

**United States Army Corps of Engineers – New England District  
Cold Regions Research and Engineering Laboratory (CRREL)  
Restoration Advisory Board**

**Minutes of Meeting #24**

**Wednesday, May 15<sup>th</sup>, 2019  
Richmond Middle School (RMS) Library  
Hanover, New Hampshire**

Attending: Scott Calkin – Wood E&IS – [Scott.Clakin@woodplc.com](mailto:Scott.Clakin@woodplc.com)  
Rod Rustad – Wood E&IS – [Rod.Rustad@woodplc.com](mailto:Rod.Rustad@woodplc.com)  
Darrell Moore (Chair) – USACE - [Darrell.A.Moore@usace.army.mil](mailto:Darrell.A.Moore@usace.army.mil)  
Robin Mongeon – NHDES – [Robin.Mongeon@des.nh.gov](mailto:Robin.Mongeon@des.nh.gov)  
Roelof Versteeg Community Member - [Roelof.versteeg@gmail.com](mailto:Roelof.versteeg@gmail.com)  
Kristine McDevitt – Community Member – [Kristinemcd@hotmail.com](mailto:Kristinemcd@hotmail.com)  
Terry Harwood – Cold regions Research and Engineering Lab (CRREL)  
[Bartlett.Harwood@USACE.army.mil](mailto:Bartlett.Harwood@USACE.army.mil)  
Chief Martin McMillan – Hanover Fire Dept. [Martin.McMillan@hanovernh.org](mailto:Martin.McMillan@hanovernh.org)

Observing: Gary Pasternak – CRREL  
Jeff Pickett – Wood E&IS – [Jeffrey.Pickett@woodplc.com](mailto:Jeffrey.Pickett@woodplc.com)

Agenda:

- Review/Accept January 16, 2019 Meeting Minutes
- Facility Impacts
- June Soil Gas Sampling
- Richmond Middle School Sampling Schedule
- Feasibility Study Report Status
- Groundwater Modeling
- Upcoming Work
- Schedule Next Meeting
- Adjourn

Items comments and notes:

The January 16<sup>th</sup> Meeting Minutes were quickly reviewed and accepted as noted.

Accepted Meeting minutes.

The May RAB meeting was initiated with a review of the above agenda from the ppt slide package.

Review of the meeting minutes from January 16th.

D. Moore motions to accept meeting minutes, R. Versteeg seconds

Darrell Moore begins meeting with a general review of the meeting agenda

Darrel begins review of the work associated with the -73 line and the impacts to the Main Laboratory building at CRREL

Cutting of the -73 line released some airborne detectable TCE into the Main Lab. Darrell Moore provides a time line-based review of the release and the actions of the Army COE. Notable concentrations included 6000 ug/m<sup>3</sup> in work area and 900 ug/m<sup>3</sup> in the upper floors of the Main Lab

The 1<sup>st</sup> and 2<sup>nd</sup> floors of the Main Lab were re-opened at approximately noon on March 20<sup>th</sup>.

Future line removal activities will be completed during weekends. The week end work will be completed as there should/will be fewer people in the main lab at the CRREL facility.

Currently working with COE H&S personnel to authorize additional week end work.

Chief Hanover FD would like to make sure that someone of authority calls the media and gets ahead of the media if there are other events. Make sure COE and CRREL be proactive with the media.

Chief of Hanover FD asked if a spray containing TCE was used to clean a wrench, would our indoor air testing be able to detect this type of an event. COE explains that we have had such an event in the past and last time this happened the Hapsite unit detected about 1200 ug/m<sup>3</sup>.

Chief would like POC at facility for future release events. Chief to call CRREL (Terry H.) in the future when he gets media calls. CRREL commits to adding Hanover FD into the communications document and communications chain for any future events.

COE and CRREL indicate that there have been numerous instances when the Hapsite unit has detected other chemicals not just TCE in daily monitoring events. Hapsite instrument is capable of detecting very low concentrations of various chemicals including TCE down to approximately 0.5 ug/m<sup>3</sup>.

CRREL to update the communication plan and add chief of Hanover FD into the communication plan.

AGCIH standard, workers can be exposed to 10 PPM (53,700 ug/m<sup>3</sup>) vs very low standard of 8.8 ug/m<sup>3</sup> at CRREL

Wood personnel lead into discussion of the SVE system. AOC 9 and AOC 2 SVE pilot systems are currently shut down as part of a planned rebound study to see if concentration of TCE in soil gas will increase. Wood has not done a lot of soil gas sampling this winter due to ice and snow buildup in well casings during the winter months however Wood is currently planning to do another synoptic event in early June 2019.

Wood will review the shutdown and rebound graphs for AOCs 2 and 9 and will update the graphs after synoptic events.

