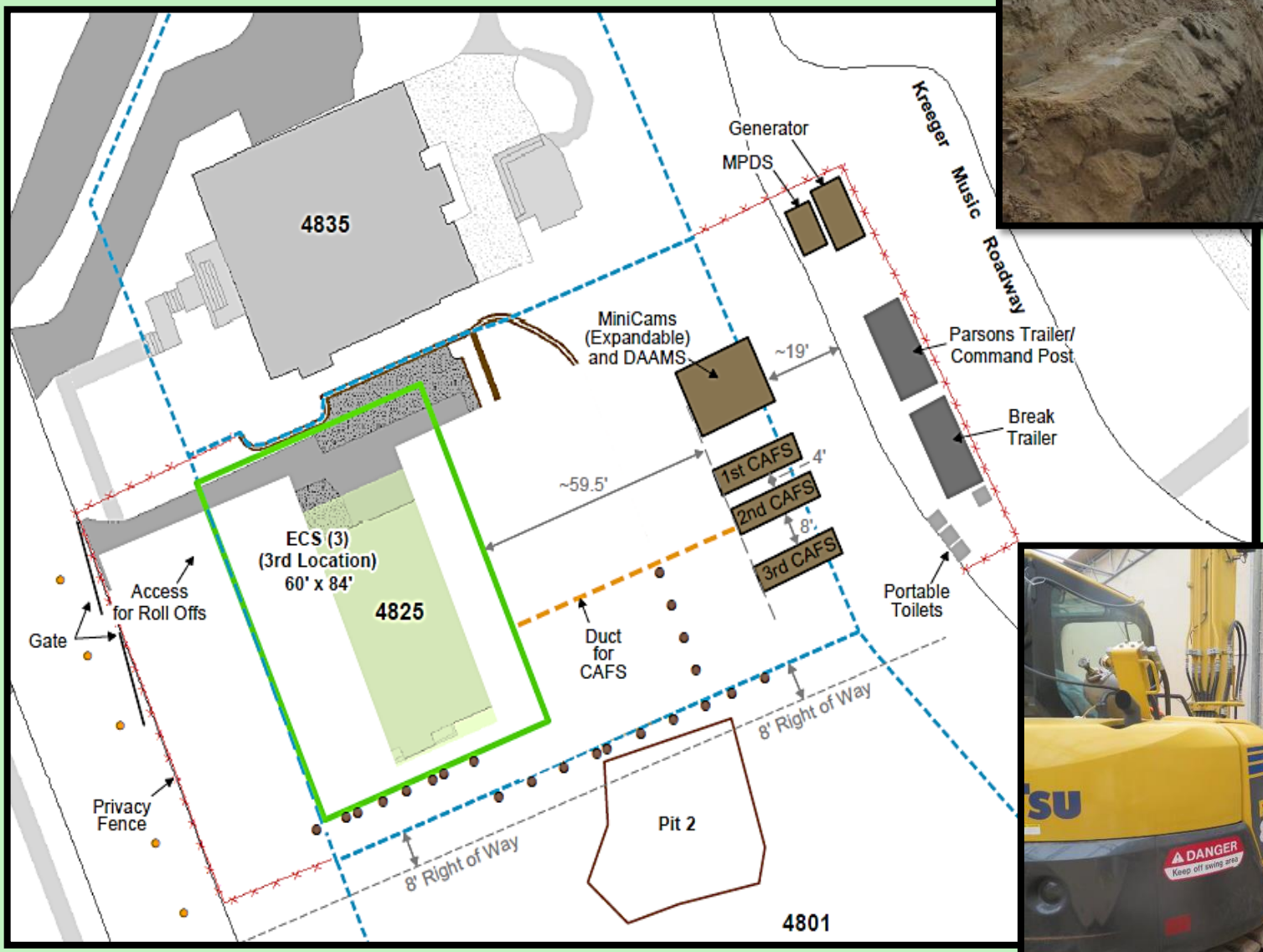
## High Probability Underway


**Site safety continues to be our number one priority. For example, high probability operations are continuously monitored remotely by the Site Safety and Site Operations Officers through live video and radio communication.**

**The EMTs are positioned on-site, and the ambulance engine exhaust is kept away from sensitive air monitors.**

# 4825 Glenbrook Road

## Tent 3 Operations




# 4825 Glenbrook Road
## Schedule Update

✓ **December 2012 through May 2013**

***Site Preparation/ Initial Low Probability Work***

- **Test pits in backyard and re-locating utilities**
- **Install soldier piles to support embankments**

✓ **May 2013 through September 2013**

***ECS Set Up, High Probability training, and Pre-Operational Exercises***

→ **September 2013 through Winter 2016/2017**

***High Probability Excavation***

**Winter 2017 through Spring 2017**

***Final Low Probability Excavation***

**Spring 2017 through Summer 2017**

***Site Restoration***

# Groundwater Remedial Investigation (RI) Findings

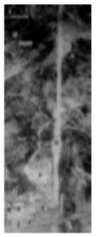
Bill Eaton & Gretchen Welshofer (AECOM)

# PURPOSE / AGENDA

- Purpose:
  - Summarize the groundwater remedial investigation (RI) findings, including the human health risk assessment
  - Present recommendations for future activities
- Agenda:
  - CERCLA process
  - Groundwater conceptual site model (CSM) and monitoring network
  - Groundwater flow and relationship to surface water
  - Chemistry results
  - Risk assessment results
  - Conclusions & Recommendations

# The CERCLA Process

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



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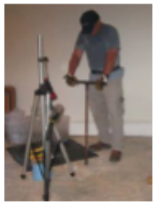

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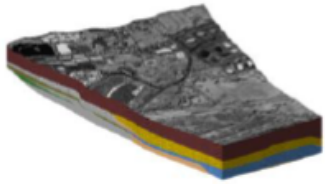

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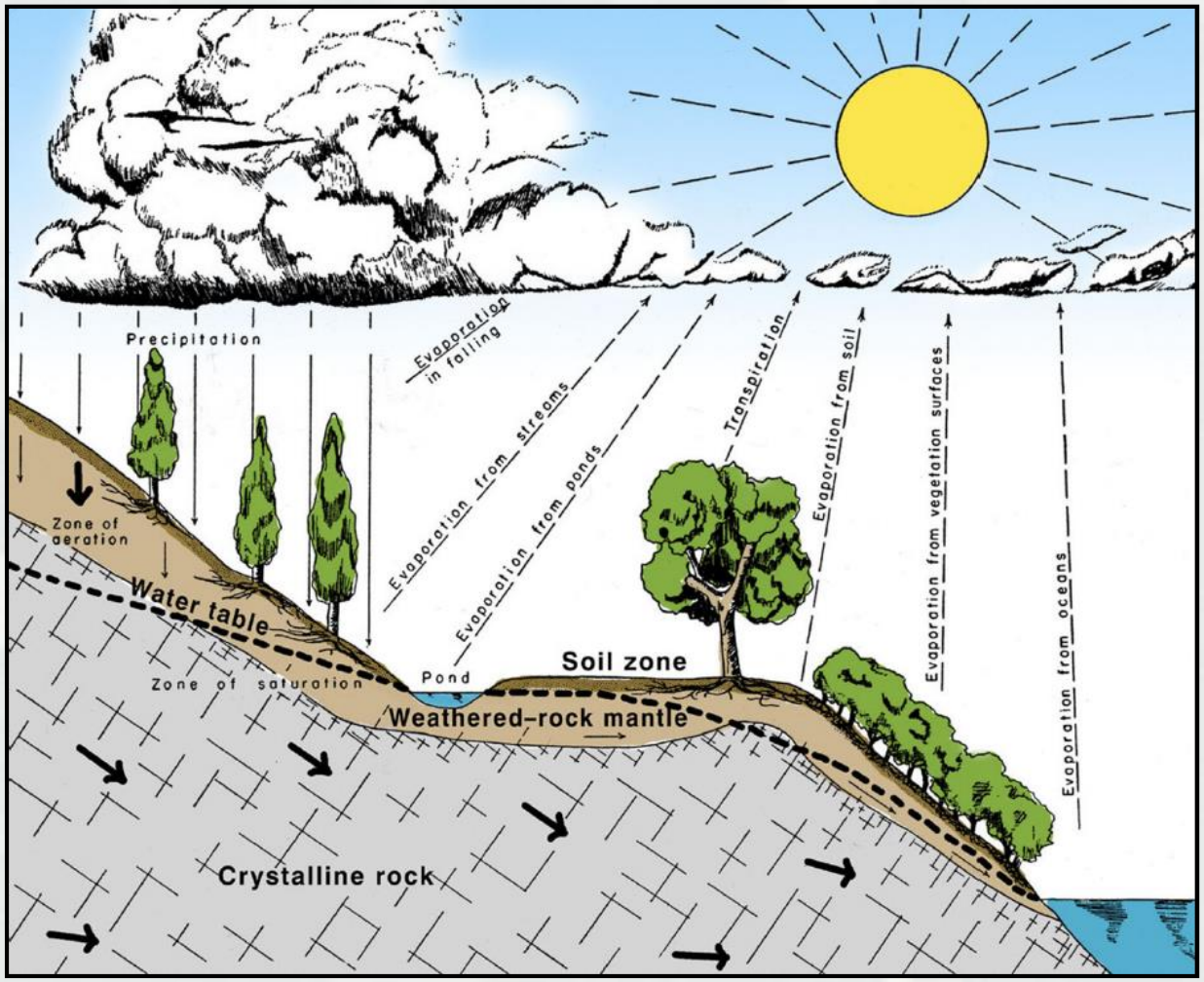
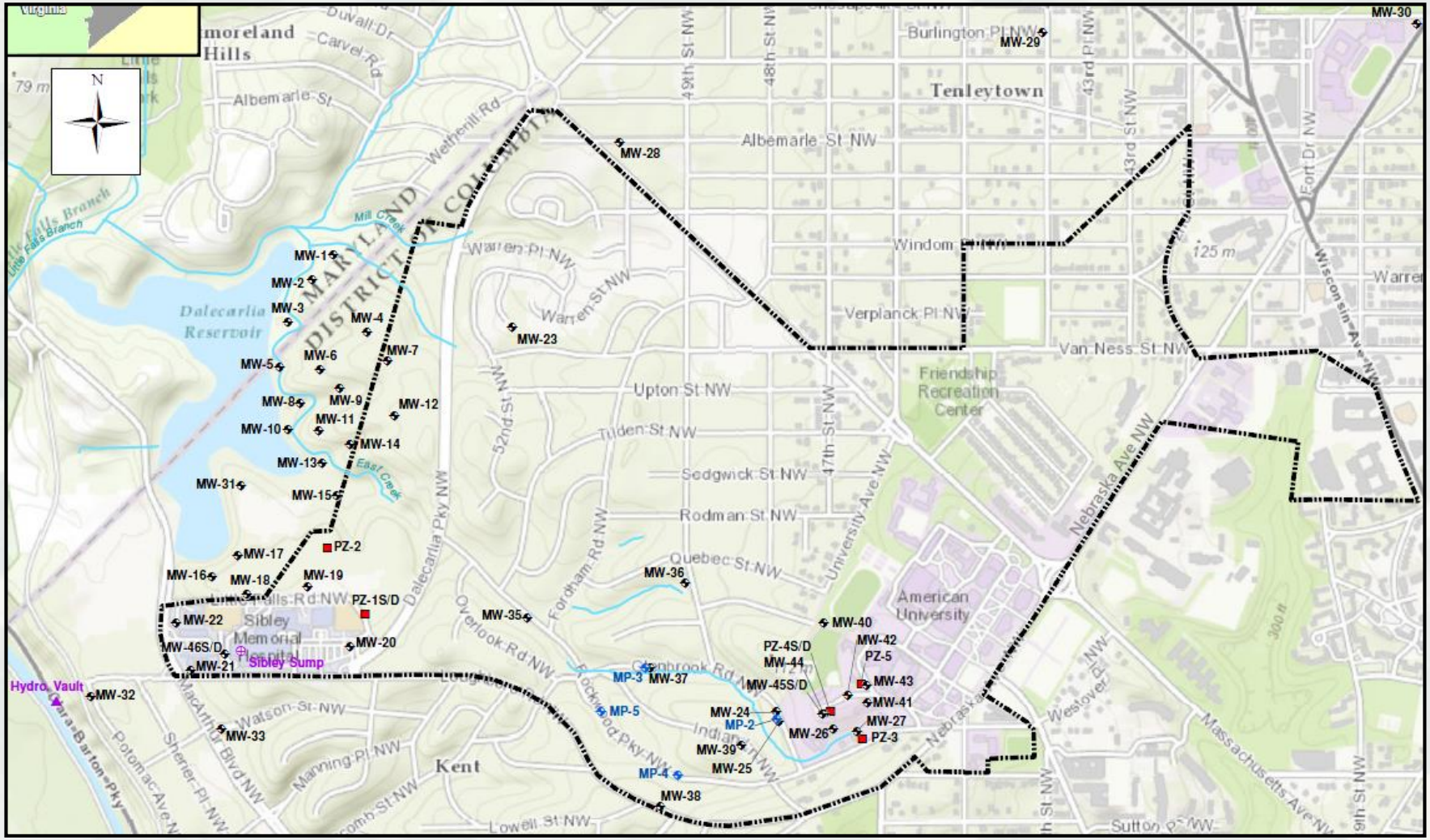
# CONCEPTUAL GROUNDWATER FLOW MODEL



