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Geophysical Report on a Helicopter borne Electromagnetic and Magnetometer Survey at the Cimadoro Property, British Columbia

NTS: 103F/1

GEOLOGICAL BRANCH
ASSESSMENT REPORT

22,517

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September, 1992

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SUMMARY

A helicopter borne electromagnetic survey was flown over Inco Exploration and Technical Services Inc.'s Cimadoro Project. The purpose was to detect conductors which may be due to economic sulphides and to provide data suitable for mapping purposes. Flight lines were nominally spaced 200 metres apart and because of the rugged topography, deviated from this. In areas, electronic navigation was lost and manual recovery of the flight paths were used. Dighem Surveys and Processing Inc. were the contractor who were awarded the contract. The Cimadoro Showings were not detected as an electromagnetic response. This may be due either to the small size of the sulphide bodies, or to the fact that the sulphides are electrically discontinuous. Other conductors were located on the property. Some are recommended for ground follow-up. The magnetometer and apparent resistivity data will be used to help map the area.

1.0 INTRODUCTION

An helicopter borne electromagnetic (EM) survey was flown over Inco Exploration and Technical Service Inc.'s Cimadoro Project. The geophysical program was envisaged to rapidly assess the property for conductors which may be due to economic concentrations of massive sulphides. A secondary goal was the acquisition of magnetometer data and the processed apparent resistivity data which can be used as a mapping tool. Dighem Surveys and Processing Inc. (Dighem) was awarded the contract to fly the survey and the survey was flown between May 1 and May 10, 1992.

2.0 LOCATION, ACCESS and TOPOGRAPHY

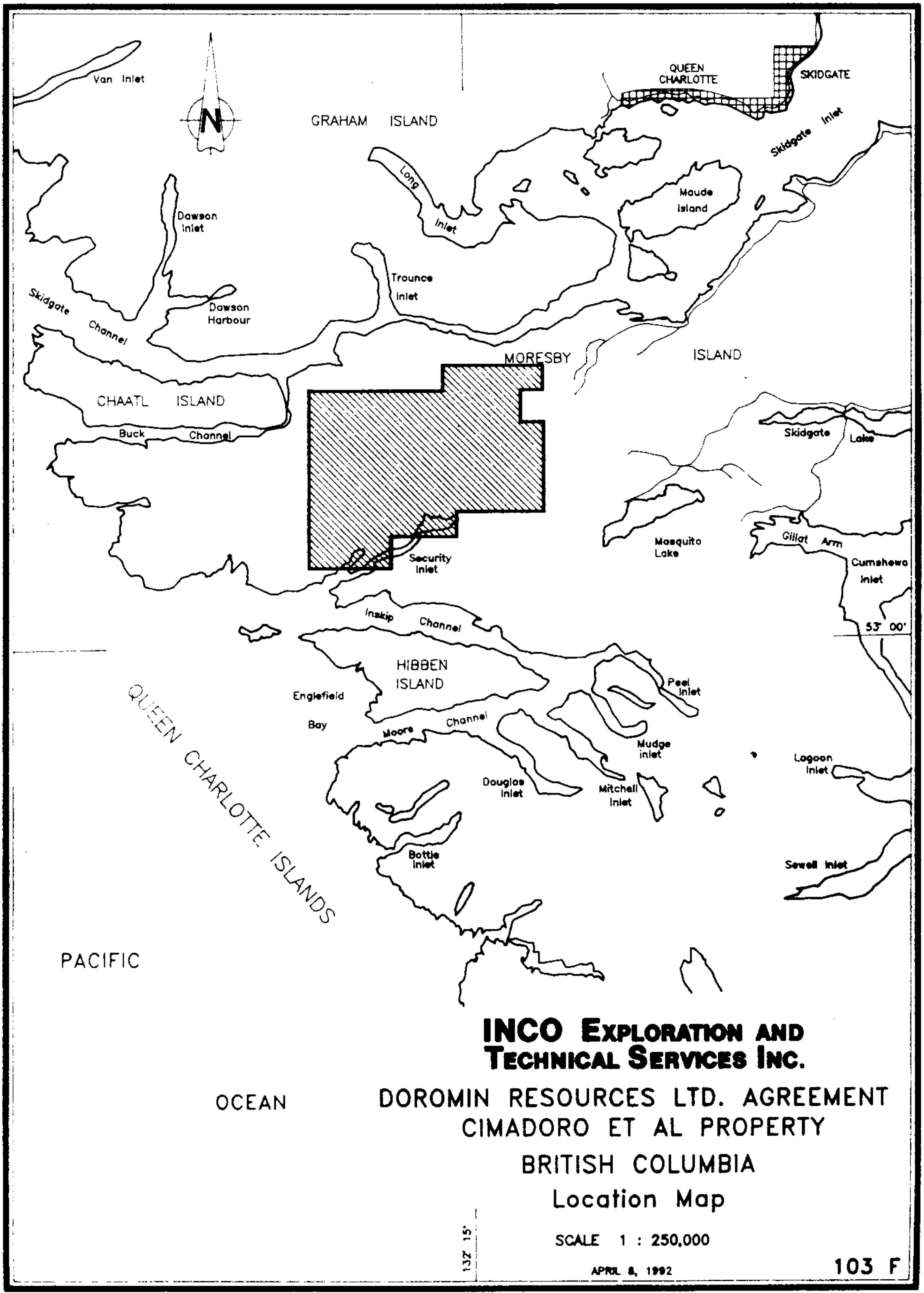
The Cimadoro property is located on the northern part of Moresby Island of the Queen Charlotte Islands. Parts of the property are accessible by logging roads from the town of Sandspit some 40 kilometres to the southwest. Access to the remainder of the property is via foot, boat or helicopter.

Topography can be very steep and elevations range from sea level to 650 metres. Streams have steep gullies which incise the property.

3.0 CLAIMS and COVERAGE

A claim map is presented in Figure 2. The airborne survey covered the following claims:

Claim	No. of Units	Tenure Number
Cimadoro 1	20	252189
Cimadoro 2	20	252190
Cimadoro 3	20	252191
Cimadoro 4	20	252192
Lucimin 1	20	252197
Lucimin 2	20	252198
Lucimin 3	18	252199
Lucimin 4	18	252200
Lucimin 5	1	252195
Lucimin 6	1	252196
Luptak	20	252518
Luptak 2	20	252519
Matajur 1	20	252887
Matajur 2	20	252888
Matajur 3	16	252889
Matajur 4	20	252890
George 1	15	306605
George 2	15	306606
Natisone 1	20	307700
Natisone 3	20	307702
Pulfero	20	307707
Udine	20	307705
Joanne 1	18	307611



INCO EXPLORATION AND TECHNICAL SERVICES INC.

DOROMIN RESOURCES LTD. AGREEMENT
CIMADORO ET AL PROPERTY
BRITISH COLUMBIA
Location Map

SCALE 1 : 250,000

APRIL 8, 1992

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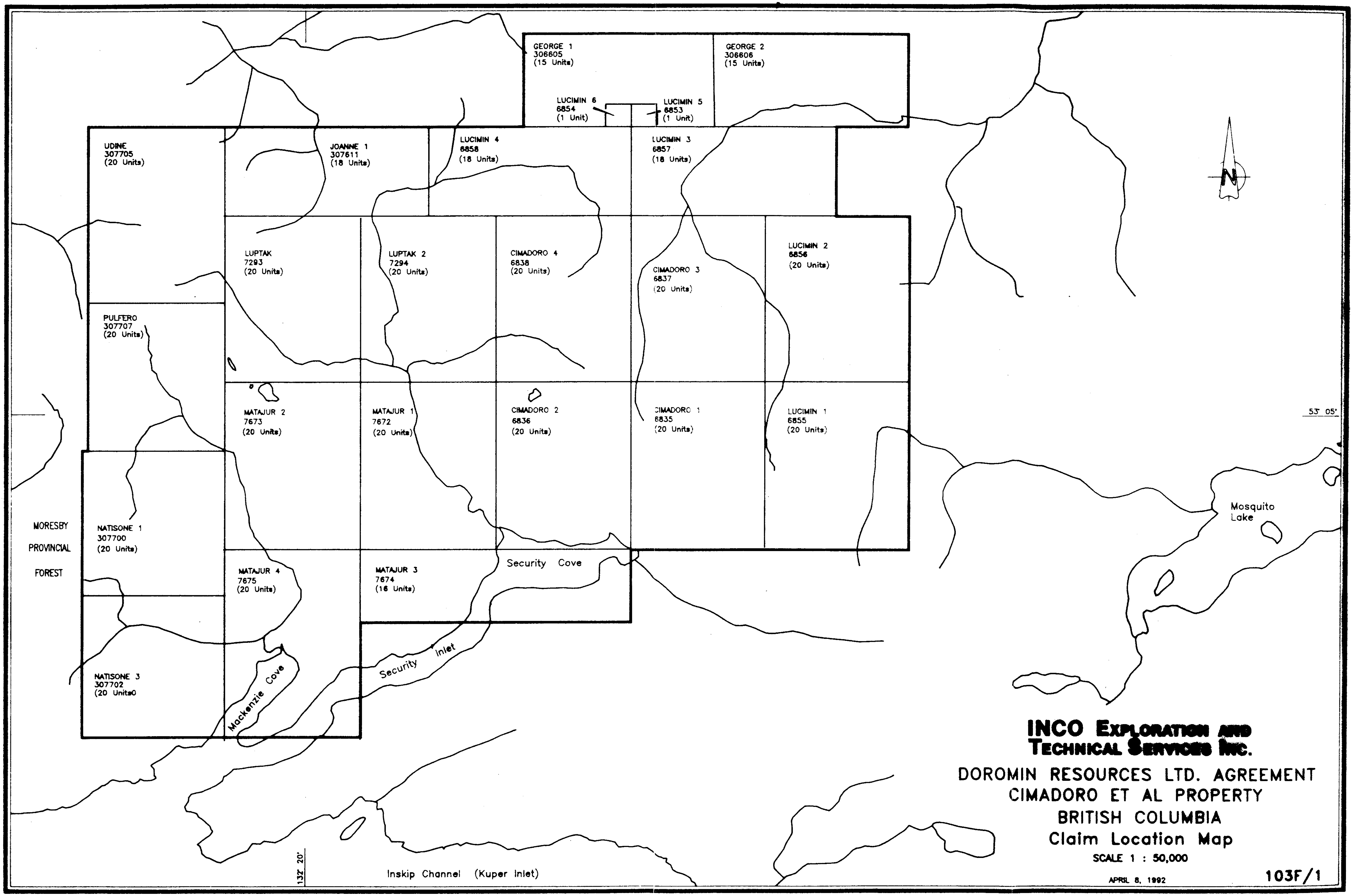

INCO EXPLORATION AND TECHNICAL SERVICES INC.

