

CATHRO

ARCHER, CATHRO

& ASSOCIATES (1981) LIMITED

CONSULTING GEOLOGICAL ENGINEERS

1016-510 WEST HASTINGS STREET
VANCOUVER, B. C. V6B 1L8

0123-73260
TN27.48
C4
F7

(604) 688-2568

SUMMARY REPORT
ON THE
ANTONIUK PROPERTY
MOUNT FREEGOLD, Y.T.
LAT. 62°16'N; LONG. 137°06'W; NTS 115I/6
WHITEHORSE MINING DISTRICT

PERMIAN RESOURCES LTD.
NORDAC MINING CORPORATION

R.J. CATHRO, B.A.Sc., P.Eng.

J.T. DENNETT, B.Sc.

DECEMBER 20, 1985



Plate 1 - 10 ton/day mill constructed by T.C. Richards
and E. Kuebke in 1939 at No. 2 adit of
LaForma Mine, Mount Freegold, Yukon

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
PROPERTY	1
LOCATION AND ACCESS	2
HISTORY AND PREVIOUS WORK	3
1985 PROGRAM	4
GEOLOGY AND MINERALIZATION	7
MINERAL INVENTORY	9
METALLURGICAL TESTING	11
CONCLUSION AND RECOMMENDATIONS	12

FIGURES

In Text

Location

Figure 1	Location Map - Scale 1:1,000,000	Follows Page 2
5	Cross-Section Through Holes 85-1 & 85-2	Follows Page 8
6	Cross-Section Through Holes 85-3 & 85-4	Follows Page 8
7	Cross-Section Through Holes 85-5 & 85-6	Follows Page 8
8	Cross-Section Through Holes 85-7 & 85-8	Follows Page 8

In Pocket

Figure 2	Compilation Map - Scale 1 inch = 200 feet
3	Geology - Scale 1 inch = 100 feet
4	Trench Assays - Scale 1 inch = 100 feet

PLATES

Plate 1	10 ton/day mill constructed by T.C. Richards and E. Koebke, in 1939 at No. 2 adit of LaForma Mine, Mount Freegold, Yukon	Frontispiece
Plate 2	Specimen of quartz-feldspar porphyry grading 0.073 opt (2.5 g/t Au)	Following Page 7
Plate 3	Typical specimen of oxidized heterolithic breccia grading 0.033 opt (1.1 g/t Au)	Following Page 7

INTRODUCTION

The Antoniuk Property covers an oxidized heap leach gold target that was acquired by Archer, Cathro & Associates (1981) Limited through option and staking in early 1985. It was assigned to Nordac Mining Corporation and was explored later in the year with trench and drill sampling and metallurgical testing in a joint venture with Permian Resources Ltd. The 1985 program, which cost approximately \$300,000, was planned and managed by Archer, Cathro & Associates (1981) Limited. J.T. Dennett served as project geologist.

PROPERTY

The Antoniuk Property consists of seven surveyed and leased claims, which are held under an option agreement dated March 12, 1985 with Discovery Mines Ltd. of Toronto, and 33 adjoining mineral claims acquired by staking during 1985. Claim details are listed below.

Surveyed and Leased Claims

<u>Name</u>	<u>Lease Number</u>	<u>Expiry Date</u>
Mayflower	790	March 19, 2001
Donalda 1	812	March 19, 2001
Donalda 2	813	March 19, 2001
Donalda 3	814	March 19, 2001
Donalda 7	818	March 19, 2001
Donalda 9	820	March 19, 2001
Donalda 13	821	March 19, 2001

Mineral Claims

Nat 1-29	YA86843-YA86871	June 5, 1986
Nat 30F-33F	YA93013-YA93016	August 12, 1986

Sufficient work credits were earned during 1985 to extend the expiry of the Nat claims to their 1990 or 1991 anniversary dates. The extension will be applied for in early 1986. No extensions are necessary for the surveyed claims, which are held under renewable 21-year leases.

LOCATION AND ACCESS

The Antoniuk Property is situated on Mount Freegold, 40 miles (65 km) by all-weather road northwest of Carmacks, Y.T. at the southeast end of the Dawson Range porphyry belt (see Figure 1). It is located at latitude $62^{\circ}16'N$ and longitude $137^{\circ}06'W$ within NTS claim sheet 115I/6.

The 1985 program was conducted from a temporary tent camp at the former LaForma Mine, which is situated about 0.6 miles (1.0 km) west of the Antoniuk deposit and approximately 500 feet (150 m) lower in elevation. Travel between camp and the deposit was by means of 4x4 truck.