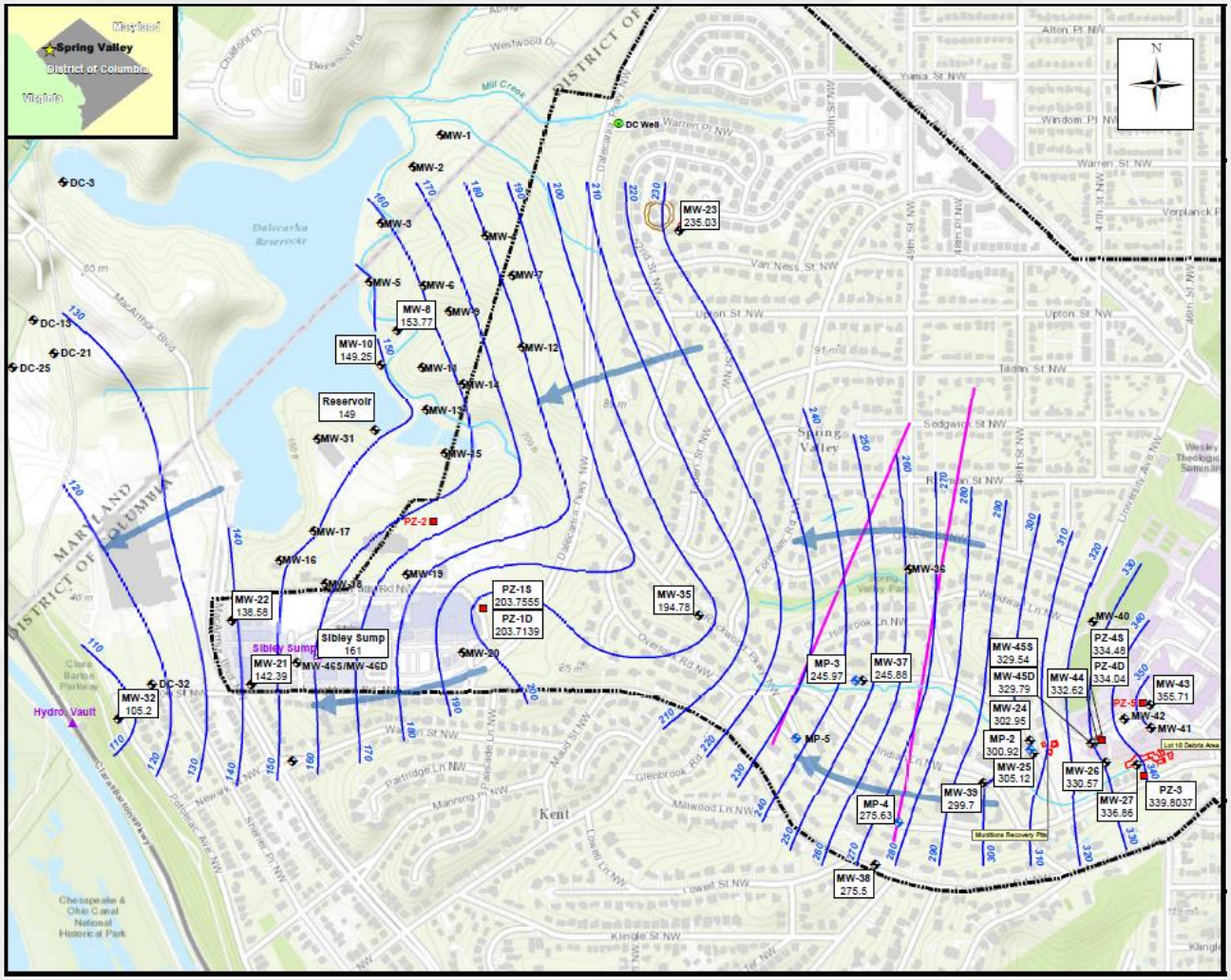
# GROUNDWATER MONITORING NETWORK

- A pre-existing sump and hydroelectric vault
- 33 shallow screened monitoring wells
- 4 wells containing  two screened intervals
- 13 open bedrock wells
- 4 multiport monitoring wells

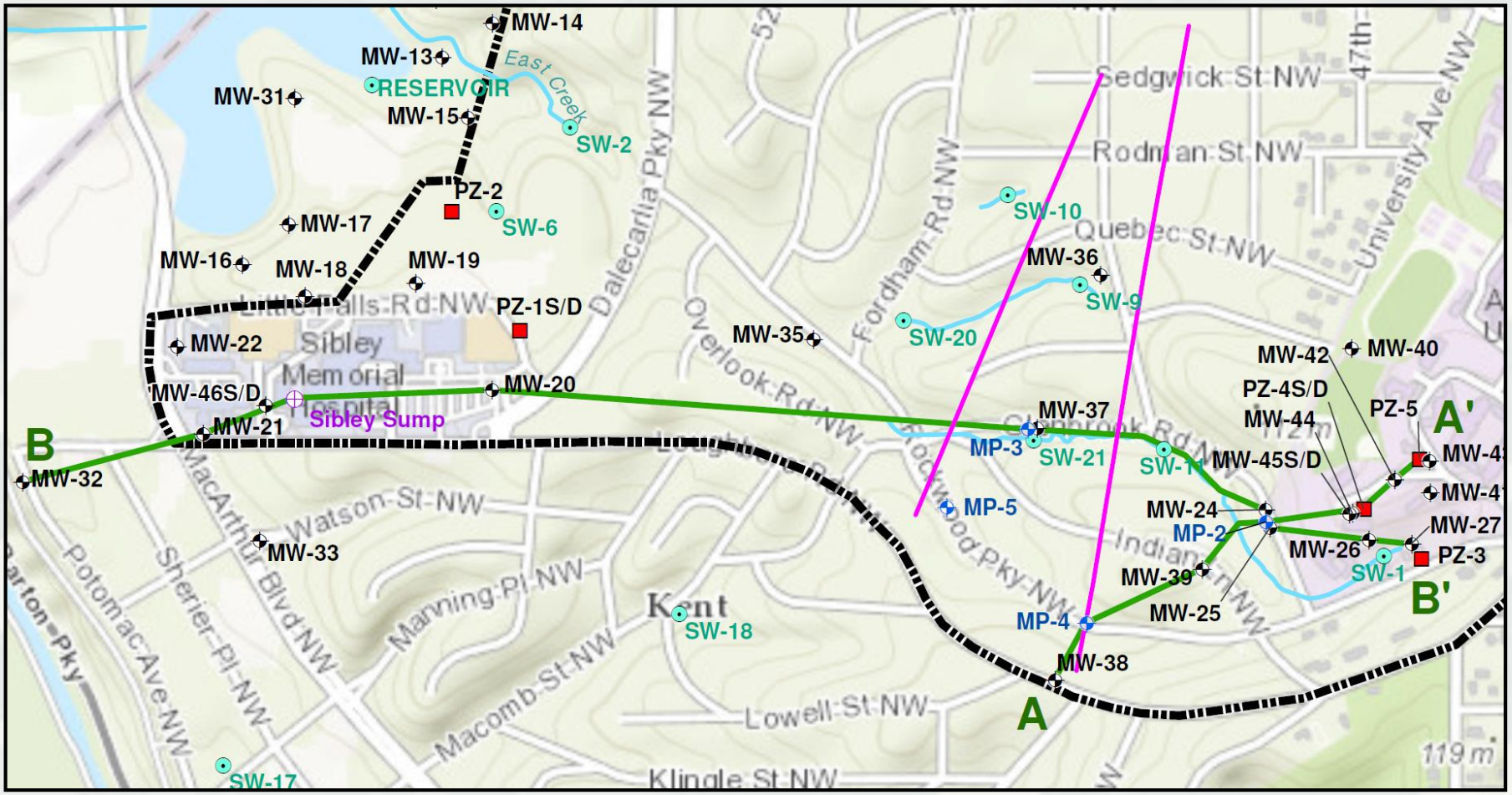
# MONITORING WELL NETWORK



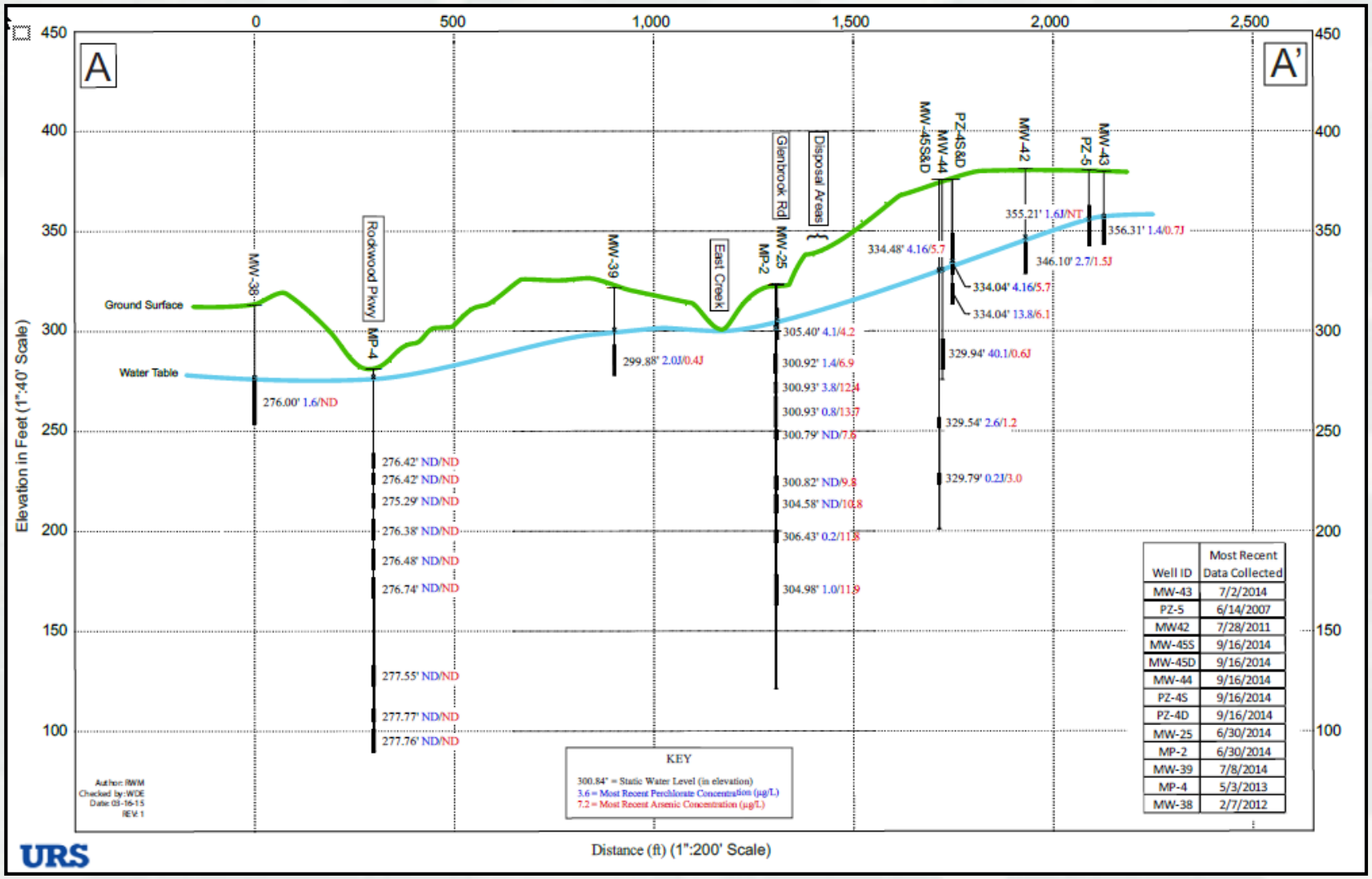
# GROUNDWATER FLOW (2012)



