ARIS SUMMARY SHEET

District Geologist, Smithers Off Confidential: 89.03.28

ASSESSMENT REPORT 17534 MINING DIVISION: Liard

PROPERTY: Mon
LOCATION: LAT 56 46 40 LONG 130 49 55
UTM 09 6293934 388054
NTS 104B15W
CLAIM(S): Mon 5-6
OPERATOR(S): Kestrel Res.
AUTHOR(S): Ikona, C.K.;Todoruk, S.L.;De Carle, R.J.
REPORT YEAR: 1988, 109 Pages
COMMODITIES
SEARCHED FOR: Gold,Silver
GEOLOGICAL
SUMMARY: Paleozoic sedimentary and metasedimentary rocks outcrop at lower elevations, and Jurassic volcanic rocks outcrop at higher elevations. These rocks are intruded by Triassic-Cretaceous felsic plugs.
WORK
DONE: Geological
EMAB 40.0 km; VLF
Map(s) - 4; Scale(s) - 1:20 000
FOTO 1000.0 ha
Map(s) - 1; Scale(s) - 1:10 000
MAGA 40.0 km
Map(s) - 3; Scale(s) - 1:20 000

LOG N: 1205 RD.
ACTION: Date received report back from amendments.

FILE NO:

LOG NO: 0627 RD.

ACTION:

FILE NO:

GEOLOGICAL REPORT
ON THE
MON 5 AND 6 MINERAL CLAIMS

Located in the Iskut River Area

Liard Mining Division

NTS 104B/15W

56°46' North Latitude

130°50' West Longitude

FILMED

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,534

- Prepared for -

KESTREL RESOURCES LTD.

- Prepared by -

S.L. TODORUK, Geologist

C.K. IKONA, P.Eng.

SUB-RECORDER
RECEIVED
JUN 23 1988
M.R. # .... $...........
VANCOUVER, B.C.

June, 1988

GEOLOGICAL REPORT on the MON 5 & 6 MINERAL CLAIMS

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APPENDICES

1.0 INTRODUCTION

The Mon 5 and 6 mineral claims (40 units) were staked in the spring of 1987 following Skyline Explorations Ltd.'s successful delineation of the Stonehouse Gold Zone on the Reg property, located 21 kilometres to the southwest. Mineral reserves are reported as 1,087,000 tons grading 0.704 ounces gold per ton. The subject property lies approximately 8 km south-southeast of Newmont Lake and 10 km north-northeast of the confluence of Snippaker Creek with the Iskut River. Gulf International Minerals holds the McLymont claims approximately 4 km to the northwest which cover ground previously known as the Warrior claims, worked by Du Pont of Canada Explorations between 1980 and 1986. Drilling completed in 1986 on Gulf's McLymont claims consisted of three 100 foot holes intersecting a five foot wide quartz-pyrite-chalcopyrite vein with average assays of 0.155 ounces gold per ton. In 1987, drilling returned results as high as 1.605 ounces per ton gold over 36.5 feet.

In November of 1987 a set of orthophotographic maps were prepared to cover the Mon 5 and 6 claims and a structural interpretation was completed. This report summarized the structural interpretation and outlines the procedures for an airborne geophysical survey presently being conducted.

2.0 LIST OF CLAIMS

Records of the British Columbia Ministry of Energy, Mines and Petroleum Resources indicate that the following claims are owned by I. Hagemoen.

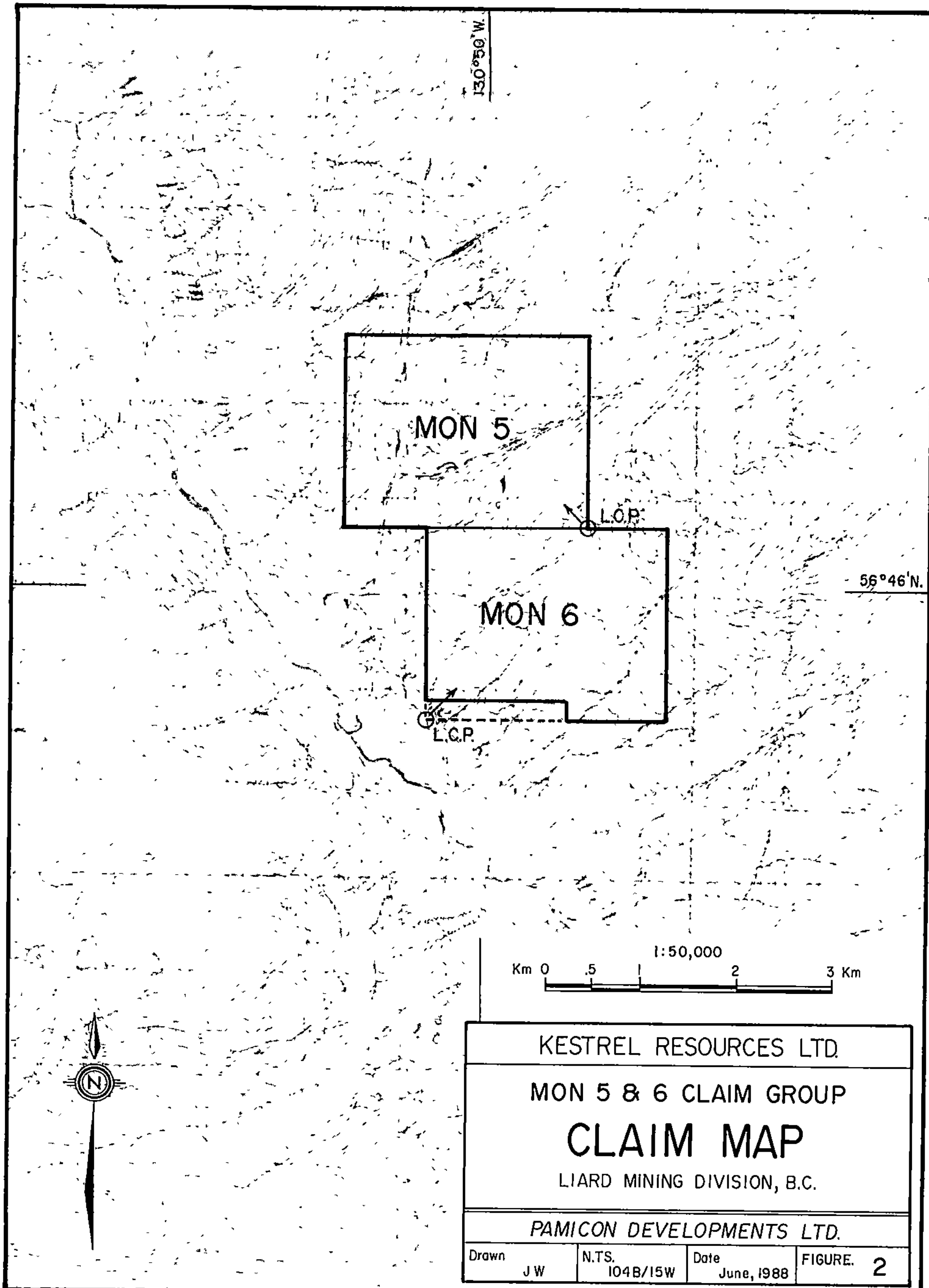
Claim Name	Record Number	No. of Units	Record Date	Expiry Date
Mon 5	3997	20	March 26, 1987	March 26, 1989
Mon 6	3998	20	March 26, 1987	March 26, 1989

The claims which lie on NTS 104B/15W fall under the jurisdiction of the Liard Mining Division.

0 100 200 MILES

0 100 200 300 KILOMETRES

KESTREL RESOURCES LTD.			
MON 5 & 6 CLAIM GROUP **PROPERTY LOCATION MAP** LIARD MINING DIVISION, B.C.			
PAMICON DEVELOPMENTS LTD.			
Drawn J.W	N.T.S 104B/15W	Date June, 1988	Figure. 1.



KESTREL RESOURCES LTD.

MON 5 & 6 CLAIM GROUP

CLAIM MAP

LIARD MINING DIVISION, B.C.

PAMICON DEVELOPMENTS LTD.

Drawn	N.T.S.	Date	FIGURE.
J W	104 B/15 W	June, 1988	2

3.0 LOCATION, ACCESS AND GEOGRAPHY

The Mon 5 and 6 claims are located approximately 80 kilometres east of Wrangell, Alaska, and 110 kilometres northwest of Stewart, British Columbia, on the eastern edge of the Coast Range Mountains (Figure 1). Newmont Lake is situated approximately 8 kilometres to the north-northwest and the Iskut River 10 kilometres to the south of the Mon 5 and 6 claims.

Coordinates of the Mon 5 and 6 claims area are 56°46' north latitude and 130°50' west longitude.

Access to the Mon 5 and 6 claims would either be via float-equipped fixed wing aircraft to Newmont Lake from Wrangell, Alaska or Stewart, B.C., or by wheeled aircraft to Bronson Creek airstrip some 18 kilometres southwest of the property. Helicopter support is then necessary from either location. Daily scheduled flights to the strip from Smithers and Terrace, B.C. have been available during the field season. Newmont Lake remains frozen and inaccessible until late June or early July.

All supplies necessary to support an exploration program are available in Wrangell, Stewart, Terrace or Smithers.

Geographically, the Iskut River area is typical of mountainous and glaciated terrain with the elevations ranging from a few hundred metres above sea level in the river valley bottoms to in excess of 1500 metres at the ridge tops. Major drainages are U-shaped, whereas smaller side creeks tend to be steeply cut due to the intense erosional environment. Active glaciation is prevalent above the 1200 metre contour, with the tree line existing at 1000 metres. The upper reaches of the area are covered with alpine vegetation. The lower slopes are predominantly timbered with a variety of conifers with an undergrowth of devil's club. More open areas and steeper slopes contain dense slide alder growth. Both summer and winter temperatures would be considered generally moderate and in excess of 200 centimetres of precipitation may be expected during any given year.

Locally within the Mon 5 and 6 claims area, elevations range from approximately 600 metres to 1300 metres above sea level and slopes vary from moderate to steep. Forest cover over much of the claims could be considered heavy.

4.0 AREA HISTORY

The first recorded work done in the Iskut Region occurred in 1907 when a prospecting party from Wrangell, Alaska staked nine claims north of Johnny Mountain. Iskut Mining Company subsequently worked crown granted claims along Bronson Creek and on the north slope of Johnny Mountain. Up to 1920, a 9 metre adit revealed a number of veins and stringers hosting galena and gold-silver mineralization.

In 1954, Hudsons Bay Mining & Smelting located the Pick Axe showing and high grade gold-silver-lead-zinc float on the open upper slopes of Johnny Mountain, which today is part of Skyline Explorations Ltd.'s Reg deposit. The claims were worked and subsequently allowed to lapse.

During the 1960s, several major mining companies conducted helicopter borne reconnaissance exploration programs in a search for porphyry-copper-molybdenum deposits. Several claims were staked on Johnny Mountain and on Sulphurets Creek.

Between 1965 and 1971, Silver Standard Mines, and later Sumitomo, worked the E + L prospect on Nickel Mountain at the headwaters of Snippaker Creek. Work included trenching, drilling and 460 metres of underground development work. Reserves include 3.2 million tons of 0.80% nickel and 0.60% copper.

In 1969 Skyline staked the Inel property after discovering massive sulphide float originating from the head of the Bronson Creek glacier.

During 1972, Newmont Mining Corporation of Canada Limited carried out a field program west of Newmont Lake on the Dirk claim group. Skarn-type mineralization was the target of exploration. Work consisted of airborne and ground magnetic surveys, geological mapping and diamond drilling. One and one-half metres grading 0.220 ounces gold per ton and 15.2 metres of 1.5% copper was intersected on the Ken showing. In 1981 and 1982 Dupont Exploration conducted work on their Warrier claims which comprised a portion of Newmont's property near Newmont Lake. These claims were allowed to lapse and now comprise a portion of the McLymont claims held by Gulf International.

Gulf has recently released the results of some of their 1987 drilling in the McLymont area. Highlights of this program include:

Hole Number	Width (metres)	Gold (oz/ton)
87-25	9.1	0.404
	1.1	1.520
87-29	11.1	1.605
87-31	3.8	0.156

After restaking the Reg property in 1980, Skyline carried out trenching and drilling for veined high-grade gold and polymetallic massive sulphide mineralization on the Reg and Inel deposits between 1981 and 1985.

In 1986, drilling and 460 metres of underground cross-cutting and drifting on the Stonehouse Gold Zone confirmed the presence of high grade gold mineralization with additional values in silver and copper over mineable widths with good lateral and depth continuity. As of January 1988, reserves on the Stonehouse Gold Zone were reported as:

	Au (oz/ton)	Tons
Total Measured	1.246	121,000
Total Drill-Indicated	0.556	236.875
Total Inferred	0.570	700,000
Subtotal	0.644	1,057,875
McFadden	2.800	30,000
Ore Reserve Total	0.704	1,087,875

On the Delaware Resources Ltd. - Cominco Snip claims immediately north of the Stonehouse Gold deposit, approximately 10,000 metres of diamond drilling was carried out, mainly delineating the Twin Zone. Drill hole S-71 intersected 10.2 metres of 2.59 oz/ton gold. An underground program is expected to begin in early 1988. As of December, 1987, reserves on the Twin Zone were reported as:

	Au (oz)	Tons
Total Inferred	0.700	1,100,000

Also, during 1987 on the Inel claims, Inel Resources Ltd. commenced an underground drifting and diamond drilling program along the main cross-cut intent on intersecting the Discovery Zone which hosts gold-bearing polymetallic massive sulphide mineralization.

Western Canadian Mining Corp. carried out an extensive diamond drilling program on their Gosson claims, concentrating on the Khyber Pass Gold Zone which is 45 metres thick. The best drill hole intersection in this zone to date is as follows:

Hole	From (m)	To (m)	Length (m)	Length (ft)	Gold (oz/t)	Silver (oz/t)	Copper (%)
85-3	11.2	16.8	5.6	18.4	0.12	6.48	1.74
	30.2	44.2	5.2	17.1	0.17	2.66	0.90
	54.5	60.1	5.6	18.4	0.15	1.77	--
	66.0	69.0	3.0	9.8	0.28	1.54	--

Tungco Resources Corporation drill tested three main gold/copper quartz vein targets; the Bluff, No. 7 and Swamp Zones on their Waratah claims. The Bluff Zone has been delineated 70 metres along strike and 60 metres downdip with better intersections grading up to 0.243 oz/ton gold across 2.45 metres. The No. 7 Vein returned 1.12 metres of 0.651 oz/ton gold.