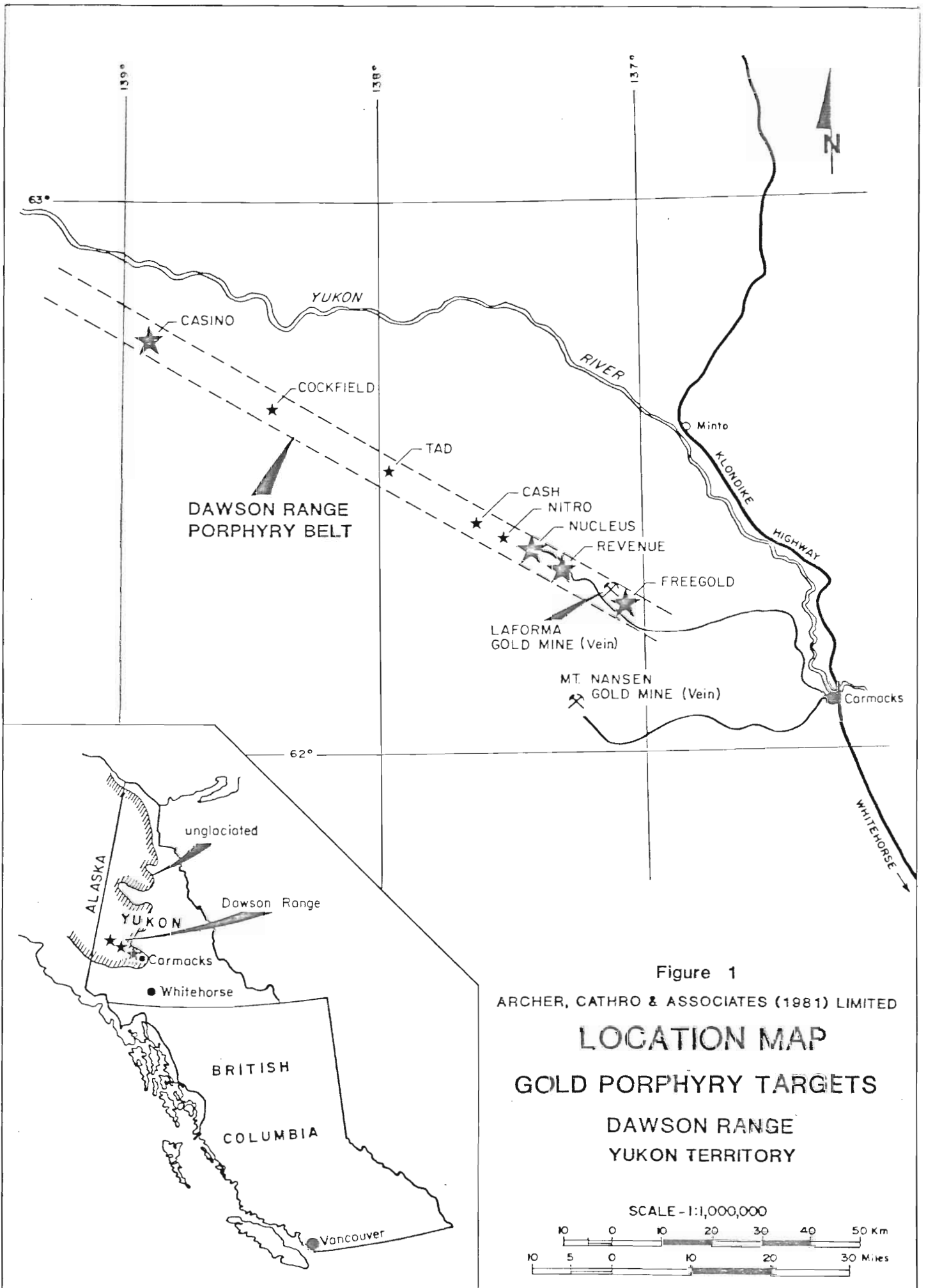
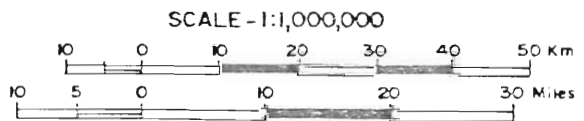


Figure 1
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
LOCATION MAP
GOLD PORPHYRY TARGETS
DAWSON RANGE
YUKON TERRITORY



HISTORY AND PREVIOUS WORK

The Antoniuk Property has a long work history extending back to 1931, when it was first staked by Afe Brown and George Fairclough during the initial staking rush triggered by P.F. (Fritz) Guder's discovery of gold veins near the northwest end of Mt. Freegold in 1930. After the initial claims lapsed, they were restaked as the Mayflower and Donalda claims in November, 1939.

Exploration between 1931 and 1974 was directed towards gold-bearing quartz veins resembling the G-3 vein at the LaForma Mine. It included four adits between 25 and 150 feet (7 to 45 m) long, and approximately 50 hand trenches and 40 bulldozer trenches to bedrock, most of which was performed on the Rambler Vein. This early exploration gave disappointing results.

Commencing in 1974, Discovery Mines Ltd. performed a mapping and geochemical sampling program over the claims under the direction of Terry Antoniuk. That survey outlined a strong gold-arsenic anomaly in soil overlying what is now called the Antoniuk deposit. Subsequent exploration included further detailed mapping and soil sampling, geophysical surveys and 10 diamond drill holes (4571 feet or 1393 m) in 1975 and 10 holes (3914 feet or 1193 m) in 1981. The 1981 work, which was managed by Archer, Cathro, was financed by Arctic Red Resources Corp. under a brief option and was performed in conjunction with a larger program of exploration that covered the remainder of the Discovery Mines Ltd. claims on Mt. Freegold, including the LaForma Mine. The remainder of the Arctic Red option is still in good standing.

The previous work performed on the Antoniuk Property outlined low grade gold values within a gold-arsenic soil anomaly about 1650 feet (500 m) by 1000 feet (300 m) in area that is associated with poorly exposed porphyritic and brecciated intrusive rocks. Gold grades in drill holes averaged about 0.015 opt (0.5 g/t) Au but contained higher grade intersections within the zone that ranged up to 0.068 opt (2.3 g/t) Au over a true thickness of about 59 feet (18 m). The drilling also showed that the deposit was oxidized for depths of up to 200 feet (60 m), which suggested that this mineralization might be amenable to heap leach mining.

1985 PROGRAM

The objectives of the 1985 program were to evaluate the potential oxide reserves outlined by the previous wide-spaced drilling and to investigate the leachability of the mineralization. Potential reserves prior to the program were estimated as about 1,100,000 tons (1,000,000 tonnes) grading over 0.055 opt (1.9 g/t) Au or 3,300,000 tons (3,000,000 tonnes) grading over 0.030 opt (1.0 g/t) Au, assuming an average mining depth of 200 feet (61 m).

