Establishing potential for leaching of Hg and As from soils in the Montague Gold District, Nova Scotia

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The soil horizons of the Montague Gold District, Nova Scotia were sampled to analyze for possible elevated levels of metals, in particular, Hg and As. Arsenic contamination is a serious concern in the surrounding environment due to the naturally high levels of As within the local metaquartzites and slates of the Meguma Supergroup. Horizons were carefully selected from locations up-ice, down-ice, and at the mill site within the District as well as one horizon outside the District, to determine background levels outside the study area. At each of the four sample sites, 8–11 samples were taken from horizons to a depth of 1 metre. Each horizon sampled included samples from the uppermost A_{00} layer continuing down into the glacial till layers of the C horizon. Samples were taken at approximately 10 cm depth intervals, although care was taken to select samples from within each horizon rather than at horizon boundaries. In contrast, there were no well-developed layers present at the mill site, so sample depth was the primary control on sampling. For comparative purposes, a homogenized sample from the top 5 cm and from the top 30 cm was taken at each of the 4 sites, which is the typical process used in environmental sampling procedures. All samples were sieved to sizes <63 microns and <2 mm for geochemical analysis. The resultant geochemical data indicate where the toxic elements are concentrated within the horizons as well as determining the influence of glacial transport and anthropogenic disturbance on these concentrations.