Alternative Raw Materials – Common, and Novel, Sources and their Impacts on Kiln System Operation and Air Emissions

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Portland cement kiln feed-mix generally consists of a combination of calcium, silica, alumina, and iron derived from a selection of traditional raw materials (e.g., limestone, clay, sand, mill scale) to form viable clinker. In efforts to increase sustainability and maximize resource efficiency, waste materials and by-products from other industries are utilized as valuable alternative raw materials to satisfy the chemistry of this blend. Alternative raw materials contain so-called impurities and may have a chemical composition varying from traditional raw materials. Presented is a discussion of commonly used alternative raw materials, as well as potential novel sources, and real examples/case studies of the impacts on operation of the kiln system and air emissions.