Gold deposits in the Zimbabwe craton: the use of large databases for gold exploration.

[1]DIRKS, P.H.G.M., [2]MIKHAILOV, A., [2]BARBER, B. and [1]JELSMA, H.A., [1]Department of Geology, Univ. Zimbabwe, POBox MP167, Harare, Zimbabwe; [2]Kairezi Exploration, 118 Mandela Ave., Harare, Zimbabwe.

Over 6000 gold occurrences within the Archean Zimbabwe Craton have been compiled on a computer database. This database includes production, host rock, structural and mineralisation details (>100000 entries). Combined with new tectonic concepts and operated within a GIS environment, the data base offers an invaluable tool for future gold exploration.

Traditionally Archean gold mineralisation has been linked to secondary structures along late-tectonic discontinuities within Archean greenstone terrains. Although successful in predicting geometries on a mining-scale, such structures can not explain the distribution pattern of deposits that occurs on a 3-50 km scale.

Using the database it can be shown that major, deep-seated lineaments exert a profound (i.e. larger-scale) control on the distribution of gold-mineralisation. These lineaments probably originated in the upper mantle, and movements along them resulted in "Riedel"-"Anti-Riedel"-"Extension vein" arrays in the upper crust, that interfere with upper-crustal greenstone geometries related to accretionary processes. Trapping of gold-bearing fluids occurred in any of these structures.

The distribution pattern of gold occurrences indicates that gold was locally derived and concentrated. Significant mobilisation of gold appears to have only occurred along deep seated lineaments of certain orientations (NW-NE and E-W trending) that were activated during E-W compression in the late Archaean. A critical component in the mineralising fluid (most likely S or Cl) was mantle-derived and released along these lineaments.