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# January 2024 Technical Advisory Group

**Former Varian Facility (Site 3-0485)**
**150 Sohier Road**
**Beverly, Massachusetts**

**January 18, 2024**
**Beverly Middle School**

# Agenda

- Greetings and Agenda Review
- Summary of Activities Since Last TAG Meeting
- Status of Treatment Activities
- Response to Comments on Phase IV Remedy Implementation Plan, Parts 2 and 3
- Upcoming Submittals and Events

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# Activities Since Last TAG Meeting

- **Submittals**
  - Phase IV Part 3 Remedy Implementation Plan (Nov 7, 2023)
  - Public Meeting Summary (December 15, 2023)
  - Phase IV Parts 2 and 3 Response to Comments (January 9, 2024)
- **Activities**
  - Completed semi-annual monitoring events (110 monitoring well and surface water sampling locations)
  - Performed ongoing indoor air sampling at Longview Drive home and commercial property on Tozer Road
  - Started outdoor installation of thermal treatment system at Building 3
  - Continued relocation and renovation of CPI facilities to provide stockroom access for thermal system installation
  - Inspected Stream A mats

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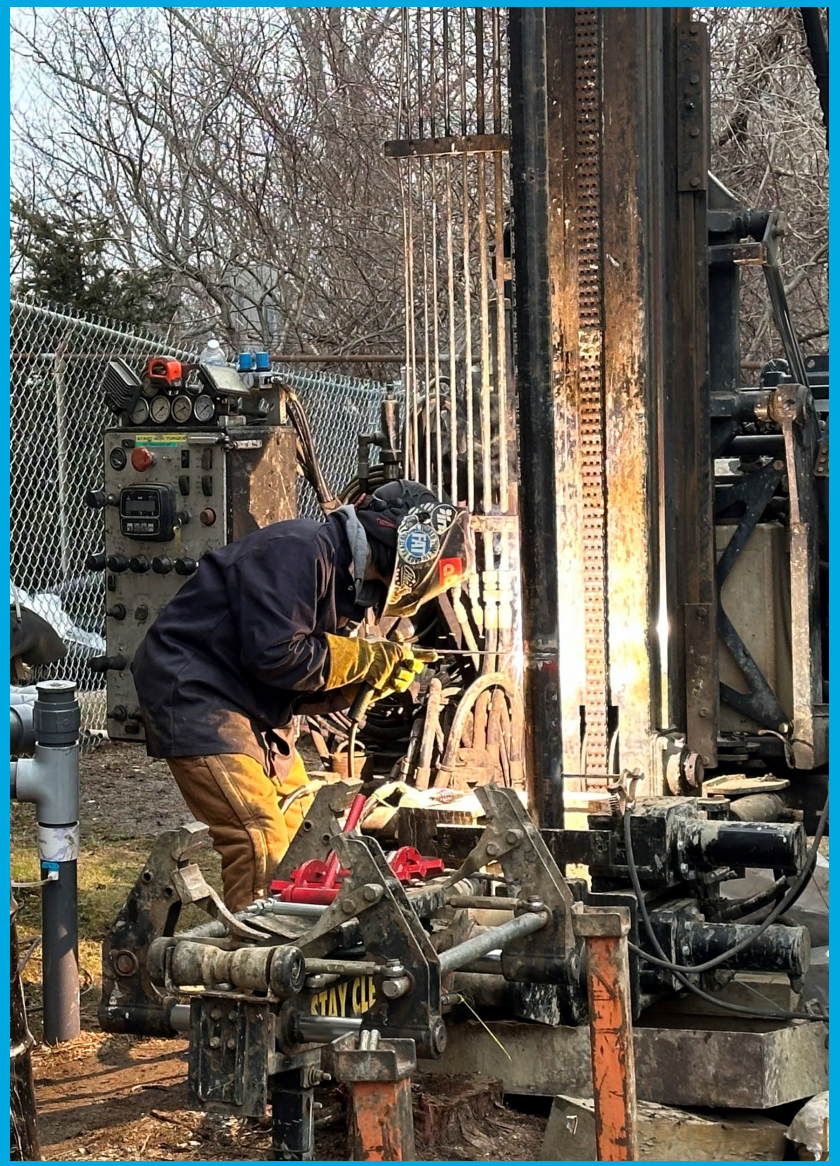
# Status of Treatment Activities

# Building 3 Thermal Treatment

- Design and construction efforts are underway on multiple aspects of the thermal treatment system
  - Relocation and renovation of CPI facilities to provide stockroom access for thermal system installation remains ongoing
  - Primary power service design by National Grid is in progress
  - Thermal system construction commenced in December!
    - Ornamental vegetation removal
    - Closed 21 PVC monitoring wells
    - Building 3 access modifications
    - SVE equipment relocation
    - Boring location and utility clearance operations at approximately 23 locations
    - Subsurface component installation (e.g., heating wells)



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# Building 2

## Renovated Basement Storage Area

- Former surplus equipment area was refurbished to accommodate sliding racks that maximize storage space
- Equipment currently in future stockroom location was relocated to the new basement storage area
- Future stockroom rehabilitation, renovation and buildout is currently underway



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# Building 3 Vapor Extraction Equipment Relocation



