

Chlorinated/Boron Bioremediation Challenges in Brazil

Sidney Aluani (saluani@sgw.com.br), Cristina Spilborghs, Eduardo Pujol, Fabiola Tomiatti, Natália Nascimento, and Tatiane Xavier (SGW Services, São Paulo, SP, Brazil)
Jim Mueller (Provectus Environmental Products, Freeport, IL, USA)
Mike Skalzi and Wade Meese (IET, Pipersville, PA, USA)

Background/Objectives. An appliance industrial plant with combined TCE and metals plumes migrating off site is located on the Guarany aquifer recharge area. The main goals were to control the plumes horizontally and vertically to protect both the external receptors and South America main underground aquifer.

Approach/Activities. Starting with a complete site investigation, the plumes were delimited and revealed a critical situation. In order to remediate both the TCE and metals plumes, mainly boron, we decided to use Provect-IRM (Provectus ISCR amendment for metals). The first pilot test failed due to an extremely rare dry season, keeping the groundwater level lower than the existing MWs. The second pilot test, performed in the rainy season, revealed very low bacterial activity and the remediation reaction was basically abiotic. We went back to the bench scale and found that the high concentration of boron was promoting a bactericide effect, lowering bioremediation stage performance. Injecting bacteria was not an option since it is forbidden in Brazil.

Results/Lessons Learned. Sometimes the best strategy is to take a stepwise remediation approach. In this project, we split the remediation into two steps, first focusing on abiotic reactions for TCE and boron plume abatement, then going to a full-scale ISCR remediation with both abiotic and biotic stages.