DOROMIN RESOURCES LTD. AGREEMENT
CIMADORO ET AL PROPERTY
BRITISH COLUMBIA
Claim Location Map
SCALE 1 : 50,000

APRIL 8, 1992

103F/1

Parts of the survey area extended beyond the claim boundaries. This was done in order to better trace any favourable stratigraphy near the outside perimeter of the claim block. It also gives a better idea of the regional picture of the claim area.

4.0 PREVIOUS WORK

During the mid 1960's Mr. Efram Specogna collected silt samples from streams which originated from the present property. Some samples had copper values in the 300 to 400 ppm range but were never followed up. In 1988, Specogna discovered unoxidized massive sulphide and banded sulphide - carbonated boulders in a tributary of Denna Creek. Follow-up prospecting led to the discovery of the outcrop source of the boulders at the head of a steep gulley.

Teck Explorations optioned the property from Doromin Resources and carried out a program of geological mapping, geophysics and soil geochemistry over 27 kilometres of grid line. In the area of the showing, a six hole diamond drill program totalling 957 metres was completed. Teck returned the property to Doromin Resources in 1990.

Doromin Resources completed nine short Winkie drill holes in the immediate areal of the showings.

5.0 REGIONAL and PROPERTY GEOLOGY

Regionally, much of the western portion of Moresby Island is underlain by the Upper Triassic Karmutsen Formation. On the remainder of the Island, the Karmutsen is sequentially overlain by the Triassic-Jurassic Kunga Formation, the Jurassic Yakoun Formation, Cretaceous Charlotte Group rocks as well as Tertiary volcanics and sediments. The Karmutsen Formation is in excess of 4,000 metres thick and consists of pillowed basalt, brecciated pillowed basalt, basaltic tuff, massive amygdaloidal chloritized basalt as well as minor limestone and volcaniclastic sediments. Diabase and gabbro bodies have been observed within the Karmutsen and are thought to be syn-volcanic. Structurally, the Queen Charlotte Islands are characterized by the presence of steeply dipping northwest trending normal fault systems. Part of the Pennel Sound Fold Belt passes through the northeastern section of the property. This belt consists of a five to ten kilometre wide zone of tight overturned folds with imbricated slices of Karmutsen volcanics and Kunga limestone. Along its eastern margin, the belt is believed to be bounded by normal faulting.

The property is underlain by a central northwest trending sediment-sill belt of possible late Palaeozoic age. This belt consists of steeply dipping chert, argillite, limestone and calc-silicate beds cut by a series of gabbroic to dioritic sills. To the northeast of this central belt, the property is underlain by Karmutsen volcanics, late Triassic sediments and post Triassic sediments. The southwest portion of the property is dominated by a dioritic pluton of Jurassic age and associated metasediments and metavolcanics.

Mineralization on the property occurs in two principle areas, namely the Cimadoro Showings and the MacKenzie Cove Showings. Previous work at the Cimadoro Showings outlined several showings (Lower Showing, Upper Showing, Cliff Showing) of massive sulphide mineralization hosted by argillite, chert and limestone beds. These showing consist of massive sulphide lenses with varying amounts of pyrite, sphalerite, galena, pyrrhotite and chalcopyrite. The Cimadoro Showings area is cut by numerous faults which are both subparallel and normal to bedding. Brecciation as well as weak graphitic and chloritic alteration are locally present. A bed of massive barite is associated with the Lower Showing. None of these lenses exceed five metres in strike length at surface. Mineralization at the Cimadoro Showings displays both syngenetic and epigenetic characteristics.

The MacKenzie Cove Showings consist of the Rod Showing and the Hood Showing. The Rod showing consists of a probable dip-slope horizon of massive chalcopyrite and pyrite hosted by highly epidotized and argillic altered mafic volcanics. The Hood Showing consists of mineralization of a 30 to 40 centimetre thick, shear hosted quartz-pyrite-sphalerite-galena-chalcopyrite vein. The mineralization has a dip-slope trend parallel to the foliation in the host metabasalts.

6.0 RATIONAL for the SURVEY

The primary reason for the survey is to quickly and economically explore the property for conductors which may be due to concentrations of sulphides. The magnetometer and calculated apparent resistivity data will be used to help the geologic mapping of the area and to help determine structure. In mountainous terrain, where the access is limited, helicopter surveying can determine the locations of the conductors to focus attention in those areas which are favourable.

Electromagnetic data

Most sulphides (sphalerite is one exception) are many orders of magnitude more conductive than the surrounding host rocks. A time varying electromagnetic field can induce currents in the sulphides. The secondary electromagnetic field from the induced currents can be measured in a receiver coil which provides a detection method for conductive sulphides (Grant and West, 1965). Other sources can produce a conductive response which mimics the response due to sulphides. Graphite, clays, and water filled shears are examples. Helicopter EM responses from coplanar and coaxial coils over simplified targets are shown in Appendix A.

One of the criteria for the volcanogenic massive sulphide targets to be economically viable is a minimum size. A tabular body of 500 by 500 metres by 10 metres thickness representing an idealized, and simplified massive sulphide deposit contains approximately 10 million tonnes of sulphides. Given these dimensions, flight lines spaced 200 metres will cross the hypothetical ore body twice -- which is sufficient for confirmation of the EM response.

Magnetometer data

The physical parameter which the magnetic method maps is based upon is magnetic susceptibility and/or remanent magnetization. Generally, magnetic susceptibility is lowest in sedimentary and metasedimentary rocks[1]. Rocks of acidic composition are slightly higher and ultrabasic rocks have the highest values. The possible range of susceptibility which any one rock type can have is very large and there can be considerable overlap of susceptibility values amongst the different rock types. In practise, the magnetic response of rocks is dominated by the contained volume of magnetite in that rock. The application for these magnetometer surveys is the recognition and delineation of structural or stratigraphic environments favourable for mineral deposits. Specifically, this may involve the delineation of volcanic-sedimentary contacts, intrusive bodies, faults, shears and alteration zones.

Faults are recognized as linears and by offsets of other magnetic features. Shears and sericitic alteration zones are areas where ground water flow or alteration may have destroyed the magnetite of the host rocks. This can create areas of lower magnetic susceptibility.

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[1] Sedimentary oxide iron formations are an exception to this generalization.

The magnetometer data can be further processed in different ways. It is often filtered to produce a calculated vertical gradient map. Hood, (1965), demonstrated that in areas of steep magnetic inclination, the zero vertical gradient contour level defines the contacts of steeply dipping bodies. Vertical gradient is used to help map contacts and near surface features.

Apparent resistivity data

A resistivity map portrays all of the EM information for that frequency over the survey area. This is in contrast to an EM anomaly map which only shows the interpreted anomalies from the survey. By representing the response in the form of contour plans, a large dynamic range is represented. Having the values in terms of a physical parameter (resistivity) instead of a field value (ppm of primary field), makes the resistivity parameter a good mapping tool.

In general, sedimentary rocks and unconsolidated materials are more conductive than most of the igneous rocks. This is primarily due to the higher porosity and moisture content of the former. Metamorphic rocks are highly variable due in part to their wide range of porosities and moisture content. Clays and hydrous minerals such as serpentine are generally good conductors and minor amounts of these material will decrease the resistivities. Apparent resistivity data is used in much the same way as magnetometer data - that is, to delineate structural or stratigraphic environments favourable for mineral deposits.

7.0 The PHYSICAL SURVEY

Dighem Surveys & Processing Inc. were the geophysical contractors who flew the helicopter EM survey between May 1 to May 10th, 1992. A total of 534 kilometres were flown over the Cimadoro Property.

7.1 Personnel

Personnel for the helicopter survey were supplied by IETS, and Dighem, with a pilot from Canadian Helicopters Ltd in the role of a subcontractor to Dighem. IETS personnel included:

Bob Lo	Senior Geophysicist
Cameron Bell	Project Geologist

Dighem personnel for the survey were:

Steve Kilty	Vice President, Operations
Robert Gordon	Survey Operations Supervisor
Dave Miles	Senior Geophysical Operator
Jordan Cronkwright	Second Geophysical Operator
Bill Johnston	Pilot (Canadian Helicopters Ltd.)
Gordon Smith	Data Processing Supervisor
Sean Clarke	Computer Processor
Jim Espey	Flight Path Recovery
Paul Smith	Interpretation Geophysicist
Lyn Vanderstarren	Draftsperson (CAD)
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

7.2 Survey Parameters and Instrumentation

A helicopter provided by Canadian Helicopters Ltd. was used for the survey. It was an Aerospatiale AS350B turbine helicopter, Registration: C-GRGU. The average aircraft speed was 75 kilometres per hour. Ground clearance of 60 metres for the helicopter, 40 metres for the magnetometer and VLF receivers, and 30 metres for the EM bird were attempted. However, the rugged topography in some cases forced the pilot to fly at a greater ground clearance for safety reasons and an average EM bird height of 45 metres was achieved. Line spacing was a nominal 200 metres. Rugged topography and the loss of electronic navigation resulted in somewhat erratic line spacings.

Instrumentation installed on the helicopter consists of the Dighem^V Helicopter Electromagnetic and Magnetometer system as detailed below and summarized in their product literature shown in Appendix B.

Flight direction was 032° with a nominal line separation of 200 metres. The flight direction was picked to be perpendicular to the general geological trend.

DIGHEM^V Electromagnetic System

This is a five frequency EM system housed in a rigid kelvar bird which is towed beneath and behind the helicopter. The rigid bird fixes the geometry and minimises geometrical noise caused by relative movement between the transmitting and receiving coils. The frequency and coil configurations are:

Frequency	Orientation	Coil Separation	Channels	Coil Sensitivity
900 Hz	vertical coaxial	8.0 metres	inphase, quadrature	0.1 ppm
900 Hz	horizontal coplanar	8.0 metres	inphase, quadrature	0.1 ppm
7200 Hz	vertical coaxial	8.0 metres	inphase, quadrature	0.2 ppm
7200 Hz	horizontal coplanar	8.0 metres	inphase, quadrature	0.2 ppm
56,000 Hz	horizontal coplanar	6.3 metres	inphase, quadrature	0.3 ppm

The internal EM system noise is less than 1 ppm of the transmitted field. Ten channels of EM information is sampled every 0.1 seconds with a time constant of 0.2 seconds. Two sferic/powerline channels are also recorded. Sferic activity is usually removed by post-survey processing to less than 2 ppm.

The EM system is calibrated with an external coil at the start and end of the survey, and with an internal coil approximately three times per hour during survey flights. Phase calibration is accomplished by using an external ferrite rod before each survey flight.

Magnetometer

A Picodas 3340 optically pumped Cesium vapour magnetometer is towed 20 metres beneath the helicopter. The airborne magnetometer has a dynamic range of 20,000 to 100,000 nanoTeslas (nT) with a sensitivity of 0.01 nT, and can operate in high magnetic gradients. It is sampled at ten times per second. An aerodynamic magnetometer noise of less than 0.5 nT is claimed.