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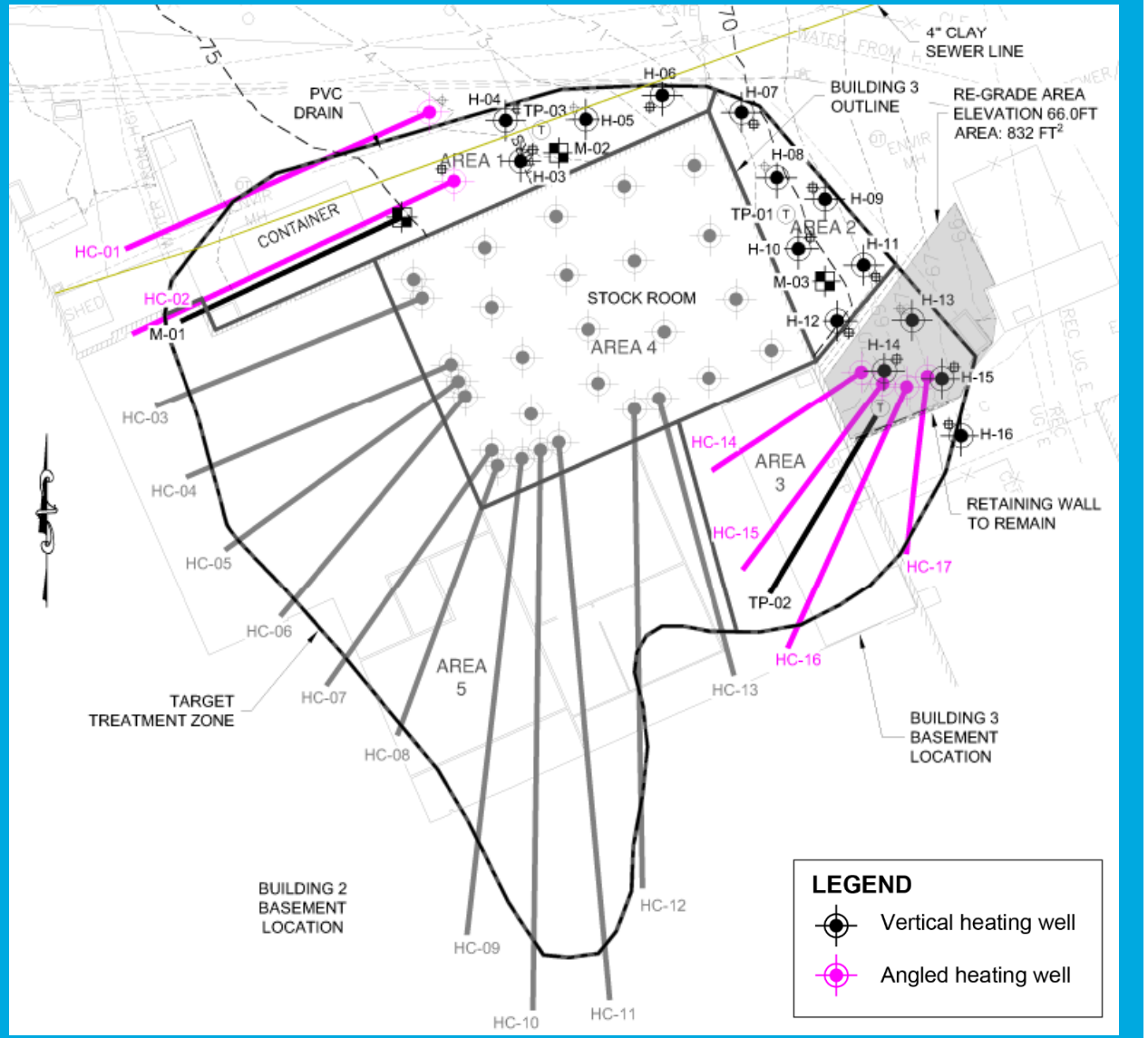
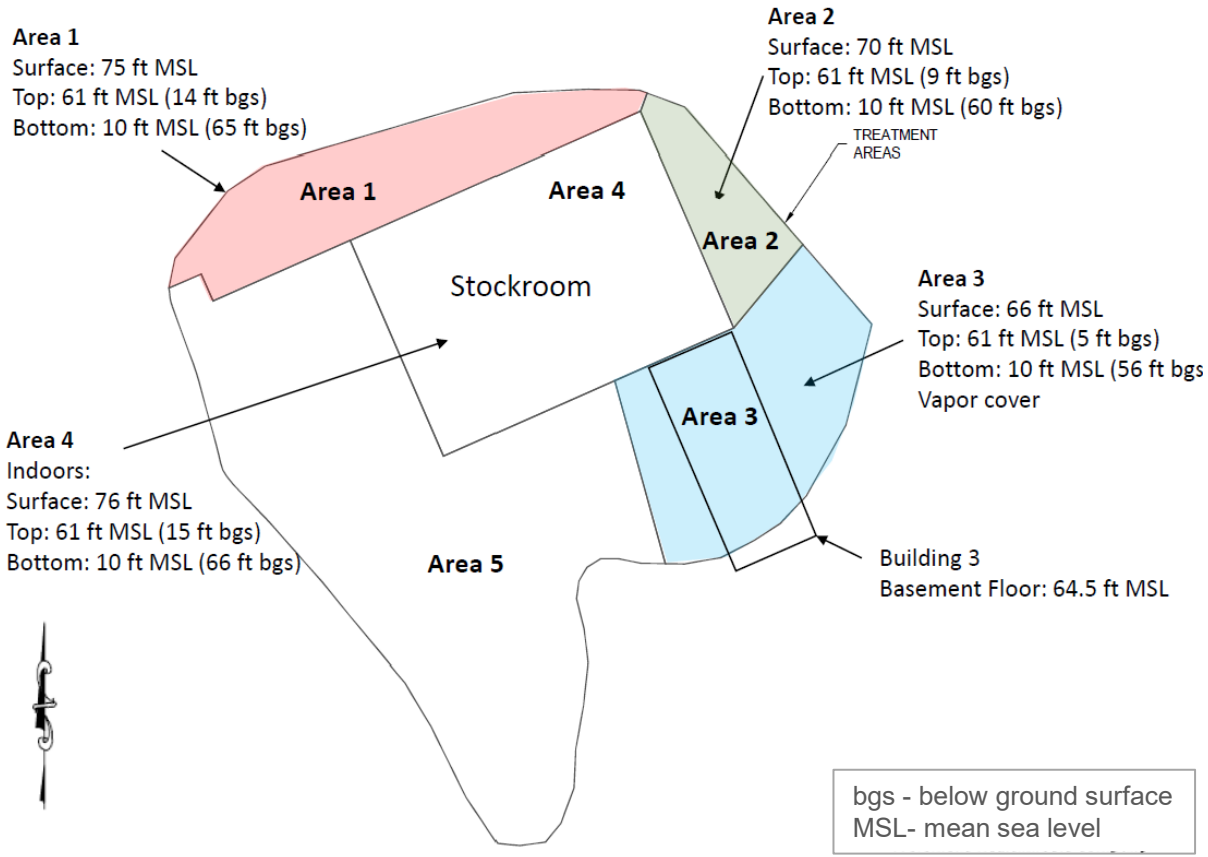
# Thermal Treatment System Construction Update




