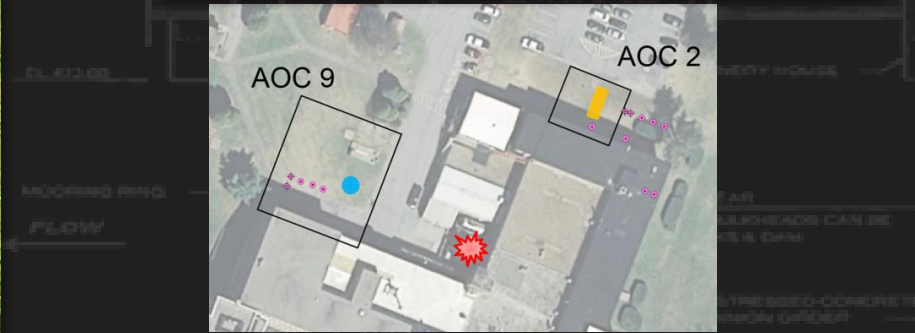
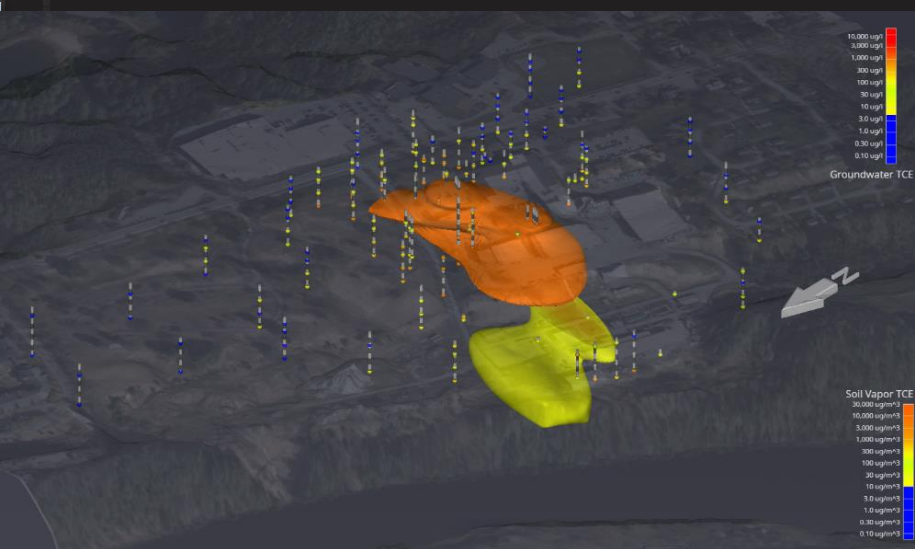


# COLD REGIONS RESEARCH AND ENGINEERING LABORATORY RESTORATION ADVISORY BOARD MEETING

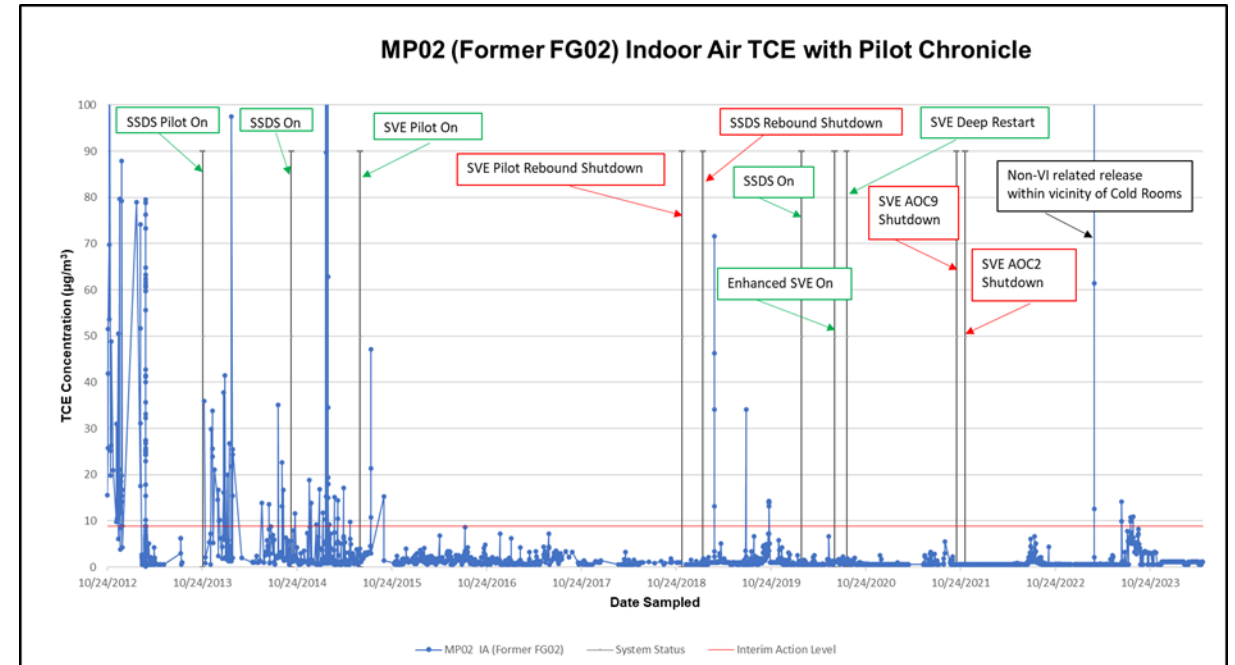
Christopher Kane, USACE Project Manager  
Date: 15 May 2024

