XCA

PHOTO GEOLOGY

115-J-1 & 8

By: G.H.K. Pearse March 1970

TELEPHONE 685-4331

ATLAS EXPLORATIONS LIMITED

330 MARINE BUILDING
355 BURRARD STREET
VANCOUVER 1, B.C.

PHOTO GEOLOGY

By

G.H.K. Pearse

012403

A study of the photos for 115-J-1 and 115-J-8 was made for the purpose of mapping the geology and obtaining the fracture pattern.

The technique has been to compile geologic data from all sources (including contacts at the west boundary of the Carmacks sheet - 115-I), onto the 1 mile aeromag maps, paying particular attention to locations where the rock type was observed on 1969 chopper hop traverses, (Dawson and Godwin). These were examined on the photos and identified by texture and tone primarily, and by other features such as vegetation and geomorphology. The magnetic patterns were used as a further refinement.

Work on 115-J-8 is of far superior quality to 115-J-1 as experience gained from 115-J-1 facilitated more accurate identification on 115-J-8. 115-J-1 will be re-examined quickly to improve the photo geology.

Several units were mapped and their significant features noted:

1) Carmacks Group Volcanics - flows and intercalated pyroclastics give the rock a sedimentary appearance on the photo. These are gently-dipping, medium to light grey in tone and of smooth rounded topography. Magnetically, the unit is reflected as clusters of small "birds eye" lows from 56,800 ɣ to 57,600 ɣ approximately, with no directional fabric evident.

2) Mt. Nanson Volcanics - are darker grey, higher sharper ridges, more massive appearing and steeper dipping than above. These are also cut by granitic dykes and a rather exceptional acid dyke swarm in places. The slopes weather smoothly. Magnetically, this unit ranges from 57,600 ɣ and up as high as 59,000 ɣ in areas of basalt (highest relief on the sheet). Obviously where no dykes cut the volcanics and where magnetic susceptibility is moderate, distinction between these two units may be in error.

3) Acid Granitic Rocks - These rocks are light grey to white and for the most part occur as smooth rounded hills and in valleys, generally a more subdued topography than the volcanics. Often a reticulate fracture pattern is evident. Dykes are white in colour and easily distinguished.

The magnetic pattern over granite is less distinct and the average susceptibility is about 57, 700 γ. The porphyry dyke swarm is mapped as a separate unit.

Two interesting anomalies occur on 115-J-8; one, a well-defined magnetic high (58,100) almost 1 mile in diameter adjacent to a major fault (NE trend) cutting across the NW sector of the sheet. The fault is readily visible as a linear fixture both on the photos and on the aeromag sheet. It was traced for 16 miles and continues into the adjacent sheets. It is Mesozoic or later (Tertiary ?) as it cuts both granite and the Mount Nansen volcanics.

A second anomaly in the centre of the sheet is a well-pronounced low (magnetite altered to hematite?) of 57,200 γ minimum. It is traversed by a strong northerly fracture and bounded by Mount Nansen Volcanics, which are cut by an intense acid dyke swarm.

4) Hb-bi-granodiorite, quartz monzonite etc. - These rocks differ from the granites by their texture and geomorphology. They are coarser in texture (salt and peppery due to blocky surfaces), and occur as sharper toothy ridges often weathered out as pillars and castles. The ridges are cut by steep closely spaced parallel ravines on the flanks.

The average susceptibility is similar to the granite although closer examination may show a difference in pattern.

5) Yukon Group - Very little Yukon group was identified on 115-J-8 and is perhaps fairly abundant in 115-J-1 (this area will be quickly re-examined). This unit is coarser textured than the volcanics and generally more steeply dipping. The foliation is more deeply incised.

CONCLUSIONS

a) Photogeology is an excellent tool in geologic mapping. A skilled worker with some experience in the area being studied can produce a map of good quality with five or more units.

b) Rapid reconnaissance mapping by chopper hopping provides good control for photogeologic mapping.

c) Major fracture directions and finer structural elements are easily mapped (strike and dip, folding, jointing).

d) In conjunction with aeromagnetics and other geologic data, it is possible to outline favourable areas for exploration and, in some instances, to pinpoint areas which may be of immediate interest.

e) Colour photography (and other types) would provide greater contrast (more detail) and would greatly increase the accuracy

and resolution of the photogeologic maps. These photos could be taken in restricted areas of interest, perhaps in grid fashion (not continuous) to supplement black and whites.