A Scintrex MP-3 proton precession magnetometer is used as a base station to monitor and remove the diurnal variations in the Earth's main magnetic field. It is a digital recording system with a sensitivity of 0.1 nT and is operated with a sampling rate of five times per second. Acceptable magnetic diurnal variations are less than 40 nT over a five minute time chord.

VLF System

The VLF System consists of a Herz Industries Ltd. Totem-2A receiver. The amplitude of the total EM field is measured along with the quadrature of the vertical component with a sensitivity of 0.1 percent of the total field. The transmitting stations used were Annapolis, Maryland (NSS, 21.4 kHz) and Cutler, Maine (NAA, 24.0 kHz). The receiver is housed in the same bird as the magnetometer sensor.

For this survey, the VLF data was collected, and is seen in the analogue records. However, because of the distortions of the field caused by topography and the sea water, and because the EM survey has frequencies which spans the VLF frequencies, the data was not processed.

Data Acquisition

A RMS Instruments, DGR 33 data acquisition system is used along with a RMS TCR - 12, 6400 bpi cartridge tape recorder operating at a repetition rate of 0.1 second. Several computed parameters such as apparent resistivity, calculated from the EM data, along with the measured parameters are plotted in real time through the use of a RMS DGR33 dot-matrix graphics recorder. The RMS DGR33 has a 4 by 4 dot matrix per square mm resolution and is operated at a chart speed of 1.5 mm/second.

Navigation and Positioning

The primary navigation system is a Del Norte 547, UHF (427.5 MHz) electronic positioning system with a sensitivity of one metre operating at a sample rate of two times per second. This navigation system uses ground based transponder stations which transmit distance information back to the helicopter. The transponders locations are positioned by GPS. An accuracy of five metres within a 75 kilometre range can be obtained. The cartesian grid output is converted into UTM coordinates during processing through the use of GPS positional fixes on the transponders and by tying into topographic features.

In areas where the line of sight requirement for UHF navigation can not be maintained with the transponder set up, a Global Positioning System (GPS) which uses positioning information from the NAVSTAR GPS satellites is used. The GPS system used for the survey is a Trimble Navigation Ltd., Pathfinder (C/A code, dual channel). This system has an accuracy of 25 metres and is updated once per second. GPS surveying requires a minimum of three satellites and a 12 degree line of sight from the horizon.

When the helicopter flies into a valley, both the UHF and GPS navigation systems can be lost. In this case, position is recovered post-surveying through the use of a flight path video. A Panasonic video, model AG 2400/WVCD132 is used to record the flight terrain beneath the helicopter along with the fiducial numbers and time. In this manner, the flight path can be estimated via recovered points which are tied into a topographic base.

This survey has large areas where the flight path recovery was manually accomplished from the tracking camera. Electronic navigation was lost in these areas due to the rugged topography causing line of sight problems with both the UHF and GPS navigation systems. The areas of manually recovered portions can be easily distinguished by the segmented, straight line appearance of the flight paths.

A radar altimeter is used to position the aircraft relative to the ground. The unit used was manufactured by Honeywell/Sperry, AA220 series. It has a sensitivity of one foot and the output is recorded ten times per second.

Field Computer

A Motorola 80386 CPU based field workstation is used at the survey base to download digital data nightly. Data quality and completeness may be checked in this manner.

7.3 Data Presentation and Processing

Final map products from the survey include maps of total magnetic intensity, calculated vertical magnetic gradient, calculated apparent resistivity from the 7200 and 56,000 Hz coplanar EM, and the EM interpretation. In addition, colour maps of the above, plan profiles of the 900 and 7200 Hz EM data, and digital line profiles of the survey and digital grids of the processed were obtained to help in the interpretation. This second set of data is not included in the report. All of the maps are presented on a subdued topographic base at a scale of 1:10,000. Flight lines, and UTM coordinates *are also shown on the maps.*

Total magnetic intensity and first vertical derivative

Diurnal variations in the earth's magnetic field are removed through the use of a base station. The values along the recovered flight paths are interpolated into a regular grid via the use of the modified Akima method. The grid cell sizes are chosen to be 0.25 centimetres at the map output scale (25 metres ground distance for 1:10,000 scale). Isomagnetic intensity contours are threaded through the grid values by a computer routine.

Using the total magnetic intensity grid values, the vertical derivative is numerically calculated via a filtering processing in the wavenumber domain (Kanasewich, 1973). The data is contoured in the same manner as the total magnetic intensity.

Calculated resistivity

The resistivity data is generated from the inphase and quadrature data using a pseudo layer over a half space model[2] (Fraser, 1978). The distance from the EM bird to the conductive earth is obtained as a by-product of the resistivity calculation. Discrepancies between the calculated distance and the bird attitude are attributed to a fictitious, resistive upper layer. In this manner, the resistivities generated are independent of altitude. In certain situations this fictitious layer can be due to the measure of the tree height in a forested area.

Resistivities from the 7200, and 56,000 Hz data were calculated. The results were gridded and contoured in the same manner as for the magnetic intensity data.

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[2] This model uses an infinitely resistive layer between the EM bird and the ground, and an uniform half space response for the earth.

Multi-channel stacked profiles

Distance-based[3] stacked profiles of the digitally recorded and calculated data are generated and plotted by computer. A horizontal distance scale of 1:10,000 is used along with various profile scales.

8.0 GEOPHYSICAL INTERPRETATION

The EM interpretation followed a two stage process. A preliminary set of anomalies were generated through the use of automatic processing routines which directly searched for local maxima in both the inphase and difference channel responses. A second screen was performed by Dighem's interpretation geophysicist who examined the analogue and stacked profiles and interpreted conductors.

These responses are classified into bedrock conductors (B), "thin dyke - like response" (D), conductive cover (S), broad conductive unit (H), edge of broad conductor (E). A number of negative inphase responses which correlate with a magnetic high are seen in the data. These are interpreted to be due to the flux gathering of the EM signals by a magnetically permeable rock unit. In some cases, a quadrature response is associated with the negative inphase. This may denote weak conductivity which is associated with the magnetic response and these anomalies are labelled either "S?" or "B?". Some responses are difficult to classify because of noise, magnetic responses, or conductive cover. These responses may be due to valid bedrock responses (B?) or to sharp undulations in the bedrock/overburden interface (S?). No cultural noise problems are detected in this survey. Dips directions of the conductor, if well defined, are interpreted at this stage.

The locations of the conductors are entered into a database and a near vertical half plane model was used to best fit the anomalies. Information on the conductance, and depth to the top are generated in this manner if the EM response can be fitted to the model. An IETS geophysicist verified the validity and the locations of the EM conductors by examining the profiles. In this particular case, a conductor on line 20262, at fiducial 2815 was added. Table 1 shows the statistics of the EM responses.

Conductor Grade	Conductance Range Siemens (S or mhos)	Number of Response
7	>100	11
6	50 to 100	2
5	20 to 50	7
4	10 to 20	13
3	5 to 10	15
2	1 to 5	29
1	<1	29

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[3] As opposed to fiducial (time) based.

*	indeterminate	217
Total		323
Conductor model	**Most likely source**	**Number of Responses**
D	Discrete bedrock source	9
B	Discrete bedrock source	102
S	Conductive cover	155
H	Rock unit or thick cover	49
E	Edge of wide conductor	8
Total		323

Table 1

Appendix C lists the individual conductors, their locations, response characteristics, and interpreted source. This list should be consulted if the conductors are to be followed up on the ground. Anomalies located near the ends of the flight lines where the helicopter has started its turn should be viewed with caution. The sudden change in direction causes a strain on the kevlar bird and a geometric error results. These geometric errors are usually seen only on the inphase responses.

Of note is the fact that the Cimadoro Showings did not show as an electromagnetic response. The salt water as expected produces a large EM response typical of a horizontal thick sheet which yield resistivities of less than one ohm-metre. Other responses were detected and the Dighem report outlined many zones which are deemed to be of interest and these zones are labelled in the EM interpretation map. These zones all have at least one conductor which is interpreted to be a bedrock conductor. The zones are as follows:

Zone A

Zone A is located in a flat magnetic intensity area. Two conductors are located, with one on top of a ridge and the other on a slope. The conductor on the slope occurs at roughly the same elevation indicating a horizontal attitude. However, this is contradicted by conductor 20030B which has indications of a south dip.

Zone B

Zone B consists of EM responses located over two lines. The responses have the characteristic double peak on the coaxial coils with the single peak on the coplanar coils of a flat lying ribbon. The source is not known and should be investigated.

Zone C

Two of the conductors in this zone show a north dip and strike in the general regional trend. The magnetometer response is quiet in this zone.

Zone D

This zone consists of a conductor located over two flight lines. No comments on the dip of the conductor can be made. The magnetic intensity in the area is flat.

Zone E

Zone E occurs in a flat magnetic intensity area south of a more magnetic unit to the north. The EM responses are broad and are indicative of a wide source. As such, the likelihood of the source being due to a lithological unit is higher.

Zone F

This zone has the appearance of being due to a lithological source. The EM responses are wide and the entire zone is detected as an area of low apparent resistivities. Also, the magnetic response is quite uniformly flat in the zone. However, some of the better defined EM responses may be due to discrete sources and are therefore exploration targets.

Zone G

This zone is located in an area of moderate magnetic intensity values just to the north of an area of low magnetic intensity. Some of the conductors are associated with this contact defined by the magnetic intensities. In general, the conductors which comprise this group are mostly discrete conductors with a steep dip.

Zone H

Zone H trends into salt water and in the eastern portion of the zone, is attributed to it. It is not clear where the influence of the salt water stops and whether some of the conductors are caused by bedrock sources. Most of the conductors are broad and appear to be due to thick bodies, indicating either lithological sources, or salt water filled overburden.

Others

In addition to the above mentioned zones, there are discrete responses which are interesting targets. Conductor 20450D -- 20461C at the northeastern corner of the survey area is an example. Others are associated with near surface magnetic responses which may mask the electromagnetic response. These include the group 20200C,E,G -- 20210C -- 20120B,C,D -- 20220C,D. Isolated responses associated with magnetic responses include 20101C, 20240C, 20350F,G, 20520A, 20300G,H. As well there are the isolated one line anomalies which are not top priority as it is believe that their strike length is too short. These include 20172C, 20200H, 20250G, 20330D, 20371F, 20381B, 20450A,C, 20511A and 20550B.

Magnetic Intensity and Apparent Resistivity

The magnetic intensity maps and apparent resistivity maps show a general northwest to southeast trend which is congruent which the regional geology. The area of the Karmutsen basalts shows up as a magnetic low area indicating that perhaps it is remanently magnetized. The apparent resistivity maps do not appear as useful for mapping purposes mainly because it appears that the underlying rocks do not significantly vary in resistivity.

Both products will be of use in the geological mapping program.

