**Spring Valley Partnering Meeting**
**February 27, 2018**
**Spring Valley Project Federal Property Conference Room**

| **Name** | **Organization/Address** | |
|---|---|---|
| Allyn Allison | USACE – Huntsville | **X** |
| Brenda Barber | USACE – Baltimore | **X** |
| Bethany Bridgham | American University | **X** |
| Sean Buckley | Parsons | **X** |
| Paul Chrostowski | CPF Associates, American University Consultant | **X** |
| Dr. Peter deFur | Environmental Stewardship Concepts/RAB TAPP Consultant | **X** |
| Satchell Doyle Jr. | ECBC | **X** |
| Chris Gardner | USACE – Corporate Communications Office | **X** |
| Alma Gates | RAB Member – Horace Mann Representative | |
| John Gerhard | Weston Solutions | **X** |
| Whitney Gross | ERT – Community Outreach Team | **X** |
| Steven Hirsh | EPA –Region III | **X** |
| Holly Hostetler | ERT | **X** |
| Carrie Johnston | ERT – Community Outreach Team | **X** |
| David Kline | ECBC | **X** |
| Michael Knudsen | ECBC | **X** |
| Lowell (J.R.) Martin | USACE – Site Operations Officer | |
| Chris Moran | Weston Solutions | **X** |
| Dan Noble | USACE – Baltimore | **X** |
| Randall Patrick | Parsons | **X** |
| Tom Rosso | ECBC | **X** |
| Gabriel Rothman | Army Chemical Materials Activity (CMA) | **X** |
| Jim Sweeney | DOEE | **X** |

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|---|---|---|
| Rebecca Yahiel | ERT – Community Outreach Team | **X** |
| Alex Zahl | USACE – Baltimore | **X** |

**Summary of 27 February 2018 Spring Valley Partnering Meeting**

**Consensus Decisions**

- None

**27 February 2018 Action Items**

- CMA will send the air modeling run reports to the Partners.
- The Partners agreed to give concurrence on the sampling plan for 4835 Glenbrook Road. The Partners will send concurrence memo emails to USACE Baltimore on or before March 2.

**Tuesday 27 February 2018**

**A. 4835 Glenbrook Road Remedial Action**

**The goal of this segment of the meeting was to review the status of the Remedial Action at 4835 Glenbrook Road.**

Parsons provided a brief update on the status of the Remedial Action at 4835 Glenbrook Road.

**1. Recent Activities**

At the time of the last partnering meeting, Parsons had just begun collecting boring hole samples from the basement along the property line. All sampling in the basement was completed on December 19. Future vapor monitoring points were installed. No chemical agent or agent breakdown products (ABPs) were detected in any of the samples collected in the basement. With the completion of Borehole (BH)-18 under the covered patio on January 29, all planned soil borings along the property line were completed.

- Several pieces of glass were recovered from BH-07 at ~4.5 ft. from the top of the concrete. The glass appears to be labware-related and cleared headspace for agent.
- No agent or ABPs were detected in any of the first set of samples. Edgewood Chemical Biological Center (ECBC) plans future basement sampling.
- Aluminum (Al), Arsenic (As), Cobalt (Co), Vanadium (V), Manganese (Mn), Antimony (Sb), Copper (Cu), Aluminum Cyanide (CN) (only in BH-17, at 6-8 ft. depth), and Dieldrin, an insecticide that was originally produced in 1948, were detected at concentrations above the 4825 Glenbrook Road residential comparison values. All sample data is preliminary and has not been validated yet. No flat qualifiers have been attached to this data. The Dieldrin was detected in one of the front two borings.

In response to a question from Dr. Peter deFur, Environmental Stewardship Concepts/RAB TAPP Consultant, Parsons explained that the results will be validated in about one month.

**2. 4825 Glenbrook Road**

On January 18, Parsons began a second set of borings in areas yet to be fully excavated in an attempt to identify the compound associated with the worker exposure incident. An additional 10 boreholes were excavated to competent saprolite; similar to the process used in the basement, with Geoprobes drilled down to competent saprolite and/or refusal.

Preliminary Results:

- In BH-28 at 0-2 ft. mustard (HD) breakdown products were detected.

- Al, Co, V, Sb, Mn, Titanium (Ti), As, and Ethylbenzene were detected above 4825 Glenbrook Road residential comparison values. This data has not yet been validated.
- No other compounds were detected at concentrations that would explain the exposure symptoms. Those compounds include chemicals such as adamsite that have the possibility of being detected as Tentatively Identified Compound (TICs). Parsons concentrated sampling on areas where chemical agent contaminated media (CACM) and glassware had previously been found.

In response to a question from Paul Chrostowski, CPF Associates, American University Consultant, Parsons confirmed that the samples were tested for a full range of possible compounds, including volatile organic compounds (VOCs), semi organic compounds (SVOCs), metals, pesticides, polychlorinated biphenyls (PCBs), and explosives.

In response to a question from EPA Region III, U.S. Army Corps of Engineers (USACE) Baltimore District and Parsons explained that there will be a separate report for 4835 Glenbrook Road, but at this time the sampling data for 4825 Glenbrook Road is being used to inform the return-to-work. A full report will be presented for 4825 Glenbrook Road when work is completed.

In response to a question from P. deFur, Parsons confirmed that the sampling results are part of the data set that is undergoing validation.

**3. Future Activities**

- Install cement lagging in the soldier piles on the 4801 Glenbrook Road property line. This will prevent settling concerns on the property on the other side of the fence.
- Further excavate areas where metals (mainly arsenic) were detected in excess of the comparison values. Over-excavation will be performed in some areas to address arsenic detected in exceedance of the comparison values. Work will be conducted in Level D personal protective equipment (PPE) with arsenic monitoring. Plans are currently being reviewed.

