Distinguishing Natural vs Petroleum F3 Hydrocarbons in Diesel Invert Biopiles

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Hydrocarbons are found in most environments and can originate from either petroleum or biogenic sources such as peat, plant tissues and animal manure. Currently, the “Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil”, cannot distinguish between biogenic and petrogenic hydrocarbons. Consequently, biogenic hydrocarbons would be mistakenly identified and regulated as if they had originated from petroleum sources. Resolution of this problem could save the Canadian petroleum industry millions of dollars annually by eliminating the unnecessary remediation and/or disposal of uncontaminated soils and composting materials.

In order to address this issue, research funding to the University of Waterloo will support a Canada-wide hydrocarbon field survey. The funds were used to run laboratory-scale experiments that specifically simulated crude oil spills in muskeg environments. This five-month experiment documented the chemical signatures that are unique to crude oil and peat sources. This data is being used to develop new

methods for distinguishing hydrocarbons sources in crude oil pipeline spill situations.

In contrast, this 2009 proposal will address a different contamination issue, which is also routinely faced by the Canadian petroleum industry. Diesel invert biopiles are used to remediate petroleum hydrocarbons by composting drilling waste with manure and bulking materials such as straw. However, manure and straw are naturally rich in biogenic hydrocarbons. This 2009 study will document the unique biopile hydrocarbon signatures, which is essential to meeting regulatory requirements by eliminating false PHC guideline exceedences.

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