# SECTION LOCATIONS

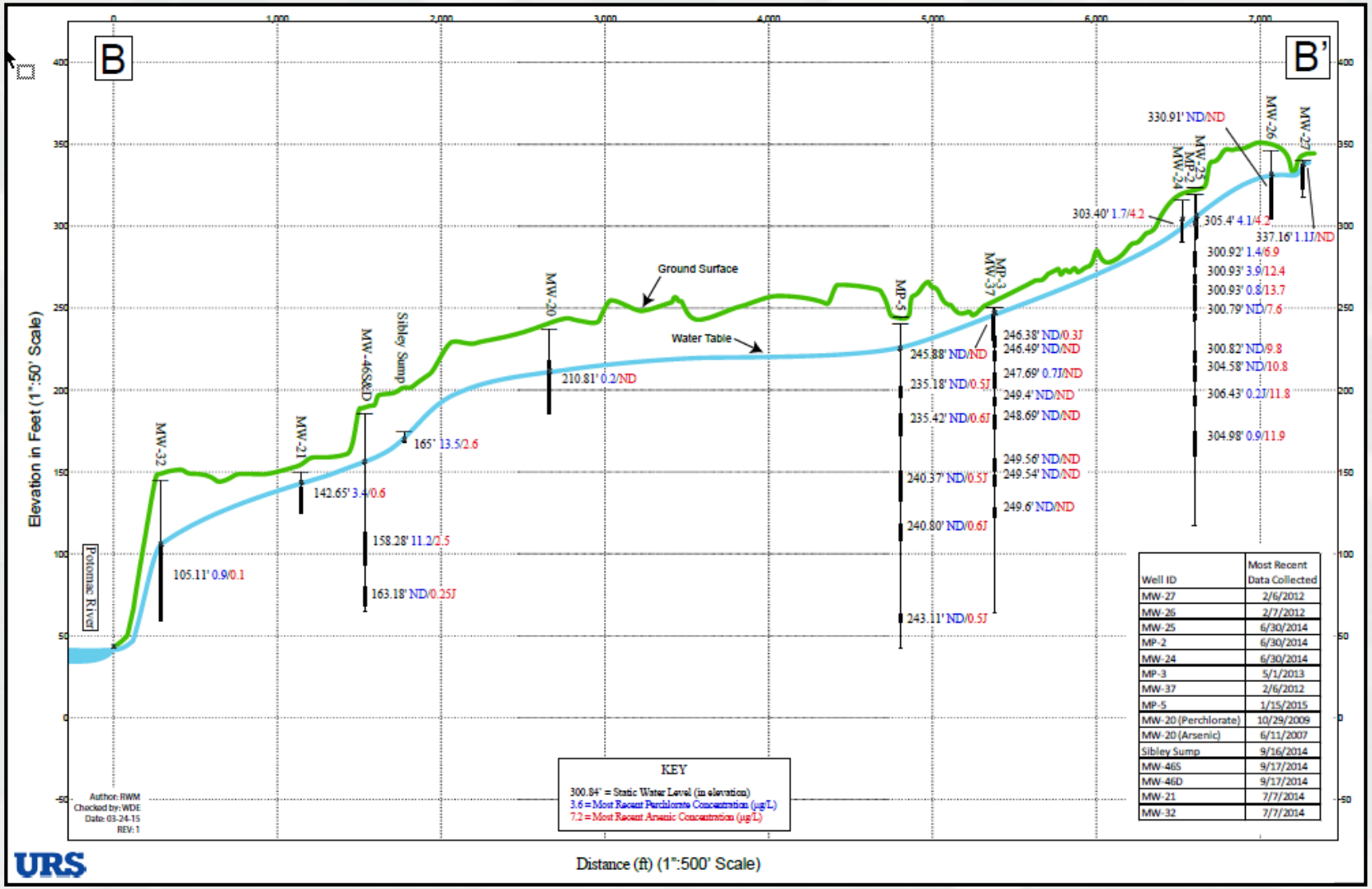


# SECTION A-A'




| Well ID | Most Recent Data Collected |
|---|---|
| MW-43 | 7/2/2014 |
| PZ-5 | 6/14/2007 |
| MW42 | 7/28/2011 |
| MW-45S | 9/16/2014 |
| MW-45D | 9/16/2014 |
| MW-44 | 9/16/2014 |
| PZ-4S | 9/16/2014 |
| PZ-4D | 9/16/2014 |
| MW-25 | 6/30/2014 |
| MP-2 | 6/30/2014 |
| MW-39 | 7/8/2014 |
| MP-4 | 5/3/2013 |
| MW-38 | 2/7/2012 |

# SECTION B-B'




| Well ID | Most Recent Data Collected |
|---|---|
| MW-27 | 2/6/2012 |
| MW-26 | 2/7/2012 |
| MW-25 | 6/30/2014 |
| MP-2 | 6/30/2014 |
| MW-24 | 6/30/2014 |
| MP-3 | 5/1/2013 |
| MW-37 | 2/6/2012 |
| MP-5 | 1/15/2015 |
| MW-20 (Perchlorate) | 10/29/2009 |
| MW-20 (Arsenic) | 6/11/2007 |
| Sibley Sump | 9/16/2014 |
| MW-46S | 9/17/2014 |
| MW-46D | 9/17/2014 |
| MW-21 | 7/7/2014 |
| MW-32 | 7/7/2014 |

# GROUNDWATER ANALYSES / RESULTS

- Over 250 Different Chemicals Analyzed
- Detected chemicals:
  - 9 volatile organic chemicals
  - 6 semi-volatile organic chemicals
  - 1 explosive compound
  - 23 metals, including arsenic
  - 7 other chemicals, including perchlorate

# SURFACE WATER ANALYSES / RESULTS

- Over 250 chemicals analyzed
- Detected chemicals:
  - 1 volatile organic chemical
  - 4 semi-volatile organic chemicals
  - No Explosives
  - 18 metals, including arsenic
  - 5 other chemicals, including perchlorate

# ANALYTICAL SCOPE UPDATING

- As water monitoring results became available they were compared to project screening levels:
  - EPA Drinking Water Standards (MCLs)
  - EPA tap water Regional Screening Levels
  - District of Columbia Groundwater and Surface Water Standards
- The Analytical scope was refined during ongoing discussion of the interim screening results by the Partners.

# GROUNDWATER CONCENTRATION TRENDS

| Exceedance Locations (a) | Arsenic | Perchlorate |
|---|---|---|
| MP-2 | Down * | Down * |
| MW-24 | Down | Down * |
| MW-25 | -- | Down |
| MW-44 | -- | Up * |
| MW-45S | -- | Down |
| MW-45D | -- | Down |
| PZ-4S | -- | Down * |
| PZ-4D | -- | Down |
| Sibley Sump | -- | Down * |
| MW-21 | -- | Down * |
| MW-22 | -- | Up * |

**NOTES:**

(a) All locations where either of the following were exceeded: 1) Arsenic MCL 2) Perchlorate DWHA.

'Down' : Concentrations decreasing, based on slope of regression line.

'Up' : Concentrations increasing, based on slope of regression line.

* Trend is significant based on statistical analysis.

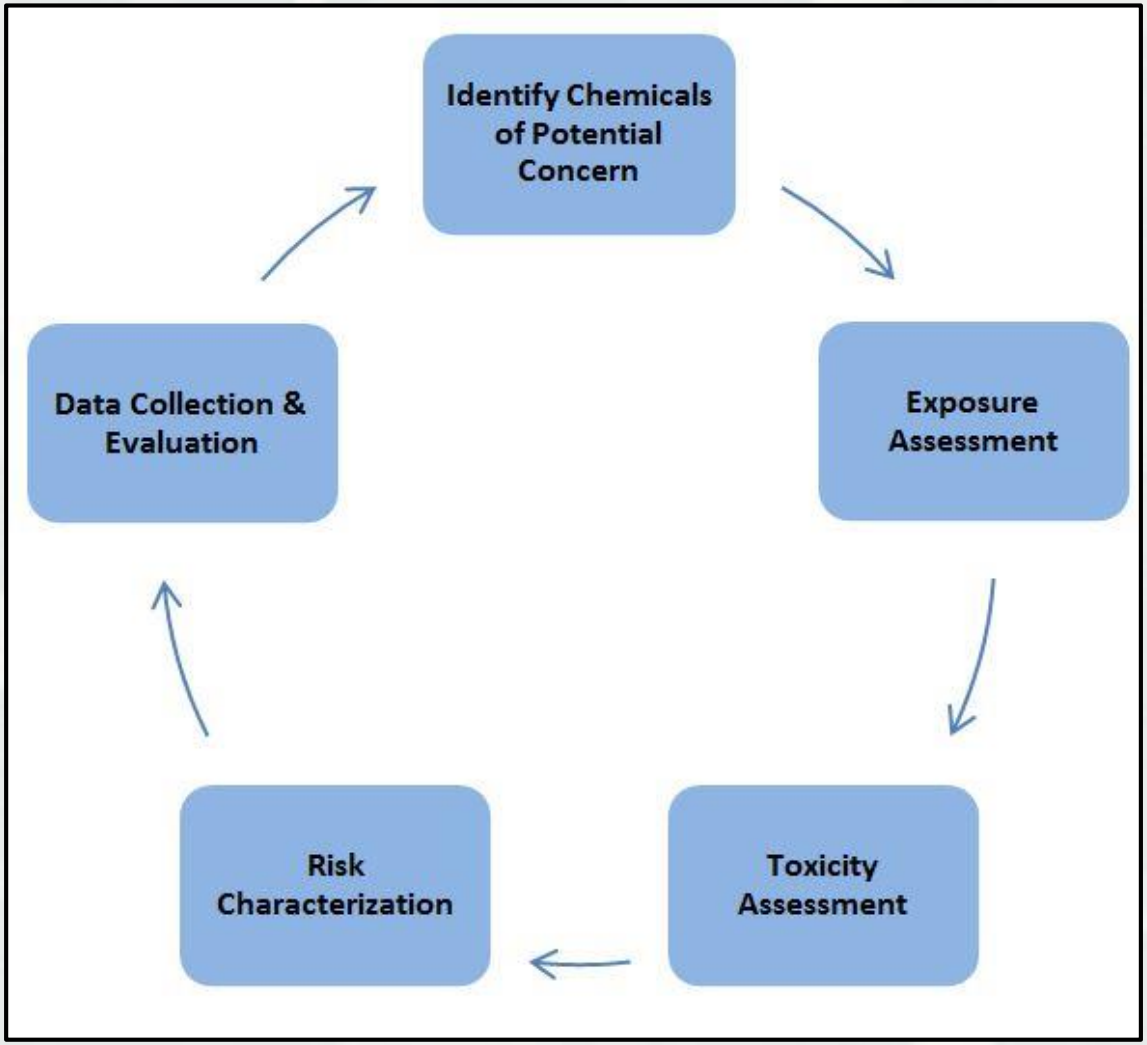
# HUMAN HEALTH RISK ASSESSMENT

- Human health risk assessment (HHRA) is an estimate of the potential for health impact.
- HHRAs are based on:
  - Conservative assumptions concerning how individuals may be exposed to contaminated media (e.g., groundwater) and for how long.
  - Published toxicity data for the chemicals to which exposure is assumed.

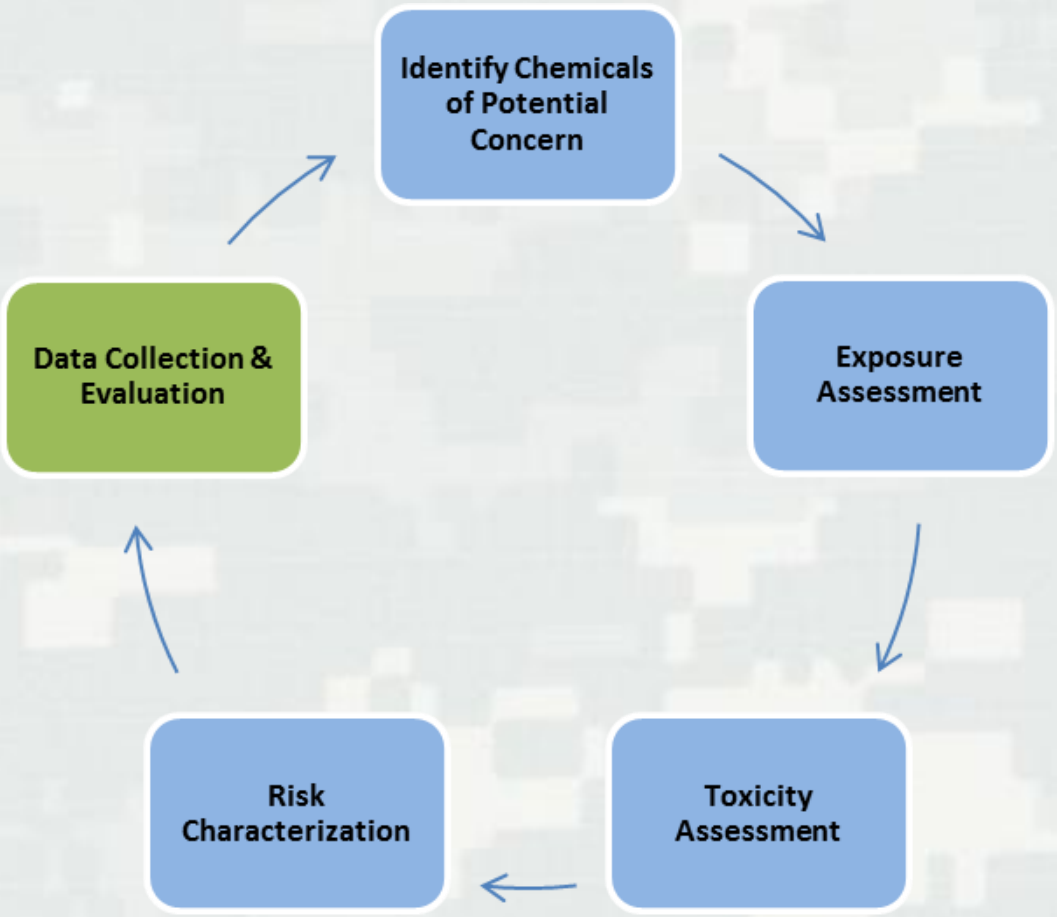
# HHRA THEORY

- Risk = Exposure x Toxicity
  - Without exposure there is no risk
  - Without toxicity there is no risk

