

Agronomic Receptor Evaluation for Ecological Direct Contact

Ian Mitchell, Millennium EMS Solutions and Sarah Thacker, Innotech Alberta

In Alberta, the ecological direct contact pathway normally applies to a depth of 3 m, or 1.5 m under certain circumstances. For substances with no management limits, the ecological direct contact pathway is also applied at depths below 3 m. However, there is uncertainty about the actual depth at which chemicals of potential concern affect this pathway. A multi-phase project was therefore initiated to develop a scientifically defensible depth at which the ecological direct contact pathway is applicable. The first phase of the project was a comprehensive literature review during which alfalfa was selected as a surrogate species for the subsequent phases, due to its deep rooting depth, sensitivity to salt and other COPCs, and presence throughout Alberta and Western Canada.

The recently completed second phase of the project was a greenhouse study evaluating the effects of salinity on plant health when found at various depths within the soil profile. Under greenhouse conditions, it was observed that plant roots did not extend into soils with high levels of salt but that aboveground biomass was not strongly affected by salinity. The third phase of the project, now underway, is a field study to verify the findings of the greenhouse study under real-world conditions.

Ian Mitchell

Ian Mitchell has over 25 years of experience focused on contaminated sites risk assessment and environmental guideline development. He was involved in the development of the Alberta Tier 1 and Tier 2 guidelines, the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, and the CCME protocols for soil, groundwater and soil vapour guidelines. Recently he has been focused on applied research initiatives aimed at modernizing risk-based approaches for contaminated sites and removing barriers to site closure.