TerraStryke® **Remediation Products LLC**
P.O. Box 254
Andover, NH 03216

www.TerraStryke.com

Project Highlights

- **Additive Deployment via Direct Push Technology (DPT)**
- **Cost-Effective - Low Impact Saturated Soil and Groundwater Remediation**

- **TPHENHANCED™** cost-effectively enhances hydrocarbon degrading heterotrophic bacteria
- **TPHENHANCED™** provides an analogue to Oxygen to realize contaminant destruction under anaerobic conditions
- **TPHENHANCED™** eliminates the costs and liabilities associated with above-ground support equipment typical to traditional in-situ bioremediation projects.
- **TPHENHANCED™** enhances contaminant solubilization and bioavailability of residual source mass contaminants achieving long-term site compliance

Safe, Green, Cost-Effective
Contact TerraStryke® NOW!
603.731.3159

TerraStryke® TPHENHANCED™

Cost-Effective, Low-Impact Residual Groundwater Remediation
Petroleum Fuel Oil Release; Philadelphia, Pennsylvania

TerraStryke® Remediation Products, LLC (*TerraStryke*®) develop and distribute biostimulation additives proven to cost-effectively enhance the destruction of dissolved phase and residual source mass contaminants by nourishing native microbial populations.

TerraStryke® **TPHENHANCED™** enriches site geochemistry and heterotrophic bacteria to realize the destruction of petroleum hydrocarbon (PHC) contaminants under anaerobic conditions, thereby eliminating the costs and liabilities associated with above ground support equipment typical to traditional bioremediation technologies.

SITE: Manufacturing facility where after removal of an Underground Storage Tank (UST), and adversely impacted soils, residual PHC source mass was documented as light non-aqueous phase liquid (LNAPL). Physical recovery decreased LNAPL thickness from 1.3 ft to 0.18 ft over a 3-year period. The regulatory contaminant drivers included Naphthalene and 1,2,4-Trimethylbenzene (1,2,4-TMB). **TPHENHANCED™** was deployed in 2010 via direct push injection in the vicinity of the former UST excavation. Within 6-months after additive deployment the following results were observed:

RESULTS:

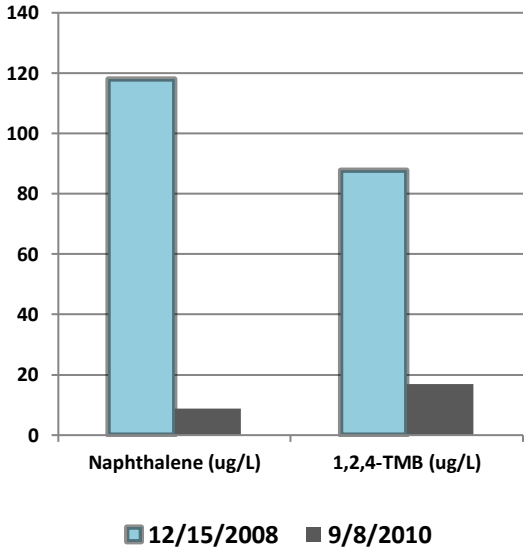
Concentrations of Naphthalene decreased by approximately **92%**

Concentrations of 1,2,4-TMB decreased by approximately **83%**

Specifically:

- Naphthalene decreased from 118 ug/L to 8.8 ug/L
- 1,2,4-TMB decreased from 97.7 ug/L to 17 ug/L

Post deployment of the biostimulation additive **TPHENHANCED™** each of the above contaminants of concern and additionally Benzene and other PHC contaminants have remained within regulatory standards.



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To evaluate our biostimulation products at a site under your management, please review the following; then contact us to discuss utilizing biostimulation to realize cost-effective, low-impact and sustainable residual source mass destruction.

On-Site PRODUCT EVALUATION PROCESS

TerraStryke® provides a low-cost, low-risk pilot program to determine additive efficacy under actual site biogeochemical conditions. We eliminate the 'jar effect' and provide potential clients a representative, yet conservative, 'Go-no-Go' evaluation to confirm additive efficacy and assist in the confirmation of estimated additive loading requirements, while assisting stakeholders (Owners/Generators, Regulators, Consultants/Practitioners) a level of assurance to confidently proceed.

DEPLOYMENT PROCEDURES

TerraStryke® Pilot Studies are performed *in-situ, under actual site biogeochemical conditions*, using Passive Release Sock (PRS) deployment units. Additive filled PRS units fit inside 2-inch groundwater monitoring well(s) and remain suspended in the screened interval proximate to a source zone. At scheduled intervals, PRS units are replaced and groundwater monitoring, sampling, and analytical testing is performed. Typically, four to five monitoring/replacement events are required per evaluation.

LENGTH OF EVALUATION

TerraStryke® evaluations require specific time per the contaminant of concern; PHC compounds may require up to 6-9 weeks; whereas, chlorinated volatile organic compounds (cVOCs) typically require 6-9 months for completion. A minimum 50% reduction Performance Criteria is established. The comparison of performance data to baseline conditions will be the basis for determining efficacy. Upon the completion of each evaluation, ***TerraStryke***® shall provide a Technical Memorandum discussing the pertinent results. PRS evaluations are not scalable and PRS deployment units are not designed for full-scale use.

PILOT STUDY COSTS

TerraStryke® provides ***at no cost*** additive filled PRS deployment units to complete an evaluation assuming all data generated during the evaluation is to be shared with ***TerraStryke***® for submittal as an abstract(s) for publication and/or presentation with client approval and/or anonymously. Concerns associated with confidentiality will be strictly observed.

It is critical, for the successful completion of a pilot evaluation, that scheduled groundwater monitoring/sampling events be adhered to accurately. For PHC sites these events typically occur every 10-14 days; for cVOC roughly every 6-8 weeks. We recommend performance monitoring/sample collection activities be combined with PRS replacement events and all field activities be completed by the same personnel. In summary, the Pilot evaluation represents a low-cost/low-risk treatability study performed under actual biogeochemical conditions, providing stakeholders proof of amendment efficacy prior to full-scale commitment, without long-term impacts to treatment zone geochemistry.

Please contact a ***TerraStryke***® representative today to discuss evaluation processes, applicability, and testing parameters.