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Photograph of the Month

Quartz veins with younger pyrite-gold mineralization, Manitoba, Canada

The photograph (aerial view) shows auriferous quartz veins hosted in a ca. 4 m wide, north-trending and steeply dipping dextral ductile–brittle fault zone at the southern margin of the Island Lake greenstone belt in the Superior craton, Manitoba. The fault cuts at right angle across a pre-existing, approximately east-trending and steeply dipping foliation in a metabasalt (dark-colored) and foliation-parallel tonalite dykes (light-colored). The quartz veins dip steeply and were emplaced during dextral

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transtensional shearing along the fault. They include: (a) the "main vein" (a fault-fill vein) that occurs in the center of, and is parallel to, the fault, (b) en echelon veins (extensional veins) that cut across the foliation, and (c) foliation-parallel veins that occur locally. A mafic dyke occurs immediately to the east, and the en echelon veins occur to the west, of the main vein. To the north of the area shown the main vein cuts across and occurs immediately to the east of the dyke, and the en echelon veins occur to the east of the main vein. The mafic dyke shows little evidence of penetrative shearing or alteration that are pervasive in the metabasalt in the fault zone. It appears that the location of the fault and the associated quartz vein emplacement were controlled by the contacts of the mafic dyke, and the dyke was more resistant to deformation and less permeable than the metabasalt at the time of emplacement of the quartz veins. The main vein is only mineralized where it is cut by a later vein-subparallel fault (the northern half of the main vein shown, rusty-colored), and U–Pb dating indicates that mineralization might not have taken place until ca. 30 million years after the emplacement of the hosting quartz veins. See Lin and Corfu (2002) for details. Top is north. Field of view is ca. 7.5 m × 6.5 m. Island Lake, Manitoba, 94°30′53″W, 53°45′50″N. Photograph provided by Shoufa Lin, Canada © Shoufa Lin.

Reference

Lin, S., Corfu, F., 2002. Structural setting and geochronology of auriferous quartz veins at the High Rock Island gold deposit, northwestern Superior Province, Manitoba, Canada. Economic Geology 97, 43–57.

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