DIGHEM AIRBORNE SURVEY
ON
THE BALSAM 1A, BALSAM 2A, CEDAR 2A, CEDAR 3A, DOGWOOD 3A CLAIM BLOCKS

FORT STEELE MINING DIVISION
BRITISH COLUMBIA
49°26'N, 115012'W
N.T.S. 82 G/6

FOR
R. H. STANFIELD
380 - 4723 1ST STREET S.W.,
CALGARY, ALBERTA

SURVEY BY: DIGHEM SURVEYS & PROCESSING INC.,
MISSISSAUGA, ONTARIO
COVERING REPORT BY: MASTER MINERAL RESOURCE SERVICES LTD.
CALGARY, ALBERTA

SEPTEMBER 1993

CONTENTS:

FIGURES:

INTRODUCTION:

Dighem Surveys & Processing Inc. of 228 Matheson Blvd. East, Mississauga, Ontario, completed a helicopter borne DIGHEM survey over the Balsam, Cedar and Dogwood claims of R. H. Stanfield (Bul River Mineral Corporation Ltd.) in November 1992. The writer of this report was retained as consultant to plan the survey using the geological data and to help evaluate the results of the survey. Copies of Dighem's report are enclosed for assessment credit on the claims described in PROPERTY.

Preparatory work for the project commenced in October 1992. The object of this report is to provide the background information on the tectonics, stratigraphy and mineralisation of the area. This information was used to pick the geophysical survey methods and arrays, and for the interpretation of the results.

LOCATION, ACCESSIBILITY, & TOPOGRAPHY:

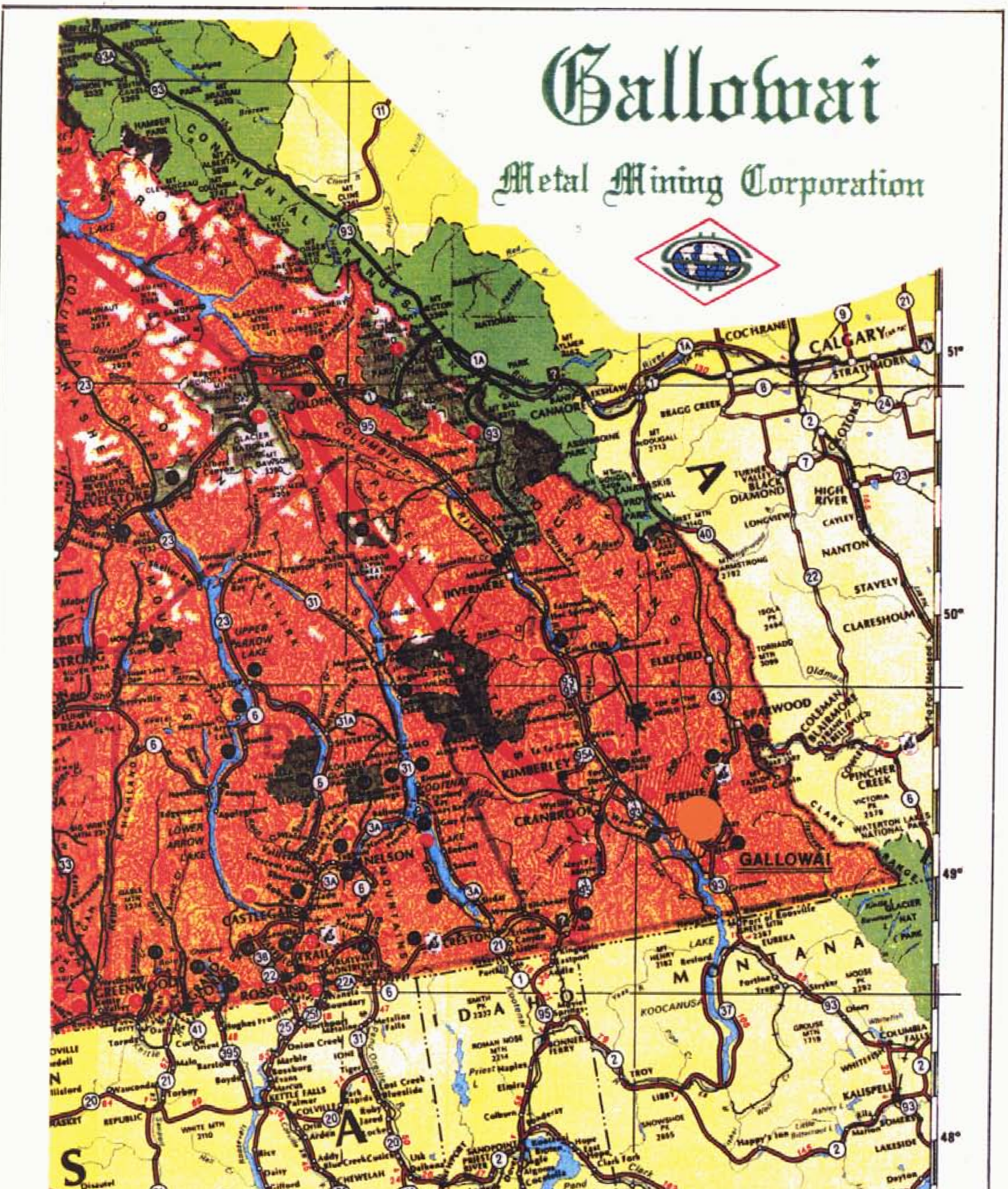
The PROPERTY is located in southeastern British Columbia, approximately 30 kilometres by Highway 3 from Cranbrook. Access from the highway to the portions of the property covered by the survey is by logging and private roads. Sections of the survey areas are only accessible by helicopter. The survey grid and the property are in the Fort Steele Mining Division, in N.T.S. 82 G/6,11,12, centred approximately at 49^{0}25'N, 115^{0}15'E. N.T.S. quadrant 82G/6, Elko.

In the accompanying DIGHEM report, Block C (Big Bear Property) consists of approximately 337 line kilometres of flight lines and 5 line kilometres of tie lines, while Block D (Sand Creek) comprises 65 line kilometres of flight lines. Flight lines were flown in 315^0 true direction for block C, and 90^0 true for block D. Both grids were on line separation of 200 metres.

Part of the area underlain by the two grids straddles the relatively modest relief of the Rocky Mountain Trench, and the main portions include the rugged western edge of the Rocky Mountains (Sand Creek – Lizard Range Domain).

Topographic relief in the Trench portion ranges from 880 metres to approximately 1000 metres, while elevations in the Rocky Mountain portions range from 1000 metres to 2100 metres, and with steeper gradients.

Fig. 1



SITE LOCATION

PROPERTY:

Group	CLAIM	Record #
Balsam 1A	Balsam 5,7,9,11	209747,209749, 209751,209755
Balsam 2A	Balsam 6,8,10,12	209748,209750, 209752,209756
Cedar 2A	Cedar 10,12,13,14	209700,209701, 209710,209711
Cedar 3A	Cedar 6,7,8,9,11	209753,209697, 209698,209699,209709
Dogwood 3A	Dogwood 16,17,18,20	209714,209715, 209716,209803,209717

GEOLOGY

LITHOLOGY AND STRATIGRAPHY :

The following Table (from McMechan, 1978) summarises the lithology and stratigraphy of the area, including the areas of blocks C and D. In addition, Cretaceous–Tertiary intrusives near the margins of the Trench are worth noting. The Trench itself is filled with Pleistocene and Recent sediments of gravel, sand, silt, till, colluvium and alluvium.

UPPER DEVONIAN TO PERMIAN

Undifferentiated Fairholme Group, Palliser Formation, Exshaw Formation, Banff Formation, Rundle Group, Rocky Mountain Group: Limestone, Shale Limestone, Shale, Quartzite, and Dolomitic Quartzite.

MIDDLE DEVONIAN AND(?) EARLIER

Upper unit (Bumais and Harrogate Formations): Shaly Limestone, Shaly Dolomite, Limestone Breccia, and Gypsum; Basal Unit: Dolomitic sandstone, Sandy Dolomite, Breccia, Conglomerate, and Shale

CAMBRIAN

'Tanglefoot Unit': Shaly Limestone, Limestone, Sandy Shale, and Dolomite

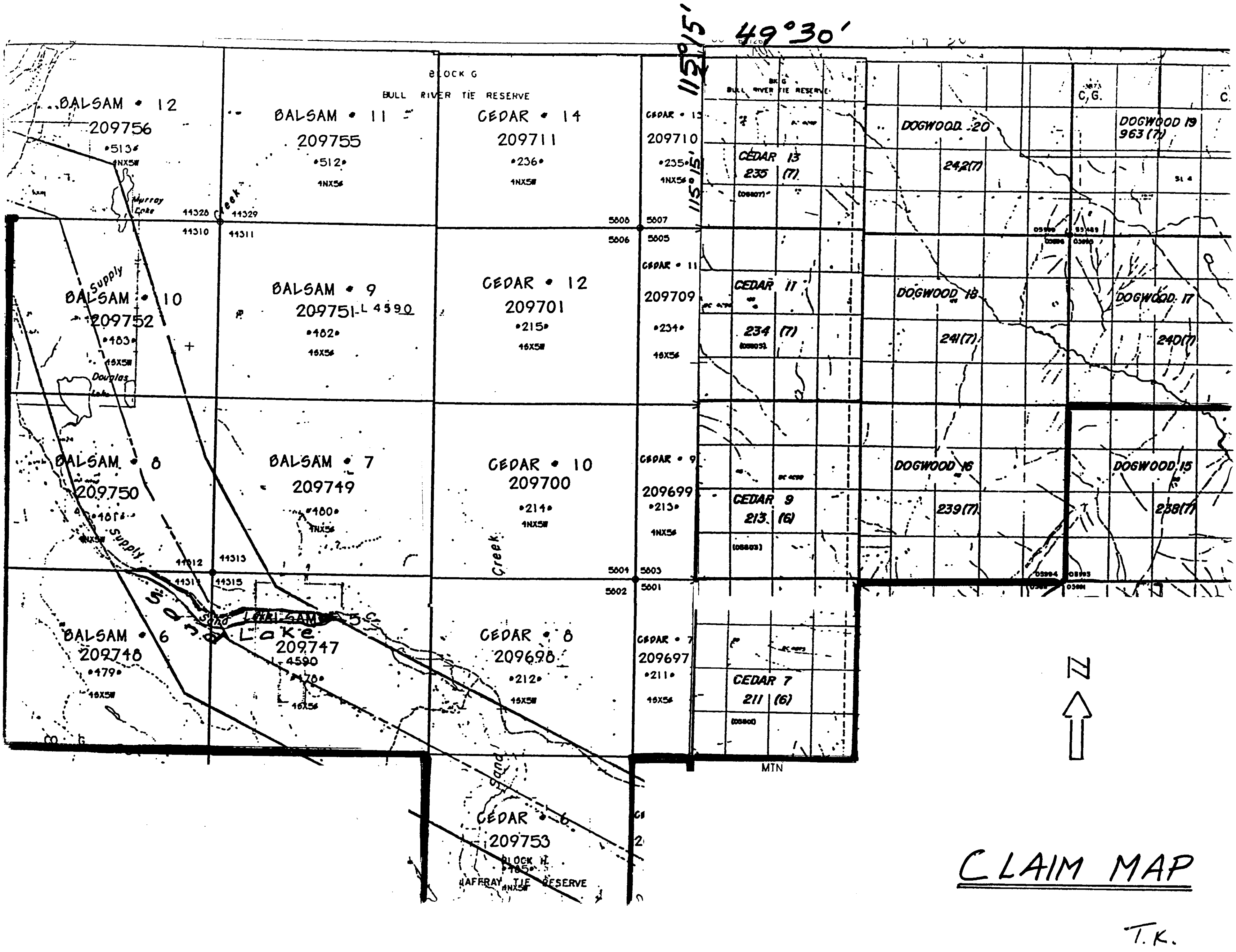
Eager Formation: Shale, Limestone, Siltstone, and Quartzite; Cranbrook Formation: Quartzite and Granule Conglomerate

MIDDLE PROTEROZOIC

Moyie Sill: Hornblende Metadiorite to Metagabbro

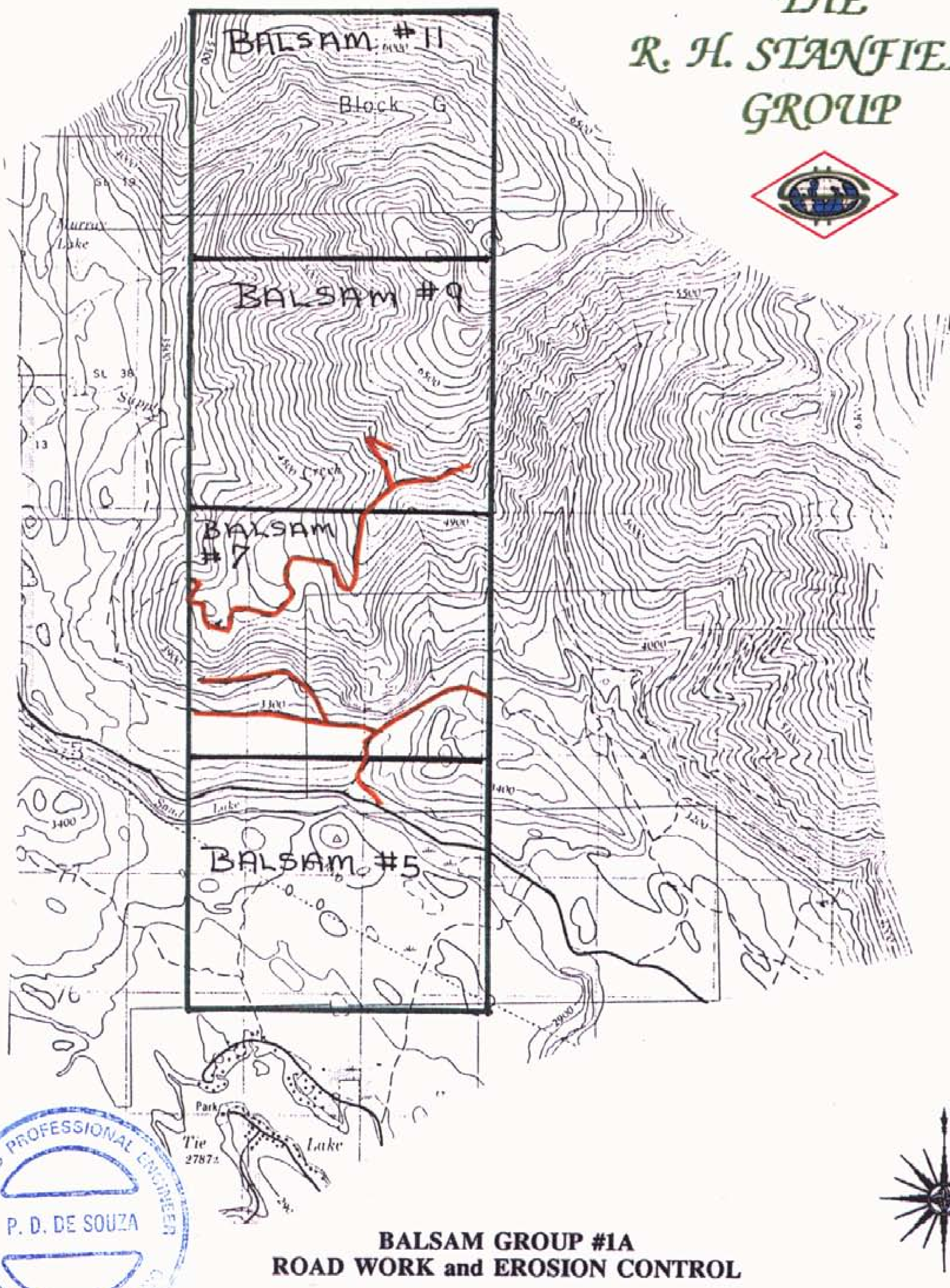
PURCELL SUPERGROUP

Phillips Formation: Red Micaceous Quartzite and Siltite
Gateway Formation: Green, Purple Siltite, Minor Quartzite, and Dolomitic Siltite near top.
Sheppard Formation: Stromatolitic Dolomite, Green, Purple Siltite, Quartzite, and Silty Dolomite
'Lava and Sediment' Unit: Massive to Amygdaloidal 'Andesitic' Lava, Volcanic and Feldspathic



115°15'
49°30'
BLOCK G
BULL RIVER TIE RESERVE
BALSAM • 12
209756
•513•
BALSAM • 11
209755
•512•
CEDAR • 14
209711
•236•
CEDAR • 13
209710
•235•
CEDAR 13
235 (7)
DOGWOOD 20
242(7)
DOGWOOD 19
963 (7)
C.G.
Murray Lake
Creek
Supply
BALSAM • 10
209752
•483•
Douglas Lake
BALSAM • 9
209751
L 4590
•482•
CEDAR • 12
209701
•215•
CEDAR • 11
209709
•234•
CEDAR 11
234 (7)
DOGWOOD 18
241(7)
DOGWOOD 17
240(7)
BALSAM • 8
209750
•481•
BALSAM • 7
209749
•480•
CEDAR • 10
209700
•214•
CEDAR • 9
209699
•213•
CEDAR 9
213 (6)
DOGWOOD 16
239(7)
DOGWOOD 15
238(7)
BALSAM • 6
209748
•479•
BALSAM • 5
Sand Lake
209747
4590
•478•
CEDAR • 8
209698
•212•
CEDAR • 7
209697
•211•
CEDAR 7
211 (6)
MTN
CEDAR • 6
209753
BLOCK H
JAFFRAY TIE RESERVE
N
CLAIM MAP
T.K.

