

Environmental Cleanup Update

150 Sohier Road Property, Beverly MA | **FALL 2025**

This annual fact sheet provides an overview of the status of environmental investigation and treatment of the former Varian Facility at 150 Sohier Road in Beverly, Massachusetts.

Varian Continues System Installation and Initiates Environmental Treatment

Throughout 2025, the Varian project team continued to work with the Beverly community and the Massachusetts Department of Environmental Protection (MassDEP) to implement the environmental cleanup plan and begin operation of new treatment systems for indoor air, groundwater, soil, and bedrock at the former Varian Site. The team expects to have the remaining treatment systems operating in 2026.

The design and implementation of the environmental remedies are separated into five treatment areas on Site (Figure 1):

- PSL-10 (Open Field) Source Area
- Building 3 Source Area
- Bedrock near Buildings 3 and 5
- Stream A Seep
- Building 5 Source Area

A Temporary Solution Statement was submitted in February 2024 to MassDEP. This statement, prepared by a Massachusetts Licensed Site Professional (LSP), stated that the Site does not pose a human health risk, but that treatment needs to continue to achieve a Permanent Solution. The cleanup plan the project team is currently implementing is expected to accomplish the additional treatment needed for a Permanent Solution.

Public updates occur four times a year through the Public Involvement Plan and Technical Advisory Group meetings. In addition, the Varian project team submits Phase IV Status Reports twice a year in accordance with MassDEP requirements.

In 2025, a Phase IV Plan modification was submitted for public comment and MassDEP review. This modification proposed a better treatment plan based on data collected in 2024 and 2025. These data led to the replacement of the Tozer Road barrier with an expanded Bedrock injection area. The Plan IV Plan modification does not change the team's objective to keep the community safe and lead to a Permanent Solution.

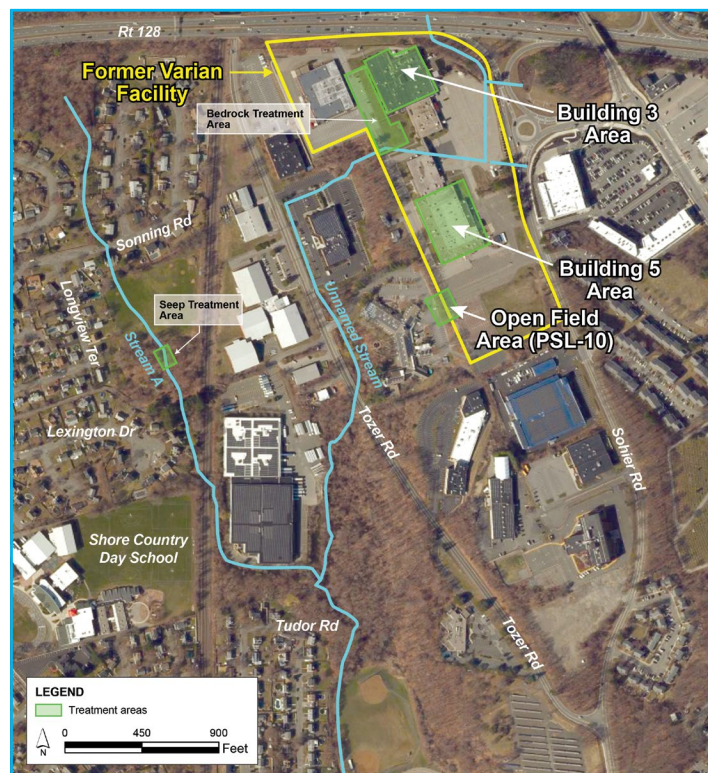


Figure 1. Site map and selected treatment areas.

Site History and Overview

The former Varian Facility, located at 150 Sohier Road, is currently owned by another firm and operated as an active manufacturing facility for microwave and radar products. The 150 Sohier Road property has been used as an industrial facility since the early 1950s. Industrial solvents were released to the environment due to the chemical handling and disposal practices that were common at the time, before stricter environmental regulations were enacted. These solvents, used primarily for surface treatment, cleaning, and degreasing operations, included trichloroethene (TCE), perchloroethene (PCE), and 1,1,1-trichloroethane (TCA). Releases of these solvents occurred in three main areas: the Building 3 area, the Building 5 area, and an open field known as potential source location (PSL) 10. TCE, PCE, and TCA are heavier than water and have limited ability to dissolve in water. They also tend to evaporate easily and are referred to as volatile organic compounds or VOCs. Varian, with support from Jacobs Solutions, has investigated and has been actively cleaning up the Site in accordance with Massachusetts regulations, known as the Massachusetts Contingency Plan (MCP). The Site is listed by MassDEP as Site Number 3-0485.

