FILMED

Province of British Columbia

Ministry of Energy, Mines and Petroleum Resources

ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TYPE OF REPORT/SURVEY(S)	TOTAL COST
AIRBORNE GEOPHYSICAL	$71,750.00

AUTHOR(S) Paul A. Smith SIGNATURE(S) [signature], Senior Geologist for Paul A. Smith

DATE STATEMENT OF EXPLORATION AND DEVELOPMENT FILED March 28, 1994 YEAR OF WORK 1993

PROPERTY NAME(S) ICE PROPERTY

COMMODITIES PRESENT diamond prospect

B.C. MINERAL INVENTORY NUMBER(S), IF KNOWN

MINING DIVISION Fort Steele NTS 82G/15W & 82J/2W

LATITUDE 50°05'N LONGITUDE 114°58'W

NAMES and NUMBERS of all mineral tenures in good standing (when work was done) that form the property [Examples: TAX 1-4, FIRE 2 (12 units); PHOENIX (Lot 1706); Mineral Lease M 123; Mining or Certified Mining Lease ML 12 (claims involved)]:

Ice 1-49, Gem 1-4, Gten 1-20, Pipe 1-15 (totalling 517 units)

OWNER(S)

(1) CONSOLIDATED RAMROD GOLD CORP. (2)

MAILING ADDRESS

104, 135 10th Avenue South
Cranbrook, B.C. V1C 2N1

OPERATOR(S) (that is, Company paying for the work)

(1) as above (2)

MAILING ADDRESS

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

The lithology is dominated by Ordivician to Jurassic aged sedimentary rocks. The main rock types are limestones, dolomites, and shales. The formations of interest are kimberlite and lamproite intrusions. A known occurrence on the property is conjectured to be of Permian age or younger.

REFERENCES TO PREVIOUS WORK

(over)

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	COST APPORTIONED
GEOLOGICAL (scale, area)			
Ground			
Photo			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne	435 km	Ice 1-22, Ice 24-33, Ice 35-41; Gten 1-20; Pipe 1-15	$71,750.00
GEOCHEMICAL (number of samples analysed for ....)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralogic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY/PHYSICAL			
Legal surveys (scale, area)			
Topographic (scale, area)			
Photogrammetric (scale, area)			
Line/grid (kilometres)			
Road, local access (kilometres)			
Trench (metres)			
Underground (metres)			
		TOTAL COST	$71,750.00

FOR MINISTRY USE ONLY	NAME OF PAC ACCOUNT	DEBIT	CREDIT	REMARKS:
Value work done (from report)				
Value of work approved				
Value claimed (from statement)				
Value credited to PAC account				
Value debited to PAC account				
Accepted .... Date	Rept. No.			Information Class

ASSESSMENT REPORT ON DIGHEM^{V} AIRBORNE GEOPHYSICAL SURVEY

FOR

CONSOLIDATED RAMROD GOLD CORPORATION

ICE PROPERTY

ICE, GTEN AND PIPE CLAIMS
ELKFORD AREA

FORT STEELE MINING DIVISION

NTS 82 G/14, 15 and 82J/2, 3

Latitude: 50° 05'N

Longitude: 114° 58'W

OWNER AND OPERATOR

CONSOLIDATED RAMROD GOLD CORP.

Suite 104, 135 - 10th Avenue South
Cranbrook, B.C.
V1C 2N1

Work performed during November 1993

Dighem, A division of CCG Canada Ltd.
Mississauga, Ontario
January 28, 1994

Paul A. Smith
Geophysicist

SUMMARY

This report describes the logistics and results of a DIGHEM^{V} airborne geophysical survey carried out for Consolidated Ramrod Gold Corporation over three properties located near Elkford, British Columbia. Total coverage of the three survey blocks amounted to 435 km. The survey was flown from November 1 to November 6, 1994.

The primary objective of the survey was to locate anomalous resistivity/magnetic patterns which might reflect kimberlite diatremes. Secondary objectives were to detect zones of conductive mineralization and to provide information that could be used to map the geology and structure of the survey areas. This was accomplished by using a DIGHEM^{V} multi-coil, multi-frequency electromagnetic system, supplemented by a high sensitivity Cesium magnetometer and a four-channel VLF receiver. The information from these sensors was processed to produce maps which display the magnetic and conductive properties of the three blocks. A GPS electronic navigation system, utilizing a UHF link, ensured accurate positioning of the geophysical data with respect to the base maps. Visual flight path recovery techniques were used to confirm the location of the helicopter where visible topographic features could be identified on the ground.

Each of the three properties contains plug-like magnetic highs or lows, which might be indicative of intrusive pipes. In addition, the properties contain several anomalous features, some of which are considered to be of moderate to high priority as exploration targets. Most of the inferred bedrock conductors appear to warrant further

investigation using appropriate surface exploration techniques. Areas of interest may be assigned priorities on the basis of supporting geophysical, geochemical and/or geological information. After initial investigations have been carried out, it may be necessary to re-evaluate the remaining anomalies based on information acquired from the follow-up program.

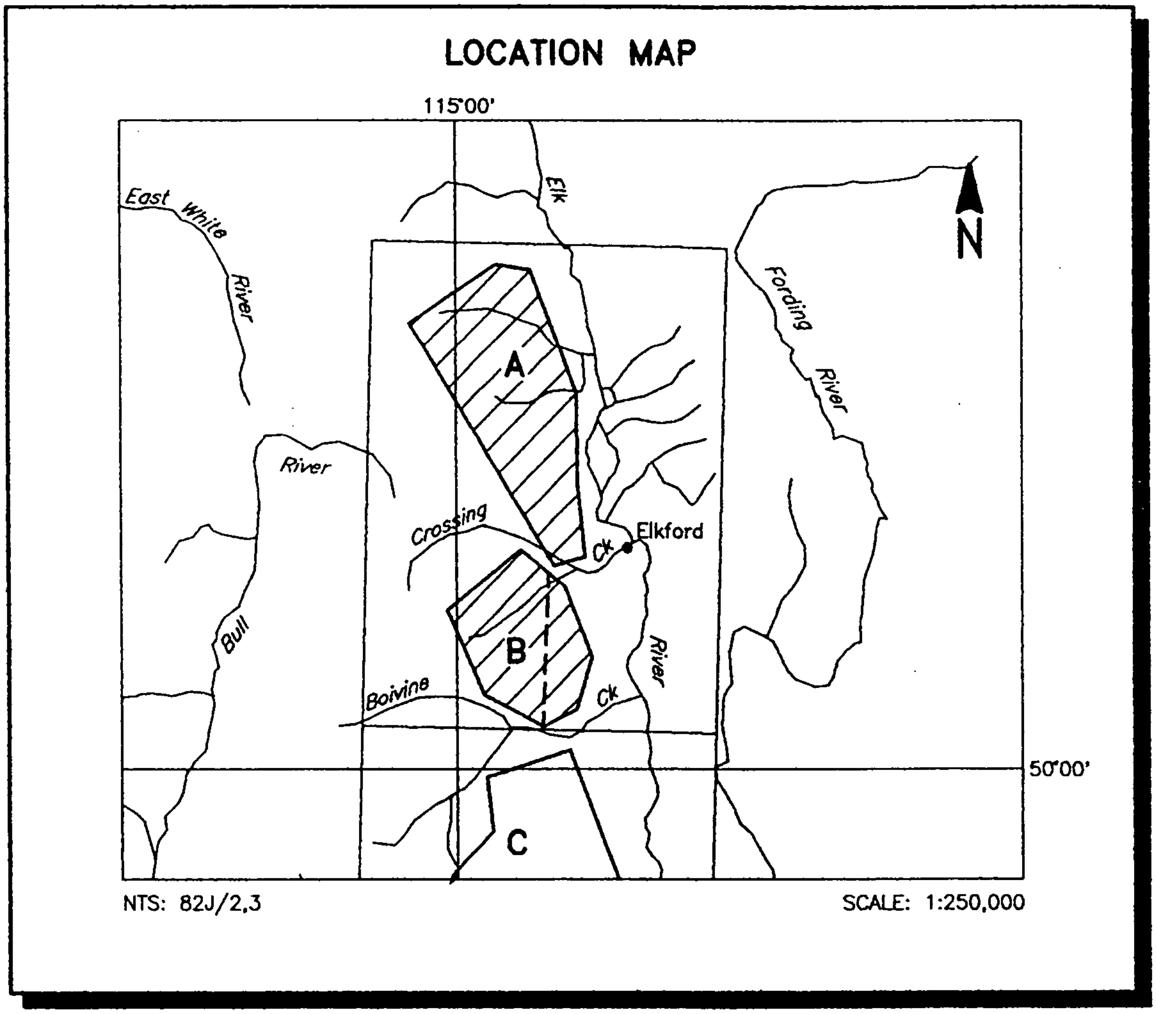

FIGURE 1

CONSOLIDATED RAMROD GOLD CORPORATION

ELKFORD, B.C. - AREAS A AND B - 1154

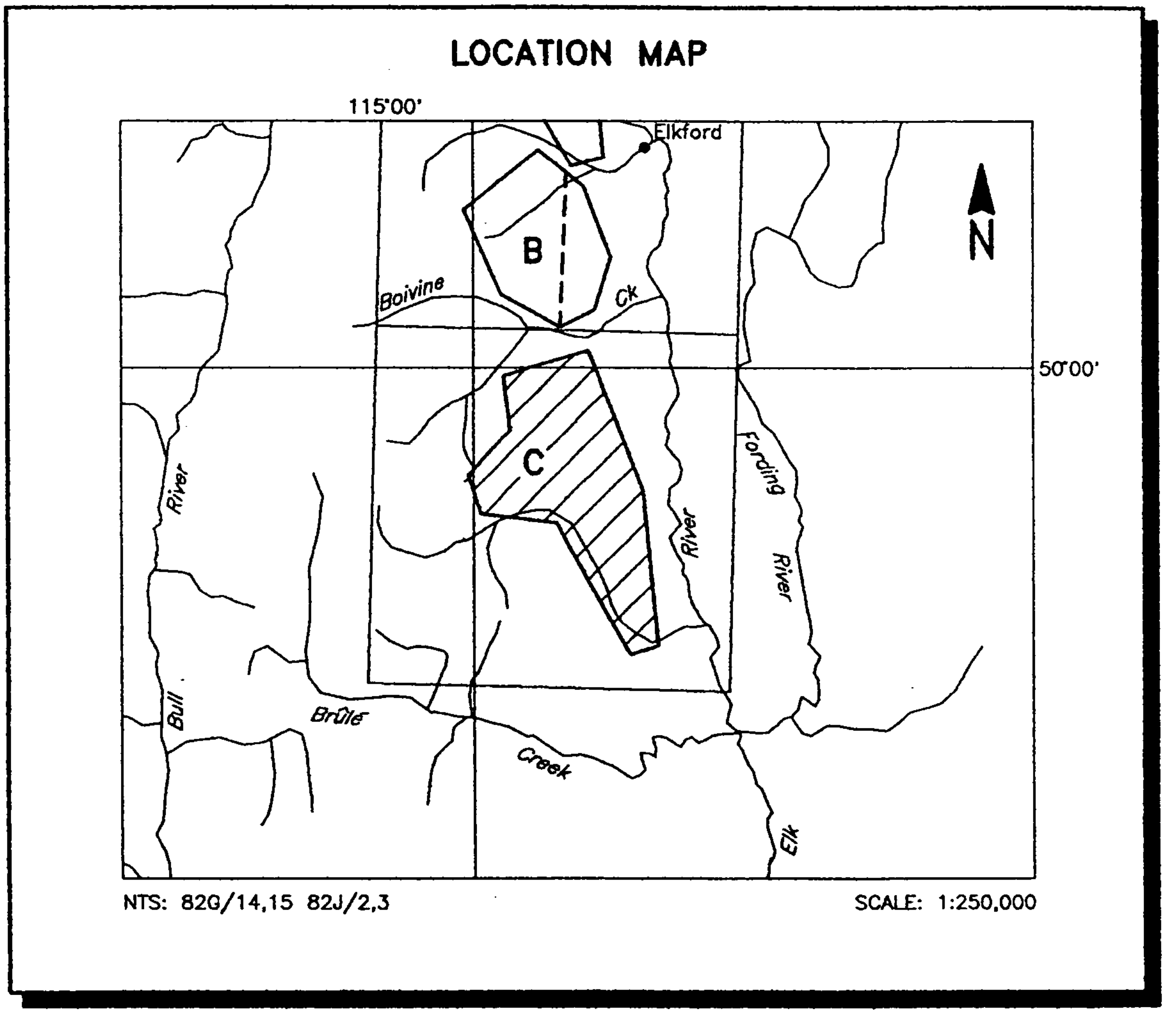

FIGURE 2

CONSOLIDATED RAMROD GOLD CORPORATION

ELKFORD, B.C. - AREA C - 1154

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INTRODUCTION

A DIGHEM^{V} electromagnetic/resistivity/magnetic/VLF survey was flown for Consolidated Ramrod Gold Corporation from November 1 to November 6, 1993, over three survey blocks located near Elkford, British Columbia. The survey areas can be located on NTS map sheets 82G/14,15 and 82J/2,3 (see Figure 1).