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





- Introductions
- Review/Approve January 2024 Meeting Minutes
- On-Site Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Investigation Status
- Connecticut River Remedial Investigation and Feasibility Study Report Status
- Groundwater Management Zone Sampling
- Groundwater Treatment Plant Design Status
- Conceptual Model Update Site and CT River
- Interim Remedial Systems Update
- Administrative Record Update
- Upcoming Work This Quarter
- Adjourn







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# INTRODUCTIONS



## Members

- Christopher Kane, RAB Chair and USACE Project Manager
- Kristine McDevitt, Community Member
- Bree Carlson, Member Representing Dartmouth
- Roelof Versteeg, Community Member
- Deputy Chief/Fire Marshal Michael Gilbert, Member Representing Town of Hanover
- Tony Daigle, Member Representing SAU 70

## Support

- Laurie Haines-Eklund, USAEC Team Lead
- Amy Rosenstein, USACE Risk Assessor
- Dan Groher, USACE Engineer
- Dr. Steve Potts, USACE Geologist
- Katherine Miller, USACE Chemist
- Terry Harwood, ERDC-CRREL IRP Manager
- Dr. Jay Clausen, ERDC-CRREL Deputy IRP Manager
- James Wieck, GZA/Dartmouth
- Scott Calkin, WSP PM
- Wolfgang Calicchio, WSP Chemist
- Amy Quintin, WSP Risk Assessor
- Ryan Ordnung, WSP Hydrogeologist
- Jack Besse, WSP Engineer

## Regulatory Agencies

- Drew Hoffman, NHDES POC
- Rene Nahlik, NHDES PM
- Richard Spiese, VTDEC POC





# ON-SITE CERCLA INVESTIGATION STATUS



## Next Steps:

### 1. Resolve NHDES Feasibility Study comments regarding Applicable or Relevant and Appropriate Requirements (ARARs)

- Discussions ongoing
- NHDES is reviewing draft USACE responses
- May result in an Addendum to the Final Feasibility Study

### 2. Once resolved Proposed Plan and Decision Documents will follow thereafter

- Provides public and stakeholders an opportunity to comment on selected remedy(s) per CERCLA.
- Provides formal record and rationale for the selected remedy(s) and commits parties to the remedy(s).

### 3. Groundwater Treatment Plant 100% Design has been tabled to keep in line with the CERCLA Process

- Design will be completed after the Decision Document is finalized.
- Extraction well design/pilot planned to optimize eventual treatment design







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# CONNECTICUT RIVER REMEDIAL INVESTIGATION REPORT



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In Draft Final Status – Vermont DEC approved the report to issue as final in July 2023.

NHDES is reviewing USACE comment responses, a meeting is scheduled in Late May to discuss.

