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Report of Geological Mapping of parts of the Dawson-Ross Group of Mineral Claims located at Mitchell Glacier, Unuk River Area, 56°30'N 130°15'W, Skeena Mining Division, B.C.

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by

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SUMMARY

In the period July 1 to August 14, 1970 a three man geological field crew was employed by Granduc Mines, Limited to examine and map accessible portions of claims of the Dawson Ross claim group (Grouping Notice #1081) situated at Mitchell Glacier in the upper Unuk River area, Northwestern British Columbia.

Claims of the Dawson-Ross group are underlain by intrusive, sedimentary, and volcanic rocks that have been modified to varying extents by dynamic and hydrothermal metamorphism. Sparce copper mineralization has been found in many locations in association with syenitic and monzonitic intrusions and in zones of shearing. An area of molybdenite mineralization adjacent to the south side of Mitchell Glacier was mapped in some detail.

INTRODUCTION

From July 1 to August 14, 1970 plane table topographic mapping and geological mapping were undertaken on claims of the Dawson-Ross group by a field crew of three men employed by Granduc Mines, Limited. The Dawson-Ross group of claims is located on the northern portion of a large gossaned area in the rugged glaciered headwaters of Unuk River.

The field work reported herein was done by Erik Ostensoe (on a part time basis) and Peter A. Brown, geologists, with the help of Jim Robertson, engineering student and David Dunn, junior assistant. This report was written by Erik Ostensoe and is based in part on Brown's field notes and on his comprehensive reports written for Granduc Mines, Limited. Other sources of information are acknowledged. The original of the topographic base map was drafted by Jim Robertson. It was redrawn in revised form by Jan Libal.

LOCATION AND ACCESS

The Dawson-Ross group claims extend northerly from near the crest of the Sulphurets-Mitchell Creek Ridge, across Mitchell Glacier and part way up the slope north of Mitchell Glacier. Elevations range from about 5000 feet at the north and south limits of the claims to about 2500 feet near the snout of Mitchell Glacier. The entire area is unforested, being in part covered by glaciers, permanent snow and morainal deposits.

The claims have not been surveyed and claim outlines as shown in figure 1 are not precise.

The Dawson-Ross claims area is forty miles north of Stewart, B.C. and is for all practical purposes inaccessible except by helicopter. Consequently field work is burdened by heavy support costs and by restrictions imposed by weather conditions.

Radiotelephone contact was established between the field camp and an expediter in Stewart, the helicopter base and source of supplies.

FIELD WORK

The 1970 program of geological field work by Granduc Mines, Limited on the Dawson-Ross claims required preparation of a topographic base map at a scale of 1 inch to 200 feet by means of a standard alidade and plane table survey. This was accompanied by detailed geological mapping.

Although difficulties are encountered in carrying out alidade surveys in rugged terrain, the method had been used by Granduc Mines, Limited personnel in previous work in the area and was thought to be preferable to pace and compass or photogrammetric methods. The alidade survey was carried forward by means of a series of closed but interlocking loops in an attempt to reduce and permit detection of errors. A high order of accuracy was not achieved nor was it thought to be necessary for the purposes of the project.

Geological mapping was done by the geologists who either worked alone and plotted observations onto work sheets traced from the plane table map or who worked along with the surveyor and selected additional points of geological significance to be plotted while the survey progressed. Stadia points were marked with splashes of fluorescent paint and could easily be relocated at any time.

PREVIOUS WORK

Prominent gossans and minor quantities of placer gold have attracted prospectors to the Sulphurets-Mitchell Creek area since the late 1800's. Most of the existing mineral claims were located in 1960 and 1961 when Newmont Mining Corporation of Canada Limited, on behalf of Granduc Mines, Limited, carried out a program of regional geophysical and geological investigations. At that time veteran Ketchikan, Alaska prospectors, Don Ross, Stan Bishop and the late Wendell Dawson, staked part of the Dawson-Ross group of claims on the Mitchell Glacier prospect.

The sequence of work in the area from 1960 to 1970 was as follows:

1960 - helicopter-borne magnetic surveys by Newmont, followed by staking by Newmont (for Granduc Mines, Limited), Don Ross and others.
- ground magnetic surveys and reconnaissance geological and prospecting work.

1961 - more detailed geological work on all claims.
- small footage of "Packsack" diamond drilling on Granduc claims.

