



ENVIRONMENTAL NEWS

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ORGANIC QUALITY CONTROL : SURROGATE SPIKES

The ability of the laboratory to analyse for organic compounds in environmental samples can be complicated by the sample matrix and by losses of target analytes during the sample analysis procedure. Typical matrix interferences can include adsorption of target compounds and the presence of non-target contaminants that interfere with the chromatographic detection / quantitation of the target analytes. Losses can arise from volatilisation, vessel transfer and photodegradation.

The standard quality control package provided by **Australian Laboratory Services** details the laboratory's ability to extract and quantitatively analyse the target analytes from a known, interference free matrix, without introducing contamination in the laboratory. However, the **effect of the matrix** and the **precision** of each individual sample preparation is examined by spiking each sample with **surrogate** compounds prior to sample preparation.

Surrogate compounds are compounds that:

- are chemically similar to the target analytes and that will behave in a similar manner to the target compounds throughout the sample preparation and analysis procedures,

do not interfere with the analysis of the target analytes,

- do not occur in the environment,
- are subject to similar losses during the analytical processes as target analytes.

The concentration of the **surrogate** in the final sample extract is determined as the **percentage recovery** of the amount spiked into the sample. (Note that these % recoveries are not to be confused with analytical results for the sample).

Acceptance criteria for surrogate recoveries are determined based on the recoveries obtained for samples of similar matrix type analysed under the same analytical conditions.

Should the surrogate % recovery fall outside of the acceptance range, then the sample analysis is repeated (provided there is sufficient sample) to determine whether the failure is due to laboratory error or to sample matrix effects.

Duplicated recoveries outside of the acceptance range are indicative of sample matrix effects.