THE R. H. STANFIELD GROUP



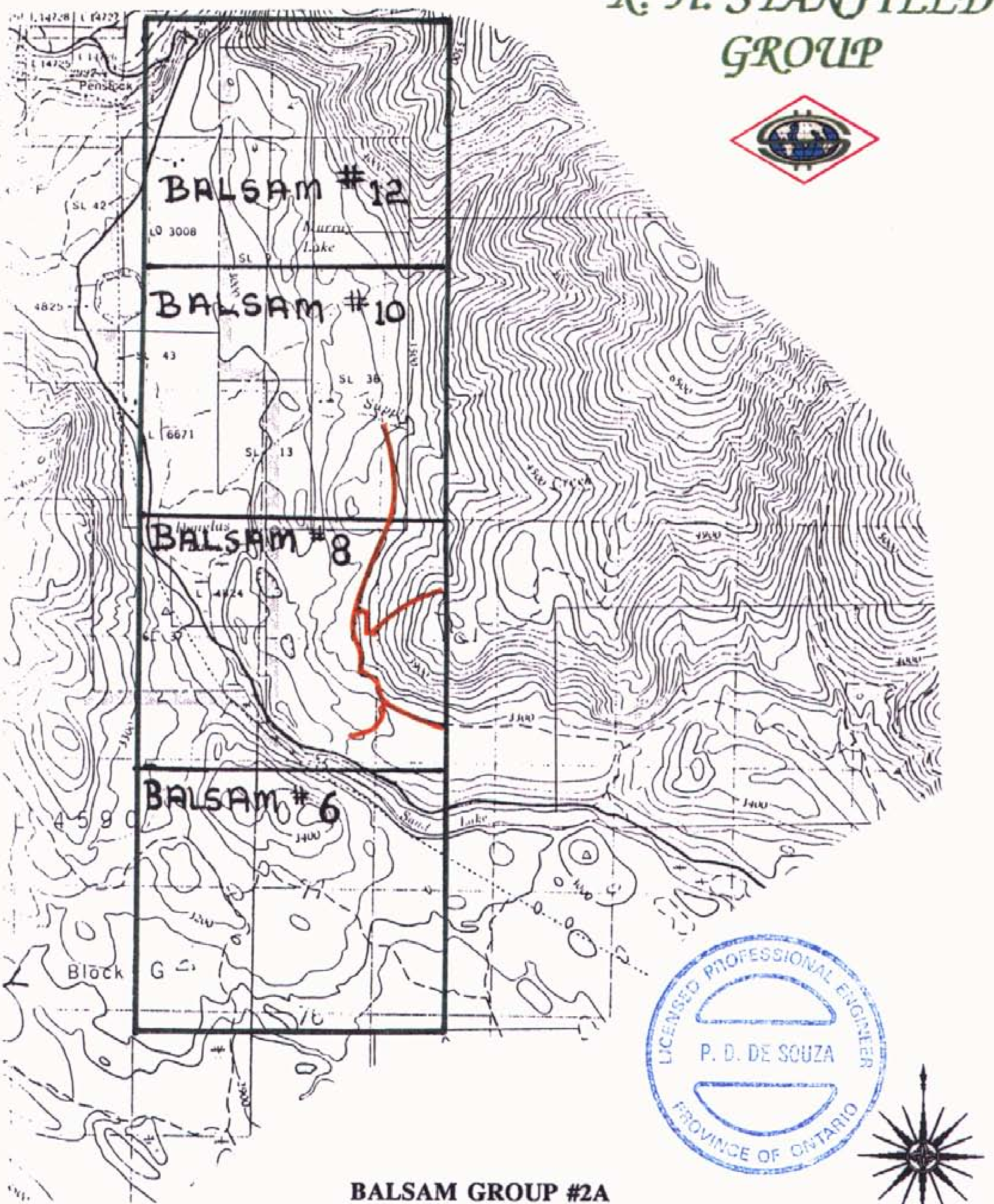
BALSAM GROUP #1A
ROAD WORK and EROSION CONTROL

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

THE R. H. STANFIELD GROUP



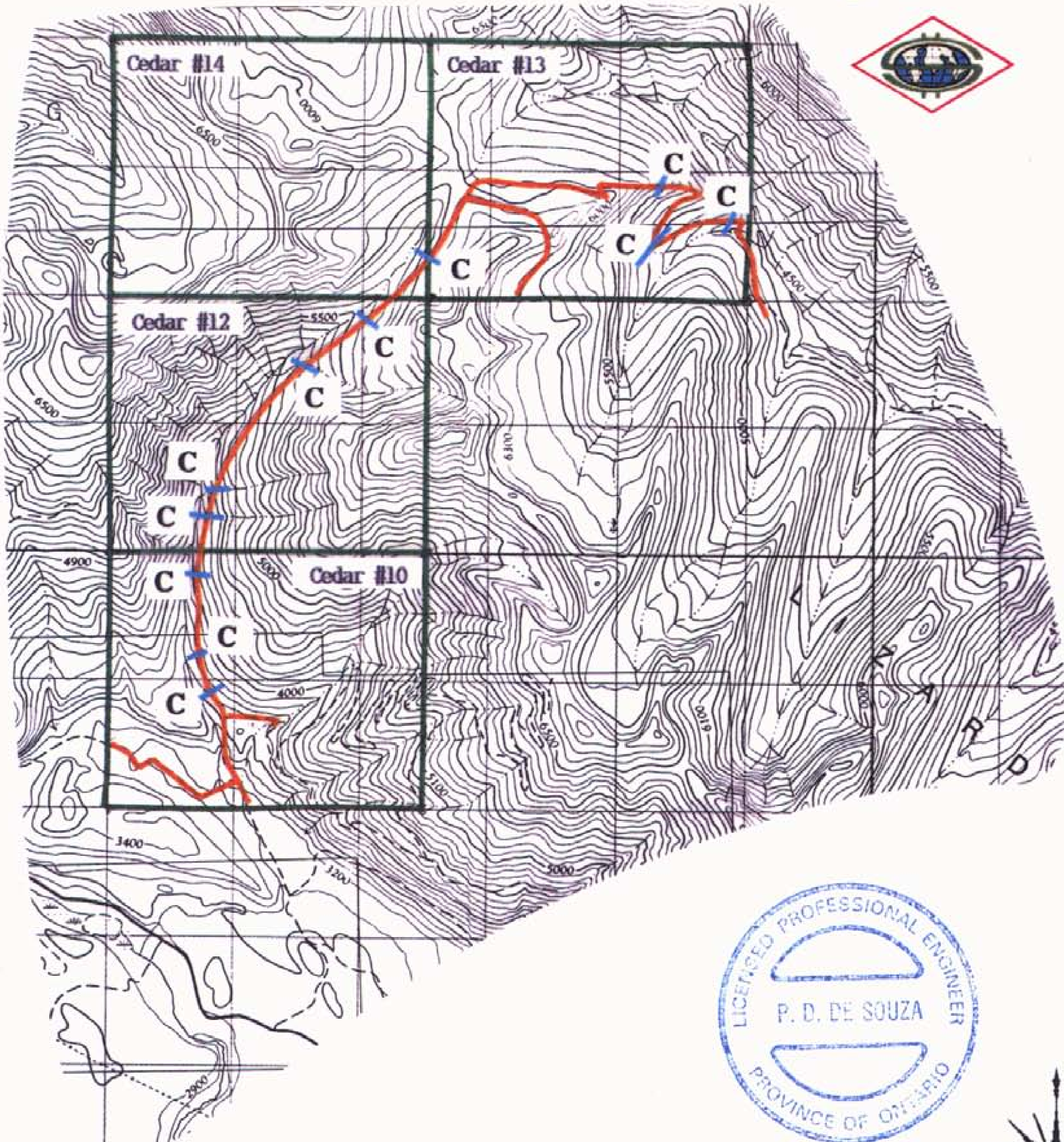
BALSAM GROUP #2A
ROAD WORK and EROSION CONTROL

Scale 1:50 000 Échelle

Miles 1 — 0 — 1 — 2 — 3 Milles

Metres 1000 — 0 — 1000 — 2000 — 3000 — 4000 Mètres

THE
R. H. STANFIELD
GROUP



LICENSED PROFESSIONAL ENGINEER
P. D. DE SOUZA
PROVINCE OF ONTARIO

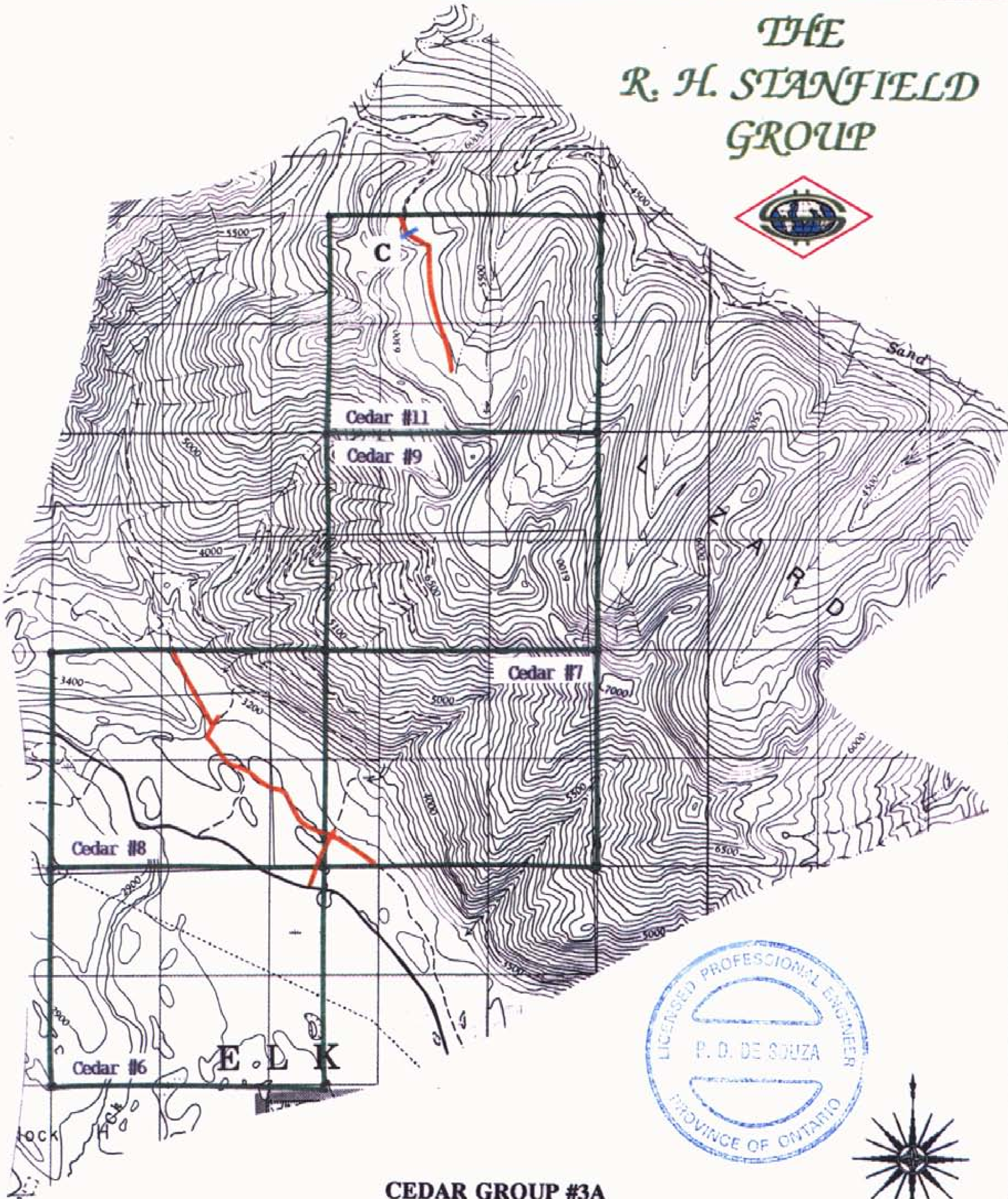
CEDAR GROUP #2A
ROADWORK and EROSION CONTROL

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

THE R. H. STANFIELD GROUP



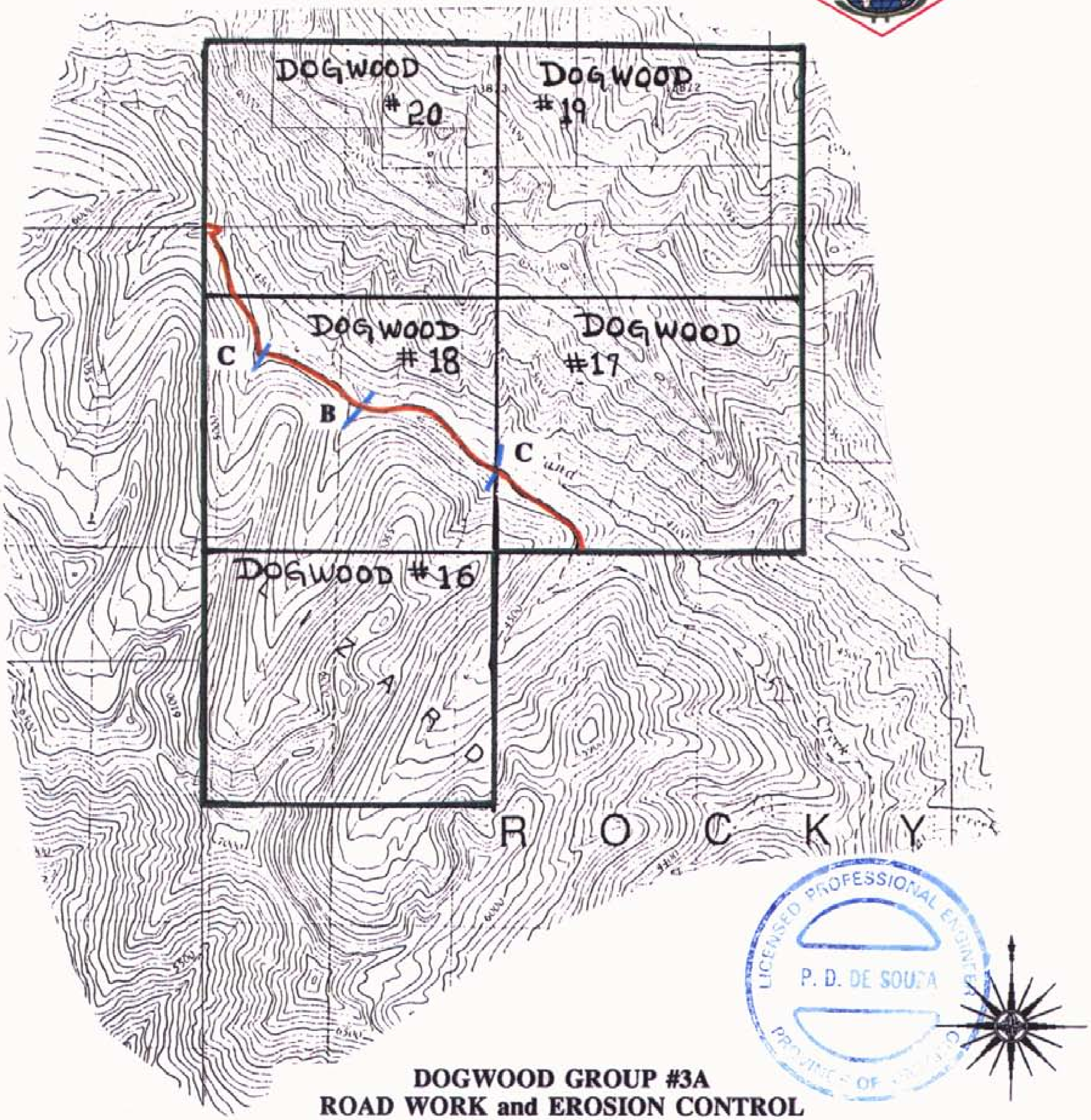
CEDAR GROUP #3A
ROADWORK and EROSION CONTROL

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

THE R. H. STANFIELD GROUP



DOGWOOD GROUP #3A
ROAD WORK and EROSION CONTROL

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

Sandstone, Siltite, and Minor Dolomitic Siltite
'Non-Dolomitic Siltite' Unit: Green, Locally purple siltite

KITCHENER FORMATION
Upper Unit (North of Dibble Creek Fault): Silty Dolomite, Grey Dolomitic Siltite, Grey Siltite, Sandy Dolomite, and Stromatolitic Dolomite

Lower Unit (North of Dibble Creek Fault): Green or Grey Dolomitic Siltite, Green Siltite, and minor Dolomitic Quartzite

CRESTON FORMATION
Upper Subunit: Green, Lesser purple siltite, Dolomitic siltite near top, white quartzite

Lower Subunit: Purple, grey or green, very coarse-grained siltite to fine-grained quartzite, white quartzite, and green, purple siltite

Upper Subunit: Purple siltite with white quartzite

Middle Subunit: Green siltite

Lower Subunit: Grey siltite (north of Bull Canyon Fault), green, fine-grained quartzite, with grey siltite (south of Bull Canyon Fault-Unit)

ALDRIDGE FORMATION
Grey Siltite and Argillite, with two Dolomitic Siltite Horizons near top, South of Bull Canyon Fault

Quartzite, Grey Siltite and Argillite: Quartzite predominant, Siltite and Argillite predominant

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TYPES OF MINERALISATION:

The following is a brief description of the types of mineralisation known in the surrounding area with similar to identical geology.

