

ACTION:

FILE NO:

REPORT ON COMBINED HELICOPTER-BORNE FILMED MAGNETIC, ELECTROMAGNETIC AND VLF SURVEY
ISKUT-UNUK RIVER AREA SKEENA MINING DISTRICT BRITISH COLUMBIA
FOR




WINSLOW GOLD CORP.
BY
AERODAT LIMITED
March 20, 1989
Z. Dvorak

Consulting Geophysicist

| Province of | Ministry of |
| :--- | :--- |
| British Columbia | Energy, Mines and |
|  | Petroleum Resources |

ASSESSMENT REPORT
title page and summany


NAMES and NUMAEPS of wll mineral townes in wood anding lwhen work wet donel thet form the property [Examples: TAX 1-4, FIRE 2 (12 unital; PHOENIX [Lot 1706); Ninern Leeve M 123; Wining or Certifted Wining Lasse ML 12 (chairss Involvad)]:
-. SEE.SCHEDULE.."A". ATTACHED-

## OWNERISI

(11) .....Mr. Anthpony. Ertank. ................. (21

## MAILING ADOPESS

.... 707. 626. Werf. Pender. Strget

OPERATOR(s) (thet th, Company peying tier the world
(1) . . . Winslow. Gold Corp. . . . . . . . . . . . . . (2)

## MAILING ADOAESS

625 . 101 .-. \$ixth Avenue.s
Calqiary, Alberta.
T2P. 3P4

Airborne. geophysicpl. survey. for, which the equipment. oporoted included a. 4. frequency. electromagetic. system. a high sensitivity cesium vapour magnetometer., a two frequency. VLF-EM system, video tracking camera and radar altimetex.


## SCHEDULE "A"

| Property Name | Record Number | No. of Units |
| :---: | :---: | :---: |
| Nestor 1 | 5714 | 15 |
| Nestor 2 | 5715 | 16 |
| Nestor 3 | 5716 | 20 |
| Nestor 4 | 5717 | 18 |
| Menelaus 1 | 5718 | 18 |
| Menelaus 2 | 5719 | 20 |
| Petroclus 1 | 5732 | 20 |
| Petroclus 2 | 5733 | 20 |
| Petroclus 3 | 5734 | 20 |
| Achilles 1 | 5728 | 20 |
| Achilles 2 | 5729 | 20 |
| Achilles 3 | 5730 | 20 |
| Achilles 4 | 5731 | 20 |
| Illiad J | 5706 | 18 |
| Illiad 2 | 5707 | 18 |
| Illiad 3 | 5708 | 18 |
| Illiad 4 | 5709 | 18 |
| Priam 1 | 5702 | 18 |
| Priam 2 | 5703 | 15 |
| Priam 3 | 5704 | 20 |
| Priam 4 | 5705 e | 18 |
| Homer 1 | 5710 | 12 |
| Homer 2 | 5711 | 15 |
| Homer 3 | 5712 | 20 |
| Homer 4 | 5713 | 16 |
| Flory 1 | 5720 | 20 |
| Flory 2 | 5721 | 20 |
| Flory 3 | 5722 | 20 |
| Flory 4 | 5723 | 20 |
| Ginny 3 | 5726 | 20 |
| Ginny 4 | 5727 | 20 |
| Maxwell Smart | 5268 | 20 |




## TABLE OF CONTENTS

Page No.

1. INTRODUCTION ..... 1-1
2. SURVEY AREA LOCATION ..... 2-1
3. AIRCRAFT AND EQUIPMENT
3.1 Aircraft ..... 3-1
3.2 Equipment ..... 3-1
3.2.1 Electromagnetic System ..... 3-1
3.2.2 VLF-EM System ..... 3-1
3.2.3 Magnetometer ..... 3-2
3.2.4 Magnetic Base Station ..... 3-2
3.2.5 Radar Altimeter ..... 3-2
3.2.6 Tracking Camera ..... 3-3
3.2.7 Analog Recorder ..... 3-3
3.2.8 Digital Recorder ..... 3-4
4. DATA PRESENTATION
4.1 Base Map ..... 4-1
4.2 Flight Path Map ..... 4-1
4.3 Airborne Electromagnetic Anomaly Map ..... 4-1
4.4 Total Field Magnetic Contours ..... 4-3
$4.5 \quad$ Vertical Magnetic Gradient Contours ..... 4.3
4.6 Apparent Resistivity Contours ..... 4-3
4.7 VLF-EM Total Field Contours ..... 4-4
4.8 Weight Percent Magnetite Content Contours ..... 4-4
5. INTERPRETATION
5.1 Area A ..... 5-1
5.1.1 Magnetics ..... 5-1
5.1.2 Total Field VLF-EM ..... 5-2
5.1.3 Apparent Resistivity ..... 5-3
5.1.4 Electromagnetics ..... 5-4
5.2 Area B2/B3 ..... 5-5
5.2.1 Magnetics ..... 5-5
5.2.2 Total Field VLF-EM ..... 5-6
5.2.3 Apparent Resistivity ..... 5-7
5.2.4 Electromagnetics ..... 5-8
5.3 Area C ..... 5-9
5.3.1 Magnetics ..... 5-9
5.3.2 Total Field VLF-EM ..... 5-10
5.3.3 Apparent Resistivity ..... 5-10
5.3.4 Electromagnetics ..... 5-11
6. CONCLUSIONS AND RECOMMENDATIONS
6.1 Area A ..... 6-1
6.2 Area B2/B3 ..... 6-2
6.3 Area C ..... 6-3
APPENDIX I - General Interpretative Considerations APPENDIX II - Anomaly List APPENDIX III - Certificate of Qualifications APPENDIX IV - Personnel

## LIST OF MAPS

(Scale 1:20,000)

1. TOPOGRAPHIC BASE MAP;
prepared from $1: 50,000$ NTS maps, showing registration crosses corresponding to UTM co-ordinates on survey maps.
2. FLIGHT LINE MAP;
showing all flight lines, fiducials and EM anomalies with the topographic base map.
3. AIRBORNE ELECTROMAGNETIC SURVEY INTERPRETATION MAP; showing flight lines, fiducials, conductor axes and anomaly peaks along with inphase amplitudes and conductivity thickness ranges for the 4600 Hz coaxial coil system with the topographic base map.

## 4. TOTAL FIELD MAGNETIC CONTOURS;

showing magnetic values contoured at 5 nanoTesla intervals, flight lines and fiducials with the topographic base map.
5. VERTICAL MAGNETIC GRADIENT CONTOURS;
showing magnetic gradient values contoured at 0.5 nanoTeslas per meter with the topographic base map.
6. APPARENT RESISTIVITY CONTOURS;
showing contoured apparent resistivity values, flight lines and fiducials with the topographic base map.
7. VLF-EM TOTAL FIELD CONTOURS; showing VLF-EM values contoured at $1 \%$ intervals, flight lines and fiducials with the topographic base map.
8. WEIGHT PERCENT MAGNETITE CÓNTENT; showing contours of the apparent weight percent magnetite per vertical foot calculated from the 4175 Hz coplanar inphase data.

