

# First Ever Co-Injectable Solid Electron Donor to Treat Chlorinated Solvents

## Frequently Asked Questions

**Aqui FIX®**  
Long-Lasting Colloidal Electron Donor



## Contaminants Addressed

**What contaminants does Aquifix address?**

Aquifix supports bioremediation via enhanced reductive dechlorination. Any contaminant that can be addressed by this form of bioremediation can be treated with Aquifix. A complete list of treatable contaminants can be found here: [Treatable Contaminants](#)

**What is the range of contaminant concentrations that Aquifix can treat?**

This is a highly site and contaminant-specific answer. Treatment strategies can be developed for nearly any contaminant concentration range. For site-specific details, contact REGENESIS directly.

**Will Aquifix treat carbon tetrachloride?**

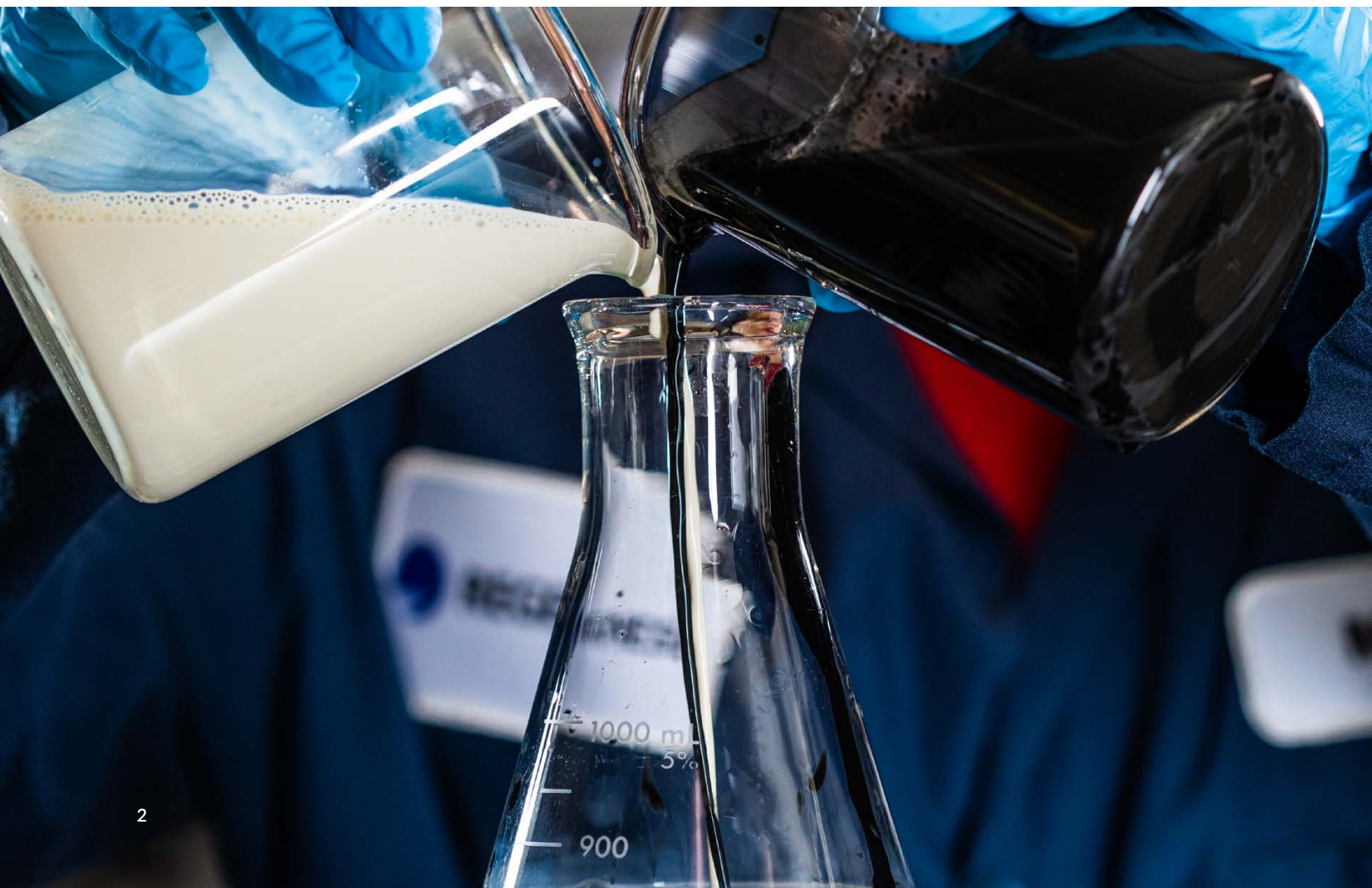
Yes, and a tech bulletin is available with more information.