9.0 RECOMMENDATIONS

The conductors which have been mentioned as being interesting should be followed up on the ground by prospecting, soil sampling, and trenching to determine the conductive source. If the results of the above prove interesting enough, then drilling of the anomalies is recommended. The known geology should be integrated with the geophysical results to develop a better understanding of the underlying rocks of the property. Ground geophysical surveys, may be warranted to further delineate conductors which are of interest.

The Cimadoro Showing did not show up as an electromagnetic response. This may be due to either a small size of sulphides, or that the sulphides are faulted into electrically separate fragments which do not yield an electromagnetic response. Induced Polarization may be required to detect these types of sulphide bodies.

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Statement of Qualifications

I, Bob B.H. Lo, am employed as a Senior Geophysicist by Inco Exploration and Technical Services Incorporated.

My work address is:

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I graduated from the University of Toronto with a Bachelor of Applied Science degree in the Geophysics option of Engineering Science in 1981 and obtained a Masters of Science degree in Physics--Geophysics also from the University of Toronto in 1985.

I am a Licensed Professional Engineer in the Province of Ontario.

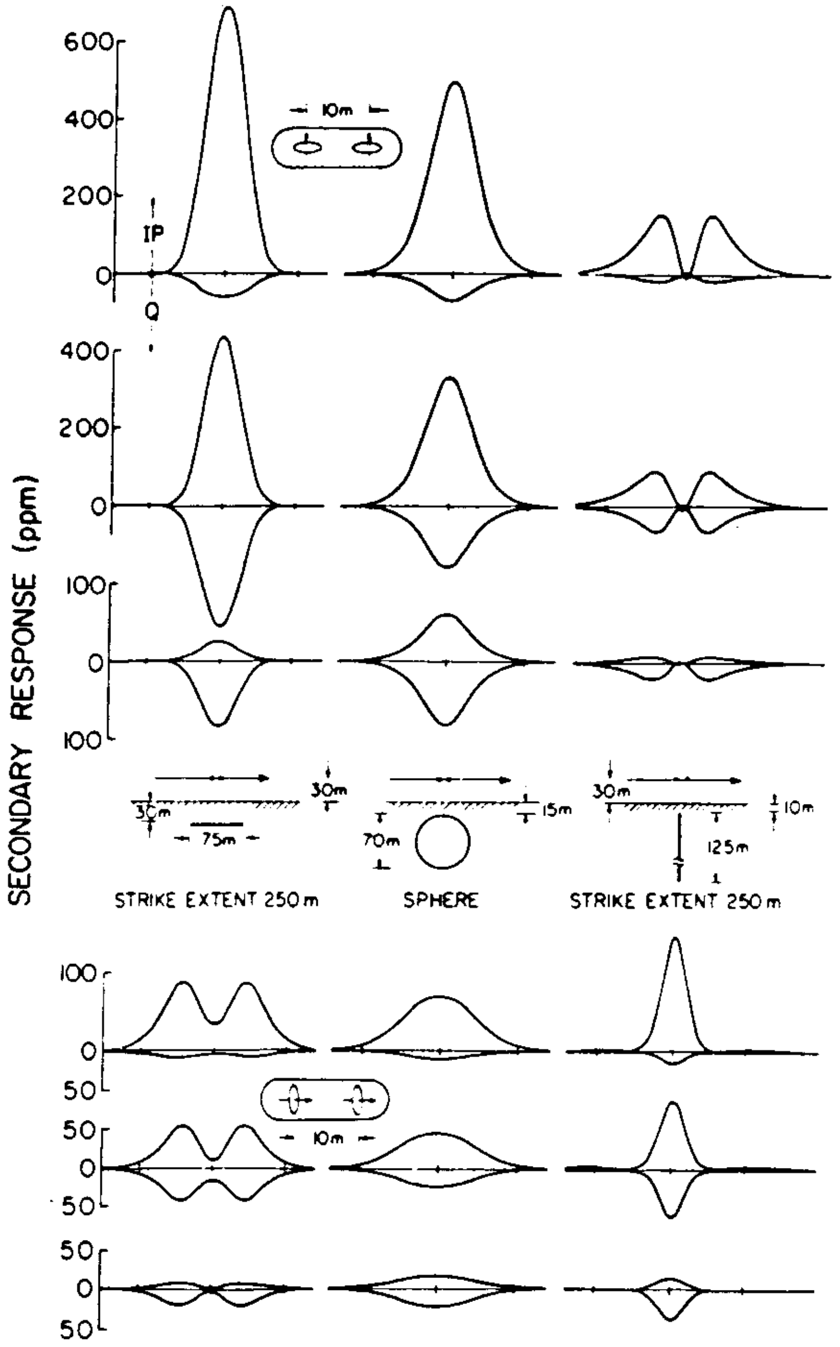
I am an associate member in the Society of Exploration Geophysicists -- **SEG** (Tulsa), a member of the Canadian Exploration Geophysical Society -- **KEGS** (Toronto), a member of the Society of Engineering and Mineral Exploration Geophysicists -- **SEMEG** (Denver), a member of the Prospectors and Developers Association of Canada -- **PDAC** (Toronto), and a member of the British Columbia & Yukon Chamber of Mines (Vancouver).

Since 1981, I have been involved in the use of geophysics for mineral exploration, geothermal site detection, and various engineering applications. I have conducted and supervised field surveys, planned, supervised, interpreted surveys and reported on projects, from Canada, the United States of America and abroad.

B. B. H. LO

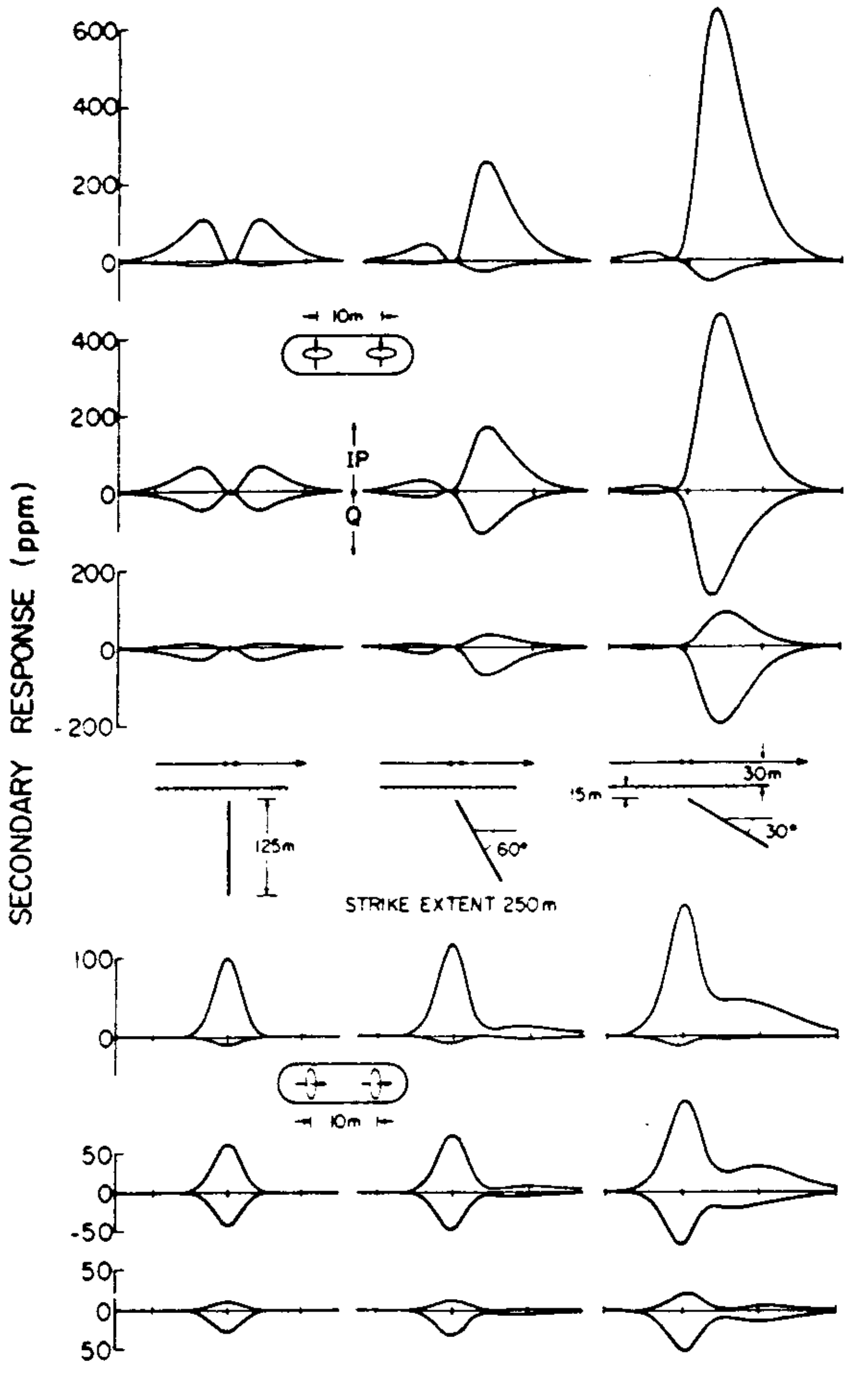
Appendix A

Helicopter EM responses for various models



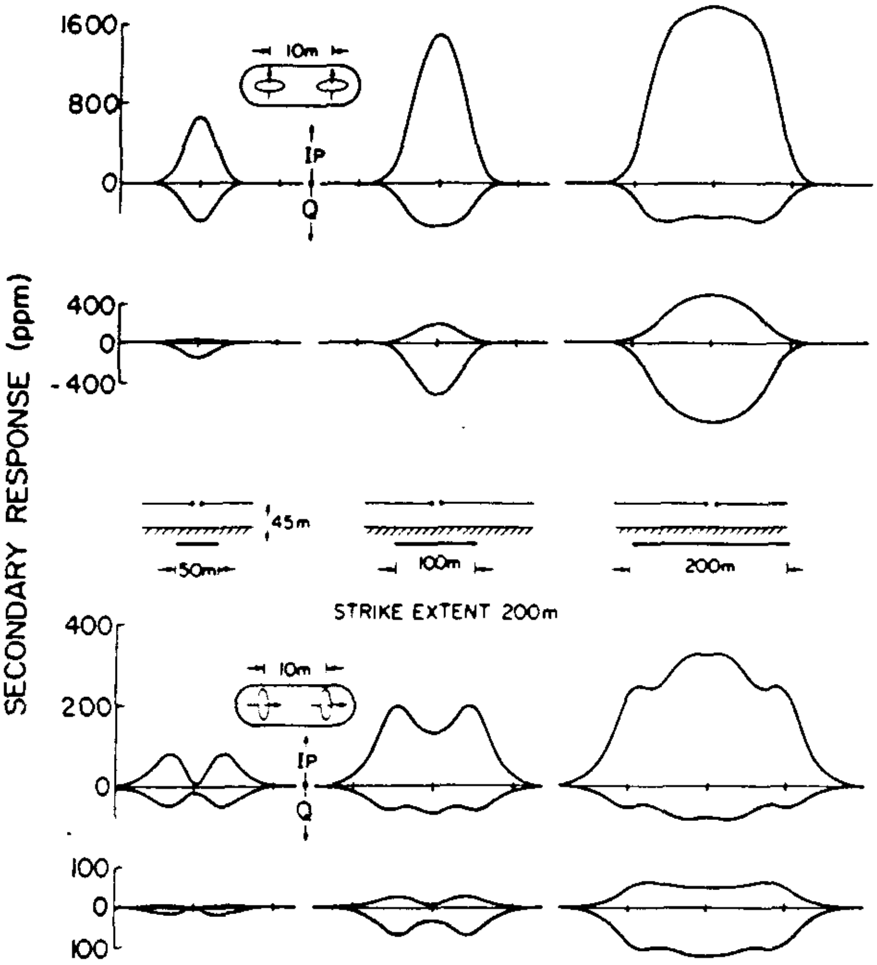
Helicopter AEM profiles over isolated conductors of different shape: a horizontal plate, a sphere, and a vertical plate. For each model, in-phase (IP) and quadrature (Q) anomaly profiles are shown for three frequencies: 20 kHz (top), 2 kHz, and 0.4 kHz. Note the differences in the form the coaxial and coplanar coil profiles in the three cases. All traverses are over the center of the conductor and normal to strike. The plate conductors have a conductance of 10 S and the sphere has a conductivity of 2.5 S/m. (Courtesy of Richard S. Smith).

after Nabighian and Macnae, 1991.