## 1. INTRODUCTION

This report describes an airbome geophysical survey carried out on behalf of Winslow Gold Corporation by Aerodat Limited. Equipment operated included a four frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a two frequency VLF-EM system, a video tracking camera, and a radar altimeter. Electromagnetic, magnetic, and altimeter data were recorded both in digital and analog forms. Recognizable topographic features were recorded on the flight path mosaic by the operator while in flight to facilitate later flight path recovery.

The survey area, comprising three blocks of ground located approximately 45 kilometres northwest of Stewart, British Columbia, was flown during the period of December 22, 1988, to January 8, 1989. Fourteen flights were required to complete the survey flying with flight lines oriented in an east-west direction and flown at a nominal spacing of 250 metres. Coverage was considered to be well within the specifications described in the service contract. The data quality was good although the high frequency responses ( 32,000 Hz ) suffered from noise which was partly removed during processing in the Aerodat's Mississauga office. For the interpretation purposes, this noise did not present any problems because it was easily recognized and differentiated from electromagnetic responses.

The purpose of the survey was to record airborme geophysical data over and around ground that is of interest to Winslow Gold Corporation.

$$
1 \cdot 2
$$

A total of 65 line kilometres of the recorded data were compiled in map form for area $A$, a total of 476 line kilometres for area $\mathrm{B} 2 / \mathrm{B} 3$, and a total of 80 line kilometres for area C . The maps are presented as part of this report according to specifications laid out by Winslow Gold Corporation.

## 2. SURVEY AREA LOCATION

The survey areas are depicted on the index map shown below. They are centred at Laditude 56 degrees 27 minutes north, Longitude 130 degrees 36 minutes west, approximately 45 kilometres northwest of the town of Stewart, British Columbia (NTS Reference Map Nos. $104 \mathrm{~B} / 10$ and $104 \mathrm{~B} / 7$ ), in the Coast Mountains, near the B.C/Alaska border. The terrain is very rugged, varying from approximately 305 metres above sea level in the east part of area $A$, to in excess of 2,185 metres above sea level in the northwest part of area B.


## 3. AIRCRAFT AND EQUIPMENT

### 3.1 $\quad$ Aircraft

An Aerospatiale 5A 315B Lama helicopter, (C-GXYM), owned and operated by Peace 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 4-frequency system. Two vertical coaxial coil pairs were operated at 935 Hz and 4600 Hz and two horizontal coplanar coil pairs at 4175 Hz and 32000 Hz . The transmitterreceiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 4 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the helicopter.

### 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 NPM, Lualualei, Hawaii broadcasting at 23.4 kHz for the Orthogonal Station.

### 3.2.3 Magnetometer

The magnetometer employed was 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 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

## 3-3

### 3.2.6 Tracking Camera

A Panasonic video tracking camera was used to record flight path on VHS video tape. Fiducial numbers and time reference 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 | $2.5 \mathrm{ppm} / \mathrm{mm}$ |
| CXQ1 | 935 Hz Coaxial Quadrature | $2.5 \mathrm{ppm} / \mathrm{mm}$ |
| CXI2 | 4600 Hz Coaxial Inphase | $2.5 \mathrm{ppm} / \mathrm{mm}$ |
| CXQ2 | 4600 Hz Coaxial Quadrature | $2.5 \mathrm{ppm} / \mathrm{mm}$ |
| CPI1 | 4175 Hz Coplanar Inphase | $10 \mathrm{ppm} / \mathrm{mm}$ |
| CPQ1 | 4175 Hz Coplanar Quadrature | $10 \mathrm{ppm} / \mathrm{mm}$ |
| CPI2 | 32000 Hz Coplanar Inphase | $20 \mathrm{ppm} / \mathrm{mm}$ |
| CPQ2 | 32000 Hz Coplanar Quadrature | $20 \mathrm{ppm} / \mathrm{mm}$ |
| PWRL | Power Line | 60 Hz |
| VLT | VLF-EM Total Field, Line | $2.5 \% \mathrm{ppm} / \mathrm{mm}$ |
| VLQ | VLF-EM Quadrature, Line | $2.5 \% \mathrm{ppm} / \mathrm{mm}$ |
| VOT | VLF-EM Total Field, Ortho | $2.5 \% \mathrm{ppm} / \mathrm{mm}$ |
| VOQ | VLF-EM Quadrature, Ortho | $2.5 \% \mathrm{ppm} / \mathrm{mm}$ |


| Channel | Input | Scale |
| :--- | :--- | :--- |
| ALT | Altimeter | $10 \mathrm{ft} / \mathrm{mm}$ |
| MAGF | Magnetometer, fine | $2.5 \mathrm{nT} / \mathrm{mm}$ |
| MAGC | Magnetometer, coarse | $25 \mathrm{nT} / \mathrm{mm}$ |

### 3.2.8 Digital Recorder

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

## Equipment

## EM System

## VLF-EM

Magnetometer
Altimeter

Recording Interval
0.1 seconds
0.2 seconds
0.2 seconds
0.5 seconds

## 4-1 <br> 4. DATA PRESENTATION

### 4.1 Base Map

A topographic base map at a scale of $1: 20,000$ was prepared from a photo enlargement of an NTS 1:50,000 topography map and was presented on a screened mylar base.

### 4.2 Flight Path Map

The flight path for the survey area was recovered from the VHS Video Tracking Tapes by transferring the time at which the helicopter passed over a recognizable feature onto the photomosaic. These coordinates were then digitized into the database and formed the basis of the flight path data.

The flight path map showing all flight lines and electromagnetic anomalies is presented on a Cronaflex copy of the topographic base map, with time and navigator's manual fiducials for cross reference to both the analog and digital data.

### 4.3 Airborne Electromagnetic Anomaly 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
four coil configurations along with the interpreted conductor axes were plotted on a Cronaflex copy of the topographic 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. The corrected profile data were interpolated onto a regular grid at a 50 metre true scale interval using an Akima 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 topographic base map.

### 4.5 Vertical Magnetic Gradient Contours

The vertical magnetic gradient was calculated from the gridded total field magnetic data. Contoured at a $0.5 \mathrm{nT} / \mathrm{m}$ interval, the gradient data were presented on a Cronaflex copy of the topographic 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 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 topographic base map.

### 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 topographic base map.

### 4.8 Weight Percent Magnetite Content Contours

The electromagnetic information was processed to yield a map of the apparent magnetite content of the underlying rock expressed as a weight percent of magnetite per vertical foot.

