



Chemtest

The right chemistry to deliver results

Environmental
Forensics



Environmental Forensics

Environmental Forensic Chemistry Approach and Applications

A common objective of many forensic investigations involves translating environmental information to allocated responsibility for contamination. Successful execution requires understanding of fate and transport as related to contaminant alterations, as well as the forensic tools employed for the investigation. Environmental forensic chemistry investigations typically utilize a multi-level tiered interpretive approach to support the identification of the source of the contamination that has been characterized by environmental sample analysis:



ChemTier 1

Provides a fingerprint for identification purposes

Identification of the product type in contaminated samples is paramount in any environmental forensic investigation as it frequently forms the foundation on which many of the relevant conclusions are derived. Both standard and specialised analytical methods can be employed to identify a wide range of contaminants, including chlorinated solvents, PCBs, metals, and specific hydrocarbon classes such as alkanes and PAHs.

ChemTier 2

Specific compound signature targeting

At this level, additional information is sought for compounds that may be unique to the contamination material and/or are resistant to degradation in the environment. Sample analysis may involve gas chromatography/mass spectrometry techniques to target selected compounds. Source specific biomarker compounds and their ratios can further provide additional diagnostic information in source allocation investigations.

ChemTier 3

Diagnostic interpretation

Following the ChemTier 1 and ChemTier 2 investigational analysis, a variety of multivariate data analysis techniques can be applied for selected data to determine the degree of similarity to source materials, degree of weathering and/or biodegradation.

Relevant chemical analyses may include chlorinated solvents, dioxins, metals, PCBs, petroleum hydrocarbons, PAHs, biomarkers, additives, and signature chemicals.