Quartz-Carbonate-Sulphide VEIN SYSTEMS in SHEAR ZONE Envelopes:

Vein systems can be massive, tens of feet wide to a few inches width in stockworks and horsetails. *Sulphides are chalcopyrite, pyrite, pyrrhotite mainly, with minor galena and arsenopyrite.* Quartz is the major gangue mineral followed by carbonates (dolomite and siderite). Gold is associated with the sulphides and/or occurs as free gold in the quartz gangue and within silicified zones in the shear envelopes.

Host rocks are either partly silicified and chloritised argillites, argillaceous quartzites, and quartzites mainly of the Aldridge formation. Other host rocks include the argillites of the Creston and Gateway formations. The meta diorite dykes and sills of the Moyie Sill group have some degree of spatial relationship to the vein systems, but their role in the mode of origin of mineralisation is not clear.

The Bull River Mine adjacent to block B is an excellent example of this type of mineralisation. Other related examples of this type in the immediate proximity, include the Strathcona-Empire, the Rex Zone, the Dean Zone, the Treasure Zone, the Don and Rimrock Zones.

Conformable (Syngenetic?) Massive Sulphide Deposit:

These are characterised by mainly conformable (to bedding) massive sulphides within the Aldridge formation. Sulphides are galena, sphalerite, pyrrhotite, with zones of massive pyrite. Zoning of sulphides is common, so is alteration, such as chloritisation and tourmaline. The host rock lithology is very similar to the Bull River Mine. The Sullivan Mine is a prime example of this type, and is located west-northwest of the survey areas, on the other side of the Trench. Location of a Sullivan Type of ore body east of the Trench, has been a long term exploration goal in this part of British Columbia.

Quartz Lode Type with Sulphides and/or Free Gold:

The Cretaceous-Tertiary quartz-monzonite and granodiorite intrusives in the area have potential for this type of mineralisation, and may be source areas for some of the placer gold deposits.

Vein Type Galena-Sphalerite Mineralisation associated with Major Structures:

This type of mineralisation has been found to date in the Aldridge, Creston, and the Lower Cambrian formations. Mineralisation occurs as fillings and replacement within faults and associated fissure systems. Examples of this type in the immediate vicinity are the Burt, O.K. Zones, and possibly the Great Western Zone. The Estella Mine and the Kootenay King Mine north of the survey areas are also of this type, and so is the St.Eugene Mine across the Trench to the west.

Pb-Zn Mineralisation in the Palaeozoic Carbonate Rocks:

No significant discoveries of these types have been made. Recognition of reef structures and geometry would be the key. Haloes of zinc mineralisation detected by geochemical surveys may provide clues also.

Iron Formations:

The Bull River Iron showing southeast of block B is probably not a classical iron formation type, and consists of hematite concentrations associated with fissures. Sandstones within the Palaeozoic and possibly Triassic formations in the area may include concentrations of iron (magnetite), and may be associated with economic deposits of other heavy minerals.

STRUCTURE AND STRUCTURAL EVOLUTION

The Sand Creek – Lizard Range tecteno stratigraphic domain of the Western Rocky Mountains is represented in this survey area. The Western Rocky Mountains form the eastern edge of the Purcell anticlinorium, against the Rocky Mountain thrust belt. The geology is fairly complex, with structural evolution mainly tied to the Hosmer Thrust.

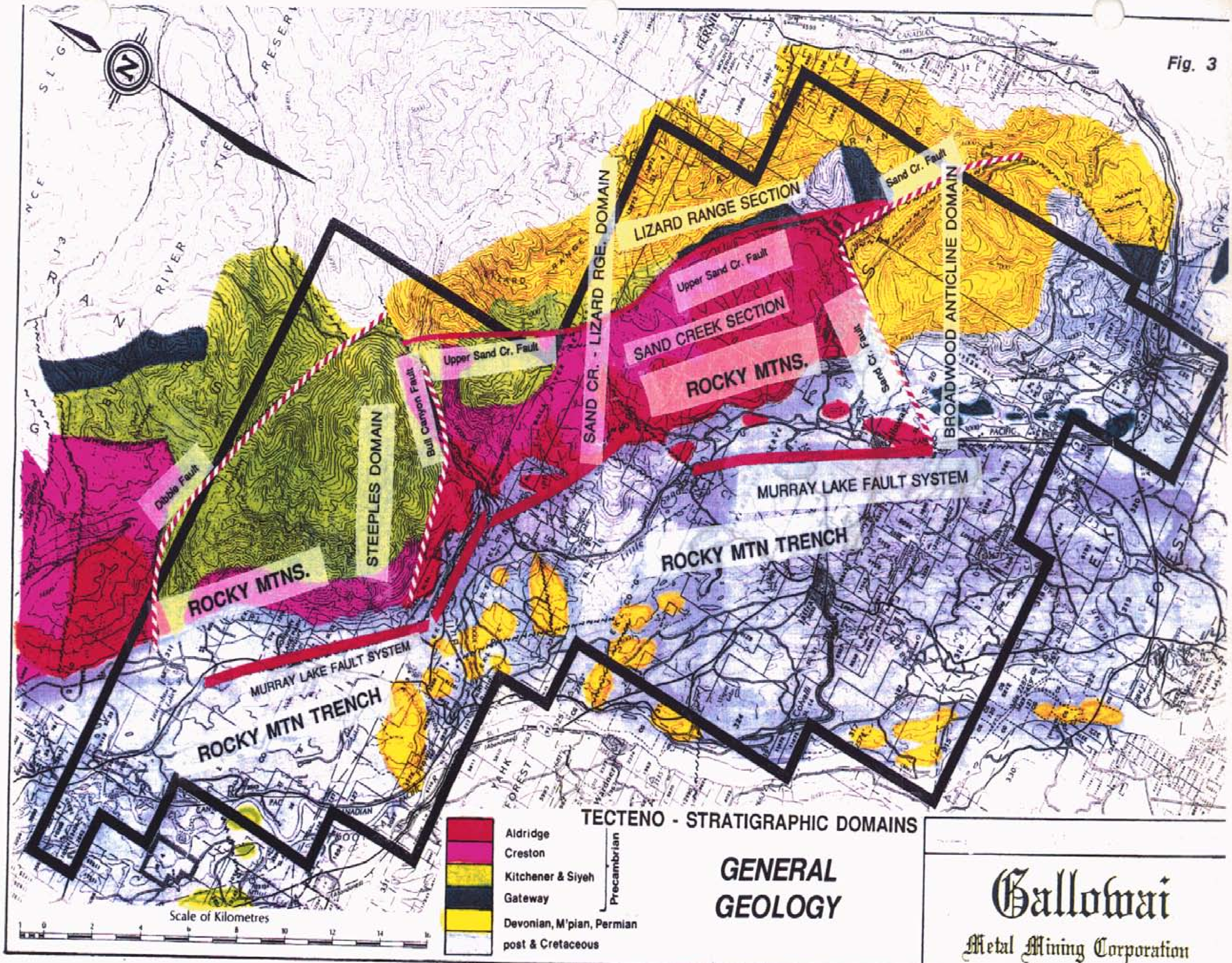
The Sand Creek – Lizard Range Domain (and the adjacent Steeples Domain to the north) is part of the LIZARD SEGMENT of the HOSMER THRUST, and is part of the structurally highest portion of the southern Rocky Mountains.

The Sand Creek - Lizard Range Domain:

This domain is divided into two longitudinal sections by the NW trending UPPER SAND CREEK thrust fault. The western segment is designated by us as the SAND CREEK SECTION, and the eastern segment is the LIZARD RANGE SECTION.

The BULL CANYON FAULT marks the northern boundary of the Sand Creek Section. It is a left–lateral reverse fault with about 2–3 Km of stratigraphic separation, and dips southward. The locus of the fault suggests that its origin is tied into the stress associated with the Dibble monocline. Also, the contrasts in the Purcell succession across the fault suggest that it may follow the locus of an older structure that controlled Purcell deposition. Although the Lower Purcell group of rocks are found on both sides of the fault, the NE trending structures in the Steeples Domain, north of the fault do not extend on to the hangingwall side of this fault. In addition, the large anticline north of the fault (in the Steeples Domain) is not one of the NE trending structures caused by compression during movement on the Dibble fault, but is formed during the Bull Canyon Fault displacement, and does not have a counterpart on the hangingwall (south) side of the fault.

In this domain the mechanics and structural history of the UPPER SAND CREEK FAULT are



GENERAL GEOLOGY

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Metal Mining Corporation

critical in understanding the stratigraphy of this domain. The fault cuts through the HOSMER NAPPE (which has a shallow NW plunge), causing the backlimb and bow of the nappe to ne thrust over the overturned forelimb. This has thrust the Precambrian Purcell Series of rocks from the backlimb of the nappe against the overturned Devonian and Mississipian strata of the forelimb. The SAND CREEK SEGMENT of the Domain is made up of a range of generally rounded slopes, underlain by this backlimb of the Purcell series, and is structurally part of a crest and east limb of an anticline (superimposed on the backlimb of the nappe) that plunges gently northwest.

East of the Upper Creek Fault the second division of the Domain forms the LIZARD RANGE. It consists of the overturned forelimb of the Hosmer Nappe forming a prism of sediments. The backbone of the Range is made up of resistant portions of the Devonian and Mississipian Formations, and its eastern slopes are underlain by softer Mesozoic strata.

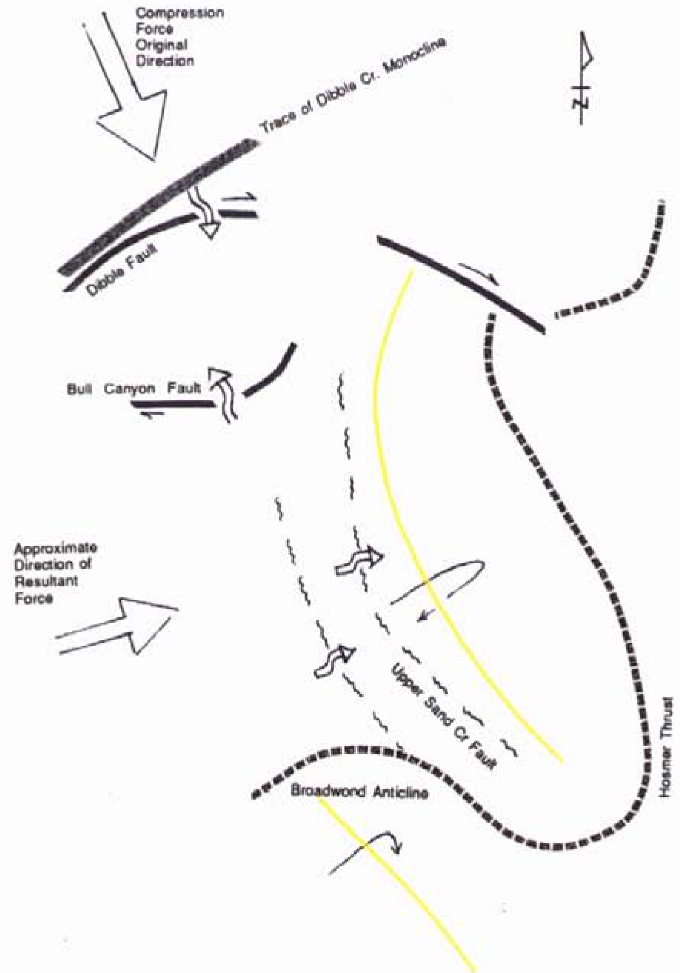
THE ROCKY MOUNTAIN TRENCH

The Rocky Mountain Trench underlies most of the block D area of the survey. Topographically it is very distinct from the Rocky Mountains, and includes the valley of the Kootenay River system in this area. However, its true structural eastern margin is variable, partly because of thrust faulting northeastward over the tecteno–stratigraphic elements of the Rocky Mountains, and partly due to the cut back eastward of the fault–line scarp that marks the normal–faulted edge of the Trench. The longitudinal Murray Lake Fault system probably represents the pre–erosional position of the fault scarp.

According to the literature, the portion of the Trench in this area is synclinal with major west dipping faults on its east side. Details of the nature of faulting are not discussed here, but features significant to the location of economic mineral deposits are referred to.

The north east flexuring of the of the Sand Mountain and Supply Creek Faults in the Sand Creek Section of the Sand Creek – Lizard Range Domain of the Rocky Mountains may be due to back–sliding (reversal of the older displacement to the NW), that also caused hinge faults transverse to the Trench, i.e. N and NE trends. Another evidence that block faulting rather than strike slip faulting resulted in the formation of the Trench in this area, is the continuation of major Palaeozoic–Mesozoic structures across the trench, e.g. the Moyie–Dibble Fault system. These cross features are also probably responsible for the formation of structural lows within the Trench, which are detectable by gravity surveys. One such structural low is located near Jaffray. Gravity surveys (REFERENCES) indicate that these cross features form the divides (structural highs) between these lows.

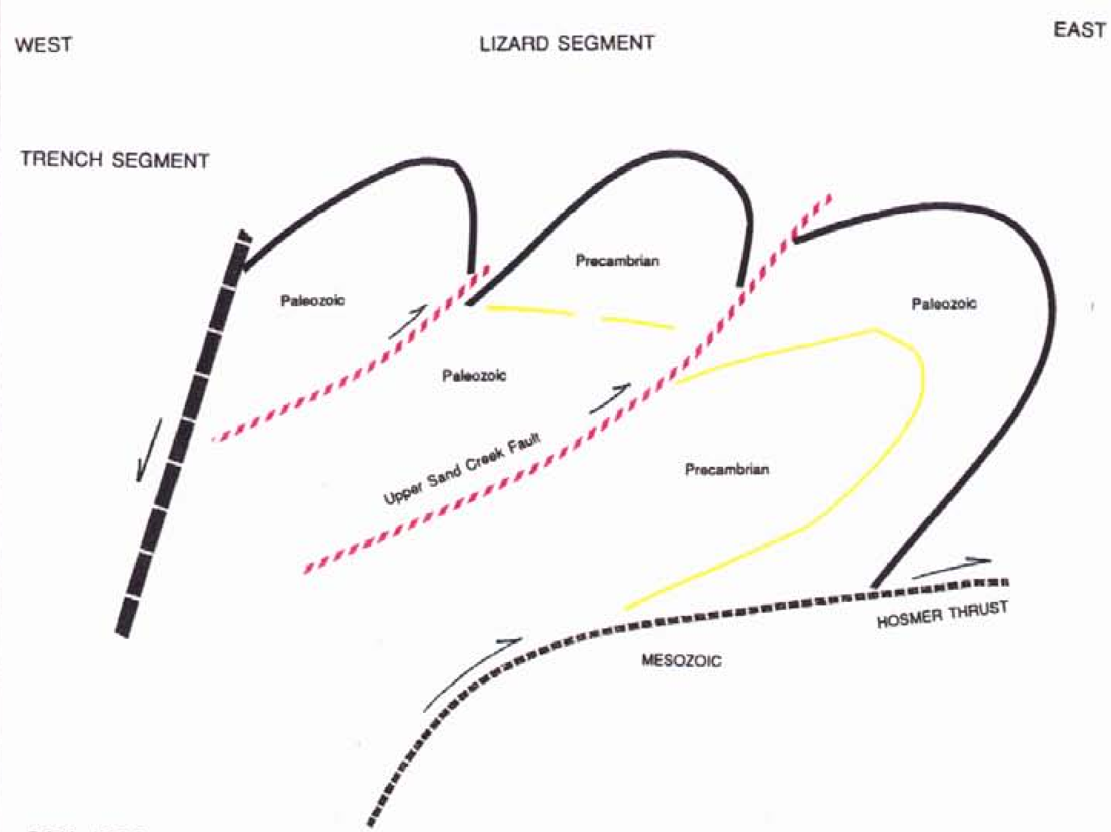
The Trench is probably located above a break in the Earth's crust formed in Precambrian time.