Helicopter AEM profiles over plate conductors with differing dips. For each model, in-phase (IP) and quadrature (Q) anomaly profiles are shown for three frequencies: 20 kHz (top), 2 kHz, and 0.4 kHz. All plates have a conductance of 10 S. Note the relatively weak response of the vertical plate relative to a horizontal one; also the stronger response of the horizontal coplanar system. (Courtesy of Richard S. Smith).

after Nabighian and Macnae, 1991.



Helicopter AEM profiles over flat lying plates of differing width. In-phase (IP) and quadrature (Q) responses are shown for frequencies of 20 kHz (top) and 2 kHz. The plates have a conductance of 2 S. The vertical coaxial system gives a much smaller response than the horizontal system and shows stronger edge effects. Narrow conductors give not only narrower but much weaker anomalies than wide ones. Also, their anomalies have a lower IP/Q phase ratio. (Courtesy of Richard S. Smith).

after Nabighian and Macnae, 1991.

Appendix B

DIGHEM^V System

Dighem

Quality and Service in Airborne Geophysics

After more than twenty years of continuous development of helicopter-borne electromagnetic systems, Dighem introduces the:

DIGHEM V

Electromagnetic Systems

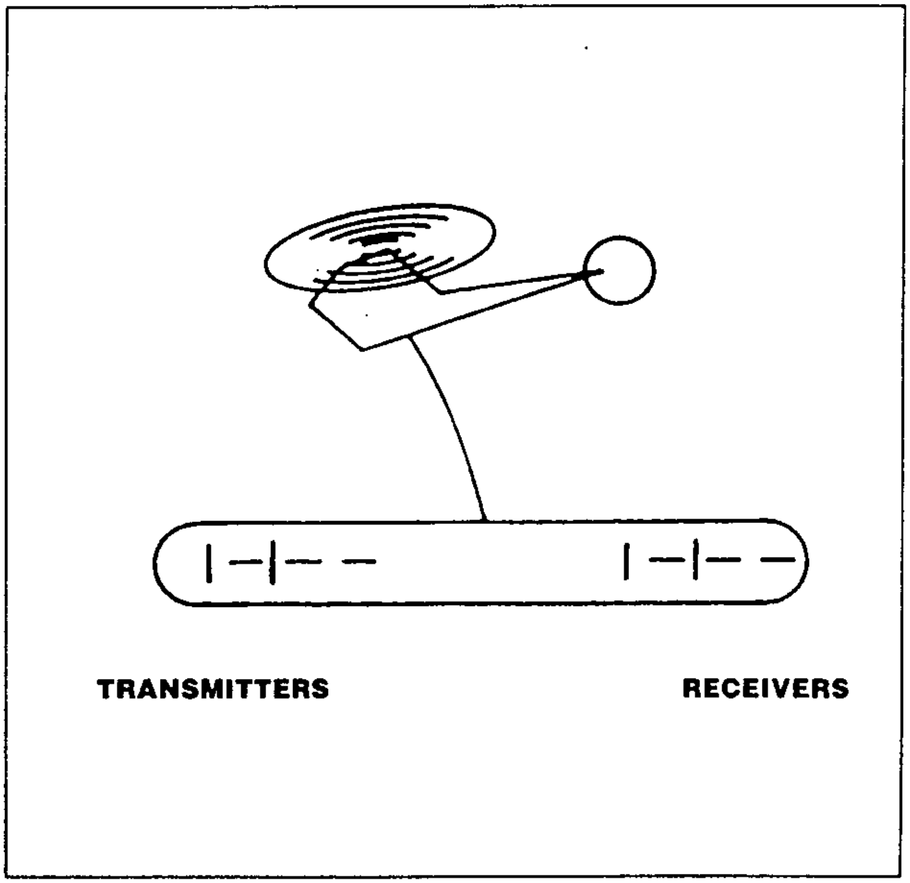
Technical Advances Pioneered by Dighem:

- ✓ 1969 First EM survey flown with **ORTHOGONAL RECEIVER COILS**
- ✓ 1970 **CONDUCTIVITY - THICKNESS** analysis provided **FOR ALL CONDUCTORS**
- ✓ 1975 First EM survey flown with **ORTHOGONAL TRANSMITTER AND RECEIVER COILS**
- ✓ 1976 **RESISTIVITY** maps computed routinely from EM survey data
- ✓ 1980 **MAGNETITE** analysis computed from EM data
- ✓ 1984 Huge increase in highest frequency, from 7200 Hz. to **56,000 Hz.**
- ✓ 1989 EM sample rate increased 10 times to **100 SAMPLES PER SECOND**, allowing spherics identification and rejection
- ✓ 1990 Conductivity depth analysis, to yield **SENGPIEL RESISTIVITY SECTIONS**

AND NOW DIGHEM V

In addition to the standard high-sensitivity Cesium **magnetometer**, four channel total field **VLF** and optional radiometric **spectrometer**, **DIGHEM V** systems include five transmitter/receiver pairs which may be operated at frequencies of 385, 900, 3600, 7200, 31,000 and 56,000 Hz. The frequencies used in a particular survey are selected to optimize the geophysical responses based on the geology in your area of interest.

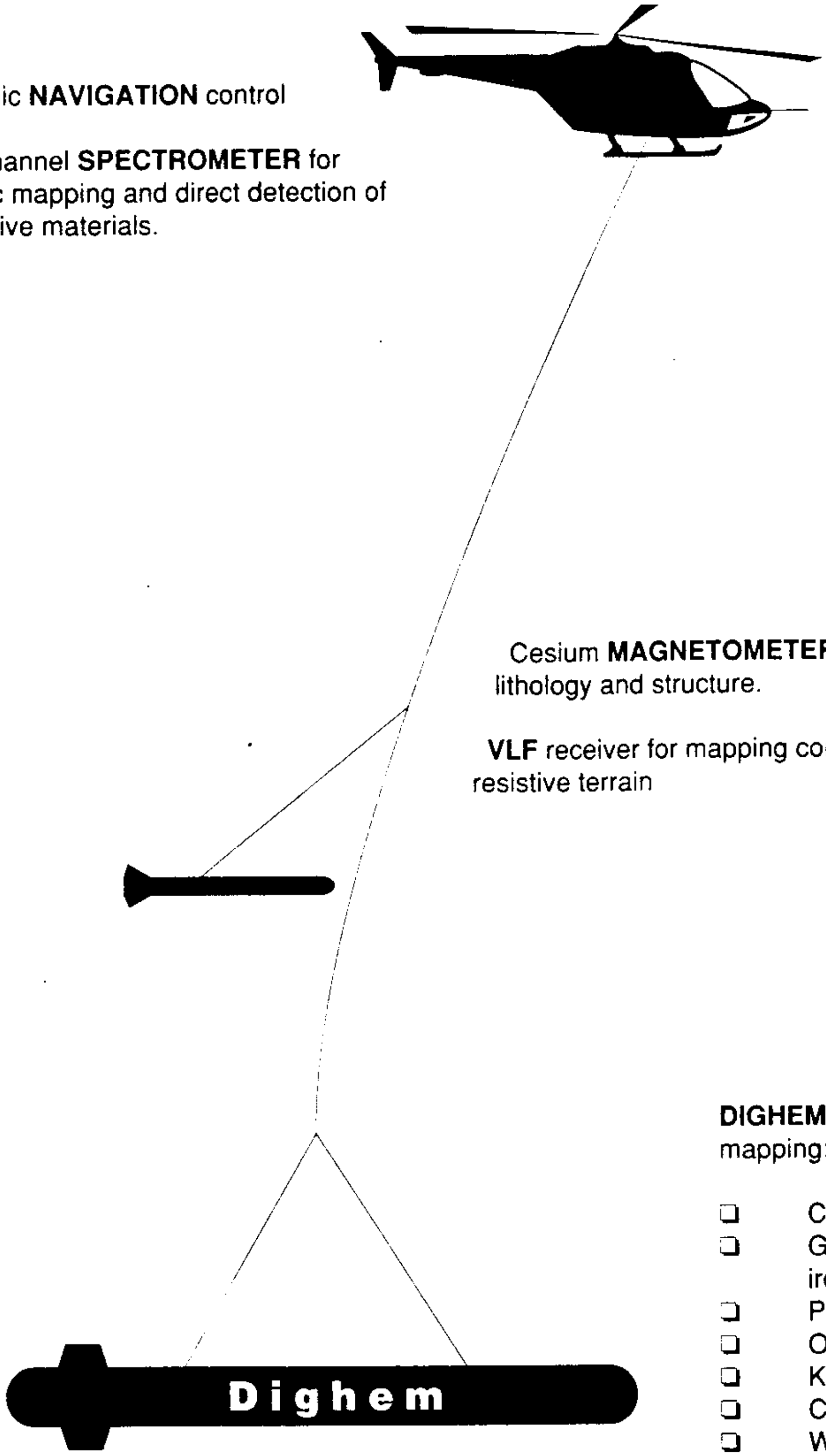
The accuracy and sophistication of the **DIGHEM V** geophysical system can be part of your next exploration project anywhere in the world. **DIGHEM systems are available for contract survey work for any target which requires the accurate measurement of earth resistivities.**



Dighem Surveys & Processing Inc., 228 Matheson Blvd. E. Mississauga, Ontario, Canada L4Z 1X1 • Tel: (416) 890-0313 • Fax: (416) 890-0347

Dighem

Quality and Service in Airborne Geophysics



Electronic **NAVIGATION** control

Multi-Channel **SPECTROMETER** for geologic mapping and direct detection of radioactive materials.

