

This report has been examined by
the Geological Evaluation Unit.
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Approved as to cost in the amount
of: \$ 2240.00

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Accepted as representation work
under Section 53(4) Yukon Quartz
Mining Act.

[Signature]
COMMISSIONER OF YUKON

A GEOLOGICAL REPORT

on

DUB CLAIMS 1 to 167 and ZOT 11 and 12

FYRE LAKE AREA
Watson Lake Mining Division
Yukon Territory

Sheets 105-G-1 105-G-2

61° 15' N. Lat. 130° 30' W. Long.

by

T. L. Sadlier-Brown
Atlas Explorations Limited

July 8 to July 27, 1966

GEOLOGICAL SURVEY

[Signature]
FEB 15 1966

Resident Geologist
Whitehorse, Y. T.

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(N. P. L.)

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355 BURRARD STREET
VANCOUVER 1, B.C.

SUMMARY

The DUB claims are located in an area underlain predominantly by mica, sericite, and chloritic schists with a general easterly dip.

Airborne geophysics has delineated two areas of particular interest on the claim group, the DUB I area near the southeast corner of Fire Lake and the DUB II area in a cirque 3 miles north of the lake. Geochemical and geophysical ground surveys were carried out in both areas during the summer of 1966 and geological mapping was done on the DUB II area during the same period.

The DUB II area is characterized by the presence of an area of quartz-chlorite schist underlying part of the floor of the cirque. This appears to have been replaced locally by sulphides forming a flat lying to gently dipping band trending southeast across the cirque. It grades from about .4 to 2 percent copper, .1 to .2 percent silver and a trace of gold. Control of sulphide deposition is not clear but may involve the contact between the chlorite and mica schists of units 1 and 2 and the overlying mica and sericite schists and phyllites.

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A REPORT ON THE GEOLOGY OF THE DUB CLAIMS

Fire Lake, Yukon

by

T. L. Sadlier-Brown

INTRODUCTION

The DUB Group consists of a block of 167 contiguous claims situated north and east of Fire Lake on NTS map sheets 105-G-1 and 105-G-2 and in the Watson Lake Mining District.

The group was staked during the spring and summer of 1966 and is presently held by Atlas Explorations Limited of #330 - 355 Burrard Street, Vancouver, B. C.

During March and April of 1966 an airborne geophysical survey by Lockwood Survey Corporation delineated a number of areas of particular interest. In May, June, and July of 1966 detailed ground geophysical, geochemical, and geological surveys were carried out on these anomalies by a field party under the direction of P. Nielson of Vancouver. The survey was controlled by cut grid lines picketed every 100 feet and spaced at 800 feet throughout most of the area but 400 and 200 feet in the vicinity of anomalies.

From this survey two areas were picked as potential drill targets; the DUB I anomaly and the DUB II anomaly.

A diamond drill project was initiated on the DUB II anomaly early in October of 1966 under the supervision of T. L. Sadlier-Brown. Five drill holes were put down before cold weather forced the suspension of the project.

LOCATION AND ACCESS

Fire Lake is located at $61^{\circ} 15'$ N. Lat. and $130^{\circ} 30'$ W. Long. about half way between Watson Lake and Ross River. A road joining these two centres passes about thirty miles to the north of the lake.

Service to the area was provided by fixed wing aircraft and helicopters, usually from Ross River although several flights were made from Watson Lake.

The DUB I anomaly is located at the southeastern corner of Fire Lake and is readily accessible from the Lake.

Access to the DUB II anomaly is by a trail which follows a creek north from the cache about half way along the north shore of the lake. The area is located in a cirque about three miles from the lake and about 1000 feet higher in elevation.

PHYSIOGRAPHY

The claims are located in an area of mountainous terrain with a maximum relief of about 2500 feet. The higher peaks reach to just over 6000 feet.

Drainage on the claim group itself is effectively

carried out by several streams which flow south into Fire Lake and the North River and ultimately, into the Liard River.

Precipitation is generally moderate although in the cirque area (DUB II anomaly) very heavy accumulations of snow blown from the ridges may be expected.

The area is well forested with spruce pine and buckbrush to an elevation of about 5000 feet.

GENERAL GEOLOGY

The DUB claims are, for the most part, underlain by metamorphic rocks; mica, sericite, and chlorite schists, phyllites, and quartz hornblende gneisses. Lesser amounts of limestone, quartzite, and graphitic schists are also present. These rocks are generally distinctly bedded and dip moderately towards the east although some extreme local variations occur.

Beyond the north and northeastern limits of the group the metamorphics are intruded by granitic rocks and numerous large boulders of peridotite along the valley near the southwestern limit of the claims suggest the presence of ultrabasic intrusives in the area as well.