PLAN VIEW OF LIZARD SEGMENT

SCHEMATIC SECTION ACROSS SAND CR - LIZARD RANGE DOMAIN

ROCKY MOUNTAIN DIVISION
of
Gallowai Property, B.C.



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The Trench is probably located above a break in the Earth's crust formed in Precambrian time. During the deposition of the Purcell sediments the Trench marked the boundary between an ancient geosyncline to the west and an ancient shelf to the east. The uplifted terrain in the west supplied detritus intermittently through Mesozoic time. In late Cretaceous–Tertiary time this supply of detritus was cut off, perhaps due to the initial formation of the Rocky Mountain Trench. It essentially became a depositional basin in the Cenozoic.

RELATIONSHIP OF MINERAL DEPOSITS, TECTONICS & STRATIGRAPHY

The Lower Purcell group of strata, particularly the Aldridge Formation, has been historically of major economic interest in the area. The Proterozoic Moyie sills and dykes are also good exploration targets, even though they are rarely host rocks for economic mineralisation. The other members of the Purcell Group have lithologic units similar or identical to the Aldridge, e.g. the Creston and Gateway Formations, and are host rocks to mineral deposits in the area.

In essence favourable target areas for syngenetic type of base metal mineralisation are the formations of the Purcell Group, particularly the Aldridge Formation. These types of deposits are probably localised near ancient crustal features, e.g. the Dibble Monocline, that controlled deposition and volcanism during Purcell time.

Cavity filling and replacement types of deposits require plumbing systems for the ore bearing fluids and significant permeability of the host rocks. Therefore, targets are in proximity to major structural features and the structures themselves. Certain faults, such as extension or normal faults may be more permeable than those caused by shear resulting in thrust faulting. Known mineral deposits on faults or proximity to faults provide clues to mode of occurance of other deposits in the area.

Within the topographic portions of the Trench, the area between the eastern structural limit (Murray Lake Fault) and the present location of the Rocky Mountain scarp are as economically significant as the western edges of the Rocky Mountain domains, because they are underlain by the same stratigraphic sequence, e.g. Lower Purcell Aldridge Formation.

Just north of the survey area quartz–monzonite porphyries intrude the Trench Area. The Reade Lake stock seals the St. Mary's Fault that is a cross–trench feature similar to the Moyie–Dibble Structure on the Property. These stocks are favourable locations for a host of mineral deposits, and although no known exposures occur on the property they may be within 300 metres of the surface and located by geophysical methods.

A classification of known mineral deposits in the immediate vicinity has been completed based on the strike–dip of the mineralisation, the metal types and locations with respect to the major faults discussed in the report.

It is obvious that all the Lead–Zinc type have distinct strikes and dips, while the Copper–Silver veins have altitudes that fall into another distinct category. Both types have a relatively East–West trend with a southerly dip. The exact correlation between the structural elements of the known mineralisations and the major tectonic elements of this area are worth investigating on a regional and local basis.

AIRBORNE GEOPHYSICS:

In 1992 the DIGHEM airborne geophysical survey over portions of the Balsam, Cedar and Dogwood was completed as part of an ongoing program of testing the R. H. Stanfield holdings in the area. Several mineral zones have been recognised in the survey area. Most of them are Pb–Zn–quartz type which generally do not respond to EM. However, they all occur in shear zone envelopes, and the geophysical methods, particularly measurement of resistivity at different frequencies is considered an important tool in determining the extent of the shear zones in the dip and strike direction. Also, the magnetic information and EM would be useful in providing correlation with known photolinears in the area.

The description of methods, equipment and data presentation are in the enclosed report by Dighem. Correlation between known geology, showings and EM anomalies is recommended. The high resistivity recorded over a large segment of the survey grid will require image processing and analysis. It is the author's opinion that ranking of several EM will change on further correlation with known geological data.

The area designated as Zone A in the Electromagnetic Anomalies map coincides fairly closely with the known exposures of the Aldridge Formation. It is difficult to explain the relatively high resistance of the remainder of the area. Most of the known bedrock geology is very similar to the Aldridge–Creston sequence of the Steeples Domain. It is noted that according to the structural model the Purcell sequence in this Sand Creek Section is overturned.

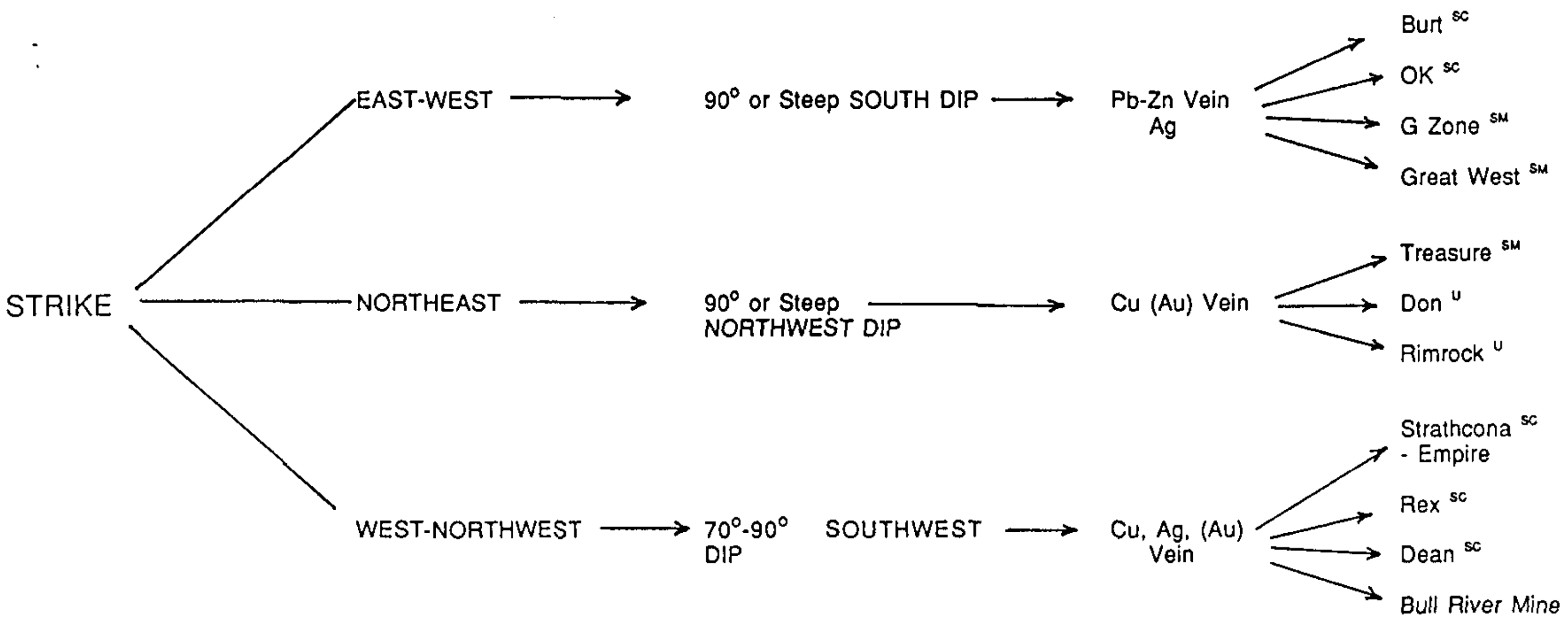
Another possible explanation of the high resistivity background may be the low angle of the

GALLOWAI PROPERTY

CLASSIFICATION OF MINERAL DEPOSITS

BASED ON

Attitude, Metal Type, Location w.r.t. Faults



B	BULL CANYON FAULT
SM	SAND MTN FAULT
SC	SAND CR. FAULT
U	UNKNOWN - PROBABLY RELATED TO NW TRENDING BROADWOOD FAULT

Upper Sand Creek Fault, and the area is underlain by a zone of higher resistivity in the Creston, Kitchener, Siyeh and Gateway Formations.

The conductors within Zone A need to be followed up by ground surveys. In addition several anomalies designated as "questionable" coincide with known trends of shear zones in the area and require further investigation and analysis.

The strong northeast trending magnetic linears in the south east edge of the Big Bear block has been attributed by DIGHEM to iron formations. Several basic and ultrabasic dykes have been reported in the company files, but no systematic mapping has been completed to correlate these with the magnetic anomalies.

RECOMMENDATIONS:

A program to accurately locate the shear zones (mineralised and barren) should be completed. These zones should then be correlated with all the EM conductor responses, even the "questionable" ones. Follow up work should include ground magnetic and EM surveys over several targets. The terrain in this area is not as rugged as in the Steeples Domain, and heavy equipment can be moved in to complete trenching and build drill pads.

Image processing of the geophysical data is also recommended to pinpoint and trace resistivity and magnetic linears, and correlate with known geology and photolinears.

Respectfully submitted
MASTER MINERAL RESOURCE SERVICES LTD.

PERMIT TO PRACTICE
MASTER MINERAL RESOURCE SERVICES LTD.
Signature
Date Sept 9, 93
PERMIT NUMBER: P 5336
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

September 9, 1993
Calgary, Alberta

Pilsum Master, M.Sc.,P.Geol.

COSTS STATEMENT:

Dighem Survey Charges:		
325 Km flying @ $126/km, plus		
Sand Creek survey for $4,500	$ 40,950	
Sub–Total		$ 40,950
Rooms & Meals,Dighem crew		
@ Stanfield camp, 10 man days		
@ $65/man day		$ 650
Pilsum Master, Consultant:		
Planning & scheduling		
Mob./demob. to site,		
Report Preparation		
17 days @ $300/day	$ 5,100	
Sub–Total		$ 5,100
Ross Stanfield Jr., Coordinator:		
10 days @ $200/day	$ 2,000	
Truck, 10 days @ $65/day	$ 650	
Room and meals, Stanfield camp		
10 days @ $65/day	$ 650	
Ross Hewison/ Kirk Halwas, Helper:		
10 days at $75/day	$ 750	
Room and meals, Stanfield camp		
10 days @ $65/day	$ 650	
Sub–Total		$ 4,700
Drafting and secretarial		$ 1,500
Phone, fax, shop facilities, snow removal		
(helicopter pad and access—including supplies		
grader,timberjack)		$ 900
Helicopter Fuel		$ 1,012
TOTAL		**$ 54,812**

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STATEMENT OF QUALIFICATION:

I Pilsum Master of 32 Midpark Gardens S.E., Calgary, Alberta certify that:

I am a graduate of the University of Bombay, India, and a graduate of the University of New Mexico, U.S.A., and hold the following degrees therefrom:

B.Sc., 1963, Geology/Chemistry
M.Sc., 1965, Geology
M.Sc., 1968, Geology/Mineralogy

I am a registered Professional Geologist (Association of Professional Engineers, Geologists and Geophysicists of Alberta), and a member of the American Institute of Mining, Metallurgical and Processing Engineers.

I have practised my profession for the past twenty five years.

I hold no interest in the properties or securities of R. H. Stanfield, or affiliates thereof, nor do I expect to receive any directly or indirectly.

The covering report on the Dighem survey is based on my direct involvement in the planning, preparation and choice of survey methods, and subsequent input into the geological interpretation of the results of the survey.

P. Master

Pilsum Master M.Sc.,P.Geol.

Report #1134B

DIGHEM^{V} SURVEY
FOR
BUL RIVER MINERAL CORPORATION LTD.
BIG BEAR PROPERTY, SAND CREEK AREA
BRITISH COLUMBIA

NTS 82G/6, 11, 12

Dighem Surveys & Processing Inc.
Mississauga, Ontario
February 11, 1993

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Geophysicist

A1134CD.92R

SUMMARY

This report describes the logistics and results of a DIGHEM^V airborne geophysical survey carried out for Bul River Mineral Corporation Ltd. over the Big Bear Property and the Sand Creek area, British Columbia. Total coverage of the two survey blocks amounted to 407 km. The survey was flown from November 19 to November 23, 1992.

The purpose of the survey was to detect zones of conductive mineralization and to provide information that could be used to map the geology and structure of the survey area. This was accomplished by using a DIGHEM^V multi-coil, multi-frequency electromagnetic system, supplemented by a high sensitivity Cesium magnetometer and a two-channel VLF receiver. The information from these sensors was processed to produce maps which display the magnetic and conductive properties of the survey area. An electronic navigation system, operating in the UHF band, ensured accurate positioning of the geophysical data with respect to the base maps. Visual flight path recovery techniques were used in areas where transponder signals were blocked by topographic features.

The survey property contains several anomalous features, 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.

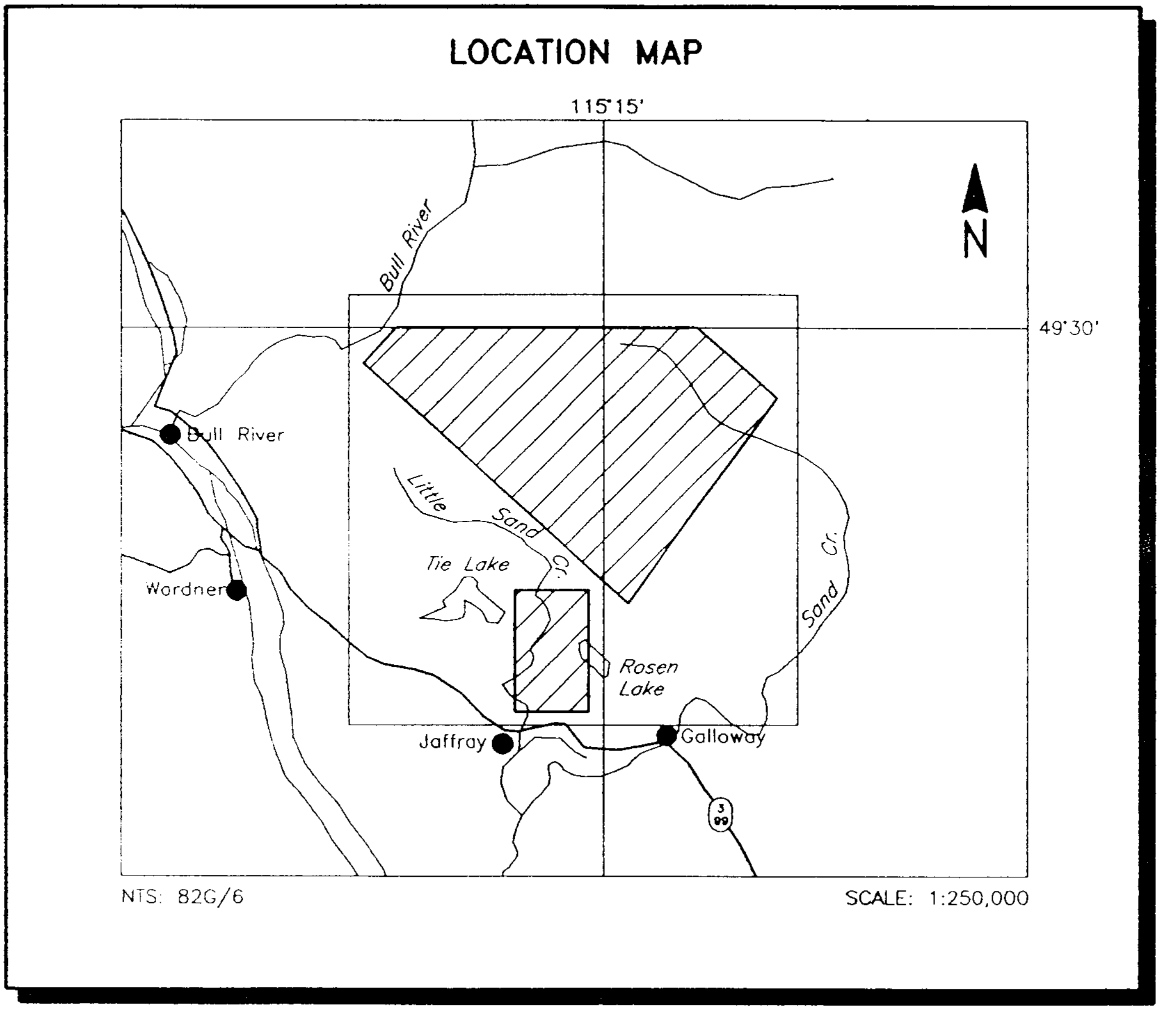

FIGURE 1

BUL RIVER MINERAL CORPORATION LTD.