In response to a question from EPA Region III, Parsons and USACE Baltimore District explained that even though excavation has been performed to saprolite, additional excavation will be conducted according to hazardous and toxic waste (HTW) follow-up as directed in the workplan. A mechanical excavator will be used to excavate past the competent saprolite.

**4. Schedule**

- Install lagging and excavate HTW soil in former high probability areas until approximately June 2018.
- Schedule going forward depends on the return-to-work plan.

**B. Board of Investigation**

USACE Baltimore District provided a brief update on the Spring Valley Board of Investigation (BOI).

DOEE noted that he and EPA Region III were members of the BOI. The final BOI report was officially released to the BOI members by email on February 26.

A limited internal release of the official BOI report was given to select personnel at USACE Baltimore. The report will go to the Safety Office within USACE Baltimore HQ before being formally released through USACE Baltimore HQ Safety Office. The BOI shared the findings and recommendations of the report with USACE Baltimore so USACE Baltimore has enough information to understand the conclusions and plan the return-to-work that will satisfy the BOI's recommendations. The report is 28 pages in length with 420 pages of appendices which contain some Health Insurance Portability and Accountability Act of 1996 (HIPPA) and personally identifiable information (PII) detail. For a public version to be released, the report will have to go through some sort of scrubbing. USACE Baltimore hopes to present a summary of the report to the Restoration Advisory Board (RAB) in a few weeks; but will have to see if there is progress or not.

EPA Region III, DOEE, USACE Baltimore, and P. deFur agreed that the work of the BOI is complete, however there has been no official notification of completion sent to the BOI members. The BOI will not be involved in developing the return-to-work plan and has no authority as to whether work may resume. There may be some administrative work USACE Baltimore still needs to do with the report, but the report has been finalized, signed, and senior leadership has been briefed. The BOI president is working on a possible abstract that may be presented to the RAB.

In response to a question from P. Chrostowski, USACE Baltimore explained that there has been a Freedom of Information Act (FOIA) request for the final report, so USACE Baltimore HQ is looking into developing a publicly releasable summary. Whether a summary will be available to the Partners before the RAB, if at all, is unclear.

**C. 4825 Glenbrook Road Return-to-Work and 4835 Glenbrook Road Sampling Effort**

**The goal of this segment of the meeting was to review the status of the return-to-work plan at 4825 Glenbrook Road and the sampling effort at 4835 Glenbrook Road.**

USACE Baltimore provided a brief update on the status of the return-to-work plan and sampling efforts at the Glenbrook Road sites.

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

The BOI Report required the Project Delivery Team (PDT) to address the following:

- Workers will require greater respiratory protection and/or implement a process to monitor the workers' breathing zones.
- Additional training or retraining will be implemented to address odor awareness and the reporting of unknown odors or the presence of odors.
- Site procedures must mandate proper communication protocols at the site between excavation teams and leadership at the site.
- Excavating in the presence of chemical agent contaminated soils will require onsite emergency medical technician (EMT) support and a formal Memorandum of Agreement (MOA) with the designated hospital, regardless if efforts are considered low probability or high probability.

**2. Conceptual Model of Events of August 9 Based on Findings of BOI**

In reviewing the BOI Report and understanding from Parsons, the team put together a conceptual model of what the team believes happened on August 9:

- Workers were in an area of known contamination, such as mustard (HD), mustard breakdown products, and Lewisite (L), based on prior soil detections. CACM continued to be present in the area in smaller quantities. Potential that unknown volatile/semi-volatile compounds were present in the area.
- Workers were impacted by inhalation of contaminant. Dermal absorption or oral ingestion is unlikely based on the report and what is known of the events.
- Weather conditions at the time of the incident were poor - higher temperature in the afternoon, stable atmosphere, and little to no wind at the site. Ventilation was very poor in the area of excavation.
- The geometry of the excavation site was poor. The workers were enclosed on three sides; either by soil faces or by the remaining retaining wall that was still in place at the time. The work face was at the lowest point of the excavation area. American University Experiment Station (AUES) compounds at the site, known to be heavier than air, likely settled in the excavation area.
- Per standard protocols, workers were hand-excavating due to glass debris in the soil. This meant that the workers were much closer to the contaminant in the breathing zone at the time of the incident.
- Based on the symptoms of the workers not directly excavating, distance from the point of soil disturbance led to rapid reductions in vapor concentrations caused by excavating of soil. The team

members that were hand-excavating were impacted, but the team members that were ~3-4' away in support roles did not experience the same types of symptoms. There was a rapid reduction in symptoms the further away the workers were from the face of the soils.

**3. Course of Action Options to Resume Work at 4825 Glenbrook Road**

The PDT developed two courses of action for return-to-work at 4825 Glenbrook Road:

**a. Course of Action 1**

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

**b. Course of Action 2**

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

In response to a question from EPA Region III, USACE Baltimore explained that the PDT did not choose Level C respiratory protection because the workers would be more comfortable in Level B. The workers would not have to work as hard to breathe in Level B as they would in Level C. Other variables were considered, such as potential heat stress. The workers would be laboring through a respirator rather than supplied air.

In response to a question from EPA Region III, USACE confirmed that Level B would use air lines.

USACE Baltimore, EPA Region III, and DOEE noted that the BOI Report uses the term 'unknown' for contaminants, which involves the USACE Safety Office. The Safety Guidance gives some flexibility between Level A and Level B, but does not seem to allow to go below Level B.

In response to a question from EPA Region III, Parsons confirmed that the Level B mask works for both hazardous, toxic, radioactive waste (HTRW) and for agent.

