A GEOLOGICAL-GEOCHEMICAL INVESTIGATION

OF THE

MAT MINERAL CLAIMS
(MAT 1-16 and 18-24)

Latitude 61°32'N
Longitude 132°35'W

N.T.S. 105F-10

WATSON LAKE MINING DIVISION

YUKON TERRITORY

During the Period July 1, 1976 to September 7, 1976

Prepared by

John S. Brock
This report has been examined by the Geological Evaluation Unit and is recommended to the Commission to be considered as representation work in the amount of $2638.27.

[Signature]
Resident Geologist or Resident Mining Engineer.

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

B.R. BAXTER
Supervising Mining Recorder
Commissioner of Yukon Territory
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>CLAIMS STATUS</td>
<td>1</td>
</tr>
<tr>
<td>LOCATION AND ACCESS</td>
<td>1</td>
</tr>
<tr>
<td>PHYSIOGRAPHY AND VEGETATION</td>
<td>2</td>
</tr>
<tr>
<td>HISTORY AND PREVIOUS WORK</td>
<td>2</td>
</tr>
<tr>
<td>REGIONAL GEOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>PROPERTY GEOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>GEOCHEMICAL SURVEY</td>
<td>6</td>
</tr>
<tr>
<td>1. Method of Survey</td>
<td>6</td>
</tr>
<tr>
<td>2. Method of Analysis</td>
<td>6</td>
</tr>
<tr>
<td>3. Treatment of Data</td>
<td>6</td>
</tr>
<tr>
<td>4. Interpretation of Results</td>
<td>6</td>
</tr>
<tr>
<td>CONCLUSIONS AND RECOMMENDATIONS</td>
<td>7</td>
</tr>
</tbody>
</table>

APPENDICES

- A. Bibliography
- B. Summary of Costs
- C. Affidavit Supporting Summary of Costs
- D. Certificate

FIGURES

- 1. Location Map
- 2. Claims Map
- 3. Geology
- 4. Geochemical Survey

Frontispiece
INTRODUCTION

The MAT mineral claims were acquired by Welcome North Mines Ltd. under the provisions of an option agreement with Marvin Sherman of Whitehorse, Yukon.

The property was acquired due to the recognition of a volcanicogenic massive sulphide environment, which geologic evidence was further supported by the findings of other companies exploring adjacent properties within the Seagull Creek area.

Preliminary exploration of the property involved geochemical sampling, assaying and prospecting.

CLAIMS STATUS

<table>
<thead>
<tr>
<th>Claim No.</th>
<th>Grant Numbers</th>
<th>Staker</th>
<th>Recording Date</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 1-4</td>
<td>Y83159-Y83162</td>
<td>M. Sherman</td>
<td>August 8, 1974</td>
<td>Aug. 8, 1977</td>
</tr>
<tr>
<td>MAT 5-12</td>
<td>Y93734-Y93741</td>
<td>K. Linille</td>
<td>Sept. 8, 1975</td>
<td>Sept. 8, 1976</td>
</tr>
</tbody>
</table>

LOCATION AND ACCESS

The claims are located in south-central Yukon Territory about 25 miles south of Ross River and roughly 100 miles northeast of the city of Whitehorse, Yukon Territory. The approximate geographic location of the claims is 61°32' north latitude and 132°35' west longitude. The South Canol Road between Ross River and Johnson's Crossing on the Alaska Highway is located about 16 miles west of the property.

Access to the property is possible by helicopter directly to the property. Ross River is equipped with an all-weather landing strip and helicopters and fixed wing aircraft can be chartered there.
PHYSIOGRAPHY AND VEGETATION

The claim groups occupy portions of the westerly slope of a prominent north-northwesterly trending ridge. The MAT claims cover portions of a small cirque which drains westerly to Seagull Creek. The GULL claims lie near the extreme south end of the prominent ridge east of Seagull Creek. Topography on both properties is moderate and elevations vary from 4,000 to 5,200 feet A.S.L.

Vegetation consists of scattered, spruce and fir trees with frequent clumps of buckbrush. Treeline occurs at approximately 4,500 feet A.S.L. with grass and minor shrubs above this elevation. Travel to any part of the properties is not difficult in this relatively open country.