Site reports and other documentation can be found under "Supporting Documents" in MassDEP's data portal at <https://eeonline.eea.state.ma.us/portal/dep/wastesite/detailviewer/3-0000485>.

Treatment Area	Selected Cleanup
PSL-10 Source Area	Soil Excavation with Permeable Treatment Zone
Bedrock Near Buildings 3 and 5	Chemical Reduction
Building 3 Source Area	Thermal Treatment and Bioremediation
Stream A Seep	Permeable Adsorptive Barrier
Building 5 Source Area	Bioremediation

Figure 2. Cleanup approach in each area.

PSL-10 Source Area – Soil Excavation with Permeable Treatment Zone

The selected treatment for the PSL-10 (Open Field) source area is soil excavation with installation of an underground **permeable treatment zone**.

Previous investigations have indicated that a relatively small shallow area of soil may be contributing volatile compounds to groundwater in this area. Under these conditions, an effective remedy is to excavate the soil and backfill the excavated area with amendments that can enhance biological and chemical breakdown of the volatile compounds remaining underground. Using a solar-powered pumping system, groundwater in the treatment area is recirculated through the amendment backfill to provide continued groundwater cleanup. This type of permeable treatment area is referred to as a “subgrade biogeochemical reactor” (Figure 3).

In early 2025, contaminated soil in the PSL-10 source area was removed and transported off site for disposal at a licensed facility. The SGBR was constructed in February and March 2025 (Figure 4) and became operational in April 2025. Local, sustainably-sourced, and common materials were used as amendments to create the treatment media. These materials included lobster shells, crushed concrete, peat moss, and spent grain from local breweries. The amendments were mixed onsite and placed into the excavation prior to backfilling with clean soil to ground surface.

The SGBR is operational and treating groundwater, with additional monitoring ongoing. The results of an initial round of post-treatment groundwater sampling were reported in the August 2025 Phase IV Status Report. Results of additional quarterly post treatment sampling events will be presented in future Phase IV Status Reports.

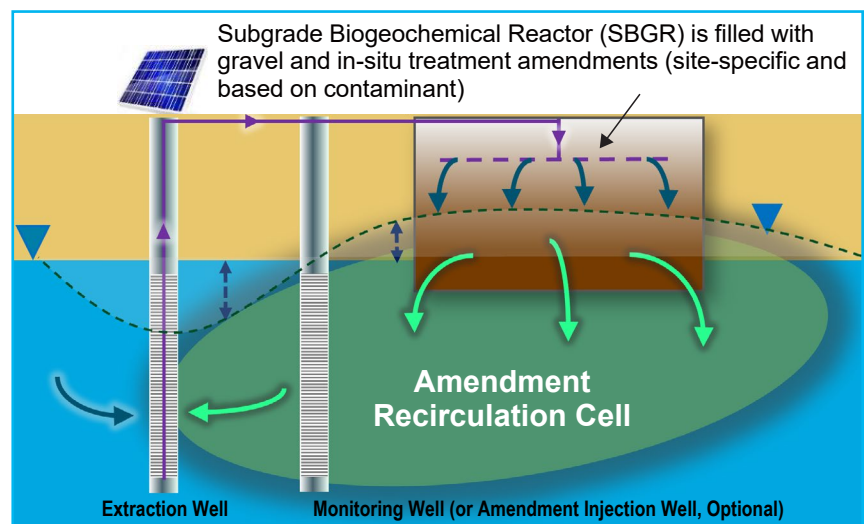


Figure 3. Diagram of an SGBR.

