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Controls on high-grade gold mineralization at Nyabirama Gold Deposit as revealed from detailed mapping and 3-D modelling. North Mara Mine (Acacia Mining plc) - Tanzania

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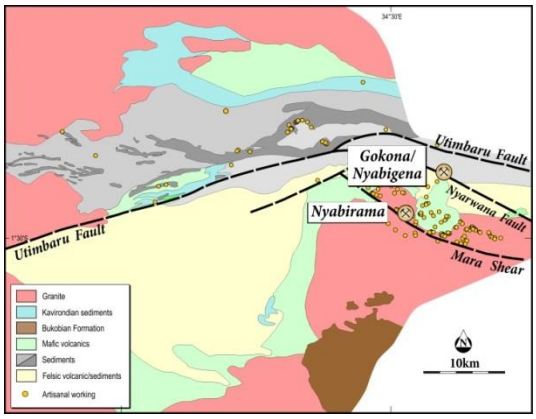
The North Mara Mines, operated by Acacia Mining, comprise the Nyabirama, Gokona and Nyabigena deposits; the deposits lie within the north-western portion of the Neoarchaean Mara Musoma Greenstone Belt. East trending regional scale faults separate thrusted and folded segments of stratigraphy. The Nyabirama ore body is located along the Mara Shear, which tracks the southerly dipping contact between tonalite and granodiorite.
See Figure 1 for location of North Mara Mines.



Recent detailed pit wall mapping, drilling, re-logging of historical core, supplemented by multi element geochemistry and 3-D geological and structural modelling, helped to define pit-scale controls on high grade gold mineralization and to delineate mineralization sub-domains.

Ore zones are hosted by an altered and sheared granodiorite characterized by a fine–grained matrix of recrystallized albite and quartz enclosing relict fragments of the host granodiorite. Mineralization is associated with K-feldspar, silica, albite, sericite, pyrite and minor chlorite and carbonate alteration. Significant silver and weakly anomalous antimony and molybdenum are associated with gold mineralization. Arsenopyrite, chalcopyrite, galena and sphalerite occur in traces in the mineralization, slightly higher amounts are found in the flanking zones.

The study has shown that mineralization is controlled by two distinct structural orientations:

(i) shallow (~$40^0 \rightarrow 320^0$) shear –hosted mineralization in broad reactivated thrust zones and
(ii) Steeply-dipping (~ $60^0 \rightarrow 190^0$) cataclastic domains in strike–slip faults parallel to the E-W trending Mara shear zone.

The contrasting rheology of tonalite in footwall and granodiorite in hanging wall is interpreted to be responsible to the structural architecture. The steeply dipping, shallow set of splay with intervening link structures are formed as dilatants zones amenable for the trapping of mineralized fluids.

The major shoots at Nyabirama are consistently hosted in right hand directional jog intersection of structures. The shallow and flatter segments of the shears and linking structures also host shoots. The

faults sub-parallel to the Mara Shear are common throughout the mineralized sequence and they delineate the hanging wall of the deposit. Late north-west crosscutting faults are also present.

These findings have significantly improved the predictability of high-grade zones (>4g/t Au) which has implications for definitions of the structural domains for resource estimation with better mining grade reconciliation and targeting of gold mineralization at depth.