Survey coverage consisted of approximately 435 line-km, including tie lines. Flight lines were flown in an azimuthal direction of 155° with a line separation of 200 metres for Blocks A and C. For Block B, two line directions of 315° and 090° were necessary to get complete coverage, with a line spacing of 200 m.

The survey employed the DIGHEM^{V} electromagnetic system. Ancillary equipment consisted of a magnetometer, radar altimeter, video camera, analog and digital recorders, a VLF receiver and an electronic navigation system. Details on the survey equipment are given in Section 2.

The instrumentation was installed in an Aerospatiale AS350B turbine helicopter (Registration C-FSWH) which was provided by Hi-Wood Helicopters Ltd. The helicopter flew at an average airspeed of 57 km/h with an EM bird height of approximately 30 m.

Section 2 also provides details on the data channels, their respective sensitivities, and the navigation/flight path recovery procedure. Noise levels of less than 2 ppm are generally maintained for wind speeds up to 35 km/h. Higher winds may cause the system to be grounded because excessive bird swinging produces difficulties in flying the helicopter. The swinging results from the 5 m^2 of area which is presented by the bird to broadside gusts.

In some portions of the survey area, the steep topography forced the pilot to exceed normal terrain clearance for reasons of safety. It is possible that some weak conductors may have escaped detection in areas where the bird height exceeded 120 m. In difficult areas where near-vertical climbs were necessary, the forward speed of the helicopter was reduced to a level which permitted excessive bird swinging. This problem, combined with the severe stresses to which the bird was subjected, gave rise to aerodynamic noise levels which are slightly higher than normal. Where warranted, reflights were carried out to minimize these adverse effects.

SURVEY EQUIPMENT

This section provides a brief description of the geophysical instruments used to acquire the survey data:

Electromagnetic System

Model:	DIGHEM^{V}
Type:	Towed bird, symmetric dipole configuration operated at a nominal survey altitude of 30 metres. Coil separation is 8 metres for 900 Hz and 7200 Hz, and 6.3 metres for the 56,000 Hz coil-pair.
Coil orientations/frequencies:	coaxial / 900 Hz coplanar / 900 Hz coaxial / 5,500 Hz coplanar / 7,200 Hz coplanar / 56,000 Hz
Channels recorded:	5 inphase channels 5 quadrature channels 2 monitor channels
Sensitivity:	0.1 ppm at 900 Hz 0.2 ppm at 7,200 Hz 0.5 ppm at 56,000 Hz
Sample rate:	10 per second

The electromagnetic system utilizes a multi-coil coaxial/coplanar technique to energize conductors in different directions. The coaxial coils are vertical with their axes in the flight direction. The coplanar coils are horizontal. The secondary fields are sensed simultaneously by means of receiver coils which are maximum coupled to their respective transmitter coils. The system yields an inphase and a quadrature channel from each transmitter-receiver coil-pair.

Magnetometer

Model:	Picodas 3340
Type:	Optically pumped Cesium vapour
Sensitivity:	0.01 nT
Sample rate:	10 per second

The magnetometer sensor is towed in a bird 20 m below the helicopter.

Magnetic Base Station

Model:	Scintrex MP-3
Type:	Digital recording proton precession
Sensitivity:	0.10 nT
Sample rate:	0.2 per second

A digital recorder is operated in conjunction with the base station magnetometer to record the diurnal variations of the earth's magnetic field. The clock of the base station is synchronized with that of the airborne system to permit subsequent removal of diurnal drift.

VLF System

Manufacturer:	Herz Industries Ltd.		
Type:	Totem-2A		
Sensitivity:	0.1%		
Stations:	Seattle, Washington;	NLK,	24.8 kHz
	Annapolis, Maryland;	NSS,	21.4 kHz
	Cutler, Maine;	NAA,	24.0 kHz

The VLF receiver measures the total field and vertical quadrature components of the secondary VLF field. Signals from two separate transmitters can be measured simultaneously. The VLF sensor is housed in the same bird as the magnetic sensor, and is towed 20 m below the helicopter.

Radar Altimeter

Manufacturer:	Honeywell/Sperry
Type:	AA 220
Sensitivity:	1 ft

The radar altimeter measures the vertical distance between the helicopter and the ground. This information is used in the processing algorithm which determines conductor depth.

Analog Recorder

Manufacturer:	RMS Instruments
Type:	DGR33 dot-matrix graphics recorder
Resolution:	4x4 dots/mm
Speed:	1.5 mm/sec

The analog profiles are recorded on chart paper in the aircraft during the survey. Table 2-1 lists the geophysical data channels and the vertical scale of each profile.

Table 2-1. The Analog Profiles

Channel Name	Parameter	Scale units/mm	Designation on digital profile
1X9I	coaxial inphase (900 Hz)	2.5 ppm	CXI (900 Hz)
1X9Q	coaxial quad (900 Hz)	2.5 ppm	CXQ (900 Hz)
3P9I	coplanar inphase (900 Hz)	2.5 ppm	CPI (900 Hz)
3P9Q	coplanar quad (900 Hz)	2.5 ppm	CPQ (900 Hz)
2P7I	coplanar inphase (7200 Hz)	5 ppm	CPI (7200 Hz)
2P7Q	coplanar quad (7200 Hz)	5 ppm	CPQ (7200 Hz)
4X7I	coaxial inphase (5500 Hz)	5 ppm	CXI (5500 Hz)
4X7Q	coaxial quad (5500 Hz)	5 ppm	CXQ (5500 Hz)
5P5I	coplanar inphase(56000 Hz)	10 ppm	CPI (56 kHz)
5P5Q	coplanar quad (56000 Hz)	10 ppm	CPQ (56 kHz)
ALTR	altimeter	3 m	ALT
CMGC	magnetics, coarse	20 nT	MAG
CMGF	magnetics, fine	2.0 nT	
VF1T	VLF-total: primary stn.	2%	
VF1Q	VLF-quad: primary stn.	2%	
VF2T	VLF-total: secondary stn.	2%	
VF2Q	VLF-quad: secondary stn.	2%	
CXSP	coaxial sferics monitor		CXS
CXPL	coaxial powerline monitor		CXP

Table 2-2. The Digital Profiles

Channel Name (Freq)	Observed parameters	Scale units/mm
MAG	magnetics	10 nT
ALT	bird height	6 m
CXI (900 Hz)	vertical coaxial coil-pair inphase	2 ppm
CXQ (900 Hz)	vertical coaxial coil-pair quadrature	2 ppm
CPI (900 Hz)	horizontal coplanar coil-pair inphase	2 ppm
CPQ (900 Hz)	horizontal coplanar coil-pair quadrature	2 ppm
CXI (5500 Hz)	vertical coaxial coil-pair inphase	4 ppm
CXQ (5500 Hz)	vertical coaxial coil-pair quadrature	4 ppm
CPI (7200 Hz)	horizontal coplanar coil-pair inphase	4 ppm
CPQ (7200 Hz)	horizontal coplanar coil-pair quadrature	4 ppm
CPI (56 kHz)	horizontal coplanar coil-pair inphase	10 ppm
CPQ (56 kHz)	horizontal coplanar coil-pair quadrature	10 ppm
CXS	coaxial sferics monitor	
CXP	coaxial powerline monitor	
	Computed Parameters	
DFI (900 Hz)	difference function inphase from CXI and CPI	2 ppm
DFQ (900 Hz)	difference function quadrature from CXQ and CPQ	2 ppm
RES (900 Hz)	log resistivity	.06 decade
RES (7200 Hz)	log resistivity	.06 decade
RES (56 kHz)	log resistivity	.06 decade
DP (900 Hz)	apparent depth	6 m
DP (7200 Hz)	apparent depth	6 m
DP (56 kHz)	apparent depth	6 m
CDT	conductance	1 grade

Digital Data Acquisition System

Manufacturer: RMS Instruments

Type: DGR 33

Tape Deck: RMS TCR-12, 6400 bpi, tape cartridge recorder

The digital data are used to generate several computed parameters. Both measured and computed parameters are plotted as "multi-channel stacked profiles" during data processing. These parameters are shown in Table 2-2. In Table 2-2, the log resistivity scale of 0.06 decade/mm means that the resistivity changes by an order of magnitude in 16.6 mm. The resistivities at 0, 33 and 67 mm up from the bottom of the digital profile are respectively 1,100 and 10,000 ohm-m.

Tracking Camera

Type: Panasonic Video

Model: AG 2400/WVCD132

Fiducial numbers are recorded continuously and are displayed on the margin of each image. This procedure ensures accurate correlation of analog and digital data with respect to visible features on the ground.

Navigation System (RT-DGPS)

Model:	Sercel NR106, Real-time differential positioning
Type:	SPS (L1 band), 10-channel, C/A code, 1575.42 MHz.
Sensitivity:	-132 dBm, 0.5 second update
Accuracy:	< 5 metres in differential mode, ± 50 metres in S/A (non differential) mode

The Global Positioning System (GPS) is a line of sight, satellite navigation system which utilizes time-coded signals from at least four of the twenty-four NAVSTAR satellites. In the differential mode, two GPS receivers are used. The base station unit is used as a reference which transmits real-time corrections to the mobile unit in the aircraft, via a UHF radio datalink. The on-board system calculates the flight path of the helicopter while providing real-time guidance. The raw XYZ data are recorded for both receivers, thereby permitting post-survey processing for accuracies of approximately 2 metres.

Although the base station receiver is able to calculate its own latitude and longitude, a higher degree of accuracy can be obtained if the reference unit is established on a known benchmark or triangulation point. The GPS records data relative to the WGS84 ellipsoid, which is the basis of the revised North American Datum (NAD83).

Conversion software is used to transform the WGS84 coordinates to the system displayed on the base maps.

Field Workstation

Manufacturer:	Dighem
Model:	FWS: V2.41
Type:	80386 based P.C.

A portable PC-based field workstation is used at the survey base to verify data quality and completeness. Flight tapes are dumped to a hard drive to permit the creation of a database. This process allows the field operators to display both the positional (flight path) and geophysical data on a screen or printer.

PRODUCTS AND PROCESSING TECHNIQUES

The following products are available from the survey data. Those which are not part of the survey contract may be acquired later. Refer to Table 3-1 for a summary of the maps which accompany this report, some of which may be sent under separate cover. Most parameters can be displayed as contours, profiles, or in colour.

Base Maps

Base maps of the survey area have been produced from published topographic maps. These provide a relatively accurate, distortion-free base which facilitates correlation of the navigation data to the UTM grid. Photomosaics are useful for visual reference and for subsequent flight path recovery, but usually contain scale distortions. Orthophotos are ideal, but their cost and the time required to produce them, usually precludes their use as base maps.

Electromagnetic Anomalies

Anomalous electromagnetic responses are selected and analysed by computer to provide a preliminary electromagnetic anomaly map. This preliminary map is used, by the geophysicist, in conjunction with the computer-generated digital profiles, to produce

Table 3-1 Survey Products

Preliminary Maps @ 1:20,000 (2 map sheets)

- Resistivity (7200 Hz)
- Total field magnetics
- Enhanced magnetics

Final Transparencies (+2 prints x 2 map sheets @ 1:20,000)

- Electromagnetic anomaly maps
- Resistivity contours (7200 Hz)
- Resistivity contours (56,000 Hz)
- Total field magnetics
- Enhanced magnetics

Colour Plots (2 sets x 2 sheets @ 1:20,000)

- All contoured parameters listed above
- Shadowed magnetic maps

Other Products

- Multi-parameter stacked profiles
- Analog chart records
- Flight path video cassettes
- Digital profile archive (Backpack)
- Digital grid archive (3½" floppies)
- Survey Report (2 copies)

Optional Parameters

- Resistivity maps (900 Hz)
- VLF maps
- Vertical magnetic derivatives
- Upward or downward continuations
- Colour or shadow maps

Note: Final transparencies consist of geophysical parameters combined with EM, flight lines and the topographic base. Clear overlays of the geophysical parameters are also supplied.

the final interpreted EM anomaly map. This map includes bedrock surficial and cultural conductors. A map containing only bedrock conductors can be generated, if desired.