**Will Aquifix treat highly chlorinated pesticides?**

Aquifix treats chlorinated pesticides. To determine whether Aquifix is the best amendment to treat your highly chlorinated pesticides, contact REGENESIS experts for more details.

**Will Aquifix treat chlorinated ethanes?**

Yes.



## How Aquifix Works

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### How does Aquifix improve subsurface distribution over other products such as emulsified oils?

The long-lasting donor in Aquifix is a colloidal natural wax, and unlike oil droplets, which can coalesce when forced together through pores during injection, the solid particles remain suspended for a longer period of time. This enhances distribution during and shortly after application.

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### What are the mechanisms for TOC release early after injection and over the long term?

After injection, Aquifix adheres to the soil matrix, and the soluble portion immediately releases organic carbon to establish a reducing environment, while providing a short-term hydrogen source for the dechlorinating bacteria. The solid phase component slowly ferments to produce volatile fatty acids and molecular hydrogen that sustain long-term anaerobic bioremediation.

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### What is the basis for saying the TOC will last 10-plus years?

This figure is based on a lab study that followed the evolution of total organic carbon (TOC) and CO<sub>2</sub> carbon being generated from Aquifix solid donor material over a study time of about 2 years. The total carbon release rate was used to conservatively extrapolate the release rate based on this data. The longevity of Aquifix in groundwater can vary depending on the injected concentration, site geology, and contaminant concentrations.

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### Does TOC released from Aquifix adsorb onto PlumeStop?

TOC released from Aquifix could possibly adsorb onto PlumeStop. The release rate is slow enough that TOC is fermented/mineralized rapidly enough to avoid this TOC from negatively impacting contaminant adsorption.

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### Is Aquifix life expectancy affected by soil type?

Its longevity is less affected by soil type and more by groundwater flow rates, water temperature, and competing electron acceptor (oxygen, nitrate, and sulfate) concentrations.

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### What types of sites would you recommend Aquifix not be used in?

Aquifix is not recommended for use on sites where the use of enhanced reductive dechlorination would yield poor performance.

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### Do such low TOC concentrations released from Aquifix provide sufficient donors to simulate meaningful reductive dechlorination rates?

Yes, Aquifix will provide sufficient molecular hydrogen, as demonstrated in our [Three-Year Pilot Study](#). Low TOC restricts the growth of other heterotrophic bacteria, allowing *Dehalococcoides sp.* bacteria (DHC) to dominate and effectively degrade chlorinated solvents in the groundwater. Unlike many bacteria that require a range of nutrients and organic carbon to support their diverse metabolic needs, DHC primarily relies on hydrogen as an electron donor, which Aquifix supplies. DHC uses explicitly halogenated organic compounds like chlorinated solvents as electron acceptors in their metabolism and is well-adapted to survive and function with low molecular hydrogen availability.

## Design and Planning

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### What are the important design criteria needed for an Aquifix design?

Some of the important design criteria for an Aquifix design are site hydrogeology, contaminant distribution, groundwater chemistry, and assessing the presence and activity of DHC.

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### Will Aquifix work with DNAPL?

Generally, DNAPL treatment by enhanced reductive dechlorination is challenging, and success is always mass transfer-limited. Aquifix can be combined with SMZVI for a successful long-term mass reduction strategy. For the most appropriate technologies to use at DNAPL sites, contact REGENESIS experts.