- Outdoor system installation is underway in Areas 1 - 3
- Indoor construction (Area 4) will begin once CPI stockroom move is completed



# Boring Clearance Operations

Material Removal by Vacuum

Heating Well Obstructions Identified



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# Outdoor Installation Activities



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# Outdoor Drilling

## Current Status

- Field construction began as scheduled
- Bedrock was encountered shallower than expected in some areas which could reduce drilling efforts
- Crews restarted construction on January 3 following holiday break
- Installation of vertical and angled system infrastructure is ongoing
- Field construction is on schedule; projected completion of outdoor drilling in April 2024



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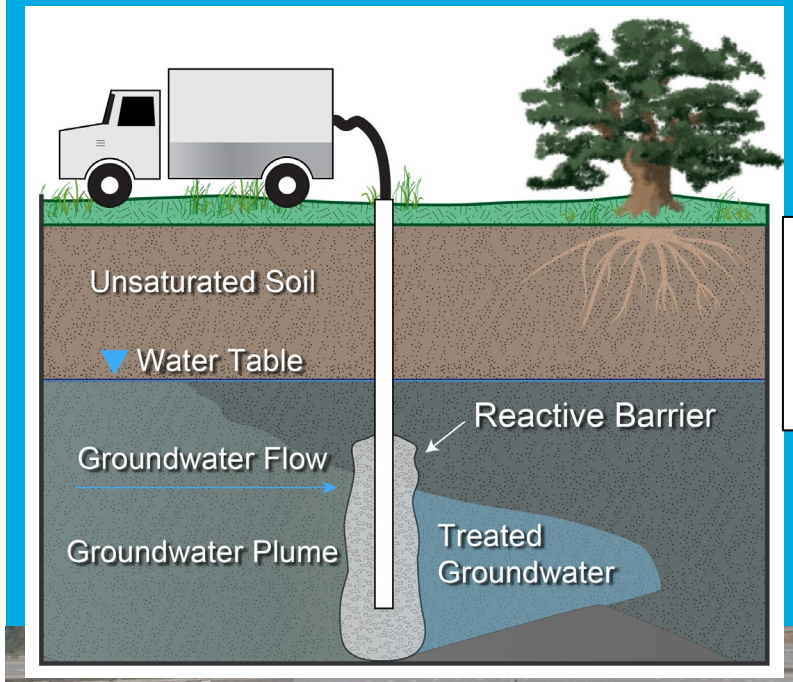
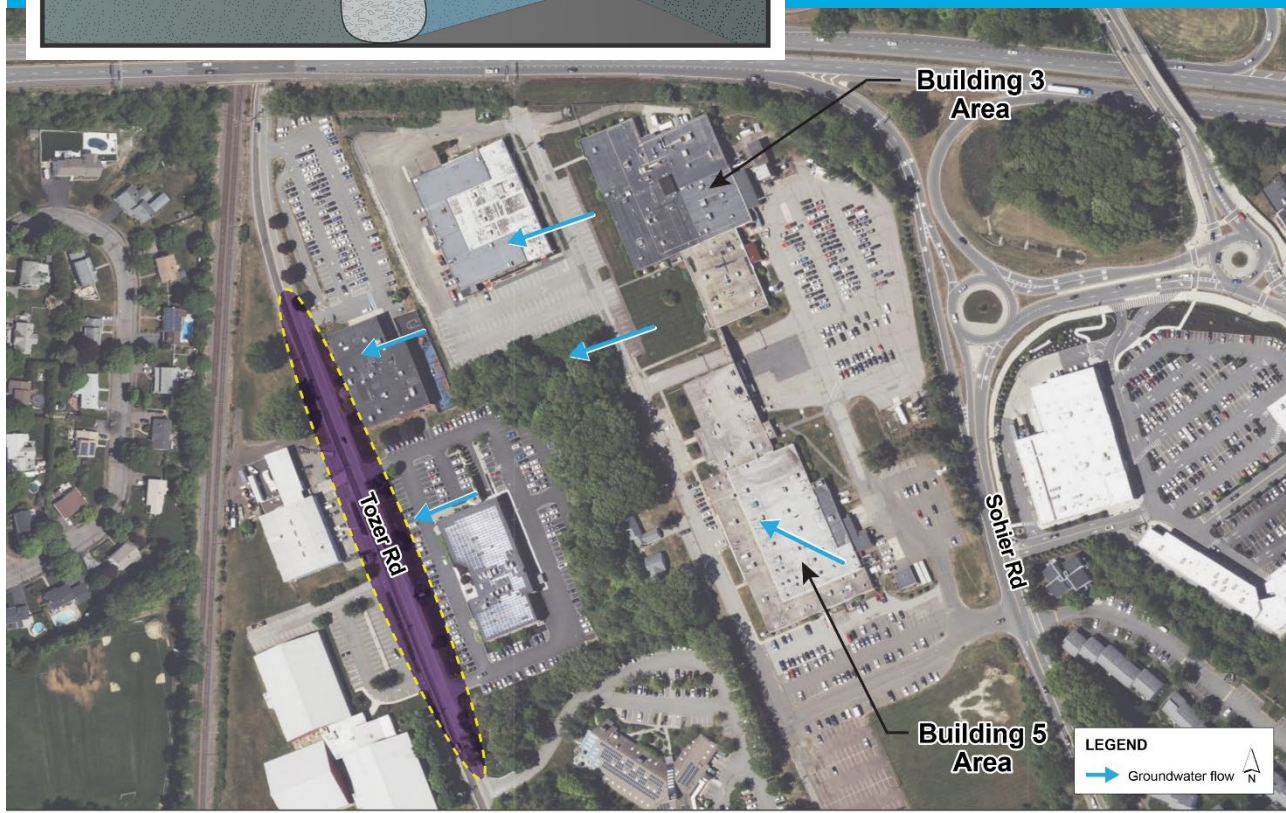
# Tozer Road Groundwater Treatment Barrier