5.0 REGIONAL GEOLOGY

Government mapping of the general geology in the Iskut River area (Kerr, 1929, GSC Maps 9-1957 and 1418-1979) has proved to be incomplete and unreliable. Subsequent mineral exploration studies have greatly enhanced the lithological and stratigraphic knowledge of this geo-entity known as the Stewart Complex (Grove, 1986).

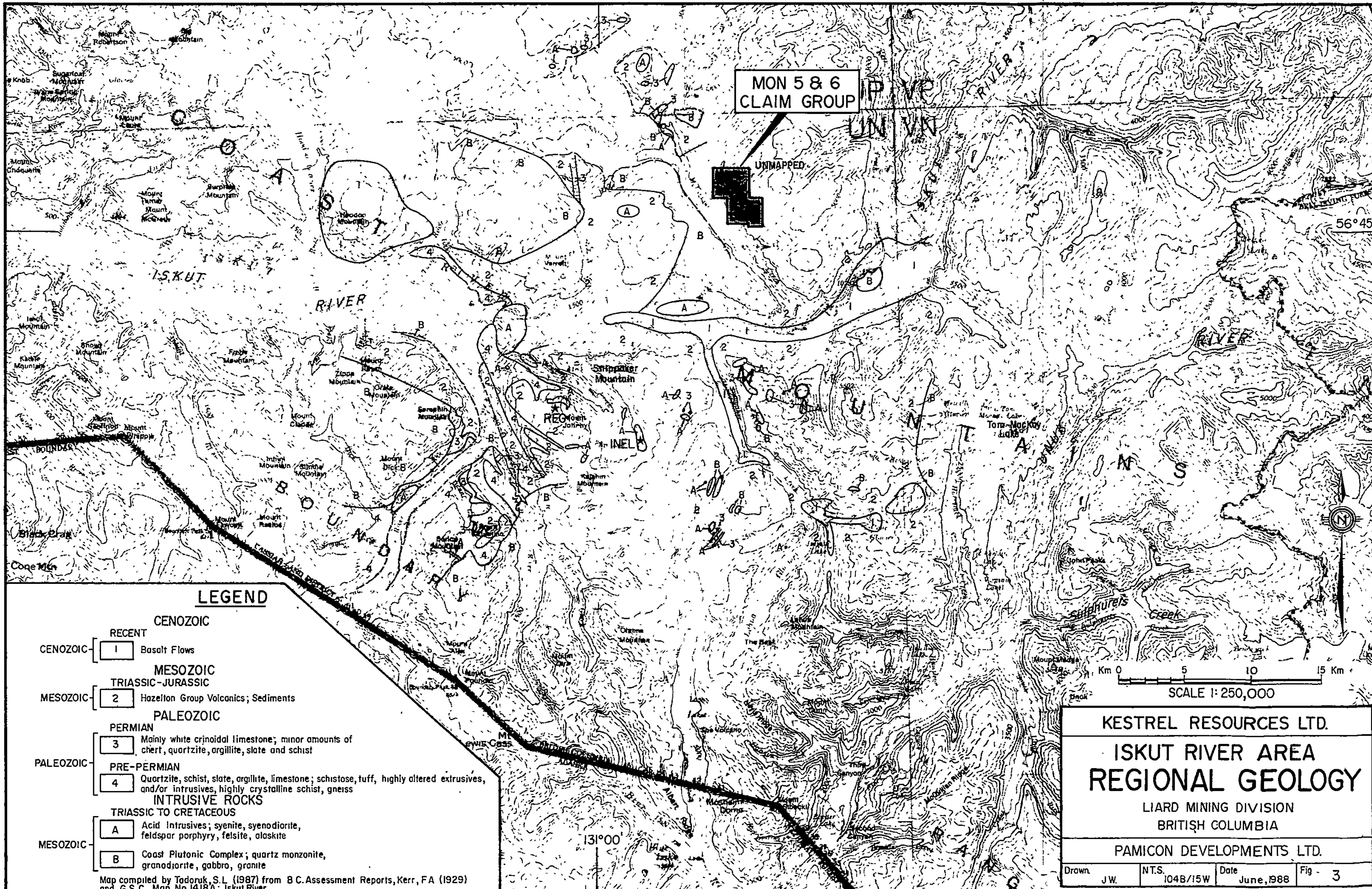
Grove (1986) defines the Stewart Complex in the following manner:

> "The Stewart Complex lies along the contact between the Coast Plutonic Complex on the west, the Bowser Basin on the east, Alice Arm on the south and the Iskut River on the north."

Within the Stewart Complex the oldest rock unit consists of Paleozoic crinoidal limestone overlying metamorphosed sedimentary and volcanic members. This oceanic assemblage has been correlated with the Cache Creek Group.

Unconformably overlying the Paleozoic limestone unit are Upper Triassic Hazelton Group island arc volcanics and sediments. These rocks have informally been referred to as the "Snippaker Volcanics." Grove (1981) correlates this assemblage to the Unuk River Formation of the Stewart Complex whereas other writers match this group with the time equivalent Stuhini Volcanics. Monotis fossils have been recognized on the north slope of Snippaker Peak and west of Newmont Lake, 20 km to the north, giving an age Late Triassic. It is within these rocks that Skyline's Reg and Inel gold deposits occur (Figure 3).

Grove reports an unconformable contact between Carboniferous and Middle Jurassic strata on both sides of Snippaker Ridge, north of Snippaker Peak. The same unconformable relationship between these major rock units appears to extend from Forrest Kerr Creek west, along the Iskut River, to the Stikine River junction. Present interpretation suggests an east-west trending thrust along the axis of the Iskut River which, like the King Salmon Thrust Fault, pushed up and over to the south.



MON 5 & 6
CLAIM GROUP
UNMAPPED
COAST
BOUNDARY
MOUNTAINS
RANGES
ISKUT RIVER
56°45'
131°00'
REG
INEL
Snippaker Mountain
Tom-MacKay Lake
Sulphurets Creek
Black Crag
Cone Mtn
LEGEND
CENOZOIC
RECENT
CENOZOIC 1 Basalt Flows
MESOZOIC
TRIASSIC-JURASSIC
MESOZOIC 2 Hazelton Group Volcanics; Sediments
PALEOZOIC
PERMIAN
3 Mainly white crinoidal limestone; minor amounts of chert, quartzite, argillite, slate and schist
PALEOZOIC
PRE-PERMIAN
4 Quartzite, schist, slate, argillite, limestone; schistose, tuff, highly altered extrusives, and/or intrusives, highly crystalline schist, gneiss
INTRUSIVE ROCKS
TRIASSIC TO CRETACEOUS
A Acid Intrusives; syenite, syenodiorite, feldspar porphyry, felsite, alaskite
MESOZOIC
B Coast Plutonic Complex; quartz monzonite, granodiorite, gabbro, granite
Map compiled by Todoruk, S.L (1987) from B.C. Assessment Reports, Kerr, F.A (1929) and G.S.C Map No.1418A: Iskut River
Km 0 5 10 15 Km
SCALE 1: 250,000
KESTREL RESOURCES LTD.
ISKUT RIVER AREA
REGIONAL GEOLOGY
LIARD MINING DIVISION
BRITISH COLUMBIA
PAMICON DEVELOPMENTS LTD.
Drawn J.W.
N.T.S. 104B/15W
Date June, 1988
Fig - 3

Following the Iskut River thrust faulting, the entire region was overlain by Middle Jurassic Hazelton Group volcanic-sedimentary rocks named the Betty Creek Formation by Grove (1986).

The batholithic Coast Plutonic Complex intrusions in the Iskut region are of Cretaceous and Tertiary age. Composition varies from quartz monzonite and granodiorite to granite. Satellitic subvolcanic acidic porphyries may be important in the localization of mineralization.

Quaternary and Tertiary volcanics occur to the east along the Iskut River near Forrest Kerr Creek and north at Hoodoo Mountains.

6.0 LOCAL GEOLOGY AND ORTHOPHOTO STRUCTURAL INTERPRETATION

To date no geologic mapping has been undertaken on the Mon 5 and 6 claims. A study of the airphotos shows the claims to be extensively overburden covered and rock types therefore difficult to distinguish.

The recessive nature of much of the topography indicates the claims are underlain mainly by a series of Paleozoic sediments and metasediments including quartzite, slate, argillite and limestone. A higher ridge occurring in the northeast Mon 6 claim appears to be underlain by volcanic rocks belonging to the Middle Jurassic Hazelton Group and possibly small Triassic-Cretaceous acid intrusive plugs.

Structurally the Mon claims are cut by a system of northeast-southwest to northerly trending linears thought to be faults. Minor secondary fracturing or jointing is observed trending generally east-westerly. Due to overburden cover, these fractures are not as apparent as at higher elevations, e.g. the ridge east of the Mon 5 claim.

7.0 CONCLUSIONS

The Mon 5 and 6 claims are predominantly underlain by Paleozoic sediments and metasediments in contact with Mesozoic volcanics of the Hazelton Group.

Recent drilling on Gulf International's McLymont claims indicated that the mineralization is associated with skarn zones within an uplifted section of Mississippian sandstones and limestones adjacent to a major northeast trending fault.

On the Mon 5 and 6 claims favourable geology and structural settings have been interpreted from orthophotographic studies and possess sufficient encouragement to warrant a preliminary exploration program.

An airborne geophysical survey is presently being conducted in conjunction with the orthophotographic structural interpretation. It is expected that the final interpretation of this data will greatly aid in future geologic mapping on the claims. The survey format is appended to this report.

Respectfully submitted,

Steve L. Todoruk, Geologist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
CHARLES K. IKONA

Charles K. Ikona, P.Eng.

APPENDIX I

BIBLIOGRAPHY

BIBLIOGRAPHY

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Gulf International Minerals Ltd.: Annual Report, February 1988.

Skyline Explorations Ltd.: Annual Report 1987.

Todoruk, S.L. and C.K. Ikona (1987): Geological Report on the Stu 1 & 2 Mineral Claims.

Todoruk, S.L. and C.K. Ikona (1987): Geological Report on the Gab 11 & 12 Mineral Claims and Stu 8 & 9 Mineral Claims.

Todoruk, S.L. and C.K. Ikona (1987): 1987 Summary Report on the Sky 4 & 5 and Spray 1 & 2 Claims.

Todoruk, S.L. and C.K. Ikona (1987): Geological Report on the Stu 4 & 5 Mineral Claims.

Tungco Resources Corporation: News release dated December 1, 1987.

Western Canadian Mining Corp.: News release dated November 12, 1987.

APPENDIX II

COST STATEMENT

COST STATEMENT
MON 5 & 6 MINERAL CLAIMS
LIARD MINING DIVISION
OCTOBER 15, 1987 - MARCH 26, 1988

WAGES		
S. Todoruk, Geologist 711, 675 West Hastings Street Vancouver, B.C. V6B 1N4 October 15, 1987 - March 26, 1988 1 day @ $350	$ 350.00	
C. Ikona, P.Eng. 711, 675 West Hastings Street Vancouver, B.C. V6B 1N4 October 15, 1987 - March 26, 1988 2 days @ $400	800.00	
T. Hutchings, Geographer 711, 675 West Hastings Street Vancouver, B.C. V6B 1N4 October 15, 1987 - March 26, 1988 3 days @ $200	600.00	
TOTAL WAGES		$ 1,750.00
EXPENSES		
Drafting	$ 300.00	
Report, Typing, Reproductions	1,000.00	
Orthophotos, Government Air Photos	2,495.00	
TOTAL EXPENSES		3,795.00
Management Fee on Expenses		569.25
TOTAL		6,114.25
Airborne Geophysical Survey		4,000.00
TOTAL THIS PROGRAM		$10,114.25

APPENDIX III

AIRBORNE GEOPHYSICAL SURVEY PROCEDURE

LOGISTICS REPORT ON
COMBINED HELICOPTER BORNE
MAGNETIC, ELECTROMAGNETIC AND VLF
SURVEY
ISKUT RIVER PROPERTIES
LIARD MINING DIVISION
BRITISH COLUMBIA

FOR
PAMICON DEVELOPMENTS LIMITED
BY
AERODAT LIMITED
February 17, 1988

J87100

R.J. de Carle
Consulting Geophysicist

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1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Pamicon Developments Limited by Aerodat Limited. Equipment operated included a three frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a two frequency VLF-EM system, a film tracking camera, and an altimeter. Electromagnetic, magnetic and altimeter data were recorded both in digital and analog form.

The survey area which is comprised of several blocks of ground in the Iskut River area, is located approximately 120 kilometres northwest of Stewart, British Columbia. All of the survey blocks are within what is known as the Liard Mining Division. Several flights, which were flown during the month of February, were required to complete the survey with flight lines oriented at an Azimuth of 000-180 degrees and flown with a nominal line spacing of 250 metres. Coverage and data quality were considered to be well within the specifications described in the contract.

The survey objective is the detection and location of mineralized zones which can be directly or indirectly related to precious metal exploration targets. Of importance, therefore, are poorly mineralized conductors, displaying weak conductivity, which may represent structural features which can sometimes play an essential role in the eventual location of primary minerals.