About 6 miles south of the claim group is the well defined northeasterly trending valley underlain by the Tintina Fault. Air photo interpretation suggests that the

valley containing the North River and Fire Lake, as well as several other valleys in the area, may also be underlain by fault zones possibly related to the Tintina break.

Except for the colluvial material on the lower slopes, the unconsolidated sands and gravels in the area all appear to be of glacial origin. Moraines, drumlins, and eskers all occur near or on the claim group and may be attributed to both the pleistocene continental glaciation and more recent alpine glaciations. The continental ice travelled in a northwesterly direction.¹

TABLE OF FORMATIONS

| | | |
|-----------------|---|--|
| Quaternary: | 6 | Unconsolidated Glacial and Alluvial Material. |
| Mesozoic: | 5 | Granodiorite, diorite, and granite. |
| (?): | 4 | Magnetite-quartz-biotite schist and gneiss with sulphides, vuggy quartz, pyrite bearing quartzite. |
| Palaeozoic (?): | 3 | Mica schist, sericite schist, phyllite, graphitic schist and limestone. |
| | 2 | Quartz-chlorite schist, minor quartzite. Disseminated and massive sulphides. |
| | 1 | Quartz-hornblende-mica schist and gneiss. |

1. Wheeler, J.O.; Green, L.H.; Roddick, J.A.; Finlayson Lake Map Area, Descriptive notes. G.S.C. Map 8-1960.

THE DUB I AREA

The DUB I anomaly is a coinciding copper geochemical, magnetic, and electromagnetic anomaly a short distance east of the southeast corner of Fire Lake.

It is situated on the well forested lower slope of a mountain in an area underlain by mica schist, phyllites and chloritic schists. These rocks trend roughly north south, dip moderately to the east and are fairly well exposed.

No mineralization that would explain the anomaly was observed but only a reconnaissance geological survey was carried out.

THE DUB II AREA

Introduction

The DUB II Anomaly is located near the head of a stream which flows from a cirque north of Fire Lake to a point about midway along the north shore of the lake. The presence of mineralization in the cirque is indicated by good copper geochem. values in this stream and by sulphide bearing float in its upper reaches.

In 1960 Cassiar Asbestos Exploration did an EM and magnetometer survey which outlined a discontinuous anomalous zone roughly 2000 feet long and 300 feet wide, and striking at about 100 degrees. The area was also mapped geologically, trenched, and diamond drilled. A grid consisting of a 2800 foot base line with cross lines every 100 feet was used for control.

The present examination was carried out during July of 1966. A base line 7600 feet long and striking at 340° was put in. Initially cross lines were put in every 400 feet although 200 spacings were used over the anomalous area while 800 foot spacings were used in the southern part of the grid where geophysical response was poor.

Magnetometer and EM surveys were carried out on this grid and are discussed in detail in a geophysical report by J. S. Brock¹ of Atlas Explorations.

A geochemical survey indicated a copper geochemical anomaly in the soil slightly west of and downhill from the geophysical anomaly. Lead and zinc values were found to be low. The strong likelihood of downhill transportation of the geochemical anomaly restricts its usefulness as an aid to pinpointing the mineralization.

GEOLOGY

The rocks in the cirque area have been divided into three units originally felt to be a stratigraphic sequence. Drill results and geophysical interpretation, however, suggest that the relationship between them is probably far more complicated.

What appear to be the oldest rocks in the cirque area are the quartz-hornblende-mica schists and gneisses (1) of the western, and topographically lowest part of the map

1. Brock, J.S. 1966, Magnetic & Electromagnetic Geophysical Surveys. DUB and ZOT Mineral Claim Groups. Atlas Explorations Ltd. 1966.

area. These tend to be flat-lying or very gently dipping in a variety of directions and outcrop in the valley near the confluence of the two streams draining the cirque. Nowhere was a contact between them and any adjacent rocks observed. An abrupt and uniform change in the magnetics in the assumed vicinity of the contact may indicate the presence of a fault.

Immediately east of Unit 1 is a quartz-chlorite schist horizon (Unit 2) of unknown but considerable thickness. This rock is generally pale green and well bedded. In places it contains up to 80% quartz with only minor amounts of chlorite while elsewhere it is predominantly chlorite with a little quartz.

This horizon invariably underlies the mineralized zone and may well be the host rock which has been replaced by the sulphides.

A general sequence through the mineralized zone is as follows:

- 4D Oxidized cap rock in places where mineralization outcrops.

- 4 B & C Massive pyrite with quartz. In places only a vuggy quartzite is present but this may be a leached equivalent of what appears to be the massive pyrite. It seems likely that the quartzite is actually rich quartz-chlorite schist.