Cesium **MAGNETOMETER** for mapping lithology and structure.

VLF receiver for mapping conductive trends in resistive terrain

DIGHEM multi-coil EM sensor for mapping:

- ☐ Conductive ore deposits
- ☐ Gold bearing structures and iron formations
- ☐ Platinum bearing ultra mafics
- ☐ Overburden thickness
- ☐ Kimberlites
- ☐ Coastal bathymetry
- ☐ Water bearing formations
- ☐ Sand & gravel deposits
- ☐ Geothermal zones

Appendix C

EM Anomaly List for Cimadoro Project

ANOMALY/ FID/INTERP	COAXIAL 1077 HZ REAL PPM	COAXIAL 1077 HZ QUAD PPM	COPLANAR 880 HZ REAL PPM	COPLANAR 880 HZ QUAD PPM	COPLANAR 7206 HZ REAL PPM	COPLANAR 7206 HZ QUAD PPM	VERTICAL DIKE COND SIEMEN	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND SIEMEN	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M	MAG CORR NT
LINE 20010 (FLIGHT 7)													
A 3537S?	1	2	0	2	2	4	-	-	-	-	-	-	14
B 3511B	6	6	5	12	7	15	5.9	29	1	50	494	0	0
LINE 20020 (FLIGHT 7)													
A 3345D	8	11	4	11	26	25	4.3	0	1	47	517	0	0
LINE 20030 (FLIGHT 7)													
A 3149B?	1	2	1	2	2	1	-	-	-	-	-	-	0
B 3144D	14	4	10	7	15	6	33.9	12	1	124	450	27	0
C 3135B?	1	2	1	2	2	4	-	-	-	-	-	-	7
LINE 20040 (FLIGHT 7)													
A 2958B	11	4	6	4	6	9	27.4	31	1	153	101	101	0
B 3013S?	0	2	0	2	1	4	-	-	-	-	-	-	12
LINE 20050 (FLIGHT 7)													
A 2717B	6	5	2	5	10	17	6.6	37	1	202	1012	0	4
B 2713B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2685S	0	2	0	2	1	4	-	-	-	-	-	-	0
LINE 20070 (FLIGHT 7)													
A 2234B?	0	2	0	2	0	4	-	-	-	-	-	-	0
B 2227B?	0	2	0	2	0	1	-	-	-	-	-	-	50
LINE 20080 (FLIGHT 7)													
A 1126S?	1	2	0	2	0	4	-	-	-	-	-	-	180
LINE 20081 (FLIGHT 7)													
A 1284S?	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1277B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1267B?	1	2	1	2	2	4	-	-	-	-	-	-	100
LINE 20082 (FLIGHT 7)													
A 1419B?	0	2	0	2	0	4	-	-	-	-	-	-	230
LINE 20090 (FLIGHT 7)													
A 784S?	0	2	0	2	0	4	-	-	-	-	-	-	0
B 818S?	0	2	0	1	0	4	-	-	-	-	-	-	0
C 832S?	0	2	0	1	0	4	-	-	-	-	-	-	0
D 1037B?	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20101 (FLIGHT 7)													
A 600S?	0	2	0	2	0	4	-	-	-	-	-	-	0

* 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.

	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20101 (FLIGHT 7)													
B 547B?	0	2	0	2	2	4	-	-	-	-	-	-	14
C 433B?	0	2	0	2	2	4	-	-	-	-	-	-	100
D 416S?	0	2	0	2	0	4	-	-	-	-	-	-	0
LINE 20120 (FLIGHT 6)													
A 6034S?	0	2	0	2	0	4	-	-	-	-	-	-	280
B 6025B?	0	9	0	5	0	21	0.4	15	1	106	912	17	150
C 6023B?	0	9	0	5	0	25	0.4	15	1	104	902	16	0
D 6009B	0	5	0	6	0	37	0.4	24	1	128	970	29	0
LINE 20130 (FLIGHT 6)													
A 5354S?	0	1	0	1	0	4	-	-	-	-	-	-	360
B 5381B?	0	2	0	2	0	4	-	-	-	-	-	-	30
C 5425S?	0	1	0	1	0	0	-	-	-	-	-	-	0
LINE 20140 (FLIGHT 6)													
A 5049B?	1	2	0	2	1	4	-	-	-	-	-	-	170
B 5028S?	1	2	0	1	1	4	-	-	-	-	-	-	100
C 4909S	1	1	0	1	1	4	-	-	-	-	-	-	0
D 4843B	7	5	13	12	21	4	10.9	23	2	89	47	54	0
E 4839B	4	4	13	12	6	5	5.5	29	2	89	50	52	0
LINE 20151 (FLIGHT 6)													
A 4161S?	0	2	0	1	0	4	-	-	-	-	-	-	0
LINE 20152 (FLIGHT 6)													
A 4584S	0	2	0	2	0	1	-	-	-	-	-	-	30
B 4660S	0	1	0	1	1	4	-	-	-	-	-	-	10
C 4702D	7	5	13	12	20	5	9.8	28	1	158	129	103	0
D 4705B	1	2	1	2	2	2	-	-	-	-	-	-	0
E 4756H	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20160 (FLIGHT 6)													
A 3725S?	0	2	0	2	1	4	-	-	-	-	-	-	0
B 3672S	0	2	0	2	2	4	-	-	-	-	-	-	0
C 3556S?	1	2	0	2	2	4	-	-	-	-	-	-	0
D 3537S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20161 (FLIGHT 6)													
A 3915B?	0	2	0	1	0	4	-	-	-	-	-	-	130
LINE 20172 (FLIGHT 6)													
A 3316S?	0	2	0	2	2	4	-	-	-	-	-	-	0

* 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.

	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20172 (FLIGHT 6)													
B 3400S?	1	2	0	2	1	11	0.8	26	1	178	1012	0	70
LINE 20180 (FLIGHT 6)													
A 2520B?	1	2	0	2	2	4	-	-	-	-	-	-	0
B 2502B?	0	2	0	2	0	4	-	-	-	-	-	-	20
C 2400S	1	2	0	2	2	4	-	-	-	-	-	-	0
D 2340S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20190 (FLIGHT 5)													
A 6884S?	0	2	0	2	0	4	-	-	-	-	-	-	60
B 6924B?	0	2	0	2	0	4	-	-	-	-	-	-	0
LINE 20192 (FLIGHT 6)													
A 2254B?	4	4	0	4	17	27	0.7	0	1	54	260	28	0
LINE 20200 (FLIGHT 5)													
A 6582S?	1	2	0	2	2	4	-	-	-	-	-	-	0
B 6573B?	1	2	0	2	2	4	-	-	-	-	-	-	340
C 6488B?	0	13	0	6	0	16	0.4	15	1	79	796	11	110
D 6483B?	0	2	0	2	0	4	-	-	-	-	-	-	300
E 6480B?	0	8	0	7	0	28	0.4	16	1	78	786	12	0
F 6473B?	0	2	0	2	0	4	-	-	-	-	-	-	0
G 6472B?	0	10	0	10	0	57	0.4	13	1	77	799	9	0
H 6329H	1	2	0	2	2	4	-	-	-	-	-	-	120
I 6303H	1	2	1	2	2	3	-	-	-	-	-	-	0
LINE 20210 (FLIGHT 5)													
A 5962H	0	2	0	2	2	4	-	-	-	-	-	-	0
B 6077S?	0	2	0	2	0	4	-	-	-	-	-	-	230
C 6088B?	0	4	0	3	1	8	0.4	2	1	174	1012	0	70
D 6238H	3	4	2	4	13	13	1.0	0	1	52	275	24	0
LINE 20220 (FLIGHT 5)													
A 5740S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 5643S?	0	2	0	2	2	4	-	-	-	-	-	-	0
C 5544B	0	11	0	4	0	12	0.4	11	1	156	1012	0	0
D 5532B	0	17	0	8	0	17	0.4	12	1	81	818	9	250
E 5525B?	0	2	0	2	0	4	-	-	-	-	-	-	0
F 5417S?	1	2	1	2	2	4	-	-	-	-	-	-	0
G 5324H	4	8	3	1	4	32	0.1	0	1	35	245	12	0
LINE 20232 (FLIGHT 5)													
A 4982B?	0	9	0	6	0	27	0.4	10	1	88	855	9	80

* 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.

	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20232	(FLIGHT	5)											
B 4990B?	0	2	0	2	0	4	-	-	-	-	-	-	40
C 5008B?	0	2	0	1	0	4	-	-	-	-	-	-	0
D 5023S?	0	2	0	2	0	4	-	-	-	-	-	-	0
E 5059S	1	2	1	2	2	4	-	-	-	-	-	-	0
F 5105S	0	2	0	1	2	4	-	-	-	-	-	-	0
G 5125S?	1	2	0	2	2	4	-	-	-	-	-	-	80
H 5154H	5	7	3	4	4	13	0.2	0	1	35	171	13	0
I 5162H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20240	(FLIGHT	5)											
A 4274B?	0	2	0	1	2	4	-	-	-	-	-	-	220
B 4077D	14	9	9	13	25	18	14.0	32	1	81	238	32	0
C 4032B?	0	7	0	6	3	30	0.4	15	1	121	977	20	60
D 3990S?	0	2	0	1	0	2	-	-	-	-	-	-	0
E 3944B?	3	9	3	12	14	30	1.6	16	1	46	341	4	0
F 3941B?	1	2	1	2	2	4	-	-	-	-	-	-	0
G 3888S?	0	2	0	2	2	4	-	-	-	-	-	-	0
H 3861S?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20250	(FLIGHT	5)											
A 3390S?	0	2	0	2	1	4	-	-	-	-	-	-	0
B 3414S	0	2	0	2	1	4	-	-	-	-	-	-	5
C 3466S?	1	2	0	2	1	4	-	-	-	-	-	-	360
D 3499B	7	3	2	4	10	11	19.6	57	1	123	827	18	0
E 3591S?	0	2	0	2	2	4	-	-	-	-	-	-	0
F 3635B	5	6	1	5	14	13	4.8	16	1	58	722	0	0
G 3708H	0	2	0	2	2	4	-	-	-	-	-	-	0
H 3736S	0	2	0	2	2	4	-	-	-	-	-	-	0
I 3752H	2	5	2	6	12	18	1.3	14	1	68	419	8	0
LINE 20260	(FLIGHT	5)											
A 2495S?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20261	(FLIGHT	5)											
A 2647S?	0	2	0	2	0	4	-	-	-	-	-	-	0
B 2638B	0	4	0	3	0	9	0.4	3	1	129	1012	0	490
LINE 20262	(FLIGHT 5)												
F 2815D	12	8	12	4	20	13	12.5						
LINE 20270	(FLIGHT	5)											
A 1533H	5	8	141	8	40	8	3.6	7	44	7	1	4	0
B 1557H	32	18	73	48	84	1	20.5	0	7	14	4	0	0
LINE 20271	(FLIGHT	5)											
A 1742S	0	2	0	2	1	4	-	-	-	-	-	-	0