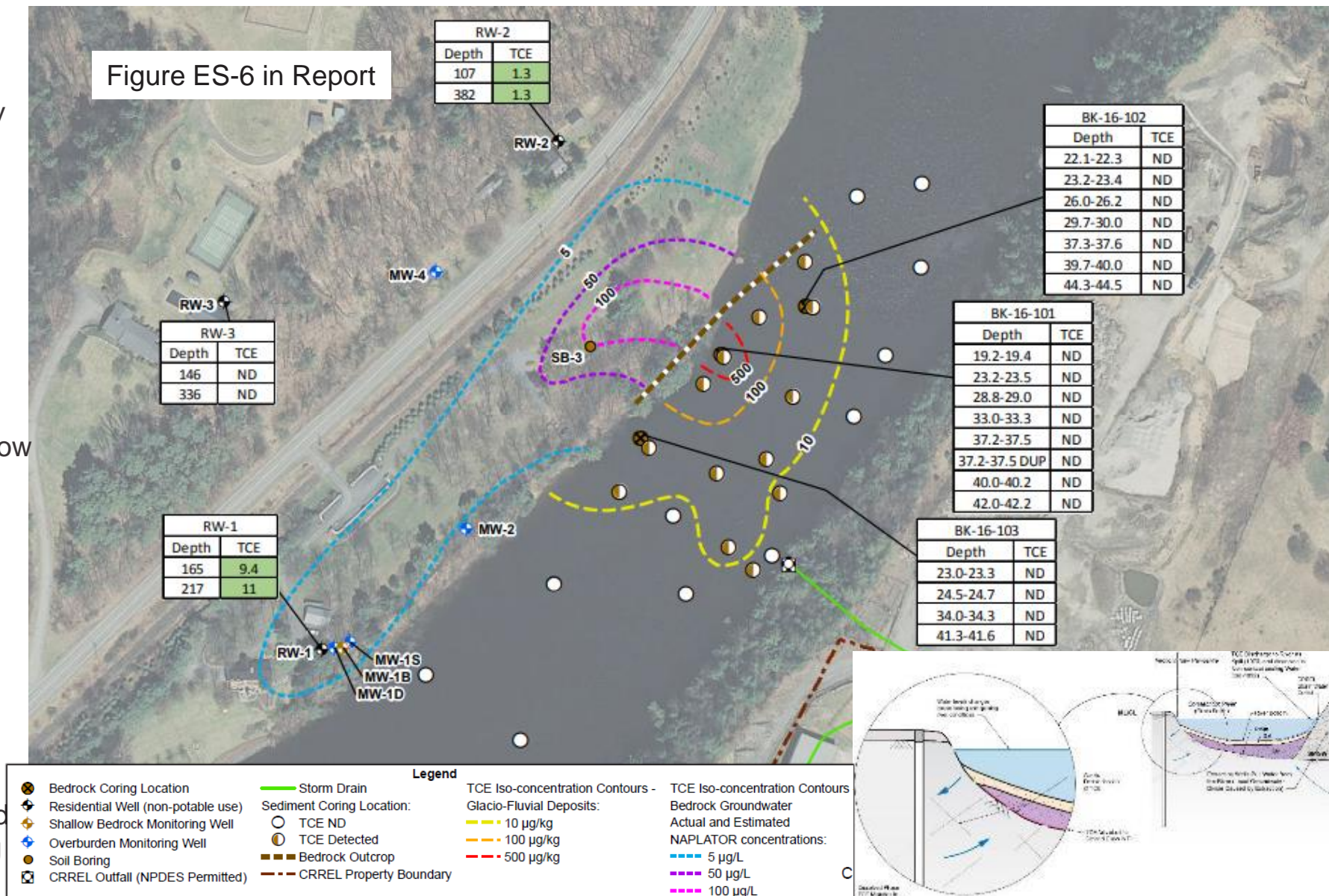
Once NHDES comments are resolved the document will be finalized.

Results for surface water and sediment show no significant risk to ecological or human receptors.

Results for groundwater wells in Vermont (not currently in use, homes supplied by municipal water) show potential for hypothetical risk at one well if the groundwater were to be used for potable purposes in the future.

A Draft Feasibility Study will be revised and resubmitted to USACE for review following RI comment resolution.

Figure ES-6 in Report







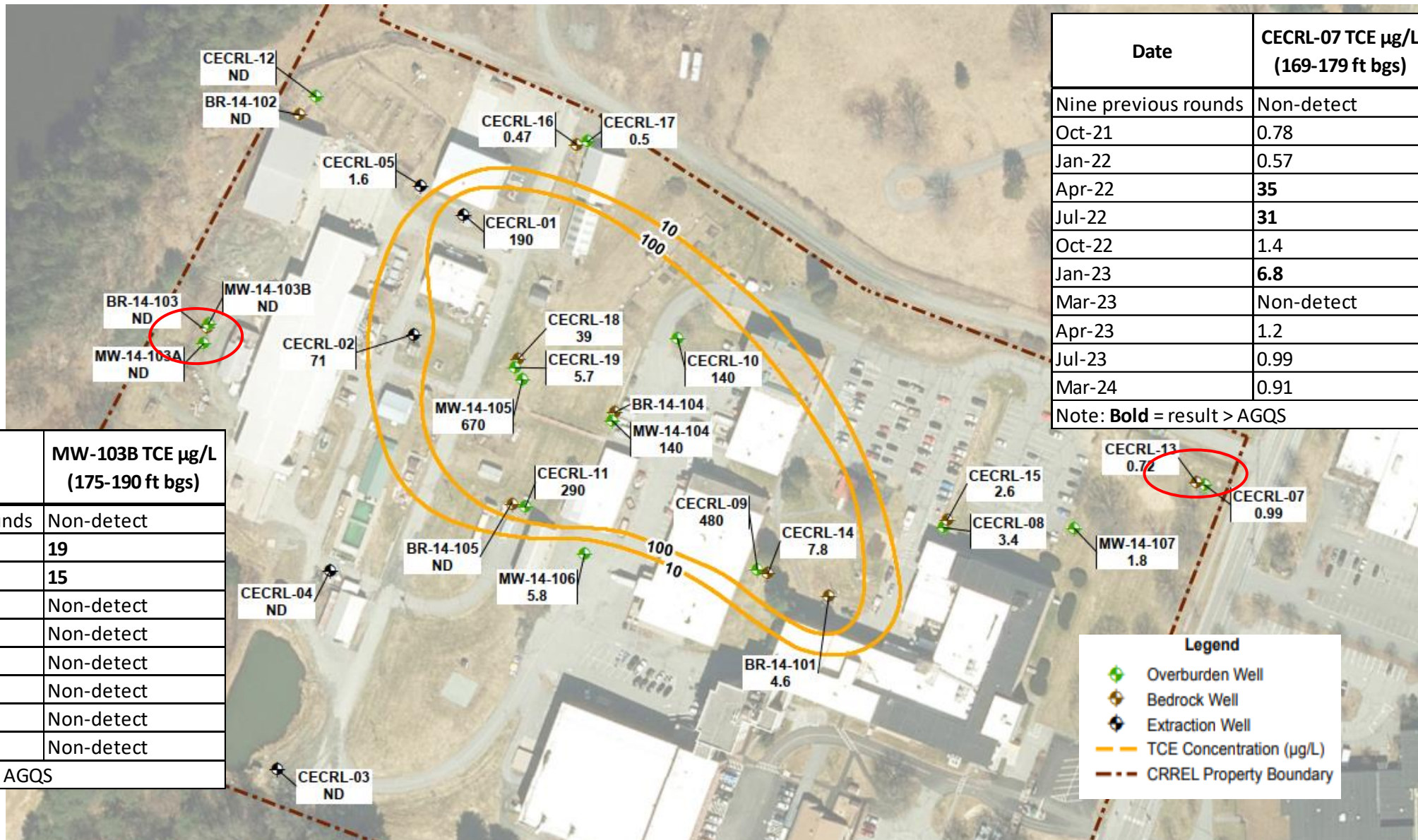
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# GROUNDWATER MANAGEMENT ZONE SAMPLING