Resistivity

The apparent resistivity in ohm-m may be generated from the inphase and quadrature EM components for any of the frequencies, using a pseudo-layer halfspace model. A resistivity map portrays all the EM information for that frequency over the entire survey area. This contrasts with the electromagnetic anomaly map which provides information only over interpreted conductors. The large dynamic range makes the resistivity parameter an excellent mapping tool.

EM Magnetite

The apparent percent magnetite by weight is computed wherever magnetite produces a negative inphase EM response.

Total Field Magnetics

The aeromagnetic data are corrected for diurnal variation using the magnetic base station data. The regional IGRF can be removed from the data, if requested.

Enhanced Magnetics

The total field magnetic data are subjected to a processing algorithm. This algorithm enhances the response of magnetic bodies in the upper 500 m and attenuates the response of deeper bodies. The resulting enhanced magnetic map provides better definition and resolution of near-surface magnetic units. It also identifies weak magnetic features which may not be evident on the total field magnetic map. However, regional magnetic variations, and magnetic lows caused by remanence, are better defined on the total field magnetic map. The technique is described in more detail in Section 5.

Magnetic Derivatives

The total field magnetic data may be subjected to a variety of filtering techniques to yield maps of the following:

- first vertical derivative (vertical gradient)
- second vertical derivative
- magnetic susceptibility with reduction to the pole
- upward/downward continuations

All of these filtering techniques improve the recognition of near-surface magnetic bodies, with the exception of upward continuation. Any of these parameters can be produced on request. Dighem's proprietary enhanced magnetic technique is designed to provide a general "all-purpose" map, combining the more useful features of the above parameters.

VLF

The VLF data are digitally filtered to remove long wavelengths such as those caused by variations in the transmitted field strength.

Multi-channel Stacked Profiles

Distance-based profiles of the digitally recorded geophysical data are generated and plotted by computer. These profiles also contain the calculated parameters which are used in the interpretation process. These are produced as worksheets prior to interpretation, and can also be presented in the final corrected form after interpretation. The profiles display electromagnetic anomalies with their respective interpretive symbols. The differences between the worksheets and the final corrected form occur only with respect to the EM anomaly identifier.

Contour, Colour and Shadow Map Displays

The geophysical data are interpolated onto a regular grid using a modified Akima spline technique. The resulting grid is suitable for generating contour maps of excellent quality.

Colour maps are produced by interpolating the grid down to the pixel size. The parameter is then incremented with respect to specific amplitude ranges to provide colour "contour" maps. Colour maps of the total magnetic field are particularly useful in defining the lithology of the survey area.

Monochromatic shadow maps are generated by employing an artificial sun to cast shadows on a surface defined by the geophysical grid. There are many variations in the shadowing technique. These techniques may be applied to total field or enhanced magnetic data, magnetic derivatives, VLF, resistivity, etc. Of the various magnetic products, the shadow of the enhanced magnetic parameter is particularly suited for defining geological structures with crisper images and improved resolution.

Conductivity-depth Sections

The apparent resistivities for all frequencies can be displayed simultaneously as coloured conductivity-depth sections. Usually, only the coplanar data are displayed as the quality tends to be higher than that of the coaxial data.

Conductivity-depth sections can be generated in two formats:

(1) Sengpiel resistivity sections, where the apparent resistivity for each frequency is plotted at the depth of the centroid of the inphase current flow*; and,

(2) Differential resistivity sections, where the differential resistivity is plotted at the differential depth**.

Both the Sengpiel and differential methods are derived from the pseudo-layer halfspace model. Both yield a coloured conductivity-depth section which attempts to portray a smoothed approximation of the true resistivity distribution with depth. The Sengpiel method is most useful in conductive layered situations, but may be unreliable in areas of

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* Approximate Inversion of Airborne EM Data from Multilayered Ground: Sengpiel, K.P., Geophysical Prospecting 36, 446-459, 1988.

** The Differential Resistivity Method for Multi-frequency Airborne EM Sounding: Huang, H. and Fraser, D.C., presented at Intern. Airb. EM Workshop, Tucson, Ariz., 1993.

moderate to high resistivity where signal amplitudes are weak. In areas where inphase responses have been suppressed by the effects of magnetite, the computed resistivities shown on the sections may be unreliable. The differential technique was developed by Dighem to overcome problems in the Sengpiel technique. The differential resistivity section is more sensitive than the Sengpiel section to changes in the earth's resistivity and it reaches deeper.

SURVEY RESULTS

GENERAL DISCUSSION

The survey results are presented on two separate map sheets for each parameter at a scale of 1:20,000. Tables 4-1 through 4-3 summarize the EM responses in the survey areas, with respect to conductance grade and interpretation.

The anomalies shown on the electromagnetic anomaly maps are based on a near-vertical, half plane model. This model best reflects "discrete" bedrock conductors. Wide bedrock conductors or flat-lying conductive units, whether from surficial or bedrock sources, may give rise to very broad anomalous responses on the EM profiles. These may not appear on the electromagnetic anomaly map if they have a regional character rather than a locally anomalous character. These broad conductors, which more closely approximate a half space model, will be maximum coupled to the horizontal (coplanar) coil-pair and should be more evident on the resistivity parameter. Resistivity maps, therefore, may be more valuable than the electromagnetic anomaly maps, in areas where broad or flat-lying conductors are considered to be of importance. Contoured resistivity maps, based on the 7200 Hz and 56,000 Hz coplanar data are included with this report.

TABLE 4-1

EM ANOMALY STATISTICS

BLOCK A

CONDUCTOR GRADE	CONDUCTANCE RANGE SIEMENS (MHOS)	NUMBER OF RESPONSES
7	>100	0
6	50 - 100	0
5	20 - 50	0
4	10 - 20	0
3	5 - 10	0
2	1 - 5	6
1	<1	4
*	INDETERMINATE	35
TOTAL		45

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
B	DISCRETE BEDROCK CONDUCTOR	2
S	CONDUCTIVE COVER	28
H	ROCK UNIT OR THICK COVER	15
TOTAL		45

(SEE EM MAP LEGEND FOR EXPLANATIONS)

TABLE 4-2

EM ANOMALY STATISTICS

BLOCK B

CONDUCTOR GRADE	CONDUCTANCE RANGE SIEMENS (MHOS)	NUMBER OF RESPONSES
7	>100	0
6	50 - 100	0
5	20 - 50	0
4	10 - 20	1
3	5 - 10	2
2	1 - 5	5
1	<1	0
*	INDETERMINATE	18
TOTAL		26

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
D	DISCRETE BEDROCK CONDUCTOR	3
B	DISCRETE BEDROCK CONDUCTOR	2
S	CONDUCTIVE COVER	14
H	ROCK UNIT OR THICK COVER	7
TOTAL		26

(SEE EM MAP LEGEND FOR EXPLANATIONS)

TABLE 4-3

EM ANOMALY STATISTICS

BLOCK C

CONDUCTOR GRADE	CONDUCTANCE RANGE SIEMENS (MHOS)	NUMBER OF RESPONSES
7	>100	0
6	50 - 100	0
5	20 - 50	0
4	10 - 20	1
3	5 - 10	0
2	1 - 5	7
1	<1	11
*	INDETERMINATE	61
TOTAL		80

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
D	DISCRETE BEDROCK CONDUCTOR	1
B	DISCRETE BEDROCK CONDUCTOR	9
S	CONDUCTIVE COVER	31
H	ROCK UNIT OR THICK COVER	36
E	EDGE OF WIDE CONDUCTOR	3
TOTAL		80

(SEE EM MAP LEGEND FOR EXPLANATIONS)

Excellent resolution and discrimination of conductors was accomplished by using a fast sampling rate of 0.1 sec and by employing a common frequency (900 Hz) on two orthogonal coil-pairs (coaxial and coplanar). The resulting "difference channel" parameters often permit differentiation of bedrock and surficial conductors, even though they may exhibit similar conductance values.

Anomalies which occur near the ends of the survey lines (i.e., outside the survey area), should be viewed with caution. Some of the weaker anomalies could be due to aerodynamic noise, i.e., bird bending, which is created by abnormal stresses to which the bird is subjected during the climb and turn of the aircraft between lines. Such aerodynamic noise is usually manifested by an anomaly on the coaxial inphase channel only, although severe stresses can affect the coplanar inphase channels as well.

Magnetics

A Scintrex MP-3 proton precession magnetometer was operated at the survey base 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 permit subsequent removal of diurnal drift.

The background magnetic level has been adjusted to match the International Geomagnetic Reference Field (IGRF) for the survey area. The IGRF gradient across the survey block is left intact. This procedure ensures that the magnetic contours will match contours from any adjacent surveys which have been processed in a similar manner.

The total field magnetic data have been presented as contours on the base maps using a contour interval of 1 nT where gradients permit. The maps show the magnetic properties of the rock units underlying the survey areas.

The total field magnetic data have been subjected to a processing algorithm to produce enhanced magnetic maps. This procedure enhances near-surface magnetic units and suppresses regional gradients. It also provides better definition and resolution of magnetic units and displays weak magnetic features which may not be clearly evident on the total field maps. Maps of the first or second vertical magnetic derivative can also be prepared from existing survey data, if requested.

There is some evidence on the magnetic maps which suggests that the survey areas have been subjected to deformation and/or alteration. These structural complexities are evident on the contour maps as variations in magnetic intensity, irregular patterns, and as offsets or changes in strike direction. Some of the more prominent linear features are also evident on the topographic base maps.

Known kimberlites in the area reportedly give rise to positive magnetic anomalies. If a specific magnetic intensity can be assigned to the rock type which is believed to represent the target, it may be possible to select areas of higher priority on the basis of the total field magnetic data. This is based on the assumption that the magnetite content of the host rocks will give rise to a limited range of contour values which will permit differentiation of various lithological units.

The magnetic results, in conjunction with the other geophysical parameters, should provide valuable information which can be used to effectively map the geology and structure in the survey areas.

VLF

VLF results were obtained from the transmitting stations at Seattle, Washington (NLK - 24.8 kHz) and Annapolis, Maryland (NSS - 21.4 kHz). However, preliminary plots of the VLF data indicate that this information appears to provide little useful information. Because of the poor results, VLF maps have not been produced as final products. Enhanced magnetic maps have been provided as substitute map products.

The VLF method is quite sensitive to the angle of coupling between the conductor and the propagated EM field. Consequently, conductors which strike towards the VLF station will usually yield a stronger response than conductors which are nearly orthogonal to it. The general north/south strike in the survey area provides poor coupling with the VLF fields from both Seattle and Annapolis.

The VLF parameter does not normally provide the same degree of resolution available from the EM data. Closely-spaced conductors, conductors of short strike length or conductors which are poorly coupled to the VLF field, may escape detection with this method. Erratic signals from the VLF transmitters can also give rise to strong, isolated anomalies which should be viewed with caution. Because of these limitations, the poor coupling angle, and the relatively severe topography, the VLF results have not provided any meaningful information. The VLF method could possibly be used as a follow-up tool in some areas, although its effectiveness would be limited unless a north/south transmitter could be utilized.

Resistivity

Resistivity maps, which display the conductive properties of the survey areas, were produced from the 7200 Hz and 56,000 Hz coplanar data. The maximum resistivity values, which are calculated for each frequency, are 8,000 and 20,000 ohm-m, respectively. This cutoff eliminates the meaningless higher resistivities which would result from very small EM amplitudes. In general, the resistivity patterns show good agreement with the magnetic trends. This suggests that many of the resistivity lows are probably related to bedrock features, rather than conductive overburden. There are some areas, however, where contour patterns appear to be strongly influenced by conductive surficial material. Note, for example, the steep magnetic gradient which parallels the western edge of the Elk River valley.

There are other resistivity lows in the area in addition to some isolated highs. Some of these are circular or lenticular in shape, and may reflect plug-like intrusives. It is expected that any kimberlitic diatremes in this area would probably be both conductive and magnetic, although the magnetic association could be either positive or negative.

Electromagnetics

The EM anomalies resulting from this survey appear to fall within one of two general categories. The first type consists of discrete, well-defined anomalies which yield marked inflections on the difference channels. These anomalies are usually attributed to conductive sulphides or graphite and are generally given a "B", "T" or "D" interpretive symbol, denoting a bedrock source. Typical examples are evident in the southeast corner of survey block 'B'.