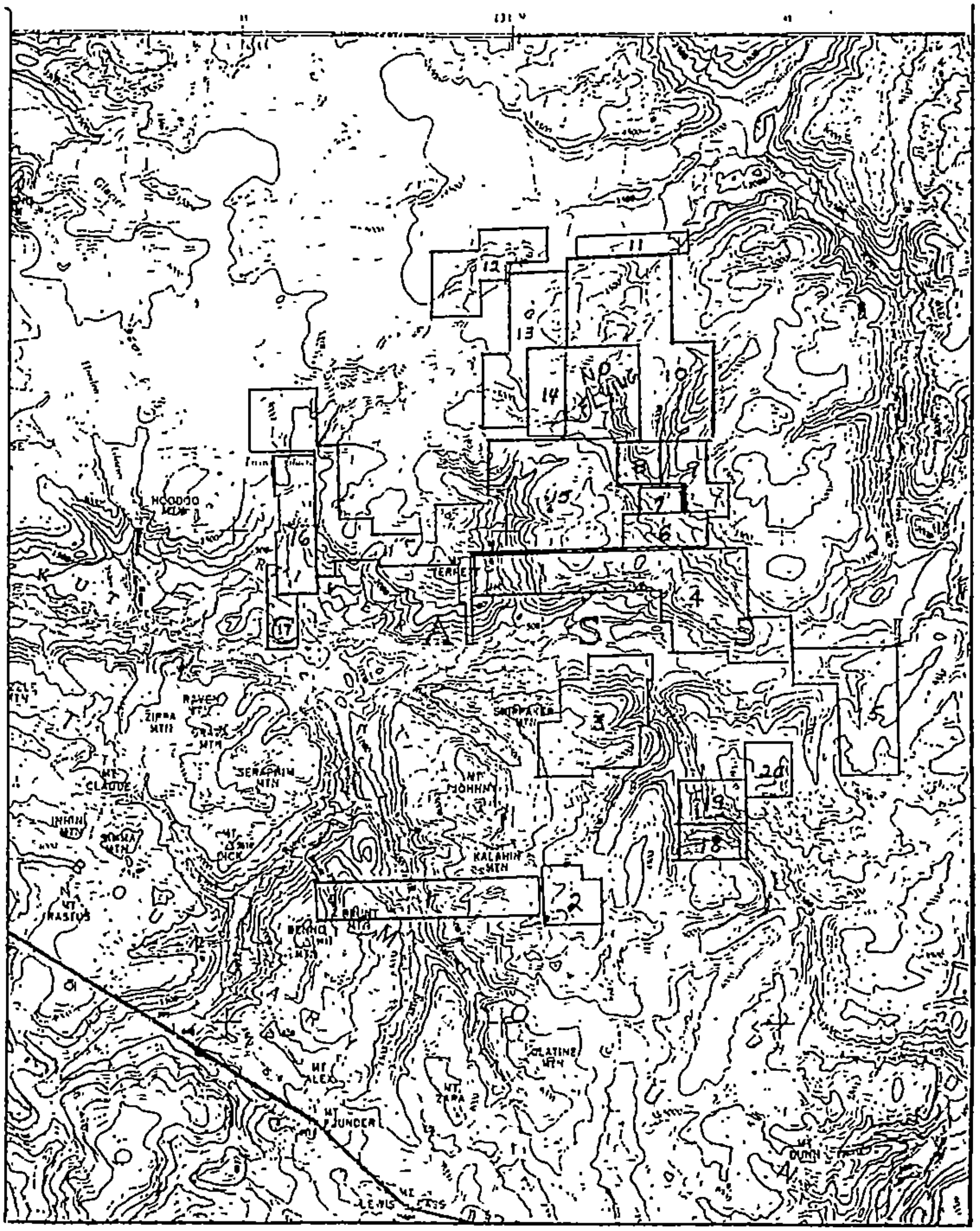
In regard to base metal targets, short, isolated or flanking conductors displaying good conductivity and having either magnetic or no magnetic correlation, are all considered to be areas of extreme interest.

A total of 1760 kilometres of the recorded data were compiled in map form and are presented as part of this report according to specifications outlined by Pamicon Developments Limited.

2. SURVEY AREA LOCATION

The survey area is depicted on the index map shown. They are centred at Latitude 56 degrees 43 minutes north, Longitude 130 degrees 57 minutes west, in the Iskut River area of northern British Columbia (NTS Reference Map No. 104B/10, 104B/11, 104B/14 and 104B/15). The survey area is located in extremely rugged country, with many mountain ranges as high as 6,000 feet above sea level. The major physiographical feature in the area, besides the mountain ranges, is the Iskut River. It is quite a wide river which traverses through the middle of the survey area in an east-west direction with its outlet to the west, flowing into the Pacific Ocean.

Because of the extreme ruggedness of the country, transportation means is by helicopter only. There are no roads into the area. Travelling to the area can be made by bush plane from either Telegraph Creek which is approximately 165 kilometres north of the survey area, or from Stewart, B.C. which is approximately 120 kilometres to the southeast of the survey area. There are three gravel airstrips in close proximity to the survey blocks, one at the base of Mount Johnny, one near Bronson Creek and the third at the head of Snippuker Creek. The writer is not aware of the conditions for any of these airstrips.


HOODOO MTN
RAVEN MTN
ZIPPA MTN
SERAPHIM MTN
MT CLAUDE
MT JOHNNY
KALAHIN MTN
MT DICK
MT RASTUS
MT ALEX
MT DUNN

3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

An Aerospatiale A-Star 350D helicopter, (C-GBBX), owned and operated by Ranger Helicopters Limited, was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a mean terrain clearance of 60 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 3-frequency system. Two vertical coaxial coil pairs were operated at 935 Hz and 4600 Hz and a horizontal coplanar coil pair at 4175 Hz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 3 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the transmitter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz Totem 2A. This instrument measures the total field and quadrature components of two selected transmitters, preferably oriented at right angles to one another. The sensor was towed in a bird 12 metres below the helicopter. The transmitters monitored were NLK, Jim Creek, Washington, broadcasting at 24.8 kHz for the Line station and NAA, Cutler, Maine broadcasting at 24.0 kHz for the Orthogonal station.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW-2321 H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.2 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG-2 proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A King Air HRA-100 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

3.2.6 Tracking Camera

A Panasonic video tracking camera was used to record flight path on VHS video tape. The camera was operated in continuous mode and the fiducial numbers and time marks for cross reference to the analog and digital data were encoded on the video tape.

3.2.7 Analog Recorder

An RMS dot-matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data were recorded:

Channel	Input	Scale
CXI1	Low Frequency Coaxial Inphase	2 ppm/mm
CXQ1	Low Frequency Coaxial Quadrature	2 ppm/mm
CXI2	High Frequency Coaxial Inphase	2 ppm/mm
CXQ2	High Frequency Coaxial Quadrature	2 ppm/mm
CPI1	Mid Frequency Coplanar Inphase	8 ppm/mm
CPQ1	Mid Frequency Coplanar Quadrature	8 ppm/mm
PWRL	Power Line	60 Hz
VLT	VLF-EM Total Field, Line	2.5%/mm

Channel	Input	Scale
VLQ	VLF-EM Quadrature, Line	2.5%/mm
VOT	VLF-EM Total Field, Ortho	2.5%/mm
VOQ	VLF-EM Quadrature, Ortho	2.5%/mm
ALT	Altimeter	10 ft./mm
MAGF	Magnetometer, Fine	2.5 nT/mm
MAGC	Magnetometer, Coarse	25 nT/mm

3.2.8 Digital Recorder

A DGR 33 data system recorded the survey on magnetic tape. Information recorded was as follows:

Equipment	Recording Interval
EM system	0.1 seconds
VLF-EM	0.4 seconds
Magnetometer	0.2 seconds
Altimeter	0.4 seconds

4. DATA PRESENTATION

4.1 Base Map

A photomosaic base at a scale of 1:20,000 was prepared from a photo lay down map, supplied by Aerodat, on a screened mylar base.

4.2 Flight Path Map

The flight path was manually recovered onto the photomosaic base using the VHS video tape. The recovered points were then digitized, transformed to a local metric grid and merged with the data base. The flight path map showing all flight lines, is presented on a Cronaflex copy of the base map, with camera frame and navigator's manual fiducials for cross reference to both the analog and digital data.

4.3 Airborne Electromagnetic Survey Interpretation Map

The electromagnetic data were recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events and to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events.

The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction applied is a linear function of time that ensures the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and levelled data were used in the interpretation of the electromagnetics.

An interpretation map was prepared showing peak locations of anomalies and conductivity thickness ranges along with the Inphase amplitudes (computed from the 4600 Hz coaxial response) and conductor axes. The anomalous responses of the three coil configurations along with the interpreted conductor axes were plotted on a Cronaflex copy of the photo base map.

4.4 Total Field Magnetic Contours

The aeromagnetic data were corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation was applied. The corrected profile data were interpolated onto a regular grid at a 20 metre true scale interval using an Akima spline technique. The grid provided the basis for threading the presented contours at a 2 nanoTesla interval.

The contoured aeromagnetic data have been presented on a Cronaflex copy of the photomosaic base map.

4.5 Vertical Magnetic Gradient Contours

The vertical magnetic gradient was calculated from the gridded total field magnetic data. Contoured at a 0.2 nT/m interval, the gradient data were presented on a Cronaflex copy of the photomosaic base map.

4.6 Apparent Resistivity Contours

The electromagnetic information was processed to yield a map of the apparent resistivity of the ground.

The approach taken in computing apparent resistivity was to assume a model of a 200 metre thick conductive layer (i.e., effectively a half space) over a resistive bedrock. The computer then generated, from nomograms for this model, the resistivity that would be consistent with the bird elevation and recorded amplitude for the coaxial frequency pair used. The apparent resistivity profile data were interpolated onto a regular grid at a 20 metres true scale interval using an Akima spline technique.

The contoured apparent resistivity data were presented on a Cronaflex copy of the photomosaic base map with the flight path.

APPENDIX II

CERTIFICATE OF QUALIFICATIONS

I, ROBERT J. DE CARLE, certify that: -

1. I hold a B. A. Sc. in Applied Geophysics with a minor in geology from Michigan Technological University, having graduated in 1970.

2. I reside at 28 Westview Crescent in the town of Palgrave, Ontario.

3. I have been continuously engaged in both professional and managerial roles in the minerals industry in Canada and abroad for the past eighteen years.

4. I have been an active member of the Society of Exploration Geophysicists since 1967 and hold memberships on other professional societies involved in the minerals extraction and exploration industry.

5. The accompanying report was prepared from information published by government agencies, materials supplied by Pamicon Developments Limited and from a review of the proprietary airborne geophysical survey flown by Aerodat Limited for Pamicon Developments Limited. I have not personally visited the property.

6. I have no interest, direct or indirect, in the property described nor do I hold securities in Pamicon Developments Limited.

7. I hereby consent to the use of this report in a Statement of Material Facts of the Company and for the preparation of a prospectus for submission to the British Columbia Securities Commission and/or other regulatory authorities.

Signed,

Robert J. de Carle

Robert J. de Carle
Consulting Geophysicist

Palgrave, Ontario
February 17, 1988

4.7 VLF-EM Total Field Contours

The VLF-EM signals from NLK, Jim Creek, Washington broadcasting at 24.8 kHz. for the Line Station were compiled in contour map form and presented on a Cronaflex copy of the photomosaic base map.

Robert J. de Carle

Robert J. de Carle
Consulting Geophysicist
for
AERODAT LIMITED

J87100

February 17, 1988

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat three frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measureable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical cross-over shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX IV

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, STEVE L. TODORUK, of Suite 129, 7451 Minoru Boulevard, Richmond, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am a Geologist in the employment of Pamicon Developments Limited, with offices at Suite 711, 675 West Hastings Street, Vancouver, British Columbia.

2. THAT I am a graduate of the University of British Columbia with a Bachelor of Science Degree in Geology.

3. THAT my primary employment since 1979 has been in the field of mineral exploration.

4. THAT my experience has encompassed a wide range of geologic environments and has allowed considerable familiarization with prospecting, geophysical, geochemical and exploration drilling techniques.

5. THAT this report is based on orthophotographic studies and a compilation of all available data surrounding the area.

6. THAT I have no interest in the property described herein, nor in securities of any company associated with the property, nor do I expect to receive any such interest.

7. THAT I hereby grant permission to Kestrel Resources Ltd. for the use of this report in any prospectus or other documentation required by any regulatory authority.

DATED at Vancouver, B.C., this 23 day of June, 1988.

Steve L. Todoruk, Geologist

APPENDIX V

ENGINEER'S CERTIFICATE

ENGINEER'S CERTIFICATE

I, CHARLES K. IKONA, of 5 Cowley Court, Port Moody, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am a Consulting Mining Engineer with offices at Suite 711, 675 West Hastings Street, Vancouver, British Columbia.

2. THAT I am a graduate of the University of British Columbia with a degree in Mining Engineering.

3. THAT I am a member in good standing of the Association of Professional Engineers of the Province of British Columbia.

4. THAT this report is based on a research of all available information on the Mon 5 & 6 mineral claims and on examination and work programs conducted on adjacent claims by myself and Steve Todoruk, Geologist of our office.

5. That I have not examined the property reported on, but have had extensive experience in the area.

6. THAT I have no interest in the property described herein, nor in securities of any company associated with the property, nor do I expect to acquire any such interest.

7. THAT I consent to the use by Kestrel Resources Ltd. of this report in a Prospectus or Statement of Material Facts or any other such document as may be required by the Vancouver Stock Exchange or the Office of the Superintendent of Brokers.

DATED at Vancouver, B.C., this 21 day of ~~March~~ June, 1988.

PROFESSIONAL ENGINEER
PROVINCE OF
CHARLES K. IKONA
BRITISH COLUMBIA

Charles K. Ikona, P.Eng.

APPENDIX VI

REPORT ON AIRBORNE GEOPHYSICAL SURVEY

REPORT ON A
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC AND VLF
SURVEY
ISKUT RIVER AREA
LIARD MINING DIVISION
BRITISH COLUMBIA

FOR
PAMICON DEVELOPMENTS LIMITED
BY
AERODAT LIMITED
September 23, 1988

J87100

R.J. de Carle
Consulting Geophysicist

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(Scale 1:20,000)

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2. FLIGHT LINE MAP;
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3. AIRBORNE ELECTROMAGNETIC SURVEY INTERPRETATION MAP;
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showing VLF-EM values contoured at 2% intervals, flight lines and fiducials with the photomosaic base map.

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showing flight lines, fiducials, inphase and quadrature responses for the:
a) 935 Hz coaxial system
b) 4175 Hz coplanar system
c) 4600 Hz coaxial system

1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Pamicon Developments Limited by Aerodat Limited. Equipment operated included a three frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a two frequency VLF-EM system, a film tracking camera, a radar positioning system, and an altimeter. Electromagnetic, magnetic and altimeter data were recorded both in digital and analog form. Positioning data were stored in digital form and recorded on VHS video cassette film, as well as being marked on the flight path mosaic by the operator while in flight.

The survey, comprised of twenty-three separate blocks of ground in the Iskut River area of northern British Columbia, are located approximately 120 kilometres northwest of Stewart. Twenty-nine (29) flights, which were flown between November 16, 1987 and June 6, 1988, were required to complete the survey with flight lines oriented at an Azimuth of 000-180 degrees and flown at a nominal line spacing of 250 metres. Coverage and data quality were considered to be well within the specifications described in the contract.

The survey objective is the detection and location of mineralized zones which can be directly or indirectly related to precious metal exploration targets. Of importance, therefore, for precious metals, are poorly mineralized conductors displaying weak conductivity, which may represent structural features which can sometimes play an essential role in the eventual location of primary minerals.

