



## Engineering Sciences Section – 2007

### C24 Attention Environmental Forensics Practitioners: Important Information Is Out There - and It's Free!

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After attending this presentation, attendees will learn about a free source of peer-reviewed information relevant to their work and the way to access the information.

Practitioners of environmental forensics will be able to access critical historical and current information through a peer-reviewed information source. This information source contains material that is often very hard to find. This presentation will impact the forensic community and/or humanity by demonstrating how associated databases can facilitate communication with non-practitioners and the lay public will be discussed as well.

There is an amazing amount of information available on-line. However, there is a source of information, often quite relevant to environmental forensic applications, which is not known to many in the field. Specifically, Specialized Information Systems (SIS), the National Library of Medicine (NLM), National Institutes of Health (NIH) has, by order of Congress several years ago, offers a broad menu of data bases whose focus is *not* just health effects.

Of particular interest is the Hazardous Substances Data Bank (HSDB). This is part of the TOXNET set of databases. The HSDB contains records on over 4700 chemicals and drugs as well as several radioactive compounds. The list of HSDB chemicals is continuously increased as additional chemicals become "of concern." The contents of all the records are peer reviewed by ongoing panels of experts (scientists, physicians, engineers, toxicologists) prior to the records being opened to the public. The records are continuously reviewed and updated.

The Peer Review Panels (PRP) are divided into two groups: 1) fate and transport; and (2) toxicology. The fate and transport panel addresses individual sections on, among other topics, methods of manufacture; past and current manufacturers with data on current and historic production and consumption patterns; data on over 20 different physical/chemical properties; ecotoxicity and associated ecotoxicity values (e.g., LC<sub>50</sub>, LD<sub>50</sub>); natural and artificial sources; bio- and abiotic- degradation; concentrations in environmental media (including source-dominated); bio-concentration factors; various international, federal, and state regulatory levels including health, environmental, and FDA; history of accidents; and major reports. There are sections on current analytical methods (USEPA, AOAC, NISOH, Standard Methods, etc.) as well as older methods that may have been used during the time of interest. Since the database is an NLM product, there is extensive toxicological information for both human and nonhuman subjects. Most records include an 'Environmental Summary' which provides a quantitative and qualitative overview of a chemical's behavior in the environment, including photolysis, hydrolysis, bio-degradation, volatilization from wet and dry media, bio-concentration, soil mobility/adsorption, routes of exposure among others.

Each record would also identify any compounds related to the title compound, e.g., precursors, metabolites hydrolysis products, which could have significant environmental ramifications. Cross-links allow the user to determine in what other HSDB chemical records the compound of interest is also mentioned.

HSDB can be searched by name, name fragments, or CAS number. The database can also be searched by health effects, e.g., peritonitis, esophageal cancer, leukemia. The database is cross-linked to structural information and graphics (via ChemID plus).

Other NLM databases include those developed specifically for the medical/scientific community (e.g., GENETOX, CCRIS, EMIC) with hot links to the referenced papers (via PubMed). However, NLM has also developed databases to help the lay population understand chemically related environmental issues by using simple, familiar graphics. Examples are ToxTown and Household Products. Such graphic databases could be of use in jury trial situations.

The records can be accessed by 'Googling' "HSDB" and following the instructions.

#### Environmental Forensics, Information, Peer-Reviewed