The distribution of gold in sulphides from the Lodestar Prospect, Newfoundland, as determined by LAM-ICP-MS analyses

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At the Lodestar Prospect, eastern Newfoundland, sulphide-mineralized, polylithic, magmatic-hydrothermal breccias have significant gold contents including 58.5 g/t Au in a grab sample of massive arsenopyrite. Other sulphide phases do not contain such highly anomalous Au values. Based on this observation, it was concluded that Au at the Lodestar Prospect is directly related to the arsenopyrite. A variety of analytical techniques, including ore microscopy, INAA, SEM, and EMP, were utilized in an attempt to determine where the Au was located in the sulphides and all were unsuccessful. Consequently we decided to analyse sulphides in polished thin sections by in-situ Laser Ablation Microprobe Inductively-Coupled-Plasma

Atlantic Geology, 2005, Volume 41, Number 2-3
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Mass Spectrometery (LAM ICP-MS). The LAM ICP-MS results demonstrate that the Lodestar arsenopyrite contains up to 201 g/t Au and that Au is homogeneously (i.e., no nugget effect) contained, chemically bound, within the structure of arsenopyrite. Such gold is typically termed "refractory" or "invisible". Pyrite and chalcopyrite contain very low levels of Au. Gold contents within individual arsenopyrite crystals vary, related to arsenic concentrations.