PetroFIX Excavation Blend

Application Guide

For Excavations, Backfill and Spill-Response Trenches

Overview

This document provides general guidance only. All site works should be risk assessed on a site-specific basis and completed by competent, qualified personnel using appropriate machinery and equipment.

Dosing Calculations

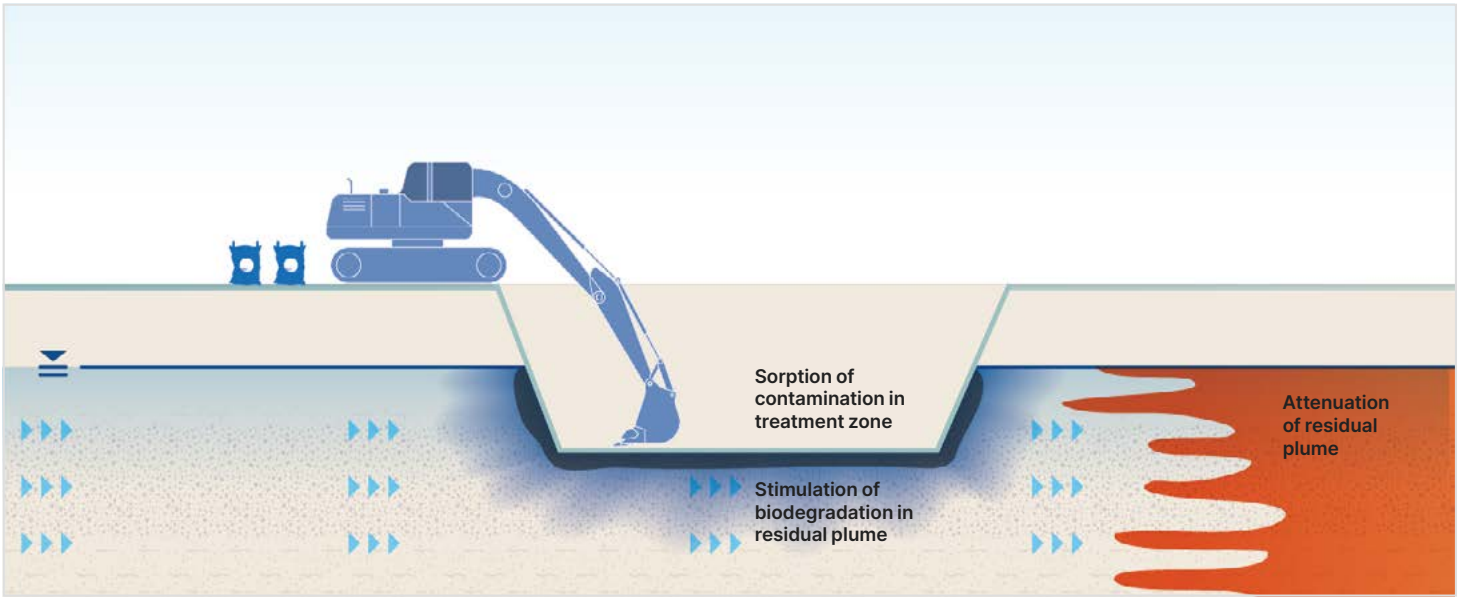
Use the Quick Dosing Guide for Hydrocarbon Excavations or contact REGENESIS for a free site-specific design. Rule-of-thumb doses support quick field decisions but are not designed on their own to meet site-specific cleanup targets or regulatory requirements.

Purpose and Treatment Objectives

After a petroleum release, UST removal, or hydrocarbon-impacted soil excavation, PetroFix Excavation Blend is a simple way to treat residual groundwater contamination to reduce the risk to onsite or downgradient receptors. Its activated carbon microaggregate sorbs dissolved hydrocarbons and limits further leaching from residual mass in the excavation footprint, rapidly reducing groundwater concentrations. The calcium sulfate component then drives enhanced biodegradation of the sorbed mass for long-term treatment. Not intended for free product, chlorinated solvent source zones, or as a substitute for source removal.

Product at a Glance

Property	Detail
Form	Dry, low-dust activated carbon microaggregate plus powdered calcium sulfate blend (CSB)
Packaging	Carbon in 1,200 lb supersacks plus 300 lb (six 50-lb bags) of CSB per 1,200 lb supersack
Storage	Not affected by freezing. Store sealed, dry, and below 95°F.
SDS	SourceStop SDS Calcium Sulfate Blend SDS
Contaminants	Petroleum hydrocarbons: BTEX, MTBE, GRO/DRO, naphthalene, PAHs, diesel, jet fuel



Carbon sorbs contamination in the treatment zone, sulfate stimulates biodegradation, and the residual plume leaving the excavation attenuates.

