



Utilization of Biogenic Hydrocarbon Assessments to Determine Extent of Petroleum Hydrocarbon Contamination

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The release of petroleum hydrocarbons onto gravel pads is generally simple to determine the extent of contamination; however, complex soil structures can be more difficult to evaluate. High moisture wetlands or peat-based soils can result in significant interferences for laboratory hydrocarbon determination, but employing source evaluation tools can rule out biogenic hydrocarbons from the total value to show reduced petroleum hydrocarbon impact in extent determination.

By evaluating key indicators in the chemical composition of a sample, we have determined that biogenic interference can be found in an F3 hydrocarbon fraction, the presence of specific biogenic monoterpene compounds and ratios of volatile and semi-volatile compounds detected by analytical methods. In compiling this data, we can provide clear indication on the origin of hydrocarbons to biogenic or petrogenic/anthropogenic sources.

Brody Andersen

Brody Andersen is a well-educated and accomplished professional with diverse expertise in environmental sciences, analytical chemistry, and research. He holds Bachelor of Science degrees in both chemistry and physics and has spent more than a decade of professional experience working in government, academic, and private research in environmental chemistry and environmental biochemistry before joining the Bureau Veritas team in 2019.

Brody currently oversees business development for our Western Canadian laboratories and is an environmental chemistry advisor to our staff and clients. As a Technical Account Manager, he is responsible for developing and maintaining professional relationships and the overall delivery of Bureau Veritas' services to the client.

Kelly Johnson

Dr. Kelly Johnson is an Environmental Site Assessment and Human Health and Ecological Risk Assessment Specialist and Stantec's Technical Lead for Risk Assessment and Toxicology for Canada. Kelly has 24 years of experience conducting site assessments and risk assessments on complex contaminated sites across Canada as far west as British Columbia and as far north as Nunavut. This aspect of her career has allowed her to become proficient in provincial and federal site assessment frameworks and regulatory guidance including the Federal Approach to Contaminated Sites, Atlantic PIRI, Canadian Council of the Ministers of the Environment, and Health Canada. Kelly is considered a leader in this field and has authored and reviewed environmental regulatory guidance frameworks and has provided associated technical training to private industry and Federal and Provincial governmental departments. Kelly's Ph.D. research focused on the ecological risk assessment of polychlorinated biphenyls (PCBs) at Saglek (site of a former United States Military Polevault Radar Station in Northern Labrador) using biomarker responses to determine effects on terrestrial and marine wildlife. This research represented some of the first biomarker research that was combined with theoretical risk assessment modelling and tissue analysis to determine potential effects and risk to wildlife. Kelly also provides technical and regulatory advice as a Regional Environmental Consulting representative on the Atlantic PIRI committee.