1962 - diamond drilling on the Granduc claims.
- sampling and mapping of Don Ross and Associates claims by Phelps Dodge Corp. of Canada Ltd. - Assessment Report #499 by D.C. Malcolm, B.A.Sc., P.Eng.

1963 - completion of M.Sc. thesis, U.B.C. "The Geology and Mineral Deposits in the Vicinity of the Mitchell and Sulphurets Glaciers Northwestern British Columbia by R. V. Kirkham.

1964 - Further airborne magnetic surveys, prospecting and trenching by Newmont/Granduc.

1965 - Don Ross property optioned to Meridian Syndicate.

1967 - Limited program of trenching and investigations by Granduc Mines, Limited.

1968 - Don Ross property optioned to Granduc Mines, Limited.
- Large program of plane table mapping, geological and geochemical surveys and diamond drilling.

1970 - Continuation of mapping program on Mitchell Glacier claims.

GENERAL GEOLOGY

A comprehensive report on the geology of the upper Unuk River area, including the Mitchell Glacier area, has not been published. Regional geological work has been done by G.W.H. Norman and geologists working under his supervision, and by E.W. Grove of the B. C. Department of Mines (B.C. Minister of Mines Report 1968 and in press). The writer of this report has been involved with mineral exploration in the Granduc and Unuk River areas for ten field seasons.

The Mitchell Glacier area lies east of the Coast Crystalline Complex at the western edge of the Bowser Sedimentary Basin and consequently has been subjected to a complex history of tectonic activity. Grove (1968) assigns the volcanic and sedimentary rocks to the Lower Jurassic period. Tectonic doming followed by erosion has exposed the large now-gossaned area of hydrothermal alteration and mineralization which appears to have developed as a result of intrusion

of a complex of syenitic-trachytic and granitic masses. Regional faulting, in particular the Sulphurets Fault Zone, has further complicated the geology of the area, perhaps by thrusting much of the intrusive complex into its present position stratigraphically higher than parts of its schistose mineralized halo.

GEOLOGY OF THE MITCHELL GLACIER AREA

In preparing this section the writer has freely used data presented by Peter Brown in his private reports to Granduc Mines, Limited dated September 15, 1970. Extrapolations from results of previous work in the area by the writer, G.W.H. Norman, R.V. Kirkham and Roy Wares are inevitable.

Figure 1 (in pocket) depicts the geology of parts of about 8.7 square miles of the Dawson-Ross claim group in the Lower Mitchell Glacier area at the scale of 1 inch to 200 feet. Of that area at least one-third is covered by ice and moraines.

Malcolm noted (1962 p.4) that "the greater part of the property is underlain by a series of sediments and flows. These rocks are extensively altered and sheared in some sections and are folded on axes with plunges to the west". The 1970 field work amplified Malcolm's observation.

North of Mitchell Glacier the dominant rock type is a monotonous intensely silicified formation that was mapped in the field as an altered syenite (Unit 1b and 2a). This field identification is now thought to have been an overly simplified one. Although thin section study indicates that much of the unit was of intrusive origin, remnants of bedding were recorded and several small areas of a metamorphosed lime-shale sequence (2 hm) were mapped. Although the latter could, as initially interpreted by Brown, be "rafts" faulted into their present positions an alternative explanation is that a mass of mixed sedimentary and volcanic rocks was almost entirely assimilated by igneous activity. Small remnants of the more refractory members resisted assimilation. Subsequently, faulting affected most parts of the mass.

The syenite (2a) mapped north and west of the silicified syenite is readily distinguishable; the fine matrix is grey-brown in color and supports a "crowded" mass of feldspar grains, both orthoclase and plagioclase, ranging from 1 to 4 mm in length.

Orthophyre (2c), a term applied to dykes of coarse-grained porphyritic syenite, similar in some aspects to 2a, is clearly related to igneous events subsequent to the alteration and shearing that produced the large scale silicification. It

approaches a "crystal mush" and consists largely of plagioclase laths up to 1 inch in length. Textures vary from trachytic to felted. A weak foliation generally parallels contacts. Although many orthophyre dykes were mapped on the John Bull 22 and 24 claims only the larger are shown on the accompanying map.

A few microdiorite dykes (2e) were mapped in the area of orthophyre instrusions. The microdiorite exhibits crosscutting relationships with the orthophyre, and together these rock types likely represent very late stages of intrusive events.

The only clearly identifiable volcanic flow rocks are of andesitic composition (2f,g). They outcrop on John Bull 22 claim and have undergone slight dynamic metamorphism.