- Membrane Interface Probe-Hydraulic Profiling Tool (MiHPT) Investigation to provide additional high-resolution data to help refine the barrier design is underway
- Additional remedial activities will include:
  - Grab soil and groundwater sampling and fluxmeters to confirm and correlate the MiHPT data and further refine the barrier design
  - Installation of new monitoring wells upgradient and downgradient of the treatment area
  - Baseline groundwater sampling
  - Injection of amendments to form a permeable treatment zone
  - Monitoring during injection
  - Post-remediation monitoring to assess performance




Installation of a permeable reactive and adsorptive barrier using sulfidated microscale zero-valent iron and colloidal activated carbon



# Status Update and Construction Photos





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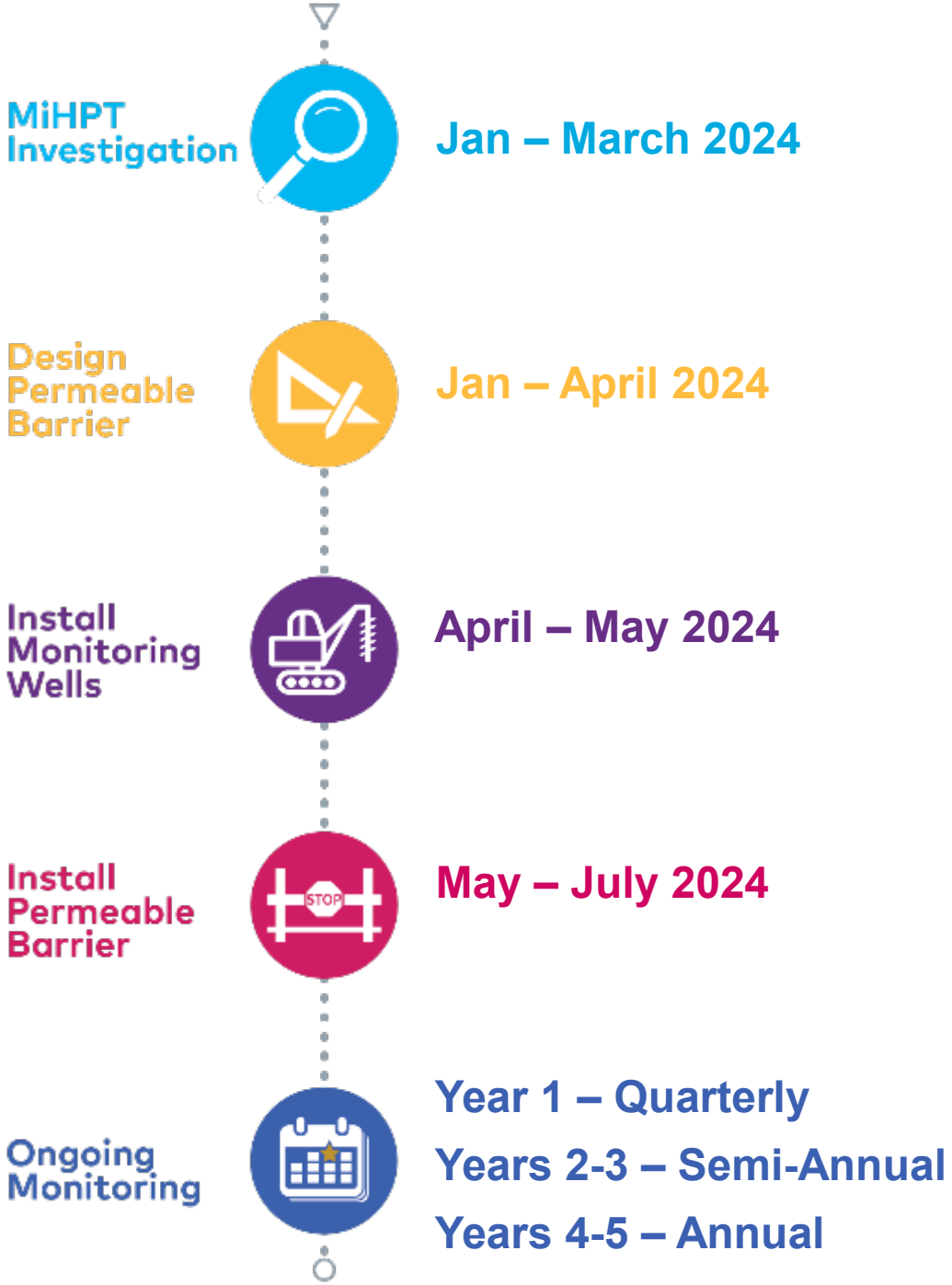
# Tozer Road Anticipated Schedule