The second class of anomalies comprises moderately broad responses which exhibit the characteristics of a half space and do not yield well-defined inflections on the difference channels. Anomalies in this category are usually given an "S" or "H" interpretive symbol. The lack of a difference channel response usually implies a broad or flat-lying conductive source such as overburden. Some of these anomalies may reflect conductive rock units or zones of deep weathering.

It should be noted that moderately broad, pipe-like conductors do not fit the model for which "discrete" EM anomalies are selected. Conductive pipes, such as kimberlites, may not give rise to discrete EM anomalies. However, the tops of broad pipes will be maximum coupled to the coplanar coil-pair, and should be clearly defined on the resistivity plots, if a suitable conductivity contrast exists.

The effects of conductive overburden are evident over portions of the survey area. Although the difference channels (DFI and DFQ) are extremely valuable in detecting bedrock conductors which are partially masked by conductive overburden, sharp undulations in the bedrock/overburden interface can yield anomalies in the difference channels which may be interpreted as possible bedrock conductors. Such anomalies usually fall into the "S?" or "B?" classification but may also be given an "E" interpretive symbol, denoting a resistivity contrast at the edge of a conductive unit.

In areas where EM responses are evident primarily on the quadrature components, zones of poor conductivity are indicated. Where these responses are coincident with magnetic anomalies, it is possible that the inphase component amplitudes have been suppressed by the effects of magnetite. Most of these poorly-conductive magnetic features give rise to resistivity anomalies which are only slightly below background. If it is expected that poorly-conductive economic mineralization may be associated with magnetite-rich units, most of these weakly anomalous features will be of interest. In areas where magnetite causes the inphase components to become negative, the apparent conductance and depth of EM anomalies may be unreliable.

Scree-covered kimberlites or lamproites may be weakly conductive and weakly magnetic, and may not yield distinct EM anomalies. Therefore, it is not logical to assess the potential of the survey areas on the basis of EM anomalies. It is recommended that an attempt be made to compile a suite of geophysical "signatures" over any known areas of interest. Anomaly characteristics are clearly defined on the computer-processed geophysical data profiles which are supplied as one of the survey products.

A complete assessment and evaluation of the survey data should be carried out by one or more qualified professionals who have access to, and can provide a meaningful compilation of, all available geophysical, geological and geochemical data.

POTENTIAL TARGETS IN THE SURVEY AREAS

The electromagnetic anomaly maps show the anomaly locations with the interpreted conductor type, dip, conductance and depth being indicated by symbols. Direct magnetic correlation is also shown if it exists. The strike direction and length of the conductors are indicated when anomalies can be correlated from line to line. When studying the map sheets, consult the anomaly listings appended to this report.

Sheet 1 (Areas A and B)

Magnetic relief varies from a low of 58,024 nT, in the western corner of Area B, to a high of more than 58,100 nT in the east. Both areas, A and B, show a gentle increase from west to east across the property. The 58,080 nT contour correlates closely with the 1000 ohm-m resistivity contour along the western side of the Elk River valley. There is also a general correlation between these contours and the 5000 ft. elevation contour. It is considered likely that a major north/south contact exists just east of the property limits. The rock units underlying the valley are much more magnetic than the (overlying?) hills to the west.

There are four or more finger-like zones of weakly magnetic material which extend towards the west. These protrusions are more clearly defined on the enhanced magnetic map, with those in area B becoming almost dike-like in appearance. These highs are considered to be of importance, as they may reflect intrusions of more magnetic rock units.

The various isolated magnetic highs on areas A and B should be subjected to follow-up work. It is interesting to note that nearly all of these positive magnetic anomalies are closely related to valleys or creek beds, and may therefore be covered by alluvial material. A few of these responses are associated with weak EM anomalies, which may enhance their exploration significance. These include 10090A, 10100A, 10091A, 10190F, 20160A, 20210A, 20072A and 40100A.

The resistivity patterns show clearly that the material underlying the Elk River valley is much more conductive than the units to the west. Part of this may be due to conductive overburden, but the close correlation between magnetic and resistivity gradients suggests that the contrast may be due to a geological contact. Valleys and creek beds in other portions of the survey blocks do not yield similarly low resistivities, so conductive overburden is not considered to be the only factor contributing to the lower resistivities.

Apart from the area along the eastern side of the two survey blocks, there does not appear to be any direct or consistent relationship between conductive and magnetic rock units. Ideally, one should be able to locate the most favourable areas for kimberlites by comparing conductive/magnetic responses. This can be most easily accomplished by overlaying the resistivity contours on the magnetic maps. This technique suggests the following locations might be of interest as higher priority targets. In Area A, anomaly 10060A, line 10080 at fiducial 780, anomaly 10090A, line 10080 at fiducial 904, anomaly 10091A, line 10131 at 1720, anomaly 10180B, 10180C and possibly line 10130 near fiducial 1510. There is only one conductor of possible bedrock origin defined on this area, at 10150B. However, even the "surficial" sources may be of interest. The weathered top of a pipe-like structure would be more likely to yield an 'S' or 'H' interpretive symbol, rather than a 'B'.

Area B

On Area B, correlation between conductive and magnetic zones is poor. There are a few areas where patterns overlap, but these may be coincidental, rather than direct. Regardless, the following locations may represent potential areas for follow-up: anomaly 20210A, 20160A, line 20130 at fiducial 984, line 20110 at fiducial 3710, 20072A, and line 40090 near 2650.

There is a moderately strong conductor which extends from 40030B, in an easterly direction through 40060A. This conductor has a strike length of more than 600 m, and may be open to the east. Anomalies comprising this conductor yield the characteristics of a thin dike-like source, although culture is considered to be a likely cause. This could be due to a fence or pipe line, as it is in very close proximity to the town of Elkford. It is recommended that a check of this area be carried out, in order to determine the source of this conductor. If no culture is evident, this becomes an attractive massive sulphide target. Part of this conductor is associated with a distinct magnetic depression.

Sheet 2 (Area C)

Area C is similar in magnetic characteristics to the two properties to the north. Magnetic relief is low, about 86 nT, showing a gradual increase in intensity from west to east. There is also a general correlation between the conductive/magnetic zone along the eastern portion of the property, and the 5000 ft. topographic contour which approximates the western edge of the Elk River valley.

Magnetic trends strike north/south, although there are two or three subtle units evident on the enhanced magnetic map which indicate an east/west component. One of these strikes roughly west-southwest from anomaly 30250C. It coincides with conductive zones at 30210B and on line 30160, outlining two possible areas of interest. A second weak anomaly also strikes west-southwest from 30092C, although only the eastern end is conductive. Other magnetic highs are indicated in the vicinity of 30092E, east of 30150E, and on line 30150 at fiducial 3356.

Isolated resistivity lows are quite prevalent, and several may warrant follow-up, even if there are no coincident magnetic responses. Some of the higher priority targets include the conductive zones associated with 30200A, 30160B, 30240C and 30130A. Furthermore, it is recommended that additional work be carried out to determine the causative sources of the isolated magnetic anomalies, such as those at fiducial 2800 on line 30160, fiducial 3358 on line 30150, fiducial 1150 on line 30170, fiducial 744 on line 30200 and fiducial 1953 on line 30220.

It is interesting to note that each of these magnetic anomalies appears to be associated with, or in close proximity to, a creek bed. This correlation was also noticed on the survey areas to the north. It suggests that the source of the magnetic anomalies is buried at a considerable depth, except where the overlying material has been removed, e.g., by erosion in the creek beds. An alternate hypothesis might suggest that the magnetic highs could be due to concentrations of magnetite-bearing placer deposits. This is considered to be highly unlikely, as drainage patterns follow the wrong direction.

There are a few EM anomalies on the sheet that have been attributed to discrete conductors of possible bedrock origin. Most are weak and poorly-defined, and are considered to be of moderately low priority. However, if disseminated to semi-massive sulphides are considered to be secondary targets, additional work is warranted in the vicinity of conductor 30060B-30070A, anomalies 30140D, 30160C, 30180A, 30190B and C, and 30240C. In addition, there are several "non-discrete" responses, indicating broader near-surface conductors, which should also be investigated. This type of response would include anomalies 30120A and 30130A, for example.

BACKGROUND INFORMATION

This section provides background information on parameters which are available from the survey data. Those which have not been supplied as survey products may be generated later from raw data on the digital archive tape.

ELECTROMAGNETICS

DIGHEM electromagnetic responses fall into two general classes, discrete and broad. The discrete class consists of sharp, well-defined anomalies from discrete conductors such as sulfide lenses and steeply dipping sheets of graphite and sulfides. The broad class consists of wide anomalies from conductors having a large horizontal surface such as flatly dipping graphite or sulfide sheets, saline water-saturated sedimentary formations, conductive overburden and rock, and geothermal zones. A vertical conductive slab with a width of 200 m would straddle these two classes.

The vertical sheet (half plane) is the most common model used for the analysis of discrete conductors. All anomalies plotted on the electromagnetic map are analyzed according to this model. The following section entitled **Discrete Conductor Analysis** describes this model in detail, including the effect of using it on anomalies caused by broad conductors such as conductive overburden.

The conductive earth (half space) model is suitable for broad conductors. Resistivity contour maps result from the use of this model. A later section entitled **Resistivity Mapping** describes the method further, including the effect of using it on anomalies caused by discrete conductors such as sulfide bodies.

Geometric interpretation

The geophysical interpreter attempts to determine the geometric shape and dip of the conductor. Figure 5-1 shows typical DIGHEM anomaly shapes which are used to guide the geometric interpretation.

Discrete conductor analysis

The EM anomalies appearing on the electromagnetic map are analyzed by computer to give the conductance (i.e., conductivity-thickness product) in Siemens (mhos) of a vertical sheet model. This is done regardless of the interpreted geometric shape of the conductor. This is not an unreasonable procedure, because the computed conductance increases as the electrical quality of the conductor increases, regardless of its true shape. DIGHEM anomalies are divided into seven grades of conductance, as shown in Table 5-1 below. The conductance in Siemens (mhos) is the reciprocal of resistance in ohms.

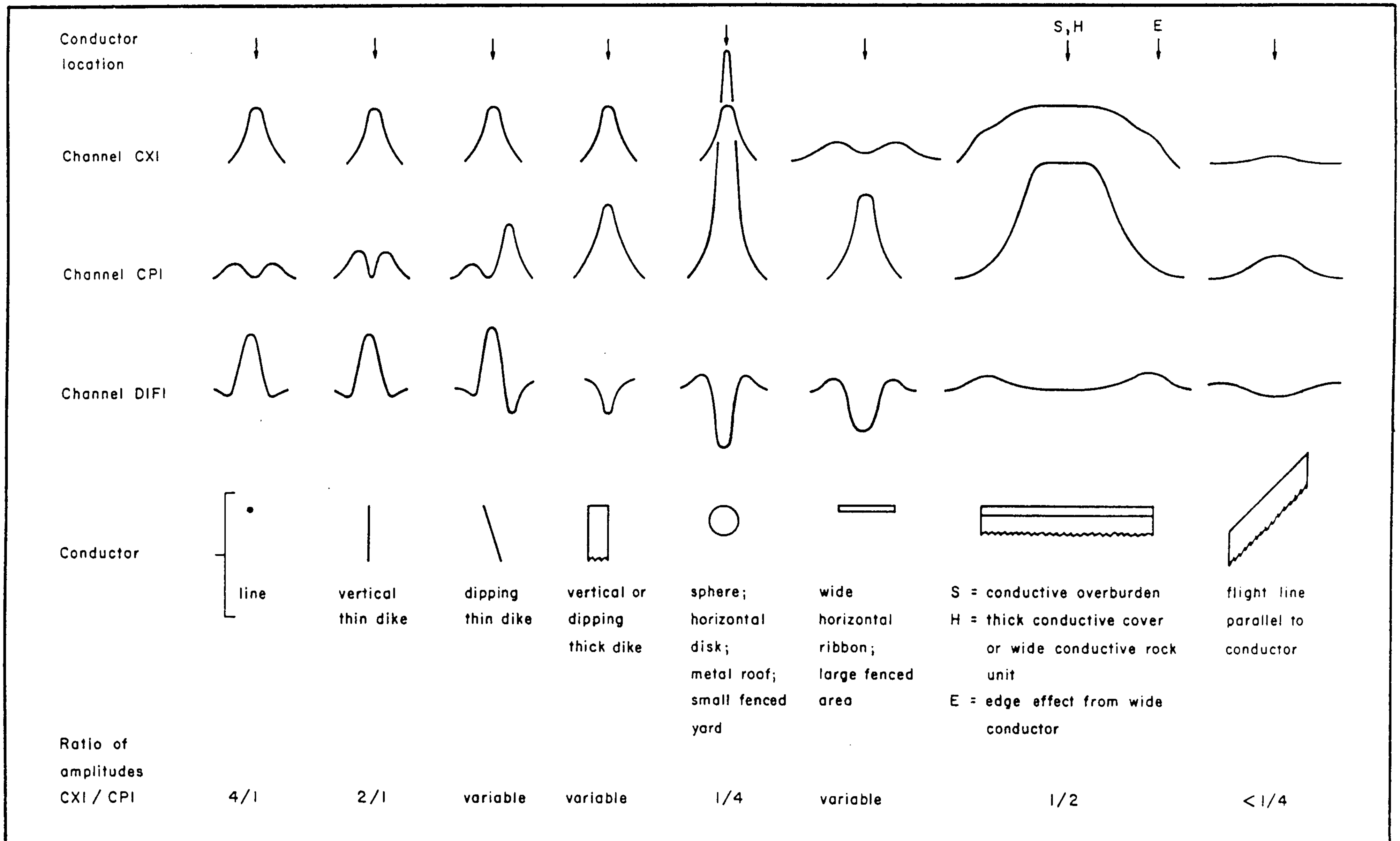

Fig. 5-1 Typical DIGHEM anomaly shapes

Table 5-1. EM Anomaly Grades

Anomaly Grade	Siemens
7	> 100
6	50 - 100
5	20 - 50
4	10 - 20
3	5 - 10
2	1 - 5
1	< 1

The conductance value is a geological parameter because it is a characteristic of the conductor alone. It generally is independent of frequency, flying height or depth of burial, apart from the averaging over a greater portion of the conductor as height increases. Small anomalies from deeply buried strong conductors are not confused with small anomalies from shallow weak conductors because the former will have larger conductance values.