The approach taken in computing apparent magnetite content was based on empirical relationships between the negative inphase response of the 4175 Hz
coplanar system and the equivalent magnetite content required to produce the desired permeability contrasts in the bedrock. The method does not apply in situations involving remanent magnetism and breaks down where responses from a conductive (positive) component as well as a magnetic (negative) component are measured.

The contoured apparent Weight Percent Magnetite Content values together with flight path and fiducials were presented on a Cronaflex copy of the topographic base map.

## 5-1

## 5. INTERPRETATION

### 5.1 AREA A

### 5.1.1 Magnetics

The total magnetic field in the survey area varies over a relatively narrow range of values, from less than $57,350 \mathrm{nT}$ to more than $57,860 \mathrm{nT}$. The magnetic contours display pronounced north-south oriented patterns. The central part of the area contains a roughly oval-shaped magnetic high (with amplitudes up to 120 nT ) which correlates with an approximately similarly shaped hill. This high extends in both the north and the south directions, however, on lines 1050 and 1130 it is interrupted by magnetic lows. Because both lines correlate with valleys, it would appear reasonable to suggest that the magnetic highs are due to a flat lying body which was cut by the valleys. If so, the body terminates on line 1030 or in its vicinity. The southern part of the anomaly is open to the south, beyond the survey boundary.

The central-east part of the survey area contains a pair of narrow, northsouth oriented anomalies with amplitudes of up to 390 nT . Neither the relation of this magnetic trend to the former one, nor its geologic/mineralogic significance are clear at this time.

The third magnetic trend of close to north-south orientation, occurs in the northeast part of the area, extending from the time mark 10:33:11 on line 1010 to the time mark $11: 42: 30$ on line 1100 . While the shape of these magnetic anomalies is similar to the two former trends, the amplitudes are much lower, being only 60 nT or less. Similar to the west trend, there is a correlation between this magnetic trend and topography.

The present magnetic data raises questions regarding lithology and structure which cannot be readily answered. Further processing and the use of enhancement techniques (e.g., second vertical derivative, apparent susceptibility mapping, shadow mapping) should be considered to improve the understanding of the geology of the area.

### 5.1.2 Total Field VLF-EM

The NLK, Jim Creek, Washington, transmitter which operates at a frequency of 24.8 kHz , and occurs at an azimuth of 144 degrees was monitored during the survey of all three survey areas. This transmitter will preferentially energize conductors striking within $+/-30$ degrees of its azimuth.

The preferred orientation of the VLF-EM anomalies and trends in the survey area is close to north-south, in apparent agreement with the orientation of magnetic anomalies and trends. Because the NLK signal was relatively weak
during the survey, the resulting VLF anomalies display low amplitudes, except in the southernmost portion of the block. Consequently, the usefulness of the VLF-EM anomaly map is somewhat limited. For example, the correlation of VLF and magnetic data is not fully understood. Whereas at places the VLF lows correlate with magnetic lows, e.g., west of the first magnetic trend, at other places, the magnetic anomalies correspond with low-to-moderate VLF responses, e.g., the western and the eastern magnetic trends.

### 5.1.3 Apparent Resistivity

The apparent resistivity values calculated from the $4,175 \mathrm{~Hz}$ data vary from less than 10 ohm-m to more than 4,000 ohm-m, the upper detection limit at this frequency. An irregularly shaped zone of low resistivity extends across the west half of the area, from the west end of line 1140 toward the time mark $14: 12: 08$ on line 1130 where it swings to the north, approximating the west boundary of the western magnetic trend. It would also appear that lower resistivities are associated with the valleys, e.g., on lines 1130 and partly on line 1050 , reflecting possibly conductive sediments in the valleys. Alternatively, they may be due to disseminated mineralization carried by the sediments. Whereas in the first case low resistivities in the valleys would be of little exploration value, in the other case they would be of exploration interest.

At the moment, there is no explanation for the low resistivity in the west part of the area. Clearly, the geologic environment in the east is more resistive which may be indicative of lithology. The boundary between the two environments may be related to the north-south oriented magnetic trends discussed earlier.

### 5.1.4 Electromagnetics

A number of EM anomalies were located in the survey area, which vary from low conductance, poorly defined anomalies to well defined anomalies.

The most attractive EM anomalies occur on lines 1010 to 1030 (group I). They are partly related to the marginls of the west magnetic trend, and reflect vertical thin sheet type conductors, possibly sulphides. Their ground followup is recommended.

Conductors within group II are generally poorly defined. They occur immediately off the low resistivity zone, and their unifying feature is the correlation with an oval-shaped magnetic anomaly of the western trend. Their ground follow-up should be considered.

It is recommended that the EM anomalies on lines 1050 and 1130 be considered for ground follow-up because they may be important as discussed
earlier. The remaining EM anomalies are weak and poorly defined, and at the present time are not considered to constitute priority targets, except for anomaly 1070 D which is well defined on the $4,600 \mathrm{~Hz}$ coaxial channels and occurs on the flank of a weak, localized magnetic anomaly.

### 5.2 AREA B2/B3

### 5.2.1 Magnetics

The magnetic field in area $\mathrm{B} 2 / \mathrm{B} 3$ varies from approximately $56,690 \mathrm{nT}$ to over $59,100 \mathrm{nT}$. The west-central and eastern parts of the area are characterized by high, frequently varying magnetic field. In contrast, the westernmost and central portions of the area display low amplitude, slowly varying anomalies.

Prominent linear features occur in areas of high field. They are particularly well portrayed on the calculated vertical gradient map. The most apparent of these anomalies are confined to the east margin of the west-central zone and to the west margin of the eastern zone. The latter narrow anomaly may continue further south, to the central portion of lines 2840 to 2920 . There are similarities between this interrupted anomaly and the north-south oriented linear trends located in area $A$. While the mutual positioning and relationship between the anomalies in areas A and $\mathrm{B} 2 / \mathrm{B} 3$ is not clear at this
time, the correlation of these eastern anomalies with topography appears to be of the same nature. Whether or not this means that the source of the anomaly is a flat lying and narrow body remains to be seen.

A weak northwesterly oriented anomaly was located in the southeast part of area B2 which may extend in a discontinuous manner further southeast, into area B3. On line 2511 to 2550 the survey located a WNW-ESE oriented anomaly oriented at shallow angle to the direction of the flight lines. Although this feature is not well defined due to a limited areal coverage, it would appear that it has limited strike length and may terminate in the region between area $A$ and $B 3$.

Both the total field magnetic map and the calculated vertical gradient map suggest that area $\mathrm{B} 2 / \mathrm{B} 3$ is underlain by complex geology. More insight can be gained by further processing and anomaly enhancement the main purpose of which would be to obtain structural information.

### 5.2.2 Total Field VLF-EM

Mostly weak VLF-EM responses occur throughout the survey area displaying low amplitudes. Exceptions occur in the west-central part of area B3, and in the southwest and southeast parts of area B2. Only a few well defined
anomalous trends exist which limits the usefulness of the VLF-EM anomaly map in areas away from bedrock : conductivity. However, even there the reader may rely more on other types of information.