4A Magnetite-quartz-biotite schist or gneiss. This often contains disseminated pyrite and chalcopyrite. It usually grades quickly into the underlying chlorite schist.

Apparently overlying the above is a very thick sequence of mica schists, phyllites, and sericite schists (Unit 3), which extends to the summit of the ridge east and south of the cirque. Bands of siltstone and white limestone are also present near the top of the section. On the east ridge these rocks have a uniform easterly dip of 30 or 40 degrees. On the ridge near the extreme southeast corner of the map area, however, is an anticline which may also be a break. Dips on the west side of this are generally west or northwest and shallow.

The maximum thickness of the unconsolidated material in the anomalous area was found to be about 50 feet. Commonly, however, it is 20 to 30 feet thick with outcrop being restricted to creek beds and mountain sides.

MINERAL OCCURRENCES

Sulphide mineralization outcrops in three general areas along a southeasterly-striking magnetic anomaly.

The most northerly of these is in the creek bed at 4+00N, 5+00E on the grid. Disseminated pyrite and chalcopyrite occur here in a magnetite-quartz-hornblende gneiss. Neighbouring outcrops are of contorted mica schist which appears to overlie the gneiss. The relationship, however, is not clear.

Two samples of the mineralized material gave the following assays:

| | |
|---------|---------|
| Cu. .15 | Ag. tr. |
| Cu. .01 | Ag. .04 |

About 2000 feet to the southeast of the above showing and in the valley of the south fork of the creek is a mineralized area upon which a considerable amount of surface work was done by Cassiar. Several shallow pits in the vicinity of lines 4+00S and 6+00S at about 16+00E.

Trenching has revealed widespread massive pyrite and limited amounts of the magnetite-quartz schist mentioned above. The sulphides appear to overly an easterly dipping horizon of chlorite schist which outcrops just west of the trenched area.

About 600 feet further to the south east and in the vicinity of 10+00S, 24+00E, is another mineralized area. Both magnetite-quartz-hornblende gneiss and pyrite forming a band from a few inches to a foot or so thick are present. The pyrite here appears massive but it is actually unconsolidated and can easily be scooped out by hand, probably as a result of the removal of some matrix mineral such as quartz. Immediately to the south and up the mountain from this area is the thick sequence of mica schist, sericite schist, and phyllite (Unit 5), which overlies the mineralization stratigraphically.

Porous rusty iron oxide deposits are associated with sulphide showings throughout the length of the anomaly.

DISCUSSION AND CONCLUSIONS

Sulphide mineralization in the DUB II area appears to occur as a replacement of the quartz-chlorite schist horizon which outcrops in the floor of the cirque north of Fire Lake. Pyrite, chalcopyrite, pyrrhotite and magnetite are all present in the mineralized zone but the control for their occurrence is not clear. The zone, however, is a sinuous band with an approximate southeast trend characterized by strong magnetic and electromagnetic properties. Where observed in outcrop it is usually flat lying or dipping moderately eastward. The lower part of the band is a highly magnetic schistose, and in places gneissic rock consisting of magnetite, quartz, and either biotite or hornblende. It is generally fine grained and dark grey in colour. It often contains disseminated pyrite and chalcopyrite and commonly grades about .6 percent copper although some has been found to assay over two percent.

Pyrite occurs in a similar mantle-like horizon which appears to overly the magnetic schist. In places, such as in the south fork of the stream immediately west of the old Cassiar base line, the pyrite is massive but usually it contains quartz in varying quantities. It grades up to a percent copper. Vuggy, weathered quartzite float occurs in the vicinity of the pyritic rocks and may be the result of the leaching of sulphide-rich quartzite.

Pyrrhotite occurs, with pyrite and lesser amounts of chalcopyrite, in contorted areas of the quartz chlorite schist. It is not abundant and does not seem related to the main body of copper mineralization.

It has been suggested¹ that the schists and gneisses in the area are of volcanic rather than sedimentary origin. If this is the case, Units 1, 2, and possibly some of the lower beds of Unit 3 may be metamorphosed intermediate volcanics. The upper part of Unit 3, which outcrops just east of the map area, contains limestones, phyllites, and cherty rocks which are more definitely of sedimentary origin. The contact at the base of Unit 3 may turn out to be an important structural feature in the area; possibly a disconformity between volcanic and sedimentary rocks and a factor in the control of the copper mineralization. It is not, however, well exposed.

RECOMMENDATIONS

Further work on the DUB II area should be directed towards determining the control for the sulphide deposition as an aid in searching for possible extensions of the known mineralized zone. This should involve a careful structural study of the cirque area with emphasis on close topographical control. Diamond drilling in this phase could test the importance of the lower contact of Unit 3 as a zone favourable to sulphide deposition by drilling through it in several places

1. C.L. Smith: Atlas Explorations Limited, Personal Communication.

(such as near the east end of line 12S).

