

SUMMARY OF EXPLORATION 1968-1971

AND PROPOSED DIAMOND DRILLING

SCOT MINERAL CLAIMS

105-0-6

ATLAS EXPLORATIONS LIMITED

By: J. S. BROCK
November, 1971

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INTRODUCTION

Past exploration of the Scot Mineral Claims has revealed several interesting targets that warrant diamond drilling.

GEOLOGY

The Scot Group area is in a geological environment very similar to the Tom Group deposit (owned by Hudson Bay Exploration & Development Ltd.), which is located about 35 miles along regional strike to the southeast. Both the Tom Group and the Scot Group are in Devonian-Mississippian, steeply dipping, graphitic cherts, slates and minor carbonates and both are in close proximity to small Cretaceous granitic intrusive plugs. The Tom Group mineralization is of replacement type in a highly altered carbonate unit. Travertine, which is found on the Scot Group, coincident with the anomalous geochemical zone, both as float and being deposited from ground water seepages, would indicate an underlying carbonate unit.

The claim group is within a thick section composed mainly of black chert, black shales and slates, and minor limestone, quartzite and phyllite.

The sediments are quite uniformly steeply dipping, and strike in an easterly to southeasterly direction.

Over the grid area outcrop is very limited. All the units are thin and interbedded. Because of this, it is impossible to interpolate units or contacts outside of the immediate outcrop area.

Only one small sulfide showing has been found in the grid area. It consists of very minor tetrahedrite in a narrow quartz - calcite vein. The vein cuts black cherts, shales and limestone.

There is very little outcrop in the eastern grid area. Centred on the base line at 8+00 W. is an area of about 400 ft. by 500 ft. in which carbonate-rich ground waters have emerged to the surface, depositing a light porous chemical sediment of calcium carbonate (travertine). Much moss and other organic material in this area has been replaced by carbonate. Travertine float was found over a wide area on the eastern portion of the grid.

GEOPHYSICS

No interesting trends or zones of magnetic response were outlined by a magnetometer survey.

Irregular and chaotic results obtained from an electromagnetic survey are likely due to high and varying percentages of graphite in the Ordovician-Devonian sediments. A weak, flat-lying conductive response exists within the area of the gravity anomaly.

Magnetic and electromagnetic surveys have not conclusively defined any economically significant targets.

An interpretation of Gravity Survey Results revealed the following targets. On the residual map a large positive closure exists in the north part of the prospect near the base line between lines 8 W and 20 E. Three local high areas have been mapped within the closed region. Amplitudes of these are as follows:

1. 3N on line 4E - 0.8 mgal. Calculated depth
 275' (?)
2. 3S on line 4E - 0.66 mgal. Calculated depth -
 130'.
3. 4N on line 0 - 0.7 mgal.

It is possible the amplitudes of #1 and #3, above, may be somewhat greater than shown. Northward extension of lines 0 and 12 E a few hundred feet would add the necessary regional control to help determine this.

GEOCHEMISTRY

Topography and Ground Conditions

The Scot grid (base line E-W cross lines N-S) straddles the valley of the creek that flows generally southwest from Jake Lake to the Hess River.

The west facing slope of the valley is quite even, almost completely overburden covered and of moderate slope. The east-facing slope is much steeper, quite irregular, and has much more outcrop than the western slope.

A well defined simple soil profile is found over most of the area sampled. Soil sampling has been hampered by frozen ground conditions on all but a small portion of the grid area.

Vegetation in the Scot Group area is generally quite thick, consisting of spruce, poplar, mountain alder and dwarf birch (buck brush)

Geochemical Results

A large, high magnitude, irregular two-limbed zinc geochemical anomaly in soils is defined on the Scot Grid between L0 and L28W, 4N to 12S. A large area is within the 5000 ppm zinc contour, with maximum values well over 100,000 ppm. Smaller areas highly anomalous in zinc (5000 ppm) are scattered throughout the eastern grid area, the next largest having an area of about 800 ft. by 300 ft. and is centred at L0, 15N. The only bedrock exposures coincident with zinc anomalies are two small outcrops of black chert at 18W, 0N, and 18W, 2S. The large zinc anomaly is elongated in a downslope direction and is also roughly parallel to the regional bedrock attitude. The seepage of ground water which is depositing travertine, located at 8W, 0N, is within the large zinc anomaly.

Zones of anomalous lead results are located generally upslope along strike from the large zinc anomaly (See Fig. 5). The lead anomalies are of low to medium magnitude (threshold value about 60 ppm, maximum values in the 200-300 ppm range).

Copper soil anomalies, like the lead anomalies, are generally on the upslope margin of the large zinc anomaly (See Fig. 6). Zones of anomalous copper and lead results are coincident in many locations. Anomalous copper zones extend into the large zinc anomaly at 12W, 6S; 8W, 0-3S; and OW, 14S. The copper anomalies are of medium magnitude with a threshold value of about 70 ppm and peak values in the 150-200 ppm range.