**4. Course of Action 1**

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

- Upgrade worker breathing protection to Level B as monitoring the breathing zones is not practical.
- Establish a worksite exclusion zone through the use of air modeling. Air modeling will require the identification of appropriate additional compounds and assumptions on concentration of compounds in the soil, plus estimating the largest amount of soil handled in a manner which could cause a release. This is very similar to what is done in a high probability operation, with key differences:
- The PDT will not establish a Maximum Credible Event. Instead, through the use of an appropriate set of conservative assumptions regarding other possible chemicals present, the PDT has established the exclusion zone.
- The PDT considered high probability versus low probability and agreed to move ahead under low probability. The PDT will update the Probability Assessment in order to justify that position.
- Parsons has established a formal MOA with George Washington Memorial (GW) hospital and the PDT will provide onsite EMT/ambulance support during Level B operations as required by the BOI.

There is a small section in the front corner of 4835 Glenbrook road that remains to be excavated. The distance to the public is ~43' to the property line. The larger area to be excavated is the back corner area. The distance of the larger area to the front property line is ~80' and ~59' to the back property line. The distance was set to the inner fence because there are students that walk through the American University (AU) fields adjacent to the property.

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore confirmed that the modeling runs are available from CMA.

Establishment of the exclusion zone relied heavily on air modeling conducted by CMA. The PDT considered the following when running the models:

- Modeling parameters similar to those used for high probability were utilized, such as weather, type of air modeling, toxicology standards, etc.
- The PDT modeled HD, L, and ABPs because those compounds are known to be onsite.
- The PDT prepared a list of other possible chemicals to model to potentially account for the unknown described by the BOI.
- Compounds considered: Arsine ($AsH_3$), Phosgene ($COCl_2$), Ricin, Chloroform($CHCl_3$), Chloropicrin (PS), Cyanogen Chloride (CK), Arsenic Trichloride ($AsCl_3$), Arsenic Oxide ($As_2O_3$), Arsenious Acid ($H_3AsO_3$), Hydrogen Chloride, Chloroacetophenone (CN), and Adamsite (Y).
- The PDT eliminated $COCl_2$, Ricin, $As_2O_3$, $H_3AsO_3$, and Hydrogen Chloride from consideration, and then when running the modeling, experienced challenges running CN.

In addition to modeling HD and L, the PDT modeled $AsH_3$, PS, CK, $AsCl_3$, and Y. These compounds can all be monitored for onsite, except for Y.

The PDT used the modeling data to calculate an equivalent concentration that would need to be present in the soil at the site to achieve that mass generated during the modeling. The PDT then compared that concentration to concentrations observed for HD and L to determine safe work in open air.

For this modeling event the PDT used WebPuff. The team attempted to utilize D2SV, but due to recent Department of Defense (DoD)-wide upgrades to newer versions of Windows, the PDT was not able to successfully run modeling with D2SV. The team is working to upgrade the version D2SV to run on the upgraded systems. The primary difference in the modeling is that D2SV accounted for very site-specific topography and other site-specific issues. The mass generated by WebPuff is roughly twice what would be expected from D2SV, so the calculations are conservative. The PDT's goal is to have D2SV running before any data is presented to the public.

P. Chrostowski, CPF Associates noted that he believed that for the Partner's purposes the data from WebPuff is good as an extra safety factor.

In response to questions from P. de Fur, USACE Baltimore explained that in estimating the concentration required, the PDT assumed the mass of soil with a particular contaminant that would fit in a 55-gallon drum. The concept is that the workers are hand-excavating in the soils because of the known presence of glassware, CACM, and some staining of the soil. The workers are then loading soil into a 55-gallon drum which takes about an hour, so that supports the 60-minute release and exposure scenario. The target receptor is a member of the public standing at the property line. This is additionally conservative because members of the public generally do not stand at the fence on the property line. If any member of the public comes to the property line fence with questions, the site team is quick to approach the person, deal with questions or requests, and move them on.

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore explained that the challenge of this modeling was the need for toxicological endpoints to create the model. The PDT had to select a subset of compounds with available information to represent stand-ins for the unknown because the unknown cannot be modeled. USACE Baltimore seeks the agreement of the Partners that the selected compounds are a good representative group; understanding that modeling thousands of different compounds would not be practical, even if the toxicological information were available. The PDT spread the selected stand-in compounds across the major types of chemical agent that were used in WWI and at the AUES, such as blister agent, systemic agents, vomiting agent, and riot control agent. CN was the only

riot agent that the PDT was aware of being in use at the AUES, but the compound could not be modeled. The PDT determined that riot control agents were less toxic than other agents that the PDT was able to model. Categories of agents such as nerve agents and incapacitating agents were eliminated because the production of those agents came along much more recently than WWI. The PDT cross-checked the candidate compounds against a list of chemicals used at AUES on an Excel spreadsheet developed by Mark Baker, USACE Baltimore, years ago. The spreadsheet indicated if a chemical was used in the lab or out in the field and other variables. The PDT then cross-checked the candidate compounds against the Centers for Disease Control (CDC) website that provided toxicological information.

P. Chrostowski, CPF Associates noted that he believed that, conceptually, the approach is a good approach. He will want to look at the list of toxic industrial chemicals (TICs) covered to assure himself and his clients that these are good indicators for all the compounds. He believed the approach was realistic.

In response to a question from P. deFur, G. Rothman, CMA explained that at this time modeling combinations of compounds is not available due to the synergistic affects.