BIG BEAR PROPERTY - 1134B

CONTENTS

INTRODUCTION

A DIGHEM^{V} electromagnetic/resistivity/magnetic/VLF survey was flown for Bul River Mineral Corporation Ltd. from November 19 to November 23, 1992, over two survey blocks located near Bull River, British Columbia. The survey areas can be located on NTS map sheets 82G/6, 11 and 12 (see Figure 1).

The survey coverage of the Big Bear Property, block C (lines 30040 to 30410), consisted of approximately 337 line-km, and 5 line-km of tie lines. The Sand Creek, block D (lines 40010 to 40220), comprised 65 line-km of flight lines. Flight lines were flown in an azimuthal direction of 315° for block C and at 90° for block D, with a line separation of 200 metres. The first Three lines of the Big Bear Property block were not flown due to persistent cloud cover.

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 105 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.

The two survey blocks from this survey were combined with the Steeples Claims data from a Dighem survey in 1991 (Dighem job# 1097). All of the geophysical parameters except for the 5,000 Hz resistivity were combined with the previous survey. There was no 5,000 Hz data obtained in 1991. The combined data was provided as map prints, originals, colour maps, shadows and as Digital grid archives suitable for workstation imaging.

In some portions of the survey area, the steep topography and cultural objects 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.

Due to the numerous cultural features in the survey area, any interpreted conductors which occur in close proximity to cultural sources, should be confirmed as bedrock conductors prior to drilling.

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 the low frequencies, and 6.3 metres for the 56,000 Hz coil-pair.			
Coil orientations/frequencies:	coaxial	/	900 Hz	
	coplanar	/	900 Hz	
	coaxial	/	5,000 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	and 5,000 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
	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)
3P6I	coplanar inphase (900 Hz)	2.5 ppm	CPI (900 Hz)
3P6Q	coplanar quad (900 Hz)	2.5 ppm	CPQ (900 Hz)
2P4I	coplanar inphase (7200 Hz)	5 ppm	CPI (7200 Hz)
2P4Q	coplanar quad (7200 Hz)	5 ppm	CPQ (7200 Hz)
4X7I	coaxial inphase (5000 Hz)	5 ppm	CXI (7200 Hz)
4X7Q	coaxial quad (5000 Hz)	5 ppm	CXQ (7200 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		
CPSP	coplanar sferics monitor		CPS
CXPL	coaxial powerline monitor		
CPPL	coplanar powerline monitor		CPP

Table 2-2. The Digital Profiles

Channel Name (Freq)		Observed parameters	Scale units/mm
MAG		magnetics	1 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	(7200 Hz)	vertical coaxial coil-pair inphase (5,000 Hz)	4 ppm
CXQ	(7200 Hz)	vertical coaxial coil-pair quadrature (5,000 Hz)	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
CPS		coplanar sferics monitor	
CPP		coplanar 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

Model:	Del Norte 547
Type:	UHF electronic positioning system
Sensitivity:	1 m
Sample rate:	2 per second

The navigation system uses ground based transponder stations which transmit distance information back to the helicopter. The ground stations are set up well away from the survey area and are positioned such that the signals cross the survey block at an angle between 30° and 150°. The onboard Central Processing Unit takes any two transponder distances and determines the helicopter position relative to these two ground stations in cartesian coordinates.

The cartesian coordinates are transformed to UTM coordinates during data processing. This is accomplished by correlating a number of prominent topographical locations with the navigational data points. The use of numerous visual tie points serves two purposes: to accurately relate the navigation data to the map sheet and to minimize location errors which might result from distortions in uncontrolled photomosaic 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.

Global Positioning System

Manufacturer:	Trimble Navigation Ltd.
Type:	Pathfinder (C/A code, dual channel)
Accuracy:	25 metres (5 metres in differential mode)
Update:	Once per second

The Pathfinder system uses signals broadcast by the NAVSTAR GPS satellites to provide positional readouts in latitude/longitude or UTM coordinates. The GPS unit is placed at each UHF transponder site to determine its exact location. The system can also be used aboard the helicopter to provide real-time navigation guidance. Recorded data can be downloaded to a field computer for immediate post-survey processing, or transmitted to the central processing facility for final plotting.

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 Plots Available from the Survey

MAP PRODUCT	NO. OF SHEETS	ANOMALY MAP	PROFILES ON MAP	CONTOURS INK	CONTOURS COLOUR	SHADOW MAP
Electromagnetic Anomalies	1	20,000	N/A	N/A	N/A	N/A
Probable Bedrock Conductors		-	N/A	N/A	N/A	N/A
Resistivity (900 Hz)	1	N/A	-	20,000	20,000	-
Resistivity (5,000 Hz)	1	N/A	-	20,000	20,000	-
Resistivity (7,200 Hz)	1	N/A	-	20,000	20,000	-
Resistivity (56,000 Hz)	1	N/A	-	20,000	20,000	-
EM Magnetite		N/A	-	-	-	-
Total Field Magnetics	1	N/A	-	20,000	20,000	20,000
Enhanced Magnetics		N/A	-	-	-	-
1st Vertical Derivative Magnetics	1	N/A	-	20,000	20,000	-
2nd Vertical Derivative Magnetics		N/A	-	-	-	-
Filtered Total Field VLF	1	N/A	-	20,000	20,000	-
VLF Profiles		N/A	-	-	-	-
Electromagnetic Profiles (900 Hz)		N/A	-	-	N/A	N/A
Electromagnetic Profiles (7200 Hz)		N/A	-	-	N/A	N/A
Multi-channel stacked profiles		Worksheet profiles				20,000
		Interpreted profiles				-

N/A Not available
- Not required under terms of the survey contract
* Recommended
20,000 Scale of delivered map, i.e, 1:20,000

Notes:

- Inked contour maps are provided on transparent media and show flight lines, EM anomalies and suitable registration. Two paper prints of each map are 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:

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.

Resistivity Sengpiel Sections

The apparent resistivity and approximate thickness of two or more horizontal layers can be displayed simultaneously for all coplanar frequencies. An inversion algorithm has been developed by Dr. K.P. Sengpiel* of the B.G.R., which determines the generalized skin depth, or "centroid depth" of the inphase current concentration, as a function of frequency. The centroid depth is combined with the apparent resistivity over a broad frequency range to produce resistivity-thickness pseudo-sections. A coloured presentation yields a smoothed representation of the true resistivity-depth distribution within the limits of the model used.

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

SURVEY RESULTS

GENERAL DISCUSSION

The survey results are presented on one separate map sheet for each parameter at a scale of 1:20,000. Tables 4-1 and 4-2 summarize the EM responses in the survey areas, with respect to conductance grade and interpretation.

The anomalies shown on the electromagnetic anomaly map 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 map, in areas where broad or flat-lying conductors are considered to be of importance. Contoured resistivity maps, based on the 5,000 Hz coaxial, 900 Hz, 7,200 Hz and 56,000 Hz coplanar data are included with this report.

TABLE 4-1

EM ANOMALY STATISTICS

BIG BEAR PROPERTY

CONDUCTOR GRADE	CONDUCTANCE RANGE SIEMENS (MHOS)	NUMBER OF RESPONSES
7	>100	1
6	50 - 100	1
5	20 - 50	13
4	10 - 20	28
3	5 - 10	43
2	1 - 5	84
1	<1	30
*	INDETERMINATE	121
TOTAL		321

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
D	DISCRETE BEDROCK CONDUCTOR	74
B	DISCRETE BEDROCK CONDUCTOR	73
S	CONDUCTIVE COVER	85
H	ROCK UNIT OR THICK COVER	89
TOTAL		321

(SEE EM MAP LEGEND FOR EXPLANATIONS)

TABLE 4-2

EM ANOMALY STATISTICS

SAND CREEK AREA

CONDUCTOR GRADE	CONDUCTANCE RANGE SIEMENS (MHOS)	NUMBER OF RESPONSES
7	>100	0
6	50 - 100	0
5	20 - 50	2
4	10 - 20	1
3	5 - 10	13
2	1 - 5	80
1	<1	11
*	INDETERMINATE	16
TOTAL		123

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
H	ROCK UNIT OR THICK COVER	116
L	CULTURE	7
TOTAL		123

(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 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 each survey block is left intact.

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

There is some evidence on the magnetic map which suggests that the survey area has been subjected to deformation and/or alteration. These structural complexities are evident on the contour map 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 map.

If a specific magnetic intensity can be assigned to the rock type which is believed to host the target mineralization, 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. A discussion of some of the magnetic responses from the survey is included in the **CONDUCTORS IN THE SURVEY AREA** section of the report.

VLF

VLF results were obtained from the transmitting stations at Cutler, Maine (NAA - 24.0 kHz), and Seattle, Washington (NLK - 24.8 kHz). The data from the Seattle station was used to produce the contour maps. Where possible, Seattle data from the 1991 survey was used for the merged presentation.

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. Regardless of these limitations, however, the VLF results have provided valuable additional information, particularly within the more resistive portions of the survey area. The VLF method could probably be used as a follow-up tool in most areas, although its effectiveness will be somewhat limited in areas of moderate to high conductivity.

Resistivity

Resistivity maps, which display the conductive properties of the survey areas, were produced from the 5,000 Hz coaxial, 900 Hz, 7,200 Hz and 56,000 Hz coplanar data. The maximum resistivity value, which is calculated for each frequency, is approximately 1.15 times the numerical value of the frequency. This cutoff eliminates the meaningless higher resistivities which would result from very small EM amplitudes. A discussion of the resistivity responses from the survey is included in the **CONDUCTORS IN THE SURVEY AREA** section of the report.

Electromagnetics

The EM anomalies resulting from this survey appear to fall within one of three 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.

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.

The third class consists of cultural anomalies which are usually given the symbol "L" or "L?"

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.

As economic mineralization within the area may be associated with massive to weakly disseminated sulphides, which may or may not be hosted by magnetite-rich rocks, it is difficult to assess the relative merits of EM anomalies on the basis of conductance. It is recommended that an attempt be made to compile a suite of geophysical "signatures" over 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.

CONDUCTORS IN THE SURVEY AREA

The electromagnetic anomaly map shows 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.

Strong, roughly linear, narrow magnetic responses, similar to that of iron formation, are mapped in the southeast portion of the Big Bear survey area. They are mostly non-conductive, but the locations of highest magnetic intensity yield EM magnetite responses. A magnetic high in the northeast corner of the Sand Creek block is likely due to a continuation of the same source.

To the southeast of these responses there is a weaker, broader magnetic trend which correlates with conductors. This feature is discussed in more detail later.

There are several interesting isolated magnetic lows which flank the inferred iron formation. These are centred at line 30090 at fiducial 3676, line 30231 at fiducial 140, line 30300 at fiducial 2564, line 30370 at fiducial 2130 and line 30390 at fiducial 1204. These could have a component due to dipolar effects from dipping magnetic sources, or they could be due to remanent magnetization caused by alteration of the iron formation, or adjacent intrusive bodies.

There is a strong, isolated magnetic anomaly in the Sand Creek area centred on line 40100 at fiducial 1218. The shape of the anomaly and the location suggest that it is from a cultural source.

There are primarily two domains mapped by all four resistivity parameters. These consist of widespread conductivity in the southern portion of the Big Bear area (Zone A on the EM interpretation map) and the Sand Creek area and secondly, the bedrock conductor in the southeast portion of the Big Bear block.

Zone A

The conductivity in Zone A comprises what appear to be numerous narrow bedrock conductors. This is a low lying area and is likely covered by surficial sediments which yield a resistivity low. The anomalies which resemble bedrock sources may be due to sharp bedrock/surficial interfaces. An alternative model would consist of a widespread zone of conductive shale or graphitic units.

The anomalies in the Sand Creek block do not yield well defined bedrock shapes like the ones in the Big Bear block. This may be due to thicker overlying conductive cover, the flight line direction, a combination of both or (obviously) different underlying lithology.

The southeastern portion of Zone A contains several conductive trends which are parallel to the line direction. These are supported by trends in the topography, such as a steep slope parallel to line 30360, and therefore, they may be associated with structure.

The river valleys in the more resistive, northeast portion of the survey area are generally more conductive than the topographic high areas, presumably because they contain conductive detrital sediments. Conductor 30300A-30340F is in a river valley but yields EM anomaly shapes that are similar to a bedrock source. The river valley may be structurally controlled. There is a magnetic high associated with the river valley. In fact, most of the deep valleys have high magnetic intensities. This may be partially a topographic association as most of the high topographic locations are magnetic lows. It is possible that relatively non-magnetic rocks, which once formed a surface layer, have been eroded to expose more magnetic rocks in the valleys.

Conductors 30120C-30210J, 30200G-30210K and 30160E-30180H

These conductors are associated with a broad magnetic high. Due to this correlation, it is possible that the source is pyrrhotite-rich. However, the conductor is in a river valley and, as noted before, many of the valleys appear to yield magnetic highs which may be related to topography. The conductivity in the valley may also be from sources similar to that in Zone A, such as a graphite-rich unit. If the geology in this location is favourable, ground follow-up is recommended. IP could be a useful tool for follow-up to identify if disseminated sulphides are present.

Conductor 30130B-30160C

Similarly to conductor 30120C-30210J, this conductor is situated in a valley. The anomaly shapes are indicative of narrow, bedrock sources, rather than conductive valley-type sediments. The conductor is parallel to the inferred iron formation, and may be associated with a contact or faulted contact.

Anomaly 30160B

This anomaly may be indicative of weak conductivity due to material overlying or associated with the magnetite-rich body. The apparent resistivity may be overstated as the magnetite suppresses the inphase EM.

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.

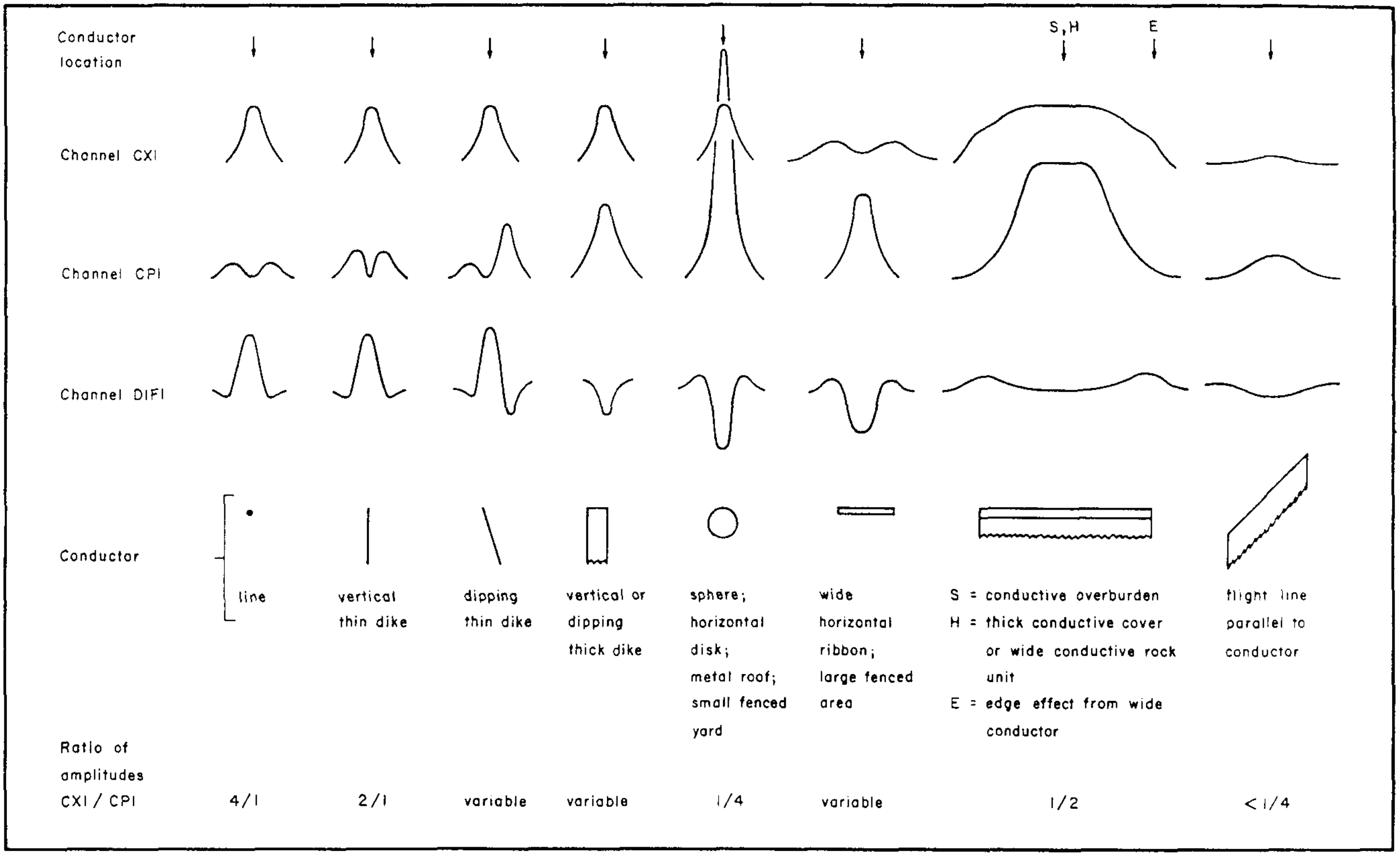

Fig. 5-1 Typical DIGHEM anomaly shapes

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 thin when the thickness is likely to be less than 3 m, and thick 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 absolute 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

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[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.

