



# Jones Environmental Forensics

## Tar analysis

Road coverings have traditionally used a resilient material referred to as Asphalt, Tarmac or Bitumen to bind a stone base. Initially this binder was manufactured from Coal Tar Pitch, a by-product from coal carbonisation and in later years this was replaced by petroleum derived asphalt. They are made up of a complex mixture of compounds, many of which are toxic. With increasing waste disposal costs, the type of binder needs to be established prior to disposal or reuse, as bituminous mixtures containing Coal Tar are classified as hazardous as an absolute entry (concentration is immaterial) in the European Waste Catalogue (EWC 17-03-01\*)

**Coal Tars** – Usually black or brown viscous liquids or semi-solids, they are complex combinations of PAHs, Phenols and heterocyclic NSOs (resins).

Coal Tar Creosotes – distillation products of coal tars having an oily consistency and containing mainly naphthalene, phenanthrene, anthracene and their derivatives. At least 75% of creosote is PAHs.

Coal tar Pitch – is a residue produced during the distillation of coal tar and is shiny, black or dark brown and contains PAHs.

**Asphalt** – a sticky, black highly viscous liquid or semi solid that is present in crude oils and some natural deposits.

**Bitumen** – a category of organic liquids that are highly viscous, black and sticky. It has two forms: Asphalt and Coal tar.



PAHs (Polynuclear Aromatic Hydrocarbons) are mixtures of organic compounds, which contain fused aromatic rings. They are ubiquitous pollutants of low solubility and high toxicity, which biodegrade very slowly. Some are known carcinogens and the ability to accurately determine concentrations of these compounds in road tars is essential in order to address the toxicity and the possibility for recycling.

By using a combination of Saturates, Aromatics, Resins and Asphaltenes (see SARA flyer) along with alkylated aromatics series (by GC-MS), it is possible to ascertain whether tarry material was derived from Coal Tar Bitumen or Asphalt Bitumen. Unfortunately there is not one single analysis that conclusively identifies coal tars and PAH (16) alone can result in incorrect identification of coal tar content.

### Case Study



Twelve tar cores from a 6km stretch of road were submitted for analysis. By sampling the top, middle and bottom of just 3 cores for a full analysis, and the remaining 9 for just SARA analysis (see associated flyer), layers were profiled and classified for disposal, saving the client many £1000's.

For further information please contact us via our website: [www.jones-forensics.com](http://www.jones-forensics.com)

Jim Jones (07767617274) [jim@jones-forensics.com](mailto:jim@jones-forensics.com)

Janet Jones (07718976066) [janet@jones-forensics.com](mailto:janet@jones-forensics.com)

Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA

Tel: 01244 833 780

Fax: 01244 833 781