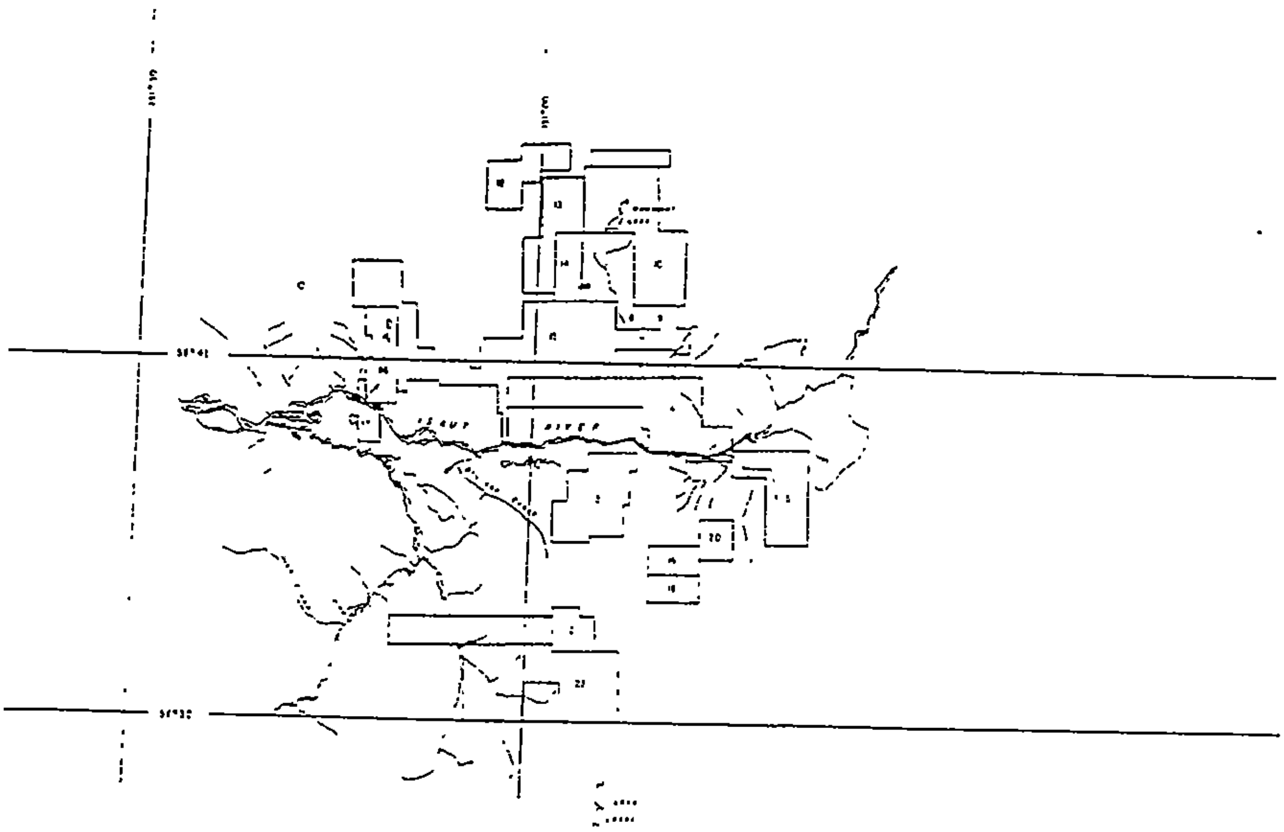
Also of considerable interest is the recent precious metal activity in the immediate Iskut River area which Cominco Limited and Delaware Resources Corp. have located the exciting SNIP discovery. The zone is apparently related to two sets of mineralized structures containing approximately 1.2 million tons grading 0.75 oz./ton gold. To the south, Skyline Explorations Ltd. carried out an extensive exploration program on its Johnny Mountain prospect. There are a number of vein systems currently being worked on. The newly discovered Zephrin zone consists of feldspathic and siliceous alteration in the brecciated zone containing 10 to 15 percent sulphides and carrying high gold values.

A total of 2000 kilometres of recorded data were compiled in map form and are presented as part of this report according to specifications outlined by Pamicon Developments Limited.

2. SURVEY AREA LOCATION

The survey areas are depicted on the index maps shown. They are centred approximately at Latitude 56 degrees 42 minutes north, Longitude 131 degrees 5 minutes west, approximately 120 kilometres northwest of Stewart, British Columbia in the Liard Mining District (NTS Reference Map No. 104B). The survey blocks straddle the Iskut River with Area 1 being located approximately 10 kilometres northeast of the State of Alaska boundary. The only means of access to any of the survey blocks is by fixed-wing aircraft or helicopter from such bases as Stewart or from Telegraph Creek which is located approximately 135 kilometres north of the survey areas.

The terrain is extremely rough with elevations ranging from 500 feet near Iskut River to as high as 6000 feet near Areas 19 and 20. Transportation within the immediate areas of the survey blocks is by helicopter only.



3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

An Aerospatiale A-Star 350D helicopter, (C-GBBX), owned and operated by Ranger Helicopters Limited, was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a mean terrain clearance of 60 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 3-frequency system. Two vertical coaxial coil pairs were operated at 935 Hz and 4600 Hz and a horizontal coplanar coil pair at 4175 Hz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 3 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the transmitter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz Totem 2A. This instrument measures the total field and quadrature components of two selected transmitters, preferably oriented at right angles to one another. The sensor was towed in a bird 12 metres below the helicopter. The transmitters monitored were NSS, Annapolis, Maryland, NLK, Jim Creek, Washington, NAA, Cutler, Maine and NPM, Laulualei, Hawaii broadcasting at 21.4 kHz., 24.8 kHz., 24.0 kHz. and 23.4 kHz respectively.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW-2321 H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.2 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG-2 proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A King Air HRA-100 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

3.2.6 Tracking Camera

A Panasonic video tracking camera was used to record flight path on VHS video tape. The camera was operated in continuous mode and the fiducial numbers and time marks for cross reference to the analog and digital data were encoded on the video tape.

3.2.7 Analog Recorder

An RMS dot-matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data were recorded:

Channel	Input	Scale
CXI1	935 Hz Coaxial Inphase	2 ppm/mm
CXQ1	935 Hz Coaxial Quadrature	2 ppm/mm
CXI2	4600 Hz Coaxial Inphase	2 ppm/mm
CXQ2	4600 Hz Coaxial Quadrature	2 ppm/mm
CPI1	4175 Hz Coplanar Inphase	8 ppm/mm

Channel	Input	Scale
CPQ1	4175 Hz Coplanar Quadrature	8 ppm/mm
PWRL	Power Line	60 Hz
VLT	VLF-EM Total Field, Line	2.5%/mm
VLQ	VLF-EM Quadrature, Line	2.5%/mm
VOT	VLF-EM Total Field, Ortho	2.5%/mm
VOQ	VLF-EM Quadrature, Ortho	2.5%/mm
ALT	Altimeter	10 ft./mm
MAGF	Magnetometer, Fine	2.5 nT/mm
MAGC	Magnetometer, Coarse	25 nT/mm

3.2.8 Digital Recorder

A DGR 33 data system recorded the survey on magnetic tape. Information recorded was as follows:

Equipment	Recording Interval
EM system	0.1 seconds
VLF-EM	0.5 seconds
Magnetometer	0.2 seconds
Altimeter	1.0 seconds

4. DATA PRESENTATION

4.1 Base Map

A photomosaic base at a scale of 1:20,000 was prepared from a photo lay down map, supplied by Aerodat, on a screened mylar base.

4.2 Flight Path Map

The flight path was manually recovered onto the photomosaic base using the VHS video tapes. The recovered points were then digitized, transformed to the standard UTM metric grid and merged with the data base. The flight path map showing all flight lines, is presented on a Cronaflex copy of the base map, with navigator's manual fiducials for cross reference to both the analog and digital data.

4.3 Airborne Electromagnetic Survey Interpretation Map

The electromagnetic data were recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events and to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events.

The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction applied is a linear function of time that ensures the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and levelled data were used in the interpretation of the electromagnetics.

An interpretation map was prepared showing peak locations of anomalies and conductivity thickness ranges along with the

Inphase amplitudes (computed from the 4600 Hz coaxial response) and conductor axes. The anomalous responses of the three coil configurations along with the interpreted conductor axes were plotted on a Cronaflex copy of the photomosaic base map.

4.4 Total Field Magnetic Contours

The aeromagnetic data were corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation was applied. The corrected profile data were interpolated onto a regular grid at a 50 metre true scale interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 5 nanoTesla interval.

The contoured aeromagnetic data have been presented on a Cronaflex copy of the photomosaic base map.

4.5 Vertical Magnetic Gradient Contours

The vertical gradient was computed from the total field magnetic data to obtain values in nanoteslas/metre.

The gridded data were compiled at a 50 metre true scale interval and contoured at an interval of 0.5 nanoTesla per metre and presented with flight path on a Cronaflex copy of the photomosaic base map.

4.6 Apparent Resistivity Contours

The electromagnetic information was processed to yield a map of the apparent resistivity of the ground. The approach taken in computing apparent resistivity was to assume a model of a 200 metre thick conductive layer (i.e., effectively a half space) over a resistive bedrock. The computer then generated, from nomograms for this model, the resistivity that would be consistent with the bird elevation and recorded amplitude for the 4600 hz coaxial frequency pair used. The apparent resistivity profile data were interpolated onto a regular grid at a 50 metres true scale interval using an Akima spline technique.

The contoured apparent resistivity data were presented on a Cronaflex copy of the photomosaic base map with the flight path.

4.7 VLF-EM Total Field Contours

The VLF-EM signals from NSS, Annapolis, Maryland, NAA, Cutler, Maine and NLK, Jim Creek, Washington broadcasting at 21.4 kHz., 24.0 kHz., and 24.8 kHz. respectively were compiled in contour map form, as the Line Station, and presented on a Cronaflex copy of the photomosaic base map.

5. INTERPRETATION

5.1 Geology

The writer did not have access to any detailed geology maps for any of the survey blocks. The only available information to the writer was a summary of exploration taken from Exploration in British Columbia 1986.

A description of the Johnny Mountain property of Skyline Explorations Limited suggests that the property is underlain by Upper Triassic andesitic tuff, breccia and associated sedimentary units which probably correlates to the Unuk River Formation of the Stewart complex to the southeast. Three showings located to date indicate pyrite, chalcopyrite, arsenopyrite and pyrrhotite mineralization in quartz-carbonate veins and veinlets. No deep-seated or moderate conductors located by pulse electromagnetic survey.

The SNIP claims of Delaware Resources and Cominco Limited are underlain by Triassic to Lower Jurassic volcanic and sedimentary rocks with related high level subvolcanic felsite and quartz-feldspar porphyry bodies. Intermediate volcanic breccias, tuff breccias and siliceous pyroclastic rocks are common. Mineralization is comprised of auriferous quartz veins, chalcopyrite-galena-sphalerite blebs and veins, and molybdenite in an altered quartz-feldspar porphyry plug.

Structural features seem to have played an important role either as being host to auriferous mineralization or as the controlling element in the formation of the deposits.

5.2 Magnetics

Area 1

Strike direction of the basement lithology is generally east-west, with some areas showing a northeast-southwest direction. There is not a great deal of contrast in the magnetics which would indicate unique rock types. There is a general trending indicating bedding but the types of rock units are difficult to interpret.

Area 2

Only one magnetic feature exists within this small block and is centred approximately in the middle of the block. It strikes in an east to northeast direction. The dip of the bedding of the basement rock unit seems to be near vertical.

Area 3

The main magnetic feature within this block shows an approximate east-west strike direction with a sudden fold towards the east end to a more southwest-northeast direction. Apparent direction of dip is towards the south although one feature towards the extreme northeast corner of the block seems to be dipping towards the northeast.

The large expanse of magnetic low may be associated with sedimentary rock types.

Area 4

A great deal of terrain relief within this survey block seems to have resulted in rather inaccurate data. If one refers to the southeastern portion of the block, the long linear magnetic low seems to correlate with the Iskut River. It is suggested that the helicopter may have been somewhat high over this area and thus farther away from the source. The magnetic highs seem to correlate, for the most part, with topographical highs. It is suggested that the client pay particular attention to this phenomena when utilizing this data set in any future ground program.

Area 5

There seems to be three individual magnetic horizons which, no doubt, would indicate three unique rock classifications. The magnetically active area towards the northwest portion suggests a mafic to ultramafic unit while a second active area towards the east central to southeastern portion perhaps suggests a more basic unit. The area showing a magnetically low intensity could be related to sediments. The magnetic profile shapes seem to indicate a rather steeply dipping to vertical attitude for the stratigraphy.

Area 6

The western and eastern extremities of the block display relatively active magnetics suggesting a completely different rock type than what possibly exists within the middle of the block. The centre portion has much lower magnetic intensity indicating a possible sedimentary rock unit. There is a considerable amount of folding so that strike directions change abruptly. It changes from north-south to east-west.

Area 7

Within this small block, it would seem that there are only two very weak magnetic features. The main one seems to traverse through the northern third of the block, with evidence of a great deal of folding. A second, smaller trend just catches the southwestern corner of the block. Dips are near vertical.

Area 8

Strike direction within this small block is generally north-south with some areas exhibiting small variations from this horizon. A stronger magnetic trend located in roughly the north central portion of the block may be related to a mafic rock unit. Its southern extent is definitely cut off. The rather large magnetic low towards the southwestern corner of the block may suggest the proximity to a contact with a mafic plug.

Area 9

The large magnetically low area towards the western portion of the block could possibly be related to sedimentary rock types. The outer margins of this zone, to the north as well as to the east, display a somewhat weak but magnetically active region which may be related to a basic volcanic rock unit. There is a definite fold in the structure towards the northeast and this may indicate a possible synclinal structure.

Area 10

There seems to be four unique horizons indicated by the magnetics within this block. Each display magnetic intensities indicative of mafic type rock units, but may be altered basic volcanics as well. Each of the units appear to be approximately two kilometres apart. Between each of these horizons, there is generally a rather magnetically low region with a few weaker magnetic trends which tend to be short and isolated. Strike direction is generally in a northeast-southwest direction, although in some areas, because of folding, the strike direction does change. Dips are generally vertical to near vertical.

Area 11

Two of the magnetic features mentioned in Area 10 extend into and traverse through this block. Otherwise, the magnetics are much similar to the previous block.