## MARCH 2024



6

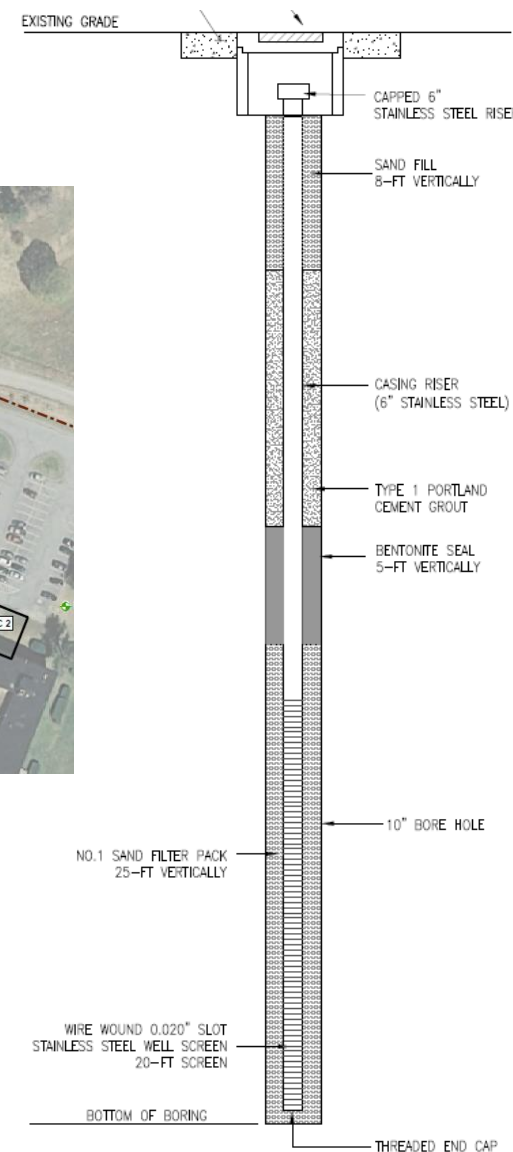
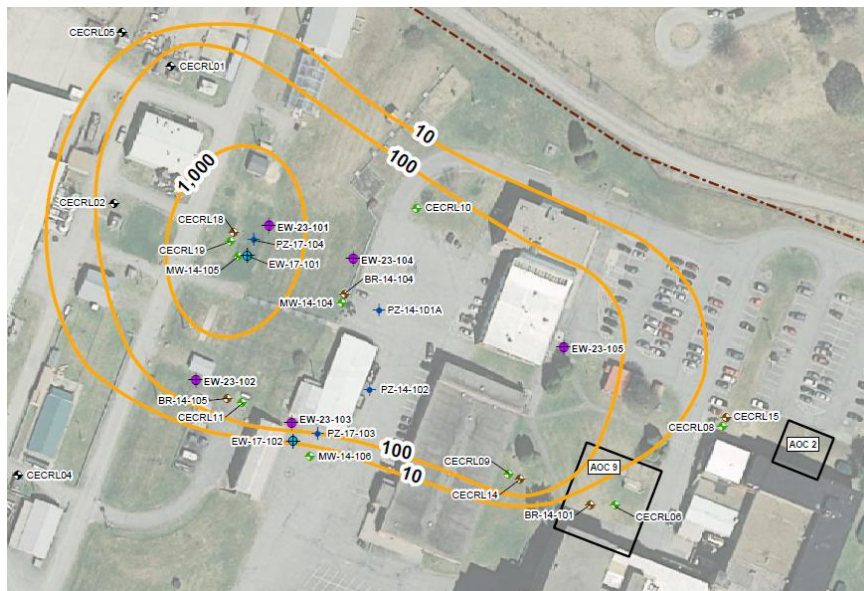




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# GROUNDWATER TREATMENT PLANT DESIGN STATUS

- Treatment plant design on hold pending completion of the ROD.
- Pilot extraction well design commenced January 2023, Draft Final Well Design was submitted to USACE for approval in spring 2023.
- Anticipate installing and operating pilot wells to deepen understanding of aquifer characteristics and demonstrate capacity to limit migration of TCE to production wells as a potential 2025 activity.