Conductive overburden generally produces broad EM responses which may not be shown as anomalies on the EM maps. However, patchy conductive overburden in otherwise resistive areas can yield discrete anomalies with a conductance grade (cf. Table 5-1) of 1, 2 or even 3 for conducting clays which have resistivities as low as 50 ohm-m. In areas where ground resistivities are below 10 ohm-m, anomalies caused by weathering variations and similar causes can have any conductance grade. The anomaly shapes from the multiple coils often allow such conductors to be recognized, and these are indicated by the letters S, H, and sometimes E on the electromagnetic anomaly map (see EM map legend).

For bedrock conductors, the higher anomaly grades indicate increasingly higher conductances. Examples: DIGHEM's New Insco copper discovery (Noranda, Canada) yielded a grade 5 anomaly, as did the neighbouring copper-zinc Magusi River ore body; Mattabi (copper-zinc, Sturgeon Lake, Canada) and Whistle (nickel, Sudbury, Canada) gave grade 6; and DIGHEM's Montcalm nickel-copper discovery (Timmins, Canada) yielded a grade 7 anomaly. Graphite and sulfides can span all grades but, in any particular survey area, field work may show that the different grades indicate different types of conductors.

Strong conductors (i.e., grades 6 and 7) are characteristic of massive sulfides or graphite. Moderate conductors (grades 4 and 5) typically reflect graphite or sulfides of a less massive character, while weak bedrock conductors (grades 1 to 3) can signify poorly connected graphite or heavily disseminated sulfides. Grades 1 and 2 conductors may not respond to ground EM equipment using frequencies less than 2000 Hz.

The presence of sphalerite or gangue can result in ore deposits having weak to moderate conductances. As an example, the three million ton lead-zinc deposit of Restigouche Mining Corporation near Bathurst, Canada, yielded a well-defined grade 2 conductor. The 10 percent by volume of sphalerite occurs as a coating around the fine grained massive pyrite, thereby inhibiting electrical conduction.

Faults, fractures and shear zones may produce anomalies which typically have low conductances (e.g., grades 1 to 3). Conductive rock formations can yield anomalies of any conductance grade. The conductive materials in such rock formations can be salt water, weathered products such as clays, original depositional clays, and carbonaceous material.

On the interpreted electromagnetic map, a letter identifier and an interpretive symbol are plotted beside the EM grade symbol. The horizontal rows of dots, under the interpretive symbol, indicate the anomaly amplitude on the flight record. The vertical column of dots, under the anomaly letter, gives the estimated depth. In areas where anomalies are crowded, the letter identifiers, interpretive symbols and dots may be obliterated. The EM grade symbols, however, will always be discernible, and the obliterated information can be obtained from the anomaly listing appended to this report.

The purpose of indicating the anomaly amplitude by dots is to provide an estimate of the reliability of the conductance calculation. Thus, a conductance value obtained from a large ppm anomaly (3 or 4 dots) will tend to be accurate whereas one obtained from a small ppm anomaly (no dots) could be quite inaccurate. The absence of amplitude dots indicates that the anomaly from the coaxial coil-pair is 5 ppm or less on both the inphase and quadrature channels. Such small anomalies could reflect a weak conductor at the surface or a stronger conductor at depth. The conductance grade and depth estimate illustrates which of these possibilities fits the recorded data best.

Flight line deviations occasionally yield cases where two anomalies, having similar conductance values but dramatically different depth estimates, occur close together on the same conductor. Such examples illustrate the reliability of the conductance measurement while showing that the depth estimate can be unreliable. There are a number of factors which can produce an error in the depth estimate, including the averaging of topographic variations by the altimeter, overlying conductive overburden, and the location and attitude of the conductor relative to the flight line. Conductor location and attitude can provide an erroneous depth estimate because the stronger part of the conductor may be deeper or to one side of the flight line, or because it has a shallow dip. A heavy tree cover can also produce errors in depth estimates. This is because the depth estimate is computed as the distance of bird from conductor, minus the altimeter reading. The altimeter can lock onto the top of a dense forest canopy. This situation yields an erroneously large depth estimate but does not affect the conductance estimate.

Dip symbols are used to indicate the direction of dip of conductors. These symbols are used only when the anomaly shapes are unambiguous, which usually requires a fairly resistive environment.

A further interpretation is presented on the EM map by means of the line-to-line correlation of anomalies, which is based on a comparison of anomaly shapes on adjacent lines. This provides conductor axes which may define the geological structure over portions of the survey area. The absence of conductor axes in an area implies that anomalies could not be correlated from line to line with reasonable confidence.

DIGHEM electromagnetic maps are designed to provide a correct impression of conductor quality by means of the conductance grade symbols. The symbols can stand alone with geology when planning a follow-up program. The actual conductance values are printed in the attached anomaly list for those who wish quantitative data. The anomaly ppm and depth are indicated by inconspicuous dots which should not distract from the conductor patterns, while being helpful to those who wish this information. The map provides an interpretation of conductors in terms of length, strike and dip, geometric shape, conductance, depth, and thickness. The accuracy is comparable to an interpretation from a high quality ground EM survey having the same line spacing.

The attached EM anomaly list provides a tabulation of anomalies in ppm, conductance, and depth for the vertical sheet model. The EM anomaly list also shows the conductance and depth for a thin horizontal sheet (whole plane) model, but only the vertical sheet parameters appear on the EM map. The horizontal sheet model is suitable for a flatly dipping thin bedrock conductor such as a sulfide sheet having a thickness less than 10 m. The list also shows the resistivity and depth for a conductive earth (half space) model, which is suitable for thicker slabs such as thick conductive overburden. In the EM anomaly list, a depth value of zero for the conductive earth model, in an area of thick cover, warns that the anomaly may be caused by conductive overburden.

Since discrete bodies normally are the targets of EM surveys, local base (or zero) levels are used to compute local anomaly amplitudes. This contrasts with the use of true zero levels which are used to compute true EM amplitudes. Local anomaly amplitudes are shown in the EM anomaly list and these are used to compute the vertical sheet parameters of conductance and depth. Not shown in the EM anomaly list are the true amplitudes which are used to compute the horizontal sheet and conductive earth parameters.

Questionable Anomalies

DIGHEM maps may contain EM responses which are displayed as asterisks (*). These responses denote weak anomalies of indeterminate conductance, which may reflect one of the following: a weak conductor near the surface, a strong conductor at depth (e.g., 100 to 120 m below surface) or to one side of the flight line, or aerodynamic noise. Those responses that have the appearance of valid bedrock anomalies on the flight profiles are indicated by appropriate interpretive symbols (see EM map legend). The others probably do not warrant further investigation unless their locations are of considerable geological interest.

The thickness parameter

DIGHEM can provide an indication of the thickness of a steeply dipping conductor. The amplitude of the coplanar anomaly (e.g., CPI channel on the digital profile) increases relative to the coaxial anomaly (e.g., CXI) as the apparent thickness increases, i.e., the thickness in the horizontal plane. (The thickness is equal to the conductor width if the conductor dips at 90 degrees and strikes at right angles to the flight line.) This report refers to a conductor as <u>thin</u> when the thickness is likely to be less than 3 m, and <u>thick</u> when in excess of 10 m. Thick conductors are indicated on the EM map by parentheses "( )". For base metal exploration in steeply dipping geology, thick conductors can be high priority targets because many massive sulfide ore bodies are thick, whereas non-economic bedrock conductors are often thin. The system cannot sense the thickness when the strike of the conductor is subparallel to the flight line, when the conductor has a shallow dip, when the anomaly amplitudes are small, or when the resistivity of the environment is below 100 ohm-m.

Resistivity mapping

Areas of widespread conductivity are commonly encountered during surveys. In such areas, anomalies can be generated by decreases of only 5 m in survey altitude as well as by increases in conductivity. The typical flight record in conductive areas is characterized by inphase and quadrature channels which are continuously active. Local EM peaks reflect either increases in conductivity of the earth or decreases in survey altitude. For such conductive areas, apparent resistivity profiles and contour maps are necessary for the correct interpretation of the airborne data. The advantage of the resistivity parameter is that anomalies caused by altitude changes are virtually eliminated, so the resistivity data reflect only those anomalies caused by conductivity changes. The resistivity analysis also helps the interpreter to differentiate between conductive trends in the bedrock and those patterns typical of conductive overburden. For example, discrete conductors will generally appear as narrow lows on the contour map and broad conductors (e.g., overburden) will appear as wide lows.

The resistivity profiles and the resistivity contour maps present the apparent resistivity using the so-called pseudo-layer (or buried) half space model defined by Fraser (1978)[1]. This model consists of a resistive layer overlying a conductive half space. The depth channels give the apparent depth below surface of the conductive material. The apparent depth is simply the apparent thickness of the overlying resistive layer. The apparent depth (or thickness) parameter will be positive when the upper layer is more resistive than the underlying material, in which case the apparent depth may be quite close to the true depth.

The apparent depth will be negative when the upper layer is more conductive than the underlying material, and will be zero when a homogeneous half space exists. The apparent depth parameter must be interpreted cautiously because it will contain any errors which may exist in the measured altitude of the EM bird (e.g., as caused by a dense tree cover). The inputs to the resistivity algorithm are the inphase and quadrature components of the coplanar coil-pair. The outputs are the apparent resistivity of the conductive half space (the source) and the sensor-source distance. The flying height is not an input variable, and the output resistivity and sensor-source distance are independent of the flying height. The apparent depth, discussed above, is

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[1] Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p.144-172

simply the sensor-source distance minus the measured altitude or flying height. Consequently, errors in the measured altitude will affect the apparent depth parameter but not the apparent resistivity parameter.

The apparent depth parameter is a useful indicator of simple layering in areas lacking a heavy tree cover. The DIGHEM system has been flown for purposes of permafrost mapping, where positive apparent depths were used as a measure of permafrost thickness. However, little quantitative use has been made of negative apparent depths because the absolute value of the negative depth is not a measure of the thickness of the conductive upper layer and, therefore, is not meaningful physically. Qualitatively, a negative apparent depth estimate usually shows that the EM anomaly is caused by conductive overburden. Consequently, the apparent depth channel can be of significant help in distinguishing between overburden and bedrock conductors.

The resistivity map often yields more useful information on conductivity distributions than the EM map. In comparing the EM and resistivity maps, keep in mind the following:

(a) The resistivity map portrays the apparent value of the earth's resistivity, where resistivity = 1/conductivity.

(b) The EM map portrays anomalies in the earth's resistivity. An anomaly by definition is a change from the norm and so the EM map displays anomalies, (i) over narrow, conductive bodies and (ii) over the boundary zone between two wide formations of differing conductivity.