Area 12

Two large units within this block display reasonably active magnetics, both of which may be related to mafic rock units. Dips vary from near vertical to westerly for the most western unit.

Area 13

There would appear to be two magnetically active areas within this block, one to the north, which is an extension of one that was mentioned in Area 10 and a second unit towards the south end of the block. It would seem that because of the amount of folding and faulting that has taken place in both of these areas, strike direction of the bedding changes drastically. Probable thrust faults have seemingly resulted in a doubling up or overlapping of magnetic features.

Area 14

This smaller block contains magnetic features which are similar to the regions of Area 13. Sedimentary rocks or perhaps volcanic tuffs are the rock types towards the southern edges of this block, as well as within the northern third portion.

Areas 15, 16 and 17

After close examination of the magnetic data for all three areas, it became rather clear that the data correlated, to a great degree, with the topography. That is, the magnetic highs correlated with the topographic highs while the magnetic lows correlated with the topographic lows or rivers and creeks. This phenomena may be just a coincidence, in that, the rock units correlating with the higher areas may be magnetically active. Not having access to any geology for the region, it is impossible to deliberate any further on the comparisons.

Areas 18, 19 and 20

It will be noted that a great deal of folding has taken place within these three areas, as well as several areas of probable thrust faulting. The stronger trend towards the northwest swings around to the east and seems to become associated with the magnetic horizon towards the southeast. Faulting seems to have displaced this trend, in a few areas, along strike. Amount of dip and direction of dip seems to vary within the region.

Area 23

This area presents several unique magnetic features, some of which may reflect the lithology of the basement rocks. It is also suggested that the rough terrain effects may have affected the acquiring of the data. Note the magnetic low in the area towards the west, that coincides with a creek. The helicopter may have been high at these points, thus acquiring data further away from the source resulting in lower intensity values. The other alternative to this suggestion is that the magnetic low is caused by a fault or major shear zone.

It would seem that the magnetically active areas towards the western half of the area are related to the same basement source. The eastern half displays somewhat lower levels of intensity and seemingly has more smaller, isolated magnetic features.

5.3 Vertical Magnetic Gradient

The areas of high intensity magnetics have been clearly broken up into unique trends as a result of the computation of the vertical gradient. This interpretation is not as readily obvious when one refers to the magnetic total field maps.

It should also be noted that the zero contour interval coincides directly or very close to geological contacts. It is because of this phenomenon that the calculated vertical gradient map can be compared to a pseudo-geological map. This is true for vertical bedding. However, with the bedding dipping at a steep to moderate angle, it will be found that the geological contacts will be closer to the magnetic peaks by a small distance.

By using known or accurate geological information and combining this data with vertical gradient data, one can use the presented maps as pseudo-geological maps. Obviously, the more that is known about an area geologically, the closer this type of presentation is to what the rock types are.

This type of presentation is an invaluable tool in helping to define complex geology, especially in drift covered areas, as well as in areas of extremely rugged terrain. Not only in areas of complex geology, but in areas of closely spaced geologic formations, has the calculated vertical gradient computation been of exceptional value. Since a good portion of the survey areas are either overlain with till and boulders or contain extremely rugged terrain, this particular presentation will be very useful.

The writer has indicated a few fault zones on the interpretation maps for each of the survey blocks. Because of the nature of the computation of the vertical gradient data, magnetic anomalies produced by near surface features are emphasized with respect to those resulting from more deeply buried rock formations. As a result, much more detail is obtained, providing a better opportunity to recognize faults. As mentioned, some fault structures have been interpreted by the writer. However, it will become more apparent to the client as more field geological information is obtained, that other fault zones do exist.

It is suggested that the development of these structural features through a more intensive interpretation of the magnetic data will greatly enhance the exploration potential, as it seems to be these geological structures that play host to some of the important discovery zones in the immediate area.

5.4 Electromagnetics

The electromagnetic data was first checked by a line-by-line examination of the analog records. Record quality was good on all frequencies. Instrument noise was well within specifications. Geologic noise, in the form of surficial conductors, is present on the higher frequency responses and to a minor extent, on both the low frequency inphase and quadrature response.

Anomalies were picked off the analog traces of the low and high frequency coaxial responses and then validated on the coplanar profile data. These selections were then checked with a proprietary computerized selection program which can be adjusted for ambient and instrumental noise. The data were then edited and re-plotted on a copy of the profile map. This procedure ensured that every anomalous response spotted on the analog data was plotted on the final map and allowed for the rejection - or inclusion if warranted - of obvious surficial conductors. Each conductor or group of conductors was evaluated on the basis of magnetic (and lithologic, where applicable) correlations apparent on the analog data and man-made or surficial features not obvious on the analog charts.

RESULTS

As a result of carrying out an airborne survey over the ground covered by Area 1, it is very clear that most of the area is extremely resistive with no indications of surficial or bedrock related conductivity. In one area, however, near Brunt Creek, there is evidence of a slightly conductive source, probably related to the creek bottom sediments. Four bedrock conductors have been outlined within this block. Zone 1A is definitely due to a bedrock source and seems to be associated with a geological contact. It is dipping to the south. A fault may have cut off the trend towards the east end so this should be kept in mind when investigating in the field. Zones 1B and 1C are extremely poor conductors that may be related to bedrock sources. Because of the proximity of these two anomalies to both Zones 1A and 1D, it is felt that both responses 1B and 1C should be looked at further while in the field. Zone 1D is definitely due to a bedrock source which could be dipping to the south. This conductor too, may be associated with a geological contact.

Regions where the three frequency inphase responses deflect in a negative direction, are areas which can be related to the magnetite content within the underlying basement rocks. The larger the negative amplitudes, the higher the magnetite content.

Area 2 as well has shown a totally resistive environment. Only one bedrock conductor was intercepted during the course of flying this block i.e., Zone 2A. It is a well defined anomaly which seems to be located very close to a vertical gradient zero contour interval suggesting a relationship with a geological contact. A dip to the south is interpreted. Referring to the base map, it will be noted that the intercept is located very close to the edge of a glacier, hopefully making a follow-up somewhat easier.

There were no bedrock conductors intercepted within Area 3. Only one area shows any signs of surficial conductivity and that is towards the northern portion of line 5211. Other areas that show negative responses are related to magnetite content.

Ten zones have been oultined within Area 4. Most are located towards the northeast corner of the survey block, in close proximity to a creek or river which flows into the Iskut River. Zone 4A to 4G display rather weak amplitude responses and certainly at this point in time are questionable responses. Zone 4K may be caused by conductive surficial effects. The only conductive trends that seem to be caused by bedrock sources are Zones 4H and 4J. They both display reasonable EM responses and seem to be associated with the flanks of magnetic features. Zone 4F could also be given further attention while in the field.

There were a few conductors intercepted within Area 5, none of which appears to be that well defined. Most display rather broad electromagnetic responses suggesting perhaps surficial conductivity. In some cases, conductive creek bottom silts may be the reason. Zones 5B and 5C display sharp responses but this is due, it is felt, to the slowing down of the helicopter. It is recommended, however, that each of these outlined areas should be considered in any future ground reconnaissance survey. In particular, Zones 5A, 5D, 5G and 5E are possible prospects.

The broad electromagnetic responses located within the middle of Area 6 are believed to be caused by conductive creek bottom silts. The thicker portion of this horizon would be towards the south and then seems to thin out towards the north. Other weaker responses within the remainder of the block are also felt to be caused by conductive surficial effects. Much the same reasons can be given for those weak EM responses within Area 7.

There were no bedrock conductors intercepted within either Areas 8 or 9.

Four conductors have been intercepted within Area 10, each being related to a bedrock source. With the exception of possibly Zone 10D, the conductive trends tend to be associated with the zero contour interval of the vertical gradient. This suggests a possible relationship with geological contacts. Follow-up work in the field is definitely warranted. Towards the northern section of this block, it will be noted that there are a number of broad EM responses. These are believed to be related to conductive silts beneath a glacial lake. No further work is warranted in this area. Generally speaking, there seems to be a somewhat more conductive nature to the surficial environment for the northern regions compared to other areas of this block.

With the exception of some surficial conductivity, there were no bedrock conductors intercepted within Area 11. The same scenario can be said for Area 12. In areas where the inphase responses deflect negatively, magnetite is the cause.

Zones 13A and 13B, within Area 13, could, in fact, be just one conductor with the two intercepts related to a flat lying source. The EM responses are certainly indicative of a bedrock source and because of this, a follow-up survey is definitely warranted. Note the magnetic enclosure for Zone 13A. Pyrrhotite may be the conductive source. Areas of weak quadrature expression would seem to be related to surficial effects.

Zone 14A was selected because of its possible association with a contact between a magnetic feature to the south and a non-magnetic source to the north. The conductivity is extremely poor although amplitudes are reasonably strong compared to most areas. It should, however, be considered as a low priority target.

There were a few conductors intercepted within Area 15, most however, are questionable as to their source. Zone 15A is a low amplitude response with no magnetic association. However, the low amplitude may be due to a deep seated source or perhaps it is related to the helicopter being a bit too high.

A further look at Zone 15A, while in the field, is warranted. Zone 15B may be caused by sulphides within a high magnetite content zone. Note the extreme negative deflection of the inphase responses. All of the higher amplitude EM responses towards the southeastern extremities of Area 15 are related to the conductive nature of the river bottom silts of the Iskut River. Zones 15C and 15D are believed to be caused by bedrock conductors. In each case, they seem to be correlating with geological contacts. It would seem that their locations are near the slope of a high plateau. A dip to the south is possible for each conductor. Just to the north of Zones 15C and 15D, there are EM responses that the writer felt were due to overburden related sources. However, the client should be well aware of their existence and perhaps, upon investigating 15C and 15D, a reconnaissance survey could be made for these other two areas. Zones 15E is extremely weak.

Only surficial conductivity seems to prevail within Areas 16 and 17. Note the higher EM responses over the Iskut River.

There were no bedrock conductors intercepted in either Area 18 or Area 20. Only one extremely weak anomaly was outlined in Area 19 and has been indicated as Zone 19A. It is a quadrature response that is located at the northern edge of a horizon that exhibits a high magnetite content. A low priority.

A number of conductors were intercepted within Area 23 but whether or not they are bedrock related is something that will have to be verified on the ground. The locations of Zones 23A and 23B to 23G and 23H to 23L, all seem to be at the base of a glacier, just up from creeks and contained within talus or rubble environments. Prospecting crews are advised to carry out reconnaissance geological surveys in each of these areas. Particular attention should be paid towards the type of rocks in the immediate area as well as the existence of sulphide mineralization.

5.5 Apparent Resistivity

This presentation has clearly shown the four intercepted bedrock conductors within Area 1, as well as possibly indicating some further strike direction to each. Other areas outlined on this map are believed to be related to either surficial conductivity or high background levels. These are areas outlined on lines 3450, 3460, 3500 and 3600.

Within Area 2, the lower resistivity region to the north is believed to be associated with underlying surficial sediments beneath a glacier. As well, to the south of Zone 2A, the apparent resistivity anomaly is probably related to high background levels.

Because of the extremely resistive nature within Area 3, there were no contrasting conductive horizons intercepted.

Not only were the previously mentioned zones outlined within Area 4, but there may have been one or two other new areas outlined as a result of this data presentation. In particular, one should refer to the region just to the south of Zone 4H. However, one should keep in mind that all of these areas are rather close to a large creek that flows into the Iskut River.

The only intercepted conductive areas within Area 5 are those that were mentioned in the previous section in Electromagnetics. The remainder of the block, as is evident, is extremely resistive.

The apparent resistivity low traversing through Areas 6,7 and 8 are believed to be related to the conductive nature of the creek bottom sediments. All other outlined apparent resistivity regions within each of these areas can be attributed to conductive surficial effects. There were no bedrock conductors intercepted within any of these blocks. As is evident from this data presentation, for the most part, the basement rocks are extremely resistive.

The apparent resistivity data presentation for Area 10 has outlined the previously mentioned bedrock conductors. It has also indicated the areas of surficial conductivity as well as the conductive silts of the glacial lake bottoms. For the most part, the basement rock types are extremely resistive.

Only the surficial environment has been outlined within Area 11. There are no bedrock conductors. The same can be said for Area 12.

It will be noted that Zones 13A and 13B have been outlined as one conductor on the apparent resistivity map. This is to be expected as this data presentation does not have the same resolution as the frequency EM data. And, of course, as mentioned previously, there is the possibility of only one flat lying conductor. All other outlined areas of lower resistivity within Area 13 are believed to be related to conductive surficial effects.

Zone 14A has been outlined and all other areas within Area 14 are related to conductive surficial environments.

There were only a few new conductive areas that were indicated on the apparent resistivity presentation, compared to the 3 frequency EM map. However, most, if not all, are probably due to conductive surficial effects.

The large relatively low resistive areas within Areas 16 and 17 are due to conductive surficial effects, as well as conductive river bottom silts of the Iskut River. Zone 17A may also be due to conductive overburden.

The outlined low resistive areas in Areas 18, 19 and 20 are interpreted to be caused by conductive creek or river bottom silts. Because Zone 19A was not indicated through this process, one wonders then of its existence as a possible bedrock source.

Most of the indicated conductors within Area 23 have been outlined on the apparent resistivity presentation. As well, a few of the other areas outlined can be attributed to creek bottom silts.

5.6 VLF-EM Total Field

The VLF data within each of the survey blocks, in general, do not conform with the magnetic data at all. It is quite clear after examining the comparison of the two sets of data, VLF and the magnetics, that there are no similarities whatsoever.

In regards to the 3 frequency EM data, only where the conductors are reasonably strong is there any indications of a VLF response.

It is suggested that the VLF-EM system has been sensitive to the rather rough terrain in all areas. It will be noted that in a good many of the areas where there are sharp valleys or gouges, that a VLF low exists. These particular signatures are thought to be related to a weakening of the VLF transmitted signal when the helicopter has been hidden behind a hill. In areas of higher elevation, a VLF high or background reading seem to prevail.

In general then, the VLF-EM has not produced data of any significance.

5.7 Recommendations

It is strongly recommended to the client that a complete and comprehensive evaluation be made of the magnetic data and especially the calculated vertical gradient magnetic data. All available geological information should be obtained, either through geological maps, diamond drill holes or through the assessment files. Once such information is obtained, a broad scale geological map should be compiled and then, in reference to the calculated vertical gradient magnetic map, a reasonable pseudo-geological map can then be prepared.