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# HISTORY/BACKGROUND



TCE used as an industrial chemical from 1960 – 1987

TCE first detected in groundwater in 1990

Water Treatment Plant constructed in 1994

TCE Vapors first detected in 2010

- Indoor air sampling began

USACE involvement began in 2011

- Sampling intensified to determine extent of TCE in indoor air
- Soil Vapor Extraction Pilot from May 2014 to Present
- Remedial Investigation Report completed June 2018
- Final Feasibility Study Report completed January 2021

Current indoor air sampling conducted during the work week in the Main Lab and intermittently in other CRREL buildings.

Currently reviewing the indoor air monitoring plan with input of NHDES to ensure worker safety and sampling efficiency.





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# PRIMARY AREAS OF CONCERN (AOCS) FOR TRICHLOROETHENE (TCE)



Underground Storage Tank



Ice Well



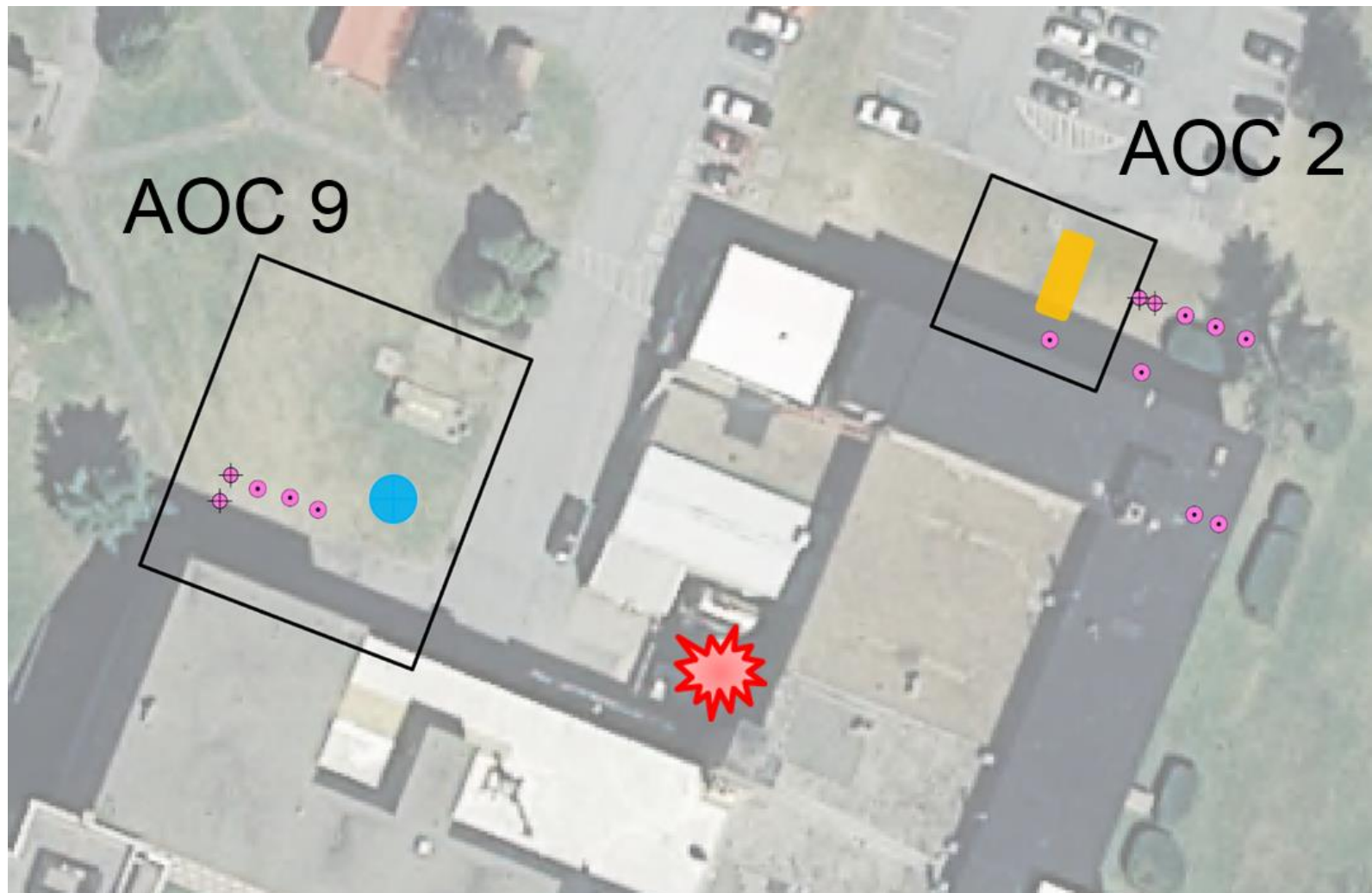
Soil Vapor Monitoring Well



Soil Vapor Extraction Well



Aboveground Storage Tank Deflagration





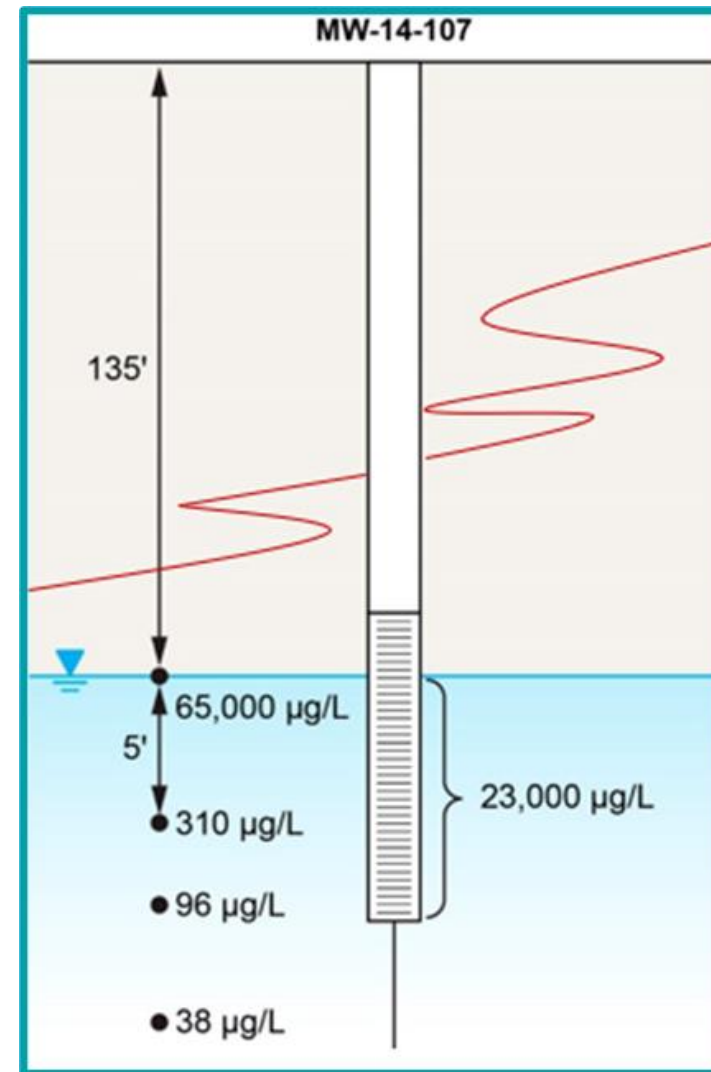
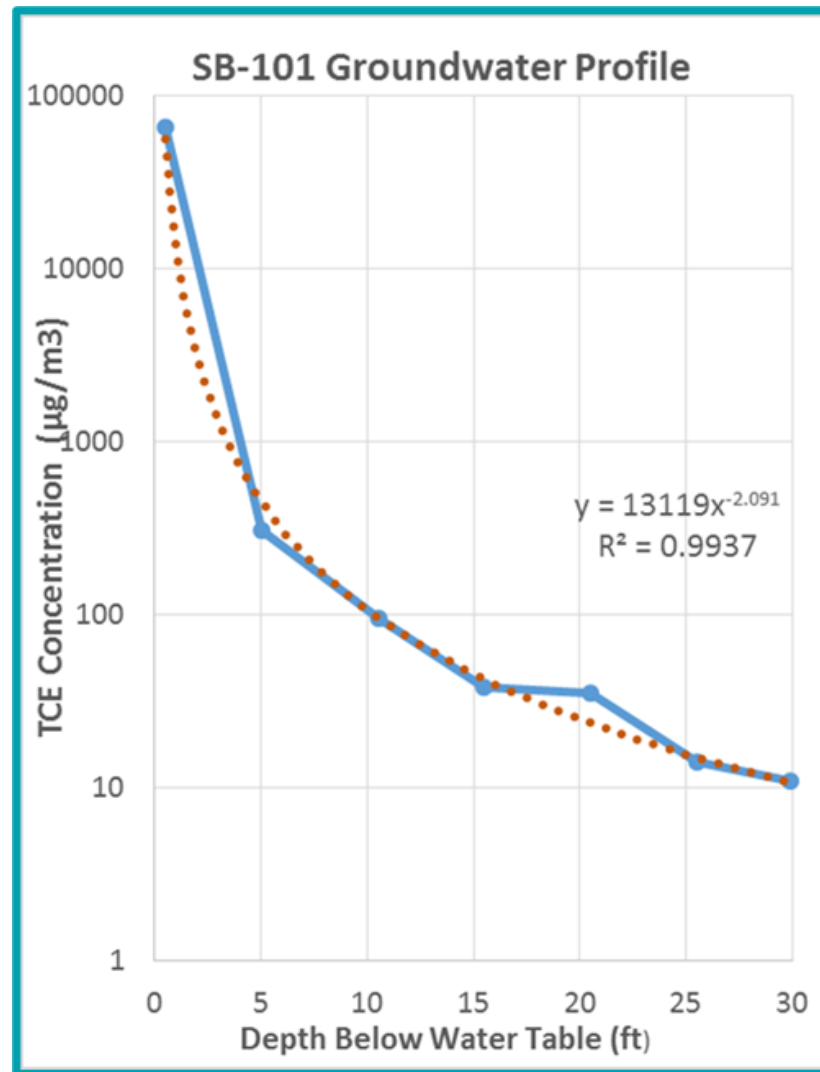
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# SOIL GAS PLUME GENERATES THE GROUNDWATER PLUME

