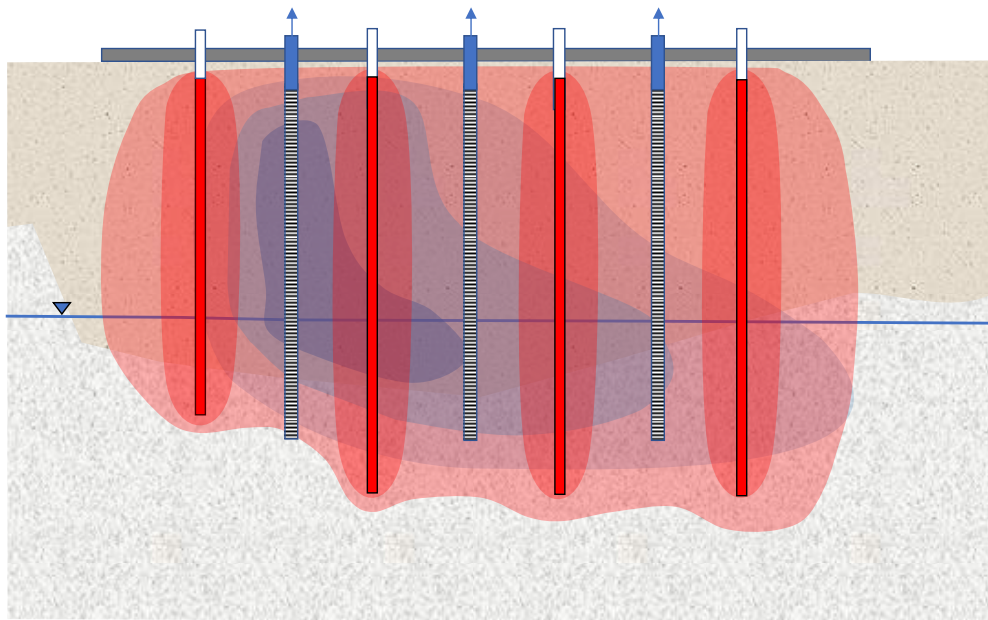


Thermal Conduction Heating

How?

Thermal conduction heating (TCH) uses heaters, typically powered by electricity, to distribute heat throughout the treatment zone. Through simple thermal conduction, heat propagates radially away from heater wells, raising the temperature of the target volume. We space the heaters in a triangular pattern for optimal heat distribution. The heat fronts from each heater well will meet over the course of the remediation with thermal diffusivity limiting the rate of heat propagation. The tighter the heater spacing, the faster a site will heat up. Typically, we design our systems to reach boiling temperatures in two to four months.

We extract vapors from separate vacuum wells or from co-located extraction screens next to heaters.



**Principle of TCH – red columns are TCH heaters; blue are extraction wells.
Blue color represents a source zone.**

Which contaminants of concern (COCs)?

We routinely use TCH to treat TCE, PCE and other volatile organic compounds (VOCs) by volatilization at temperatures from 70 to 100°C. By removing the pore water, TCH can achieve higher temperatures than the boiling point of water, which is advantageous for the volatilization of semi-volatile organic compounds (SVOCs), such as PFAS, PCBs, dioxins, and PAHs. Further, we can treat excavated soils or dredged sediments in above-grade piles.

In June 2020, the United States Patent and Trademark Office awarded TRS a patent for the in situ and ex situ thermal treatment of PFAS in soils.



FlexHeater® Element

*Why **FlexHeater®** technology?*

TRS has developed patented, more sustainable, and cost-efficient heaters that are more flexible and less expensive than the heaters developed by Shell Oil in the 1990s. **FlexHeater®** elements use less energy and nickel and weigh less than the older designs. Further, our heaters allow us to deliver power customized in three dimensions.

Above and below the water table

TCH works well above and below the groundwater table. At sites with significant groundwater flow, we combine TCH with groundwater pumping, a physical barrier to flow, or in conjunction with steam enhanced extraction (SEE) in the more permeable strata.



TCH site in operation