The magnetics, however, certainly seem to have been affected by the extremely rugged terrain. In effect, the altitude changes of the helicopter (or magnetic sensor) may have affected the intensity but probably not the actual trending. It is this phenomena that will have to be sorted out before any serious exploring can take place in most of the survey blocks.

Structural information should be obtained through a more comprehensive evaluation of the magnetic data and possibly through an overview of the VLF data. Cross cutting faults are evident throughout the survey areas and are extremely important with respect to any mineralogical controls and as such, the development of these structural events through interpreting the magnetic data, will be strongly advised.

Local prospecting and till sampling should be carried out in the proximity of the selected targets. If results are encouraging, then ground geophysical surveys are definitely warranted. Electromagnetic surveys are perhaps more conductive in the search for the targets in this area, as opposed to magnetics, because of the nature of the sulphides and the lack of any magnetic susceptibility related to the targets. Magnetic lows and/or fault structures are important horizons, especially if there are conductors associated.

Because known zones in this area have somewhat short strike lengths, it is imperative that one use the correct mode of ground geophysics so that interception is made without difficulty. It is suggested that a vertical mode vertical loop EM survey be carried out initially before any further surveying is done. This could be done, in fact, before any traverse lines are set up. Once a conductor is located by this method, then either a horizontal loop EM survey or an induced polarization (IP) survey could be carried out. The writer prefers the former because of the logistical and operational constraints of an IP survey, especially in an area such as this. With either the Vertical mode or Horizontal mode EM surveys, the highest frequencies available are advised.

The writer has given brief comments on most conductors and it is within this area of the report where the client will establish some feeling for the type of conductor referred to. There is no question of the existence of bedrock conductors within some of the survey blocks. It is a matter of using all resources, including geophysics, drill information and the compilation of a pseudo-geological map. Geochemical soil sampling may render additional information, for some areas, that will lead to an exciting exploration program.

Respectfully submitted,

R.J. de Carle

Robert J. de Carle
Consulting Geophysicist
For
AERODAT LIMITED

J87100

September 23, 1988

APPENDIX I

CERTIFICATE OF QUALIFICATIONS

I, ROBERT J. DE CARLE, certify that: -

1. I hold a B. A. Sc. in Applied Geophysics with a minor in geology from Michigan Technological University, having graduated in 1970.

2. I reside at 28 Westview Crescent in the town of Palgrave, Ontario.

3. I have been continuously engaged in both professional and managerial roles in the minerals industry in Canada and abroad for the past eighteen years.

4. I have been an active member of the Society of Exploration Geophysicists since 1967 and hold memberships on other professional societies involved in the minerals extraction and exploration industry.

5. The accompanying report was prepared from information published by government agencies, materials supplied by Pamicon Developments Limited and from a review of the proprietary airborne geophysical survey flown by Aerodat Limited for Pamicon Developments Limited. I have not personally visited the property.

6. I have no interest, direct or indirect, in the property described nor do I hold securities in Pamicon Developments Limited.

Signed,

R. J. de Carle

Palgrave, Ontario
September 23, 1988

Robert J. de Carle
Consulting Geophysicist

APPENDIX II

PERSONNEL

FIELD

Flown - November, 1987 to June, 1988

Pilot - K. Miller

Operator - Joe Mercier

OFFICE

Processing - Diana Bradley

Report - Robert de Carle, Consulting Geophysicist

APPENDIX III

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat three frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measureable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical cross-over shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX IV

ANOMALY LIST

J87100

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
2	80	A	0	3.0	4.6	0.3	0	87
2	80	B	0	3.7	5.1	0.4	0	94
2	80	C	0	3.6	6.2	0.2	0	69
2	100	A	0	4.3	0.6	11.6	10	87
2	100	B	2	2.9	1.1	2.4	10	94
2	110	A	0	1.0	2.4	0.0	1	71
2	110	B	0	3.8	4.3	0.5	0	97
2	120	A	1	5.3	3.1	1.6	0	90
2	130	A	1	8.1	5.5	1.5	0	89
2	130	B	4	6.3	1.1	9.6	16	68
2	140	A	0	1.0	2.8	0.0	9	57
2	140	B	1	7.0	4.5	1.6	0	108
2	150	A	2	17.7	10.3	2.5	0	53
2	150	B	0	8.6	9.2	0.8	12	42
1	160	A	1	4.2	2.6	1.4	7	77
19	1170	A	0	-2.2	3.6	0.0	0	28
6	1440	A	0	0.3	4.2	0.0	0	47
6	1440	B	0	0.7	5.3	0.0	0	57
6	1451	A	0	0.2	4.6	0.0	0	62
6	1451	B	0	2.8	6.5	0.1	0	72
6	1460	A	0	7.4	7.5	0.8	0	70
6	1471	A	0	4.7	6.3	0.4	0	65
10	2010	A	1	6.3	4.7	1.2	0	76
10	2020	A	2	5.4	1.9	3.4	0	109
10	2030	A	0	5.3	1.0	8.1	0	89
10	2040	A	0	5.3	4.6	0.9	0	86
10	2050	A	0	-1.6	2.3	0.0	0	54

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J87100

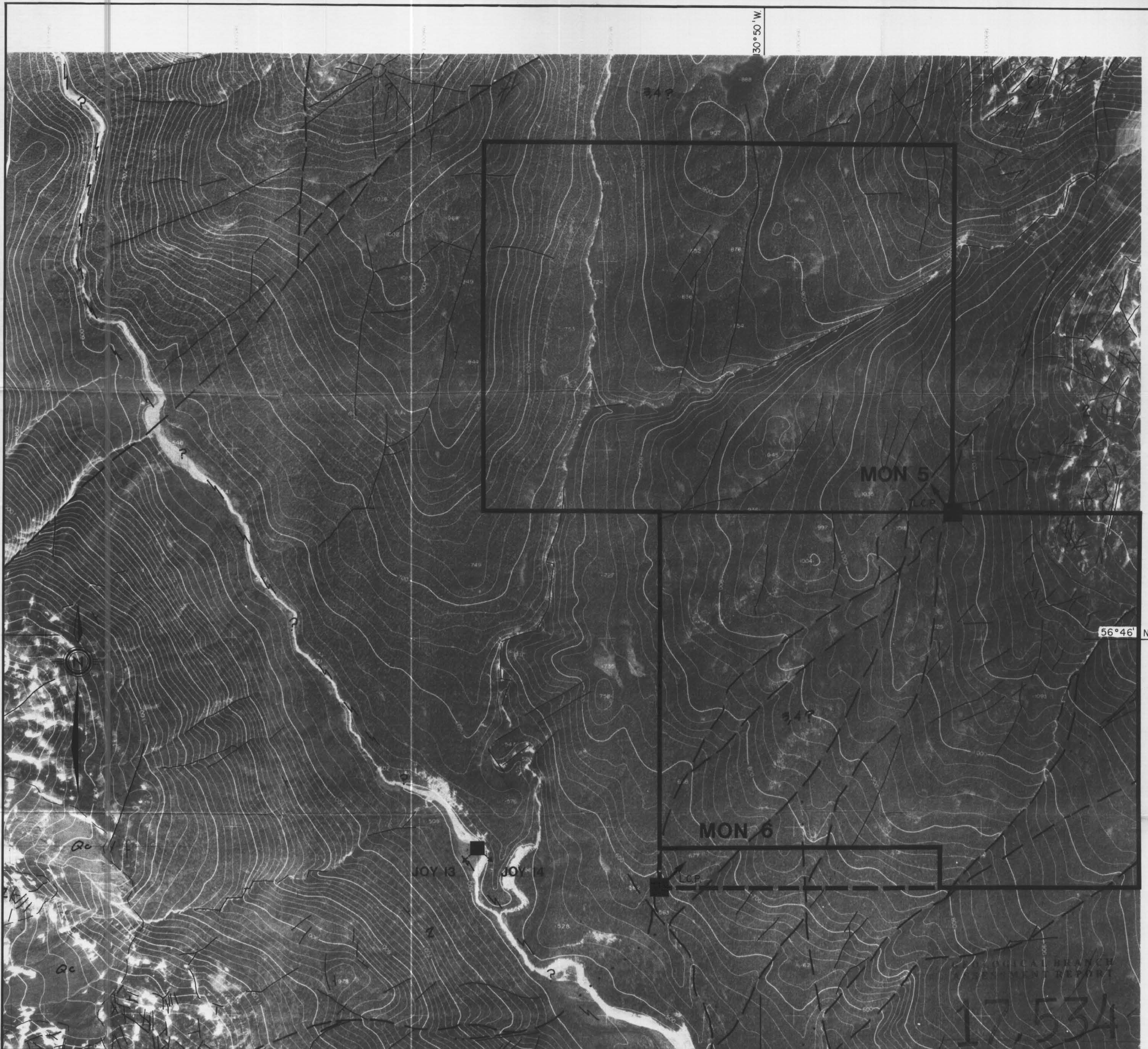
FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
11	2090	A	1	10.7	7.9	1.5	0	69
11	2101	A	1	4.9	3.2	1.3	0	79
11	2130	A	0	1.4	4.6	0.0	0	53
22	2540	A	2	11.8	6.6	2.3	0	70
22	2550	A	0	1.4	3.7	0.0	5	56
22	2560	A	0	9.5	16.8	0.4	0	42
22	2570	A	0	3.2	8.0	0.1	0	53
22	2570	B	0	1.9	6.3	0.0	0	63
22	2580	A	0	2.9	8.7	0.1	0	59
22	2580	B	0	2.0	12.1	0.0	0	52
23	2760	A	0	2.4	8.5	0.0	0	1192
23	2770	A	0	5.9	15.0	0.2	0	847
23	2770	B	0	4.8	11.4	0.2	0	846
26	2840	A	0	2.1	6.7	0.0	3	44
27	2860	A	0	3.7	3.2	0.8	10	69
27	2900	A	0	-166.8	8.4	0.0	0	23
14	3580	A	0	2.5	4.2	0.2	0	1221
14	3580	B	0	0.2	4.5	0.0	0	1212
14	3580	C	0	1.3	8.2	0.0	0	1199
14	3600	A	0	0.3	4.4	0.0	0	63
14	3610	A	0	3.4	12.9	0.0	0	40
14	3620	A	0	1.6	8.5	0.0	0	56
14	3630	A	0	0.8	4.3	0.0	0	103
32	5040	A	3	13.8	3.5	7.3	0	78
32	5040	B	4	19.7	4.5	9.3	0	80
31	5060	A	1	5.9	3.9	1.4	0	75

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J87100

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
31	5060	B	5	16.0	2.3	16.5	0	79
30	5100	A	0	6.1	8.6	0.5	1	52
30	5100	B	1	12.6	9.1	1.7	0	60
34	5101	A	1	8.6	7.2	1.2	0	64
30	5110	A	0	4.0	7.7	0.2	20	30
30	5110	B	0	10.8	12.8	0.8	18	29
9	5180	A	1	8.7	6.1	1.5	0	62
39	5320	A	1	13.5	10.2	1.6	0	74
39	5320	B	1	21.8	19.6	1.5	0	61
39	5320	C	1	19.7	16.4	1.6	0	56
39	5320	D	0	9.3	9.3	0.9	0	66
39	5320	E	0	5.5	6.2	0.6	0	62
39	5330	A	0	3.7	3.4	0.7	0	90
39	5340	A	1	12.2	10.1	1.4	0	64
39	5340	B	2	17.5	11.3	2.2	0	65
39	5350	A	2	4.6	1.4	3.9	0	117
39	5360	A	2	6.7	3.5	2.1	8	65
39	5370	A	2	5.0	1.7	3.5	0	1211
39	5380	A	0	2.3	4.9	0.1	0	69
39	5380	B	1	3.2	2.1	1.1	0	1209
39	5380	C	2	4.3	1.8	2.4	9	81
39	5390	A	0	3.2	-0.2	0.0	0	416
39	5400	A	2	4.8	1.7	3.2	26	62
21	7690	A	0	0.8	12.7	0.0	0	28
41	8450	A	1	9.4	7.9	1.2	0	66
41	8450	B	1	15.0	15.2	1.1	0	52
41	8450	C	1	14.2	10.1	1.8	0	59
41	8460	A	0	2.1	0.6	3.3	31	89
40	8480	A	1	5.6	3.8	1.3	0	81

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.



LEGEND

- Fault, inferred
- Joints, Fractures, Linaments
- Geology Boundary, Contacts
- Pre-Glacial Fault (older fault)?
- Qc — Colluvial Deposit
- As — Alluvial Sediments
- Strike and Dip

CENOZOIC

CENOZOIC — RECENT
- 1 — Basalt Flows

MESOZOIC

MESOZOIC — TRIASSIC-JURASSIC
- 2 — Hazelton Group Volcanics; Sediments

PALEOZOIC

PALEOZOIC — PERMIAN
- 3 — Mainly white crinoidal limestone; minor amounts of chert, quartzite, argillite, slate and schist.

PRE-PERMIAN
- 4 — Quartzite, schist, slate, argillite, limestone; schistose, tuff, highly altered extrusives, &/or intrusives, highly crystalline schist, gneiss.