Systematic bulldozer trenching to provide bedrock exposure for rock sampling and mapping was selected as the initial phase of the ore reserve evaluation. The trenching was performed with a Caterpillar D7E bulldozer contracted from E. Caron Diamond Drilling Ltd. of Whitehorse. About 16,250 feet (4950 m) of trench length was excavated within an area approximately 4300 feet (1300 m) long by 1300 feet (400 m) wide (see Figure 2).

Some 1050 channel samples were collected in 15 foot (4.6 m) intervals from the trenches. Individual samples averaged about 15 lbs (7 kg) and consisted of 60 to 100 rock chips up to 1 inch (2.5 cm) long. These were collected either from a ripper furrow along the trench floor or from a rock rib along the lower side of the trench wall. The bulldozer trenches averaged about 8 feet (2.5 m) deep.

Rock samples were shipped by truck to Chemex Labs, North Vancouver, where a half of an assay-ton portion was prepared for fire assay by primary and secondary jaw crushing, tertiary cone crushing, ring pulverizing and screening to -100 mesh.

Eight rotary percussion holes totalling 1990 feet (607 m) were drilled late in the program using a Schramm drill contracted from Caron. The holes were drilled in intersecting pairs within four of the better grade zones outlined by trenching.

Drill hole samples were collected in 5 foot (1.5 m) intervals and varied widely in weight between 35 and 155 lbs (15 to 70 kg) because of recovery problems. Most of the samples were dry and these were reduced with Jones splitters into assay portions weighing between 8 and 15 lbs (3.4 to 7 kg). Excess water was decanted in a deep pail from wet samples, which were then split into an assay portion of comparable size consisting of several vertical pipefuls. Adjacent samples were combined into 10 foot (3 m) intervals and the resulting 199 drill samples were fire assayed at Chemex using the same technique described earlier except for an increase to a full assay-ton.

All rock sample splits and rejects are permanently stored at Chemex, along with those from 450 soil samples collected in 1985 and all soil and rock sample splits from the 1981 Arctic Red programs . Four water samples were also analyzed at Chemex for environmental purposes in 1985.

Aerial photographs of the property were flown on August 28 by Geographic Air Survey Ltd. of Edmonton as part of a large contract for the Yukon Department of Highways and Transportation managed by UMA Engineering Ltd. of Whitehorse. The new photography is being used to prepare a contoured map and orthophoto of the property at Western Photogrammetry Ltd., Edmonton (a member of the UMA Group).

In addition, one column leach test was performed early in the program by Coastech Research Inc., North Vancouver and preliminary metallurgical and engineering studies were commenced later in the year by Witteck Development Inc., Mississauga, Ontario. The sample tested by Coastech consisted of 82 lbs (37 kg) from a bulldozer trench. The material sent to Witteck consisted of 4 uncrushed bulk samples weighing approximately 5.5 tons (5 tonnes). The final phase of the 1985 investigation consisted of 11 bottle roll tests on 1985 drill cuttings to determine the effect of depth of oxidation on leachability.

It is expected that the Witteck study will be partially financed under a contract with the Canadian Centre for Mining and Energy Technology (CANMET), a division of the Federal Department of Energy, Mines and Resources. A sister agency, the Geological Survey of Canada, is funding an M.Sc. thesis study of the geology of the Antoniuk and LaForma deposits on Mt. Freegold that was started in 1985 by Brent McInnes at McMaster University, Hamilton, Ontario.

GEOLOGY AND MINERALIZATION

The 1985 trenching and drilling has outlined a crudely elliptical, plug-like body of heterolithic breccia that cuts an igneous complex near the centre of the gold-arsenic soil anomaly. The position of this body, whose long axis trends northwest, is shown on Figures 2 and 3. Breccia fragments consist of porphyry, porphyritic rhyodacite and granodiorite, all of which are exposed at surface nearby. It appears that the breccia is intrusive in origin and has experienced considerable vertical movement. It is probably a subvolcanic diatreme that is related in origin to the nearby Mid-Cretaceous Mount Nansen Group porphyry dykes and fine-grained intrusive rocks of rhyodacite composition that are associated with the gold-arsenic anomaly. It is noteworthy that this is the only such breccia body identified on Mount Freegold.

Quartz porphyry and quartz-feldspar porphyry dykes are common on the northeast side of the breccia body. These strike parallel to a series of weak northeast-striking faults. However, on the southwest side of the breccia body, porphyritic rocks are uncommon and the small dykes that are present tend to strike northwest, roughly parallel to the Pal Fault. This suggests that the diatreme may have intruded along a previous zone of structural dislocation that controlled the emplacement of the porphyry bodies.

Weathering has removed most traces of mineralization from surface, leaving only occasional disseminated pyrite and limonitic staining. Although significant quartz veins are not abundant, thin limonitic fractures are common and some of these contain quartz or carbonate veinlets. Most of what is presently known about the mineralogy of the Antoniuk deposit has come from the 20 diamond drill holes drilled previously as the 1985 drilling consisted of