[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.

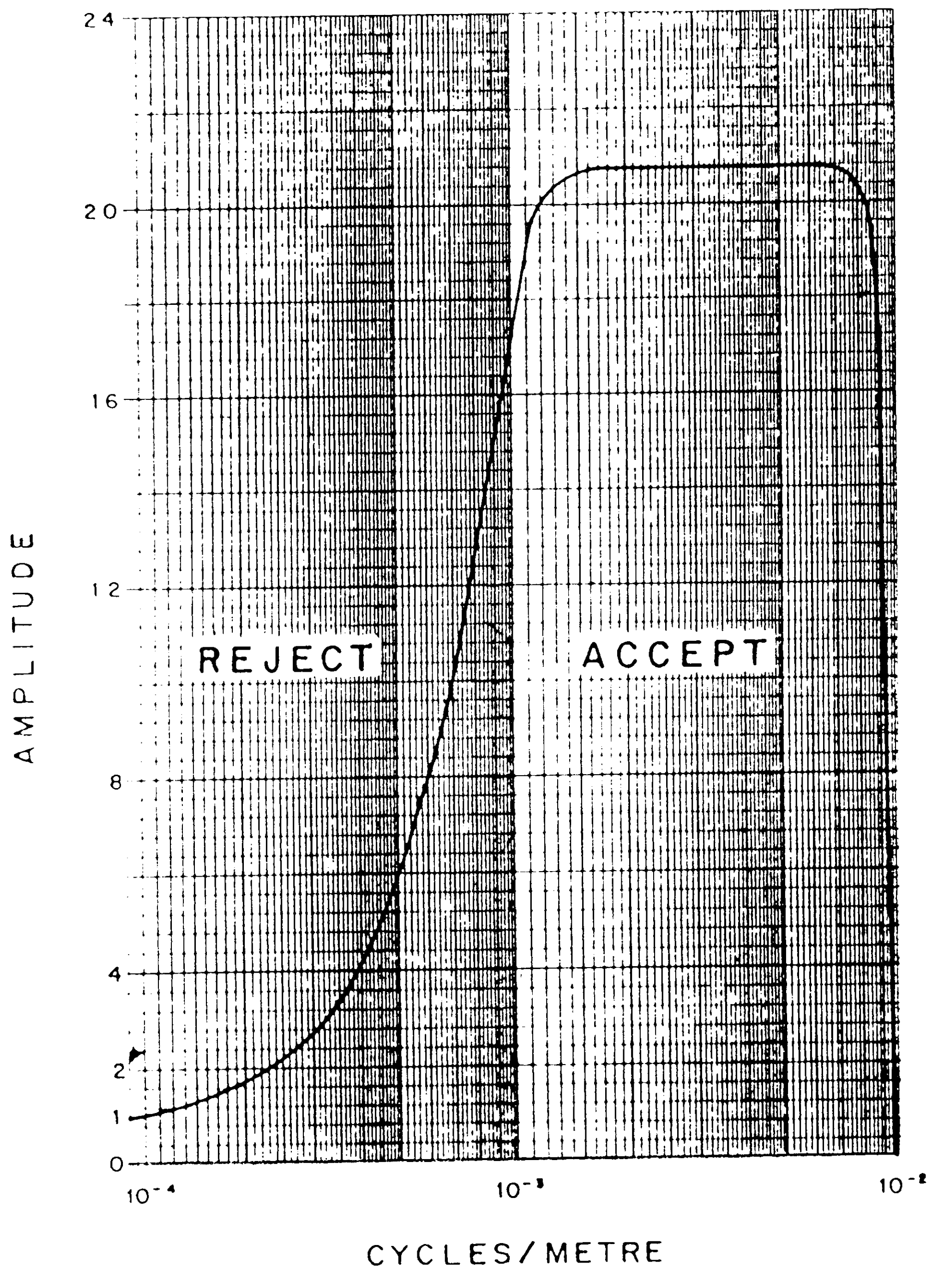

Fig. 5-2 Frequency response of magnetic enhancement operator.

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.

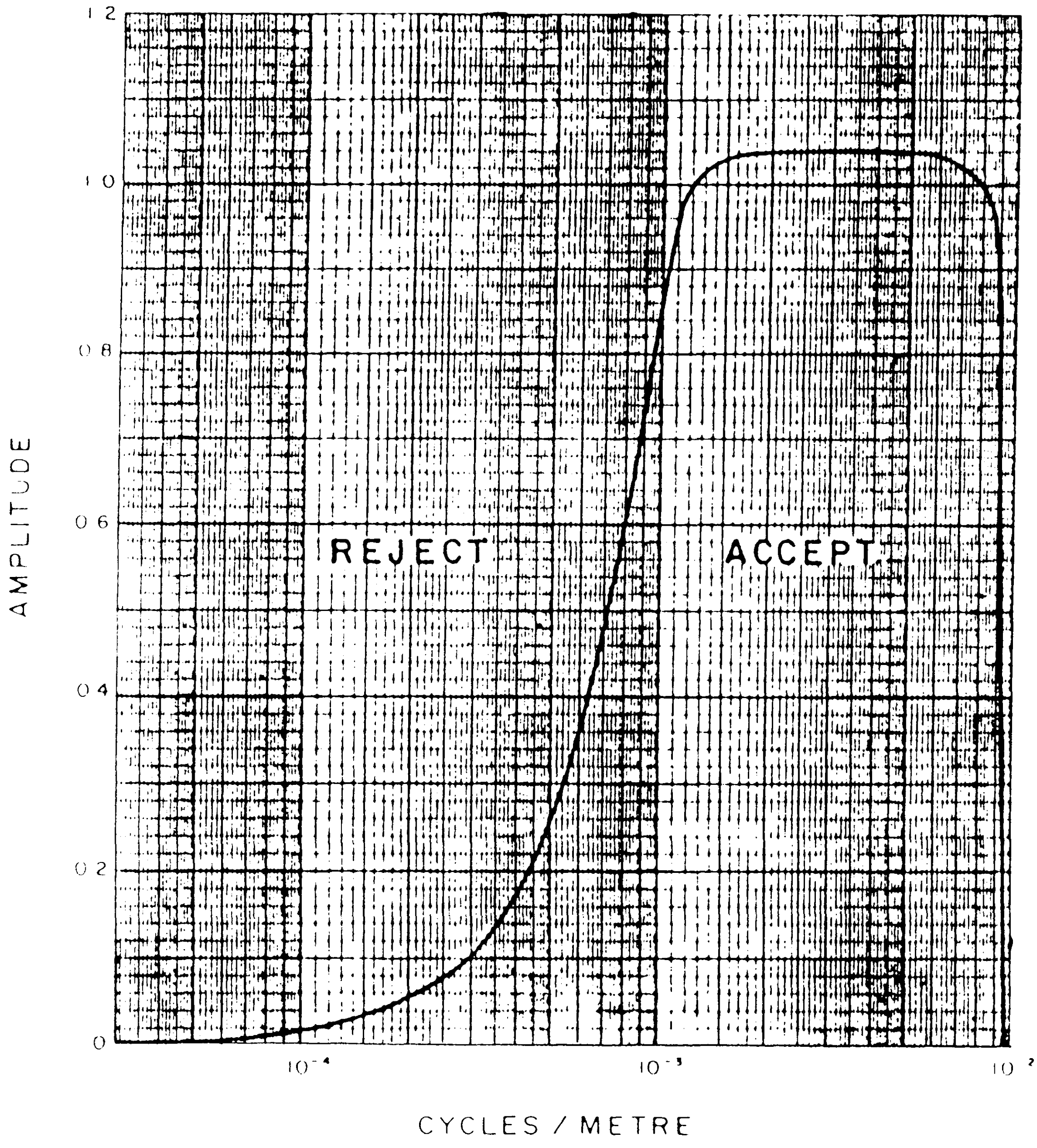

Fig. 5-3 Frequency response of VLF operator.

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.

There are numerous anomalies in the Big Bear survey block which are typical of discrete bedrock conductors. Conductors in the vicinity of conductor 30120C-30210J will probably warrant further investigation for sulphide mineralization. A broad zone, which appears to comprise numerous narrow conductors was also identified. Identifying the source of this conductive zone may aid in geological mapping. 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 survey area. 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.

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 should be noted that there are numerous cultural sources of EM and magnetic anomalies in the area. Interpreted bedrock conductors should be checked on site for man made metallic objects prior to undertaking more expensive follow up.

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 SURVEYS & PROCESSING INC.

Doug McConnell

Douglas L. McConnell, P.Eng.
Geophysicist

DLM/sdp

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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 Bul River Mineral Corporation Ltd., near Bull River B.C.

Steve Kilty	Vice President, Operations
Robert Gordon	Survey Operations Supervisor
Dave Miles	Senior Geophysical Operator
H. Lorenz	Pilot (Hi-Wood Helicopters Ltd.)
Gordon Smith	Data Processing Supervisor
Doug McConnell	Interpretation Geophysicist
Lyn Vanderstarren	Draftsperson (CAD)
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

The survey consisted of 407 km of coverage, flown from November 19 to 23, 1992.

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

DIGHEM SURVEYS & PROCESSING INC.

Doug McConnell

Douglas L. McConnell, P.Eng.
Geophysicist

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A1134CD.92R

APPENDIX B

STATEMENT OF COST

Date: December 9, 1992

IN ACCOUNT WITH
DIGHEM SURVEYS & PROCESSING INC.

To: Dighem flying of Agreement dated November 4, 1992, pertaining to an Airborne Geophysical Survey of the Big Bear Property and Sand Creek area, British Columbia.

Survey Charges

325 km of flying @ $126.00/km
plus Sand Creek survey for
$4,500.00 $40,950.00

Allocation of Costs

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

DIGHEM SURVEYS & PROCESSING INC.

Doug McConnell

Douglas L. McConnell
Geophysicist

DLM/sdp

A1134CD.92R

APPENDIX C

STATEMENT OF QUALIFICATIONS

I, Douglas L. McConnell of the City of Mississauga, Province of Ontario, do hereby certify that:

1. I am a geophysicist, residing in Mississauga, Ontario.

2. I am a graduate of Queens University, with a B.Sc. Engineering, Geophysics (1984).

3. I have been actively engaged in geophysical exploration since 1986.

4. I was personally responsible for the interpretation of the geophysical data described in this report.

Doug McConnell

Douglas L. McConnell, P.Eng.
Geophysicist

A1134CD.92R

APPENDIX D

EM ANOMALY LIST

ANOMALY/ FID/INTERP	COAXIAL 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 30050	(FLIGHT		8)										
A 4662S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30060	(FLIGHT		8)										
A 4382S	0	2	0	2	0	4	-	-	-	-	-	-	0
B 4478S	0	1	0	2	2	15	0.9	36	1	152	1006	0	0
LINE 30080	(FLIGHT		8)										
A 3900S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 3981S	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30090	(FLIGHT		8)										
A 3636S	0	2	0	2	1	4	-	-	-	-	-	-	0
LINE 30100	(FLIGHT		8)										
A 3294S	1	2	0	2	1	4	-	-	-	-	-	-	0
B 3370S	0	2	0	2	2	4	-	-	-	-	-	-	0
C 3440S	1	1	0	1	2	4	-	-	-	-	-	-	0
LINE 30110	(FLIGHT		8)										
A 3126S	1	1	0	2	2	4	-	-	-	-	-	-	0
B 2988S?	1	1	0	2	2	4	-	-	-	-	-	-	90
C 2908B?	1	2	0	2	2	4	-	-	-	-	-	-	0
LINE 30120	(FLIGHT		8)										
A 2698S	1	1	0	2	2	4	-	-	-	-	-	-	0
B 2756S?	1	2	0	2	2	3	-	-	-	-	-	-	0
C 2779B?	1	5	3	8	23	19	0.9	19	1	40	447	0	0
LINE 30130	(FLIGHT		8)										
A 2289S	1	2	1	2	2	4	-	-	-	-	-	-	0
B 2205D?	1	1	0	2	2	4	-	-	-	-	-	-	4
C 2202S	0	2	1	2	2	4	-	-	-	-	-	-	0
D 2147D?	1	2	1	2	2	4	-	-	-	-	-	-	0
E 2145D?	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30140	(FLIGHT		8)										
A 1873S	1	2	1	1	2	4	-	-	-	-	-	-	0
B 1944S	3	3	1	3	10	9	0.9	0	1	29	424	2	0
C 1978D?	1	1	0	1	2	4	-	-	-	-	-	-	0
D 1985D?	1	2	1	2	2	4	-	-	-	-	-	-	0
E 1987D?	5	3	5	6	17	12	9.2	23	1	80	75	39	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 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 30150	(FLIGHT	8)											
A 1485S?	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1350B?	1	2	1	2	2	1	-	-	-	-	-	-	0
C 1295B?	1	0	1	1	2	2	-	-	-	-	-	-	0
LINE 30160	(FLIGHT	8)											
A 836S	0	2	1	2	2	4	-	-	-	-	-	-	0
B 1060S?	0	1	1	1	1	4	-	-	-	-	-	-	410
C 1080B?	2	2	4	2	6	3	4.1	56	4	141	11	115	0
D 1126D	1	2	1	2	1	4	-	-	-	-	-	-	0
E 1132D	7	4	16	10	23	7	12.7	16	3	46	14	24	0
F 1141D	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30170	(FLIGHT	8)											
A 525S	3	3	1	6	12	40	3.2	44	1	58	791	0	0
B 357D	1	2	1	2	2	4	-	-	-	-	-	-	0
C 349D	0	2	1	2	2	4	-	-	-	-	-	-	7
LINE 30180	(FLIGHT	7)											
A 2582S	1	2	0	2	1	4	-	-	-	-	-	-	0
B 2745S	1	2	0	2	2	4	-	-	-	-	-	-	0
C 2771S	0	3	0	7	17	17	0.4	0	1	67	836	0	0
D 2809S	0	1	0	1	2	4	-	-	-	-	-	-	270
E 2882B	1	2	1	1	2	4	-	-	-	-	-	-	0
F 2895D	23	16	21	11	29	13	13.9	0	1	57	723	0	320
G 2898D	13	16	21	11	29	13	5.7	0	2	53	40	21	0
H 2901D	11	8	12	10	23	13	10.2	0	1	49	151	3	0
LINE 30190	(FLIGHT	7)											
A 2286S	0	4	0	4	9	25	0.3	0	1	30	524	4	0
B 2273S	0	2	1	2	2	4	-	-	-	-	-	-	0
C 2249S	0	4	1	6	11	5	0.4	0	1	83	917	0	0
D 2130B	13	14	15	20	53	5	6.5	0	2	46	33	18	0
LINE 30200	(FLIGHT	7)											
A 1670S	0	2	0	2	2	4	-	-	-	-	-	-	0
B 1786S	0	1	0	2	2	4	-	-	-	-	-	-	0
C 1866S	0	5	0	8	9	28	0.4	0	1	42	733	0	0
D 1873S	0	4	0	5	17	42	0.4	0	1	51	763	0	0
E 1885S	0	5	1	7	14	40	0.4	0	1	45	712	0	0
F 1974D	6	7	10	11	20	11	4.7	0	1	42	108	2	0
G 1983D	1	2	1	2	2	4	-	-	-	-	-	-	0