Small areas of fragmental volcanic rocks were noted near Mitchell Glacier on Ran 9 claim. Outcroppings were too small to indicate on the map. They resemble rocks mapped about 2 miles to the south on the Sulphurets-Mitchell Creek Ridge and termed epiclastics by Grove (1968).

Argillaceous and coarser grained sedimentary rocks (3a,b) that outcrop at high elevation north of John Bull #24 claim are thought to be unconformable, probably in fault contact with the sheared and altered igneous and bedded rocks.

South of Mitchell Glacier a 4000 foot by 600 foot section was mapped in detail to give further information concerning an occurrence of molybdenite in shears and quartz veins. The host rock is sericite schist (1c) with variations sericite-talc schist (1d) and sericite-chlorite schist (1e).

Thin section studies by Brown indicated that the rock is chiefly quartz and sericite and that feldspars are absent. He concluded that the rock was originally a syenite but that silicification has completely replaced the feldspar. Pyrite is abundant in grains up to 1 mm size. In thin section pyrite grains exhibit quartz "tails" indicative of stress "shadows" developed during dynamic metamorphism. Two schistosities were recognized: east-west and north-south and molybdenite in shears and the pyrite "tails" are folded in conformity to the north-south foliation. Brown's suggestion that the pyrite pre-dated the first (east-west) schistosity whereas the molybdenite in shears pre-dated the second (north-south), seems accurate.

Molybdenite also occurs in quartz veins up to 1/4" in width that cross cut the various foliations. Pyrite is ubiquitous and chalcopyrite is present in small quantities.

The structures mapped south of Mitchell Glacier are compatible with proximity to the axial plane of an east-west striking fold. Grove (1968) reported evidence of a broad regional dome structure elongated in a northwesterly direction. Such a framework would aid in reconciling some of the dissimilarities of geology found on opposite sides of Mitchell Glacier.

References

Norman, G.W.H., 1960, 1961 Unpublished Private Reports to Newmont Mining Corporation of Canada and Granduc Mines, Limited.

Kirkham, R.V., 1963, The Geology and Mineral Deposits in the Vicinity of the Mitchell and Sulphurets Glaciers, Northwest British Columbia, unpublished M.Sc. thesis, U.B.C.

Grove, E.W., 1968, Lode Metals in British Columbia. In press, Bulletin concerning Geology of Stewart Area, Northwestern British Columbia (sic).

Malcolm, D.C., 1962, Geological Report, Mitchell Creek, Assessment Report No. 499.

APPENDIX A

STATEMENT OF QUALIFICATIONS

The field work for this report was done by Erik Ostensoe, Peter A. Brown, Jim Robertson and David Dunn whose qualifications are outlined below:

Erik Ostensoe, Chief Geologist for Granduc Mines, Limited (N.P.L.), Vancouver, B. C. completed B.Sc. (Honours Geology) at University of B. C. in 1960, completed course requirements for M.Sc. (Geology) at Queen's University, Kingston in 1966; employed by Newmont Mining Company of Canada from May, 1960 through August, 1964 as field and mine geologist in Granduc area of northwestern B. C., under supervision of D.M. Cannon and G.W.H. Norman; employed by Mount Billings Venture from May through September 1965 as syndicate geologist in Southern Yukon; employed by Asarco and assigned to Scud Venture, from May through October 1966 as field geologist in northern B.C. under supervision of R.H. Seraphim and W. St. C. Dunn; employed by Granduc Mines, Limited (N.P.L.) from October 1966 to present as geologist and chief geologist under supervision of P.I. Conley.

Peter A. Brown, geologist employed by Granduc Mines, Limited (N.P.L.), completed B.Sc. (Honours Geology) at University of Aberdeen, Aberdeen, Scotland in 1970; worked for Granduc Mines, Limited in 1969 in Stewart area of northwestern B. C. engaged in field mapping in vicinity of Max copper-iron deposits and during the 1970 field season in similar work in the same area and at Mitchell Glacier.

Jim Robertson, second year mineral engineering student at U.B.C., employed in 1969 as field assistant in Unuk River area and in 1970 as surveyor and field assistant at Mitchell Glacier. Responsible for field surveys and for compilation of topographic base maps used in Mitchell Glacier project.

David Dunn, first year student, U.B.C. employed in 1969 and 1970 as laborer and surveyor's assistant in Unuk River and Mitchell Glacier areas.