# HHRA PROCESS



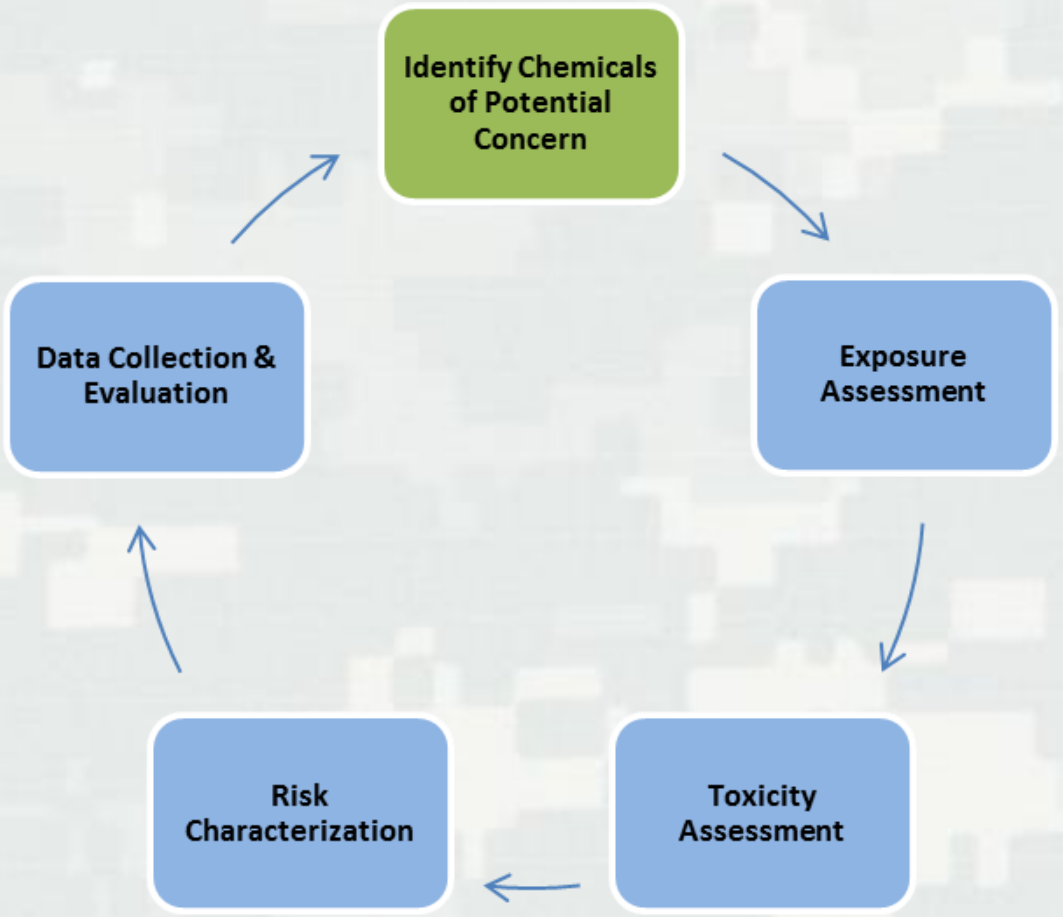
# DATA COLLECTION



# DATA COLLECTION RESULTS

- Groundwater Detections
  - 9 volatile organic chemicals
  - 6 semi-volatile organic chemicals
  - 1 explosive compound
  - 23 metals, including arsenic
  - 7 other chemicals, including perchlorate
- Surface Water Detections
  - 1 volatile organic chemical
  - 4 semi-volatile organic chemicals
  - No Explosives
  - 18 metals, including arsenic
  - 5 other chemicals, including perchlorate

# CHEMICALS OF POTENTIAL CONCERN (COPCs)



# COPC IDENTIFICATION PROCESS

- Tentative Chemicals of Potential Concern (COPCs) selected by comparing maximum detected concentrations to:
  - EPA Regional Screening Levels (RSLs) for tap water (THQ of 0.1 and target TCR of 1E-06)
  - USEPA Vapor Intrusion Screening Levels (VISLs)
  - District of Columbia Risk-Based Corrective Action (DCRBCA) groundwater screening values for indoor inhalation

# COPC IDENTIFICATION PROCESS (CONTINUED)

- Final COPCs selected by additionally considering other factors such as:
  - Persistence across multiple sampling events
  - Background concentrations (MWs 28, 29 & 30)
  - Validation flags
  - Detection frequencies

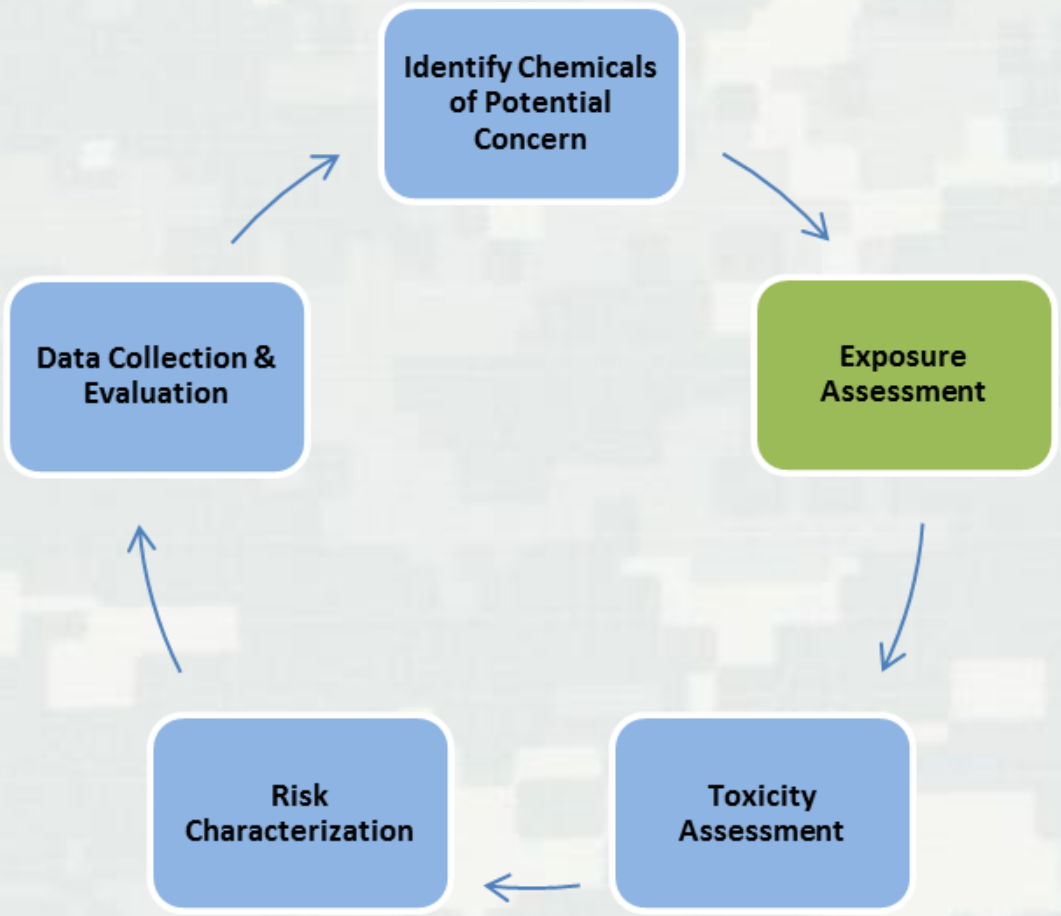
# COPC RESULTS FOR GROUNDWATER

- Arsenic
- Cobalt
- Manganese
- Perchlorate
- Strontium

# COPC RESULTS FOR SURFACE WATER

- Manganese

# EXPOSURE ASSESSMENT



# CONCEPTUAL SITE MODEL RESULTS

**CURRENT LAND USE SCENARIO**

| SOURCE MEDIA | RECEPTOR ACTIVITY | EXPOSURE ROUTE | CURRENT RECEPTOR: Adult Resident | Child Resident | AU Student | Indoor Office Worker | Outdoor Worker (Landscaper) | Construction/ Utility Worker |
|---|---|---|---|---|---|---|---|---|
| Surface Water | Recreation [a] | Incidental Ingestion | | | | | | |
| | | Dermal Absorption | • | • | • | | | |
| Groundwater | Watering Gardens/Lawns | Incidental Ingestion | • | • | | | • | |
| | | Dermal Absorption | • | • | | | • | |
| | Garden Vegetables Consumption | Ingestion | ○ | ○ | ○ | | | |
| | Excavation, Utilities | Incidental Ingestion | | | | | | ○ [b] |
| | | Dermal Absorption | | | | | | ○ [b] |
| | Indoor Activities | Inhalation of Intruding Vapors | • | • | • | • | | |

(a) Assuming a wading scenario (not full immersion) for recreational activities.

(b) The depth to groundwater generally is much deeper than anticipated excavation depths (10 feet or less) for buildings or utility line work.

| | |
|---|---|
| • | Pathway complete and quantified in the risk assessment. |
| Δ | Pathway assumed to be complete for informational purposes only and, therefore, quantified in the risk assessment. |
| ○ | Pathway to be qualitatively evaluated. |
| | Pathway incomplete |

# CONCEPTUAL SITE MODEL RESULTS

**FUTURE LAND USE SCENARIO**

| EXPOSURE MEDIA | RECEPTOR ACTIVITY | EXPOSURE ROUTE | FUTURE RECEPTOR: Adult Resident | Child Resident | AU Student | Indoor Office Worker | Outdoor Worker (Landscaper) | Construction/ Utility Worker |
|---|---|---|---|---|---|---|---|---|
| Surface Water | Recreation [(a)] | Incidental Ingestion | Same as current land use scenario | | | | | |
| | | Dermal Absorption | | | | | | |
| Groundwater | Watering Gardens/Lawns | Incidental Ingestion | Same as current land use scenario | | | | | |
| | | Dermal Absorption | | | | | | |
| | Garden Vegetables Consumption | Ingestion | Same as current land use scenario | | | | | |
| | Excavation, Utilities | Incidental Ingestion | Same as current land use scenario | | | | | |
| | | Dermal Absorption | | | | | | |
| | Indoor Activities | Inhalation of Intruding Vapors | Same as current land use scenario | | | | | |
| | Potable Water Usage | Ingestion | Δ | Δ | Δ | Δ | | |
| | | Dermal Absorption | Δ | Δ | Δ | Δ | | |
| | | Inhalation (Shower/bathing) | Δ | Δ | Δ | | | |

(a) Assuming a wading scenario (not full immersion) for recreational activities.

| | |
|---|---|
| ● | Pathway complete and quantified in the risk assessment. |
| Δ | Pathway assumed to be complete for informational purposes only and, therefore, quantified in the risk assessment. |
| ○ | Pathway to be qualitatively evaluated. |
| | Pathway incomplete |

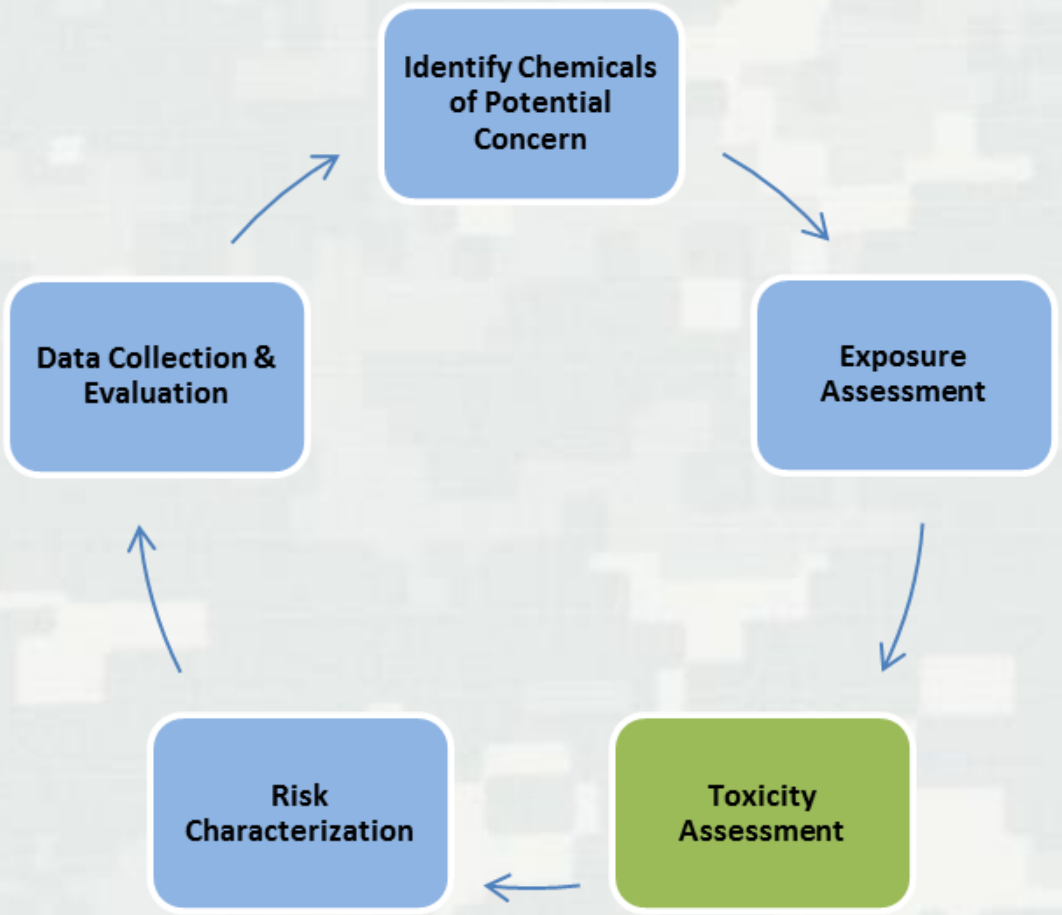
# EXPOSURE UNITS

- Group the data so that ‘hot spots’ do not get diluted away during the process of calculating exposure point concentrations.
- Groundwater:
  - Exposure Unit No. 1 (vicinity of Sibley Memorial Hospital)
  - Exposure Unit No. 2 (vicinity of AU and Glenbrook Road disposal areas)
  - Exposure Unit No. 3 (everywhere else)