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ANOMALY/ FID/INTERP	COAXIAL 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 30210	(FLIGHT		7)										
A 1499S	0	2	1	2	2	4	-	-	-	-	-	-	0
B 1470S	0	2	0	2	2	4	-	-	-	-	-	-	0
C 1372S	0	2	0	2	0	4	-	-	-	-	-	-	0
D 1325S	3	1	0	4	11	11	0.8	0	1	28	464	0	0
E 1314S	2	3	1	3	11	12	0.8	0	1	42	505	10	0
F 1255S	0	2	0	2	2	4	-	-	-	-	-	-	0
G 1242S	1	3	0	7	15	48	0.9	27	1	55	766	0	0
H 1229S	0	4	0	7	15	46	0.4	5	1	56	738	0	0
I 1198S	0	2	0	2	2	4	-	-	-	-	-	-	0
J 1097D	6	5	11	16	39	39	7.2	41	1	61	107	24	30
K 1088D	9	10	7	2	19	20	6.2	12	1	66	67	30	830
LINE 30220	(FLIGHT		7)										
A 562S	1	1	0	2	2	4	-	-	-	-	-	-	30
B 649S	0	2	0	0	0	4	-	-	-	-	-	-	0
C 740S	0	2	0	2	2	4	-	-	-	-	-	-	0
D 866S	4	1	0	1	4	3	24.0	45	1	172	1006	0	210
E 928S	0	1	0	2	2	4	-	-	-	-	-	-	0
LINE 30230	(FLIGHT		7)										
A 220S	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30231	(FLIGHT		7)										
A 334S	1	2	0	1	2	4	-	-	-	-	-	-	0
B 249S	1	2	1	2	2	4	-	-	-	-	-	-	0
C 238S	1	2	1	2	2	4	-	-	-	-	-	-	0
D 154B?	0	1	0	1	0	13	0.4	29	1	238	1006	0	0
LINE 30250	(FLIGHT		7)										
A 2132S	1	2	0	2	2	4	-	-	-	-	-	-	0
B 2100D?	6	2	3	2	4	9	20.8	50	1	139	853	16	0
C 2074S	1	2	1	2	2	4	-	-	-	-	-	-	0
D 1898B?	0	3	0	2	0	10	0.4	29	1	238	1006	0	360
LINE 30261	(FLIGHT		7)										
A 1428S	1	2	0	2	2	4	-	-	-	-	-	-	0
B 1547S	1	2	0	1	2	4	-	-	-	-	-	-	0
C 1683S	0	1	0	1	1	4	-	-	-	-	-	-	290
LINE 30270	(FLIGHT		7)										
A 320S?	0	2	0	4	2	15	0.4	0	1	101	952	4	0

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		COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH		MAG 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 30280		(FLIGHT		6)										
A	4474S	0	2	0	3	1	23	0.4	4	1	214	1006	0	0
B	4270B?	1	1	1	2	2	2	-	-	-	-	-	-	0
C	4230S	1	2	0	2	2	1	-	-	-	-	-	-	0
D	4126S	0	1	0	1	1	4	-	-	-	-	-	-	0
LINE 30290		(FLIGHT		6)										
A	3406S	0	2	0	2	3	17	0.4	0	1	208	1006	0	0
B	3690S?	0	2	0	2	0	4	-	-	-	-	-	-	0
C	3836S	0	2	0	2	0	22	0.4	5	1	178	1006	0	0
LINE 30300		(FLIGHT		6)										
A	2797H?	1	1	1	2	2	4	-	-	-	-	-	-	0
B	2699D	1	2	1	2	2	4	-	-	-	-	-	-	0
C	2695H?	5	6	6	9	18	30	3.7	32	1	73	81	36	0
D	2676H?	1	2	1	1	2	4	-	-	-	-	-	-	0
E	2568D	5	4	6	8	16	4	7.3	23	1	78	551	0	0
F	2564B?	4	2	5	8	16	9	7.4	36	1	51	107	11	0
G	2546D	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30310		(FLIGHT		6)										
A	1672S?	0	2	0	2	2	4	-	-	-	-	-	-	0
B	1913S?	0	2	0	2	2	4	-	-	-	-	-	-	0
C	2102S	0	0	0	2	1	4	-	-	-	-	-	-	0
D	2210H	5	5	4	7	24	17	6.2	18	1	46	246	0	0
E	2219H?	4	4	3	5	12	15	5.8	37	1	71	242	20	0
LINE 30320		(FLIGHT		6)										
A	1478S	0	2	0	2	0	4	-	-	-	-	-	-	0
B	1440S	0	1	0	2	2	4	-	-	-	-	-	-	0
C	1294S	0	2	0	2	0	4	-	-	-	-	-	-	0
D	1190S	0	2	0	1	2	4	-	-	-	-	-	-	0
E	1074B	3	3	6	5	12	8	3.6	40	2	104	54	66	0
F	995D	4	8	2	6	10	21	2.7	18	1	59	127	19	0
G	983D	7	3	1	5	12	0	18.9	33	1	84	223	30	0
H	900S	0	2	0	2	0	4	-	-	-	-	-	-	0
LINE 30331		(FLIGHT		6)										
A	190S	1	2	0	2	2	4	-	-	-	-	-	-	0
B	210S	1	2	1	2	2	4	-	-	-	-	-	-	0
C	482S	0	2	0	2	0	4	-	-	-	-	-	-	0
D	575B?	1	2	1	2	2	4	-	-	-	-	-	-	0

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		COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 30331		(FLIGHT 6)												
E	629B?	4	3	4	5	9	5	1.0	0	1	29	684	0	0
F	678B?	1	2	2	3	6	7	0.6	0	1	20	1390	0	0
LINE 30340		(FLIGHT 6)												
A	924B?	6	4	1	1	1	13	10.4	0	1	43	130	0	0
B	919B	7	4	7	5	18	18	14.2	12	1	63	121	18	80
C	896S?	1	1	1	2	2	4	-	-	-	-	-	-	0
D	884S?	1	2	1	2	2	4	-	-	-	-	-	-	0
E	681S	1	3	0	1	2	1	0.9	33	1	213	1006	0	0
F	610B?	1	2	1	2	2	2	-	-	-	-	-	-	0
G	586S	1	1	1	2	2	4	-	-	-	-	-	-	0
H	563B	1	2	1	2	2	4	-	-	-	-	-	-	0
I	555B	3	4	5	6	16	9	3.6	24	1	64	106	23	0
J	519B?	5	2	6	5	13	18	0.6	0	1	57	332	28	0
K	500B?	1	2	5	6	11	13	1.4	43	2	110	60	71	0
L	428S	1	1	1	2	2	4	-	-	-	-	-	-	0
M	416S	1	2	1	2	2	4	-	-	-	-	-	-	0
N	408S	1	1	1	2	2	4	-	-	-	-	-	-	0
LINE 30350		(FLIGHT 5)												
A	3773B	1	2	1	2	0	4	-	-	-	-	-	-	0
B	3766D	5	3	4	6	11	51	11.3	28	2	100	37	65	0
C	3763D	6	10	7	17	44	40	3.3	10	2	70	60	35	0
D	3757B?	4	8	7	16	35	42	2.8	20	1	56	70	22	0
E	3743B?	1	2	1	2	2	4	-	-	-	-	-	-	0
F	3730H	1	2	5	8	19	3	1.7	59	2	91	40	59	0
G	3718H	1	3	3	3	9	19	0.3	0	1	28	571	1	0
H	3704D	2	2	2	5	10	28	0.3	0	1	21	647	0	0
I	3685D	4	7	7	5	12	54	2.3	30	1	59	227	16	0
J	3671H	2	5	3	8	5	35	1.8	34	1	92	93	51	0
K	3473H	6	8	8	11	16	18	4.3	27	2	73	28	45	0
L	3464H	7	12	5	17	34	32	3.7	15	2	53	40	26	0
M	3446B	3	9	17	12	7	8	1.7	23	2	63	39	35	0
N	3438B	7	10	24	38	99	76	3.9	23	2	42	22	20	0
O	3432B	3	18	19	41	85	96	0.8	0	2	78	32	50	0
P	3426D	14	9	24	41	85	96	12.9	23	1	46	58	16	0
Q	3389D	5	7	7	5	15	16	3.2	44	1	92	83	54	0
R	3380H	3	4	11	10	16	3	2.7	33	2	58	28	31	0
S	3364H	1	2	1	2	2	4	-	-	-	-	-	-	0
T	3349D	2	4	6	13	36	29	2.1	36	1	76	80	38	0
U	3343D	6	8	7	13	36	29	4.1	26	1	84	95	43	0

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ANOMALY/ FID/INTERP		COAXIAL 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 30350		(FLIGHT		5)										
V	3321B?	1	2	1	2	2	4	-	-	-	-	-	-	0
W	3300D	4	3	3	4	13	15	0.8	0	1	39	541	9	0
X	3291B	5	3	13	6	14	6	10.3	33	3	80	18	53	0
Y	3270B	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 30360		(FLIGHT		5)										
A	2523D	13	13	4	13	30	49	6.7	5	2	61	31	32	0
B	2528D	9	13	3	15	30	93	4.4	33	2	74	39	46	0
C	2542H	1	4	2	5	14	39	1.3	40	1	80	119	40	0
D	2562H	4	7	6	10	31	8	3.0	38	1	71	65	38	0
E	2591H	4	4	5	7	8	17	4.9	51	1	79	83	42	0
F	2610B	7	8	7	7	17	32	5.4	34	1	79	110	40	0
G	2617B	6	4	11	7	12	13	7.7	43	2	93	26	64	0
H	2630D	4	7	4	6	9	17	2.6	36	1	80	196	34	0
I	2678H?	2	4	4	6	9	10	2.4	48	1	93	155	46	0
J	2770D	0	2	0	2	0	4	-	-	-	-	-	-	0
K	2788S	1	2	1	2	2	4	-	-	-	-	-	-	0
L	2801S?	0	2	1	2	2	4	-	-	-	-	-	-	0
M	2829B	5	10	11	19	45	53	2.9	23	2	61	45	32	0
N	2845B	4	4	7	6	11	4	5.8	28	1	60	107	19	0
O	2853D	9	11	15	31	71	49	4.8	0	1	34	60	3	0
P	2856D	14	20	15	31	71	49	4.8	9	1	51	57	21	0
Q	2862D	7	12	19	15	36	22	3.4	16	2	45	34	19	0
R	2865D	13	8	19	15	36	22	12.9	32	2	59	50	29	0
S	2868D	7	9	10	21	55	26	4.6	26	1	65	79	30	0
T	2882B	8	5	12	20	53	31	8.9	40	2	57	44	28	0
U	2890D	4	4	5	7	18	26	5.1	49	2	65	44	36	0
V	2898D	10	8	26	45	112	94	9.1	23	2	57	35	29	0
W	2903B	6	38	28	56	141	160	1.0	4	2	47	25	26	0
X	2909D	10	38	27	66	170	242	2.0	6	1	51	71	22	0
Y	2916D	5	6	17	42	104	83	3.7	29	1	64	61	31	0
Z	2922D	12	25	17	42	104	83	3.2	14	1	50	62	22	0
AA	2953D	11	15	14	31	63	80	5.1	28	1	59	55	30	0
AB	2960D	1	2	1	2	2	4	-	-	-	-	-	-	0
AC	2965D	12	7	17	17	40	25	12.8	22	2	63	43	32	0
AD	2986D	22	24	34	36	92	73	7.6	18	2	55	29	31	0
AE	2987D	22	24	34	36	92	73	7.6	19	3	68	16	46	0
AF	2991D	22	4	33	8	23	19	101.6	31	4	69	13	48	0
AG	2997D	3	8	7	9	24	2	1.7	19	3	80	16	57	0
AH	3001D	8	5	6	9	24	5	10.6	32	3	73	18	48	0
AI	3038D	2	6	0	5	16	14	1.1	178	1	258	100	200	0

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		COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 30370	(FLIGHT 5)													
A	2496B	25	16	38	24	64	31	14.8	14	5	62	7	44	7
B	2489B	14	9	32	19	42	39	13.7	29	3	68	16	45	0
C	2484B	1	2	1	1	2	4	-	-	-	-	-	-	0
D	2459H	8	6	13	10	20	17	9.3	30	2	64	35	35	0
E	2445H	13	12	22	22	59	30	8.3	18	3	55	16	33	0
F	2432H	5	3	11	8	14	11	13.4	55	1	79	71	43	0
G	2424H	1	2	1	2	2	4	-	-	-	-	-	-	0
H	2411D	6	9	7	5	17	26	3.8	31	1	79	80	42	0
I	2405D	15	14	19	18	27	22	8.1	22	2	72	31	45	0
J	2401B	1	2	1	2	2	4	-	-	-	-	-	-	0
K	2393B	1	2	0	2	2	4	-	-	-	-	-	-	0
L	2379B	1	2	1	2	2	4	-	-	-	-	-	-	0
M	2367B	4	5	2	9	25	27	3.5	37	1	82	207	33	0
N	2348H	2	4	5	8	12	20	1.8	27	1	64	104	25	0
O	2233H	3	5	1	7	9	39	2.2	38	1	46	318	4	0
P	2188D	1	2	1	2	2	4	-	-	-	-	-	-	0
Q	2186D	6	14	17	35	103	38	2.3	6	1	48	71	16	0
R	2180D	5	3	11	19	52	25	9.5	40	1	63	66	29	0
S	2172B	14	20	33	50	130	63	5.1	18	2	56	29	32	0
T	2167B	11	12	38	47	100	39	6.2	20	3	40	16	20	0
U	2163B	6	12	38	47	100	39	2.8	27	2	60	30	35	0
V	2155D	29	22	57	60	128	66	13.1	27	4	53	9	37	0
W	2154D	29	24	57	60	128	66	11.5	18	3	44	20	24	0
X	2149B	1	2	1	2	2	4	-	-	-	-	-	-	0
Y	2145B	14	15	17	27	53	41	7.2	11	3	44	15	23	0
Z	2144B	14	15	17	27	53	41	7.2	13	3	48	17	27	0
AA	2135H	1	6	11	10	24	14	0.4	2	3	85	25	58	0
AB	2121H	1	1	1	2	2	4	-	-	-	-	-	-	0
AC	2106B	13	4	28	7	18	13	31.2	41	4	93	9	72	0
AD	2105B	11	4	28	7	18	2	30.8	45	6	86	5	68	0
AE	2103B	11	3	16	7	18	2	34.9	37	6	78	5	61	0
AF	2101B	8	3	16	7	24	2	21.0	53	6	88	5	71	0
AG	2092B	1	2	1	2	2	4	-	-	-	-	-	-	0
AH	2083B	1	2	1	2	2	4	-	-	-	-	-	-	0
AI	2074D	11	18	12	23	45	50	4.1	6	2	75	38	44	0
AJ	2068D	7	12	12	23	66	51	3.2	19	2	71	36	42	0
AK	2056B?	1	2	1	2	2	4	-	-	-	-	-	-	0
AL	2032B	22	11	18	11	33	2	22.2	0	5	51	7	31	0
LINE 30380	(FLIGHT 5)													
A	1580B	1	2	1	2	2	4	-	-	-	-	-	-	0