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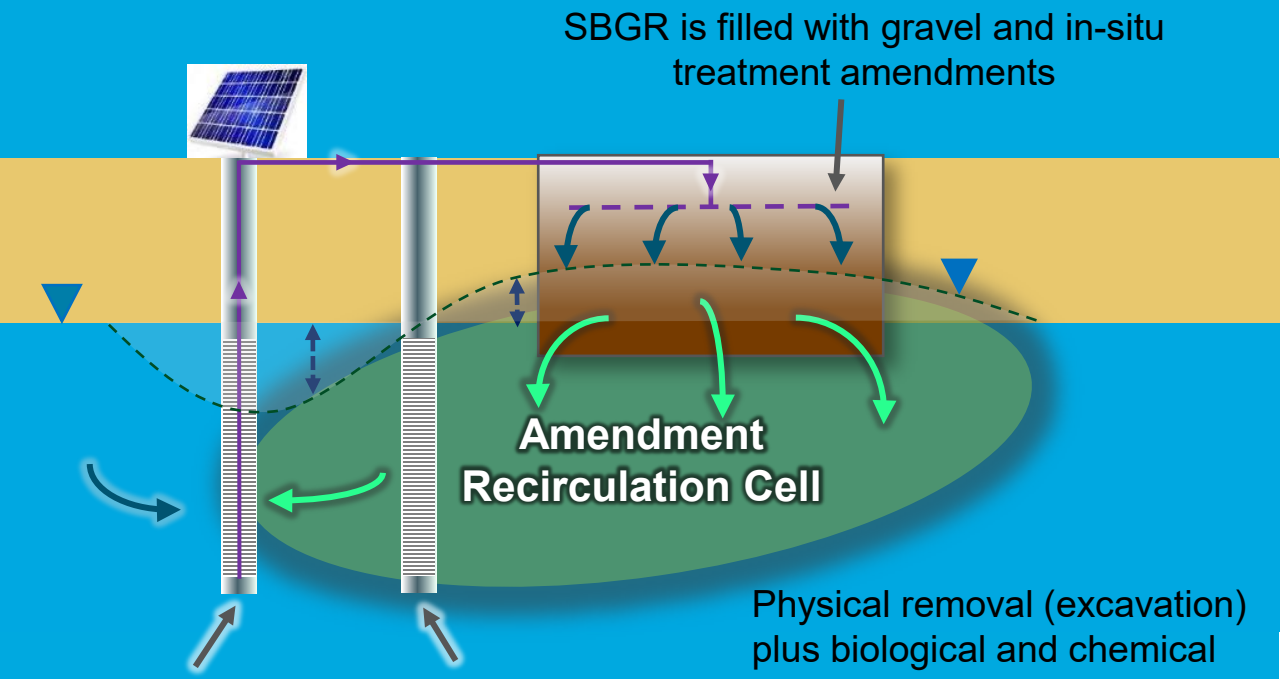


# PSL-10

- Predesign Investigation
  - August soil gas survey
  - September soil borings and monitoring well installation (5 wells)
  - Results identified VOC source mass in unsaturated and shallow saturated zones
- Phase IV Plan, Part 3 – **Subgrade Biogeochemical Reactor (SBGR)**
  - Excavation of residual source
  - Backfill with a mixture of gravel and other amendments (contaminant specific)
  - Recirculate contaminated groundwater through the SBGR
  - Sustainability considerations (power source, amendments)

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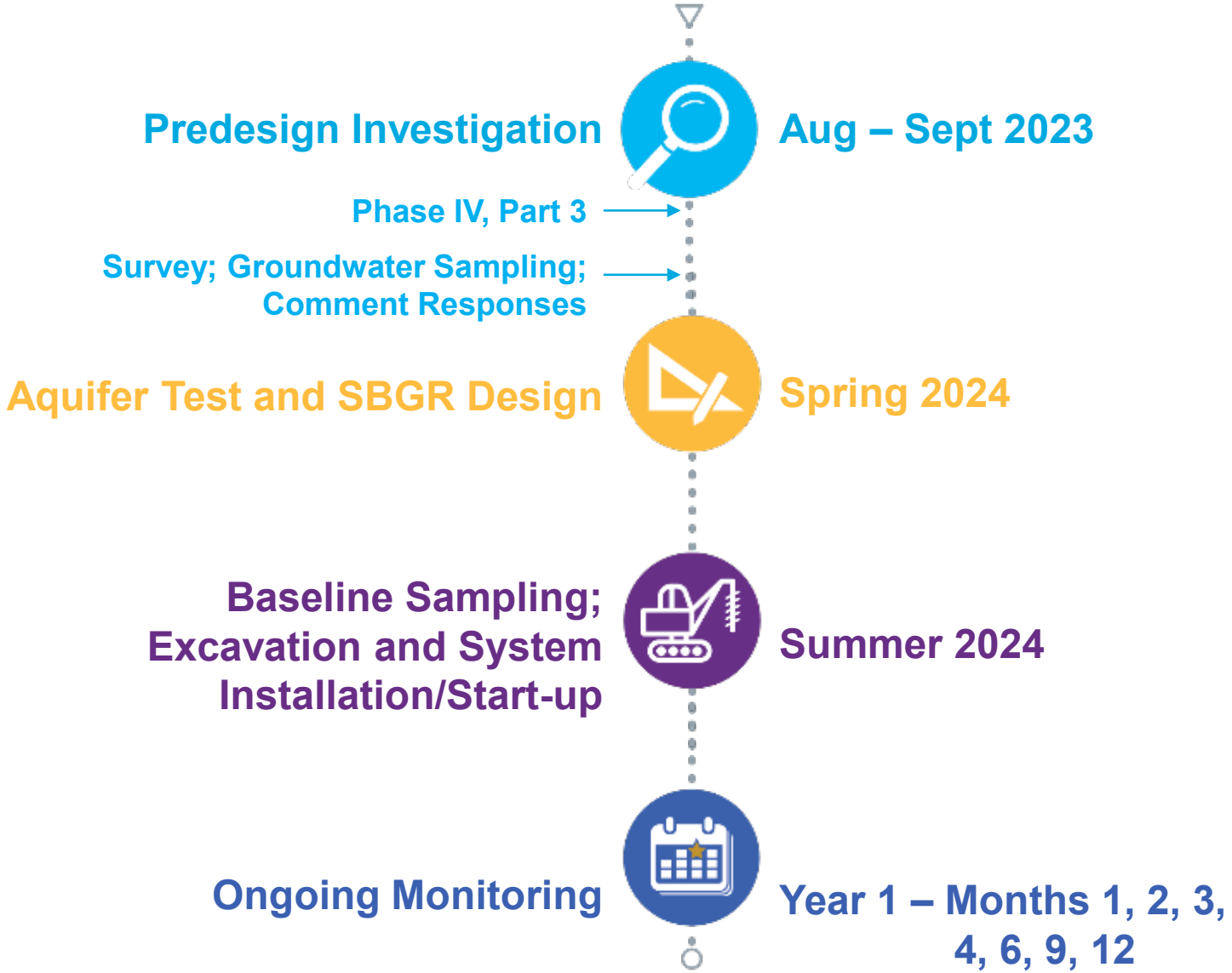
# PSL-10 Progress and Anticipated Schedule

