

Supplementary Material

Post-wildfire contamination of soils and sediments by polycyclic aromatic hydrocarbons in north-central British Columbia, Canada

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Methods

Analytical methods for the determination of PAHs

Samples were sent to SGS AXYS Analytical Services in Sidney, BC for PAH analyses using SGS AXYS method MLA-021. Samples were manually homogenized to ensure a representative subsample was used for analysis. Moisture content was measured, and the analysis was performed on a 10g dry weight subsample.

Prior to extraction, sediment samples were fortified with a suite of 17 deuterium-labeled quantification standards. Samples were extracted by soxhlet extraction using dichloromethane. Sample extracts were chromatographically cleaned in preparation for instrumental analysis using a combination of silica and alumina columns. Once cleaned, the extracts were reduced in volume and fortified with an internal recovery standard.

Instrumental analysis was performed by gas chromatography with mass spectrometric detection (GC/MS) using an Agilent 6890N gas chromatography/MSD system. Chemstation software was used for instrument control and data analysis. Gas chromatographic separation was achieved using a 30 m RTX-5 (30m, 0.25mm i.d, 0.25 film thickness) gas chromatography column. The mass spectrometer was operated at a unit mass resolution in the electron impact ionization mode. Two ions were monitored for all PAH and labeled surrogates. Initial calibration of instrument response was performed using a five-point calibration series that included all analytes and labeled surrogate standards. Calibration was verified once every 12 hours by analysis of the mid-level calibration solution.

Target PAHs were confirmed when individual chromatographic peak responses were at least three times the background noise level, were within three seconds of the elution time predicted from the calibration run, peak centroids from quantification and confirmation ions coincided within two seconds, and relative ion abundance ratios of the two monitored ions per analyte were within 20% of the corresponding ratio in the calibration run. Concentrations of target PAHs were calculated using the isotope dilution method, by comparing the peak area of the analytes quantification ion to that of the corresponding deuterium-labelled surrogate standard and correcting for response factors. Compounds that did not have an exact labeled surrogate analog were quantified by the internal standard method using the labeled surrogate of a related PAH compound.