In response to a question from P. deFur concerning whether chemists can determine the likelihood of chemical interactions, USACE Baltimore explained that one thing that caused some discussion among the PDT when selecting the chemicals was types of chemicals such as $AsH_3$. $AsH_3$ would have to be present and released from a container. The concept of returning to work is that a container would not be the case. If an intact container of any kind is found, work stops. That scenario is not part of safety modeling. The safety modeling is the idea that the compounds are generating or off-gassing from the contaminated soils somehow. The PDT left $AsH_3$ in the selected compounds because other solid compounds such as magnesium arsenide ($As_2Mg_3$) were found at the site a year or two ago. If $As_2Mg_3$ was loose in the soil, that compound would have gone through an environmental degradation reaction and be gone, but if for some reason $As_2Mg3$ had not degraded, it may generate $AsH_3$ through disturbance of the soil and exposure to water or humidity in the air. So a container of $AsH_3$ would not need to be present for a release of $AsH_3$ to occur. This speaks to the stand-in effect that the groups of selected chemicals represent. In that case, $AsH_3$, a very toxic chemical, would be a good indicator of how a compound would act once the compound goes into the air.

P. DeFur and P. Chrostowski, CPF Associates agreed that the selected list of compounds was a good representation.

In response to a question from P. deFur, USACE Baltimore confirmed that multiple boundary distances were considered for the modeling.

Parsons noted that the 95-degree temperature model is very conservative, because the workers will be operating in Level B respiratory protection. This will cause the project to shut down at temperatures in the low 70s because of potential heat stress.

P. Chrostowski, CPF Associates commented that he will want to review all the conservative variables that will help his evaluation of the options.

In response to a question from EPA Region III, USACE Baltimore explained that the health effect endpoints will be discussed as the presentation goes through each compound. Some of the compounds have acute exposure guideline level (AEGL) values and some of the compounds only have temporary emergency exposure limits (TEELs). The PDT has recommendations and proposals of which guidelines to use, depending on the modeling for each compound.

**5. Comparison Charts**

The PDT used HD and L as the base comparison compounds for modeling, using the distances to the public receptors of 43', 80', and 59'.

In response to a question from EPA Region III, USACE Baltimore explained that the three distances to potential public receptors were created from the locations that still require excavation to the project perimeter. The front yard is the closest, and then the portion in the backyard. The distance to the front of the property is bordered by the fence line and the distance to the back of the property is bordered by AU's fence line, rather than the project command post. Some students and other visitors still walk through a gate at 4835 Glenbrook Road along the property line, so the PDT measured to the property line rather than the back of the command area.

HD was modeled to AEGL-1 and AEGL-2 and L was modeled to 'No Effect' and AEGL-2. Concentrations were developed that would have to be present in the soils. The assumptions for the modeling were a 60-minute continuous evaporative release, atmospheric stability of D, 1m/second wind speed, and a maximum temperature of 95 degrees (which is very conservative, since it is unrealistic that workers would be working in 95-degree temperatures in Level B respiratory protection). These assumptions are consistent with high probability. The modeling assumes one full 55-gallon drum of soil.

The highest concentration of HD seen to date is 360 micrograms/kg, and the highest concentration of L seen to date is 72 micrograms/kg.

The concentrations of HD and L were then used to compare each of the other compounds:

- The compound PS had AEGL values, therefore was modeled for AEGL-1 and AEGL-2.
- There were no AEGL values for CK, so TEEL-1 and TEEL-2 values were used. The PDT calculated resultant concentrations that would need to be present for those CK modeled amounts.
- $AsH_3$ had an AGEL-2 and a TEEL-1. The preference is AEGL-2 because it is validated, but the PDT modeled both AEGL and TEEL values for discussions at the partners meeting.
- $AsCl_3$ had only TEELs available, so the PDT modeled TEEL-1 and TEEL-2. TEEL-1 is currently used for site safety considerations.
- There were AEGLs available for Y, so the AEGL-1 and AEGL-2 for comparison purposes.

In response to a question from EPA Region III, G. Rothman, CMA explained that the 'No Effect' number instead of AEGL-1 for L was found in Army technical manuals.

EPA Region III noted that if the AEGL guideline numbers are not publicly available, the sources of the 'No Effect' numbers should be referenced. All sources of guideline numbers should be referenced.

CMA confirmed this.

**6. Maximum Concentrations Detected to Date**

The maximum concentrations detected to date onsite and along the shared property lines:

- L at 72 micrograms/kg
- HD at 360 micrograms/kg
- ABPs at 24,000 micrograms/kg

The point of summarizing the concentrations is to show that the compounds are acting as stand-in concentrations. Then the model concentrations are compared to the highest known concentrations of compounds detected at the site.

P. Chrostowski, CPF Associates agreed with this method and explained that he intended to review the chemical structure of detected TICs to possibly compare the structures to the selected stand-in compounds.

**7. Discussion of AEGL-1, AEGL-2, and TEELs**

EPA Region III, P. Chrostowski, CPF Associates, and USACE Baltimore discussed the use of TEELs in a report to the public. While the AEGLs are considered the best vetted and researched numbers, when AEGLs

are not available it may be best to use a hierarchy of values including the TEELs. It may be better to have an uncertain value rather than no value at all to be able to assess risk.

When EPA Region III noted that EPA preferred AEGL-1s for public protection, USACE Baltimore pointed out that the Federal Emergency Management Agency (FEMA) and the DoD formally adopted AEGL-2 as the level of protection provided to the public during an incident.

In response to a question from EPA Region III, USACE Baltimore confirmed that USACE Baltimore could show that concentrations meet the TEEL-1 levels for AsH3 and be protective of the public.

EPA Region III commented that, in the past, AEGL-2 values for L were used only because there was no AEGL-1. If there is another number that shows that the public is protected, he would rather talk to the other number than the AEGL-2.

USACE Baltimore reiterated that the AEGL is validated and the TEEL is not. The PDT's preference on $AsH_3$ would be to use AEGL-2 because it is a validated, scientifically proven number, as opposed to the TEEL, which is a temporary number.