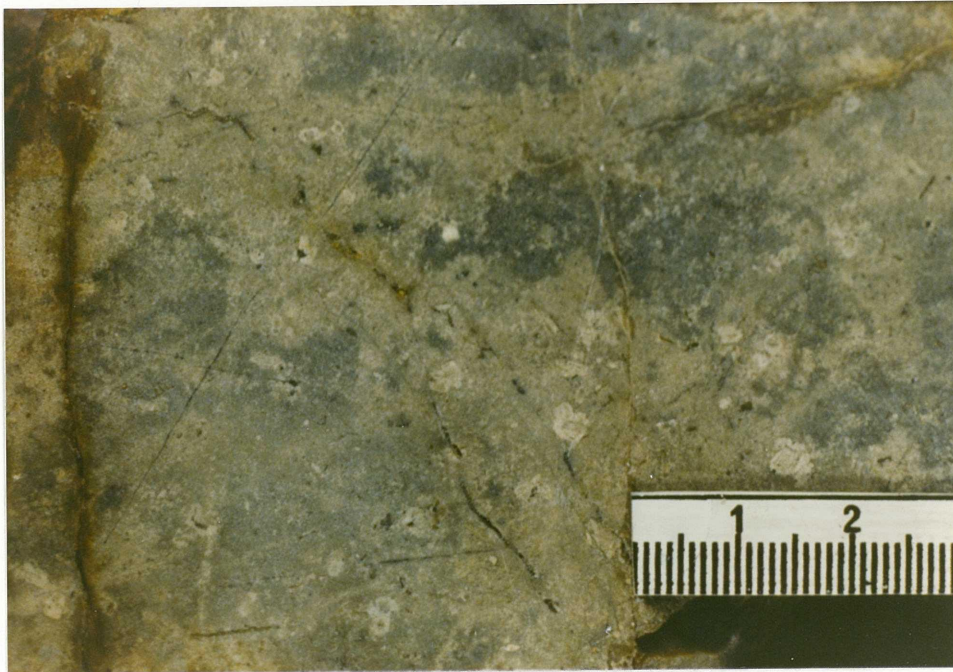


Plate 2 - Specimen of quartz-feldspar porphyry
grading 0.073 opt (2.5 g/t) Au



Plate 3 - Typical specimen of oxidized heterolithic
breccia grading 0.033 opt (1.1 g/t) Au

percussion holes that produced little lithological or mineralogical information. The core holes, most of which were drilled outside the better grade gold zones, intersected up to 2 or 3% each of disseminated pyrite and arsenopyrite, traces of disseminated chalcopyrite and quartz veins containing occasional sulphide patches comprised of pyrite, pyrrhotite, arsenopyrite, stibnite, bornite, galena, sphalerite, molybdenite and sulphosalts.

The presence and location of the better grade portions of the gold deposit have been determined entirely from trench and drill assays. Detailed mapping and sampling of weathered bedrock exposed in the trenches did not indicate a consistent geological control. The 1985 trench assays are plotted in detail on Figure 4 and are shown in a simplified form with core hole intersections and percussion hole locations on Figure 2. The grades of the 1985 percussion hole assays are given on Figures 5 to 8.