The resistivity map might be likened to a total field map and the EM map to a horizontal gradient in the direction of flight[2]. Because gradient maps are usually more sensitive than total field maps, the EM map therefore is to be preferred in resistive areas. However, in conductive areas, the absolute character of the resistivity map usually causes it to be more useful than the EM map.

Interpretation in conductive environments

Environments having background resistivities below 30 ohm-m cause all airborne EM systems to yield very large responses from the conductive ground. This usually prohibits the recognition of discrete bedrock conductors. However, DIGHEM data processing techniques produce three parameters which contribute significantly to the recognition of bedrock conductors. These are the inphase and quadrature difference channels (DFI and DFQ), and the resistivity and depth channels (RES and DP) for each coplanar frequency.

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[2] The gradient analogy is only valid with regard to the identification of anomalous locations.

The EM difference channels (DFI and DFQ) eliminate most of the responses from conductive ground, leaving responses from bedrock conductors, cultural features (e.g., telephone lines, fences, etc.) and edge effects. Edge effects often occur near the perimeter of broad conductive zones. This can be a source of geologic noise. While edge effects yield anomalies on the EM difference channels, they do not produce resistivity anomalies. Consequently, the resistivity channel aids in eliminating anomalies due to edge effects. On the other hand, resistivity anomalies will coincide with the most highly conductive sections of conductive ground, and this is another source of geologic noise. The recognition of a bedrock conductor in a conductive environment therefore is based on the anomalous responses of the two difference channels (DFI and DFQ) and the resistivity channels (RES). The most favourable situation is where anomalies coincide on all channels.

The DP channels, which give the apparent depth to the conductive material, also help to determine whether a conductive response arises from surficial material or from a conductive zone in the bedrock. When these channels ride above the zero level on the digital profiles (i.e., depth is negative), it implies that the EM and resistivity profiles are responding primarily to a conductive upper layer, i.e., conductive overburden. If the DP channels are below the zero level, it indicates that a resistive upper layer exists, and this usually implies the existence of a bedrock conductor. If the low frequency DP channel is below the zero level and the high frequency DP is above, this suggests that a bedrock conductor occurs beneath conductive cover.

The conductance channel CDT identifies discrete conductors which have been selected by computer for appraisal by the geophysicist. Some of these automatically selected anomalies on channel CDT are discarded by the geophysicist. The automatic selection algorithm is intentionally oversensitive to assure that no meaningful responses are missed. The interpreter then classifies the anomalies according to their source and eliminates those that are not substantiated by the data, such as those arising from geologic or aerodynamic noise.

Reduction of geologic noise

Geologic noise refers to unwanted geophysical responses. For purposes of airborne EM surveying, geologic noise refers to EM responses caused by conductive overburden and magnetic permeability. It was mentioned previously that the EM difference channels (i.e., channel DFI for inphase and DFQ for quadrature) tend to eliminate the response of conductive overburden. This marked a unique development in airborne EM technology, as DIGHEM is the only EM system which yields channels having an exceptionally high degree of immunity to conductive overburden.

Magnetite produces a form of geological noise on the inphase channels of all EM systems. Rocks containing less than 1% magnetite can yield negative inphase anomalies caused by magnetic permeability. When magnetite is widely distributed throughout a survey area, the inphase EM channels may continuously rise and fall, reflecting variations in the magnetite percentage, flying height, and overburden thickness. This can lead to difficulties in recognizing deeply buried bedrock conductors, particularly if conductive overburden also exists. However, the response of broadly distributed magnetite generally vanishes on the inphase difference channel DFI. This feature can be a significant aid in the recognition of conductors which occur in rocks containing accessory magnetite.

EM magnetite mapping

The information content of DIGHEM data consists of a combination of conductive eddy current responses and magnetic permeability responses. The secondary field resulting from conductive eddy current flow is frequency-dependent and consists of both inphase and quadrature components, which are positive in sign. On the other hand, the secondary field resulting from magnetic permeability is independent of frequency and consists of only an inphase component which is negative in sign. When magnetic permeability manifests itself by decreasing the measured amount of positive inphase, its presence may be difficult to recognize. However, when it manifests itself by yielding a negative inphase anomaly (e.g., in the absence of eddy current flow), its presence is assured. In this latter case, the negative component can be used to estimate the percent magnetite content.

A magnetite mapping technique was developed for the coplanar coil-pair of DIGHEM. The technique yields a channel (designated FEO) which displays apparent weight percent magnetite according to a homogeneous half space model.[3] The method can be complementary to magnetometer mapping in certain cases. Compared to magnetometry, it is far less sensitive but is more able to resolve closely spaced magnetite zones, as well as providing an estimate of the amount of magnetite in the rock. The method is sensitive to 1/4% magnetite by weight when the EM sensor is at a height of 30 m above a magnetitic half space. It can individually resolve steep dipping narrow magnetite-rich bands which are separated by 60 m. Unlike magnetometry, the EM magnetite method is unaffected by remanent magnetism or magnetic latitude.

The EM magnetite mapping technique provides estimates of magnetite content which are usually correct within a factor of 2 when the magnetite is fairly uniformly distributed. EM magnetite maps can be generated when magnetic permeability is evident as negative inphase responses on the data profiles.

Like magnetometry, the EM magnetite method maps only bedrock features, provided that the overburden is characterized by a general lack of magnetite. This contrasts with resistivity mapping which portrays the combined effect of bedrock and overburden.

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[3] Refer to Fraser, 1981, Magnetite mapping with a multi-coil airborne electromagnetic system: Geophysics, v. 46, p. 1579-1594.

Recognition of culture

Cultural responses include all EM anomalies caused by man-made metallic objects. Such anomalies may be caused by inductive coupling or current gathering. The concern of the interpreter is to recognize when an EM response is due to culture. Points of consideration used by the interpreter, when coaxial and coplanar coil-pairs are operated at a common frequency, are as follows:

1. Channels CXP and CPP monitor 60 Hz radiation. An anomaly on these channels shows that the conductor is radiating power. Such an indication is normally a guarantee that the conductor is cultural. However, care must be taken to ensure that the conductor is not a geologic body which strikes across a power line, carrying leakage currents.

2. A flight which crosses a "line" (e.g., fence, telephone line, etc.) yields a center-peaked coaxial anomaly and an m-shaped coplanar anomaly.[4] When the flight crosses the cultural line at a high angle of intersection, the amplitude ratio of coaxial/coplanar response is 4. Such an EM anomaly can only be caused by a line. The geologic body which yields anomalies most closely resembling a line is the vertically dipping thin dike. Such a body, however, yields an amplitude ratio of 2 rather than 4. Consequently, an

[4] See Figure 5-1 presented earlier.

m-shaped coplanar anomaly with a CXI/CPI amplitude ratio of 4 is virtually a guarantee that the source is a cultural line.

3. A flight which crosses a sphere or horizontal disk yields center-peaked coaxial and coplanar anomalies with a CXI/CPI amplitude ratio (i.e., coaxial/coplanar) of 1/4. In the absence of geologic bodies of this geometry, the most likely conductor is a metal roof or small fenced yard.[5] Anomalies of this type are virtually certain to be cultural if they occur in an area of culture.

4. A flight which crosses a horizontal rectangular body or wide ribbon yields an m-shaped coaxial anomaly and a center-peaked coplanar anomaly. In the absence of geologic bodies of this geometry, the most likely conductor is a large fenced area.[5] Anomalies of this type are virtually certain to be cultural if they occur in an area of culture.

5. EM anomalies which coincide with culture, as seen on the camera film or video display, are usually caused by culture. However, care is taken with such coincidences because a geologic conductor could occur beneath a fence, for example. In this example, the fence would be expected to yield an m-shaped coplanar anomaly as in case #2 above.

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[5] It is a characteristic of EM that geometrically similar anomalies are obtained from: (1) a planar conductor, and (2) a wire which forms a loop having dimensions identical to the perimeter of the equivalent planar conductor.

If, instead, a center-peaked coplanar anomaly occurred, there would be concern that a thick geologic conductor coincided with the cultural line.

6. The above description of anomaly shapes is valid when the culture is not conductively coupled to the environment. In this case, the anomalies arise from inductive coupling to the EM transmitter. However, when the environment is quite conductive (e.g., less than 100 ohm-m at 900 Hz), the cultural conductor may be conductively coupled to the environment. In this latter case, the anomaly shapes tend to be governed by current gathering. Current gathering can completely distort the anomaly shapes, thereby complicating the identification of cultural anomalies. In such circumstances, the interpreter can only rely on the radiation channels and on the camera film or video records.

MAGNETICS

The existence of a magnetic correlation with an EM anomaly is indicated directly on the EM map. In some geological environments, an EM anomaly with magnetic correlation has a greater likelihood of being produced by sulfides than one that is non-magnetic. However, sulfide ore bodies may be non-magnetic (e.g., the Kidd Creek deposit near Timmins, Canada) as well as magnetic (e.g., the Mattabi deposit near Sturgeon Lake, Canada).

The magnetometer data are digitally recorded in the aircraft to an accuracy of 0.01 nT for cesium magnetometers. The digital tape is processed by computer to yield a total field magnetic contour map. When warranted, the magnetic data may also be treated mathematically to enhance the magnetic response of the near-surface geology, and an enhanced magnetic contour map is then produced. The response of the enhancement operator in the frequency domain is illustrated in Figure 5-2. This figure shows that the passband components of the airborne data are amplified 20 times by the enhancement operator. This means, for example, that a 100 nT anomaly on the enhanced map reflects a 5 nT anomaly for the passband components of the airborne data.

The enhanced map, which bears a resemblance to a downward continuation map, is produced by the digital bandpass filtering of the total field data. The enhancement is equivalent to continuing the field downward to a level (above the source) which is 1/20th of the actual sensor-source distance.

Because the enhanced magnetic map bears a resemblance to a ground magnetic map, it simplifies the recognition of trends in the rock strata and the interpretation of geological structure. It defines the near-surface local geology while de-emphasizing deep-seated regional features. It primarily has application when the magnetic rock units are steeply dipping and the earth's field dips in excess of 60 degrees.

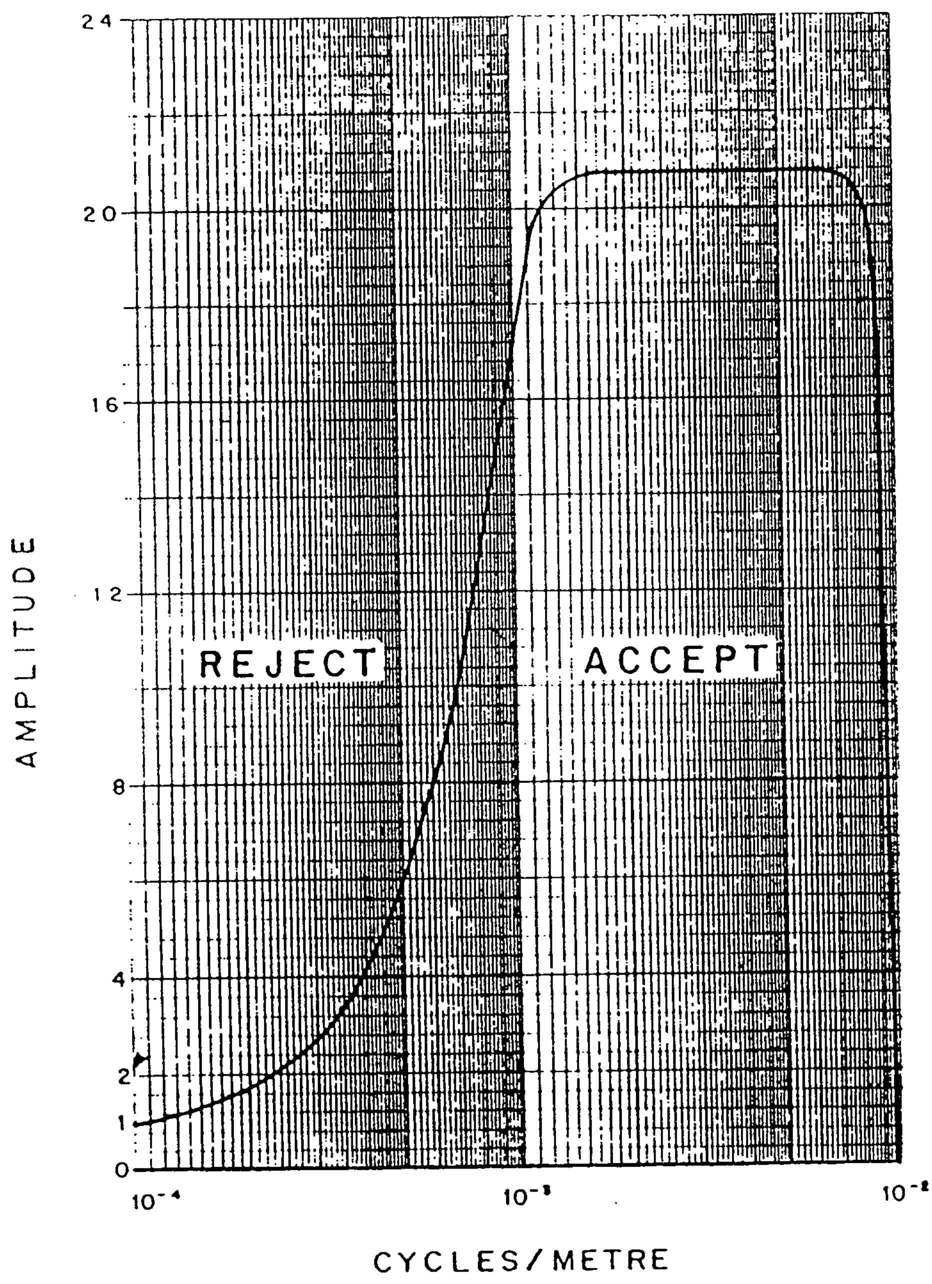

Fig. 5-2 Frequency response of magnetic enhancement operator.