In response to the suggestion by EPA Region III that USACE Baltimore explain the AEGL-2 to the public, USACE Baltimore confirmed that the explanatory AEGL slide used in 2007 will be utilized again to explain the different levels of AEGLs to the public. An AEGL-2 value does not mean that a contaminant will not be noticed when present, but that a receptor will not be exposed to a level that would cause serious permanent harm. A receptor's eyes might water, an odor might be detected, or the receptor might feel nauseous.

In response to questions from EPA Region III, USACE Baltimore explained that a receptor's eyes would water above AEGL-1. Under AEGL-1 a receptor would not notice the contaminant. Above AEGL-2 is when serious harm might occur.

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore confirmed that the compounds other than L and HD are used as surrogates. Some of the compounds have been found at 4825 Glenbrook Road in other areas of the property in the past, such as $AsCl_3$ in April 2010.

AEGL Levels:

- Above Level 1 - notable discomfort, irritation, and non-sensory effects. Nothing disabling and completely reversible.
- Above Level 2 - irreversible or other serious, long-lasting adverse health effects.

The PDT recommends using AEGL-2 at the site perimeter so there would be nothing above AEGL-2 beyond on the site perimeter and the workers will be protected.

In response to an observation by P. Chrostowski, CPF Associates, USACE Baltimore confirmed that the workers experienced AEGL-1 exposure symptoms on August 9. The workers had no respiratory protection at that time. Course of Action 1 provides respiratory protection for the workers onsite and will not allow a release offsite beyond AEGL-2.

If there are AEGLs, the AEGL committee has incorporated uncertainty factors when the levels are set. If the AEGL committee is not confident about the data available, a factor of 10 to 30 is added to the level.

EPA Region III commented that factors of 10 in risk assessment are small, factors of 1,000 are routine.

In response to a question from EPA Region III, USACE Baltimore explained that the AEGL-2 would be used for the property line, not the hot zone, exclusion zone, or cold zone.

TEEL Levels:

- For those compounds that did not have an available AEGL value, the TEEL value is used. TEEL levels are very similar to AEGL levels. Since TEEL-1s are already used at the site, the PDT proposes continuing to use TEEL-1s for any compounds with no AEGLs.
- The 3 levels of the AEGL and TEEL values are basically the same, but published literature indicates that the TEEL levels are not as well-vetted as the AEGLs, therefore AEGLs are preferred. If the PDT must use TEELs, then the PDT prefers TEEL-1, such as was used for $AsCl_3$.

**8. Course of Action 1 Changes to the Workplan**

In response to a question from EPA Region III, USACE Baltimore confirmed that Course of Action 1 includes continuing work with no significant changes except the workers will upgrade to Level B respiratory protection. The workplan will need to be adjusted for operations in Level B.

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore confirmed that the PDT discussed adding additional Depot Area Air Monitoring System (DAAMS) tubes, however the air monitoring systems cannot monitor for an unknown.

In response to a question from EPA Region III, ECBC, and USACE Huntsville explained that a Fourier Transform Infrared (FTIR) would not be used because the detection limits are significantly higher with an FTIR for individual compound phases. Not all compounds are detectable by FTIR or are included in the system's overall database. Similar to cases where the miniature chemical agent monitoring system (MINICAMS) detected a peak somewhere else while the team was monitoring for HD.

In response to a question from EPA Region III, USACE Baltimore and USACE Huntsville explained that an extensive study was performed because an interferent was causing false detections to the MINICAMS. The best tool that has resulted in identifying an unknown has been sampling the soil or the source, such as a container that is discovered or soil around an area where an odor is detected. Collecting stainless steel (SUMMA) canisters, vapor cells for FTIR, or things in the air have never pointed back to specific compounds.

P. Chrostowski, CPF Associates pointed out that considering what is known about 4825 Glenbrook Road, FTIR might be used to detect a particular functional group. If, for example, it looks like an arsenic chlorine single line is a functional group that is responsible for most of the toxicity, then that functional group may be detected. The difficulty would be, quantitatively, how to use that information.

P. Chrostowski, CPF Associates and P. deFur agreed that an indicator monitor might be useful, but testing the soil is best for detecting compounds.

USACE Huntsville explained that when compounds are found in the soil, the air monitoring systems are adjusted to detect those compounds. If the compound is new and not in the original monitoring list, then a standard is identified so the team may act.

**9. Course of Action 2**

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

- Upgrade worker breathing protection to Level B as monitoring of breathing zones is not practical.
- Implement engineering controls, to include an engineering control structure (tent) and a CAFS unit, and possibly additional air monitoring support (MINICAMS trailer), similar to air monitoring used during high probability.
- This approach is similar to the safety approach for a high probability operation but would be low probability at the site.
- The PDT will adjust work plans and Site Operation Procedures (SOPs) to reflect revised working conditions to engineering control structure and CAFS unit.

- Parsons has established a formal MOA with George Washington Memorial (GW) Hospital and the PDT will provide onsite EMT/ambulance support during Level B operations as required by the BOI.

If Course of Action 2 is selected, the PDT recommends waiting for the sampling results for 4835 Glenbrook Road before proceeding with planning. If an action is required at 4835 Glenbrook Road, the implementation may require the same engineering controls and could be implemented more cost efficiently if combined with 4825 Glenbrook Road.

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore explained that if an action is required for only the shared property line, AU campus access would not be required for installing a tent. If an action is required at 4835 Glenbrook Road, then installing the same tent used at 4825 Glenbrook Road would require AU campus access.

**10. Recommended Course of Action**

For operations at 4825 Glenbrook Road, USACE Baltimore recommends that the team should return to work with Level B worker protection with no engineering control structure (open air). The PDT seeks formal Partner concurrence on the selection of Course of Action 1.