INTRUSIVE ROCKS

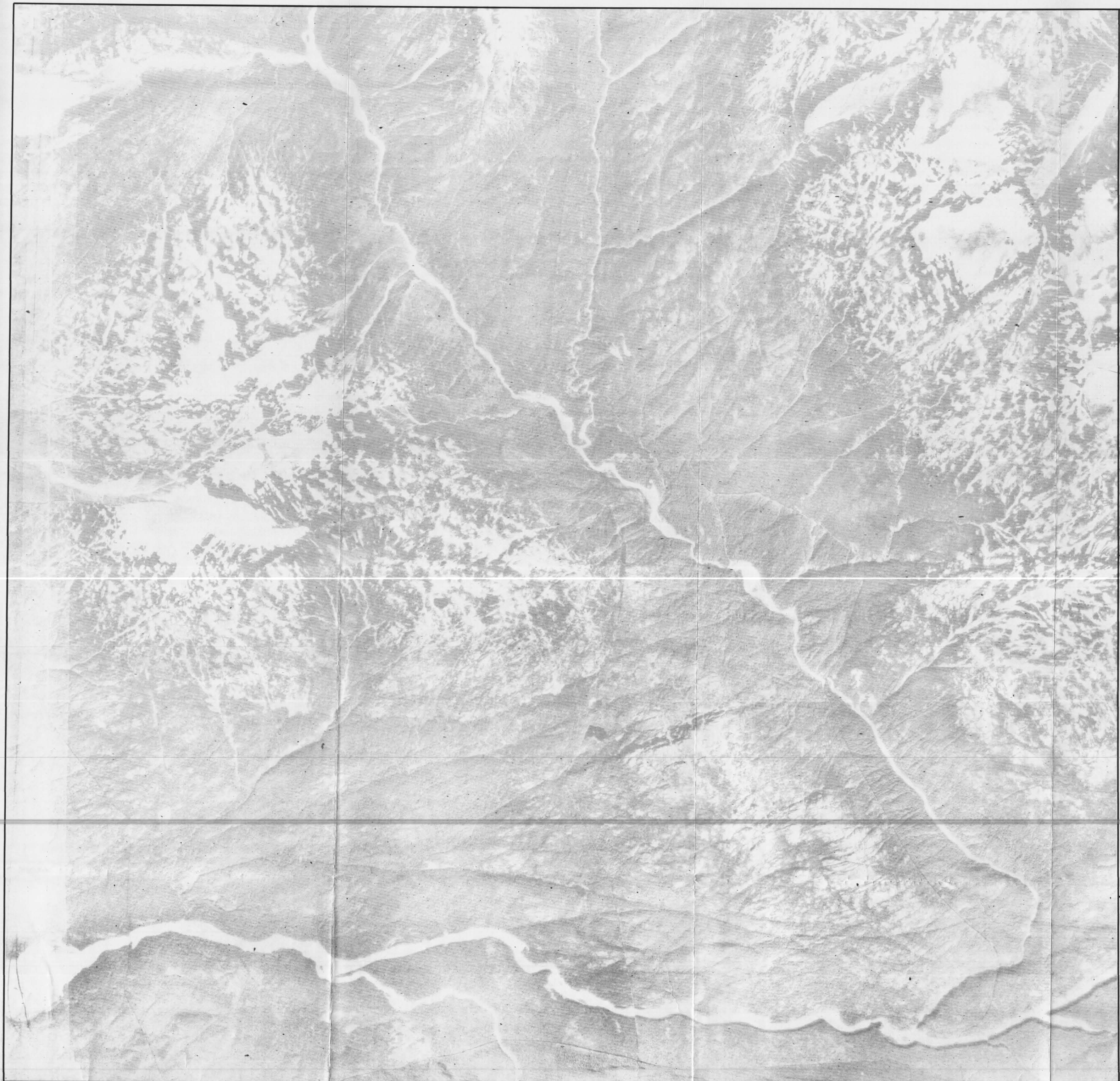
MESOZOIC — TRIASSIC TO CRESTACEOUS
- A — Acid Intrusives; syenite, syenodiorite, feldspar porphyry, felsite, alaskite.
- B — Coast Plutonic Complex; quartz monzonite, grandiorite, gabbro, granite.

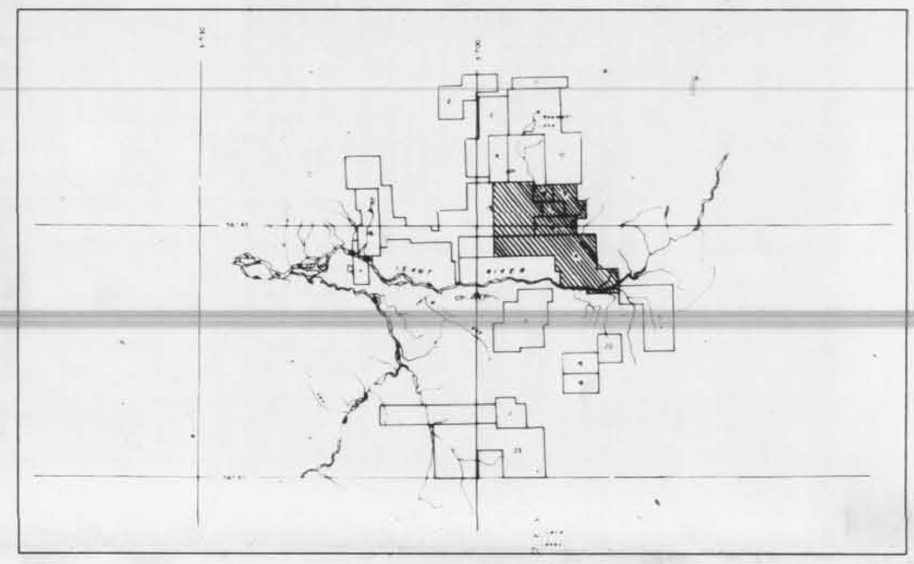
KESTREL RESOURCES LTD.

MON 5 & 6 CLAIMS

Geological and Structural Orthophoto Map

SCALE	1:10000	DATE	JUNE 1988
REFERENCE	N.T.S. 104 B/15W		FIGURE 4
MINING DIV.	LIARD		





PAMICON DEVELOPMENTS LTD.

BASE MAP

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C. 17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

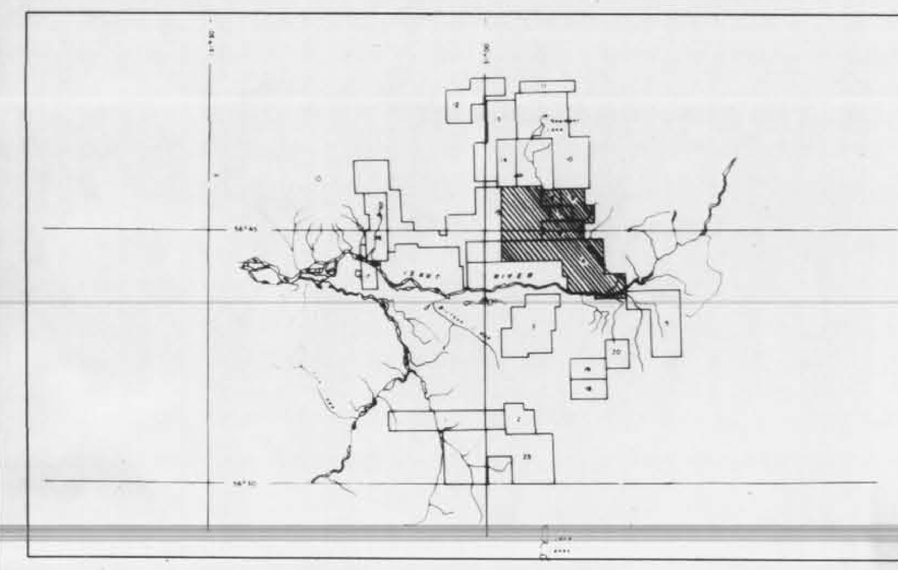
AERODAT LIMITED

DATE: MAY 88

NTS No: 104B

MAP No: 1 J87100

N



Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 250m

PAMICON DEVELOPMENTS LTD.

FLIGHT PATH

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C. 17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

AERODAT LIMITED

DATE:	MAY 88
NTS No:	104B
MAP No:	2 J87100

N

INTERPRETATION LEGEND

Possible bedrock conductor axis
2A Selected target
Fault
Direction of dip
Vertical dip
Dip of conductor

Flight Path

Flight path recovery from VHS video tape.

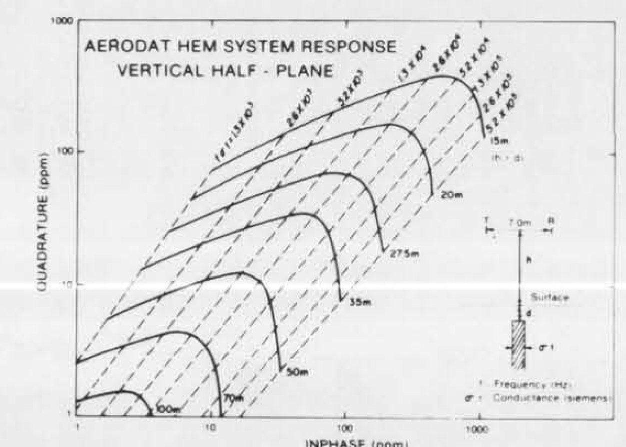
Average terrain clearance 60m
Average line spacing 250m

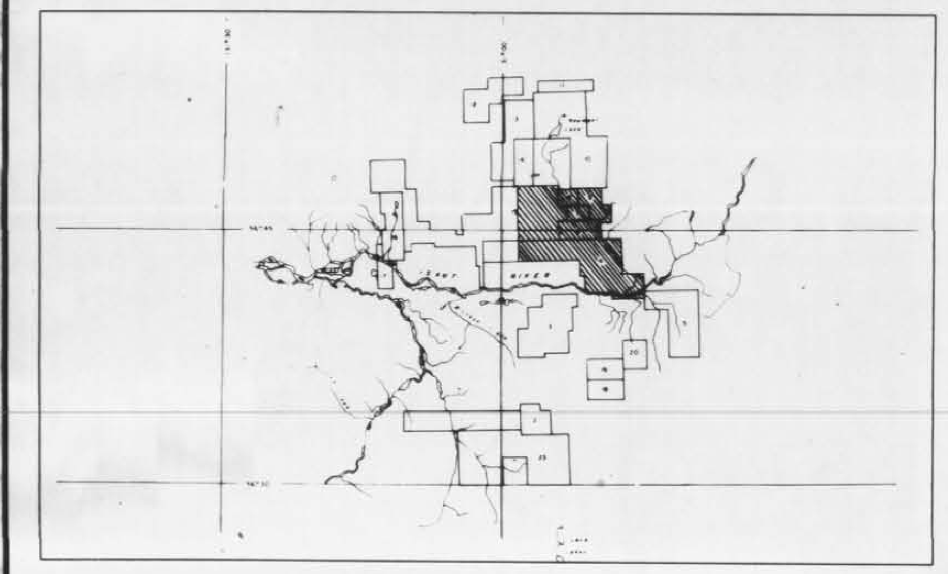
EM Anomalies

Conductivity Thickness (mhos)

0 - 1
1 - 2
2 - 4
4 - 8
8 - 15
15 - 30
> 30

EM Anomaly A, 4600 Hz inphase amplitude 7 ppm. Conductivity thickness 1-2 mhos (see code).





PAMICON DEVELOPMENTS LTD.

INTERPRETATION

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C. 17,534

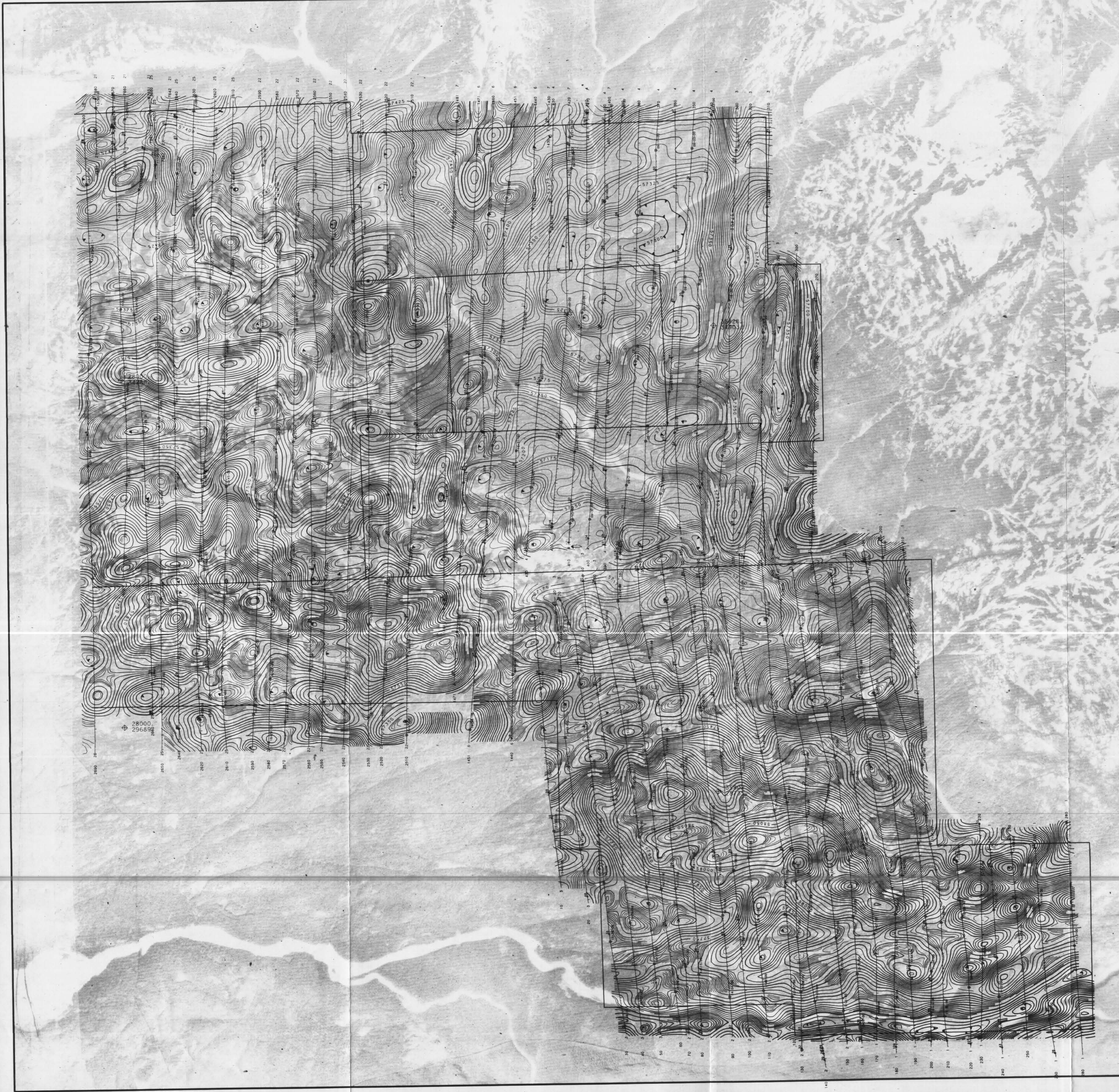
SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

AERODAT LIMITED

DATE:	MAY 88
NTS No:	104B
MAP No:	3 J87100



Magnetics

Total Field Magnetic Intensity Contours in nT.