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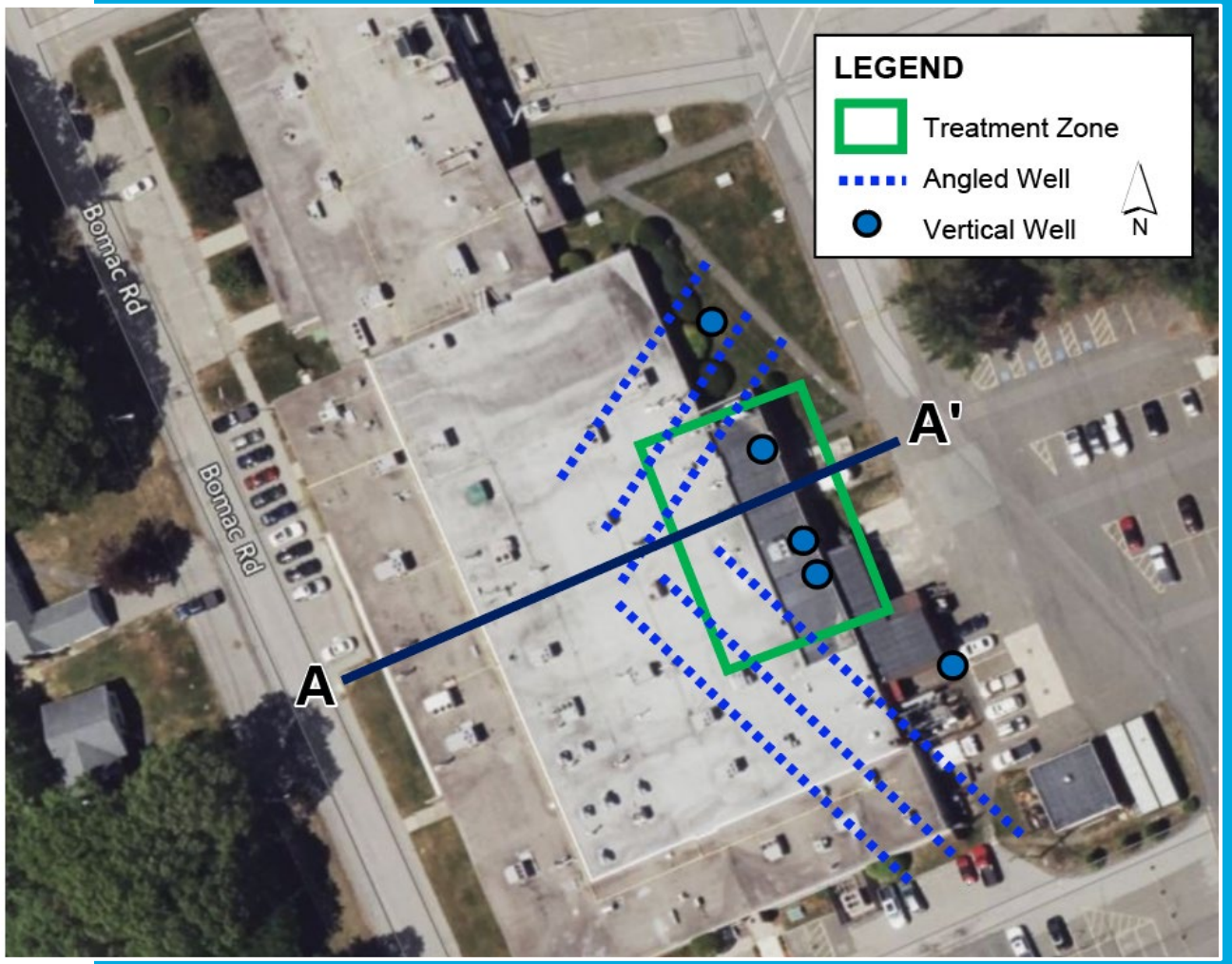
# Stream A Mat Operation