In response to questions from DOEE, USACE Baltimore confirmed that work would resume at 4825 Glenbrook Road. The PDT would continue to work with ECBC on sampling 4835 Glenbrook Road, and Parsons could resume work along the shared property line. Impacts at 4835 Glenbrook Road would continue to be evaluated. If something were to happen, work would stop, and the PDT would be convened.

In response to a question from EPA Region III, USACE Baltimore indicated that this presentation was the formal proposal and the partners are encouraged to review the 2 Courses of Action and consider which option is best.

**11. Discussion of Advantages and Disadvantages of the Options**

P. deFur, USACE Baltimore, and EPA Region III discussed the advantages and disadvantages of the two Courses of Action:

If Option 2 is selected there is very little improvement in performance. There would be some improvement in the reassurance of the public, however if there is an unknown contaminant ECBC cannot say the filters will filter that unknown contaminant, nor can the filter beds be monitored for an unknown.

Course of Action 1 assumes that the exposure issue was confined to the workers and that risk is reduced by upgrading the workers' respiratory protection to Level B. The public must be reassured that the public was not at risk, documented by the modeling.

Course of Action 1 assumes that the project will continue to encounter small amounts of CACM, very low levels of HD, L, and ABPs, contaminated soil, broken debris but no intact containers, no munitions, and will continue to work on the property line. If high concentrations, an intact container, or a jar is found, then work stops and a new Course of Action will be determined.

**12. Community Outreach**

Depending on the selected Course of Action, USACE Baltimore would work very closely with Corporate Communications, the Partners, and the Community Outreach Team. USACE Baltimore would prepare an appropriate way to message the options to the public that explains the potential model of the assumptions and seek community acceptance of the options.

**13. Community Relocation Requests**

- The PDT is likely to receive at least one relocation request.

- Prior to USACE efforts at 4825 Glenbrook Road, USACE received one request for relocation and one request for real estate compensation due to efforts by USACE. The relocation request ran up the entire chain of command and was denied by leadership. A formal review was completed by USACE HQ as part of their final analysis and the technical team's approach and methodology was deemed safe, therefore relocation was not provided.

In response to a question from EPA Region III, USACE Baltimore explained that USACE Baltimore partnered with AU to lease 4835 Glenbrook Road for exclusive use to perform due diligence, so the president was not a relocation.

Under Course of Action 1 there are potential relocation options:

1. Stay consistent with the prior determination and deny any potential relocation request. The PDT would prepare the appropriate documentation to deem the technical approach safe to the public.
2. Publicly acknowledge that there is some risk to the public which would allow one of two options:
    - Mandatory evacuations, similar to the procedure employed at 52 Court, which would require that residents be evacuated every single day for the entire duration of the operation. The residents would be out of the house from 8AM to 4:30PM daily during work operations. If a resident chooses not to leave their property for whatever reason, the team would not work that day.
    - Relocate the residents within the affected area. This may mean the relocation of up to 7 residents based on the shelter-in-place zone.

The PDT recommends relocation item 1 for Course of Action 1. The PDT can prepare the required documentation to illustrate plans to resume work can be implemented without an increase in risk to the public.

EPA Region III and DOEE pointed out that the Partners do not have to agree that Course of Action 1 is acceptable but no relocation is required.

Under Course of Action 2, USACE Baltimore believes there is no need for any relocation. By utilizing an engineering control structure and a CAFS unit, there is minimal risk to the public.

**14. Potential Community Relocation Requests**

In response to a question from EPA Region III, USACE Baltimore explained that the current potential circular hazardous zone is completely within the site perimeter that includes 4835 Glenbrook Road, but no other private property. Course of Action 1 can be completed without any relocations.

In response to a suggestion from EPA Region III, USACE Baltimore confirmed that the circles would need to be redrawn based on the three excavation areas.

In response to a question from AU, USACE Baltimore explained that Course of Action 1 will not include atmospheric controls.

**15. Additional Briefings on Return-to-Work**

Upon concurrence on the return-to-work plan by the Partners, USACE Baltimore will brief senior leadership:

- North Atlantic Division (NAD)
- USACE Baltimore HQ
- Pentagon staff – DASA ESOH

USACE Baltimore will also offer a brief to Ms. Holmes-Norton and DC Homeland Security and Emergency Management Agency (HSEMA).

All briefings must be complete before USACE Baltimore may present to the RAB.

In response to a question from P. deFur, USACE Baltimore explained that the different briefings are not sequential. Most of the briefings happen at the same time.

**16. Schedule to Resume Work at 4825 Glenbrook Road**

Course of Action 1:

- February 27 – present approach to the Partners
- March 13 – present approach to the RAB (if Partner concurrence is achieved).

In response to a question from P. Chrostowski, CPF Associates, USACE Baltimore explained that the schedule was aggressive. If the Partners need more time to review the options, the presentation to the RAB may be delayed.

Under Course of Action 1, if USACE Baltimore obtains the RAB's general concurrence, the earliest return-to-work would be June 2018.

Course of action 2:

- February 27 – present approach to the Partners
- March 13 – present approach to the RAB (if Partner concurrence is achieved).

Under Course of Action 2, if USACE Baltimore obtains the RAB's general concurrence, the earliest return-to-work would be December 2018 or January 2019.

Once work begins under Course of Action 2, excavation will take approximately six months to complete.

In response to a question from EPA Region III, USACE Baltimore explained that the six-month excavation estimate is the same for Course of Action 1 or 2, because for either option the workers will be excavating in Level B respiratory protection. For Course of Action 2, the site must be prepared and reset with a tent and CAFS unit installed. The site preparation is not included in the six-month excavation estimate. If the reset begins in January, then excavation work would not begin before April or May. Then after excavation all engineering controls must be taken down.