# EXPOSURE UNITS
# (continued)

- Surface Water:
  - Exposure Unit No. 1 (East Creek along Glenbrook Road)
  - Exposure Unit No. 2 (everywhere else, excluding SW-24 and SW-25)

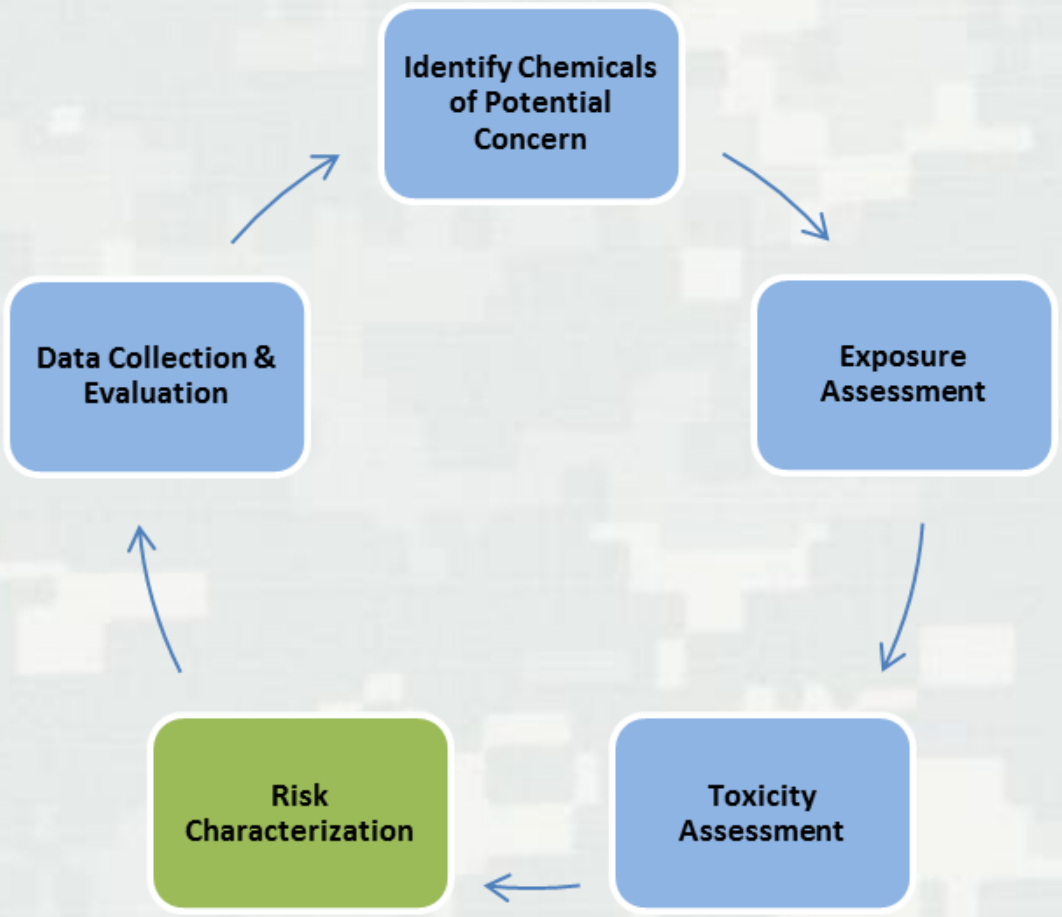
# TOXICITY ASSESSMENT



# CHEMICALS TOXICITY

- Toxicity data determines what chemical concentrations are acceptable or would adversely affect human health
- Toxicity is measured in
  - Non-cancer health effects
  - Cancer health effects

# RISK CHARACTERIZATION



# RISK CHARACTERIZATION

- Risk Characterization is the “extra risk” of health problems due to exposure to the site
- Average background risk in the U.S.

  1 in 2 for men, 1 in 3 for women (developing cancer)

  1 in 4 for men, 1 in 5 for women (dying from cancer)

# USEPA RISK CHARACTERIZATION THRESHOLDS

- CANCER RISK (CR) = Probability of an individual developing cancer over a lifetime of exposure (or, number of individuals who may develop cancer out of a population of 1 million)
- Acceptable CR Range: $1\times10^{-4}$ (1 in 10,000) to $1\times10^{-6}$ (1 in one million).
  - Cumulative CR threshold of $1\times10^{-4}$
- NON-CANCER HAZARD INDEX (HI) = Sum of chemical non-cancer hazard estimates for all exposure pathways evaluated for each receptor.
  - Non-Cancer HI threshold of 1

# HHRA CANCER RISK RESULTS

## Current Scenarios

- Resident, AU Student, and Outdoor Worker at EU1, EU2, and EU3
- CR results below $1x10^{-6}$
- NO UNACCEPTABLE RISK

## Future Scenarios

- Resident at EU2
- CR result is $1x10^{-4}$
- UNACCEPTABLE RISK (using groundwater for drinking water)

- AU Student and Indoor Office Worker at EU1, EU2, and EU3
- Resident at EU1 and EU3
- CR results within Risk Range ($10^{-4}$ to $10^{-6}$)
- NO UNACCEPTABLE RISK

# HHRA NON-CANCER RESULTS

## Current Scenarios

- Resident, AU Student, and Outdoor Worker at EU1, EU2, and EU3
- Non-Cancer HIs below 1
- NO UNACCEPTABLE RISK

## Future Scenarios

- Resident and AU Student at EU1, EU2, and EU3 and Indoor Worker at EU3
- Non-Cancer HIs greater than 1
- UNACCEPTABLE RISK POSSIBLE (using groundwater for drinking water)

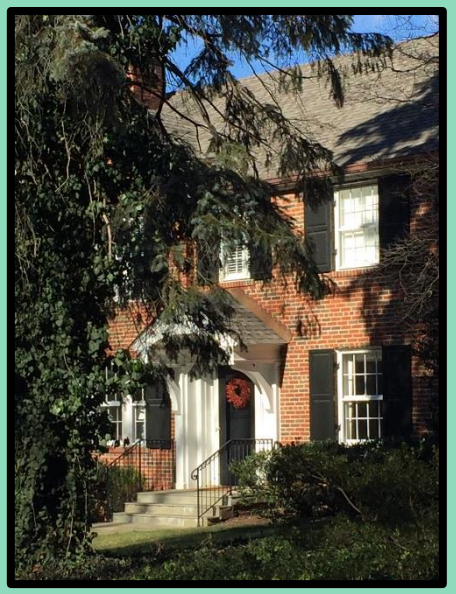
# CONCLUSIONS / RECOMMENDATION

- Site characterization is complete.
- No unacceptable risk for current land use.
- Unacceptable risk if groundwater is used as potable water in the future in EU2.
- A Feasibility Study is recommended to address the risk for potential groundwater potable use in EU2 (vicinity of American University and Glenbrook Road) .

# GROUNDWATER SCHEDULE

- Address Partner comments and Finalize Remedial Investigation Report - **Spring 2016**
- Draft Feasibility Study - **Summer 2016**
- Final Feasibility Study - **Winter 2017**
- Proposed Plan, public comment period, public meeting - **Summer 2017**
- Final Decision Document - **Winter 2018**

# Spring Valley FUDS
## Restoration Advisory Board



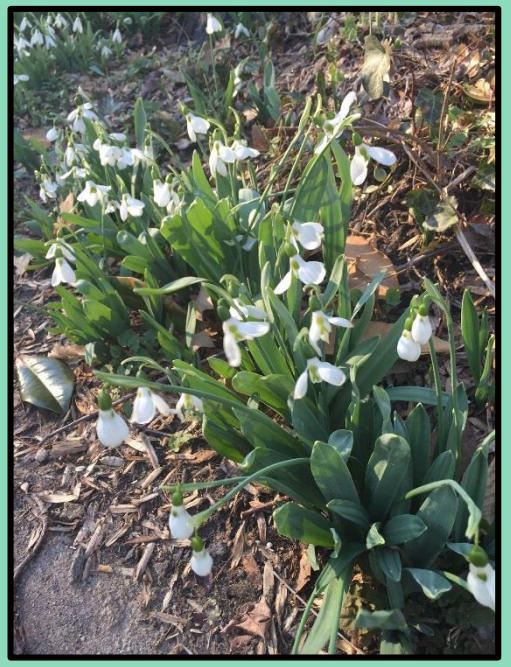
## *Community Items*

# Spring Valley FUDS
## Restoration Advisory Board

- **Reminders:**
  - **The next RAB meeting will be Tuesday, May 10th**

- **Upcoming Agenda Items**
  - 4825 Glenbrook Road Health Consultation Update (ATSDR) - May
  - Site-Wide Proposed Plan
  - **Suggestions?**
    - **Real Estate Attorney**
    - **Invite new Director of DOEE to address the RAB**

# Spring Valley FUDS
## Restoration Advisory Board



- Public Comments

- Wrap-Up

**U.S. Army Corps of Engineers**
**Spring Valley Restoration Advisory Board**
**St. David's Episcopal Church**
**Minutes of the March 2016 Meeting**

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

| | |
|---|---|
| Cliff Opdyke | USACE, Risk Assessor |
| Bill Eaton | AECOM |
| Gretchen Welshofer | AECOM |
| Carrie Johnston | Spring Valley Community Outreach Program |
| Holly Hostetler | ERT, Inc. |
| Rebecca Yahiel | Spring Valley Community Outreach Program |
| **HANDOUTS FROM THE MEETING** | |
| I. Final Agenda for the March 8, 2015 RAB Meeting<br>II. Army Corps of Engineers Presentation<br>III. February 2015 Monthly Project Summary<br>IV. Refusal of Right-of-Entry at a Non-Federal Property for a Site-Inspection (SI), Military Munitions Center of Expertise (MM CX) interim Guidance Document (IGD) 07-01 | |

# AGENDA

**Starting Time:** The March 2016 Restoration Advisory Board (RAB) meeting began at 7:05 PM.

## I. Administrative Items

### A. Co-Chair Updates

Greg Beumel, Community Co-Chair, welcomed everyone and opened the meeting. He turned the meeting over to Dan Noble, Spring Valley Project Manager and Military Co-Chair.

D. Noble welcomed everyone to the RAB meeting. He reviewed the agenda, which included Point of Interest (POI) 2 on the 3700 Block of Fordham Road; the Site-Wide Feasibility Study (FS); the Pilot Project; 4825 Glenbrook Road; and the Introduction to the Groundwater Remedial Investigation (RI) Document.

### B. Introductions

D. Noble introduced Todd Beckwith, Project Manager for US Army Corps of Engineers (USACE); Bill Eaton, AECOM; Cliff Opdyke, Risk Assessor for USACE; and Gretchen Welshofer, AECOM.

### C. General Announcements

D. Noble reviewed website updates which included the January and February monthly project updates, the weekly 4825 Glenbrook Road updates and photos, the January RAB meeting minutes, and the Finalized Feasibility Study. The Agency for Toxic Substances and Disease Registry (ATSDR) plan to release their Health Consultation on 4825 Glenbrook Road in the next few weeks, and plan to address the RAB at the May meeting. Prior to the May meeting, ATSDR will begin a public comment period. It is possible that the public comment period will end before the May RAB meeting; USACE will alert the RAB when the ATSDR public comment period begins.

Question from Allen Hengst, Audience Member – The most recent Partners meeting minutes on the website are from August. Was there a Spring Valley Partners meeting in November, and when do you expect the minutes to be posted?

D. Noble responded that yes, there was a meeting, and he would look into when the minutes will be posted.

Question from Dr. Peter deFur, Environmental Stewardship Concepts/RAB TAPP Consultant – Has ATSDR indicated whether they will hold an additional public meeting, since the public comment period may end before the May RAB meeting?

D. Noble understood that ATSDR will not hold an additional meeting. Chris Gardner, USACE, Corporate Communications Office, added that the ATSDR mentioned the possibility of extending the public comment period to include the May 10th RAB meeting.

Question from P. deFur, Environmental Stewardship Concepts/RAB TAPP Consultant – Do you believe the ATSDR would extend the public comment period to include the RAB meeting if the RAB made that request?

Chris Gardner, USACE Corporate Communications Office, confirmed it would be a good idea to let the ATSDR know the RAB expressed an interest in extending the public comment period for that reason. D. Noble indicated the USACE would alert the ATSDR to the RAB's request.

