Remediation Case Studies for Salt Impacted Sites using Recently Release SST V3.0 – Learnings and Potential Pitfalls

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Alberta Environment and Parks (AEP) has released Subsoil Salinity Tool (SST) V3.0. This tool was used to develop remediation guidelines for a simple and a complex site, both at the Tier 2A level, and to assess excavation confirmatory sampling results as well as backfill quality options. For the more complex site, waste segregation was a critical site activity in order to allow for some of the low level impacted excavated material to be utilized as backfill and placed in areas and at depths where previously greater salt concentrations were measured.

During the analysis for the two sites, it was found that there are notable complexities associated with the identification of suitable backfill, and algorithms were developed to assess backfill options for selection of the most suitable quality (in terms of texture, salinity, and sodicity) to produce defensible SST-based guidelines associated with lower volumes of excavated material. Furthermore, greater initial data and information organization is required for the development of impacted SubAreas requiring remediation driven by root zone as well as subsoil sodicity and salinity, and excavation activities are not optimized until both sodicity and salinity are evaluated as distinct variables driving remediation. Lessons learned and potential pitfalls will be presented along with the case study examples. Considerable cost savings can be achieved through a more extensive initial data organization activity combined with a backfill options quality assessment, and effective waste segregation and use at larger more complex sites, prior to deriving final SST guidelines and determining soil volumes to be landfilled.

Jonathan Donahue

Jonathan Donahue is an environmental scientist working with Equilibrium Environmental for over 4 years. He has over 8 years experience as an environmental scientist working in a variety of upstream and midstream oil and gas sites, as well as industrial and commercial properties. Jonathan holds a B.Sc. in Environmental Earth Sciences from the University of Saskatchewan. His work experience includes all phases of an environmental project, with the goal of progressing a site towards regulatory closure.

Anthony Knafla

Anthony Knafla has worked in the environmental industry for 27 years. He is a biochemist and medical scientist by education and has spent his career on human health risk assessments, toxicological profiles and guideline methodologies for regulatory agencies, innovating a non-invasive approach for measuring genetic damage in humans, designing unique remediation approaches for salinity, hydrocarbon, solvent, and fertilizer impacts in soil/groundwater environments, developing microcosm studies to gauge the potential for microbial remediation of biodegradable pollutants prior to field scale implementation, and refining field screening techniques that can be used to guide investigation programs and remediation closure.