### 5.2.3 Apparent Resistivity

The apparent resistivity values were calculated from the $4,175 \mathrm{~Hz}$ EM data. At the low end of the range, values lower than 20 ohm-m have been calculated. At the upper end of the range, the values are limited to less than $4,000 \mathrm{ohm}-\mathrm{m}$, the upper detection limit at this frequency.

The apparent resistivity map contains four prominent low resistivity zones. Three of the zones are related to groups of bedrock conductors, the fourth one correlates with the Unuk River valley and as such does not appear to be interesting from the exploration point of view. Two low resistivity zones occur in area B2, at its west and east boundaries. Both zones are associated with well defined bedrock conductors. West part of area B3 contains an arcuate low resistivity zone correlating with magnetically low core of an extensive magnetic unit of complex internal structure. Topographically, the zone occurs on the west and south slopes of a hill. There is a possibility that this may indicate a flat lying conductive zone.

Low resistivity was also calculated over Hawilson and Pearly Lakes. Neither is regarded to be significant.

### 5.2.4 Electromagnetics

Four major groups of EM anomalies were located in area B2/B3. The individual anomalies, displaying conductances which vary from low to intermediate values, are mostly quite distinct. Only few are poorly defined, where they occur at the margins of wide conductive zones. They are believed to be mainly due to edge effects.

Group I conductors, which are located at the west boundary of area B2, are broadly associated with an extensive low magnetic zone. The EM anomalies located at the eastern edge of the group, on lines 2410 and 2420, are well defined and display high amplitudes. They are recommended for follow-up work. Similarly, anomalies located along the southwest edge of the group should be investigated on the ground as they appear to reflect a sequence of thin conductive sheets of steep dip.

Group II conductors display characteristics similar to those found in the southwest part of group I. The conductors have produced a well defined low resistivity zone and are associated with a localized magnetic low. Their follow-up is recommended.

Area B3 contains an extensive group of conductors III situated in the west portion of the block. Most of the EM anomalies are well defined though local problems exist. For example, the flying altitude on line 2680 was excessively high which resulted in low EM signals. This did not allow recognition and calculation of EM anomalies which are believed to occur on the line. Ground investigation is required to prove or disprove this hypothesis. Conductors within group III follow the magnetic patterns but almost all of them correlate with magnetic lows. The central magnetic high separates thus conductors III into east. and west parts. The west part consists of higher amplitude anomalies which reflect multiple conductors, generally of higher conductance values than the east part EM anomalies which have lower amplitudes and appear to reflect a maximum of three parallel conductors. The entire group is quite attractive and should be investigated on the ground.

### 5.3 AREA C

### 5.3.1 Magnetics

Magnetic field in the survey area varies over a relatively broad range of values, from less than $56,300 \mathrm{nT}$ to in excess of $58,500 \mathrm{nT}$. High values occur along the west survey boundary along and parallel to the Third Canyon of Unuk River, in the central part of the block in an arcuate-shaped anomaly bordering the west and northwest shores of Flory Lake, and in the northeast and southeast corners of the area.

The west and central anomalies are separated by a distinct low zone. The west magnetic high appears to have a complex structure but because of its proximity to the survey boundary, this cannot be fully investigated. The calculated vertical gradient defines and separates the individual anomalies better than the total field map. It suggests that NNE-SSW trends may be present. Also present appear to be WNW-ESE lineations. Whether any of these features reflect structures is not clear at this time. Further processing and the use of enhancement techniques should be considered in conjunction with the data from the other two areas, in order to improve the structural knowledge and understanding.

### 5.3.2 Total Field VLF-EM

Similar to the other two areas, the VLF-EM responses are mostly weak, displaying low amplitudes. As expected, preferred NNW-SSE trend is present. Very little correlation, if any, exists between the VLF-EM data and magnetics which is also true about VLF-EM and resistivity. Consequently, at the present time, the VLF-EM data appears to be of little value.

### 5.3.3 Apparent Resistivity

The apparent resistivity map shows the presence of a narrow low resistivity zone at the west survey boundary. This zone correlates with the Third Canyon valley and as such, it may be of little exploration significance.

Possibly more interesting is a low resistivity zone extending from the time mark 10:30:11 on line 3050 toward the time mark 10:20:16 on line 3040, and further east along the same line. Lower resistivities may occur due to conductive sediments in a creek valley.

The only other low resistivity zone is associated with Flory Lake and it is not considered of exploration importance.

### 5.3.4 Electromagnetics

Eleven EM anomalies were detected in the survey area, six of which are associated with Third Canyon/west low resistivity zone. Most of these anomalies reflect near vertical thin sheet type conductors which are confined to the margins of the conductive zone. This diminishes their exploration attractiveness because they may merely be due to edge effects, i.e., reflect abrupt resistivity change at the edge of the zone. They cannot be discarded because the zone may reflect a conductive rock unit the contact of which may be mineralized. Consequently, these anomalies must be regarded as potential targets.

Anomaly 3091A is interpreted to be an edge effect associated with Flory Lake and is not recommended for follow-up. However, anomaly 3050A, which is poorly defined, should be considered for follow-up as it is not related to an apparent topographic feature and appears to be real.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 AREA A

The magnetic data collected during the present survey indicates that the area is underlain by generally north-south striking geology. A pair of prominent, northsouth oriented magnetic trends was located in the central part of the area. Similar, but weaker trend also occurs in the northeast corner of the block. Neither geologic, nor exploration significance of these magnetic trends is clear at this time. The apparent lack of continuity of the western and eastern magnetic trends across valleys may be indicative of their flat lying sources. The central trend which displays the highest magnitudes, may be indicative of localized intrusive.

It is recommended to further process the magnetic data and to extract additional (structural) information by employing various anomaly enhancing techniques.

An attempt should be made to identify the source of the lower resistivity zone located in the western half of the area. Ground follow-up of the EM anomaly groups I and II should be undertaken. While the group I conductors may reflect massive(?) sulphidic mineralization, the group II conductors may be due to disseminated mineralization. Attention should be also paid to the EM anomalies located in the valleys on lines 1050 and 1130.

### 6.2 AREA B2/B3

The survey area contains two zones of large lateral extent displaying high magnetic field. They occur in the west-central part of the block and along its east boundary. Margins of these zones are associated with well defined narrow highs, indicating probably the contacts of these units. Similarities with certain magnetic features found in area $A$ occur in the eastern part of block B2/B3, suggesting that flat lying magnetic bodies may be present. The present data does not appear sufficient to derive structural information. It is recommended to reprocess the magnetic data using various enhancement techniques with the aim of obtaining quality structural information.