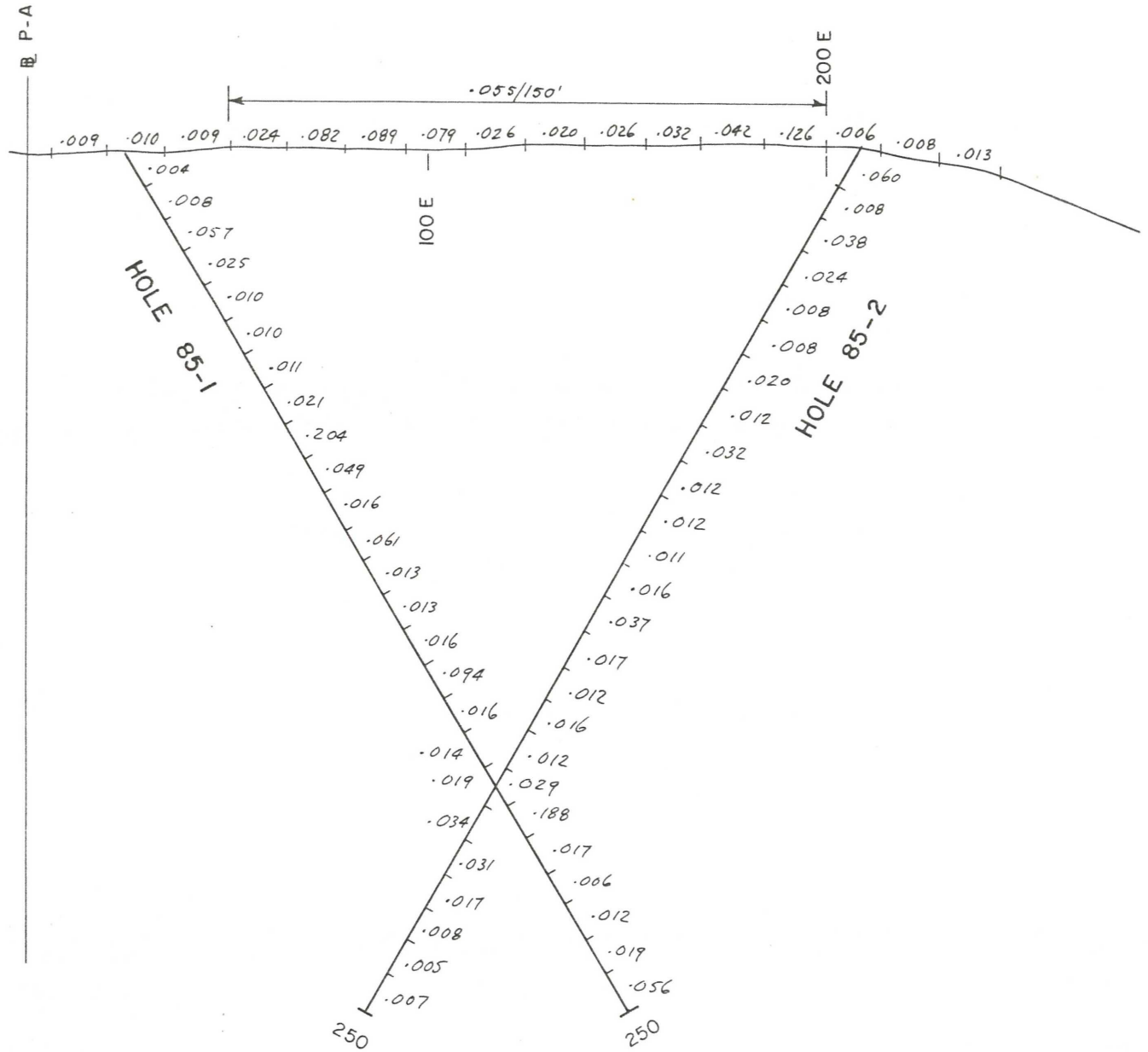


Figure 5

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

VERTICAL CROSS-SECTION

HOLES 85-1 & 85-2

TRENCH 18N

ANTONIUK DEPOSIT- MT. FREEGOLD, Y.T.

PERMIAN JOINT VENTURE

0 50 100 Feet

SCALE 1:500

Assays in oz/ton Au by fire assay
at Chemex Labs, Vancouver

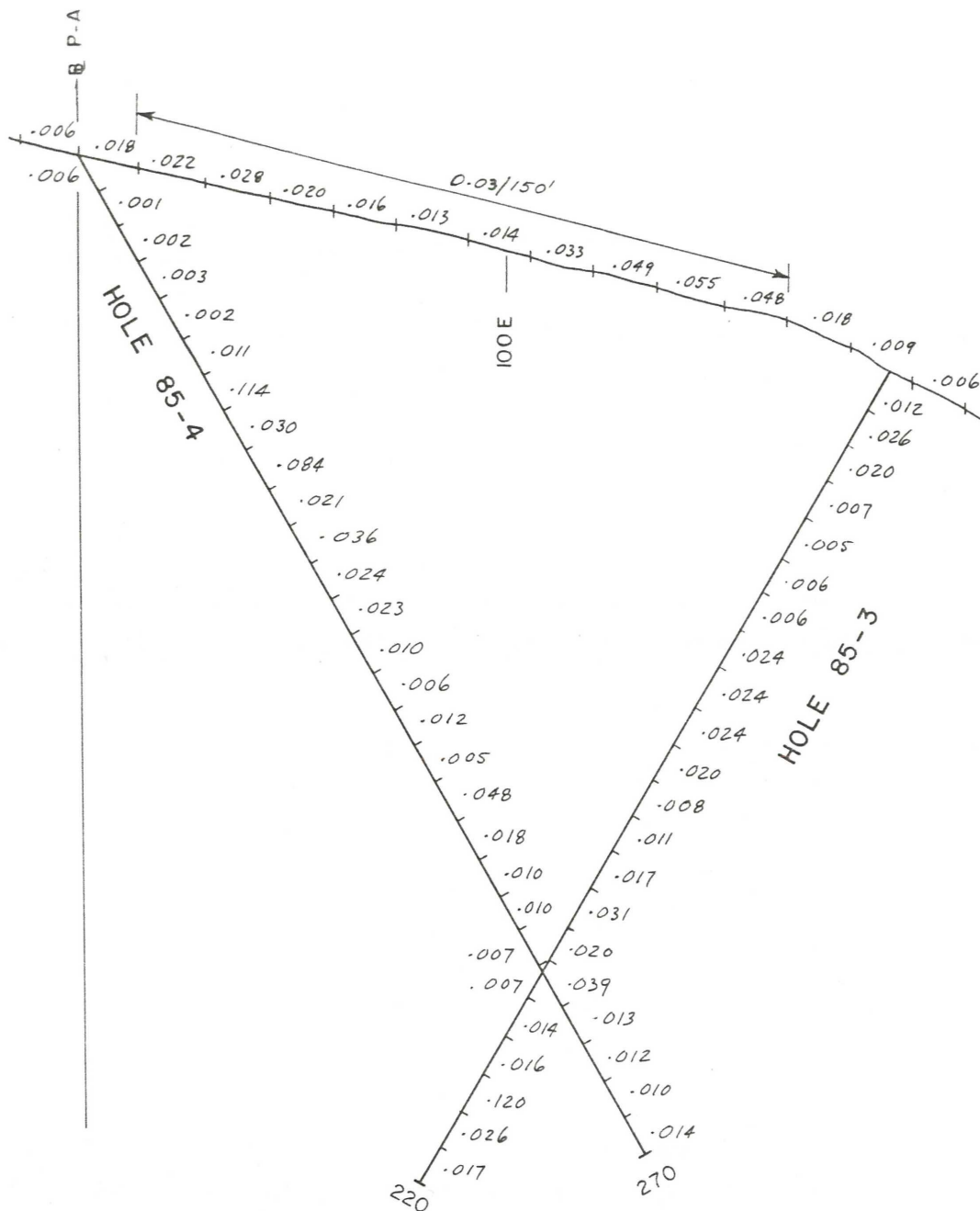


Figure 6

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

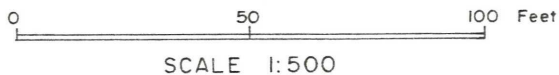
VERTICAL CROSS-SECTION

HOLES 85-3 & 85-4

TRENCH 20N

ANTONIUK DEPOSIT - MT. FREEGOLD, Y.T.