10



- Soil gas TCE concentrations in source areas up to 10,000,000  $\mu\text{g}/\text{m}^3$  (1,850 ppm<sub>v</sub>)
- TCE in groundwater at the water table at 65,000  $\mu\text{g}/\text{L}$  (groundwater profiler data)
- Monitoring well (10 ft screen) TCE at 23,000  $\mu\text{g}/\text{L}$
- Groundwater and soil gas are in equilibrium based on Henry's law.
- Groundwater velocity is 0.5 to 1 ft/day

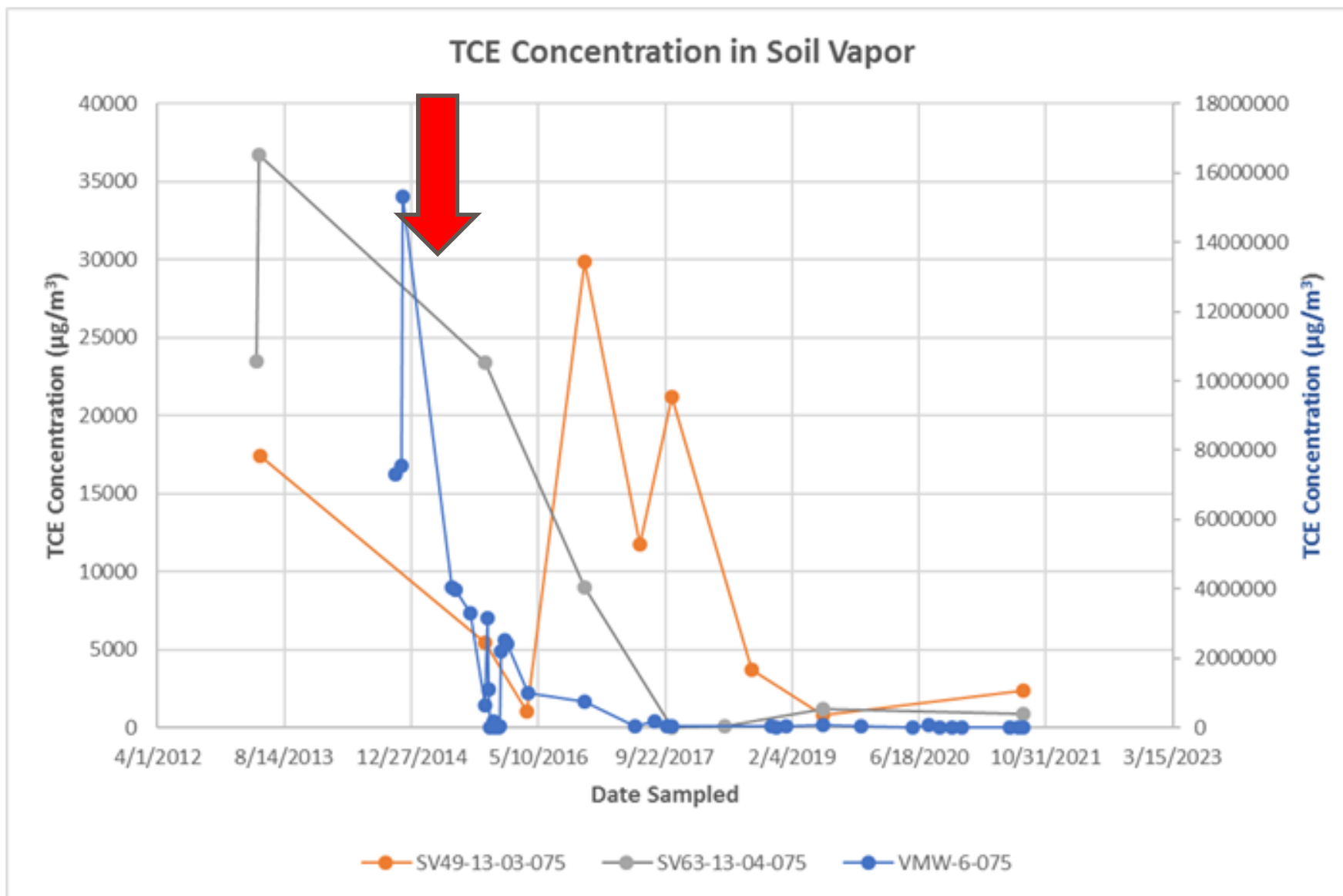






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# SVE REMOVED ~3,600 KILOGRAMS (~7,940 POUNDS) OF TCE FROM SOIL GAS





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# CSM OVERVIEW USING EVS

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# INTERIM REMEDIAL SYSTEMS UPDATE



Soil Vapor Extraction (SVE) pilot systems were shut down/decommissioned in October and November 2021. Tentative restart Fall 2024.

Site-wide soil vapor sampling conducted in August 2023.

Healthmates® continue to operate on-site, filters were replaced March 15<sup>th</sup> – 18<sup>th</sup>, 2024.

Plenum Air Purifying Units were shut off in mid December and will be turned back on most likely in May 2024.

Sub-slab depressurization systems are currently running.

Actively monitoring indoor air quality daily with the HAPSITE® for protection of human health.





# ADMINISTRATIVE RECORD UPDATE



The Administrative Record is available for review:

- CRREL library (hard copies) and
- Howe Library in Hanover (digital copies)
  - Includes all final reports
  - See the information desk to access the files

May 2024:

