Structural analysis of IKONOS satellite data, Jumping Lake, Ontario

CONFIDENTIAL

Summary Report submitted to

Aur Lake Exploration

MIR Télédétection

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by

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Introduction

Responding to an AUR Lake Exploration Inc. request, MIR Télédétection was mandated to generate satellite products to support gold exploration. In addition to the products furnished, the data set is completed with a fracture analysis and some broad suggestions on the structural context of the region to support an eventual structural analysis.

The permits held by AUR Lake Exploration Inc. (Jessie Lake and Jumping Lake) are located within an area characterised by three volcanic cycles. The first two cycles are bimodal and define the Fourbay cycle and the Six Mile cycle and the third one is mafic and defines the North Sturgeon cycle (Robinson, 1992). Both permits are enclosed in the bimodal Six Mile cycle. Figure 1 presents the different geological assemblages associated to the study area on the magnetic data. The study area is represented by massive and pillowed tholeiitic to calco-alcaline basalt intervals with intercalated intermediate and felsic subaqueous pyroclastic flows and tuffs.

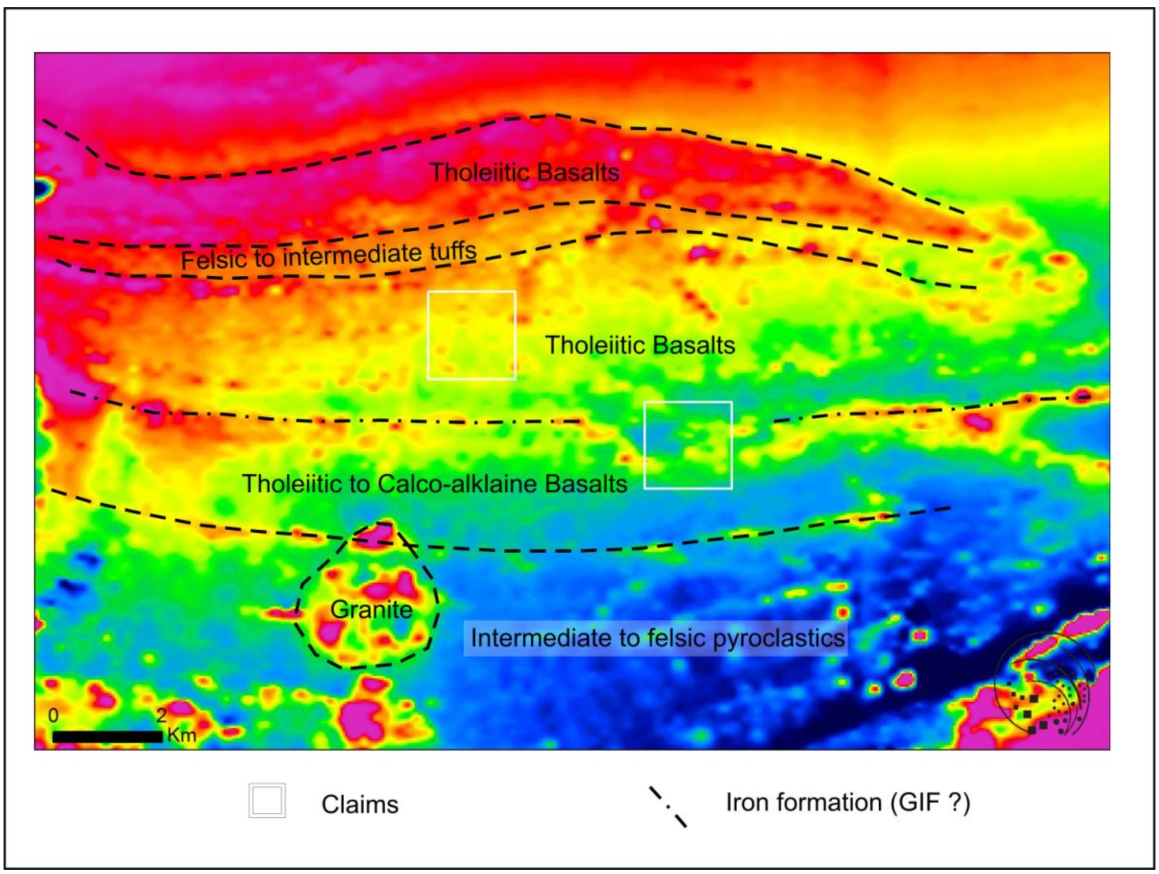

Figure 1. Geologic assemblages with permit overlaid on the Magnetic Total Field.

Surface lineaments map

Analysis of the Ikonos products led to a lineaments map for the study area. Interpretations of the data comprise visual extraction of significant linear and curvilinear information based on probable geological expression of linear features associated to scarps, hydrographic configuration, discontinuities and spectral contrasts. Digitizing and integration of the results allow to discriminate features related to probable fractures. A rose diagram was thereafter calculated on this fractures layer. Figure 2 shows the interpreted probable fractures with a rose diagram of the different systems. A total of four fracture systems can be interpreted: NNE (20^o), ENE (65^o), ESE (110^o) and SSE (145^o), where the NNE and the ENE appear to be the most dominant trends of fracture.