HISTORY AND PREVIOUS WORK

The following summary of previous work has been derived from the Archer-Cathro Northern Cordillera Mineral Inventory - 1972:

"Staked as Box cl (88443) in Sept/63 by O. Haug for Conwest, which explored with hand trenching in 1964. Restaked as MC cl (Y2879) in April/66 by J.K. Campbell and optioned in 1966 to Tay River ML (controlled by Silver Standard ML, Copper Ridge ML and Utica ML), which trenched, sampled, and mapped the showings in Aug/66. In 1968, the claims were optioned by Canol ML but no further work was done. Restaked as Mat cl (Y83159) in Aug/74 by Nithex E & Dev L, which added the Gull cl (Y83155) two miles SE and conducted mapping and trenching later in the year and optioned the property in 1975 to a joint venture between Northern Homestake ML and Royal Agassiz ML. The joint venture added more Mat and Gull cl (Y93701) in Sept/75 and conducted more mapping and trenching. Northern Homestake changed its name to Robbins EL early in 1976.

REGIONAL GEOLOGY

Within the Pelly Mountain region (N.T.S. 105F - Quiet Lake) Mississippian to Permian acid to intermediate submarine explosive volcanic rocks have been mapped by the Geological Survey of Canada. The volcanic centres would appear to be located in and to the north of the
Seagull Creek area and the whole pile (900 meters plus) is composed of a number of coalescing sheets of ejecta extruded from several centres. Further to the north and southwest a thinner (100 meter) sequence of volcanoclastic and sedimentary rocks are facies equivalents of the units described above. Syenites, presumably a subvolcanic relative of the extrusive rocks, occur as several small plugs within the volcanic pile. These rocks are underlain by 500 meters of Devonian to Mississippian black siliceous slate and minor wacke representing quiet deeper water sedimentation.

Overlying the volcanic sequence are several hundred meters of laminated strongly bioturbated shales and siltstones which are in turn overlain by 500 meters of Middle to Upper Triassic silty sandy medium grey, thin-bedded limestones.

PROPERTY GEOLOGY

The main showing area is exposed on the walls and bottom of a shallow gorge cut by a north-northwesterly flowing creek. A 5-foot wide bed of massive galena is exposed in the creek bottom. The mineralization strikes northerly and dips moderately east. A selected sample taken from this zone assayed 19.40% lead, 11.63 oz. silver and 0.046 oz. gold per ton.

The creek appears to follow a fault or shear zone as the graphitic slate and foliated quartz-eye tuffs exposed there are highly brecciated and altered. Pyrite is scattered throughout the outcrop area as fine-grained disseminated material and as larger semi-massive lenses. An area about 75 feet long is exposed in the creek walls and scattered stringers and nests of medium to coarse-grained galena cubes are found throughout this area. The pyrite mineralization surrounds the bed of massive galena and seems to be part of a northwesterly-trending zone of unknown width which follows the creek.