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### How would you apply Aquifix on a large, diffuse plume?

This would best be done in a series of barriers along the length of the plume. This is a commonly employed strategy also with PlumeStop, for which Aquifix complements well on cVOC sites.

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### Do you expect this product to allow a one-time application and why?

Yes, it is possible for a single application to maintain reducing conditions over many years. However, this is site-dependent. Factors such as contaminant concentrations, the presence of competing electron acceptors, large migrating plumes, or dynamic site conditions can affect the longevity of this product.

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### Do you recommend bioaugmentation of Aquifix projects with a bacterial culture such as Dehalococcoides?

Yes, Aquifix is an electron donor that should be paired with a bacteria culture such as DHC. We nearly always suggest bioaugmentation on ERD sites because it is an inexpensive add-on that can provide a lot of certainty to the health of a treatment.

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### Which REGENESIS products is Aquifix compatible with?

Aquifix is fully compatible with and does not interfere with the performance of complementary remediation amendments, including PlumeStop and S-MicroZVI.

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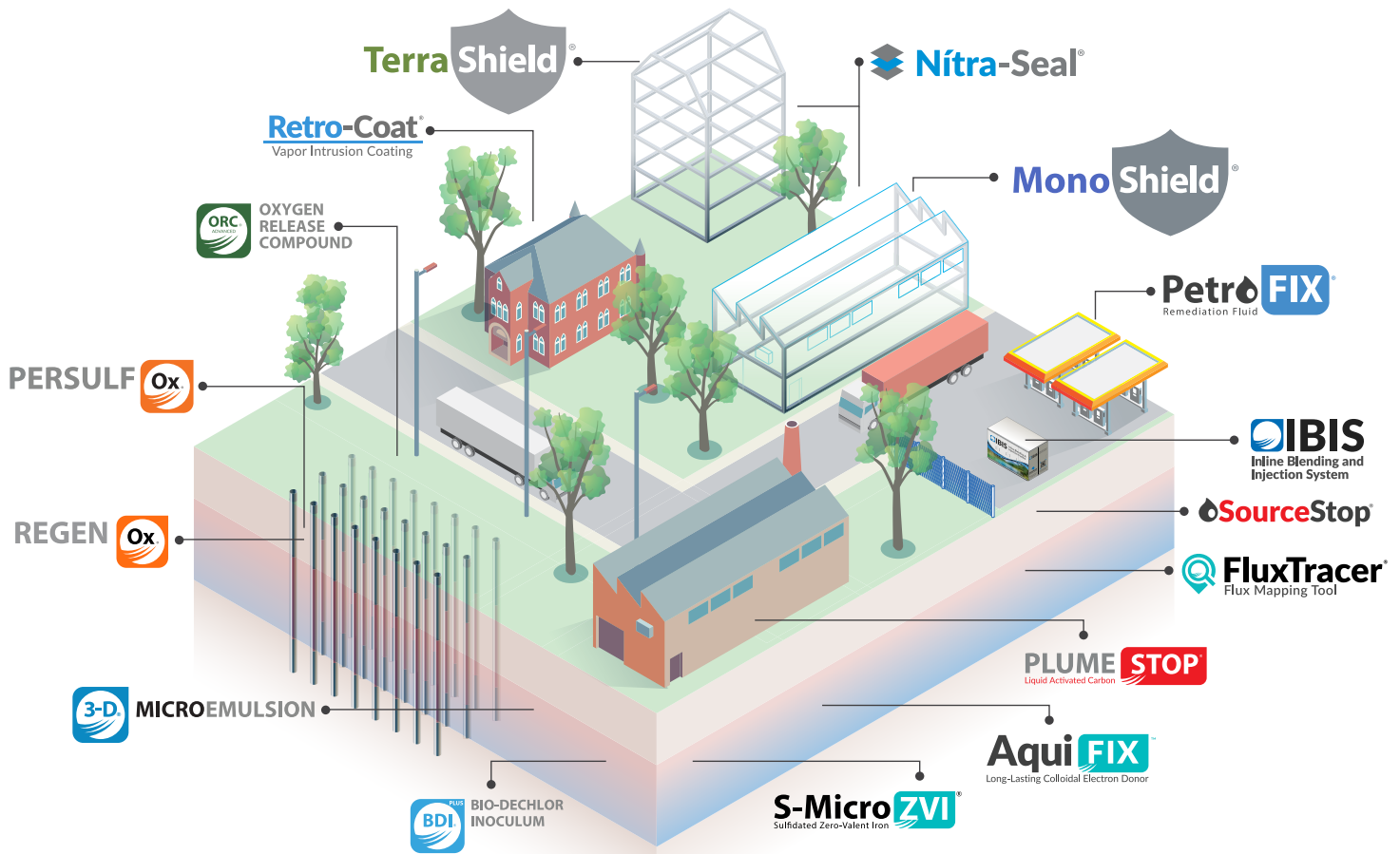


