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Real-time air mercury response from sediment-covered, volcanogenic massive sulphide mineralization on southern Vancouver Island, British Columbia, Canada.

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New data from the Lara-Coronation polymetallic occurrence, southern Vancouver Island, British Columbia, Canada confirm that direct and continuous analysis of gaseous elemental mercury (GEM) concentrations in near-surface air using a portable RA-915M Zeeman Hg analyzer can instantly delineate mineralized zones that are buried beneath overburden 10s of m thick. Real-time grid sampling of air 1 cm above ground across steeply dipping, massive sulphide zones in volcanic rocks of the McLaughlin Ridge Formation (Sicker Group; Middle to Late Devonian) reveals a pattern of northwest-trending GEM haloes that reflect bedrock structure, including a 224 by 30 m halo above the polymetallic Coronation zone, covered by up to 22 m of overburden. Measured GEM concentrations range from 0.61 to 251 ng·m^{-3} in this study, with the strongest halo (206x background Hg) above exposed mineralization. Weak haloes (1.7x background Hg) mark sediment-covered mineralized zones. Before sampling GEM above overburden, we disturbed surface sediment mechanically with a hoe pick to release Hg^0 adsorbed in soils and vegetation. Measuring gaseous mercury using a portable device is simple, effective, and more efficient than standard geochemical surveys that collect sediment, soils, and vegetation. The method will become increasingly useful to the mineral industry as exploration shifts into areas covered by overburden.