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	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20271	(FLIGHT	5)											
B 1827S?	0	2	0	1	0	4	-	-	-	-	-	-	0
C 1929H	1	2	1	1	2	4	-	-	-	-	-	-	0
D 2005S?	0	2	0	2	0	4	-	-	-	-	-	-	160
E 2064S	1	2	1	2	2	2	-	-	-	-	-	-	0
F 2150S?	0	2	0	2	1	4	-	-	-	-	-	-	0
G 2224B?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20280	(FLIGHT	5)											
A 802B?	3	5	1	4	5	7	3.2	38	1	82	332	27	0
LINE 20281	(FLIGHT	5)											
A 1452H	1234	148	935	560	2173	156	623.0	0	33	8	1	5	0
B 1160B	8	3	3	1	7	5	19.6	15	1	117	1012	0	0
LINE 20290	(FLIGHT	11)											
A 880H	106	25	559	156	95	13	103.2	2	41	8	1	5	0
B 786S?	0	2	0	2	1	4	-	-	-	-	-	-	260
C 634B	11	7	0	4	7	7	11.6	26	1	158	1012	0	0
D 383H	5	7	0	6	11	6	3.3	26	1	37	720	0	0
E 363B?	0	2	0	2	2	4	-	-	-	-	-	-	210
LINE 20300	(FLIGHT	10)											
A 5508E	1	1	1	2	2	4	-	-	-	-	-	-	0
B 5541B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 5624S	0	2	0	2	2	3	-	-	-	-	-	-	0
D 5659S?	0	2	0	2	2	4	-	-	-	-	-	-	110
E 5685H	1	2	0	2	2	4	-	-	-	-	-	-	0
F 5774S?	1	2	0	2	2	4	-	-	-	-	-	-	0
G 5851B?	0	23	0	13	0	32	0.4	21	1	88	809	18	0
H 5854B?	0	10	0	13	0	32	0.4	21	1	112	907	23	0
LINE 20310	(FLIGHT	10)											
A 5410S	0	2	0	2	2	4	-	-	-	-	-	-	20
B 5378S?	0	2	0	2	0	4	-	-	-	-	-	-	80
C 5326B?	4	4	2	8	21	10	5.2	4	1	23	517	0	0
D 5272B?	0	2	0	2	0	4	-	-	-	-	-	-	0
E 5222S?	1	2	1	2	2	4	-	-	-	-	-	-	0
F 5174S	0	2	0	1	0	4	-	-	-	-	-	-	0
G 5152B?	0	4	0	1	0	8	0.4	8	1	217	1012	0	190
H 5025B?	2	9	0	7	5	17	1.2	28	1	92	855	13	60
I 5013S	1	2	0	2	2	4	-	-	-	-	-	-	0

* 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.

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               COAXIAL  COPLANAR  COPLANAR  .  VERTICAL   . HORIZONTAL CONDUCTIVE    MAG
               1077 HZ    880 HZ   7206 HZ  .    DIKE     .   SHEET       EARTH      CORR
                                            .             .
ANOMALY/  REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH
FID/INTERP PPM  PPM  PPM  PPM  PPM  PPM .SIEMEN    M .SIEMEN    M OHM-M     M    NT
 ---------                              .             .
LINE 20310   (FLIGHT  10)               .             .
 J  4982S    1    2    0    2    2    4 .    -     - .    -     -     -     -     0
 K  4972S?   0    2    0    2    2    4 .    -     - .    -     -     -     -   260
 L  4939S?   1    2    1    2    2    4 .    -     - .    -     -     -     -     0
 M  4920S?   1    2    0    2    2    4 .    -     - .    -     -     -     -     0
 ---------                              .             .
LINE 20320   (FLIGHT  10)               .             .
 A  4352H    5    2   14    2    9    1 .   1.0    0 .    8    14     1    11     0
 B  4360H    5    5    7    3   18    2 .   1.0    0 .    3    19     3    14     0
 C  4387S    1    2    0    2    2    4 .    -     - .    -     -     -     -     0
 D  4478B?   1    2    1    2    2    4 .    -     - .    -     -     -     -     0
 E  4747S    1    2    0    2    2    4 .    -     - .    -     -     -     -     0
 F  4766B?   4   17    0   24   30  117 .   1.3    8 .    1    19   497     0     0
 G  4779H    3    6    4    5   16   15 .   2.8   29 .    1    39   224     0     0
 H  4785H    1    2    1    2    2    3 .    -     - .    -     -     -     -     0
 ---------                              .             .
LINE 20330   (FLIGHT  10)               .             .
 A  4018B    9    7    6    7    9   14 .   8.2   17 .    1   107  1012     0     0
 B  4006B    4    6    8   11   12    8 .   2.5    0 .    1    59    74    21     0
 C  3945S?   0    2    0    1    0    3 .    -     - .    -     -     -     -     0
 D  3866S    1    2    0    2    2    4 .    -     - .    -     -     -     -     0
 E  3801B    2    9    0    9    4   41 .   1.1   16 .    1    52   734     0     0
 F  3766B?   1    2    0    2    2    4 .    -     - .    -     -     -     -   140
 G  3753H    7    9    5   11   28   18 .   4.5   21 .    1    38   206     0     0
 ---------                              .             .
LINE 20331   (FLIGHT  10)               .             .
 A  4312H  300   62  704  206  543   59 . 172.2    2 .   29     8     1     4     0
 B  4299E  167    4   44  328   50   18 . 999.0    0 .   29    11     1     7     0
 C  4192B    5    5    4    8   20    3 .   5.5   15 .    1    44   203     0     0
 D  4145B?   0    2    0    2    2    4 .    -     - .    -     -     -     -     0
 ---------                              .             .
LINE 20340   (FLIGHT  10)               .             .
 A  3166H  345   73  526  404  637   69 . 174.7    0 .   32     8     1     4     0
 B  3254H    7    4    7    9   21    4 .  12.3    0 .    1    42    85     2     0
 C  3261H    1    2    1    2    2    3 .    -     - .    -     -     -     -     0
 D  3497S    0    2    0    2    2    4 .    -     - .    -     -     -     -     0
 E  3577E    1    2    0    2    2    4 .    -     - .    -     -     -     -   160
 F  3583B?   1    2    1    2    2    4 .    -     - .    -     -     -     -     0
 G  3589B    9   11    7   12   39   39 .   5.2   21 .    1    27   186     0     0
 ---------                              .             .
LINE 20350   (FLIGHT  10)               .             .
 A  3073H  729   76 1141  313 1139   69 . 645.3    0 .   30    10     1     7     0

      .                                                  .
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      .  OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
      .  LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.    .
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	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20350 (FLIGHT 10)													
B 3060E	1	2	1	2	2	4	-	-	-	-	-	-	0
C 3010S	1	2	0	1	0	4	-	-	-	-	-	-	0
D 2980B	11	4	8	11	20	2	27.6	0	1	14	310	0	0
E 2975B?	1	2	1	2	2	4	-	-	-	-	-	-	0
F 2912B	4	7	0	5	9	30	2.9	41	1	152	1012	0	0
G 2762B?	0	14	0	10	0	34	0.4	28	1	110	871	28	13
H 2728B?	0	2	0	2	0	4	-	-	-	-	-	-	0
I 2587S	1	2	0	2	2	4	-	-	-	-	-	-	0
J 2551B?	1	2	0	2	2	4	-	-	-	-	-	-	0
K 2541B?	1	2	1	2	2	4	-	-	-	-	-	-	0
L 2532H	6	7	4	7	14	27	4.3	18	1	27	241	0	0
M 2525B?	7	8	4	2	26	14	1.0	0	1	34	124	13	0
N 2519E	7	4	2	7	3	14	11.2	41	1	72	337	19	0
O 2503S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20360 (FLIGHT 10)													
A 1968B?	4	9	7	11	5	21	2.2	26	1	50	423	7	0
B 1978B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2080B?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20361 (FLIGHT 10)													
A 2355S	1	2	0	2	2	4	-	-	-	-	-	-	0
B 2359S?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2367B?	3	10	5	12	4	23	1.7	8	1	40	213	1	0
D 2373B?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20370 (FLIGHT 10)													
A 1486S?	1	2	0	2	2	1	-	-	-	-	-	-	0
B 1468S	0	2	0	2	2	4	-	-	-	-	-	-	0
C 1384B	1	2	1	2	1	3	-	-	-	-	-	-	0
D 1377B	6	2	5	0	2	7	17.1	49	1	30	233	0	0
LINE 20371 (FLIGHT 10)													
A 1809B	11	12	13	18	38	20	6.0	0	2	47	51	15	0
B 1751S?	0	7	0	6	0	23	0.4	0	1	41	883	0	0
C 1748S?	0	6	0	5	0	23	0.4	21	1	95	837	19	0
D 1744B?	0	2	0	2	0	4	-	-	-	-	-	-	520
E 1738S?	0	6	0	4	1	16	0.4	14	1	107	922	17	0
F 1719S?	1	2	0	2	2	4	-	-	-	-	-	-	6
LINE 20380 (FLIGHT 10)													
A 785B	16	6	33	26	9	18	28.5	13	1	59	63	25	0