Delineating the known mineralization and testing geophysical anomalies could be done with a light diamond drill, such as the Winkie, as outcrop distribution and Cassiar drill information suggest near surface targets.

Respectfully submitted,

A handwritten signature in cursive script that reads "T. L. Sadlier-Brown".

T. L. Sadlier-Brown,
Geologist,
Atlas Explorations Limited,
#330 - 355 Burrard Street,
Vancouver, 1, B. C.

VALUE OF GEOLOGICAL WORK
DUB and ZOT CLAIMS

| | | |
|---|----|----------|
| Salary, 1 geologist, 20 days @ \$40/diem | \$ | 800.00 |
| Camp and living expenses, 20 days @ \$12/diem | | 240.00 |
| Transportation (helicopter), 6 hrs. @ \$120/hr. | | 720.00 |
| Compilation and presentation, 12 days @ \$40/diem | | 480.00 |
| | | <hr/> |
| Total | \$ | 2,240.00 |
| | | <hr/> |

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AFFIDAVIT SUPPORTING SUMMARY OF COSTS:

I, T. L. Sadlier-Brown, Geologist, Atlas Explorations Limited, of Ross River, Yukon Territory, do hereby state that to the best of my knowledge and belief the statement of costs as presented in this report "Geology of the DUB Claims" is both correct and true.

T. L. Sadlier-Brown

T. L. Sadlier-Brown

Jan 18, 1957

Date

John Bush

A Commissioner of Oaths
in and for the Yukon
Territory

BIBLIOGRAPHY

Brock, J. S. 1966: Magnetic & Electromagnetic Geophysical Surveys, DUB and ZOT Mineral Claim Groups. Atlas Explorations Limited. Unpublished Report.

Wheeler, J.O.; Green, L.H.; Roddick, J.A.: Finlayson Lake Map Area, Descriptive Notes, G.S.C. Map 8-1960.



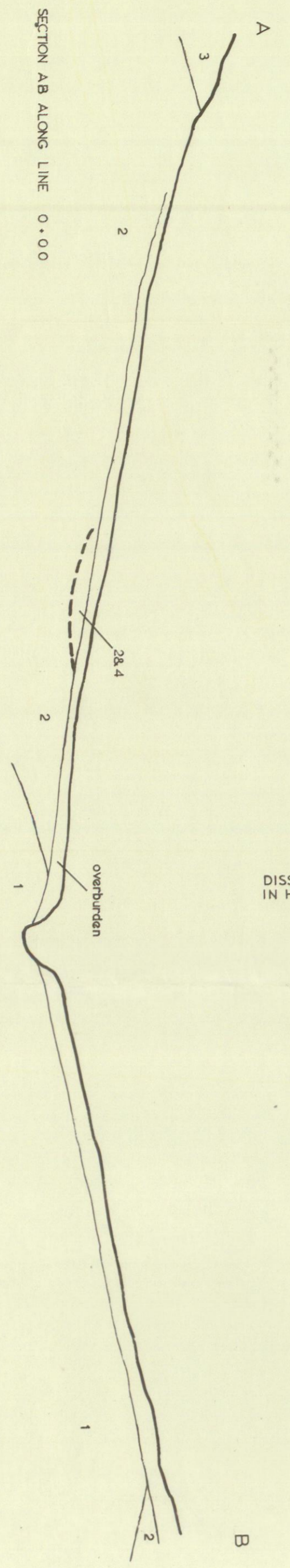
KEY MAP FYRE LAKE AREA
 Grid Location: DUB Mineral Claims

ATLAS EXPLORATIONS LIMITED
 0 5000 ft.

Approx Elevation

4600
4800
5000

SECTION AB ALONG LINE 0.00



LEGEND

- 4 Sulphide zone. (A) magnetite-quartz-biotite schist, gneissic in places & often containing chalcopyrite (B) massive pyrite with quartz (C) vuggy quartz sometimes with sparse disseminated pyrite (D) porous rusty Fe oxide cap rock.
- 3 Mica schist, sericite schist, phyllite, graphitic mica schist, Quartz veining & banding common.
- 2 Chlorite schist
- 1 Quartz-hornblende-mica schist

- trench
- stream
- outcrop area
- pit
- height of land
- geological boundary
- attitude inclined bedding or schistosity
 horizontal bedding or schistosity
 quartz veining
- diamond drill hole
- claim post

ATLAS EXPLORATIONS LIMITED
DUB MINERAL CLAIMS
DUB 2 AREA
 FIRE LAKE YT 105 G-2
 GEOLOGICAL MAP
 Scale: one inch to 400 feet