- 2 documents added
- 2024 up to present including:
  - groundwater reports







# UPCOMING WORK

## Indoor Air

- Continued HAPSITE® monitoring of the Main Lab, FERF, and LMO as well as other CRREL buildings
- Routine sampling of sub-slab depressurization systems
- Prepare revised indoor air monitoring approach and work plan in Summer 2024
- Install Vaporsafe™ air monitoring system in Fall 2024 to supplement indoor air monitoring on the Main Lab 2<sup>nd</sup> floor
- Plenum Study approach and work plan for Fall 2024

## Groundwater

- Monitor GMZ boundary wells, next sampling tentatively scheduled for June 2024
- Finalized pilot groundwater extraction well design

## Soil Gas

- Finalize Synoptic Soil Gas/Rebound August 2023 Report
- Draft Soil Vapor Extraction Pilot Test Report
- SVE Pilot Re-Start pending funding/new contract

## CRREL RI/FS/Proposed Plan/Decision Document

- Resolve NHDES Feasibility Study Comments
- Draft Proposed Plan and Decision Document

## Connecticut River RI/FS

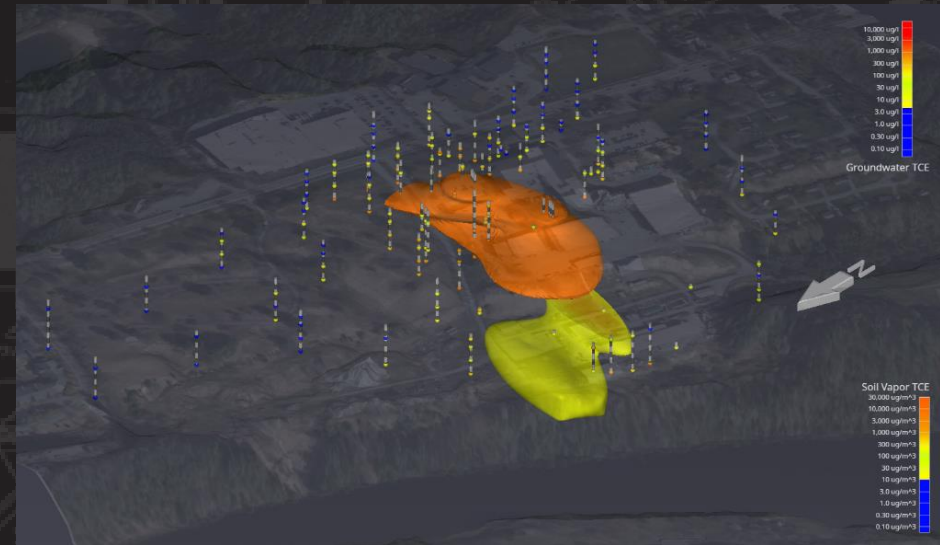
- Prepare Final RI incorporating NHDES Comments
- Submit Draft Feasibility Study after the RI is finalized for USACE Review
- Next Steps-Draft Proposed Plan and Decision Document



# QUESTIONS OR COMMENTS

## Contact Information:

Christopher Kane  
Programs & Project Management Division  
New England District  
US Army Corps of Engineers  
696 Virginia Road  
Concord, MA 01742  
[Christopher.G.Kane@usace.army.mil](mailto:Christopher.G.Kane@usace.army.mil)  
1-978-318-8025



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