- Granular activated carbon permeable adsorptive barrier installed October 2023
  - Designed to intercept and capture contaminants before water discharges to the stream
  - Designed to limit access to the groundwater seep
  - Encountered historical drainpipe
- Scheduled and storm-related inspections completed – no issues observed
- Drainpipe water has been tested
  - Will be video-inspecting drainpipe
  - Mat covers drainpipe and treats discharge

# Building 5 Bioremediation

- Bioremediation involves injecting carbon amendments (e.g., vegetable oil) that natural microbes use as food; promotes breakdown of contaminants
- Components of the treatment system
  - Angled drilling will be used to access areas beneath the building from the exterior to avoid disturbing occupants
  - The angled drilling will include fans of wells to collect test data from different depths
  - Some vertical wells will also be installed inside and outside of the building
  - The new wells will refine the treatment zone and may be used for treatment
  - Additional wells will be installed to provide complete treatment



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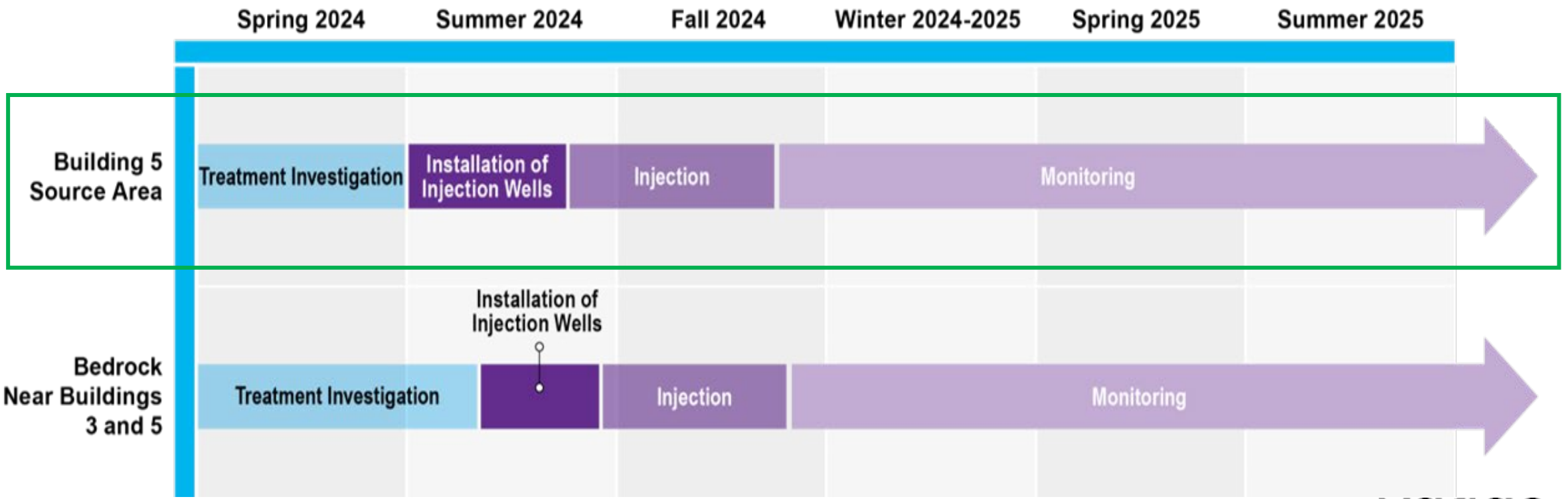
# Building 5 Bioremediation

- Currently preparing pre-design investigation
- Investigation will include fans of wells beneath the building
- Expect to start drilling in spring



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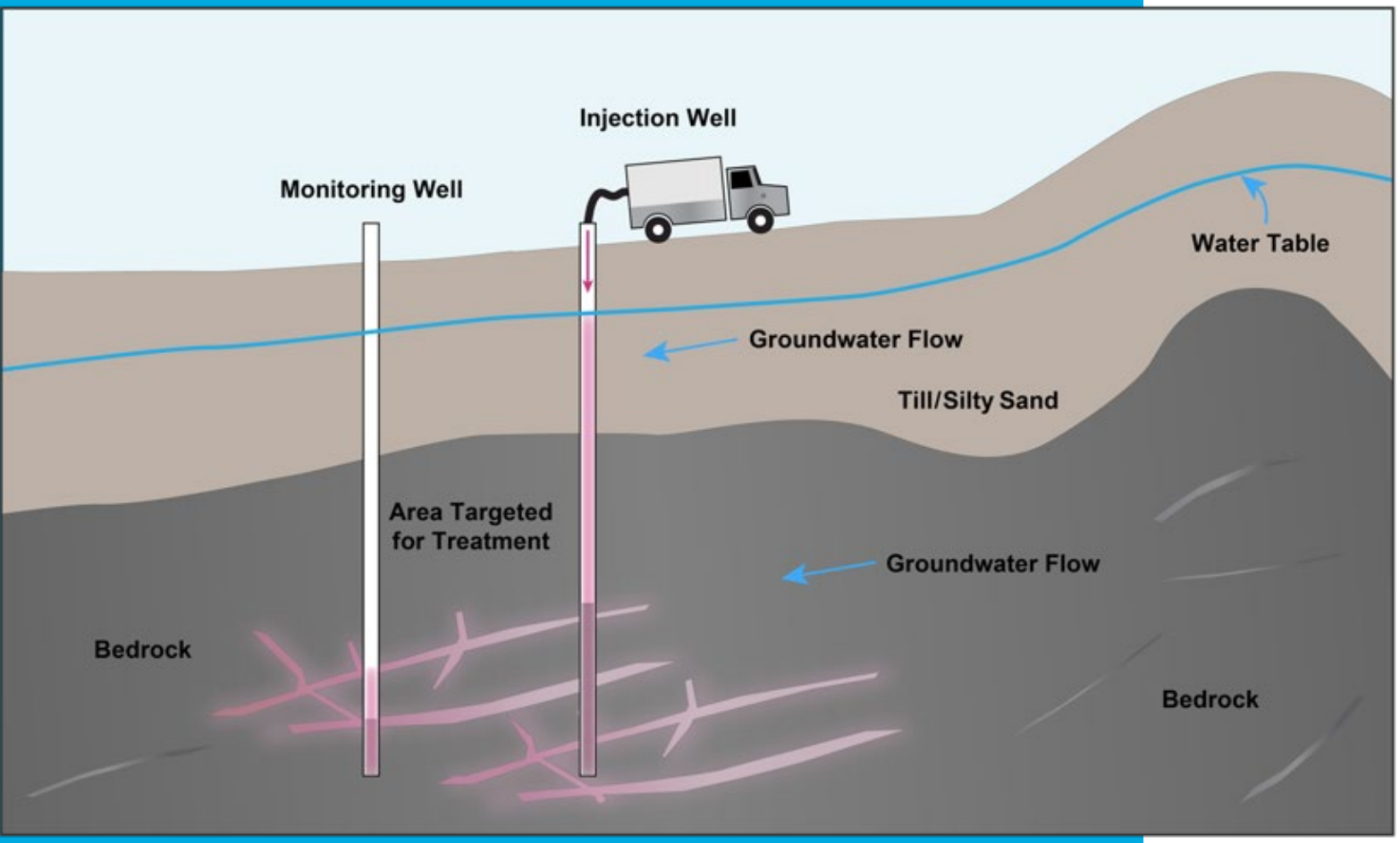
# Bedrock In Situ Chemical Oxidation (ISCO)




