Preliminary results from detailed geological mapping of the Powell block, Rouyn-Noranda area, Quebec

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The Rouyn-Noranda district, located in the Abitibi Greenstone belt, hosts 22 Cu-Zn-Au-Ag volcanogenic massive sulfide (VMS) deposits, 17 orogenic gold deposits and several vein-Cu deposits. The Powell Block (PB) is a ~32 km^2 wedge-shaped fault block bounded by the Beauchastel fault to the north and the Horne Creek fault to the south. It hosts the Au-rich Quemont VMS deposit (14 Mt at 5.5 g/t Au, 331 g/t Ag, 1.32% Cu, and 2.44% Zn) and is located immediately north of the Horne deposit, a world class Au-rich VMS deposit (54 Mt at 6.1 g/t Au, 13 g/t Ag, and 2.2% Cu). Despite years of research, uncertainty remains as to the volcanic and deformation history, as well as the metallogeny of the PB. Of particular importance is how its strata, VMS deposits, mineralization, and alteration relate to strata and deposits within adjacent blocks. The PB also provides an unparalleled opportunity to document the effects and to establish the timing of two spatially associated ore systems: a syngenetic base and precious metal VMS system and an orogenic gold system. These questions will be addressed through detailed geological mapping at 1:2000 scale, petrography, zircon U-Pb geochronology, detailed lithogeochemistry (major, trace, and rare earth elements), and stable isotopes including mass independent fractionation of sulphur isotopes. Initial results include the recognition of a synvolcanic fault and fissure system defined by Héré Creek felsic dikes that cross cut and offset volcanic strata, and associated synvolcanic discordant alteration defined in the field by a distinctive spotting, and Au-poor Cu-vein mineralization. This synvolcanic fault-fissure system may represent the deep plumbing system to VMS deposits within the PB, but lacks the Au-enrichment associated with the Quemont VMS deposit.