The apparent resistivity technique indicated a series of low resistivity zones in the area which are mostly related to bedrock conductivity. The low resistivity zone associated with conductors III occurs on the slopes of a local hill which may be indicative of the presence of a flat laying conductive zone. Other low resistivity zones in the area are believed to reflect conductive sediments and as such are considered to be of low priority.

The EM anomalies reflecting bedrock conductors, occur in three main groups. Practically all these conductors are non-magnetic and generally well defined. Ground follow-up work is recommended for all three groups. Prior to the commencement of ground work, data from the present survey should be compiled on a map
containing other types of pertinent information, including geology, geochemistry, and other available geophysical data. Selection of targets for follow-up should be based on the evaluation of the entire body of information.

### 6.3 AREA C

The magnetic data collected over the area suggests complex structures, particularly in the west half of the block. An arcuate magnetic feature was located on the west and northwest shores of Flory Lake. The exploration importance of this feature is not clear and should be investigated.

The VLF-EM data did not yield any apparently novel information. In contrast, the resistivity technique defined a low resistivity zone on lines 3040 and 3050, which appears to warrant further work.

The EM method identified a string of anomalies of good quality which are associated with the margins of Third Canyon. In spite of their proximity to the survey boundary and the associated difficulty to correlate them properly from line to line, their follow-up is recommended on the grounds that they may reflect mineralization along a contact.

Potential structures, such as faults and contacts, usually constitute prime exploration targets, because structural zones of weakness may have served as conduits of
hydrothermal fluids, which in turn would deposit various minerals. It is recommended to initiate a detail structural evaluation of the data and direct future exploration according to the results of this study.

Numerous conductors of bedrock origin occur in the survey area. Most of them occur in magnetically quiet or low areas. Ground follow-up work is recommended for most of them as indicated in the preceding paragraphs. The follow-up decisions should be based on correlating results of the present survey with other types of available information (e.g., geologic, geophysical, geochemical, satellite and photo analyses) and tying these with a workable geologic model.

Respectfully submitted,


Zbynek Dvorak Consulting Geophysicist For AERODAT LIMLTED

## APPENDIX I

## GENERAL INTERPRETIVE CONSIDERATIONS

## Electromagnetic

The Aerodat four 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 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 nonmagnetic 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 chance 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 ration 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 $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF $(15-25) \mathrm{kHz}$ provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measurable 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 to 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 II

ANOMALY LIST

J8890A - WINSLOW GOLD CORP - SKEENA MINING DISTRICT

| FLIGHT | LINE | ANOMALY | CATEGORY | AMPLITUDE INPHASE | (PPM) QUAD. | $\begin{gathered} \text { CON } \\ \text { CTP } \\ \text { MHOS } \end{gathered}$ | UCTOR DEPTH MTRS | BIRD HEIGHT MTRS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 | 1010 | A | 0 | 9.7 | 13.0 | 0.6 | 0 | 62 |
| 2 | 1010 | B | 0 | 10.4 | 16.5 | 0.5 | 0 | 57 |
| 2 | 1010 | C | 0 | 10.0 | 19.8 | 0.3 | 0 | 44 |
| 2 | 1010 | D | 0 | 0.8 | 26.8 | 0.0 | 0 | 23 |
| 2 | 1020 | A | 0 | 0.9 | 3.5 | 0.0 | 5 | 49 |
| 2 | 1020 | 8 | 0 | 5.9 | 9.9 | 0.3 | 0 | 53 |
| 2 | 1020 | c | 0 | 6.3 | 6.5 | 0.8 | 0 | 80 |
| 2 | 1020 | D | 0 | 4.0 | 5.2 | 0.4 | 0 | 73 |
| 2 | 1030 | A | 0 | 20.2 | 25.8 | 0.9 | 0 | 47 |
| 2 | 1030 | B | 0 | 25.7 | 49.8 | 0.6 | 0 | 27 |
| 2 | 1030 | C | 0 | 6.6 | 25.6 | 0.1 | 0 | 30 |
| 2 | 1050 | A | 0 | 17.0 | 23.5 | 0.8 | 0 | 59 |
| 2 | 1050 | B | 1 | 17.8 | 18.6 | 1.1 | 0 | 62 |
| 2 | 1050 | C | 1 | 18.2 | 16.0 | 1.5 | 0 | 71 |
| 2 | 1050 | D | 0 | 9.2 | 12.6 | 0.6 | 0 | 65 |
| 2 | 1060 | A | 0 | 3.7 | 13.9 | 0.0 | 0 | 36 |
| 2 | 1060 | B | 0 | 0.6 | 8.5 | 0.0 | 0 | 48 |
| 2 | 1060 | C | 0 | 3.4 | 7.7 | 0.1 | 0 | 67 |
| 2 | 1070 | A | 0 | 6.1 | 10.4 | 0.3 | 6 | 41 |
| 2 | 1070 | B | 0 | 7.0 | 9.0 | 0.6 | 0 | 64 |
| 2 | 1070 | C | 0 | 4.8 | 8.3 | 0.3 | 0 | 54 |
| 2 | 1070 | D | 0 | 9.5 | 21.0 | 0.3 | 0 | 45 |
| 2 | 1070 | E | 0 | 7.0 | 17.8 | 0.2 | 2 | 33 |
| 2 | 1080 | A | 1 | 9.4 | 6.1 | 1.7 | 0 | 88 |
| 2 | 1080 | B | 0 | 4.0 | 5.9 | 0.3 | 10 | 49 |
| 2 | 1080 | C | 0 | 1.6 | 3.7 | 0.1 | 6 | 57 |
| 2 | 1090 | A | 0 | 2.0 | 5.6 | 0.1 | 10 | 41 |
| 2 | 1090 | B | 0 | 2.8 | 8.6 | 0.1 | 0 | 50 |
| 2 | 1100 | A | 0 | 0.0 | 7.3 | 0.0 | 0 | 39 |
| 2 | 1100 | B | 0 | 6.3 | 8.2 | 0.5 | 0 | 71 |
| 2 | 1100 | C | 1 | 8.5 | 7.5 | 1.1 | 0 | 87 |
| 2 | 1100 | D | 0 | 3.3 | 7.2 | 0.2 | 7 | 44 |
| 2 | 1100 | E | 0 | 6.6 | 10.0 | 0.4 | 0 | 65 |
| 2 | 1110 | A | 0 | 0.9 | 4.7 | 0.0 | 0 | 47 |
| 2 | 1110 | B | 0 | 3.3 | 5.8 | 0.2 | 7 | 50 |

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.


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.