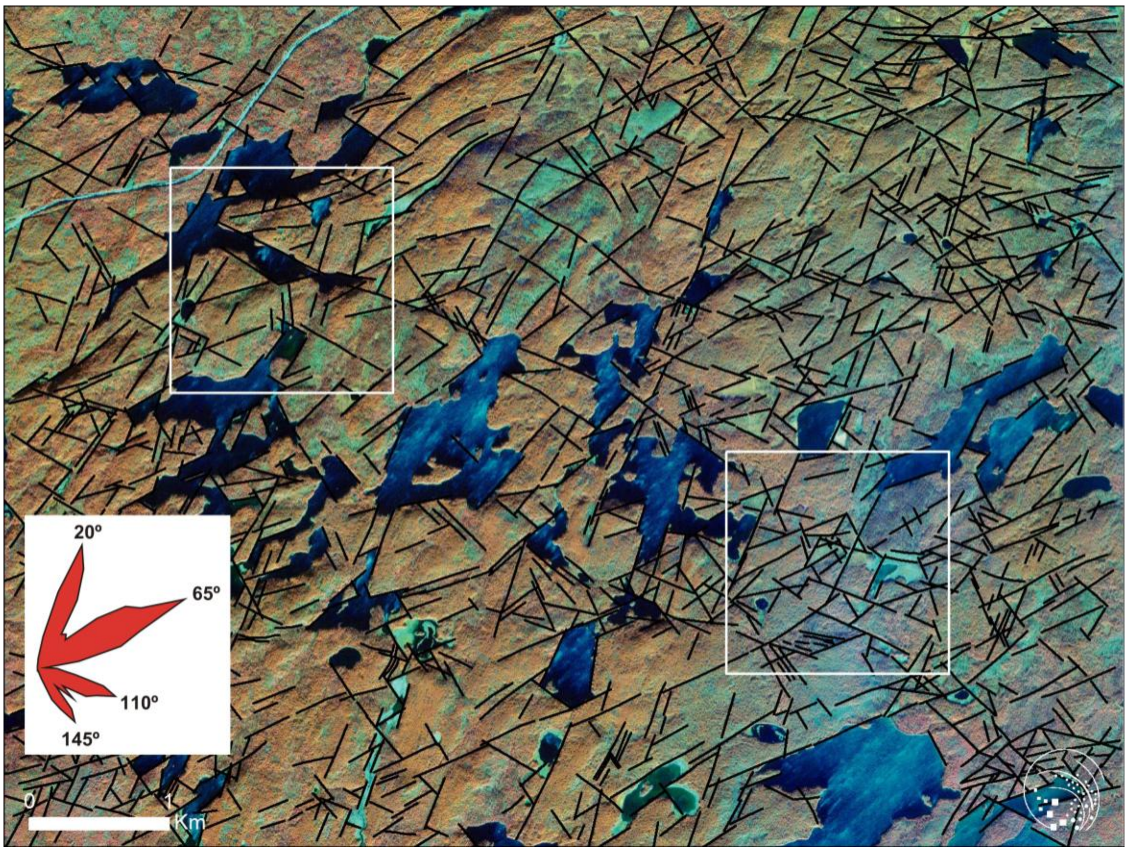

Figure 2. Interpreted lineaments (fractures) with rose diagram on the Ikonos data with permit overlaid.

Preliminary structural pattern

The results of the lineaments interpretation were compared with the magnetic data in order to reveal the relationship between surface structures (shown on remotely sensed data) and deeper structures (shown on magnetic data). This allows to define the most meaningful lineaments and fractures that may represent faults, and the generation of a lineament-based structural map (Figure 3a). Several observations can be made. The Jessie Lake permit appears to be located at the intersection of two significant NNE- and NW-trending probable fault sets. A felsic plug (QFP?) is inferred on the western part of the Jumping Lake permit where a low magnetic circular feature appears to disrupt the positive magnetic axis. The permit zone is also characterised by the crossing of three significant probable fault sets oriented NNE, NW and ENE.

Despite the fact that no deep structural analyses were undergone on the datasets, which would required more data and field checks, two preliminary models can be suggested on the basis of the probable fault pattern: (1) a syn-tectonic brittle-ductile model and (2) a syn-to late-tectonic brittle model.

(1) Several faults display evident kinematics where NW-oriented probable dextral strike-slip fault system is induced from magnetic discontinuities. The Jumping Lake claim appears to be located within a major dextral shearing corridor and encloses a portion of the inferred felsic plug. The fault pattern suggests the development of a pull-apart system and multiple en-echelon tensional gashes. Such pull-apart system may have favoured the intrusion of the inferred plug. In this scenario, the latter would represent a syn-tectonic felsic intrusion. A schematic view of this assumption is display in Figure 3b.

(2) In an alternative model, the fault pattern displayed in the Jumping Lake permit area may also suggest fault deflection caused by an early (resistant) plug during the deformation. The fault pattern depicts in Figure 3c would represent, in that case, fault deflection around the core of the intrusive body.