Grab samples were taken of typical mineralization encountered within the "pyrite zone".
<table>
<thead>
<tr>
<th>ERA</th>
<th>PERIOD OR EPOCH</th>
<th>FORMATION &amp; THICKNESS</th>
<th>LITHOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MESOZOIC</td>
<td>MID TO UPPER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRIASSIC</td>
<td>8</td>
<td>500M</td>
<td>Silty sandy, medium grey thin-bedded limestone</td>
</tr>
<tr>
<td>PERMIAN</td>
<td>6b,6c</td>
<td>200M</td>
<td>Laminated strongly bioturbated shale and siltstone</td>
</tr>
<tr>
<td>MISSISSIPPIAN</td>
<td>6b</td>
<td>100M</td>
<td>Orange weathering, thin-bedded, pale green tuffaceous char</td>
</tr>
<tr>
<td></td>
<td>6c</td>
<td>900M</td>
<td>Acid to intermediate volcanic and volcanoclastic rocks and shale</td>
</tr>
<tr>
<td>MISSISSIPPIAN</td>
<td>5</td>
<td>500M</td>
<td>Black siliceous slate with minor greywacke and barite</td>
</tr>
<tr>
<td>DEVONIAN</td>
<td>LOWER TO UPPER</td>
<td>2400+</td>
<td>Dolomite and orthoquartzite dolomite mudstone</td>
</tr>
<tr>
<td></td>
<td>DEVONIAN</td>
<td></td>
<td>UNCONFORMITY</td>
</tr>
<tr>
<td>PALEOZOIC</td>
<td>LOWER TO MIDDLE</td>
<td>4</td>
<td>Laminated thin-bedded dolomite siltstone. Crinoidal packstone and wackestone, dolomite</td>
</tr>
<tr>
<td>SILURIAN</td>
<td>1000M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOWER TO UPPER</td>
<td>ORDOVICIAN</td>
<td>3</td>
<td>Fissile black graptolitic slate. Thin-bedded orthoquartzite. Dolomitized mudstone. Medium grey noncalcareous phyllites and volcanic rocks</td>
</tr>
<tr>
<td></td>
<td>1500-2000M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPPER CAMBRIAN</td>
<td>2</td>
<td>1000M</td>
<td>Calcareous slate, phyllite and argillaceous limestone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UNCONFORMITY</td>
</tr>
<tr>
<td>LOWER CAMBRIAN</td>
<td>1c</td>
<td>1500+M</td>
<td>Orthoquartzite, slate and phyllite, limestone and dolomite.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UNCONFORMITY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROTEROZOIC</td>
<td>HADRYNIAN</td>
<td>1b,1a</td>
<td>Green argillite, fine-grained, thin-bedded crosslaminated greenish argilaceous quartzite</td>
</tr>
<tr>
<td>SAMPLE</td>
<td>Cu</td>
<td>Zn</td>
<td>Pb</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>812</td>
<td>.05</td>
<td>2.06</td>
<td>.068</td>
</tr>
<tr>
<td>813</td>
<td>.02</td>
<td>1.72</td>
<td>.034</td>
</tr>
<tr>
<td>814</td>
<td>.25</td>
<td>21.0</td>
<td>.03</td>
</tr>
<tr>
<td>815</td>
<td>.05</td>
<td>.68</td>
<td>.089</td>
</tr>
<tr>
<td>816</td>
<td>32</td>
<td>816</td>
<td>ppm</td>
</tr>
<tr>
<td>817</td>
<td>.03</td>
<td>.25</td>
<td>.044</td>
</tr>
<tr>
<td>818</td>
<td>1204</td>
<td>132</td>
<td>ppm</td>
</tr>
<tr>
<td>819</td>
<td>89</td>
<td>688</td>
<td>ppm</td>
</tr>
<tr>
<td>820</td>
<td>648</td>
<td>132</td>
<td>ppm</td>
</tr>
<tr>
<td>821</td>
<td>24</td>
<td>1000</td>
<td>ppm</td>
</tr>
<tr>
<td>822</td>
<td>33</td>
<td>400</td>
<td>104</td>
</tr>
</tbody>
</table>

A parallel gossan zone which is now completely oxidized occurs about 400 feet west of the zone exposed in the creek. Portions of the gossan zone have been traced over a strike length of 1200 feet. The gossan appears to be transported and cements fragments of a felsic tuff.

The property was examined by an independent geological consultant, Dr. Paul Sawyer. An excerpt from his report is tabled on the following page.
Mineralization in the upper showing is a very heavy gossan which is possibly transported. The rocks are fairly acid, green to green grey volcanics, in which very little sulphide is visible but the weathered surfaces show good limonite development. In one or two places we do find small seams of pyrite and possibly minor amounts of zinc and some pyrrhotite in place. The strike of the cleavage here is about 095°.

On the lower showing down in the creek, there are exposures of grey schists or phyllites with abundant pyrite. The strike again is about 095° to about 105°. In the creek bed also there is heavy pyrite associated with quartz veins. Higher up the creek there is more schists, sometimes quite graphitic. The strike appears to be about 125°, dipping south. There is galena in some of the schists and in places fairly massive pyrite with galena, and again some green staining which may or may not be copper staining. The impression is still of a fairly flatly dipping band. Overall dip might be of the order of 30° - 35° to the south.
**LEGEND**

- 206 SOIL SAMPLE LOCATION WITH ZINC VALUES IN P.P.M.
- 1.0 Sclc
tin EER SILVER
- Claim Posts
- Py, Ge MINERAL OCCURRENCE: PYRITE, GALENA.

**WELCOME NORTH MINES LTD.**

**MAT MINERAL CLAIMS**

**GEOLOGY**

Scale: 1" = 200'  Date: Sept 1976  NTS 056/10
Revised: By: J.S.B.  Fig.: 3
GEOCHEMICAL SURVEY

1. **Method of Survey**

The geochemical survey was carried out under the direction of Dr. Paul Sawyer, P.Eng. Soil sampling was confined to a previously cut picket-line grid. All soil samples were obtained with a prospector's grub hoe from the "B" soil horizon.

2. **Method of Analysis**

All samples were analyzed by Bondar-Clegg Limited at Whitehorse, Yukon. The samples received were dried, screened to -100 mesh, weighed out to 0.5 grams and digested in hot aqua regia. Samples were then diluted, clarified for 20 hours and tested for copper, lead, and zinc on an atomic absorption spectrophotometer.