J8890B2/B3 - WINSLOW GOLD CORP - SKEENA MINING DISTRICT

| FLIGHT | LINE | ANOMALY | CATEGORY | AMPLITUDE (PPM) |  | CONDUCTOR |  | $\begin{aligned} & \text { BIRD } \\ & \text { HEIGHT } \\ & \text { MTRS } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | CTP | DEPTH |  |
|  |  |  |  | INPHASE | QUAD. | MHOS | MTRS |  |
| 7 | 2370 | A | 0 | 12.4 | 15.3 | 0.8 | 0 | 63 |
| 8 | 2390 | A | 0 | 2.3 | 8.2 | 0.0 | 9 | 33 |
| 8 | 2390 | B | 0 | 0.1 | 3.7 | 0.0 | 0 | 25 |
| 8 | 2400 | A | 0 | 1.1 | 12.2 | 0.0 | 0 | 31 |
| 8 | 2410 | A | 0 | 0.1 | 15.1 | 0.0 | 0 | 37 |
| 8 | 2410 | B | 0 | 0.4 | 5.1 | 0.0 | 1 | 32 |
| 8 | 2410 | C | 0 | 73.5 | 208.7 | 0.5 | 1 | 13 |
| 8 | 2410 | D | 1 | 85.8 | 131.8 | 1.2 | 0 | 25 |
| 8 | 2420 | A | 0 | 6.0 | 13.3 | 0.2 | 2 | 38 |
| 8 | 2420 | B | 1 | 63.7 | 64.0 | 1.9 | 0 | 1237 |
| 8 | 2420 | C | 2 | 35.4 | 23.8 | 2.7 | 0 | 1236 |
| 8 | 2420 | D | 0 | 2.5 | 4.8 | 0.2 | 0 | 1240 |
| 8 | 2420 | E | 0 | -3.6 | 11.9 | 0.0 | 0 | 1240 |
| 8 | 2430 | A | 0 | 3.9 | 10.2 | 0.1 | 0 | 62 |
| 8 | 2430 | B | 1 | 8.2 | 5.5 | 1.6 | 15 | 50 |
| 8 | 2430 | C | 0 | 8.8 | 10.5 | 0.7 | 0 | 198 |
| 8 | 2430 | D | 0 | 15.4 | 23.3 | 0.6 | 15 | 21 |
| 8 | 2440 | A | 0 | 9.7 | 27.8 | 0.2 | 0 | 32 |
| 8 | 2440 | B | 0 | 21.4 | 46.2 | 0.4 | 0 | 30 |
| 8 | 2440 | C | 1 | 5.2 | 3.8 | 1.2 | 0 | 79 |
| 8 | 2440 | D | 0 | 8.0 | 12.3 | 0.5 | 11 | 34 |
| 8 | 2440 | E | 0 | 4.1 | 12.3 | 0.1 | 0 | 41 |
| 8 | 2450 | A | 0 | 9.2 | 14.1 | 0.5 | 0 | 47 |
| 8 | 2450 | B | 0 | 10.2 | 18.0 | 0.4 | 0 | 51 |
| 8 | 2450 | C | 1 | 13.2 | 14.3 | 1.0 | 0 | 71 |
| 8 | 2450 | D | 1 | 10.2 | 8.5 | 1.3 | 0 | 74 |
| 8 | 2450 | E | 0 | 6.1 | 37.6 | 0.0 | 0 | 27 |
| 20 | 2461 | A | 2 | 6.7 | 2.9 | 2.7 | 0 | 106 |
| 20 | 2461 | B | 1 | 8.5 | 8.0 | 1.0 | 0 | 61 |
| 20 | 2461 | C | 0 | 7.4 | 11.1 | 0.5 | 0 | 52 |
| 20 | 2471 | A | 1 | 11.6 | 12.2 | 1.0 | 0 | 49 |
| 20 | 2471 | B | 0 | 14.2 | 19.7 | 0.7 | 5 | 34 |
| 20 | 2471 | C | 0 | 14.3 | 20.9 | 0.6 | 0 | 41 |
| 20 | 2471 | D | 0 | 10.7 | 12.4 | 0.8 | 0 | 47 |
| 20 | 2471 | E | 0 | 15.4 | 24.4 | 0.6 | 4 | 31 |

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.

| FLIGHT | LINE | ANOMALY | CATEGORY | AMPLITUDE (PPM) |  | CONDUCTOR |  | $\begin{aligned} & \text { BIRD } \\ & \text { HEIGHT } \\ & \text { MTRS } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | CTP | DEPTH |  |
|  |  |  |  | INPHASE | QUAD. | MHOS | MTRS |  |
| 20 | 2471 | F | 0 | 14.0 | 21.2 | 0.6 | 4 | 33 |
| 20 | 2471 | G | 0 | 8.7 | 30.1 | 0.1 | 0 | 29 |
| 20 | 2481 | A | 1 | 11.6 | 9.0 | 1.5 | 0 | 63 |
| 20 | 2481 | B | 1 | 13.4 | 9.4 | 1.8 | 0 | 56 |
| 20 | 2481 | C | 1 | 9.3 | 7.8 | 1.2 | 0 | 62 |
| 20 | 2481 | D | 1 | 11.9 | 12.0 | 1.0 | 0 | 64 |
| 20 | 2481 | E | 0 | 7.5 | 8.7 | 0.7 | 0 | 54 |
| 20 | 2491 | A | 0 | 9.8 | 14.6 | 0.5 | 5 | 38 |
| 20 | 2491 | B | 0 | 16.6 | 25.9 | 0.6 | 0 | 38 |
| 20 | 2491 | C | 0 | 23.4 | 57.1 | 0.4 | 3 | 20 |
| 20 | 2491 | D | 0 | 21.2 | 34.8 | 0.7 | 0 | 34 |
| 20 | 2491 | E | 0 | 18.7 | 26.7 | 0.8 | 0 | 36 |
| 20 | 2491 | F | 0 | 18.5 | 23.2 | 0.9 | 0 | 37 |
| 20 | 2491 | G | 0 | 9.3 | 13.4 | 0.5 | 0 | 44 |
| 20 | 2491 | H | 1 | 4.9 | 3.9 | 1.0 | 9 | 65 |
| 20 | 2501 | A | 0 | 1.2 | 12.9 | 0.0 | 0 | 36 |
| 20 | 2511 | A | 0 | 7.0 | 22.8 | 0.1 | 0 | 33 |
| 20 | 2511 | B | 0 | 7.2 | 14.4 | 0.3 | 0 | 41 |
| 20 | 2511 | c | 0 | 6.3 | 11.7 | 0.3 | 0 | 45 |
| 10 | 2550 | A | 0 | 0.0 | 8.3 | 0.0 | 0 | 69 |
| 10 | 2550 | B | 0 | 9.5 | 9.8 | 0.9 | 0 | 72 |
| 10 | 2550 | C | 0 | 5.8 | 9.3 | 0.4 | 0 | 69 |
| 10 | 2550 | D | 0 | 8.6 | 9.7 | 0.8 | 0 | 85 |
| 10 | 2550 | E | 0 | 6.8 | 9.2 | 0.5 | 0 | 65 |
| 20 | 2570 | A | 0 | -1.6 | 6.8 | 0.0 | 0 | 53 |
| 20 | 2590 | B | 0 | 0.1 | 4.3 | 0.0 | 0 | 45 |
| 20 | 2590 | C | 1 | 4.1 | 2.7 | 1.2 | 0 | 105 |
| 11 | 2610 | A | 0 | 7.4 | 14.3 | 0.3 | 0 | 55 |
| 11 | 2610 | B | 0 | 4.2 | 7.7 | 0.2 | 0 | 65 |
| 11 | 2620 | A | 0 | 2.9 | 4.4 | 0.3 | 0 | 85 |
| 11 | 2620 | B | 0 | 2.0 | 5.8 | 0.0 | 0 | 76 |
| 11 | 2630 | A | 0 | 19.8 | -5.5 | 0.0 | 0 | 51 |
| 11 | 2630 | B | 6 | 26.6 | 0.2100 | 0.0 | 6 | 48 |
| 11 | 2630 | C | 0 | 14.6 | -5.1 | 0.0 | 0 | 51 |
| 11 | 2630 | D | 0 | 3.6 | -8.6 | 0.0 | 0 | 50 |