APPENDIX B

STATEMENT OF COSTS

APPLIED TO CERTIFICATES OF WORK

Salaries

Peter Brown - field mapping 1-1/2 months @ $675.	$1,012.00	
Jim Robertson - surveying 1-1/2 months @ $500.	750.00	
David Dunn - laborer 1-1/2 months @ $450.	675.00	
Total Salaries		$2,437.00
Camp Costs - $7.50 per man day - 130 man days	$ 975.00	
Field and Engineering Supplies	174.00	
		1,149.00
Total		$3,586.00

Erik A. Ostensoe.

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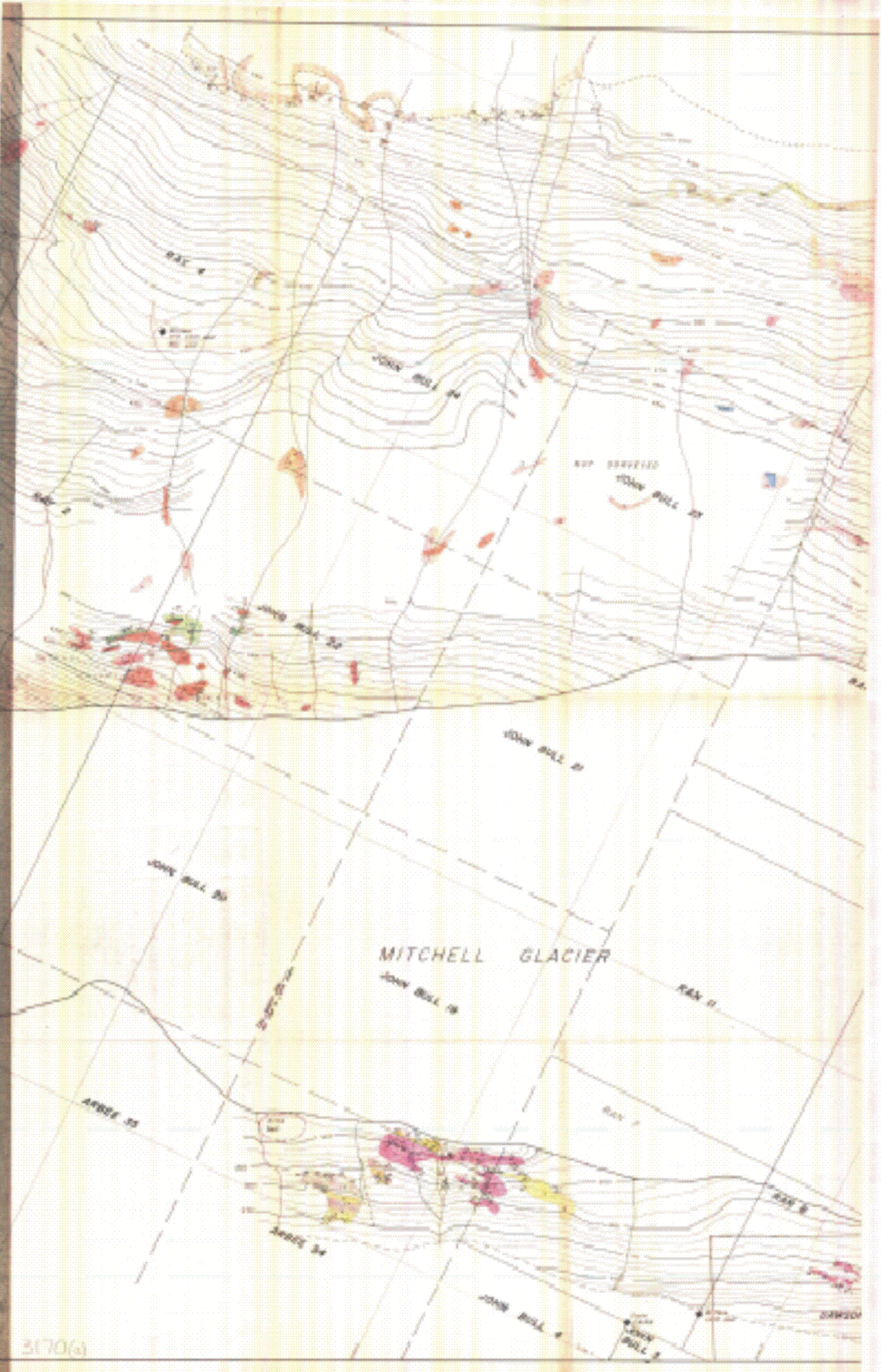
MITCHELL GLACIER
JOHN BULL 54
JOHN BULL 27
JOHN BULL 52
JOHN BULL 21
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JOHN BULL 19
RAN 11
ARBEE 35
ARBEE 34
RAN 8
JOHN BULL 6