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                COAXIAL  COPLANAR  COPLANAR .  VERTICAL   . HORIZONTAL CONDUCTIVE     MAG
                1077 HZ   880 HZ   7206 HZ .    DIKE     .   SHEET       EARTH      CORR
                                           .               .
 ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH
FID/INTERP PPM  PPM  PPM  PPM  PPM  PPM .SIEMEN    M .SIEMEN    M OHM-M     M      NT
----------                                 .               .
LINE 20380    (FLIGHT   10)                .               .
 B    789H   19   11   33   26   47   18 .  17.6     6 .    4    50    12    28      0
 C    791B   13    8   33   26   47    4 .  12.6     0 .    3    22    15     0      0
----------                                 .               .
LINE 20381    (FLIGHT   10)                .               .
 A   967B?    0    8    0   12    5   26 .   0.4    24 .    1    63   700    14     17
 B  1138S?    1    2    1    2    2    4 .     -     - .    -     -     -     -      0
 C  1147S     1    2    0    2    2    1 .     -     - .    -     -     -     -     19
 D  1172B?    1    2    1    2    2    4 .     -     - .    -     -     -     -      0
 E  1176S?    1    2    1    2    1    4 .     -     - .    -     -     -     -      0
 F  1181S?    1    2    1    2    2    4 .     -     - .    -     -     -     -      0
----------                                 .               .
LINE 20390    (FLIGHT   10)                .               .
 A    394S?   1    2    0    2    0    4 .     -     - .    -     -     -     -      0
 B    384S?   0    2    0    2    0    4 .     -     - .    -     -     -     -      0
 C    291H    1    2    0    2    2    4 .     -     - .    -     -     -     -      0
 D    262S?   1    2    0    2    2    4 .     -     - .    -     -     -     -    100
 E    251B    0   16    0   14    0   27 .   0.4    12 .    1    54   710     2    610
 F    234H    8   10    5   16   11   43 .   4.5    28 .    1    32   369     0      8
 G    226H    7    3    5    4    7    2 .   1.0     0 .    1    33   129    13      0
----------                                 .               .
LINE 20400    (FLIGHT    9)                .               .
 A  6074H    62    9  137   19   86   14 . 178.2     0 .   29    10     1     6      0
 B  6081H    36    2   38   44   55   29 . 514.0     9 .   10    11     1     2      0
----------                                 .               .
LINE 20401    (FLIGHT    9)                .               .
 A  6249S?    0    2    1    2    2    4 .     -     - .    -     -     -     -      0
 B  6351S     0    2    0    1    1    4 .     -     - .    -     -     -     -      0
 C  6399S     1    2    0    2    2    4 .     -     - .    -     -     -     -      0
 D  6455H     5    5    2    6   14   18 .   5.4    13 .    1    45   211     0      0
----------                                 .               .
LINE 20410    (FLIGHT    9)                .               .
 A  6019H   819  128 1250  557 1332  146 . 366.4     0 .   26     7     1     3      0
 B  5952S     0    2    0    2    2    4 .     -     - .    -     -     -     -      0
 C  5744S     1    2    0    2    2    4 .     -     - .    -     -     -     -      0
 D  5718S     1    2    0    2    2    4 .     -     - .    -     -     -     -      0
 E  5671S     0    2    0    2    1    4 .     -     - .    -     -     -     -     90
 F  5625H     3    7    2    7   26   14 .   2.3    18 .    1    46   240     3     20
 G  5559S?    1    2    0    2    2    4 .     -     - .    -     -     -     -      0
----------                                 .               .
LINE 20420    (FLIGHT    9)                .               .
 A  5073H    23    8  114   37   85   11 .  38.1     0 .   20     5     1     0      0
      .                                                              .
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      .  OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
      .  LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.    .
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ANOMALY/ FID/INTERP	COAXIAL 1077 HZ REAL PPM	COAXIAL 1077 HZ QUAD PPM	COPLANAR 880 HZ REAL PPM	COPLANAR 880 HZ QUAD PPM	COPLANAR 7206 HZ REAL PPM	COPLANAR 7206 HZ QUAD PPM	VERTICAL DIKE COND SIEMEN	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND SIEMEN	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M	MAG CORR NT
LINE 20420	(FLIGHT	9)											
B 5076E	22	7	114	37	85	11	39.3	0	5	10	8	0	0
C 5473H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20430	(FLIGHT	9)											
A 4496H	221	22	261	93	264	15	458.9	0	29	7	1	3	30
B 4481E	32	7	70	27	45	11	73.7	0	4	13	10	0	0
C 4419S?	0	2	0	2	0	4	-	-	-	-	-	-	0
D 4238S?	0	2	0	2	0	1	-	-	-	-	-	-	0
E 4002H	1	2	1	2	2	4	-	-	-	-	-	-	0
F 3941B?	1	2	0	2	2	4	-	-	-	-	-	-	0
G 3928S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20440	(FLIGHT	9)											
A 3590S	0	1	0	2	0	4	-	-	-	-	-	-	5
B 3786S?	1	2	1	2	2	1	-	-	-	-	-	-	0
C 3803S	1	2	1	2	2	4	-	-	-	-	-	-	10
D 3839S?	1	1	1	2	2	3	-	-	-	-	-	-	7
E 3871S?	3	8	2	15	9	13	1.6	29	1	35	416	1	0
F 3878S?	5	12	3	16	9	81	2.1	7	1	33	354	0	0
LINE 20441	(FLIGHT	9)											
A 4647H	21	13	74	27	44	4	15.8	0	19	7	1	1	0
B 4654E	56	17	96	63	95	13	55.0	0	3	25	19	1	0
LINE 20450	(FLIGHT	9)											
A 3020S	1	2	1	2	2	2	-	-	-	-	-	-	0
B 2994S?	1	2	1	2	1	4	-	-	-	-	-	-	0
C 2949S?	1	2	1	2	2	3	-	-	-	-	-	-	0
D 2930B	14	28	3	24	54	127	3.7	11	1	14	356	0	0
LINE 20451	(FLIGHT	9)											
A 3161S?	0	2	0	1	1	4	-	-	-	-	-	-	0
LINE 20452	(FLIGHT	9)											
A 3388S?	0	1	0	1	0	4	-	-	-	-	-	-	230
LINE 20453	(FLIGHT	9)											
A 4937B?	10	4	11	11	20	10	18.6	0	2	53	56	17	30
B 4919H	193	51	220	388	767	366	104.2	0	4	8	8	0	0
C 4838S?	1	2	0	2	1	4	-	-	-	-	-	-	0
D 4832S?	1	2	0	2	1	4	-	-	-	-	-	-	7

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	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20460	(FLIGHT		9)										
A 2247H	3	24	34	51	80	3	0.6	0	2	3	30	0	0
LINE 20461	(FLIGHT		9)										
A 2412S	0	1	1	2	2	4	-	-	-	-	-	-	0
B 2746S?	1	2	1	2	2	4	-	-	-	-	-	-	14
C 2805D	8	12	1	9	13	40	4.0	1	1	32	407	0	0
LINE 20470	(FLIGHT		9)										
A 1722H	1	2	1	1	2	4	-	-	-	-	-	-	0
B 1687H	1	2	1	2	2	0	-	-	-	-	-	-	0
C 1676S	1	2	0	2	2	4	-	-	-	-	-	-	11
LINE 20471	(FLIGHT		9)										
A 2151H	12	10	6	16	41	24	8.5	0	1	5	221	0	0
B 2105D	13	12	3	7	12	15	8.4	14	1	95	991	0	0
C 2096S?	1	2	1	0	2	4	-	-	-	-	-	-	14
D 2088B?	1	2	0	2	2	4	-	-	-	-	-	-	0
E 2081S?	0	5	0	4	0	19	0.4	13	1	140	1012	0	0
F 2014S	0	2	0	1	0	4	-	-	-	-	-	-	20
G 1900S?	0	1	0	2	2	4	-	-	-	-	-	-	0
LINE 20481	(FLIGHT		9)										
A 1106S	0	1	0	1	0	4	-	-	-	-	-	-	50
LINE 20490	(FLIGHT		9)										
A 415S?	1	2	0	2	2	4	-	-	-	-	-	-	0
B 352S?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20491	(FLIGHT		9)										
A 757H	1	2	1	2	2	3	-	-	-	-	-	-	0
B 721H	2	1	0	1	1	7	0.1	0	1	167	5214	0	0
C 688B	5	11	0	17	32	53	2.2	20	1	56	762	0	0
D 682D	8	6	1	17	9	10	8.3	37	1	127	1012	0	30
E 671S	1	2	1	2	2	4	-	-	-	-	-	-	0
F 653S?	0	2	0	1	0	4	-	-	-	-	-	-	0
LINE 20500	(FLIGHT		8)										
A 2444D	7	5	1	3	9	2	9.8	7	1	171	1012	0	160
B 2499S?	0	2	0	2	2	4	-	-	-	-	-	-	110
C 2613S	1	2	0	2	2	4	-	-	-	-	-	-	0
D 2638S?	1	2	0	2	2	4	-	-	-	-	-	-	0

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	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20511 (FLIGHT 8)													
A 2072S	4	3	1	1	3	5	7.9	48	1	143	757	22	0
B 2030S?	0	2	0	2	0	3	-	-	-	-	-	-	600
LINE 20512 (FLIGHT 8)													
A 2275B?	0	2	0	2	2	4	-	-	-	-	-	-	150
LINE 20520 (FLIGHT 8)													
A 1658B?	0	2	0	2	0	4	-	-	-	-	-	-	50
B 1724S	1	2	0	2	2	4	-	-	-	-	-	-	0
C 1775S	1	1	0	2	2	4	-	-	-	-	-	-	0
D 1806S?	0	2	0	2	0	4	-	-	-	-	-	-	400
LINE 20531 (FLIGHT 8)													
A 1525B	1	2	0	2	2	4	-	-	-	-	-	-	0
B 1504S?	0	2	0	2	0	4	-	-	-	-	-	-	0
C 1426S?	1	2	0	2	0	4	-	-	-	-	-	-	40
D 1416S?	1	2	0	2	0	4	-	-	-	-	-	-	0
E 1378S	1	1	0	0	1	4	-	-	-	-	-	-	130
LINE 20540 (FLIGHT 8)													
A 865S?	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20550 (FLIGHT 8)													
A 400S	1	2	1	2	1	4	-	-	-	-	-	-	0
B 269B?	1	1	1	2	2	4	-	-	-	-	-	-	0
C 258B?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 20560 (FLIGHT 7)													
A 5440S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 5475S	0	1	0	1	2	4	-	-	-	-	-	-	0
LINE 20570 (FLIGHT 7)													
A 5244S?	0	2	0	1	0	4	-	-	-	-	-	-	0
B 5232S?	0	2	0	2	0	4	-	-	-	-	-	-	30
C 5198S	1	2	0	2	1	4	-	-	-	-	-	-	0
LINE 20580 (FLIGHT 7)													
A 4938S?	0	2	0	2	0	4	-	-	-	-	-	-	50
B 4974S?	0	2	0	2	0	4	-	-	-	-	-	-	210
C 4998S	1	2	0	2	2	4	-	-	-	-	-	-	0
D 5021S?	0	2	0	2	1	4	-	-	-	-	-	-	0

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	COAXIAL 1077 HZ		COPLANAR 880 HZ		COPLANAR 7206 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG CORR
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND SIEMEN	DEPTH* M	COND SIEMEN	DEPTH M	RESIS OHM-M	DEPTH M	NT
LINE 20590	(FLIGHT		7)										
A 4756S	0	2	0	2	1	4	-	-	-	-	-	-	0
B 4693S?	0	2	0	2	2	4	-	-	-	-	-	-	280
LINE 20600	(FLIGHT		7)										
A 4513S	0	2	0	1	2	3	-	-	-	-	-	-	0
B 4544S?	0	1	0	1	2	4	-	-	-	-	-	-	160
C 4573S?	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20610	(FLIGHT		7)										
A 4366S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 4358B	0	10	0	7	0	12	0.4	14	1	107	917	17	230
LINE 29020	(FLIGHT		11)										
A 1654S	0	2	0	2	0	4	-	-	-	-	-	-	0
B 1591S	1	2	0	1	0	3	-	-	-	-	-	-	0
C 1322S?	0	2	0	1	0	4	-	-	-	-	-	-	0

* 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.