Any of a number of filter operators may be applied to the magnetic data, to yield vertical derivatives, continuations, magnetic susceptibility, etc. These may be displayed in contour, colour or shadow.

VLF

VLF transmitters produce high frequency uniform electromagnetic fields. However, VLF anomalies are not EM anomalies in the conventional sense. EM anomalies primarily reflect eddy currents flowing in conductors which have been energized inductively by the primary field. In contrast, VLF anomalies primarily reflect current gathering, which is a non-inductive phenomenon. The primary field sets up currents which flow weakly in rock and overburden, and these tend to collect in low resistivity zones. Such zones may be due to massive sulfides, shears, river valleys and even unconformities.

The VLF field is horizontal. Because of this, the method is quite sensitive to the angle of coupling between the conductor and the transmitted VLF field. Conductors which strike towards the VLF station will usually yield a stronger response than conductors which are nearly orthogonal to it.

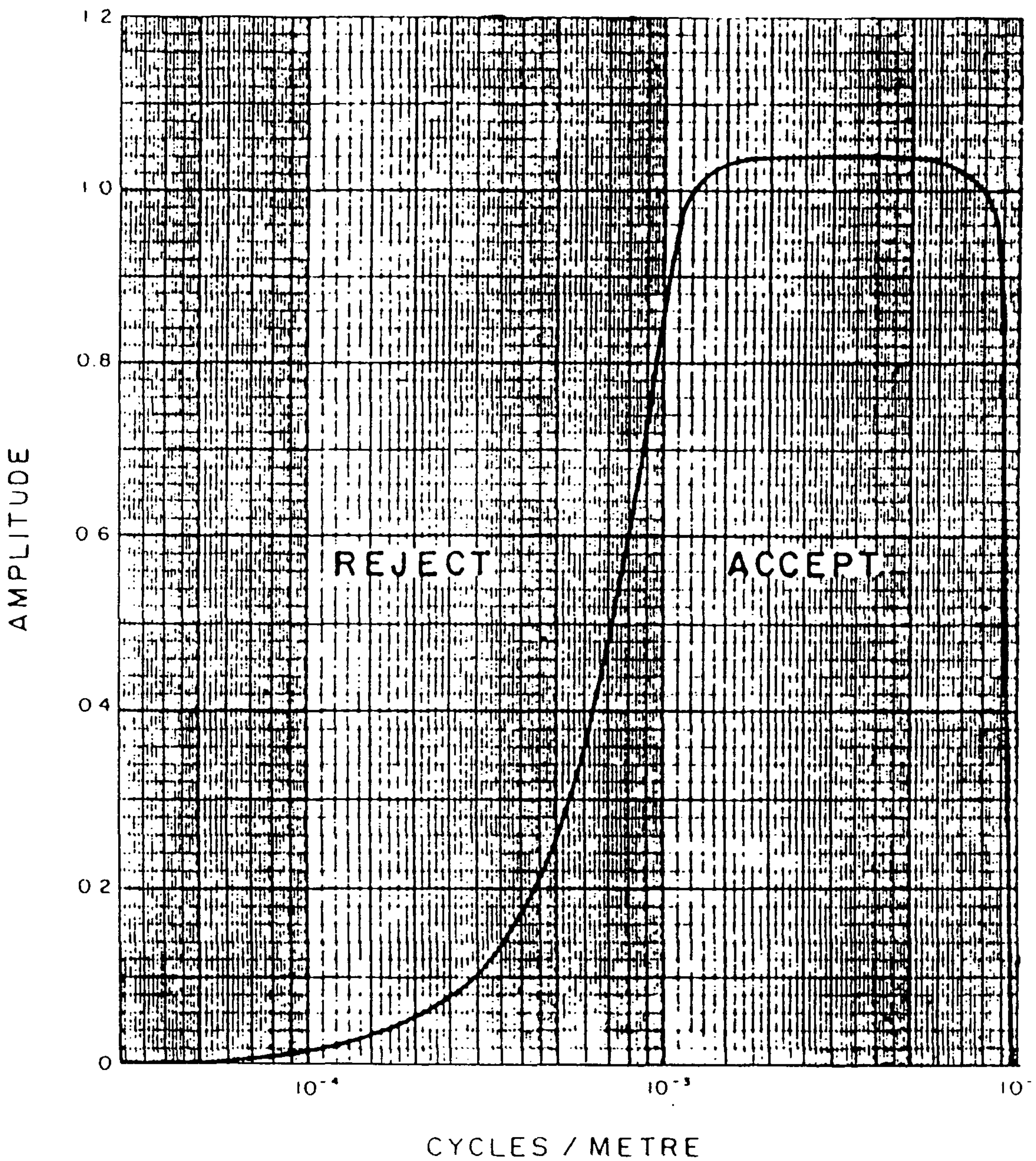

Fig. 5-3 Frequency response of VLF operator.

The Herz Industries Ltd. Totem VLF-electromagnetometer measures the total field and vertical quadrature components. Both of these components are digitally recorded in the aircraft with a sensitivity of 0.1 percent. The total field yields peaks over VLF current concentrations whereas the quadrature component tends to yield crossovers. Both appear as traces on the profile records. The total field data are filtered digitally and displayed as contours to facilitate the recognition of trends in the rock strata and the interpretation of geologic structure.

The response of the VLF total field filter operator in the frequency domain (Figure 5-3) is basically similar to that used to produce the enhanced magnetic map (Figure 5-2). The two filters are identical along the abscissa but different along the ordinant. The VLF filter removes long wavelengths such as those which reflect regional and wave transmission variations. The filter sharpens short wavelength responses such as those which reflect local geological variations.

CONCLUSIONS AND RECOMMENDATIONS

This report provides a very brief description of the survey results and describes the equipment, procedures and logistics of the survey.

The airborne survey results have defined several plug-like magnetic highs and similarly shaped low resistivity anomalies, many of which could represent clay-weathered tops of magnetite-rich intrusions, such as kimberlitic diatremes. It is recommended that these potential target areas be subjected to further investigation, in order to determine their causative sources. Highest priority should be given to those areas where annular or lenticular magnetic anomalies are coincident with the conductive zones shown on the resistivity maps. Such areas can easily be located by superimposing the resistivity contour overlays on the coloured magnetic or enhanced magnetic maps.

The three properties exhibit similar geophysical characteristics, showing a gentle increase in magnetic amplitudes from west to east, across each survey block. This magnetic gradient varies from 60 nT to approximately 90 nT, with the more magnetic rocks to the east of the survey areas. The actual contact between the magnetic units to the east and the non-magnetic (overlying) units to the west is not well-defined, but is assumed to be close to the western edge of the Elk River Valley. This location is based partially on the resistivity contours, which show a well-defined gradient at the western edge of the valley. The material underlying the valley is much more conductive and more magnetic than the hills to the west.

There are several anomalies in the survey areas which may be indicative of sulphide responses. The survey was also successful in locating a few moderately weak or broad conductors which may warrant additional work. The various maps included with this report display the magnetic and conductive properties of the three areas. It is recommended that the survey results be reviewed in detail, in conjunction with all available geophysical, geological and geochemical information. Particular reference should be made to the computer generated data profiles which clearly define the characteristics of the individual anomalies.

Most anomalies in the area are moderately weak and poorly-defined. Some have been attributed to conductive overburden or deep weathering, while others appear to be associated with magnetite-rich rock units. A few are associated with resistivity or magnetic gradients which may reflect faults or shears. Such structural breaks are considered to be of particular interest as they may have influenced mineral deposition within the survey area.

All pipe-like magnetic/resistivity anomalies, in addition to the interpreted bedrock conductors defined by the survey, should be subjected to further investigation using appropriate surface exploration techniques. Anomalies which are currently considered to be of moderately low priority may require upgrading if follow-up results are favourable.

It is also recommended that image processing of existing geophysical data be considered, in order to extract the maximum amount of information from the survey results. Current software and imaging techniques often provide valuable information on structure and lithology, which may not be clearly evident on the contour and colour maps. These techniques can yield images which define subtle, but significant, structural details.

Respectfully submitted,

DIGHEM

Paul A. Smith
Geophysicist

PAS/sdp

A1154JAN.94R

APPENDIX A

LIST OF PERSONNEL

The following personnel were involved in the acquisition, processing, interpretation and presentation of data, relating to a DIGHEM^{V} airborne geophysical survey carried out for Consolidated Ramrod Gold Corporation, over three properties near Elkford, British Columbia.

Steve Kilty	Vice President, Operations
Greg Paleolog	Survey Operations Supervisor
Steve Haney	Senior Geophysical Operator
Dave Hayward	Second Geophysical Operator/Dataman
Herman Lorenz	Pilot (Hi-Wood Helicopters Ltd.)
Gordon Smith	Data Processing Supervisor
Paul A. Smith	Interpretation Supervisor
Lyn Vanderstarren	Drafting Supervisor
Steve Mast	Draftsperson (CAD)
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

The survey consisted of 435 km of coverage, flown from November 1 to November 6, 1993.

All personnel are employees of Dighem, except for the pilot who is an employee of Hi-Wood Helicopters Ltd.

DIGHEM

Paul A. Smith
Geophysicist

PAS/sdp

A1154JAN.94R

APPENDIX B

STATEMENT OF COST

Date: January 28, 1994

IN ACCOUNT WITH DIGHEM

To: Dighem flying of Agreement dated September 27, 1993, pertaining to an Airborne Geophysical Survey over three properties in the Elkford area, British Columbia.

Survey Charges

425 km of flying @ $150.00/km
plus mobilization costs of
$8,000.00 $71,750.00

Allocation of Costs

- Data Acquisition (60%)
- Data Processing (20%)
- Interpretation, Report and Maps (20%)

DIGHEM

Paul A. Smith
Geophysicist

PAS/sdp

A1154JAN.94R

Breakdown of Total Cost

Statement of Work #	% of 425 km flown over group	Cost per Statement
3048486	37% (157.25 km)	$26,547.50
3048491	17% (72.25 km)	12,197.50
3048495	16% (68.00 km)	11,480.00
3048498	13% (55.25 km)	9,327.50
3048499	17% (72.25 km)	12,197.50

* All Statement of Work forms dated Mar.28/94

APPENDIX C

EM ANOMALY LIST

1154 AREA A ELKFORD, B.C.

ANOMALY/ FID/INTERP	COAXIAL 1190 HZ REAL PPM	COAXIAL 1190 HZ QUAD PPM	COPLANAR 895 HZ REAL PPM	COPLANAR 895 HZ QUAD PPM	COPLANAR 7233 HZ REAL PPM	COPLANAR 7233 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 10060	(FLIGHT	13)											
A 809H?	1	2	0	2	0	4	-	-	-	-	-	-	0
LINE 10080	(FLIGHT	15)											
A 930S?	0	1	0	2	2	4	-	-	-	-	-	-	0
B 609S	0	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10090	(FLIGHT	14)											
A 1591H	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1897H	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 10091	(FLIGHT	15)											
A 283S	1	2	1	2	2	4	-	-	-	-	-	-	0
B 269S?	1	2	0	2	2	4	-	-	-	-	-	-	0
C 194H	1	2	1	2	2	4	-	-	-	-	-	-	0
D 183H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10100	(FLIGHT	14)											
A 574S	0	2	1	2	0	4	-	-	-	-	-	-	0
B 456S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10110	(FLIGHT	13)											
A 3972S?	4	6	2	9	21	36	2.4	37	1	56	167	17	0
LINE 10130	(FLIGHT	8)											
A 1533H	1	2	0	2	2	4	-	-	-	-	-	-	0
B 1426S?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1355S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10140	(FLIGHT	5)											
A 3810S	0	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10150	(FLIGHT	5)											
A 3112H	0	1	0	2	2	4	-	-	-	-	-	-	0
B 3166B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 3456S	1	2	1	2	2	4	-	-	-	-	-	-	0
D 3468S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10160	(FLIGHT	5)											
A 2434S	1	2	1	2	2	4	-	-	-	-	-	-	0
B 2347S?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10170	(FLIGHT	5)											
A 1993H	1	2	1	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.