PERMIAN JOINT VENTURE



Assays in oz/ton Au by fire assay
at Chemex Labs, Vancouver

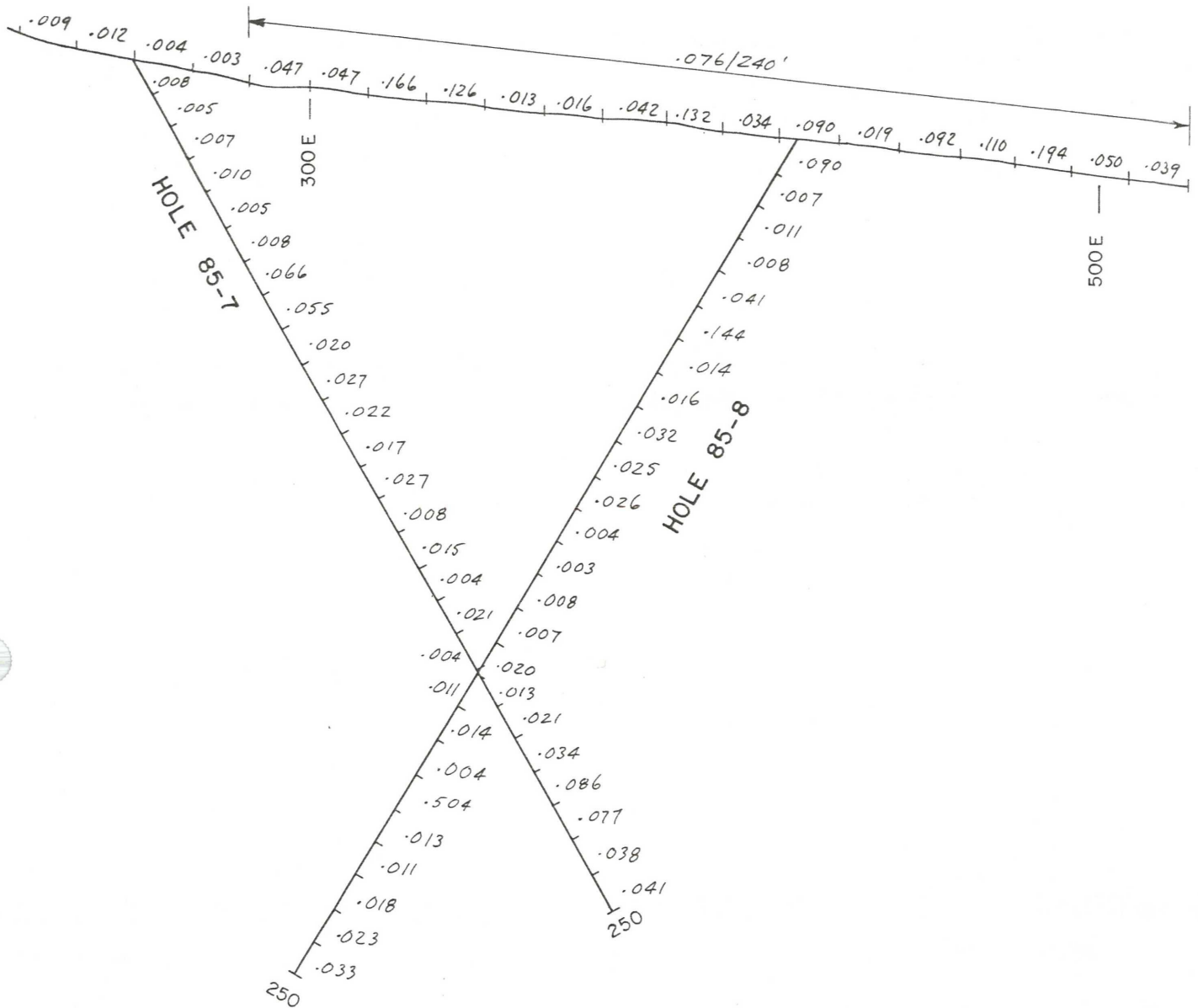


Figure 8

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

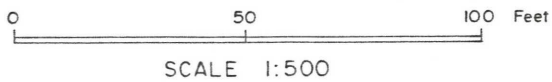
VERTICAL CROSS-SECTION

HOLES 85-7 & 85-8

TRENCH 24N

ANTONIUK DEPOSIT - MT. FREEGOLD, Y.T.

PERMIAN JOINT VENTURE



Assays in oz/ton Au by fire assay
at Chemex Labs, Vancouver

MINERAL INVENTORY

Insufficient drilling has been performed to permit calculation of ore reserves with confidence. However, the available data has been used to calculate an inferred mineral reserve that is useful as an indication of the order of magnitude of identified tonnage and grade. The calculation was made by laying out individual cells around each assay data point and extending each cell midway to the next assay point. Individual cells were no smaller than 15 feet (4.6 m) wide for surface assays and 10 feet (3.0 m) wide for drill assays. Weighted averages were calculated at various cutoff grades between 0.010 and 0.030 opt (0.3 to 1.0 g/t) gold on the assumption that some selective sorting of waste from ore will be possible during open pit mining. The results are tabulated on the following page. Silver grades are approximately double the gold grades but have not been systematically assayed or plotted.

The calculations show that gold assays cluster into three zones of better grade mineralization that have sufficient size to be included in the mineral inventory at this time. The bulk of the inventory occurs in one large block that is associated with the east side of the breccia body, extending from about 15N to 21N on the grid. A smaller but better grade zone occurs to the northeast, centred on the east side of Trench 24N. The two nearest diamond drill holes (75-5 and 75-23) bottomed in weakly mineralized breccia, suggesting that this zone may occur near the top of a lobe of the breccia body that does not reach surface. The third zone, to the southwest, consists of two adjacent small blocks situated between 5N and 7N.

