
**Chaswood Formation lignite records
mid-Cretaceous volcanic eruptions**

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Lignite and coal, because of their low sedimentation rates of terrigenous detritus, commonly preserve a record of the input of volcanic ash. A reconnaissance study has been made of lignite from the Lower Cretaceous Chaswood Formation of the Elmsvale basin, central Nova Scotia. The bulk mineralogy and geochemistry of lignite and lignitic mudstones has been determined by X-ray diffraction (XRD) and whole-rock geochemical analysis of ashed samples; in addition, selected samples have been examined by electron microprobe (EMP) and scanning electron microscope (SEM).

Lignite from the middle member of the Chaswood Formation has several features indicating the presence of volcanic ash: distinctive REE patterns with low La/Nd ratio; unusual abundance of high-field strength elements such as Nb and Y; the presence of augite in EMP and XRD analyses; and rare presence of possible glass shards and euhedral quartz. Wood or charcoal fragments appear mineralized and diagenetic talc is present. Much of the terrigenous component of the lignite consists of background detrital sediment (characterized by detrital illite) and most of any ash component has been altered to kaolinite. Bulk compositions of ash are inferred to be principally basaltic or dacitic, with rare felsic ash.

Well-defined ash beds are present in the middle member of the Chaswood Formation, but our sampling density was insufficient to correlate single beds from one borehole to another. Several discrete ash beds may be present in a single lignite unit. Evidence for ash in the lower member is sparse and equivocal. The closest source of ash is the early Albian volcanics within the lower Cree Member of the Orpheus graben, in a stratigraphic interval that has been previously correlated with the middle member of the Chaswood Formation. However, paleogeographic reconstructions suggest a monsoonal climate with dominant winds from the SW. More distant sources in the Quebec - New England igneous province are thus possible.