**D. Task Group Updates**

**1. Right of Entry**

In response to a number of Right-of Entry questions from the previous RAB meeting, D. Noble made available the 2007 policy memo 'Refusal of Right-of-Entry at a Non-Federal Property for a Site-Inspection (SI), Military Munitions Center of Expertise (MM CX) interim Guidance Document (IGD) 07-01,' which explains the USACE's policy for Refusal of Right-of-Entry.

**2. Questions about Real Estate Disclosure addressed by William Krebs, Community Member**

W. Krebs was asked to give a brief explanation of the subject of disclosures and obligations to disclose the existence of the Formerly Used Defense Site (FUDS) and contamination within the FUDS.

If a person bought a piece of property in the past, Common Law observed *caveat emptor,* or 'buyer beware.' The seller had no obligation to disclose anything about the property. As society became more complicated, the Seller Disclosure Requirement Act (SDRA) in the District of Columbia (D.C.) was instituted. The SDRA sets forth the District of Columbia's particular terms of what needs to be disclosed by the seller of residential real property. The Code Section 42-1305 sets forth the factors of inclusion in a disclosure. Early on, the Code listed about 6 different factors, including history and known hazards. Later, the Code went on to include anything the Real Estate Commission of DC deemed a factor for disclosure. In the most recent revised disclosure statute form from 2007, there is nothing in the statute, disclosure regulations, or disclosure form that mention Spring Valley, FUDS, contamination, or munitions. However, there is a provision that requires a disclosure of environmental impact with respect to the property. Two scenarios may happen:

1. If the property had been surveyed and high levels of arsenic were found, that would be

considered an environmental issue and would need to be included in the seller's disclosure statement, in W. Krebs opinion.

2. If a property is within the FUDS but does not have any history of contamination, then the seller would not be required to disclose under the Code or regulations.

In addition, there are requirements placed upon real estate brokers. The only disclosure responsibility is placed on the buyer's agent. The buyer's agent has an obligation to inform the buyer of any material fact concerning the property. A material fact is defined in the regulations as a fact that would cause a reasonable person to halt or reexamine a decision to buy or sell a property, or continue with a transaction. If there is a material fact, and the buyer's agent fails to inform the buyer, that buyer's agent could be held liable.

Question from W. Krebs, Community Member - Mary Bresnahan, are you aware of anyone that backed out of a transaction in Spring Valley because of the FUDS, contamination, high arsenic levels, or having been remediated?

M. Bresnahan, Community Member, replied that she had no personal experience with someone backing out, but she had heard of someone backing out because of the most recent study conducted at the FUDS. She added that each brokerage firm in the Spring Valley area has their own disclosure policies, specifically dealing with remediation.

W. Krebs continued, saying that the statement that Mary is talking about is a statement that is imposed by the private association of brokers. It is not a matter of requirement of D.C. law.

Question from Lee Monsein, Community Member – Let us say there was a precedent, you could survey people and say reasonable people would decide not to buy a property. What would a person be subject to; criminal prosecution, personal or civil penalties, cancellation of the contract, what would be the ramifications?

W. Krebs answered that if the property had been remediated because it had an environmental issue, and it was not disclosed by the seller, then the buyer, showing a material fact, could probably rescind the transaction. They could probably sue for damages, although he did not know what the damages would be, since there would not be loss of value at that time.

Question from L. Monsein, Community Member –So if there was a property with high levels of compound x, and someone sold it without disclosing, and if the buyer could prove that a reasonable person would not buy that property, then the buyer could cancel a contract, but there would be no civil or criminal penalties?

W. Krebs explained that would require there to be a property that had been tested, determined to be contaminated, not remediated, and sold without anyone telling the buyer about the existence of that test.

M. Bresnahan commented that if a latent defect can be proved, the buyer could sue.

Question from L. Monsein, Community Member – What is a latent defect?

W. Krebs explained that there are patent defects and latent defects. A patent defect is obvious to the eye; a latent defect is one that is not obvious. A latent defect is something hidden, lying in wait; of which the seller is aware. The seller and buyer's agent have to disclose if they know about a material fact. If the fact does not constitute an environmental issue on the property, and the seller answers the questions as they are framed in the questionnaire accurately and honestly, then

the seller is protected under the Statute of Disclosure; which is the exception to the *caveat emptor* rule. That does not mean the seller could not be sued for common law fraud or something else.

Question from John Wheeler, Community Member - So if the property has not been tested, there is no known environmental hazard to report. Assuming the seller knows nothing other than it has not been tested.

W. Krebs confirmed this.

M. Bresnahan noted that, as a realtor in the Spring Valley area, she would not represent a property that has not been tested.

Question from P. de Fur, Environmental Stewardship Concepts/RAB TAPP Consultant - Is this all according to D.C. law?

W. Krebs confirmed this.

Question from Giuseppine Fancellu, Audience Member – If a real estate agent sells a house that has been tested, and found to be not contaminated, can the agent be sued for professional negligence because they did not disclose that information?

W. Krebs answered that in the hypothetical situation where a property has been tested, and there was no contamination, there is nothing to disclose.

Question from G. Fancellu, Audience Member – Does that seller have to disclose the Spring Valley FUDS situation?

W. Krebs responded that it appears to him there is a distinction between whether the seller's property is merely in the Spring Valley FUDS, and whether there is actual contamination. Under the way that these regulations are written, there is no obligation to disclose being in the Site if there is no reason to believe the property itself has any contamination.

Question from J. Wheeler, Community Member - Let me see if I am right about this. D.C. provides people with a radon testing kit. If everything is fine, the seller forgets about it, there is no reason to disclose that test. If things were not fine, and the seller did not do anything about it, I think from this D.C. law that you mentioned, the seller is required to disclose.

W. Krebs confirmed this, adding that radon is possibly specifically addressed.

M. Bresnahan added that every buyer has the option to have a contingency for a radon test. Radon is very common in this area, and often the levels depend on rainfall.

Question from J. Wheeler, Community Member - Do buyers often waive the option for a radon test?

M. Bresnahan confirmed this. She added she always recommends a radon test for peace of mind.

Question from George Vassiliou, Community Member - Does the disclosure have to do with chemicals and munitions in particular? I have an example: A man was running a meth lab in the basement of a property in Kansas. Before the house was sold, it was cleaned nominally. As a result, the walls and carpet caused illness to the buyer. The court in Kansas stated that the seller had no requirement to disclose. How does that compare?

L. Monsein commented that the reason this came up was the question of what is the obligation to tell a prospective buyer moving into D.C. about arsenic. Bill has clarified that if the property is still contaminated, there is some obligation to tell the buyer. There is no criminal penalty and no

civil penalty, but the buyer can get out of the signed contract. If the property has been remediated and there is no known risk, then there is no obligation. The homeowner is under no obligation to disclose the rest of the Spring Valley FUDS.

Comment from W. Krebs, Community Member - The seller must disclose if they have actual knowledge of any substances, materials, or environmental hazards including but not limited to: asbestos, radon gas, lead-based paint, underground storage tanks, formaldehyde, contaminated soil, or other contamination on or affecting the property.

Question from L. Monsein, Community Member - Under the D.C. law, someone who refused entry and never permitted testing wouldn't disclose anything, because they have no knowledge of contamination?

W. Krebs confirmed this. With the one caveat being that if the seller shows willful ignorance. If someone had reason to suspect contamination, and deliberately turned a blind eye from finding out, that person might still be liable.

M. Bresnahan commented that willful ignorance is another reason why the brokerage companies have their own addendum disclosure that all buyers and sellers sign, so there is no liability for the agents or brokers.

W. Krebs added that the 'no knowledge' question is ambiguous in terms of whether it is a continuing condition or a condition with prior knowledge on the property. The wiser thing would be to disclose and say that it has been remediated.

The RAB thanked W. Krebs for his time and expertise.

## II. USACE Program Updates

D. Noble provided an update on the Arsenic Removal and Anomaly Investigation Efforts at Point of Interest (POI) 2, Fordham Road, the Feasibility Study, and 4825 Glenbrook Road.

Alex Zahl, Spring Valley Technical Manager, provided an update on the Pilot Project.

Todd Beckwith, Spring Valley Project Manager, provided an update and overview of the Groundwater Remedial Investigation Report.

### A. Point of Interest (POI) 2, 3700 Block Fordham Road

POI 2 was a feature that USACE was not able to investigate during the Remedial Investigation. In January 1993, the first discovery of munitions in Spring Valley was made on 52 Court, N.W., when a backhoe operator excavated part of the disposal pit, exposing munitions items. At that location, there were circular trenches that were used for munitions testing during the World War I era. This discovery opened up a series of questions concerning the history and present condition of the FUDS. When USACE began investigating and reestablishing the history of the American University Experiment Station (AUES), USACE noticed a very similar set of trenches existing on Sedgwick. The Sedgwick Trenches became POI 1 in the site conceptual model of what needed to be further investigated in Spring Valley. POI 2, 3, and 4 were areas immediately adjacent to Sedgwick Trench, where aerial photography suggested the existence of disposal features. During the remedial investigation, USACE was able to investigate POI 3 and 4, but not POI 2. After 2012, USACE reestablished communication with the property owner at 3700 Block of Fordham Road, whose property POI 2 is located. USACE was able to gain access to the property to intrusively

investigated POI 2 within the last few weeks.

In 2003, two geophysical surveys were conducted at this property; an Electromagnetic (EM) survey and a Magnetic (MAG) survey. The EM survey showed two clusters of single point anomalies in the front yard. A 'possible pit' feature was seen on the MAG survey, but not on the EM survey. Although there may be some error in the aerial photograph from 1918, the location of the 'possible pit' feature shown in the MAG survey very closely matches the location of a 'possible pit' ground scar on the 1918 map, causing this area to be of more interest to the Army Corps.

The MAG survey looks for magnetic dipoles, positive and negative. What are actually being seen in picture 2 are dipoles between blue area and orange area. So the item in the ground that causes the magnetic anomaly lays between the two colored boundaries. What is shown in the picture as a large anomalous area is actually two separate anomalous areas side by side.

There are two basic explanations why an anomaly would be seen with a MAG, but not an EM:

1. The MAG survey is scanning for items that are magnetic. Munitions are made out of ferrous metal, which is magnetic. There are other item in the ground that are not metal, but are magnetic. Certain bricks, certain types of soils and rocks, and other non-metal items can be magnetic and appear as an anomaly on the MAG survey. On the other hand, an EM survey scans for items that can conduct electricity. If the EM survey can induce a current in the item, the item can conduct electricity. So an anomaly may show up in a MAG survey, but not an EM survey, because while the anomaly is magnetic, it may not be made of a material that conducts electricity. Items such as bricks and certain types of gravel and rocks will not conduct electricity but are magnetic.

2. The other explanation is that the MAG survey can be more sensitive, and can scan deeper into the ground. Anomalies do not show up on an EM survey if they are buried very deep. So there might be a disposal pit full of World War I bombs made out of metal, which could be an explanation as to why the anomalies show up in the MAG Survey but not in the EM survey.

**Initial Investigation in February**

A team of Army Corps bomb technicians assessed whether the anomalies could be hand-excavated. The team performed initial scanning for anomalies using Schoenstadtand and a Vallon All Metals Detector. The technicians excavated 5 anomalies and determined that all anomalies could be hand-excavated. During this initial excavation, a 75mm munitions debris (MD) item was found.

The team also performed an initial scan of POI 2. The technicians could locate the larger anomaly with the hand held instruments, despite the inability to locate it with the EM instrument. This discovery led USACE to believe the anomaly was not metal.

**Intrusive Investigation of POI 2 in March**

USACE went back to the property in March. The large anomaly was intrusively investigated in two locations, which were hand excavated down to four feet. Once these holes were excavated to four feet, the geophysical instruments were inserted into the holes. The instruments did not detect a signal at the bottom of either hole. When the instruments were brought up the side of the hole near the surface, the signal returned.

The conclusion is that something about the soil structure in this area causes a magnetic signature. The signal happens near surface, in the first foot or two. However, there were no more magnetic

signals at the bottom of the holes. USACE believes that this large anomalous area, which was designated as POI 2, is due to what is referred to as 'hot soil' or 'hot rocks,' not buried metal.

Question from G. Vassiliou, Community Member - Is there a way to analyze the soil and find out was causes the magnetic signature?

D. Noble replied that there may be a high iron content in the soil, such that there would be a magnetic signature but not conduct electricity. There is no absolute answer to that question.

**Investigation of Single Point Anomalies**

In addition to the large anomalous area, 66 single point anomalies were excavated, including the two large clusters of anomalies in the front yard. USACE was able to resolve about 62-63 of those anomalies. No additional American University Experiment Station (AUES) related items were found. The single piece of MD found during the initial visit was the only AUES-related item found during the anomaly investigation at this property.

**Arsenic Contaminated Soil Removal**

Three arsenic contaminated grids were also removed from this property. The team marked out the grids with flags and excavated the soil to a foot deep. In two of the grids, the team encountered significant tree roots. The team used hand tools to removal the soil around these roots to avoid root damage. Once the contaminated soil was removed, the three areas were restored with clean soil.

In conclusion, all arsenic contamination at this property has been completed. Additionally, USACE is confident that there is no munition disposal area at this property. With these conclusions, USACE will write an addendum to the Final Site-Wide RI to describe these findings with respect to POI 2.

Question from A. Hengst, Audience Member - What made the homeowner decide to allow the right-of-entry?

