

## In-situ Electrokinetic Remediation of a Salt Impacted Soil at a Decommissioned Well Site

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Soil remediation by electrokinetics (EK) is an emerging technology that has shown positive results for fine textured soils. In an effort to find new technologies that require less soil movement, reduce operational intensity, and minimize distances to haul contaminated soils, NAIT and partners have identified EK remediation as an enabling technology that may allow for responsible and sustainable remediation of soil and groundwater. Although the technology has shown promising results at small scale, we aimed to optimize the technology and make it cost-effective for large scale implementation. The goal of the present project was to understand how to implement EK remediation and to demonstrate if there is a repeatable treatment trend for salt-affected soil. Specifically, our objectives include the development of a cost effective EK remediation technology for large scale implementation and the assessment of the impact of EK on soil microbial population. We further assessed the implications of voltage and electrode spacing on conductivity. The EK Technology was able to remove a large volume of salt from the ground without any excavation. Interestingly, the data indicated that EK facilitated the greatest movement of ions in the top 1 to 2 meters of soil. EK is on pace to remediate salt-impacted soils for less cost than conventional technology, especially if EK were to focus on containment and root zone remediation. The results were promising and also showed areas in which can be improved both in technical optimization and in operational cost savings.

### Jean-Marie Sobze

Dr. Jean-Marie Sobze is the Applied Research Chair in Plant and Seed Technologies, focused on developing practical technologies for plant propagation and seed delivery. He joined NAIT in 2010 as the Technology Transfer Coordinator, and has more than 17 years of experience in forest management and oil and gas industry-related reclamation research. He received his Ph.D. in Forestry at the University of Gottingen, Germany, specializing in community-based forest management, and is registered as a Professional Forester with the Association of Alberta Forest Management Professionals (AAFMP).

### Ricky Kong

Dr. Ricky Kong is a research assistant at the NAIT Centre for Boreal Research. He joined the team in 2021 and received his Ph.D. in Plant Physiological Ecology at The University of Western Ontario. He completed his B.Sc. in Ecology at the University of Alberta. He has experience assessing plant responses to abiotic stress in herbaceous and woody plant species.