# Low Temperature Thermal Remediation

## Enhancing Remedies Without the Cost or Disruption of Traditional Thermal

TerraTherm's patented low temperature thermal remediation (LTTR) technology expands what is possible in site remediation by safely and gently heating contaminant source zones to between 35–80°C, depending on the application being enhanced. At these temperatures, thermal energy is used not to volatilize contaminants but to accelerate the physical, chemical, and biological processes that drive remediation.

By elevating subsurface temperatures into optimal reaction ranges, LTTR reliably enhances:

- Biodegradation (aerobic and anaerobic)
- Chemical reduction
- Chemical oxidation
- Hydrolysis reactions

The result is faster, more effective cleanup, often reducing remediation timelines by years without the complexity and cost of full-scale thermal systems.

## Thermal Performance Without Full Scale Thermal Complexity

LTTR delivers these performance benefits without the cost, construction, and operational burdens of traditional thermal systems. There is no need for vapor covers, extraction wells, manifold piping, or extraction and treatment systems.

Projects can typically be monitored and operated remotely, significantly reducing or eliminating full-time on-site staffing. Power demands are also much lower, improving sustainability and compatibility with existing electrical infrastructure. Because heating is controlled and non-intrusive, low temperature systems can be safely deployed beneath and around occupied buildings, utilities, and active facilities, without disrupting site use.

## A Smarter Way to Strengthen Injection-Based Remedies

LTTR is especially effective as a targeted enhancement for sites already using injection-based remedies.

When injection-based programs underperform due to limited amendment distribution, mass transfer constraints, rebound, or stalled reaction pathways, LTTR can be selectively applied to re-energize the remedy rather than replace it.

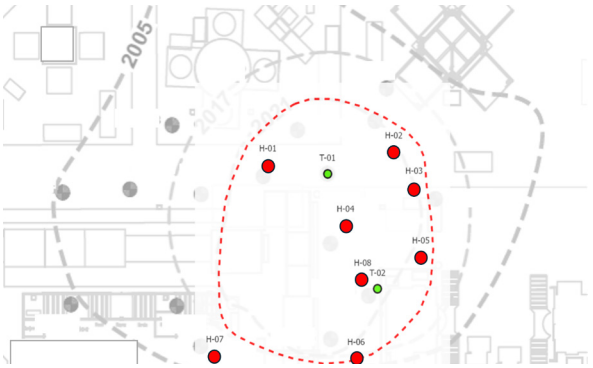
Gentle heating increases contaminant desorption and mobility, improves amendment contact with residual or sorbed mass, and accelerates biological and chemical reaction rates. At sites where low-permeability strata act as contaminant reservoirs, elevated temperatures can also increase the back-diffusion rates of contaminants out of these strata, thereby improving remediation performance.

Applied strategically, LTTR acts as a catalyst to address the root causes of poor injection performance, reduces rebound risk, and restores progress toward remedial objectives without replacing the underlying injection strategy.

## Applicable to a Wide Range of Contaminants

LTTR has been successfully applied to enhance the remediation of:

- Petroleum hydrocarbons and LNAPL
- BTEX and other VOCs
- Chlorinated solvents (CVOCs), including PCE and TCE
- Other contaminant source zones where reaction rates, contaminant availability, or amendment contact limit performance




## Contact Us

If your site needs faster progress without full scale thermal complexity, TerraTherm's patented low temperature thermal remediation technology offers a smarter, targeted path to closure. Talk with TerraTherm to discuss how LTTR can enhance your remedy and accelerate site cleanup.

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