

Applying Thermal Conduction Heating for PFAS-Impacted Soil Remediation
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TRS Group (TRS) has completed three field demonstrations, using thermal conduction heating (TCH) to treat PFAS contaminated soil. TCH involves heating steel casings inserted into soil to hundreds of degrees Celsius ($^{\circ}\text{C}$). The heat propagates from the casings, heating the surrounding soil, volatilizing PFAS, which is then captured and treated. The field demonstrations include:

- Treatment of an existing soil pile at Eielson Air Force Base
- In situ treatment of soil in a fire-training area at Beale Air Force Base
- Treatment in an engineered soil pile at Joint Base Elmendorf Richardson (JBER)

TRS has demonstrated the effectiveness of PFAS thermal desorption at temperatures between 350 and 700 $^{\circ}\text{C}$, most recently at JBER near Anchorage, Alaska. Incorporating lessons from earlier demonstrations, TRS heated 2,000 cubic yards of soil over three months to an average temperature of 638 $^{\circ}\text{C}$. To evaluate performance, 30 soil samples were collected- all showed PFAS concentrations below USEPA and Alaska DEC soil criteria. The combined sample was non-detect for all targeted PFAS, analyzed by EPA Method 1633.

A total of 710,000 kilowatt-hours (kWh) of energy were applied to the soil stockpile, which equates to 355 kWh/yd³- which is low compared to other thermal solutions. An analysis completed by the US Navy TRS's treatment at Beale AFB more sustainable than alternatives such as excavation, off-site disposal, or incineration. Vapors were treated via cooling, condensation and filtration, meeting all local air and water discharge requirements.

Thermal treatment works for all soil fractions, including fine particles like clay and silt, construction debris, asphalt and concrete. Final waste is minimal, mostly composed of spent activated carbon, which can be regenerated or destroyed. Nearly all treatment equipment components can be reused or recycled.