ANOMALY/ FID/INTERP	COAXIAL 1190 HZ REAL PPM	QUAD PPM	COPLANAR 895 HZ REAL PPM	QUAD PPM	COPLANAR 7233 HZ REAL PPM	QUAD PPM	VERTICAL DIKE COND SIEMEN	DEPTH* M	HORIZONTAL SHEET COND SIEMEN	DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	DEPTH M	MAG CORR NT
LINE 10170	(FLIGHT		5)										
B 2051H	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2104S?	4	6	5	14	34	53	3.4	34	1	46	84	13	0
D 2115H	6	9	4	15	34	46	3.2	28	1	63	76	29	0
E 2132S?	1	2	1	2	2	4	-	-	-	-	-	-	0
F 2163S?	2	7	1	11	21	38	1.1	9	1	68	160	24	0
G 2189S	1	2	1	2	2	4	-	-	-	-	-	-	0
H 2225H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10180	(FLIGHT		5)										
A 1666H	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1640H	1	2	0	2	2	4	-	-	-	-	-	-	0
C 1616H	2	6	4	10	24	26	1.2	30	1	73	102	36	0
D 1564S	3	6	4	10	20	29	1.7	17	2	50	53	19	0
E 1510S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10190	(FLIGHT		5)										
A 1210S	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1220S	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1238S?	1	7	1	13	22	76	0.7	15	1	40	270	3	0
D 1273S	1	5	4	8	14	42	0.6	14	1	64	86	29	0
E 1345S?	1	2	1	2	2	4	-	-	-	-	-	-	0
F 1398H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10200	(FLIGHT		5)										
A 1113S	1	5	2	10	26	49	0.5	4	1	41	159	5	0
B 1088B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1079S?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 10210	(FLIGHT		5)										
A 782S	3	15	9	26	53	106	0.8	9	1	52	73	22	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.

1154 AREA B ELKFORD, B.C.

ANOMALY/ FID/INTERP	COAXIAL 1082 HZ REAL PPM	COAXIAL 1082 HZ QUAD PPM	COPLANAR 874 HZ REAL PPM	COPLANAR 874 HZ QUAD PPM	COPLANAR 7233 HZ REAL PPM	COPLANAR 7233 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 20030	(FLIGHT	12)											
A 3583S?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20050	(FLIGHT	12)											
A 3117S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 3024S	0	2	0	2	1	4	-	-	-	-	-	-	0
LINE 20072	(FLIGHT	12)											
A 2291S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20080	(FLIGHT	10)											
A 2239S?	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 20140	(FLIGHT	11)											
A 1418H	1	2	1	2	1	4	-	-	-	-	-	-	0
LINE 20160	(FLIGHT	11)											
A 2226H	1	2	0	2	1	4	-	-	-	-	-	-	0
LINE 20210	(FLIGHT	11)											
A 3883S	0	2	0	2	1	2	-	-	-	-	-	-	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.

1154 AREA B ELKFORD, B.C.

ANOMALY/ FID/INTERP	COAXIAL 1082 HZ REAL PPM	COAXIAL 1082 HZ QUAD PPM	COPLANAR 874 HZ REAL PPM	COPLANAR 874 HZ QUAD PPM	COPLANAR 7233 HZ REAL PPM	COPLANAR 7233 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 40010	(FLIGHT	4)											
A 3140H	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 40020	(FLIGHT	4)											
A 2421H	1	1	0	2	2	4	-	-	-	-	-	-	0
B 2558S?	1	2	0	2	0	4	-	-	-	-	-	-	0
C 2601S?	3	7	0	3	0	22	1.9	30	1	130	1005	0	0
D 2673H	0	2	0	2	2	3	-	-	-	-	-	-	0
LINE 40030	(FLIGHT	4)											
A 2220S?	3	4	1	12	23	60	3.2	55	1	39	449	3	0
B 2211B?	5	5	3	10	20	47	5.7	39	1	64	485	3	0
LINE 40040	(FLIGHT	4)											
A 1787D	10	10	3	4	5	7	6.9	23	1	40	249	0	0
LINE 40050	(FLIGHT	4)											
A 1713D	8	10	2	4	7	9	4.8	22	1	53	117	16	0
B 1616S	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1603S?	2	4	1	8	13	52	1.8	45	1	29	513	0	0
LINE 40060	(FLIGHT	4)											
A 1260D	7	4	2	3	8	6	11.9	33	2	69	58	34	0
B 1268B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1318H	3	4	1	10	18	57	3.3	55	1	47	293	7	0
D 1347H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 40090	(FLIGHT	9)											
A 2668S?	0	1	0	2	1	4	-	-	-	-	-	-	0
LINE 40110	(FLIGHT	9)											
A 3418S?	1	2	0	1	0	4	-	-	-	-	-	-	0
LINE 49010	(FLIGHT	15)											
A 3949S?	0	2	1	1	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 1190 HZ		COPLANAR 895 HZ		COPLANAR 7233 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 30030	(FLIGHT		7)										
A 3290H	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30050	(FLIGHT		7)										
A 2596S?	1	2	1	2	2	4	-	-	-	-	-	-	0
B 2605S?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2689S?	1	2	1	1	1	2	-	-	-	-	-	-	0
LINE 30060	(FLIGHT		7)										
A 2100S?	1	2	1	2	2	4	-	-	-	-	-	-	0
B 2111D	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30070	(FLIGHT		7)										
A 1519B	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1613S	1	1	0	2	2	3	-	-	-	-	-	-	0
LINE 30080	(FLIGHT		7)										
A 996H	1	2	0	2	2	4	-	-	-	-	-	-	0
B 1103H	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30092	(FLIGHT		9)										
A 1483H	1	1	1	2	2	4	-	-	-	-	-	-	0
B 1473H	1	1	1	2	2	4	-	-	-	-	-	-	0
C 1439H	1	2	0	2	2	4	-	-	-	-	-	-	0
D 1430S?	1	2	0	2	2	4	-	-	-	-	-	-	0
E 1379S?	0	2	0	2	2	4	-	-	-	-	-	-	4
F 1333H	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30100	(FLIGHT		6)										
A 2129S	1	2	0	2	2	4	-	-	-	-	-	-	0
B 2011H	1	2	0	2	2	4	-	-	-	-	-	-	0
C 1929S?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30110	(FLIGHT		6)										
A 598E	1	2	1	2	2	4	-	-	-	-	-	-	0
B 563H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30120	(FLIGHT		6)										
A 1441H	0	2	1	2	1	4	-	-	-	-	-	-	0
B 1537S?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30130	(FLIGHT		4)										
A 423H	3	8	0	15	34	87	1.5	27	1	33	616	0	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. .

1154 AREA C ELKFORD, B.C.

ANOMALY/ FID/INTERP	COAXIAL 1190 HZ REAL PPM	QUAD PPM	COPLANAR 895 HZ REAL PPM	QUAD PPM	COPLANAR 7233 HZ REAL PPM	QUAD PPM	VERTICAL DIKE COND SIEMEN	DEPTH* M	HORIZONTAL SHEET COND SIEMEN	DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	DEPTH M	MAG CORR NT
LINE 30131	(FLIGHT		9)										
A 1078S?	0	2	1	2	2	1	-	-	-	-	-	-	0
B 1145S?	0	2	1	2	0	4	-	-	-	-	-	-	0
LINE 30140	(FLIGHT		3)										
A 3777S	0	4	1	10	18	45	0.3	8	1	41	527	1	0
B 3791H	1	2	1	2	2	4	-	-	-	-	-	-	0
C 3811E	0	2	0	2	2	4	-	-	-	-	-	-	0
D 3986B?	0	8	1	14	5	45	0.3	1	1	30	628	0	0
LINE 30150	(FLIGHT		3)										
A 3714H	1	6	2	11	25	48	0.5	12	1	36	392	0	0
B 3623S?	0	2	0	2	0	1	-	-	-	-	-	-	0
C 3518H	1	2	1	2	2	4	-	-	-	-	-	-	0
D 3413H	1	2	0	2	1	4	-	-	-	-	-	-	0
E 3290S?	0	2	0	2	2	4	-	-	-	-	-	-	0
F 3121S	1	2	0	2	1	4	-	-	-	-	-	-	0
LINE 30160	(FLIGHT		3)										
A 2318H	1	2	1	2	2	2	-	-	-	-	-	-	0
B 2631H	1	15	1	13	36	90	0.4	7	1	14	375	0	0
C 2639B?	1	16	1	29	11	160	0.4	9	1	23	460	0	0
D 2655S?	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30170	(FLIGHT		3)										
A 816H	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1051B?	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1164S?	0	2	0	2	2	4	-	-	-	-	-	-	0
D 1245B?	1	2	1	2	0	4	-	-	-	-	-	-	0
E 1460S	3	5	2	9	5	26	1.9	43	1	44	495	1	0
F 1464S?	2	4	1	5	10	18	1.9	44	1	35	567	0	0
LINE 30180	(FLIGHT		3)										
A 2058B?	1	6	3	12	11	42	0.5	3	1	23	367	0	0
B 1894S?	2	6	0	17	21	111	1.3	30	1	24	547	0	0
C 1891E	0	2	0	2	2	4	-	-	-	-	-	-	0
D 1880S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30190	(FLIGHT		3)										
A 651S?	1	6	1	10	15	57	0.6	14	1	25	370	0	0
B 648B	4	6	1	10	15	57	3.1	47	1	43	405	4	0
C 627B	5	2	4	4	3	5	13.7	55	1	12	429	0	0

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1154 AREA C ELKFORD, B.C.

		COAXIAL 1190 HZ		COPLANAR 895 HZ		COPLANAR 7233 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 30190		(FLIGHT		3)										
D	531S?	1	2	0	2	2	4	-	-	-	-	-	-	0
E	515S?	3	8	0	3	11	20	1.3	17	1	33	693	0	0
F	508H	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30200		(FLIGHT		2)										
A	695H	1	2	1	2	2	4	-	-	-	-	-	-	0
B	706H	1	2	1	2	2	4	-	-	-	-	-	-	0
C	780S?	0	2	0	2	2	4	-	-	-	-	-	-	0
D	812S?	0	2	0	2	2	4	-	-	-	-	-	-	0
E	988H	1	1	3	2	8	13	0.5	0	1	50	176	27	0
LINE 30210		(FLIGHT		1)										
A	2641H	1	2	1	2	2	3	-	-	-	-	-	-	0
B	2572H	1	2	1	2	2	4	-	-	-	-	-	-	0
C	2561H	1	6	1	9	16	54	0.5	16	1	50	642	0	0
D	2412H	0	2	0	2	2	4	-	-	-	-	-	-	0
E	2385H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30220		(FLIGHT		1)										
A	1894S?	1	2	1	2	2	4	-	-	-	-	-	-	0
B	1936S?	0	2	0	2	2	4	-	-	-	-	-	-	0
C	2111H	2	2	3	5	11	11	1.0	0	1	59	185	35	0
LINE 30230		(FLIGHT		1)										
A	1315H	1	2	1	2	2	4	-	-	-	-	-	-	0
B	1137H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30240		(FLIGHT		1)										
A	799H	0	3	1	2	5	45	0.1	0	1	29	362	5	0
B	837S	1	2	0	2	2	4	-	-	-	-	-	-	0
C	909B	1	2	1	2	2	4	-	-	-	-	-	-	0
D	1044H	0	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30250		(FLIGHT		1)										
A	682H	1	7	3	12	8	36	0.5	13	1	86	114	45	0
B	638H	1	2	1	2	2	4	-	-	-	-	-	-	0
C	586S	0	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30260		(FLIGHT		1)										
A	330H	1	2	1	1	2	4	-	-	-	-	-	-	0
B	398H	1	2	1	2	2	4	-	-	-	-	-	-	0

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