

# **Comparison of Waste from PF Utilities and Transitional Technologies using Australian Coal**

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## **ABSTRACT**

Australia produces approximately 10 million tonnes per annum of pf-combustion wastes (ash) from coal-fired power stations. A small proportion is utilised but most is deposited in wet ash dams or dry repositories. The nature of this waste stream is expected to change as a consequence of constraints on the emission of carbon dioxide and the adoption of power generation transitional technologies such as fluidised bed combustion, oxyfuel combustion and integrated gasification combined-cycle using slagging gasifiers. The leach properties of the major solid waste streams from each of these (transitional) processes are compared with those of fly ash from conventional pf. power stations using Australian bituminous thermal coals. Leach tests were done at two liquid:solid ratios i.e. 3.5:1 and 20:1 and the results of these compared. From the results, it is concluded that most trace elements were leached from the fly ash and bottom ash of FBC systems at similar concentrations to those present in the leachate of ash from the conventional power stations (lower concentrations of Cd, Co, Ni and Zn were leached from the waste of two FBC power stations). Trace elements were leached in similar proportions from fly ashes derived from the same coals fired under air-firing (conventional) and oxy-fuel combustion conditions. Some of the trace elements (e.g. B, Cr, Mn, V and Zn) in the gasifier slags were not leached as readily as those in the fly ash from conventional power stations; others (e.g. As and Se) were leached at similar concentrations. The significance of these findings is discussed.

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