In either scenario, low pressure zones are inferred in the surroundings of the plugs and could represent favourable contexts for fluids circulation and veins formation.

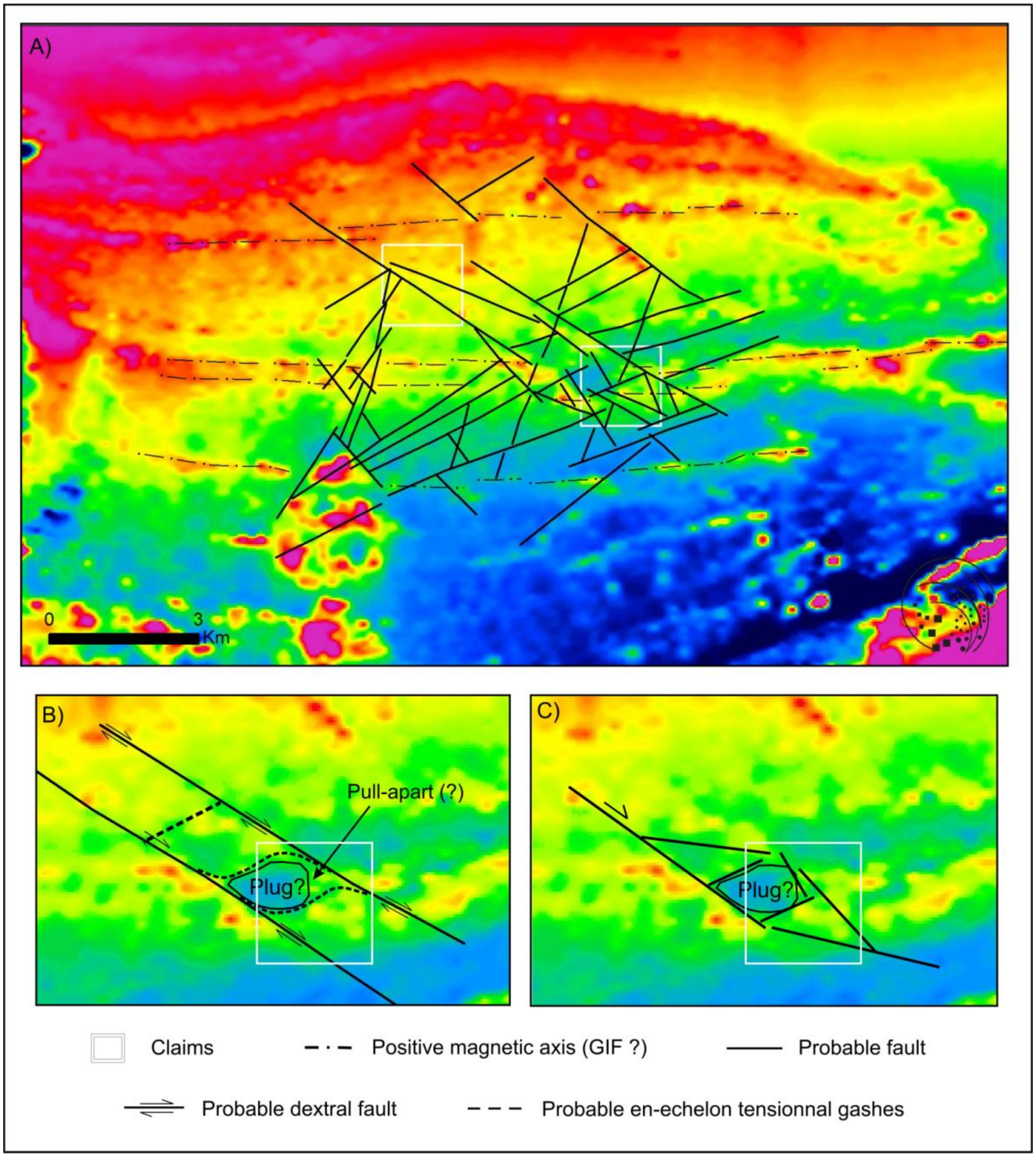

Figure 3. Lineament-based structural map (preliminary) on the Magnetic Total Field with b) the pull-apart scenario and c) the faults deflection scenario.

Conclusion

Analysis and interpretation of the Ikonos and geophysical products allow the generation of a lineament-based structural map, the individualization of four fracture systems at surface in a NNE, ENE, ESE and SSE directions and the interpretation of different probable fault sets. Some models are foreseen but would required further analysis and field works to be confirmed. Such works could be part of a second phase study.

Granitoid contacts, heterogeneous stress and fault intersections are well-recognized prospective environments to host gold mineralization. We recommend to pursue the exploration works with a particular interest on the Jumping Lake claim. We also strongly recommend to stake claim to the west of this permit corresponding to the location of the western part of the inferred felsic plug and the deflection of the magnetic signal.

Reference

Robinson, D. J., 1992. Geology of the Six Mile Lake Area. Ontario Geological Survey, Open File Report 5838, 93 p.