**17. 4835 Glenbrook Road Sampling**

The PDT worked with ECBC to prepare 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 the remaining portions of the basement to saprolite, including the crawlspace area.
- Six of the sample locations will be left for future sub-slab vapor sampling if required in future.
- The team anticipates collecting 1-3 samples per bore hole all samples, depending on depth to saprolite.
- All samples will be run for low level agent; a full mass spec will be run if agent or ABPs are detected. The full mass spec was run during the last sampling if agent was detected. Arsenic will also be run on all samples that test positive for agent/ABPs because those samples may not go to a commercial lab.
- If the samples clear for low level agent, the samples will be sent to a commercial lab for full suite analysis on every sample.

In response to a question from EPA Region III, USACE Baltimore explained that there was a detection at 4825 Glenbrook Road, not at 4835 Glenbrook Road. A full mass spec was conducted on that sample.

In response to a question from EPA Region III, USACE Huntsville explained that the analysis for chemical agents is set for a high degree of sensitivity, so the team utilizes selected ion monitoring, a scaled down ion

search that only focuses on HD or some other ABP. A full scan analyzes everything present. Every peak that occurs through the mass spec is run through the library. The team then interprets the library results.

In response to a question from EPA Region III, USACE Baltimore, Parsons, and P. Chrostowski, CPF Associates explained that when there is no agent or ABPs, the commercial labs do not conduct full spec. The commercial labs use full EPA methods. The range of analysis would be specified in the contract with the commercial lab. Typically for EPA projects, when P. Chrostowski, CPF Associates is working for a PRP, the 20 highest VOCs/SVOCs are requested. Parson noted that is the method Parsons uses.

In response to a question from EPA Region III, USACE Huntsville explained that the analysis looks for the main HD degradation products. There are 100s of other HD degradation products; most of them end up being poly-sulphides, which are HD plus two, three, or four sulphurs.

The ECBC SOP was sent to the Partners, and USACE Baltimore requested that the Partners review and submit comments/concurrence by March 2.

Slide 29 of the presentation is a figure of the 36 new ECBC sampling locations. The locations are spread out in the basement; primarily in the hallway, the middle area where the former workers said there was potential for debris, and 3 borings in the crawlspace. A vapor point will also be installed in the crawlspace. There will be six new vapor points added to the four vapor points installed by Parsons.

**18. 4835 Glenbrook Road Sampling Schedule**

- Current plan is to begin implementation of the sampling effort on or about March 5 if concurrence is obtained by March 2. ECBC is ready to move in on March 5 and sampling should begin that week or the week after.
- Sampling should take 4-6 weeks to complete.
- Low level agent results will be provided weekly for all samples.
- Commercial lab results require a longer duration, from 21 to 30 days.
- The team expects to receive all sample results by late May. The commercial results will likely be unvalidated at that time.
- A review of the results will be prepared to brief leadership by late May or early June. USACE Baltimore will be prepared to meet with AU about recommendations for 4835 Glenbrook Road.

This schedule is subject to delays if any agent detections are made onsite.

In response to a question from EPA Region III, Parsons and USACE Baltimore explained that if the samples came back clean, but the commercial lab detected an SV list contaminant in the TICs such as Y, or a high level of volatile contamination, that would affect decisions made about 4835 Glenbrook Road. If for some reason the slab of the house preserved volatile contamination underneath the slab that may cause an indoor air concern, the commercial lab would detect that contamination.

EPA Region III pointed out that the agent results will be back before the end of April, so by the end of April the team will have a good idea whether 4835 Glenbrook Road remains in place. That will affect Course of Action 1 versus Course of Action 2. He suggested waiting until the end of April for the ECBC data to decide on Course of Action 1 or 2, because the decision may already be made by the data.

USACE Baltimore noted that there are contractual considerations. If an action is required at 4835 Glenbrook Road there will be a long pause in operations while the plan is reworked. Work could continue towards completion at 4825 Glenbrook Road. If Course of Action 1 is selected, work may go ahead no matter what the results at 4835 Glenbrook Road. If Course of Action 2 is selected, it may be reasonable to wait and see if the house will be removed before planning to construct the tents.

In response to a request from EPA Region III, CMA confirmed that he would send the air modeling run reports to the Partners.

EPA Region III and P. deFur agreed that the decisions ought to be made closer together, rather than deciding about 4825 Glenbrook Road first, and then discover that 4835 Glenbrook Road requires a larger action.

EPA Region III, P. DeFur, and P. Chrostowski, CPF Associates agreed that the 2-week review period for the Course of Action selection was too short. The best plan is to wait until April for the low-level agent results from 4835 Glenbrook Road, reconvene the Partners, discuss the results, and review the two possible Courses of Action.

The Partners agreed to give concurrence on the sampling plan for 4835 Glenbrook Road. The Partners will send concurrence memo emails to USACE Baltimore on or before March 2.

USACE Baltimore will begin to mobilize the sampling action at 4835 Glenbrook Road this week with the Partners' verbal concurrence.

In response to a question from USACE Baltimore, the Partners agreed that it is a good plan to present the 2 Courses of Action to the RAB and explain that the Partners are still in discussion about the best option. The RAB would then have the opportunity to submit comments and opinions to the Partners.

In response to a question from AU, USACE Baltimore explained that the decision to postpone selecting a Course of Action will affect the schedule of return-to-work. If Course of Action 1 is selected, the return-to-work will likely be the end of September.

In response to a question from EPA Region III, USACE Huntsville explained that work has been conducted in other places under operational constraints such as the constraints used for the Course of Action modeling to the site perimeter. The worse-case scenario is modeled for several variables, such as the 95-degree temperature. Additional operational constraints could be included to create a larger margin of safety, so a contaminant would not leave the site.