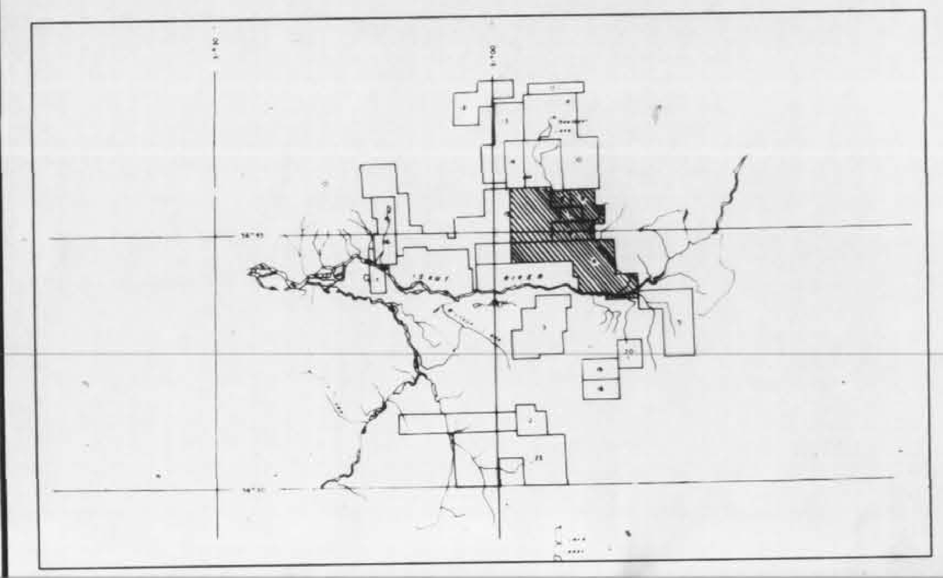
Cesium high sensitivity magnetometer.

Sensor elevation 45m

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 250m



PAMICON DEVELOPMENTS LTD.

TOTAL FIELD MAGNETIC CONTOURS

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C. 17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

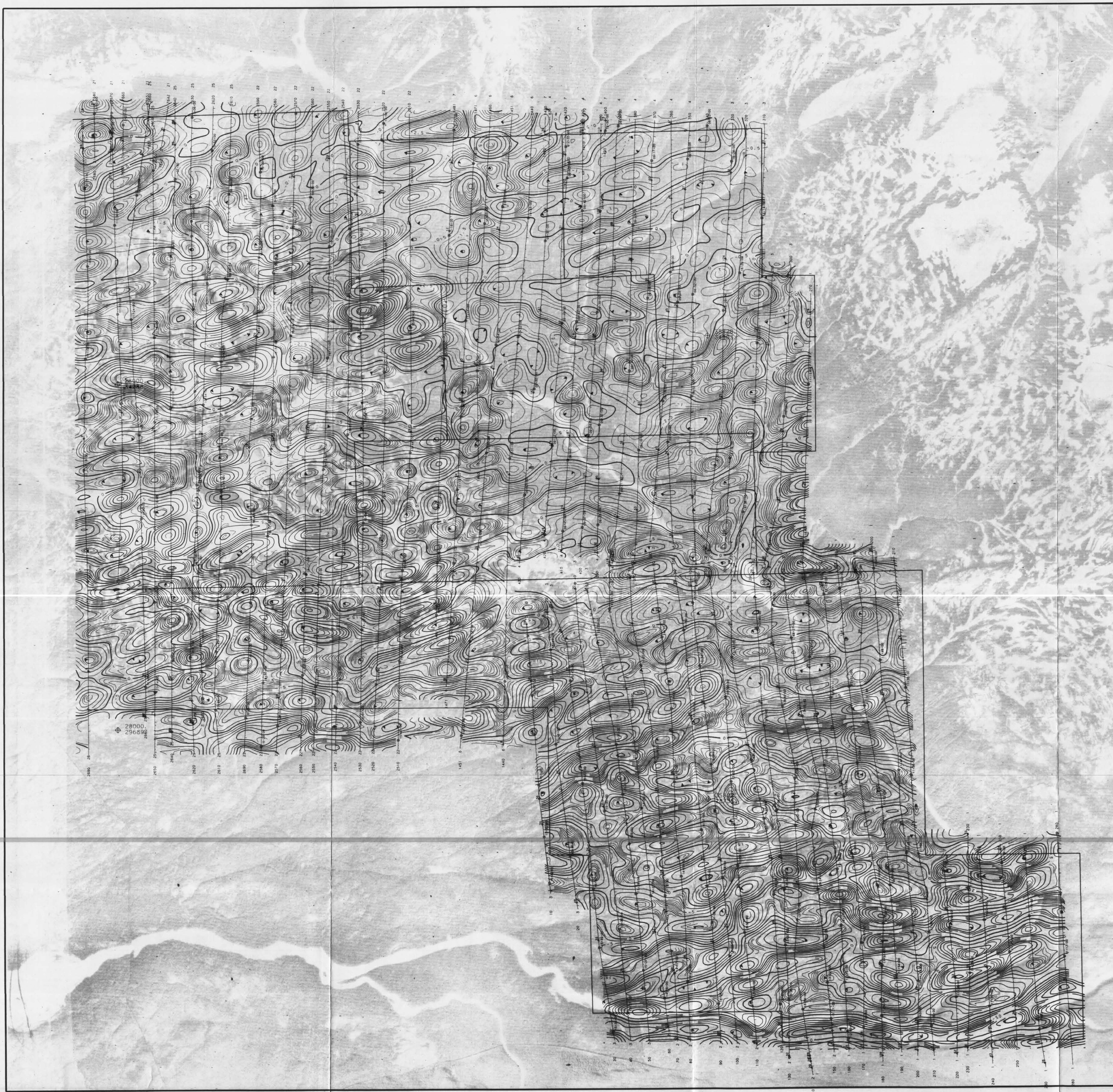
0 200 400 1000 2000 METRES

AERODAT LIMITED

DATE: MAY 88

NTS No: 104B

MAP No: 4 J87100



Vertical Gradient

Vertical Magnetic Gradient calculated from the total field magnetic intensity in nT/m.

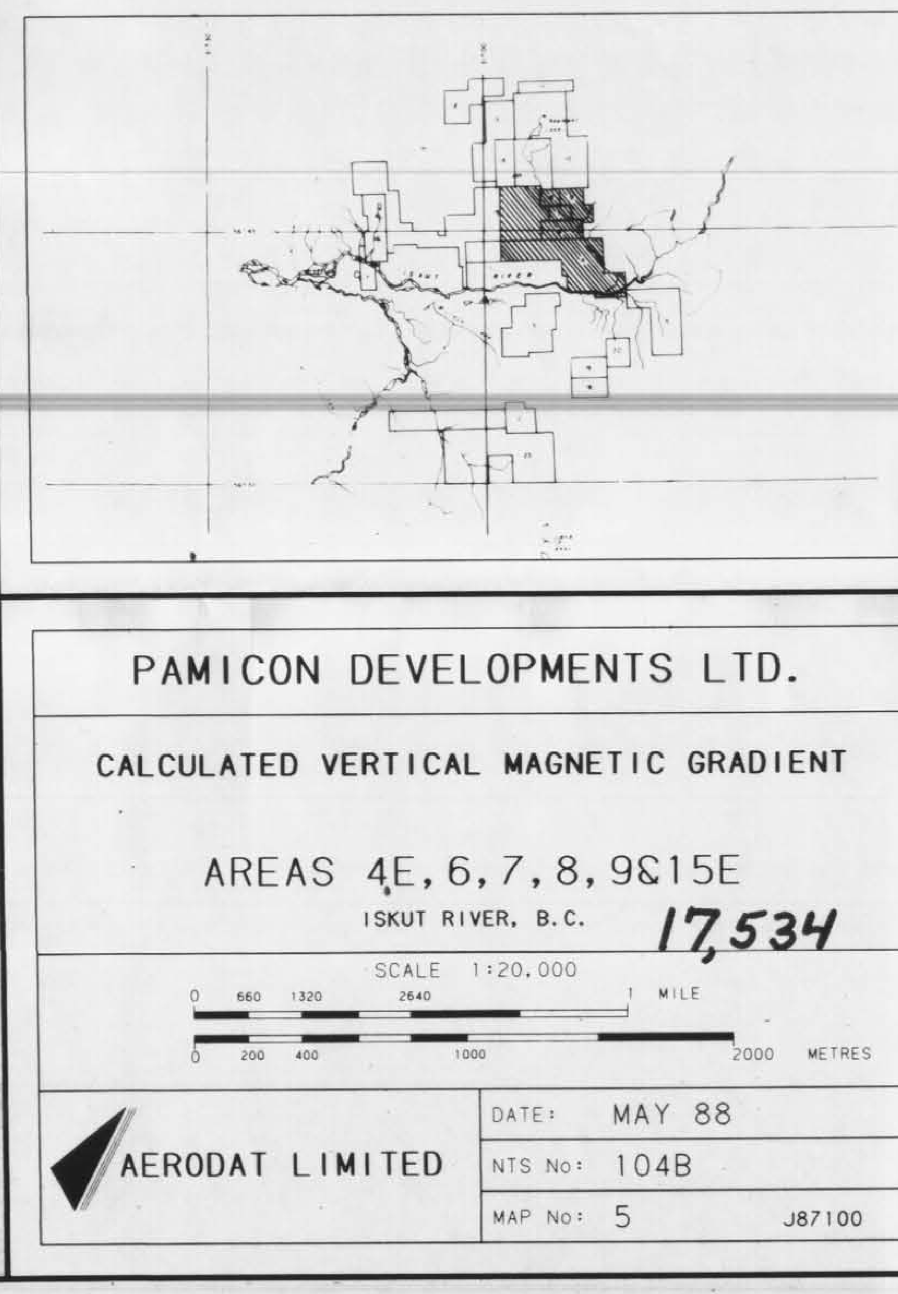
Cesium high sensitivity magnetometer.

Sensor elevation 45m

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 250m



PAMICON DEVELOPMENTS LTD.

CALCULATED VERTICAL MAGNETIC GRADIENT

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C.

17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

AERODAT LIMITED	DATE: MAY 88
	NTS No: 104B
	MAP No: 5 J87100

N

Apparent Resistivity

Calculated from 4600 Hz coaxial EM response assuming a 200 m conductive layer.

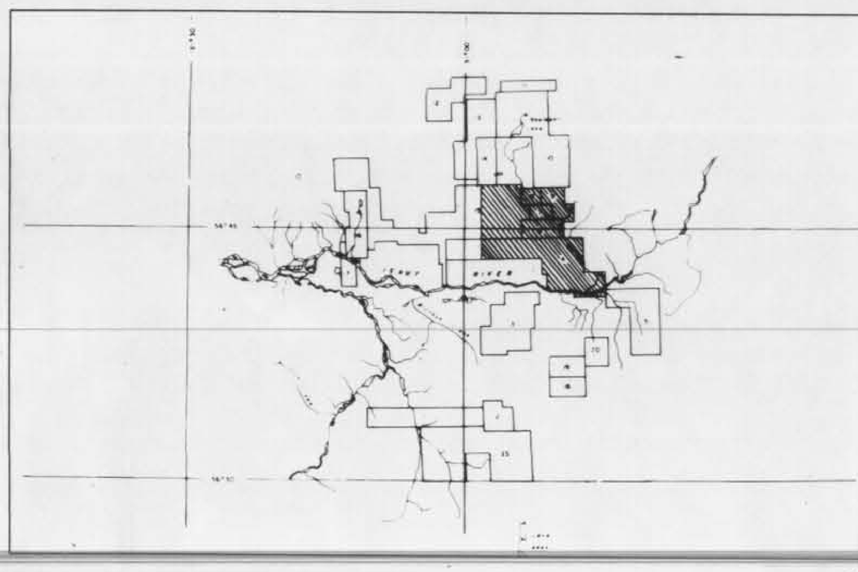
Contouring in ohm•m at logarithmic intervals.

Sensor elevation 30m

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 250m



PAMICON DEVELOPMENTS LTD.

APPARENT RESISTIVITY CONTOURS

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C.

17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

AERODAT LIMITED

DATE:	MAY 88
NTS No:	104B
MAP No:	6 J87100

VLF-EM

VLF-EM Total Field Intensity (%)

FLIGHTS 28,32 to 37 :
Station-NAA, Cutler, Seattle 24.0kHz

FLIGHTS 30,31:
Station-NLK, Jim Creek, Wash. 24.8kHz

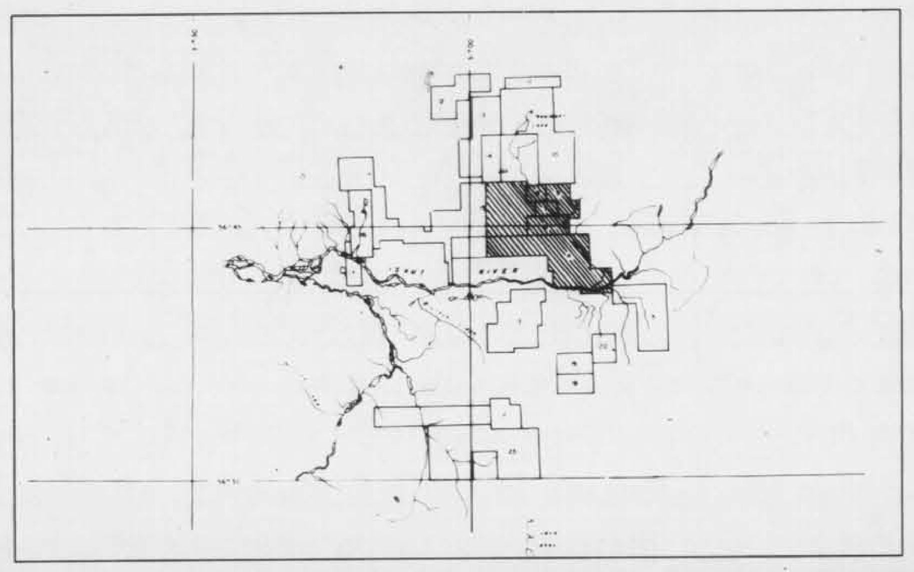
REMAINING FLIGHTS:
Station-NSS, Annapolis, Md. 21.4kHz

Sensor elevation 45m

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 250m



PAMICON DEVELOPMENTS LTD.

VLF-EM TOTAL FIELD CONTOURS

AREAS 4E, 6, 7, 8, 9&15E

ISKUT RIVER, B.C. 17,534

SCALE 1:20,000

0 660 1320 2640 1 MILE

0 200 400 1000 2000 METRES

AERODAT LIMITED

DATE:	MAY 88
NTS No:	104B
MAP No:	7 J87100