The manganese values are very erratic with values ranging from extremely high to low over very short distances.

Only one manganese contour line was drawn, enclosing the area with manganese values above 1000 ppm. This contour enclosed with a large zone with two irregular limbs meeting at an acute angle, similar in shape to the zinc anomaly, but displaced slightly upslope. Manganese values above 1000 ppm (and up to 100,000 ppm) are coincident with most of the best copper and zinc values.

A geochemical consultant, Dr. R. Horsnell offered the following comments regarding the geochemistry of the Scot Group.

The data suggest emergence of metal bearing acid ground water at hillside seepage sites variously depositing both travertine and Mn or Fe hydroxides. The soil Mn pattern is particularly suggestive of such a process.

It is well known that, under low Ph-Eh conditions Mn passes readily into solution as the divalent cation. However a pH-Eh increase, which generally occurs when ground waters enter the near-surface zone, causes oxidation of Mn from the di to the quadrivalent state with consequent

precipitation of Mn hydroxide wad. Fe_2 behaves, similarly although, as oxidation of Fe^{2+} to Fe^{3+} takes place a little more readily than does the comparable Mn reaction, it generally precipitates before Mn. Thus a zonation of Fe and Mn hydroxide deposits is frequently observed.

Freshly precipitated Mn and Fe hydroxides are powerful "scavenging" agents. Mn readily attracts and concentrates heavy metal cations (eg. Zn, Co, Ni, Ba) whereas Fe attracts oxyanions (eg. Mo, As).

The travertine deposits are suggestive of acidic (possibly rendered so by oxidizing sulphides) groundwaters reacting with calcareous rocks before emerging at the surface.

The origin of the Zn anomaly is somewhat complex as the metal has probably undergone:

- i) Transport in groundwater
- ii) Concentration by Mn hydroxide scavenging
- iii) Coprecipitation (as Zn carbonate?) with travertine and possible concentration

It is thus possible that the most intense soil anomaly is not directly related to its source, either in position or magnitude. It is difficult to estimate from what depth the Zn might have been derived. There are at least two possibilities:

- i) The Zn soil anomaly essentially overlies a mineralized bedrock source (as suggested by Adamson) - and the concentration reactions have merely been a re-working of metal within the near surface environment.
- ii) The source of Zn is completely buried - and should be sought up the direction of groundwater flow -- i.e. the weak Pb (a relatively immobile element) anomalies may be closer to the mineralized source than is much of the Zn pattern.

It is the writer's opinion that both the above hypotheses should be tested by trenching and/or diamond drilling. It is understood that testing of (i) above is planned by Atlas. It is suggested that, in addition, at least one hole be drilled beyond the upslope margin of the Zn soil anomaly to test (ii) above. Further study of the local hydrology might assist drill hole siting. It is also suggested that four further claims be staked to the east of the existing block in order to guard against the possibility of a buried orebody extending off Atlas' ground.

CONCLUSIONS

The geologic setting of the Scot Mineral Claims is similar to that of the Tom zinc deposit owned by Hudson Bay Exploration and Development Ltd.

A residual gravity anomaly has been defined over a strike length of 3,000 feet and widths of up to 1,400 feet. Peak values reach 0.9 milligals. The gravity anomaly does not appear to be due to surface topographic effects.

A large zinc anomaly in soils is coincident with the gravity anomaly, some downslope migration of zinc has been assumed.

Diamond drill testing of the gravity-zinc anomaly is recommended.

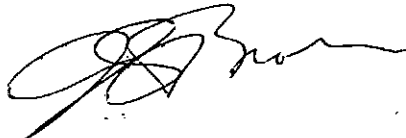
RECOMMENDATIONS

Diamond drilling of the Scot Mineral Claims is recommended at the following sites :

Hole	Co-ordinates	Dip	BRG	Depth	Target
Hole 72S - 1	Line 12 E 4N	-90°	Vert.	500'	.9 mg gravity coincident with 2500 ppm zinc in soils. Vertical hole recommended to test geologic structure.
72S - 2	2W 2N	-45	35°	500'	0.8 mg gravity 300 ppm zinc in soils
72S - 3	10W 1S	-45	35°	500'	area of travertine seepage, 8800 ppm zinc in soils 0.8 mg gravity
72S - 4	4W 13S	-45	35°	500'	to test south limb of zinc geochem anomaly

Initial budget for a minimum of 2,000 feet of drilling will be assumed to be in the order of \$50,000. Overall drilling costs will be approximately \$20/foot for BQ wireline coring, footage charges include camp support supplied by the contractor.

J. S. Brock

A handwritten signature in black ink, appearing to read 'J. S. Brock', written in a cursive style.

November, 1971