## Application and Performance

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<b>How is Aquifix typically applied?</b>	Aquifix is typically applied via injection through direct-push or injection wells.
<b>Would Aquifix clog wells used for application?</b>	No, with careful control of injection rate, pressure, and ongoing well maintenance, Aquifix will not clog the wells used for application.
<b>Does Aquifix move with groundwater after injection?</b>	Like PlumeStop, Aquifix will temporarily move with the groundwater while coating the soil it travels through until the rest is eventually sorbed onto the soil shortly after.
<b>Will I need high pressure for injecting the material?</b>	Typically, no. We do not recommend fracturing to apply our colloidal materials in almost all circumstances.
<b>Will Aquifix work in bedrock?</b>	Yes, but it depends on the project's objectives since achieving uniform product distribution will require extra attention. Contact REGENESIS for more information.
<b>Does Aquifix work in brackish water?</b>	Yes, but depending on the presence of appropriate microbial communities, temperature, pH, and salinity. <i>Dehalococcoides sp.</i> has a specific salinity tolerance that can be referenced to understand the suitability for a particular site.
<b>Does Aquifix help overcome stall?</b>	Yes, by providing sustained electron donors, maintaining reducing conditions, supporting microbial diversity, and increasing DHC abundance.
<b>How significant is methane generation from Aquifix?</b>	Methane formation is minimal. Depending on the injected concentration, Aquifix will provide a steady and controlled release of TOC that minimizes methane production, since there is minimal excess carbon available to methanogens.
<b>Will the solid form of Aquifix create clogging or pressure buildup?</b>	Not under normal circumstances. Aquifix will inject very similarly to water or PlumeStop.

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## About REGENESIS

At REGENESIS we value innovation, technology, expertise and people which together form the unique framework we operate in as an organization. We see innovation and technology as inseparably linked with one being born out of the other.