- ISCO refers to the use of oxidants to convert contaminants to non-hazardous or less toxic compounds
- Components of the system
  - Pumps
  - Downgradient non-injection test wells
  - Regular field monitoring (real time)
  - Regular groundwater analytical testing



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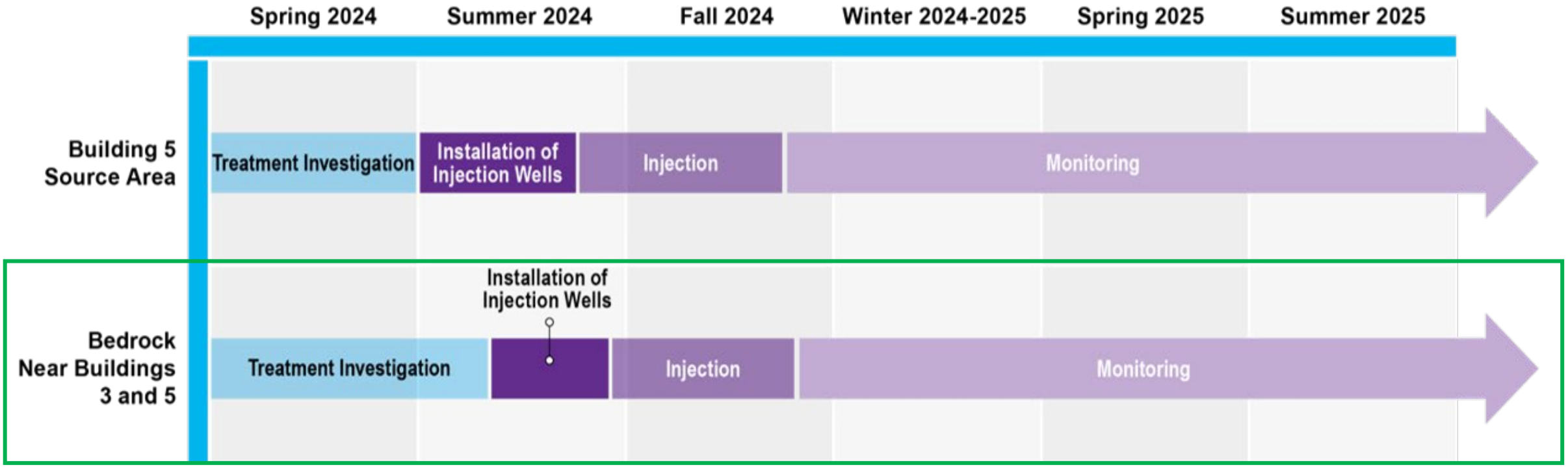
# Bedrock In Situ Chemical Oxidation

- Currently preparing pre-design investigation
- Investigation will include bedrock wells and test to confirm connections in fractures
- Expect to start investigation drilling in spring



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# Response to Comments
# Phase IV Remedy Implementation Plan, Parts 2 and 3



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# Public Comments - Phase IV Remedy Implementation Plan, Parts 2 and 3

- One set of comments received from Sage Environmental
- Technical comments, including questions regarding:
  - Clarifications on text and figures
  - Bedrock fractures and groundwater flow
  - What was the area of influence during previous injections at Building 5?
  - Potential VOC movement at PSL-10
  - What measures were taken at PSL-10, to limit potential worker exposure to VOCs during drilling? What measures will be taken at PSL-10 during excavation activities?
  - Clarifying the planned soil excavation volumes and treatment media volumes at PSL-10


https://eeaonline.eea.state.ma.us/EEA/FileViewer/FileViewer.aspx?fileEncryptionId=ibjigcde



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# Upcoming Submittals and Events

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*2024 Deliverable Schedule*

- Combined Phase IV Update Report and Temporary Solution (February 19)
- RAM Completion Report (February 19)
- Bi-Annual Status Report (August)

*Proposed Public Outreach Schedule*

- Quarterly – alternating PIP and TAG meetings
  - Mar/Apr - Public (PIP) Meeting - Temporary Solution
  - June - TAG (after close of public comment period on Temporary Solution)
  - Sept PIP – to coincide with bi-annual status report
  - Winter TAG


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