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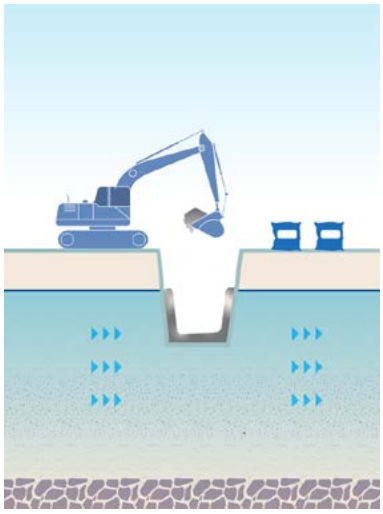
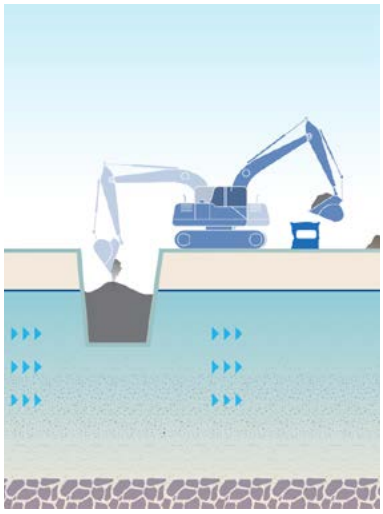
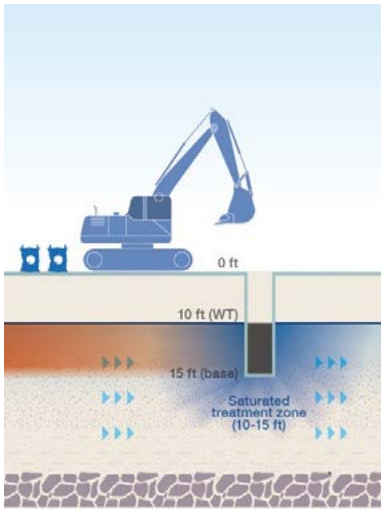
Common Application Methods

	A. In-Excavation Mixing	B. Surface Pre-Blend + Backfill	C. Spill-Response Trench
Objective served	Treat groundwater contacting residual contamination in the excavation base and lower sidewalls	Create a treatment zone within backfill placed below the water table; limit recontamination of clean backfill.	Intercept the dissolved plume before it reaches a receptor; installed soon after the spill
Best when	Immediately following excavation	Backfill is placed in lifts; greater vertical treatment is required	A fresh release threatens a nearby receptor, allowing completion of primary spill response works
Where it goes	Mixed into the base and lower sidewalls	Mixed into the backfill, which is then placed back into excavation	Trench backfill across the shallow saturated interval
Typical equipment	Excavator / backhoe with toothed bucket	Excavator, backhoe, or loader on a lined staging pad	Excavator / backhoe (one bucket-width trench)
Illustration (not to scale)			
Description:	Excavator mixing in the pit base	Sacks staged with excavator placing pre-blended backfill into the excavation	Excavator placing product into a narrow interception trench



Mixing and Placement Equipment Options

A standard excavator bucket is suitable for most applications. For clayey soils, large volumes, or precise dose control, the options below may improve mixing or productivity. Select an approach based on soil type, treatment depth, site access, available equipment, and crew experience.

Works with the equipment already on site:
Most applications need nothing more than the excavator that dug the hole. Material can be placed in excavation and mixed with native soils. No water tanks, pumps, injection rigs, or added mobilization.

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Equipment	Best for	How to use it
Excavator / trackhoe bucket (Standard)	Excavation base, backfill lifts, trenches; sandy to silty soils	Mix the soil: dig, lift, and drop, followed by spreading and smearing with the bucket teeth or bottom. Soils with higher clay or silt content may require more aggressive mixing with trackhoe, or other high-energy mixing options (e.g., rotary mixing heads or above ground pre-mixing)
Backhoe or loader	Small digs; pre-blending backfill in a staging area	Similar to above and mix until product is evenly distributed. Good for Method B on smaller sites.
Screening / mixing bucket (e.g., ALLU®)	Pre-blending backfill; cloddy or clay soils	Attaches to an excavator or loader. Screens, breaks clods, and blends in one pass for a consistent pre-blend.
Rotary mixing head (e.g., Alpine®, Antraquip®)	Clay soils; larger in-place volumes	Excavator-mounted rotating drum. High shear with good depth control. In-place mixing systems typically treat 400 to 1,200 yd^3 per day. Carefully match horsepower on mixing heads to attain sufficient mixing rates.
Shallow soil mixer / tiller (e.g., Stehr®)	Pre-blending volumes of backfill	Works like a large rotary tiller. Suited to pre-blending backfill in a staging area, not deep excavation bases.
Bottom-discharge hopper or concrete skip	Metering into narrow trenches or measured lifts	Fill the hopper from the supersack at grade, lift it over the target, and open the gate to meter out evenly.
Lifting frame or hanging scale	Every job; partial sacks	Lift supersacks with an excavator, telehandler, or skid steer rated for the load. Weigh partial sacks with a hanging scale or controlled-discharge frame.