Accuracy of the instrument ideally is 1 percent of the amount of metal present. Individual cathode lamps are used for each element determined and a direct readout in parts per million are given.

3. **Treatment of Data**

All results of the geochemical soil samples were treated statistically to determine background-threshold-anomalous values. Values are presented on Figures 3 and 4. Values are colour coded on the maps to aid in distinguishing anomalous areas. Threshold values of 40, 100 and 50 ppm were determined respectively for lead, zinc and copper.

4. **Interpretation of Results**

Lines 48E and 52E (ref. Figure 4) contain anomalous values in lead and zinc which have been interpreted as reflecting extensions of known sulphide mineralization located at station 2S on line 52E. Weakly anomalous areas south of the creek between lines 40E and 48E could either reflect extensions of the main zone whose geochemical sequence is marked by noticeably deeper overburden or downslope...
migration of metal ions from the known sulphide occurrence on line 52E.

Two reconnaissance lines of soil samples were run parallel to topographic slope (ref. Figure 3) by Marvin Sherman in 1975. These soils, analyzed for lead, zinc and silver, reflect underlying metal concentrations related to the gossan zone as well as a westerly extension of the main showing area.

CONCLUSIONS AND RECOMMENDATIONS

Known exposures of sulphide mineralization coupled with the presence of related geochemical anomalies and a gossan zone, present an exploration target that warrants further investigation.

Recommendations for further work would include:

Phase 1:

1) Geologically map the claim groups at a scale of 400 feet equals 1 inch.

2) Soil sample the claim area on a 400 x 100 grid and analyze for lead, zinc, copper, and silver. Anomalous areas should be detailed by closer spacing of samples.

3) Trench with a bulldozer those areas which are significantly anomalous and where geological mapping indicates possible extension of mineralized zones.

Respectfully submitted,

John S. Brock
APPENDIX A

BIBLIOGRAPHY

Archer Cathro & Assoc. Ltd., Northern Mineral Inventory.

Open file mapping and personal communication.


Wheeler, J.P. et al, 1960, Geology of Quiet Lake, Yukon Territory,
G.S.C. Map 7 - 1960.

Personal Communication, Mr. M. Sherman, Whitehorse, Yukon Territory.

G.S.C. Paper 74-1, Part A, Page 43
G.S.C. Paper 75-1, Part A, Page 45
G.S.C. Paper 76-1, Part A, Page 97


APPENDIX B

STATEMENT OF COSTS

WAGES - John S. Brock
7 days @ $110/day $ 770.00

HELICOPTER SUPPORT - Terr-Air Ltd. 712.38

ASSAYS 130.20

CONSULTING - J. Pau, Sawyer 600.00

EXPEDITING 11.65

CAMP COSTS - 7 man days @ $25/day 175.00

ADMINISTRATION - @ 10% 239.00

TOTAL COSTS $2,638.23
APPENDIX C

AFFIDAVIT SUPPORTING SUMMARY OF COST

I, JOHN S. BROCK, President of Welcome North Mines Ltd. (N.P.L.) of Vancouver, B.C., do hereby state that, to the best of my knowledge and belief the Statement of Costs presented in this report (A Geological-Geochemical Investigation of the MAT Mineral Claims) is both correct and true.

[Signature]

John S. Brock

SWORN BEFORE ME at the City of Vancouver, in the Province of British Columbia, this 28 day of October, 1976.

[Signature]

A Notary Public in and for the Province of British Columbia.
CERTIFICATE

1, JOHN S. BROCK, of 3029 Procter Avenue, West Vancouver, British Columbia, DO HEREBY CERTIFY:

1. That I am a geologist and geophysicist with a business office at 1027 - 470 Granville Street, Vancouver, B.C.

2. That I am a graduate in geology and geophysics of the University of British Columbia (B.Sc. - 1964).

3. That I am a Fellow of the Geological Association of Canada (1967), a member of the Canadian Institute of Mining and Metallurgy (1966), and a member of the Society of Exploration Geophysicists (1968).

4. That I have practiced my profession as a geologist and geophysicist for the past twelve years.

5. That the information, opinions, and recommendations in the attached report are based on personal knowledge of the property gained from work in the field during the period July 1 to September 7, 1976 and on general knowledge of the Pelly Mountains, Yukon gained over the past thirteen years.

DATED at Vancouver, British Columbia this 26 day of October, 1976.

John S. Brock