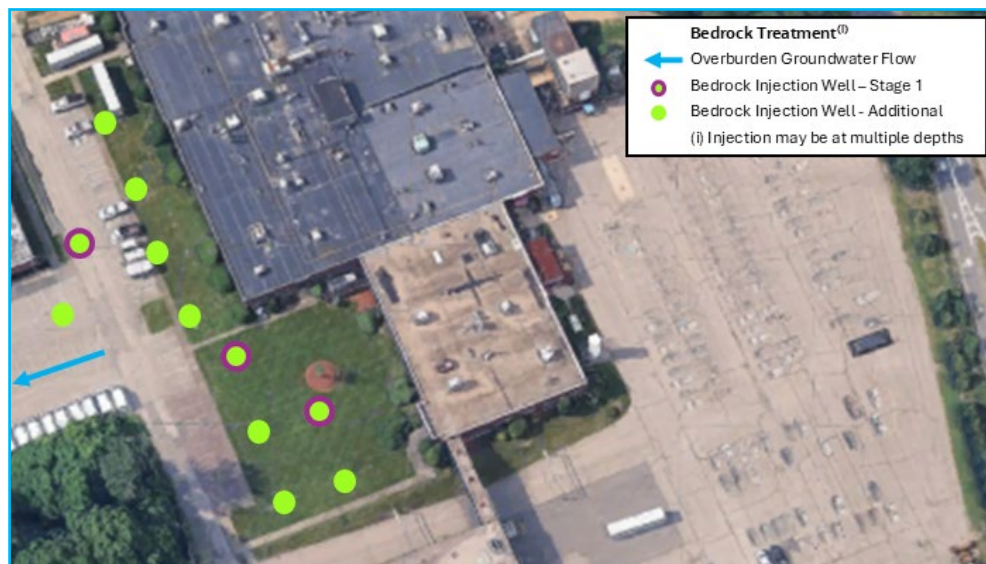


Figure 4. Final SGBR treatment cell.

Bedrock Near Buildings 3 and 5 – Chemical Reduction

A bedrock treatment area has been delineated along the western boundary of the property surrounding the Building 3 and Building 5 source areas. In that area, **chemical reduction** will be implemented to treat volatile compounds in underground bedrock fractures (groundwater-containing cracks in the rock). Data collected in 2024 and 2025 indicated that VOCs in the Building 3 and Building 5 source areas were passing through these fractures before migrating to the west of the property. Fracture treatment will destroy VOCs before they can move further west.

Chemical reduction involves injecting a mixture of emulsified vegetable oil and small particles of zero-valent iron to break down volatile compounds that are present in the fractures. Volatile compounds break down through chemical reactions with the zero-valent iron and through biological reactions with the emulsified vegetable oil and microorganisms naturally present below ground.



Bedrock treatment will be performed in stages, with each stage informing the next. Drilling of Stage 1 injection boreholes was completed in August 2025. Borehole testing was conducted to identify fractures with VOC-containing groundwater and to characterize groundwater movement and fracture connectivity across the treatment area. Injection of additives to treat bedrock groundwater occurred in September 2025 at the first three treatment wells (Figure 5). The results of performance monitoring will be reported in the next Phase IV Status Report. Stage 2 of the bedrock treatment program is expected to start in late 2025, with additional stages to follow thereafter.

Figure 5. Location of Injection wells for Bedrock Chemical Reduction.

Building 3 Source Area – Thermal Treatment and Bioremediation

Groundwater below Building 3 will be treated using **thermal treatment**, followed by a **bioremediation** polish and continued operation of the **soil vapor extraction system**.

Thermal treatment involves installing heating elements into the ground below Building 3 and heating the groundwater to the boiling point. The heating elements are like the ones in a toaster, only larger. Heating the groundwater causes the volatile compounds to become vapors. The treatment system uses extraction wells to capture the VOC vapors and pump them to the ground surface for treatment using activated carbon. The activated carbon filters out the volatile compounds (in much the same way a household water filter does), and the clean vapors are released to the environment. The carbon containing the captured volatile compounds is recycled at a licensed off-site facility.

Following thermal treatment, **bioremediation** will continue to reduce the concentrations of volatile compounds by taking advantage of the increased temperature underground. The warm groundwater that remains after thermal treatment provides an excellent environment for microbial growth. Certain microbes “eat” compounds, such as TCE and PCE, and break them down into harmless elements. Bioremediation involves stimulating microbial growth by injecting amendments (such as vegetable oil or molasses) that provide food which microbes use to grow and multiply, so they can consume more volatile compounds.

Drilling and installation of the exterior underground thermal wells was completed in January 2025. The interior drilling began thereafter (Figure 6). Interior drilling will be completed in 2026, with installation of system components occurring concurrently. Once installation is complete, treatment will begin.

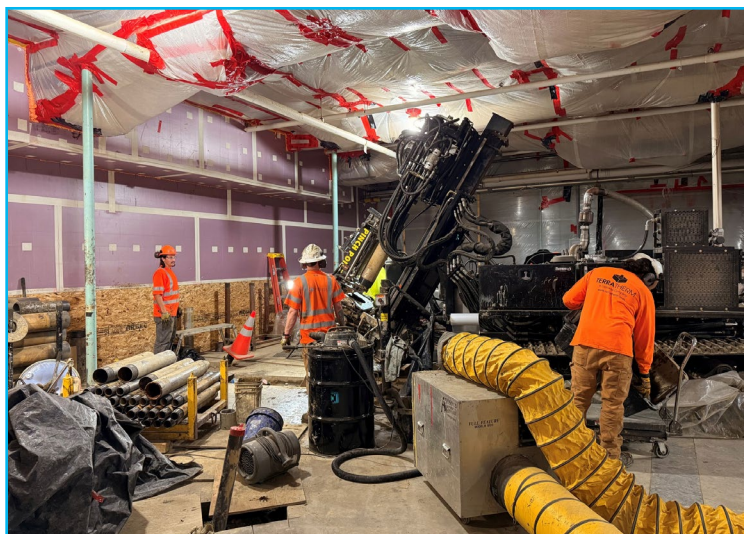


Figure 6. Drilling and installation of interior thermal wells.