Field example: metering through a concrete skip. A supersack is emptied into a rented bottom-discharge skip, which is then lifted over the trench and opened to place a controlled amount of product. Useful when the target is narrow or each lift needs a set quantity. Use equipment and application approaches commensurate with the needs of the project and training of personnel.

Photo Courtesy of Sheeba Environmental

Before You Start

- **Remove free product first.** Skim LNAPL or heavy sheen with a skimmer, boom, or absorbent pads.
- **Confirm the dose and sack count** from the Quick Dosing Guide or your REGENESIS design. Assign supersacks and CSB bags to each cell, lift, or trench section.
- **Mark cells.** Stake or paint cells so each one can be dosed, mixed, and logged as complete.
- **Never enter an unshored excavation.** All placement and mixing is done from the bucket (OSHA 29 CFR 1926 Subpart P). Keep people clear of suspended loads and excavation edges; use edge protection as necessary.
- **PPE:** Level D is standard. Carbon stains, so wear clothing you don't mind marking. A dust mask is optional for bag opening on windy days or when mixing very dry, fine soils.
- **On site:** excavator with toothed bucket, rated lifting frame or spreader bar, long-handled bag knife, poly sheeting, stakes or paint, and water if soils are very dry or cloddy.

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Low dust by design

PetroFix Excavation Blend uses a colloidal activated carbon and powdered activated carbon microaggregate engineered to stay low dust. It handles very differently from conventional powdered activated carbon, removing most of the usual dust concerns. Smooth, controlled handling keeps it that way:

- Lower the sack close to the soil or water, then open it.
- Make one or two short slits in the bottom from the side with a long-handled knife; fewer, shorter slits slow the pour.
- Move the sack across the cell while it discharges.
- Keep product bagged until use; product left out to dry loses some of its low-dust character.

Field tip: dig ahead, backfill behind

On long barriers, dig a few bucket-widths ahead and place treated backfill behind. Less open trench means less shoring, less water handling, and a safer site.

Step-by-Step Application

Method A: In-Excavation Mixing

1. Lower a sack to just above the first cell and discharge it while moving across the cell. Product can go directly into standing water or onto the excavation base.
2. Open the CSB bags at grade, empty them into the lowered bucket, and place onto the same cell.
3. Blend the product into the excavation base and lower sidewalls across the smear zone, where residual mass contacts groundwater, by repeatedly digging, lifting, dropping, and blending into the soil with the bucket.
4. Mix until the product is evenly distributed. Log the cell as complete, then move to the next cell and then backfill per specification.

Method B: Surface Pre-Blend and Backfill in Lifts

1. Lay poly sheet next to the excavation; add a small berm if rain is expected.
2. Stage one lift of clean backfill (2 to 3 ft thick when placed; count bucket loads or cubic yards) and spread that lift's product and separate CSB on top.
3. Mix soil with surface equipment or backhoe until product is evenly distributed and clods are small (ideally 1 inch or less). Water is not typically needed to help blend at this step.
4. Place the treated lift into the saturated / smear zone interval, compact as specified, and repeat. Treated backfill is intended for placement at or below the water table, not throughout the full backfill column.

Method C: Emergency Spill-Response Trench Barrier

> **Goal:** stop dissolved hydrocarbons in shallow groundwater from reaching a receptor while the source is investigated and addressed. The trench is a passive interception barrier, not a free-product barrier and not a substitute for source removal.

1. Site the trench perpendicular to shallow groundwater flow, between the release and the receptor, extending past the edges of the impacted area.
2. Excavate one bucket-width (about 2 to 3 ft) through the saturated interval. Shore or slope as required.
3. Place the product directly in the trench and mechanically mix it if adequate distribution can be achieved. Alternatively, use pre-blended trench backfill (Method B) or meter the product into the trench with a bottom-discharge hopper or similar equipment.
4. Place treated backfill through the saturated interval, then cap with clean or native soil to grade.
5. Survey and mark the barrier on site drawings for monitoring.

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PetroFIX® Excavation Blend

Is It Mixed? Quick Visual Check

PetroFix Excavation Blend is designed to mix and coat soils quickly and easily. In most cases, mixing can be assessed visually.

Great	Good (acceptable)	Keep mixing
Uniform gray to black	Mostly dark; some lighter streaks	Bands of native soil, dry product pockets, and product clearly not distributed into native soils or backfill

In dark soils or at low doses, color change may be subtle. Focus on even distribution and the absence of product pockets rather than a specific color.

Questions or a free site-specific design?

Contact REGENESIS Technical Services | 949-366-8000 | REGENESIS.com

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