

Our skill and experience implementing in situ bioremediation creates high-value solutions to complex groundwater and soil contamination and related issues at lower cost than competing approaches.

Sustainable Solutions. Partner-Level Involvement.

Geosyntec is a reliable partner for creative, cost effective and successful solutions because we approach remediation with an environmental management perspective. For each client, we develop a clear understanding of how to achieve best-value outcomes using the most appropriate technologies and management strategies for each project.

Innovative Technologies. Practical Applications.

Our professionals set the standard for engineered control of processes for environmental remediation. From advanced vapour intrusion evaluation strategies to sophisticated bioaugmentation techniques and beyond, Geosyntec delivers practical environmental management solutions that meet project-specific needs and achieve our clients' objectives.

Research Leaders. First-to-Field.

Geosyntec scientists pioneered the use of bioaugmentation to profoundly refashion in situ biodegradation processes in groundwater. Our scientists are active in applied research and development with the DOD ESTCP and SERDP programs, NASA, the University of Western Australia, the University of Toronto, and others on topics such as bioremediation, metals biogeochemistry, reactive metals, chemical oxidation, waste water treatment, vapour intrusion, and the treatment of energetic, chlorinated and recalcitrant compounds and dense nonaqueous phase liquids.



Geosyntec led the development of a successful groundwater remediation strategy at Aberdeen Proving Ground. We developed detailed designs for six sites and assisted in negotiations with regulators to achieve Agency approvals.

Client Service. Project Solutions.

At Geosyntec, our vision of success builds on a long-held belief that exceptional client service coupled with exceptional project solutions will result in long-term business relationships of mutual reward. We support our client service and project solutions approach through an internal culture of technical excellence and collegial relationships, common commitment to our core values, and the innovation and practical thinking our staff bring to every assignment.

Geosyntec has been at the forefront of developing bioremediation as a sustainable alternative low-cost treatment technology.



- Geosyntec scientists pioneered the use of bioaugmentation to enhance biological processes in groundwater
- SiREM, a division of Geosyntec, has developed and commercialised multiple biological cultures that efficiently degrade specific contaminant groups, now available in Australia
- Geosyntec scientists and engineers are active in applied research and development on various aspects of bioremediation design, including the use of partitioning donors to enhance biodegradation of NAPLs, development of molecular biological tools, bioremediation of emerging contaminants, and enhanced distribution of electron donors in low permeability units using electrokinetics.

INNOVATION AND COMMERCIALIZATION





Our Experience Benefits Your Project Results

PROJECT SABRE (SOURCE AREA BIOREMEDIATION), UNITED KINGDOM

Geosyntec was a key member of this multi-million dollar collaborative research project, which was designed to develop and demonstrate that enhanced anaerobic bioremediation can result in cost-effective and quantifiable treatment of chlorinated solvent DNAPL source areas. Geosyntec's role on the project included designing the in situ test cell and conducting bench-scale microcosm batch and column studies to support the project design. This project was instrumental in advancing the state of the science and practice of DNAPL source area bioremediation, and has resulted in public acceptance of the ability of bioremediation to effectively treat DNAPL sources.

FULL-SCALE BIOREMEDIATION OF PCE DNAPL SOURCE AREAS AND PLUME, SYDNEY, NSW

Geosyntec designed and provided technical support during implementation and operation of a pilot trial and full-scale treatment of three separate PCE DNAPL sources and the downgradient plume (operation of the system was completed by AECOM Pty Ltd). The bioremediation system successfully treated PCE concentrations over 100 mg/L, and enhancement of dissolution of the DNAPL mass was demonstrated. In the area of the pilot trial, the plume downgradient of the DNAPL source reduced to non-detect concentrations in less than two years after initiation of treatment.

BIOREMEDIATION OF MULTI-CONTAMINANT, CHLORINATED SOLVENT PLUME IN GROUNDWATER, BOTANY, NSW

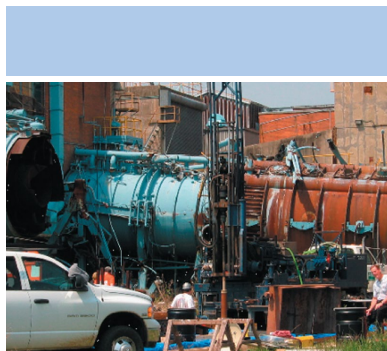
Geosyntec designed and oversaw four pilot trials for a site in Botany, NSW (operation of the pilot trials was completed by URS Australia Pty Ltd), which demonstrated the robustness of EISB for treatment of high concentrations of mixed chlorinated solvents in a complex and challenging environment (groundwater pH between 4.5 to 5.5, high organic content soil and thus high sorbed mass, high mass flux, heterogeneous soil environment). Engineering controls such as mixing and dilution were used to overcome inhibition issues related to high concentrations of certain VOCs (biodegradation was successfully stimulated at concentrations of 1,000 mg/L 1,2-DCA and up to 5 mg/L chloroform). Biodegradation to innocuous end products was achieved and desorption of mass from the soil was enhanced. Estimated mass degraded was somewhere between 3,800 to 11,000 kg of total VOC mass biodegraded over an 18 month period, at rates of up to 60 kg/day. Concentration reductions of up to 99% of influent concentrations were seen and contaminant degradation half-lives on the order of hours to days were achieved. Also demonstrated was the ability to reverse the inhibitory effect of high DCA concentrations and stimulate growth of natural microbial communities in previously inhibitory environments.

ELECTROKINETICALLY-ENHANCED BIOREMEDIATION OF A PCE SOURCE ZONE AT A FORMER INDUSTRIAL FACILITY, DENMARK

Electrokinetically-enhanced bioremediation was demonstrated in a PCE source zone located within a clay till at a former industrial site in Denmark. The pilot test successfully confirmed the positive bench-scale testing results, tested the engineering design of the electrodes and electron donor recirculation and delivery systems, measured site-specific electron donor migration rates, and confirmed that the applied voltage field did not adversely impact microbial growth and activity. Migration of the electron donor from injection points to all monitoring wells was observed within days as a result of application of the electrical field. Rapid increases in daughter product concentrations was observed as a result of the enhanced electron donor distribution. Ethene formation was observed in post application monitoring, indicating microbial activity was not adversely impacted and the distribution of the augmented culture was enhanced by the application of the electrical field.

BIOREMEDIATION OF ENERGETIC CONSTITUENTS INCLUDING PERCHLORATE AND NITROAROMATICS

Beginning in 1999, Geosyntec has pioneered the development, demonstration, and validation of bioremediation as a cost-effective remediation technology for treatment of energetic constituents including perchlorate and nitroaromatics. Geosyntec was the first to demonstrate the use of bioremediation techniques to treat perchlorate-impacted soils and groundwater in situ. To date, Geosyntec has completed field applications at dozens of sites and was awarded the prestigious Project of the Year award from the Strategic Environmental Research & Development Program (SERDP) operated by the United States Department of Defense for its research and development efforts.



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About Geosyntec

Geosyntec Consultants is a consulting firm with engineers, geologists, environmental scientists, and other technical and project staff based in offices in the United States, Australia, Canada, Ireland, Malaysia, and the United Kingdom. We address new ventures and complex problems involving our environment, natural resources, and civil infrastructure.

For more information visit:
<http://www.geosyntec.com>

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