

# Ligand-Based Partial Extraction of Soil Samples: An Innovative Approach to the Assessment of Hydrocarbon Prospectivity

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*Hydrocarbon reservoirs represent “metal-sources” characterized by variable amounts of trace elements and related compounds. This diagnostic suite can be used to define exploration targets by measuring their concentrations in near-surface soils subsequent to a new and innovative approach to geochemical exploration. This technique is referred to as Mobile Metal Ions Process Technology or “MMI”.*

*Mobile Metal Ions are ions that have migrated from a buried and/or blind source region to near-surface environments where they become weakly attached to the surface of soil particles. These ions are present in very low concentrations however they provide a precise ‘signal’ on the location of subsurface metal-enriched source regions. Mobile Metal Ions migrate to the surface under the influence of vapour-phase transport (light hydrocarbon gases, Hg-vapour, carbon dioxide), electrochemical, evaporation and evapo-transpiration, convection and simple diffusion. Evidence for this dynamic ongoing vertical migration of characteristic metal suites is the production of zoned mineralogical and geochemical “haloes” in plumes above oil and gas reservoirs. The rate of ion movement from source to surface is dictated by thermal maturation of hydrocarbons, “plumbing systems” that channel metal-rich vapours, depth to and magnitude of source region and numerous other variables. By stripping Mobile Metal Ions and related metals and compounds from near-surface soils in a ligand-based extraction, MMI Technology can document the presence of focused apical responses directly over the metal sources. This source can be any accumulation of metals or compounds diagnostic of hydrocarbons in geochemical contrast with host rocks. Currently, and well into the foreseeable future, the seismic approach will likely be unsurpassed for the definition of oil and gas reservoirs. MMI technology can identify and quantify metals associated with hydrocarbon micro-seepage and differentiate between “productive” and “non-productive” reservoirs. Seismic, other geophysical and/or geological targets can be evaluated for their prospectivity and greenfield exploration areas assessed for hydrocarbon potential.*

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