D. Noble replied that it was a process. USACE was in communication with the homeowner since 2012. The homeowner was cooperative and had questions. USACE sometimes took a while to answer those questions. Both sides had a desire to get it done.

Question from M. Bresnahan, Community Member – How deep was the one item that was found?

D. Noble replied that the munition debris item was about a foot deep under the ground surface. The item was headspaced negative for chemical contamination (*Editor's note: headspace refers to the vapor/air mixture trapped above a solid or liquid in a sealed vessel*), and has joined the other munitions scrap at Federal Property.

**B. Site-Wide Feasibility Study (FS)**

The FS was finalized in late January and posted on the project website. USACE began preparing the Draft Proposed Plan (PP). The PP is being reviewed internally by the Army's Center of Expertise (CX). Once the CX's review is complete, the PP will be sent to EPA, DOEE, and the RAB's independent technical consultant, P. deFur.

The PP also must go through a formal public comment period. Once the regulators have completed their review of the PP and their comments addressed the Draft Final PP will be made available for a 30-day public review period.

The public comment period for the PP is tentatively scheduled to begin about the time of the next RAB meeting in May. In this case, USACE will brief the RAB on the PP at the May meeting. After the public comment period, USACE will incorporate the public comments into the document and finalize the PP. During the public comment period, USACE will begin to prepare the Decision Document (DD).

In the fall or winter of 2016, the USACE team will begin the contract acquisition phase. USACE will hire contractors to carry out the decisions set forth in the DD. The Remedial Design is tentatively scheduled to be complete before the end calendar year 2017. Once the Remedial Design is completed, the Remedial Action may begin.

### C. Pilot Project Update

When searching for past military related metallic items, USACE uses electro-magnetometers (EM) and magnetometers (MAG) to locate them at formerly used defense sites (FUDS). Hundreds of FUDS are scanned per year for munition items. These sites often have target ranges with thousands of objects. Due to this need and practice of searching for old munitions, the process to find them has improved over the last 10-15 years.

A device called a Metal Mapper, which is a larger EM survey equipment, has been used at FUDS that are not residential areas and are more open. The Metal Mapper uses the same EM principles, but runs the data it's collected through an extensive Department of Defense (DoD) library. This allows the Metal Mapper to recognize every kind of ordnance object the DoD has ever used, despite its orientation underground. If the Metal Mapper identifies an anomaly as an ordnance-related object, then that item will be safely removed. The efforts to intrusively investigate other innocuous anomalies, such as nails or pieces of rebar, can be eliminated.

The Metal Mapper has been used at other sites with open land for the last 10-15 years. The device is fairly large and needs a tractor to move it around a property, which is not practical for a landscaped Spring Valley property. However, in the last 5 years, the Navy, who are considered DoD experts in finding ordnance items, has developed a smaller version of the Metal Mapper. This instrument is called the Time-Domain Electromagnetic Multi-sensor Towed Array Detection System (TEMTADS). At roughly 2 feet by 2 feet, the TEMTADS is pushed on a cart, making it more maneuverable and able to fit in smaller areas. For this reason, USACE believes this new technology may have use in Spring Valley.

The Man Portable Vector (MPV) is another handheld unit, about 15 inches in diameter. The MPV is still in its developmental phase and only one exists at this time.

The Navy has a prototype of the MPV and a TEMTADS. USACE has partnered with the Navy to conduct a Pilot Project in Spring Valley.

For the Pilot Project, five Spring Valley properties will be selected out of the approximately 100 properties that were recommended by the Remedial Investigation report to undergo an EM survey. The five properties will be chosen based on the geophysical challenges each one presents.

Geophysical challenges include the houses themselves, which cause electromagnetic interference, referred to as 'background noise' that can cause false signals. Background noise is created by electrical systems, such as electrical lines in the ground, lighting in the backyard, or overhead wires. One goal of the Pilot Project is to determine whether or not these two new technologies would be applicable for use in Spring Valley.

It is anticipated that one hundred percent of the anomalies located with the new technology at those 5 properties will be excavated during the Pilot Project. This will provide a method to prove that this instrumentation is successful in identifying anomalies in Spring Valley, despite the background noise interferences.

The main objective of testing and using these new technologies in Spring Valley is to minimize property disruption, at the same time being efficient in identifying and excavating potentially hazardous anomalies.

USACE is in the process of putting a contract acquisition in place. The Navy Research Lab (NRL) will be doing the actual geophysical testing, but they will need support. In support of the NRL, a contractor will use the existing geophysical surveys of the selected properties from 8-10 years ago, bring in a global positioning system to create coordinates necessary to accurately show the locations of the anomalies, operate the TEMTADS and the MPV, assess what anomalies are identified by the two technologies, perform the anomaly removal, and finally restore the property.

USACE has tentatively scheduled the field effort for late spring/early summer. The data will be evaluated, and the team will determine in what capacity the technologies are applicable in Spring Valley. The final Pilot Test Report is scheduled to be completed by the end of the year.

Question from Rob Liberatore, Audience Member - Can you explain why it would take 3 years to do all 100 properties?

A. Zahl explained that each property is done one at a time. A landscape survey is performed and any landscape causing interference has to be removed. The geophysical survey is then performed to create a list of anomalies to be investigated, which is approved by the regulatory partners. The anomalies are removed and the property is restored. When dealing with private homes, each individual homeowner has a different amount of impact tolerance, to which USACE strives to be sensitive. USACE also wants to make sure to be thorough and do a proper restoration. The process may not take the full 3 years, but it is not an unreasonable estimate at this point.

D. Noble added that by using these techniques and methods during the Remedial Investigation (RI), USACE was able to get through about 30-35 properties a year. This is the number on which USACE has based the time estimate for the Remedial Action. The project could go quicker when the process is refined and established. USACE will dialogue with the contractor and emphasize that the schedule is a big priority and want to finish as quickly as possible.

Question from R. Liberatore, Audience Member - How is the order of the homes to be remediated determined?

D. Noble explained that a priority order for when the project moves to the larger group of 100 homes has not been developed yet.

Question from R. Liberatore, Community Member - I hope there is a process for when a homeowner has a compelling reason for having their property remediated sooner?

D. Noble confirmed this. USACE will try to build in as much flexibility as possible. Certainly for those folks eager to have it done, USACE will try to get to those properties as soon as possible.

Question from M. Bresnahan, Community Member – Will you begin remediating properties before finished evaluating all 100?

D. Noble confirmed this. Not everyone will have to wait until 2020. Some properties will be

finished in 2017.

Question from P. DeFur, Environmental Stewardship Concepts/RAB TAPP Consultant - Is the Work Plan being released soon? Is there a prove-out being released?

Steve Hirsh, EPA, Region III, explained that four different reports need to occur, including a Quality Assurance (QA) Plan, an Advance Classification template, a Work Plan, and a prove-out report.

A. Zahl added that there will also be a seed property, where the team will bury a non-hazardous munition item to test during the Pilot Project. A variety of geophysical processes will be performed to prove that the equipment is functional, including calibrations every day.

S. Hirsh commented that the QA process is very thorough because some metal will be left in the ground.

A. Zahl reiterated that for the Pilot Project no metal will be left in the ground. The prove-out will cover that so when metal is left in the ground during the Remedial Action phase, USACE's intent will be that item is innocuous.

**D. 4825 Glenbrook Road**

High probability operations have resumed under the third tent location. All tent move tasks between the second and third tent locations were completed. The correct combination of temperature and humidity needed in order to run a smoke test was achieved to show that the structure under negative pressure. The smoke test was completed on February 19th.

The site was also effected by the significant snow storm in January, resulting in the necessary removal of 30 inches of snow. Snow that slid off of the roof of the large tent demolished a smaller support tent. This smaller tent was replaced. The crews also completed thorough procedural refresher trainings.

With the third tent location, the Shelter-in-Place (SIP) zone shifted. The SIP zone moves a little to the west, off AU campus and into the neighborhood. This minor shift does not change who is within the SIP zone.

During high probability operations in the tent, all activity is captured through video monitors to help ensure site safety. In addition, an ambulance is always parked in the driveway while the crew members are working in the tent.

The third tent is located closer to Glenbrook Road than the second tent. It is centered over the house's footprint and the last part of the basement slab. This slab will be removed, along with the underlying dirt, down to the competent saprolite. In addition, there was one remaining section of the basement foundation wall with some soil behind. The crew began their tent 3 work by pulling down that wall and removing the soil from behind the wall. Once this task was complete, the crews began removing the basement slab.

For the last 18 months, USACE has remained on schedule. Currently, the schedule says that high probability operations under tent 3 will be completed in the winter of 2016-2017. However, once the basement slab has been lifted and USACE can determine how much soil needs to be removed, the schedule may be adjusted. USACE hopes to potentially shorten the schedule based on findings in the next four to six weeks.

## E. Groundwater Remedial Investigation (RI) Findings

USACE is in the process of responding to comments from EPA Region III, DOEE, and P. deFur on the Draft Groundwater RI report. If significant changes are made to the report, USACE will review those changes with the RAB.

B. Eaton reviewed the Groundwater RI efforts. He summarized the findings of where groundwater samples were taken, what was detected, and how those chemical detections were evaluated.

### Conceptual Site Model

The groundwater Conceptual Site Model (CSM) illustrates the essential elements of the groundwater flow, and is fairly representative of the Spring Valley area. When a well is drilled, it will fill with groundwater at a certain depth. The source of this groundwater is called the water table, which flows towards a body of water. In Spring Valley, the water table flows towards the Potomac River. The water table encounters different materials in the subsurface, depending on its location in Spring Valley. These materials include soil, weathered bedrock mantle or saprolite, and crystalline rock. Crystalline rock in Spring Valley includes metamorphic rocks and intrusive igneous rocks that were injected into those metamorphic rocks.

### Groundwater Monitoring Network

The groundwater monitoring network for Spring Valley consists of the following:

- A pre-existing Sump at Sibley Memorial Hospital, located at the bottom of an elevator shaft. Since it is so deep, the Sump encounters groundwater. Many years ago, the water in the Sibley Sump was sampled and perchlorate was detected. This was one of the first observations of chemical contamination of groundwater in Spring Valley.
- A hydroelectric vault located downhill from the Dalecarlia Water Treatment Plant. Years ago this hydroelectric plant used water from the Dalecarlia Reservoir to drive turbines that generated electricity. Perchlorate was detected in this vault at lower concentrations.
- Thirty-three shallow screened monitoring wells. When building these wells, a vertical hole is bored into the ground and a pipe is inserted into the hole. A screen is then attached to the well, which allows water to come into the well, which keeping the soil out.
- Four monitoring wells that contain two pipes at different depth intervals in each hole. This approach was to determine if chemical concentrations vary vertically at the same location.
- Thirteen deep bedrock wells. These well borings will stay open by themselves, without the need for screens.
- Four multiport monitoring wells, drilled deep into the bedrock. These wells have ports at 8 vertical sampling intervals in the same bore hole.

Several wells were initially installed east of the Dalecarlia Reservoir to establish that the groundwater was not contaminated near the reservoir. There are a number of wells proximate to the Sibley Sump and a number of monitoring wells in the Glenbrook Road/Rockwood Parkway area. There are also three background monitoring wells, north of the FUDS boundary. These background monitoring wells give the team an idea of local groundwater quality that has not been impacted by FUDS related activities. Having those baseline wells are important and useful because many metals are naturally occurring in groundwater: including arsenic, cobalt, manganese, iron, aluminum. In fact, on the eastern shore of Maryland, arsenic concentrations in

groundwater are much larger compared to Spring Valley and they are all naturally occurring. In Spring Valley, there are no high naturally occurring arsenic concentrations.

Based on the groundwater monitoring network, the water table could be measured to produce a topographic-like map of the surface of the water table. The water table and surface water both flow downhill. In Spring Valley, the groundwater generally flows west, towards the Potomac River.

Springs appear when the ground elevation changes quickly. In the location called A-A prime, the water table is very close to ground surface. Springs are not uncommon in Spring Valley, as they are how Spring Valley got its name.

The vertical lines shown in the Section B-B prime illustration represent the vertical monitoring wells. The one shown in the illustration is MP-2, which has multiple monitoring points at different depth intervals within a single borehole. This allows physical and chemical data to be collected from the water table at this location. This data can help determine how deep the contamination extends into the bedrock.

**Analysis/Results**

At the beginning of the groundwater analysis program, which began in 2005, the program focused on the analysis of 250 different chemicals. The sampling data was distributed to the Partners and evaluated. If a chemical was not detected, then our analysts were inclined to eliminate that chemical from future analysis.

To date, the following has been detected in the groundwater, out of 250 chemicals:

- 9 volatile organic chemicals
- 6 semi-volatile organic chemicals
- 1 explosive compound
- 23 metals, including arsenic
- 7 other chemicals, including perchlorate

To date, the following has been detected in the surface water, out of 250 chemicals:

- 1 volatile organic chemical
- 4 semi-volatile organic chemicals
- No explosives
- 18 metals, including arsenic
- 5 other chemicals including perchlorate

Perchlorate was detected along East Creek adjacent to Glenbrook Road, which was anticipated since there was suspected groundwater discharge near some of the disposal areas. Additional surface water stations further west along East Creek confirmed the perchlorate concentrations attenuated very rapidly to background levels.