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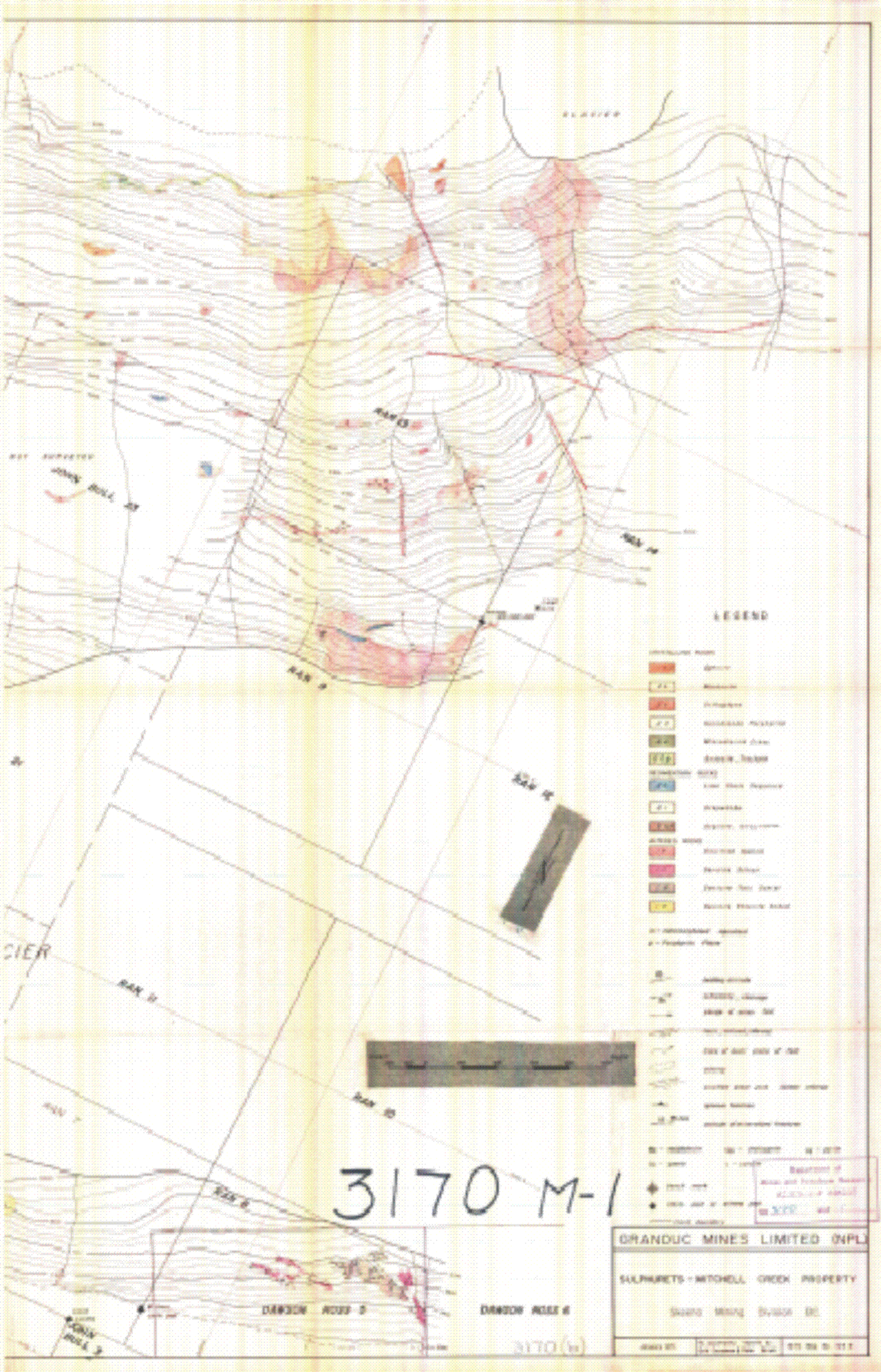
GLACIER
LEGEND
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GRANDUC MINES LIMITED (NPL)
SULPHURETS - MITCHELL CREEK PROPERTY