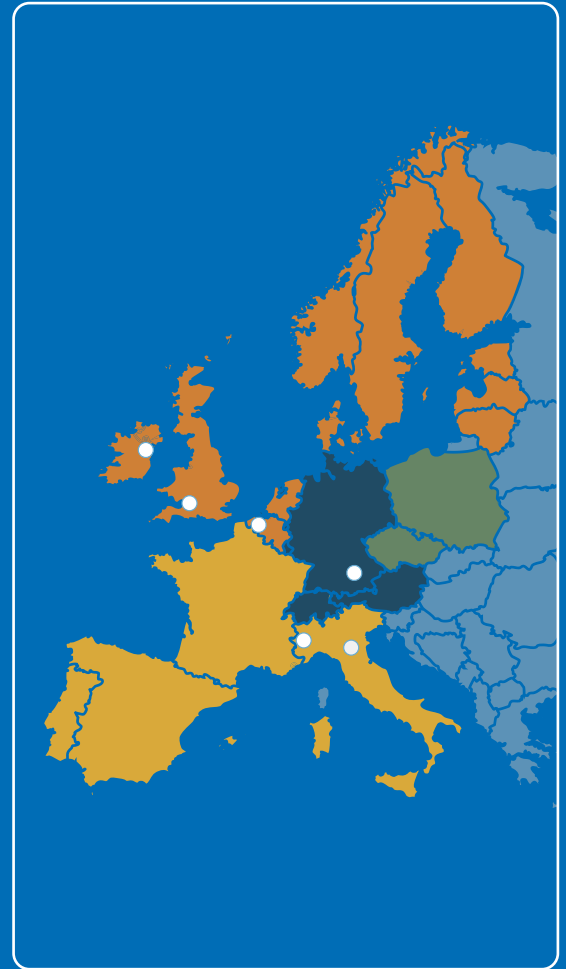
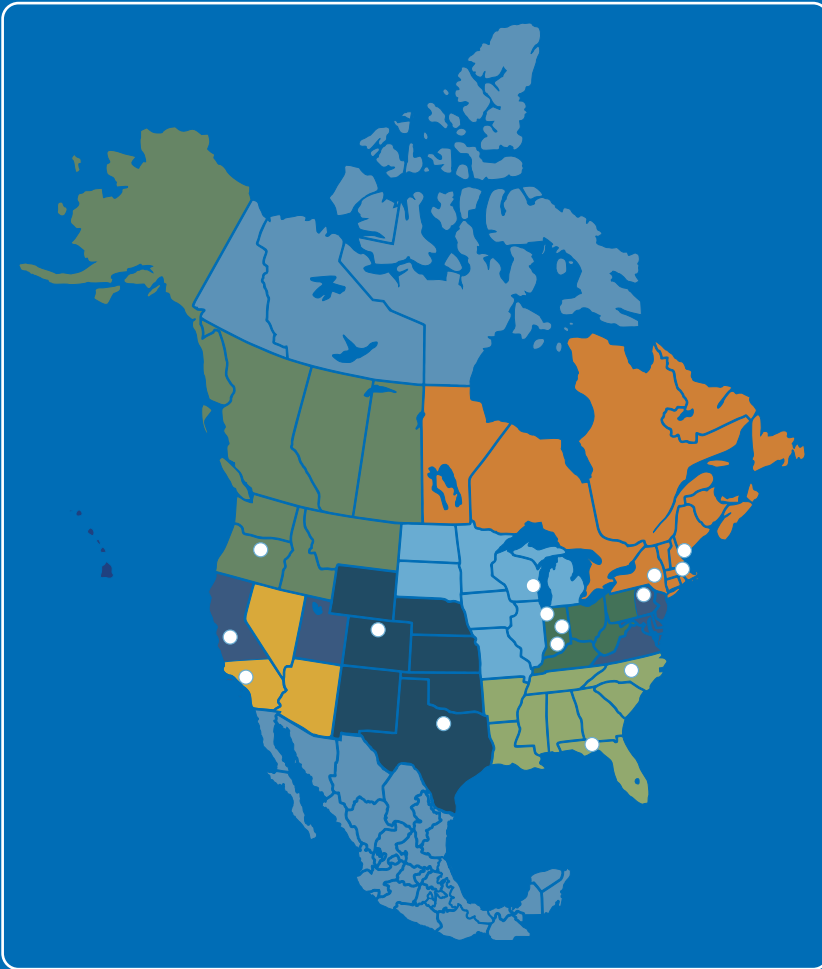
Inherently, innovation imparts new and better ways of thinking and doing. For us, this means delivering expert environmental solutions in the form of the most advanced and effective technologies and services available today.

We value expertise, both our customers' and our own. We find that when our experienced staff collaborates directly with customers on complex problems, there is a high potential for success including savings in time, resources and cost.

At REGENESIS we are driven by a strong sense of responsibility to the people charged with managing the complex environmental problems we encounter and to the people involved in developing and implementing our technology-based solutions. We are committed to investing in lasting relationships by taking time to understand the people we work with and their circumstances. We believe this is a key factor in achieving successful project outcomes.

We believe that by acting under this set of values, we can work with our customers to achieve a cleaner, healthier, and more prosperous world.

# We're Ready to Help You Find the Right Solution for Your Site



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Visit [www.REGENESIS.com](http://www.REGENESIS.com) to learn more.

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