Once the sampling results are analyzed, the team determines if that concentration is significant. One way is to compare the detected concentrations to EPA's acceptable drinking water concentrations, called Regional Screening Levels (RSLs). For example, if the RSL for a chemical is 5 parts per billion (ppb), then the water is safe to drink, or does not pose unacceptable health risks, if that chemical is present in drinking water at 5ppm or less.

Question from L. Monsein, Community Member – Why compare the samples in the water table to drinking water standards, since we don't drink well water in this area?

B. Eaton explained that, typically, groundwater is a valuable resource. Out of abundant caution, USACE treats it as such, despite the groundwater not currently used as a drinking water source in Spring Valley.

Question from L. Monsein, Community Member – That seems counter to everything we have heard over the years; that we are in a community where we don't drink well water; all water is processed in an above ground water treatment plant.

T. Beckwith explained that USACE has always pointed out that currently there is no risk, since no one drinks well water. USACE follows EPA's guiding regulation, the National Contingency Plan, which identifies the restoration of groundwater to beneficial use as a programmatic expectation. USACE understands that no one is currently using the Spring Valley groundwater. However, the risk assessment evaluated the scenario if someone were to use that groundwater in future.

Comment from A. Hengst, Audience Member - If there was a nuclear accident and meltdown and there was fallout landing on the surface of Dalecarlia Reservoir and the Potomac River, we would be drinking groundwater — unless you wanted to drink radioactive water.

B. Eaton replied that those types of observations influence the decision making for what is referred to as Future Land Use in a risk assessment. The Current Land Use scenario is that residents of Spring Valley do not use the groundwater as drinking water. USACE must assume that the groundwater could be used in the future. Therefore, in the risk assessment, USACE does assume in the future scenario that people might drink the groundwater. This greatly influences the risk assessment results for the Future Land Use scenario.

Question from P. Dueffert, Community Member - What was the explosive compound found in the groundwater?

B. Eaton replied that he believed the explosive compound was HMX at monitoring well MW-24, at a very low concentration.

T. Beckwith added that HMX was not a compound that was used during WWI, so USACE is not sure why it was detected.

Question from M. Bresnahan, Community Member – What is the compound [HMX], and what would be the source?

B. Eaton explained that HMX is an acronym for a long formulation used in explosives. The source is probably military munitions or military industrial process. However, the detection may have been inaccurate since the detection was so low.

Question from Larry Miller, Community Member – Haven't we seen, in the past groundwater sampling reports, fairly substantial fluctuations from test to test, over the seasons, over the years?

B. Eaton explained that there are small fluctuations, but the concentrations are in terms of parts per billion. In general, there is a downward trend in concentrations at the locations that were obviously contaminated.

Comment from L. Miller, Community Member – If someone started drinking the groundwater in 50 to 75 years, and assuming there continues to be a decreasing effect of the 100 year old munitions breakdown products, USACE might not remediate as quickly.

T. Beckwith explained that the decreasing contamination is certainly a factor that USACE would consider when making decisions about what should be done about the contamination.

Groundwater concentration trends are groundwater concentrations versus time. The chemical concentrations fluctuate between increasing, remaining steady, and decreasing over time. USACE draws a line through that data called a correlation line. If the correlation line is sloping downward, it indicates a downward concentration trend through time. Each well has its own correlation line that either goes up or down. When the maximum contaminant level (MCL) for arsenic was exceeded for drinking water, USACE performed a trend analysis.

However, some trends' statistical significance can be verified using the Mann-Kendall (MK) trend test. For example, if a set of data points were going down in a straight line, and a line could fit through all of the data points, then there is a very high degree of correlation. With a high degree of correlation, there is a very high confidence that the downward trend is statistically significant. If the set of data points were scattered, but one could still fit a line through the points, there might be a question of whether that trend is statistically significant or not. The MK trend test enables USACE to make a definitive determination of statistical significance.

Arsenic concentration trend analyses were conducted at all locations (two) where the arsenic MCL (10 parts per billion) had ever been exceeded (MP-2 and MW-24). The MW-24 arsenic concentrations exhibit a downward trend based on the correlation line, and the MK test did not indicate that it was significant. The MP-2 arsenic concentrations exhibit a downward trend based on the correlation line, and the MK test indicates that the downward trend is statistically significant. Arsenic trend analyses are not mentioned for locations where the arsenic concentrations have always been below the MCL.

Similarly, perchlorate concentration trend analyses were conducted at all locations (nine) where the perchlorate DWAL (currently 15 parts per billion) had ever been exceeded. Most of the groundwater perchlorate concentration trends are downward and significant, according to the MK test.

There are 2 locations where there are upward trends; MW-44, located at American University (AU); and MW-22, located adjacent to Sibley Hospital.

Question from M. Bresnahan, Community Member – When the level is so high in those two places, does that mean it is near the source?

B. Eaton explained that these wells are next to suspected sources. For instance, the Glenbrook Road disposal areas.

Question from M. Bresnahan, Community Member – Is the perchlorate man-made?

B. Eaton confirmed this. The levels of concentrations at these locations are above what we have seen at the background locations. This is indicative of a man-made release of arsenic and perchlorate at those locations.

S. Hirsh added that arsenic is not man-made, but some of it is in Spring Valley due to AUES activities.

Question from A. Hengst, Audience Member – The drinking water health advisory will probably go lower. Should this level come down, how would that affect the other calculations?

B. Eaton explained that if the drinking water standard value goes down, USACE would have to do another trend analysis.

Question from A. Hengst, Audience Member - Do you think this level will be set before the project is finished?

T. Beckwith explained that the USACE trend analysis is not affected by the level. If the level goes down, the table remains correct, although the table may have more entries. The trend analysis is not going to change.

**Human Health Risk Assessment (HHRA)**

The goal of the HHRA is to estimate the potential for human health impact from the groundwater and surface water contaminants. This assessment is from conservative decision points, because USACE's goal is to be protective of human health in Spring Valley. USACE compared the sampling data to EPA's toxicity data.

In order to have any kind of risk, there has to be exposure and a chemical that is toxic. Without exposure there is no risk, and without toxicity there is no risk.

A Human Health Risk Assessment has 5 steps:

1. Data Collection and Evaluation in the RI effort.
2. Identify Chemicals of Potential Concern (COPC).
3. Exposure Assessment; look at different scenarios.
4. Toxicity Assessment; compare with EPA's toxicity data to assess whether or not there are any health risks.
5. Risk Characterization; summary of cancer and non-cancer health effects results.

For the Groundwater HHRA, the data collection results were used to create risk based screening. This screening focused strictly on values that are protective of exposure to neighborhood residents.

The EPA's regional screening levels were used, which are conservative risked-based concentrations that consider both cancer and non-cancer risks. Other screening values that were used were the vapor intrusion screening levels developed by EPA and DOEE.

The groundwater sampling data was assessed with a risk-based screening process and compared how persistent each chemical was during the different sampling events. The data was also compared to the arsenic and perchlorate concentrations of the three background wells, which are located outside of the site. The data went through a validation process to make sure there were true detections of the chemicals. A detection frequency analysis was used to determine whether a detection of a chemical could be considered a site contaminant.

The risk-based screening results named five COPCs: arsenic, cobalt, manganese, perchlorate, and strontium. For surface water, only manganese exceeded the risk-based screening criteria.

Once the COPCs were identified, different exposure scenarios were developed to identify how people might be affected if exposed to these chemicals.

For a current land use scenario, surface water could be used for recreational activities. For groundwater, since residents currently use city water, the risk of potential exposure was separately calculated for both current and future use.

For future use, the risk exposure was calculated for potable use of the groundwater. Here are examples of receptors in future groundwater use scenarios: an AU student, resident, indoor/outdoor worker, construction worker. The various scenarios described how each receptor could potentially use the groundwater, or surface water in a recreational scenario.

USACE also grouped the sampling data by areas of concentration, so that an area of higher chemical concentrations would not be missed. These groupings are called Exposure Units (EUs). For groundwater, there were three EUs; EU-1 is Sibley Memorial Hospital, EU-2 is American University and Glenbrook Road, and EU-3 is the rest of the site.

For surface water, EU-1 is East Creek and along Glenbrook Road, EU-2 is the rest of the site, excluding surface water (SW) sampling points SW-24 and SW-25 used for background concentrations.

Toxicity data determines what chemical concentrations are acceptable and would adversely effects human health. Toxicity is assessed in two categories: cancer and non-cancer health effects.

Risk Characterization is the 'extra risk' that the site would produce, in addition to what people would normally be exposed to in everyday life. Risk assessments have built in levels of conservatism and USACE does not want to contribute to the risk.

Cancer Risk (CR) is the probability of a person developing cancer over a lifetime of exposure, or the number of individuals that might develop cancer out of a population of 1 million. The EPA has developed an acceptable cancer risk range of 1 in 10,000 to 1 in 1 million. For the non-cancer health effects the target is a non-cancer hazard index threshold of 1.

For current groundwater use scenarios, which includes the use of groundwater for activities such as watering lawns, there was no unacceptable risk for all three EUs. In fact, the cancer risk results were below the lowest level of the acceptable cancer risk range. For future scenarios, assuming a person was drinking the groundwater over the course of their lifetime, which would be drinking 2 liters of groundwater per day, for more than 26 years, the results varied. At EU-2, the cancer risk equaled the top level of acceptable cancer risk, which means there was unacceptable risk. At EU-1 and EU-3, there was no unacceptable risk.

For all three EUs, the non-cancer hazard indices were below 1, which means no unacceptable risk. If the groundwater is used as drinking water for the resident, the AU student, or an indoor worker, the hazard indices were greater than 1, which means that there was unacceptable risk. These results were primarily due to perchlorate, arsenic, cobalt, and manganese.

Site characterization of the Spring Valley groundwater is complete. There is no unacceptable risk for current land use. However, there is unacceptable risk if the groundwater is used as a potable source, at EU-2. USACE recommends doing a Feasibility Study due to the potential risk in a future use scenario at EU-2.

Question from L. Monsein, Community Member - What are the non-cancer diseases?

G. Welshofer explained that cancer would be tumor-causing health effects, whereas non-cancer health effects can vary and include skin rash or liver damage. For a non-cancer health affect, a person does not have to be exposed over a long time period to suffer an adverse health affect.

Question from L. Monsein, Community Member – Would the AU student be for 2 or 4 years?

G. Welshofer explained that USACE assumed the student scenario was an international student living there year round for four years.

Comment from A. Hengst, Audience Member – I believe California lowered their perchlorate MCL to 1 part per billion, and Massachusetts set their perchlorate MCL at 5 parts per billion due to the possibility of thyroid cancer?

G. Welshofer confirmed that thyroid is the target organ for perchlorate, but did not readily have the data of the other states' perchlorate MCL levels.

Question from G. Fancellu, Audience Member – Where is EU-2?

G. Welshofer confirmed that EU 2 includes AU property in the vicinity of Kreeger Hall and Glenbrook Road.

B. Eaton added that if one were to calculate the average of the arsenic concentrations in Spring Valley, and calculate the risk using that average, the result would dilute the problem away, because the level would be low and misleading. Therefore, USACE groups the data in a more sensible way, considering the wells near the suspected source areas. EU-2 includes Kreeger Hall on AU and the Glenbrook Rd project.

Question from G. Fancellu, Audience Member – Why is recreation area behind the art center area not mentioned?

B. Eaton explained that in general, the well locations were chosen based on known contaminated areas and/or locations where groundwater contamination was confirmed.

Question from G. Fancellu, Audience Member – Arsenic is one of the two main chemicals concerned?

T. Beckwith explained that USACE detected arsenic in groundwater above drinking water levels at two locations, across the street from the main disposal area at Glenbrook Road. There was a significant amount of contamination in the soil near Glenbrook Road. Soil remediation occurred at many properties in Spring Valley where there were no significant detections of arsenic in the groundwater.

B. Eaton added that arsenic in groundwater was found at 2 locations where the arsenic concentration exceeds the MCL that public water suppliers around the country use to make decisions about the quality of water. Only at two locations are there arsenic concentrations that have rendered the water not drinkable now. At every other location throughout the entire Spring Valley FUDS, the levels are low enough to qualify the water as drinkable now. Although arsenic is prevalent in the soil, and is the main driver for many FUDS activities, the occurrence in groundwater is highly localized.

Question from Gerald Barton, Audience Member - Why is the level at Sibley Memorial Hospital high?

B. Eaton explained that this answer is still unknown. USACE installed many monitoring wells between the AU, Glenbrook Road area and the Sibley Hospital area to test the hypothesis that the groundwater contamination could have come from the disposal areas at Glenbrook Road. However, there were many non-detect results for arsenic and perchlorate in these areas, leading us to believe there is currently no continuous perchlorate between the AU and Sibley Hospital.

## III. Community Items

No community items were presented.

## IV. Open Discussion and Future RAB Agenda Development

### A. Upcoming Agenda Item

- 4825 Glenbrook Road Health Consultation Update (ATSDR) – May
- Site-Wide Proposed Plan
- Suggestions?
  - Real Estate Attorney
  - Invite new Director of DOEE to address the RAB

### B. Next RAB Meeting

Tuesday, May 10, 2016

## V. Public Comments

No public comments were presented.

## VI. Adjourn

The meeting was adjourned at 9:06 PM.