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.

| FLIGHT | LINE | ANOMALY | CATEGORY | AMPLITUDE INPHASE | (PPM) QUAD. | $\begin{gathered} \text { COND } \\ \text { CTP } \\ \text { MHOS } \end{gathered}$ | DUCTOR DEPTH MTRS | BIRD HEIGHT MTRS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 11 | 2640 | A | 0 | 7.5 | 9.3 | 0.6 | 0 | 61 |
| 11 | 2640 | B | 0 | 9.1 | 9.7 | 0.8 | 0 | 73 |
| 11 | 2640 | C | 0 | 7.5 | 19.8 | 0.2 | 0 | 36 |
| 11 | 2640 | D | 1 | 12.4 | 11.8 | 1.1 | 0 | 67 |
| 11 | 2650 | A | 0 | 5.0 | 7.9 | 0.3 | 0 | 68 |
| 11 | 2650 | B | 0 | 13.7 | 17.3 | 0.8 | 0 | 48 |
| 11 | 2650 | C | 1 | 16.1 | 17.0 | 1.1 | 0 | 60 |
| 11 | 2650 | D | 0 | 9.3 | 12.8 | 0.6 | 0 | 54 |
| 11 | 2650 | E | 0 | 7.2 | 8.5 | 0.7 | 0 | 64 |
| 11 | 2660 | A | 1 | 5.2 | 3.9 | 1.1 | 0 | 98 |
| 11 | 2660 | B | 0 | 19.7 | 25.2 | 0.9 | 0 | 48 |
| 11 | 2660 | C | 1 | 22.8 | 17.4 | 1.9 | 0 | 51 |
| 11 | 2660 | D | 0 | 6.6 | 8.5 | 0.6 | 0 | 58 |
| 11 | 2660 | E | 0 | 24.5 | 64.6 | 0.4 | 0 | 27 |
| 11 | 2660 | F | 1 | 52.4 | 49.5 | 1.9 | 0 | 41 |
| 11 | 2660 | G | 1 | 62.8 | 94.4 | 1.1 | 0 | 37 |
| 11 | 2660 | H | 0 | 47.0 | 87.0 | 0.8 | 0 | 30 |
| 11 | 2660 | J | 0 | 21.8 | 60.7 | 0.3 | 0 | 27 |
| 11 | 2660 | K | 0 | 16.1 | 39.4 | 0.3 | 0 | 34 |
| 11 | 2660 | M | 0 | 7.3 | 21.1 | 0.2 | 0 | 52 |
| 11 | 2670 | A | 0 | 10.3 | 15.6 | 0.5 | 0 | 60 |
| 11 | 2670 | B | 1 | 23.9 | 23.3 | 1.4 | 0 | 52 |
| 11 | 2670 | C | 2 | 30.6 | 22.0 | 2.3 | 0 | 63 |
| 11 | 2670 | D | 2 | 29.9 | 18.8 | 2.7 | 0 | 60 |
| 11 | 2670 | E | 2 | 40.6 | 30.4 | 2.4 | 1 | 34 |
| 11 | 2670 | F | 2 | 34.6 | 26.8 | 2.2 | 0 | 47 |
| 11 | 2670 | G | 2 | 45.4 | 33.1 | 2.6 | 0 | 39 |
| 11 | 2670 | H | 1 | 44.0 | 55.3 | 1.2 | 2 | 25 |
| 11 | 2670 | J | 2 | 26.7 | 18.7 | 2.3 | 8 | 34 |
| 11 | 2670 | K | 2 | 28.1 | 20.1 | 2.3 | 1 | 40 |
| 11 | 2670 | M | 2 | 35.5 | 25.8 | 2.4 | 0 | 41 |
| 11 | 2670 | N | 2 | 9.6 | 4.7 | 2.6 | 0 | 84 |
| 11 | 2670 | 0 | 0 | 6.1 | 6.9 | 0.6 | 0 | 67 |
| 12 | 2680 | A | 0 | 4.2 | 6.5 | 0.3 | 7 | 50 |
| 12 | 2680 | B | 0 | 7.8 | 15.6 | 0.3 | 2 | 37 |
| 12 | 2680 | C | 0 | 11.1 | 17.1 | 0.5 | 0 | 55 |
| 12 | 2680 | D | 1 | 17.4 | 20.5 | 1.0 | 0 | 49 |
| 12 | 2680 | E | 0 | 8.8 | 10.2 | 0.7 | 0 | 63 |
| 12 | 2680 | F | 0 | 6.9 | 7.7 | 0.7 | 0 | 94 |
| 12 | 2690 | A | 1 | 16.9 | 13.5 | 1.6 | 0 | 74 |

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.