Several scattered mineralized intercepts in trenches and diamond drill holes were considered too uncertain for inclusion in the inventory at this time, although many of these warrant further sampling and may be added to the inventory after more exploration.

ANTONIUK DEPOSIT

MINERAL INVENTORY AS OF DECEMBER 1, 1985

<u>CUTOFF GRADE</u> <u>(opt Au)</u>	<u>To 100 Foot Depth</u>				<u>To 200 Foot Depth</u>			
	<u>TONS</u>	<u>GRADE</u> <u>(opt Au)</u>	<u>ozs Au</u>	<u>W/O RATIO</u>	<u>TONS</u>	<u>GRADE</u>	<u>ozs Au</u>	<u>W/O RATIO</u>
.010	2,616,164	0.036	94,334	0.7	5,581,960	0.034	192,254	1.5
.015	2,023,270	0.043	87,243	1.2	4,168,951	0.042	175,739	2.3
.020	1,542,550	0.050	77,579	2.0	2,916,168	0.053	154,549	3.5
.025	1,246,542	0.060	74,337	2.6	2,356,206	0.060	140,717	3.9
.030	964,294	0.066	63,292	5.4	1,862,315	0.069	128,057	5.0

Note: 1.0 opt Au = 34.3 g/t
 1.0 ton = 0.907 tonne

METALLURGICAL TESTING

Since testing by Witteck is still in progress, the following discussion should be considered as preliminary only.

The initial 1985 testing was performed by Coastech on an 82 lb (37 kg) sample of surface mineralization grading 0.033 opt (1.1 g/t) Au and 0.09 opt (3.1 g/t) Ag. The sample was crushed to -1/4 inch (-0.6 cm), agglomerated and leached in a 4 inch (10 cm) by 72 inch (1.8 m) column. Gold recovery was 83.4% in 9 days, while silver recovery was 31.8%. Cyanide consumption was 1.2 lbs/ton (0.6 kg/tonne).

Bottle roll tests were next performed by Chemex on 11 samples of drill core cuttings from Holes 85-1, 85-2, 85-7 and 85-8 to provide preliminary leachability information at vertical depths of up to 215 feet (65 m). Tests were conducted for 24 hours on -100 mesh material and gave recoveries of between 61.7 and 90.6% from head grades of up to 0.095 opt (3.3 g/t). No correlation between recoverability and depth was evident. Final results of these tests are still awaited.

Results of the major phase of metallurgical testing, which was commenced by Witteck in mid-November, will not be available for several weeks. Two leach tests in 30 inch (0.76 m) by 96 inch (2.43 m) columns are currently underway on uncrushed surface mineralization from Trenches 20N and 24N. Other tests are planned on material from Trenches 18N and 21N. The location of these bulk sample sites is shown on Figure 2.

Initial reports from Witteck indicate that the uncrushed sample from Trench 20N gave gold recovery of 92.4% in 15 days. Cyanide consumption was 1.5 lbs/ton (0.8 kg/tonne), lime consumption was 0.45 lbs/ton (0.2 kg/tonne) and head grade was 0.02 opt (0.7 g/t) Au.

CONCLUSIONS AND RECOMMENDATIONS

Although current metallurgical testing is still incomplete, it is already apparent that 1985 exploration results from the Antoniuk Property on Mount Freegold, Y.T. have been strongly encouraging. Inferred reserves are approaching commercial ranges and preliminary metallurgical results are favourable.

Based on preliminary results, the Antoniuk property appears to be well suited for heap leach extraction. Gold is apparently present in the native form on fractures and veinlets and host rocks are strongly fractured with sufficient permeability to provide strong leachability on uncrushed material. Consumption of cyanide appears normal and lime consumption to maintain pH control is surprisingly low, perhaps due to low carbonate content of the mineralization. Of even more significance is the bottle roll test results, which suggest that relatively unoxidized mineralization from as deep as 200 feet (60 m) leaches as easily as surface samples. This implies a potential for deeper reserves that would be available, due to topography, without a large increase in stripping ratio.

More intensive exploration is warranted in 1986 as the next step in determining if heap leach mining is feasible at this location. The objectives of the next phase of work are:

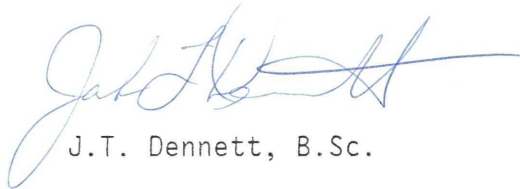
- (1) to upgrade present reserves to a proven category by means of systematic, close-spaced drilling and control surveys;
- (2) to add to existing reserves with deeper drilling and wider-spaced drilling in adjacent areas containing scattered indications of mineralization; and,
- (3) to obtain large and representative samples from deeper parts of the deposit for metallurgical testing in order to confirm that deeper ore has good leachability.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED



R.J. Cathro, B.A.Sc., P.Eng.



J.T. Dennett, B.Sc.



