Nanometals for Contaminated Land Remediation

New nano-iron formulations, including sulfidised nano-iron and bimetallic nanoparticles to overcome the limitations associated with traditional zero-valent iron for contaminated land remediation. The conditions generated by nano-iron are favourable for follow-on in situ bioremediation.

More Information

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Competitive advantage

- Expertise in optimisation of sulfidised nano-iron formulations for improved reactivity, contaminant selectivity and reaction longevity, resulting in formulations that are:
- Able to degrade a wide range of chlorinated compounds, including ethlyene dichloride and potentially many pfas
- Reactive in situ over extended periods (in excess of one year).
- Electrochemically activated sorbents for pfas defluorination
- Next generation nano-iron formulation to degrade pfas

Impact

- More effective remediation of contaminated land

Successful applications

- Electrokinetic enhanced transport of nano-iron, persulfate and lactate for emplacement of these amendments in chlorinated solvent contaminated clay in Ontario, Canada. Continued monitoring demonstrating considerable contaminant degradation
- Sulfidised nanoiron applied at site impacted by chlorinated solvent in Ontario, Canada, with significant decreases in chlorinated solvent concentrations including ethlyene dichloride
- Additional field trials in collaboration with Canada's Department of National Defense, Dow Chemical, ch2m and Geosyntec

Capabilities and facilities

- The water research laboratory has extensive facilities, including:
- Numerous wave flumes, a spillway flume and a wave basin
- A fully equipped chemistry lab and a soils lab for sample preparation, separation and analysis
- Groundwater field and survey equipment
- A centrifuge permeameter
- Uav/drone surveying equipment