J8890B2/B3 - WINSLOW GOLD CORP - SKEENA MINING DISTRICT

| FLIGHT | LINE | ANOMALY | CATEGORY | AMPLITUDE (PPM) |  | CONDUCTOR <br> CTP DEPTH |  | $\begin{aligned} & \text { BIRD } \\ & \text { HEIGHT } \\ & \text { MTRS } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | INPHASE | QUAD. | MHOS | MTRS |  |
| 12 | 2690 | B | 1 | 20.2 | 18.9 | 1.4 | 0 | 60 |
| 12 | 2690 | C | 0 | 7.6 | 14.0 | 0.3 | 4 | 38 |
| 12 | 2690 | D | 1 | 11.6 | 10.5 | 1.2 | 0 | 69 |
| 12 | 2690 | E | 0 | 7.6 | 9.1 | 0.7 | 0 | 76 |
| 12 | 2690 | F | 0 | 11.3 | 13.1 | 0.8 | 0 | 60 |
| 12 | 2700 | A | 0 | 6.8 | 8.2 | 0.6 | 0 | 60 |
| 12 | 2700 | B | 0 | 4.4 | 5.7 | 0.4 | 3 | 59 |
| 12 | 2700 | C | 1 | 8.9 | 6.5 | 1.4 | 0 | 75 |
| 12 | 2700 | D | 0 | 12.2 | 21.3 | 0.5 | 0 | 43 |
| 12 | 2700 | E | 1 | 9.0 | 5.7 | 1.8 | 0 | 81 |
| 12 | 2700 | F | 0 | 5.8 | 5.3 | 0.9 | 0 | 105 |
| 12 | 2710 | A | 0 | 4.7 | 6.5 | 0.4 | 0 | 118 |
| 12 | 2710 | B | 1 | 10.3 | 8.3 | 1.3 | 0 | 92 |
| 12 | 2710 | C | 1 | 15.9 | 14.1 | 1.4 | 0 | 68 |
| 12 | 2710 | D | 1 | 16.6 | 17.1 | 1.1 | 0 | 66 |
| 12 | 2710 | E | 0 | 15.3 | 27.2 | 0.5 | 0 | 42 |
| 12 | 2710 | $F$ | 0 | 13.4 | 26.2 | 0.4 | 0 | 38 |
| 12 | 2710 | G | 0 | 0.6 | 1.3 | 0.0 | 57 | 35 |
| 12 | 2710 | H | 0 | 9.5 | 11.1 | 0.8 | 0 | 56 |
| 12 | 2720 | A | 1 | 28.8 | 28.6 | 1.5 | 0 | 59 |
| 12 | 2720 | B | 2 | 5.0 | 2.1 | 2.6 | 24 | 61 |
| 12 | 2720 | C | 0 | 12.1 | 13.8 | 0.9 | 0 | 60 |
| 12 | 2720 | D | 1 | 17.8 | 14.4 | 1.6 | 0 | 56 |
| 12 | 2720 | E | 1 | 20.7 | 24.4 | 1.0 | 4 | 33 |
| 12 | 2720 | F | 1 | 41.4 | 42.0 | 1.6 | 0 | 48 |
| 12 | 2720 | G | 1 | 36.2 | 33.5 | 1.7 | 0 | 55 |
| 12 | 2720 | H | 1 | 18.2 | 14.5 | 1.7 | 0 | 67 |
| 12 | 2720 | J | 2 | 29.0 | 18.9 | 2.6 | 0 | 69 |
| 12 | 2720 | K | 1 | 14.7 | 9.9 | 1.9 | 0 | 85 |
| 12 | 2730 | A | 1 | 14.5 | 9.9 | 1.9 | 0 | 57 |
| 12 | 2730 | B | 3 | 25.1 | 9.3 | 5.2 | 0 | 55 |
| 12 | 2730 | C | 2 | 8.2 | 3.8 | 2.7 | 0 | 114 |
| 12 | 2730 | D | 0 | 4.1 | 5.9 | 0.4 | 0 | 82 |
| 12 | 2730 | E | 0 | 2.5 | 2.8 | 0.4 | 12 | 68 |
| 12 | 2730 | F | 0 | 4.1 | 5.8 | 0.4 | 7 | 53 |
| 12 | 2740 | A | 0 | 5.2 | 6.2 | 0.6 | 0 | 96 |
| 12 | 2740 | B | 0 | 16.2 | 26.2 | 0.6 | 0 | 56 |
| 12 | 2740 | c | 0 | 13.9 | 24.1 | 0.5 | 0 | 62 |
| 12 | 2740 | D | 0 | 6.8 | 6.2 | 0.9 | 0 | 90 |
| 14 | 2840 | A | 0 | 6.5 | 9.3 | 0.5 | 0 | 69 |

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.


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.

## APPENDIX III

## CERTIFICATE OF QUALIFICATIONS

1. I hold a PhD in Geophysics from Charles University, Czechoslovakia having graduated in 1967.
2. I reside at 146 Three Valleys Drive, in the town of Don Mills, Ontario.
3. I have been continuously engaged in both professional and managerial roles in the minerals industry in Canada and abroad for the past 19 years.
4. I have been an active member of the Society of Exploration Geophysicists since 1978 and a member of KEGS since 1978.
5. The accompanying report was prepared from information published by government agencies, materials supplied by Winslow Gold Corporation and from a review of the proprietary airborne geophysical survey flown by Aerodat Limited for Winslow Gold Corporation. 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 Winslow Gold Corporation.

Signed

## APPENDIX:IV

## PERSONNEL

## FIELD

Flown December, 1988 - January, 1989
Pilot C. Armstrong
Operator J. Huisman
OFFICE
ProcessingT. J. Gamey
Report Z. Dvorak


$\frac{\text { Flight Path }}{\text { Flight path }}$
Flignt path recovery trom
vis video tape.
Average lerrainociear ance
Average
ine spacing
250m


- $\begin{gathered}15-30 \\ -30\end{gathered}$

5


WINSLOW GOLD CORP.




Magnetics
$\frac{\text { Magnelics }}{\text { Tolal Field Magnetic intensity }}$
cestum high sensitivity
magnetomiter.
Sensor elevalion 45m

| Map cont ours are multiples of |
| :---: |
| inose 1 ssed |
| $=$ |





WINSLOW GOLD CORP.
Apparent Resistivity

Contiourng in onmem at
iogar inmic inter val is.
Sensor elevation 30 m
Map contours are mulliples of
inose lisied below
$\stackrel{=}{\bar{y}}$



GEOLOGICALBRANCH
ABESSMENTREDOCHT




















WINSLOW GOLD CORP.


SKUT-UNUK RIVER AREA
british coiumbia

$\int_{200}^{100} \int_{100}^{2000}$
aerodat limited
 J8890c


WINSLOW GOLD CORP.


GEOLOGGALBRANCH
AERMSMENTRFORT




Vertical Gradient

Cestum high sensitivity
megnet omeler.
Sensor elevation $45 m$

Map contours are multiples of
inose listed bel



WINSLOW GOLD CORP.
CALCULATED VERTICAL MAGNETIC GRADIENT
I SKUT-UNUK RIVER AREA 29
BRItISH columbia

aERodat limited $\square$ Date: DEC/88 - JAN
aerodat limited
AER
 $]$



Apparent Resistivity

Contour ing in, onmem at
Sensor elevation 30 m




WINSLOW GOLD CORP.
APPARENT RESISTIVITY CONTOURS
ISKUT-UNUK RIVER AREA british columbia

aERODAT LIMITED

| DATE: | DEC/88 - JAN/89 |
| :--- | :--- |
| NTS NO: | 104 |
| MAP No: | 6 |

GEOLOGICALBRANCH







Weight Percent Magnetite

lon tours in percent.
contours in per cent.
Sensor elevation 30 m
 $\bar{\Longrightarrow}$






WINSLOW GOLD CORP.
weight percent magnetite content

ISKUT-UNUK RIVER AREA
british columbia