EPA Region III replied that the additional constraints would be useful. The workers would not be operating in 95-degree temperatures, so the model should be adjusted to reflect a more realistic operating temperature.

USACE Baltimore and Parsons agreed that work would be shut down when temperatures reach above 75 degrees. The modeling can be adjusted to reflect the lower temperature and operationally not exceed that temperature.

**D. Site-Wide Remedial Action (RA)**

**The goal of this segment of the meeting was to review the status of the Site-Wide Remedial Action.**

Weston Solutions provided a brief update on the Site-Wide Remedial Action (RA).

The Site-Wide RA will include:

- Sub-slab work on the Public Safety Building (PSB).
- Soil removal at the Southern AU Exposure Unit and Spaulding-Rankin exposure unit.
- Advanced geophysical surveys for the residential areas with removal of anomalies.

**1. Planning Document Phase**

Remediation Components:

- Draft Final LUCIP was submitted to the Partners for review on December 22, 2017. Weston Solutions is awaiting comments from the Partners.
- Draft Final Advanced Geophysical Classification-Quality Assurance Project Plan (AGC-QAPP) for the unexploded ordnance/munitions and explosives of concern/munitions debris (UXO/MEC/MD) Remediation at 91 Residential Properties and 13 Federal/City Lots was submitted to the Partners for review on February 26, 2018.

- Combined Draft Uniform Federal Policy (UFP)-QAPP for the Spaulding-Rankin and Southern AU exposure units is under revision by Weston Solutions, based on USACE comments dated February 16, 2018.
- Combined Draft UFP-QAPP for UXO/MEC/MD and Soil Remediation at the PSB is under revision by Weston Solutions, based on USACE comments dated February 16, 2018.

In response to a comment from USACE Baltimore, EPA Region III explained that that the 30-day submittal date for comments requested from the Partners is likely to be enough time, since EPA does not expect to have many comments.

**2. Future Activities**

- Prepare a MEC Information Packet to distribute to the Spring Valley Formerly Used Defense Site (FUDS) residents once the LUCIP is finalized.
- Residential Properties and Federal/City Lots - Obtain Rights-of-Entry (ROEs) for properties and permits for the first 18 properties, finalize the AGC-QAPP, and conduct:
  - Civil and landscape surveys, landscape plan, and arborist appraisal of vegetation that might need to be removed or trimmed.
  - Site walk with property owners, document site conditions, review and approval of landscape plan by the property owners.
  - Landscape trimming/tie-back/clearing.
  - Begin field work – AGC and Magnetometer dynamic surveys.

Weston Solutions noted that the 18 properties of homeowners that volunteered to be in the first group out of the 91 properties are spread out across the whole residential area, which Weston Solutions considers an advantage. The scattered properties will provide data across the entire site for the geophysical determination. After the first group of properties is complete, the remaining properties will be grouped by street.

USACE Baltimore added that both the G858-Magnetometer and the Man-Portable Vector (MPV) will be used during the project.

- Soil Remediation at the Spaulding-Rankin and Southern AU Exposure Unit
- Obtain ROE for properties and permits, finalize the UFP-QAPP, and conduct:
  - Civil and landscape surveys, landscape plan and appraisal.
  - Site walk with owners, document site conditions, review and approval of landscape plan by owners.
  - Landscape trimming/tie-back/clearing.
  - Start field work – pre-excavation direct push technology (DPT) soil sampling. The sampling will be conducted to 10’ at the location and then investigate outward to determine how far to excavate.
- MEC/Soil Remediation at the PSB - obtain ROE and permits, finalize the UFP-QAPP, and conduct:
  - Civil survey, utility marking and document site conditions.
  - Set up construction site compound and facilities.
  - Shut off and temporarily relocate utility lines near PSB - to be determined.
  - Start field work - conduct 12 sub-slab pre-characterization soil sample borings (using DPT).

In response to a question from USACE Baltimore, Weston Solutions explained that field work at the PSB is scheduled to begin at the end of July or August.

USACE Baltimore noted that an ROE is still needed for the PSB.

In response to a question from USACE Baltimore, Weston Solutions explained that Weston Solutions was waiting for word from USACE Baltimore about renting an AU office building.

AU and USACE Baltimore agreed to work out details of the office building rental.

EPA Region III requested a general schedule slide for future presentations to the Partners. USACE Baltimore suggested a table or grouping the schedule by task would be helpful.

In response to a question from EPA Region III, USACE Baltimore explained that the first geophysical investigations are expected to begin by April. The timing is influenced by the signing of the planning documents and the ROEs.

In response to a question from EPA Region III, Weston Solutions explained that the first MPV to be used for the project has been manufactured and should be delivered next week.

In response to a question from AU, Weston Solutions explained that excavation work at AU is expected to begin in August or September. Mobilization for the sub-slab soil sampling will likely be in June.

In response to a question from USACE Baltimore, Weston Solutions confirmed that Weston Solutions will collect the sub-slab samples and then send the samples to ECBC for analysis.

USACE Baltimore and ECBC pointed out that it is best if ECBC integrates data as Weston Solutions develops the SOP. Sometimes the analysis, monitoring, site logistics, or other items in a contractor's plan contradict what ECBC might have in ECBC's monitoring plan. To avoid that scenario, ECBC suggested that Weston Solutions send the SOP to ECBC for comment.

Weston Solutions confirmed this.

**E. Open Issues and New Data**

No new data presented.

**F. Future Agenda Items**

1. BOI report
2. Groundwater FS
3. 4825 Glenbrook Road/4835 Glenbrook Road
4. Site-Wide DD
5. Site-Wide RA

**G. Agenda Building**

The next meeting was scheduled for Tuesday, May 1, 2018.

**H. Adjourn**

The meeting was adjourned at 12:34.