

ABSTRACT

This thesis was concerned with some aspects of an Air Quality Study which was one component of the JAVEMEX Ecological Preaudit Study for a proposed alumina plant to be sited in South Manchester, Jamaica. In addition, a brief survey of the trace metal levels in surface waters (rivers and a wetland area) in the study area was carried out.

The dustfall levels in the vicinity of the plant site which is rural were lower than those in the vicinity of an existing alumina plant. Chemical analyses of the dustfall indicated that the source was predominantly from the bauxitic soil and limestone. The Al/Fe and Mn/V ratios in dustfall samples were similar to those found in bauxite. In the vicinity of the existing alumina plant, high Al/Fe ratios as well as high vanadium levels in dustfall indicated the influence of dustfall arising from calcination of alumina or the rail transportation of alumina and fuel oil combustion sources respectively. The influence of marine aerosols as evidenced by the absolute values of sodium and chlorine as well as their ratio was noted for stations near the sea. The data clearly demonstrate the efficacy of chemical analyses in the identification of dustfall sources.

In the case of water samples from rivers and springs which serve a wetland area, somewhat high levels of cadmium and zinc were found but this was also the case of cadmium levels in samples of soil taken from the area.