LEGEND


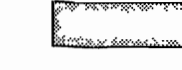


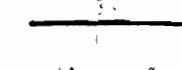
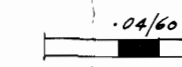
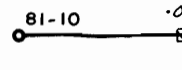
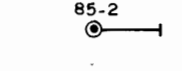



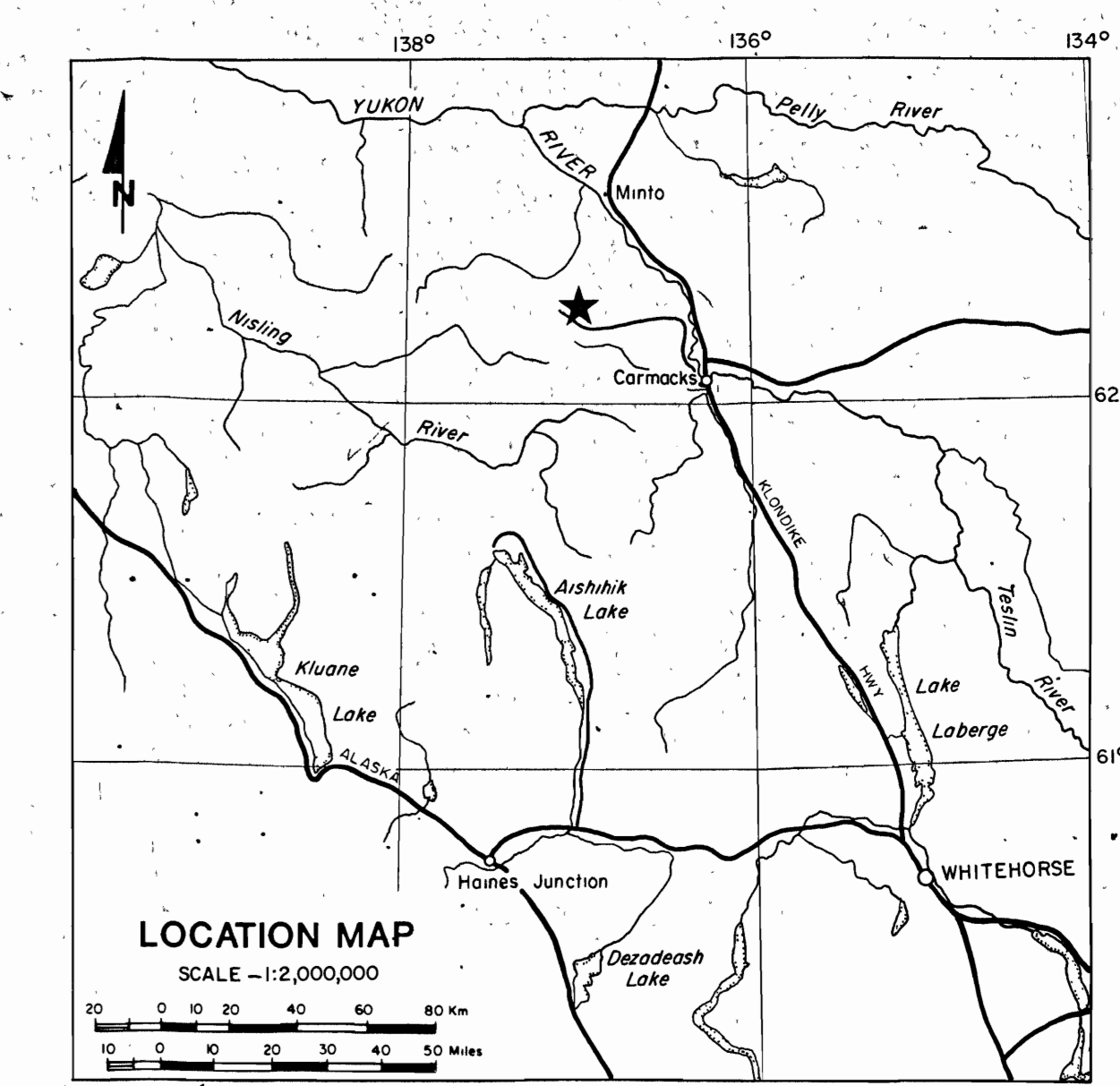
-  Brecchia body
-  Mineral reserve block
-  Gold assays in soil (1980-1985)
-  All-weather road
-  4 wheel drive road
-  Bulldozer or hand trench (old)
-  Vein
-  1985 bulldozer trench with position of better grade zones (gold assays in OPT)
-  Diamond Drill Hole (gold assays in opt)
-  Percussion Drill Hole
-  Bulk sample site

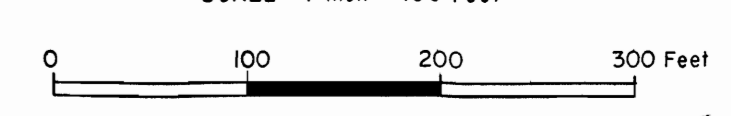
Figure 2
 ARCHER, CATRO & ASSOCIATES (1981) LIMITED
COMPILATION MAP
ANTONIUK OPTION
MT. FREEGOLD, YUKON
 PERMIAN JOINT VENTURE
 NTB 1161/6





- LEGEND**
- MID-CRETACEOUS**
- MOUNT NANSEN GROUP**
- VOLCANIC**
- Kdrf** Heterolithic breccia and tuff, contains fragments of Kmnr, Kgd and Jy.
- SUB-VOLCANIC**
- Kmnr** Quartz - feldspar porphyry (ryhodycite composition)
 - Kmn** Feldspar porphyry (andesite composition)
 - Krd** Porphyritic rhyodacite
- PLUTONIC**
- Kgd** CASINO GRANODIORITE: porphyritic biotite, granodiorite
- JURASSIC**
- Jy** BIG CREEK SYENITE: hornblende syenite
- SYMBOLS**
- ~ Fault (observed, assumed)
 - Quartz vein (defined, assumed)
 - - - Geological boundary (defined, assumed)
 - 75-05 ● 85-02 Drill hole (diamond, percussion)
 - Adit
 - Trench (to bedrock)
 - - - Trench (overburden)
 - - - 4 wheel drive road
 - - - Bulldozer trail

Figure 3
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
GEOLOGY
 ANTONIUK OPTION
 MT. FREEGOLD, YUKON
 PERMIAN JOINT VENTURE
 NTS 115 U6
 SCALE 1 Inch = 100 Feet



100557 & 38