Wood also displayed picture of the extent of TCE in soil vapor from 2017. The upcoming June synoptic event will provide data for an updated soil gas distribution map. The CRREL Main Lab sub-slab depressurization system (SSDS) has been off and Wood personnel have continued to sample interior air with the Hapsite unit. The daily sampling events with the Hapsite unit have not been seeing indicators of vapor intrusion since the shutdown of the SSDS at the Main lab. Currently using the Main Lab SSDS vacuum to control -73 line until the -73 line is completely removed.

Wood personnel review the current schedule for indoor air sampling at the Richmond Middle School.

Meeting continues with feasibility study (FS) discussion. A formal comment resolution meeting was held with the COE, CRREL, USAEC and COE Omaha, back in February 2019. As result of this meeting and discussions Wood has completed some additional groundwater modeling to look at some additional active clean up scenarios to try and reduce the cleanup times of the groundwater plume associate with the CRREL facility.

Also plan to add the results of the soil gas sampling into the FS evaluations. The RAB may see the draft FS Report late summer early fall of this year. The FS Report does not contain a recommendation of the cleanup method alternative. The proposed clean up alternative will be included in the proposed plan (PP) vs the FS.

There are a couple of additional pilot studies that may be completed after the FS is completed and is a final document.

Looking to get these additional pilot studies funded in the next couple of months.

Trying to build some flexibility into the FS and proposed plan to select the most cost-effective alternative vs spending \$ on a costly and expensive "Cadillac remedy" which doesn't provide additional clean up value. This is a tiered approach vs a linear approach.

Wood personnel moves forward into a discussion of the on-going GW model. We are also taking an iterative approach to GW clean up of the GW plumes at CRREL. Even if we clean up the soil vapor we still have a lot of TCE in the GW that will not be easy to clean up. Wood reviews The NH GW standards of 5 µg/L for GW and <2.5 µg/L for discharge to the CT river.

Current pump and treat system clean up has a very long clean up tail of over 200 years. Through various modeling approaches and various remedial technologies and injection of de-chlorination materiel and in a perfect world some modeling by Wood indicates that GW may be able to be clean up to NH Standards in 50 to 80 years. These alternatives would be expensive and very disruptive to the physical operations and landscapes at CRREL.

No one at the Army wants to be running a treatment system for 80 plus years so we have used modeling to look at multiple ways to clean up GW plumes including various extraction and reinjection wells.

Wood personnel talks to the paint roller example to explain how difficult the cleanup of the GW plume will be to < 5 µg/L and discharge of < 2.5 µg/L to the CT River. Wood personnel explain, when one cleans a paint roller with soap and water you get 90% of the paint out of the roller in the first few minutes of washing the roller however you very seldom get the roller as clean as it

was when it was new and the last 10% of the paint in the roller takes a lot of additional washing and time to get it out of the roller fibers.

The RAB Members asked about the size of the TCE cores in the GW and Wood personnel estimate the GW plume cores to be approximately 50 ft thick by 50 feet wide. Noted that Wood is still doing some modeling in an effort to expedite the GW cleanup process.

It was also noted in reviewing the modeled extraction of GW and clean up and re injection that we must be careful with this process. We would not want to spread the plume out even more than it currently is at the facility.

Results of the model output and variants of cleanups will be added and incorporated into the FS Report

Estimated amounts of TCE in GW likely about 120 gallons.

Wood personnel describes the difference in the likely release at AOC 2 mechanism vs the likely release at AOC 9. There may have also been some additional spills at AOC 9 in addition to the single catastrophic release the was documented in July 1970

Wood personnel continue the presentation to the RAB describing what we will be doing at the site for future work.

Future work at the Frost Effects Research Facility (FERF). Will be doing some additional sampling at the FERF site. The concentrations at the FERF are still quite low but there does seem to be some continuing vapor intrusion issues at the FERF. However, concentrations at the FERF rarely exceed HQ of 1. The exceedances typically occur coincident with barometric low periods.

Just received access to a couple of properties in VT and will be doing some additional well inventory and potential sampling in VT.

Enhanced Permeability pilot testing tentatively scheduled for Fall of 2019

Synoptic soil gas sampling event in June 2019.

Wood personnel explain the means and methods of the additional well sampling in VT and why we are looking at some new wells in VT. Extrapolation of a potential radius for new wells in VT. Doing initial survey to see if wells do exist and tap sample initially.

Work in/on CT River that has been completed to date will be an addendum to the RI/FS. NHDES wants to know what the schedule is for this work. COE explains that this work has been delayed due to the pending access agreements but should move ahead now that we signed access agreements with the new property owners.

There will be some additional investigation and testing post RI that will be included in the FS and or appendix.

Last testing at RMS will be in August 2020. After the 2020 testing event additional testing at RMS will be determined via the 5-year review process. If anything shows up in the future the army will do additional sampling at the school if people believe it is needed.

Next RAB meeting will be in September 2019.