Stream A Seep – Permeable Adsorptive Barrier

Permeable adsorptive barriers were installed in October 2023 at two seep areas along Stream A to capture volatile compounds in seep water before it discharges to the stream. Reactive core mats containing granular activated carbon filter out the volatile compounds (like a water filter does), and the compounds stick to the carbon as the water passes through the mats. The mats are covered with stone to prevent access or damage (Figure 7). Once the upgradient treatment has been completed, the mats will be removed, and the carbon filter material will be recycled at a licensed off-site facility.

A conservative risk assessment indicated that there was no significant risk to people or pets from contact with water from the stream before the mats were installed. The seep treatment is being conducted as an additional protective measure.

Regular inspection of the treatment mats continues as scheduled.



Figure 7. Stone covers reactive core mats along the stream.

Building 5 Source Area – Bioremediation

The selected treatment technology for groundwater in the Building 5 area is **bioremediation** and continued operation of the **soil vapor extraction system**.

Concentrations of volatile compounds in groundwater beneath Building 5 are significantly lower than beneath Building 3. In addition, bioremediation has been previously successful in the Building 5 area. Therefore, the use of bioremediation technology will continue and be expanded to new locations beneath the building. To address the deep groundwater, pressure injections will be used as a new application method. During the implementation of the bioremediation treatment in the Building 5 source area, the **soil vapor extraction system** will continue to operate to protect workers.

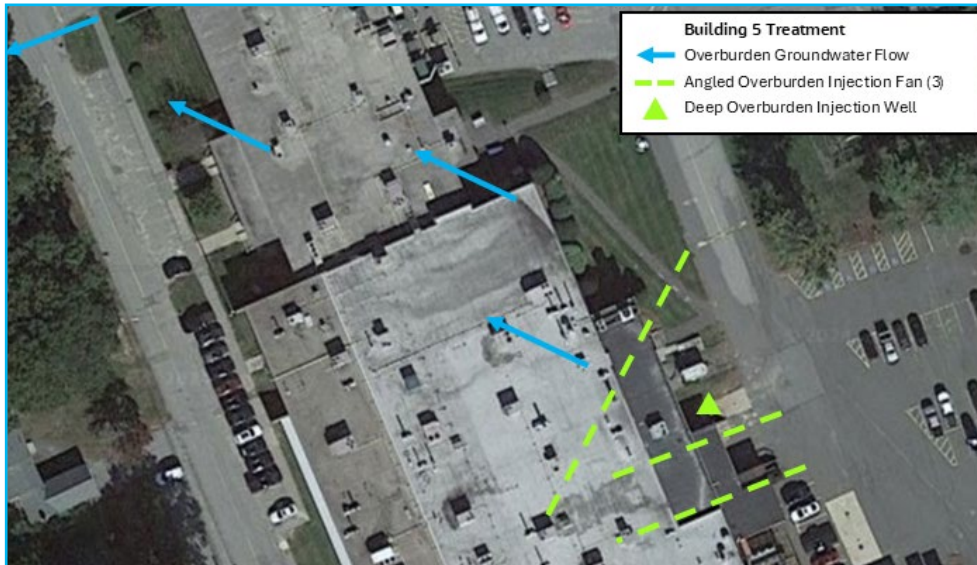


Figure 8. Treatment plan for Building 5 bioremediation.

Varian is actively working with the Beverly community and MassDEP to achieve a permanent solution at the site.

FOR MORE INFORMATION

Visit the project website: <https://beverlysitecleanup.com/>

Sign up for our mailing list: <https://beverlysitecleanup.com/more-information/>

View recent site documents: Beverly Public Library Reference Desk

Email questions: beverlysitecleanup@jacobs.com

View all site documents on the MassDEP's website: <https://eeaonline.eea.state.ma.us/portal/dep/wastesite/detailviewer/3-0000485>

In 2026, the operating systems will continue treatment, keeping the community safe, and installation of the remaining treatment systems will expand the cleanup.