ABSTRACT

A Preliminary Multi-Element Geochemical Study of the Epping Farm Area

Blue Mountains, Jamaica.

This thesis describes a preliminary multi-element geochemical survey for soils, stream sediment and rock media in the Epping Farm area of the Blue Mountains, Jamaica. The Epping Farm area is comprised of the Epping Farm Formation of the Upper Cretaceous Blue Mountain Volcanic Group, and is a location of known metallic mineral occurrence in Jamaica. Hydrothermal alteration is believed to be responsible for the mineralisation present in the study area.

The geochemical results indicating the concentrations of up to 10 elements (Cu, Co, Mn, Mo, Fe, Pb, Ag, Ni, Zn and Cd) of 454 soil, 57 stream sediment and 10 rock samples taken from the Epping Farm Area were utilised. Interpretation involved using univariate and multivariate statistics and the results were plotted as cummulative frequency plots, contoured and distribution maps.

The cumulative frequency plots were utilised to determine threshold values of the respective elements, however the nature of the distribution of the data for some elements (Mo, Ag, and Cd), did not allow threshold values to be determined for all media. The contoured and distribution maps indicate anomalous patterns for most of the elements and served to highlight the associations of the different elements encountered. Several open ended anomalies were also indicated by these maps.

Mineralisation seems to be associated with sheared zones with subsequent alteration in the form of silicification, chloritization and sericitization occurring. XRD analysis indicated and confirmed that clinochlore, malachite, quartz, and albite occur in the area, with possibilities of ramsbeckite, gold tellurium iodide, cuprite and sursassite also occurring.

Copper mineralisation is prominent, but XRD analysis indicated that the possibility of gold occurrence exists in the area. This possibility is supported by a previously conducted regional stream sediment survey of Jamaica for this area.

Further work in the form of geological mapping, additional geochemical soil sampling, a geophysical VLF survey and drilling is recommended to fully realise the potential of the area.