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		COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 30380	(FLIGHT 5)													
B	1587D	17	20	33	56	60	18	6.5	23	2	43	48	17	0
C	1600H	1	2	1	2	2	4	-	-	-	-	-	-	0
D	1607H	9	7	19	31	11	5	9.1	34	2	45	38	19	0
E	1638D	1	4	2	12	20	23	1.2	42	1	64	191	24	0
F	1645B?	1	2	1	2	2	4	-	-	-	-	-	-	0
G	1658H	2	10	3	13	26	58	1.1	17	1	60	104	25	0
H	1678H	5	12	5	21	60	80	2.3	25	1	58	111	23	0
I	1691H	2	4	1	7	7	20	1.6	562	1	563	216	200	0
J	1705D	2	2	3	1	5	5	2.2	44	1	47	188	5	0
K	1716H	4	4	1	4	3	26	0.1	0	1	46	119	27	0
L	1738H	2	3	3	7	15	36	2.8	59	1	73	107	35	0
M	1749H	1	2	1	2	2	4	-	-	-	-	-	-	0
N	1805S?	1	2	1	2	2	4	-	-	-	-	-	-	0
O	1829H	1	3	3	5	12	39	1.1	24	1	55	254	9	0
P	1854H	2	8	1	12	20	80	1.0	30	1	58	283	19	0
Q	1885S?	1	2	1	2	2	4	-	-	-	-	-	-	0
R	1927H	1	2	1	2	2	4	-	-	-	-	-	-	0
S	1934H	1	1	1	2	2	4	-	-	-	-	-	-	0
T	1938H	7	6	18	13	23	3	7.7	27	2	56	37	28	0
U	1949H	6	5	11	8	20	3	6.5	36	3	77	18	52	0
V	1964H	3	4	7	7	15	17	2.9	54	1	93	68	58	0
W	1977H	14	5	25	9	23	1	29.1	27	5	75	8	55	0
X	1987H	11	3	24	6	13	7	33.5	31	8	72	3	57	0
Y	1990H	10	6	24	5	13	7	11.9	16	9	53	2	39	0
Z	1992H	11	2	12	5	4	7	67.8	30	7	62	4	47	0
AA	1995H	1	2	1	2	2	4	-	-	-	-	-	-	0
AB	2002H	5	4	8	11	28	18	6.9	50	6	88	5	70	0
AC	2011H	10	12	10	27	46	46	5.2	5	3	54	14	32	0
LINE 30390	(FLIGHT 5)													
A	1504H	2	3	6	7	17	5	2.9	27	1	53	89	15	0
B	1493H	2	5	1	8	21	12	1.1	17	1	48	163	9	0
C	1482H	2	7	3	9	24	37	1.6	7	1	30	219	0	0
D	1456H	5	10	5	14	20	40	2.8	27	1	54	123	18	0
E	1452H	4	2	5	11	18	2	8.7	67	1	56	103	21	0
F	1447H	3	3	3	5	16	21	3.9	54	1	66	127	27	0
G	1434B	5	3	6	4	6	13	10.2	57	1	57	205	15	0
H	1428B	1	2	1	2	2	4	-	-	-	-	-	-	0
I	1424H	2	7	2	5	14	33	1.3	11	1	55	107	18	0
J	1402H	2	3	5	7	7	4	2.6	55	1	71	61	38	0
K	1322D	4	8	3	9	29	43	2.4	18	1	46	230	4	0

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ANOMALY/	FID/INTERP	COAXIAL 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 30390	(FLIGHT 5)													
L	1279D	4	5	11	14	23	25	4.3	41	1	56	93	21	0
M	1276D	4	9	21	45	110	36	1.9	22	1	47	66	18	0
N	1273D	6	17	21	45	110	36	2.2	13	1	47	53	20	0
O	1259D	6	3	13	8	6	7	13.3	50	2	76	38	45	0
P	1236H	3	7	14	11	2	2	1.7	34	3	87	20	63	0
Q	1227B	14	22	52	54	115	60	4.4	23	3	59	17	38	0
R	1223B	22	22	52	54	115	14	8.9	25	2	50	23	29	0
S	1212B	36	26	61	52	127	2	14.9	22	4	56	12	37	0
T	1209B	36	26	61	52	127	6	14.9	20	4	57	9	40	0
U	1195B	25	13	61	19	76	18	19.4	36	7	72	4	58	0
V	1191D	37	15	61	31	76	24	33.3	27	8	60	2	47	0
W	1179B	1	2	1	2	2	3	-	-	-	-	-	-	0
LINE 30400	(FLIGHT 5)													
A	609H	3	4	4	11	28	33	2.9	57	1	47	166	12	0
B	623H	1	2	1	2	2	4	-	-	-	-	-	-	0
C	638H	1	7	1	10	12	74	0.7	24	1	38	480	3	0
D	663H	3	7	2	10	31	40	2.1	28	1	43	277	4	0
E	691H	6	18	6	21	51	75	2.1	22	1	52	145	18	0
F	704H	3	3	4	6	15	19	4.0	59	1	70	95	33	0
G	715H	7	6	10	11	28	25	7.7	40	1	66	58	34	0
H	725H	4	2	8	8	15	44	13.3	77	2	74	48	44	0
I	738H	1	2	1	2	2	4	-	-	-	-	-	-	0
J	811H?	1	2	1	2	2	4	-	-	-	-	-	-	0
K	850H?	2	5	2	7	12	26	1.4	36	1	53	668	0	0
L	906H	3	11	9	17	19	8	1.6	0	1	33	84	1	0
M	921H	1	2	1	2	2	4	-	-	-	-	-	-	0
N	980H	1	2	1	2	2	4	-	-	-	-	-	-	0
O	997H	7	12	12	25	31	31	3.3	39	2	68	39	42	0
P	1020H	14	3	27	9	23	12	48.8	38	5	75	8	55	0
Q	1030H	22	17	42	35	35	35	11.4	11	7	48	4	34	0
R	1032H	22	6	42	35	35	27	43.8	22	5	43	7	26	0
S	1044B	24	37	116	53	57	117	5.5	6	4	35	8	20	0
T	1048B	32	45	116	155	360	229	6.8	10	6	29	4	18	11
U	1053B	24	60	22	153	360	229	3.6	0	5	44	6	28	0
V	1055B	24	17	51	7	17	14	13.1	24	5	63	7	45	0
LINE 30410	(FLIGHT 5)													
A	512H	3	8	4	13	39	47	1.4	20	1	48	194	11	0
B	488H	4	4	1	5	11	31	4.4	53	1	55	662	0	0
C	471H	2	4	3	8	24	12	1.4	25	1	34	322	0	0

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ANOMALY/ FID/INTERP		COAXIAL 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 30410		(FLIGHT		5)										
D	452H	4	3	3	3	9	9	9.0	42	1	50	235	4	0
E	437H	8	10	12	13	31	32	5.0	24	2	65	50	34	0
F	413H	0	4	2	7	26	29	0.4	0	1	40	398	0	0
G	352H	0	2	0	2	2	4	-	-	-	-	-	-	0
H	315H	6	13	9	24	24	17	2.5	5	1	31	195	0	0
I	282H	2	3	4	6	17	11	1.5	28	1	72	138	28	0
J	259B	4	5	5	9	19	6	3.8	48	1	71	130	32	0
K	241H	4	5	9	6	12	11	4.4	45	2	87	51	54	0
L	229H	9	6	20	10	24	17	12.0	40	3	80	20	54	0
M	206H	11	6	39	13	19	7	13.6	25	3	53	18	30	0
N	204H	10	8	39	33	10	40	8.4	23	4	53	9	34	0
O	202H	22	8	39	33	10	40	31.8	25	3	68	20	43	6
LINE 39020		(FLIGHT		8)										
A	5059H	6	5	9	10	11	8	5.9	21	2	75	39	43	0
B	5016H	5	4	2	5	13	5	7.1	8	1	166	1006	0	0

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		COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 40010	(FLIGHT 9)													
A	688H	4	2	1	4	15	22	0.6	0	1	34	204	11	0
B	675H	3	8	5	3	7	40	0.1	0	1	25	123	7	0
C	659H	1	2	1	2	2	4	-	-	-	-	-	-	0
D	647H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 40020	(FLIGHT 9)													
A	563H	5	8	4	15	34	64	3.5	24	1	60	180	17	5
B	578H	4	10	4	16	41	93	2.0	16	1	53	130	16	5
C	590H	3	5	3	7	20	51	2.3	36	1	54	86	20	0
D	605H	8	9	10	15	29	10	5.3	21	2	46	36	20	0
E	614H	12	18	15	37	101	97	4.6	12	2	50	49	21	0
LINE 40030	(FLIGHT 9)													
A	533H	1	2	1	2	2	4	-	-	-	-	-	-	0
B	523H	4	9	4	15	34	76	2.2	19	1	53	98	19	0
C	514H	2	4	1	6	13	51	1.9	38	1	57	86	22	0
D	503H	6	12	9	22	52	11	2.9	11	2	45	53	15	0
E	498H	8	11	9	16	40	16	4.3	17	2	41	40	15	0
F	489H	6	9	5	15	39	59	4.0	34	1	54	59	25	0
G	472L	11	15	9	23	26	23	4.8	4	1	71	63	35	0
LINE 40040	(FLIGHT 9)													
A	383H	1	2	1	2	2	4	-	-	-	-	-	-	0
B	391H	1	2	1	2	2	4	-	-	-	-	-	-	0
C	419H	2	12	4	23	27	43	0.8	0	1	41	54	13	0
D	429H	3	3	4	9	16	23	3.3	48	2	51	42	23	0
E	438H	3	7	3	9	28	44	1.9	18	2	49	44	21	0
F	444H?	7	20	7	35	101	152	2.3	9	1	39	68	11	0
LINE 40050	(FLIGHT 9)													
A	354H	4	3	4	5	11	32	7.4	33	1	59	69	23	0
B	327H	12	27	12	44	65	87	3.3	8	2	32	47	8	0
C	322H	1	2	1	2	2	4	-	-	-	-	-	-	0
D	314H	7	2	9	17	37	22	31.7	42	2	35	33	9	0
E	295H	4	8	5	24	42	28	2.7	28	1	56	72	24	5
F	284L?	18	18	15	13	27	6	8.1	0	2	65	44	32	0
LINE 40060	(FLIGHT 9)													
A	151L	15	23	8	18	15	8	4.7	0	5	176	3	166	0
B	167H	6	6	8	18	5	7	5.0	26	2	63	45	32	0
C	206H	11	21	10	33	100	101	3.3	2	2	32	44	7	0

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	COAXIAL 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 40060	(FLIGHT	9)											
D 238L	57	36	23	11	19	10	20.9	4	2	80	32	51	5
E 245H	5	8	15	35	52	73	3.3	29	1	42	59	14	0
LINE 40065	(FLIGHT	9)											
A 2545L	14	20	1	13	19	28	4.9	0	1	124	136	71	0
B 2554H	4	10	4	28	17	11	2.0	15	1	53	140	15	0
C 2573H	3	5	6	10	26	24	3.0	14	1	64	94	23	0
D 2579H	2	4	4	5	16	12	2.3	38	1	76	111	35	0
LINE 40070	(FLIGHT	9)											
A 874L	13	25	10	21	8	7	3.7	0	3	108	18	79	0
B 883H	11	11	12	29	53	62	6.4	19	2	44	38	17	0
C 911H	7	7	10	11	5	27	5.6	17	2	35	43	7	0
D 918H	1	2	1	2	2	4	-	-	-	-	-	-	0
E 924H	8	16	7	23	70	58	3.0	2	2	34	45	7	0
F 941H	4	5	5	11	13	26	3.5	43	2	69	55	38	0
G 959L?	7	8	8	4	37	38	5.2	21	2	111	32	78	0
LINE 40080	(FLIGHT	9)											
A 1040H	3	4	3	9	19	20	2.4	19	1	38	63	6	0
B 1024H	2	8	8	13	22	36	1.1	1	2	40	43	13	0
C 1015H	1	2	1	2	2	4	-	-	-	-	-	-	0
D 999H	3	8	4	12	7	42	1.8	15	1	51	56	20	4
E 982H	3	5	3	14	19	24	2.4	28	2	60	55	28	0
LINE 40090	(FLIGHT	9)											
A 1082H	2	5	2	7	3	4	1.9	15	2	50	57	17	0
B 1102H	4	12	10	21	40	36	1.8	0	2	41	44	13	0
C 1114H	3	4	2	6	21	22	2.7	25	2	41	48	12	0
D 1140H	7	12	10	24	60	71	3.3	14	1	50	60	19	0
LINE 40100	(FLIGHT	9)											
A 1218H	9	9	9	13	10	58	6.4	28	1	38	57	11	120
B 1200H	4	5	4	14	19	21	3.9	36	2	39	43	12	0
C 1177H	3	6	3	9	18	16	1.8	19	1	50	70	17	0
D 1159H	4	6	6	13	19	26	2.7	20	1	51	62	19	0
LINE 40110	(FLIGHT	9)											
A 1244H	5	8	6	12	35	35	2.9	15	2	40	51	11	0
B 1253H	1	3	2	6	18	39	0.7	0	1	46	57	16	0
C 1265H	6	9	9	15	35	42	4.0	16	2	44	36	17	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 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 40110	(FLIGHT		9)										
D 1272H	6	11	8	17	13	46	3.0	19	2	48	40	21	0
E 1288H	5	11	6	17	51	69	2.1	33	1	68	62	37	0
F 1309H	6	12	11	26	10	41	2.8	29	1	58	63	28	0
LINE 40120	(FLIGHT		9)										
A 1395H	5	7	4	5	28	15	3.8	20	2	55	49	24	0
B 1382H	1	2	1	2	2	4	-	-	-	-	-	-	0
C 1371H	4	7	4	11	37	23	3.1	20	2	45	48	16	0
D 1350H	2	3	2	4	15	6	1.0	0	1	26	73	10	0
E 1332H	2	4	3	7	15	5	2.0	24	1	43	59	12	0
LINE 40130	(FLIGHT		9)										
A 1423H	3	7	3	7	34	67	1.7	16	2	54	52	24	0
B 1449H	7	14	11	23	65	33	3.2	0	2	33	42	6	0
C 1467H	5	7	7	14	11	5	3.7	14	2	39	46	11	0
D 1483H	5	8	5	14	33	56	2.7	34	1	52	66	22	0
E 1495H	5	10	10	22	65	53	2.8	23	1	54	65	23	0
LINE 40140	(FLIGHT		9)										
A 1582H	1	2	1	2	2	4	-	-	-	-	-	-	0
B 1571H	3	4	2	5	10	22	0.4	0	1	31	126	12	0
C 1554H	2	4	5	6	15	5	2.0	16	2	38	51	7	0
D 1536H	5	9	7	16	44	41	3.0	14	2	38	49	10	0
E 1521H	2	8	4	11	37	47	0.8	17	1	60	63	29	0
F 1516H	1	7	6	5	20	27	0.4	0	1	37	72	6	0
LINE 40155	(FLIGHT		9)										
A 2830H	4	7	4	19	31	21	2.8	15	2	43	48	14	0
B 2818H	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2799H	4	5	5	7	18	12	3.7	18	2	36	46	7	0
D 2791H	1	2	1	2	2	4	-	-	-	-	-	-	0
E 2784H	3	5	4	8	24	19	2.3	13	2	34	54	4	0
F 2765H	7	17	3	23	35	52	2.3	8	1	37	66	9	0
G 2759H	3	9	5	4	13	16	0.7	0	1	23	51	10	0
LINE 40160	(FLIGHT		9)										
A 1762H	1	2	1	2	1	4	-	-	-	-	-	-	0
B 1744H	5	7	7	11	35	22	4.0	23	2	46	50	16	0
C 1735H	5	10	5	17	46	62	2.5	31	1	62	63	31	0
D 1718H	4	8	4	12	34	26	2.3	9	1	38	71	6	0
E 1710H	4	6	1	10	21	7	3.8	39	1	63	63	30	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 1094 HZ REAL PPM	COAXIAL 1094 HZ QUAD PPM	COPLANAR 875 HZ REAL PPM	COPLANAR 875 HZ QUAD PPM	COPLANAR 8174 HZ REAL PPM	COPLANAR 8174 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 40170	(FLIGHT		9)										
A 1795H	4	2	5	14	14	19	15.0	53	1	58	164	14	0
B 1817H	3	15	3	22	21	119	1.1	6	1	43	115	11	0
C 1820H	4	15	4	22	25	119	1.3	8	1	43	101	12	0
D 1857H	6	15	6	15	59	54	2.5	5	1	35	69	5	0
E 1865H	10	3	1	5	8	9	0.6	0	1	27	66	11	0
LINE 40180	(FLIGHT		9)										
A 1959H	6	10	4	18	39	69	3.3	25	1	51	146	14	0
B 1944H	2	4	2	7	18	32	1.6	29	1	49	167	9	0
C 1929H	7	7	10	12	15	9	6.1	4	1	33	57	1	0
D 1910H	4	5	6	8	17	18	4.2	26	1	45	61	13	0
E 1896H	1	6	9	25	36	66	0.4	1	1	46	125	12	0
LINE 40190	(FLIGHT		9)										
A 1978H?	4	8	5	14	43	45	2.6	26	1	68	157	26	0
B 1982H	6	9	5	15	35	44	3.3	38	1	75	222	30	8
C 1986H	8	9	5	15	35	44	5.2	61	1	78	140	42	5
D 1996H	3	7	5	11	19	73	1.7	19	1	46	132	10	0
E 2020H?	9	13	10	20	59	24	4.6	0	1	23	92	0	0
F 2028H	1	2	1	2	2	4	-	-	-	-	-	-	0
G 2042H	6	4	1	5	15	17	8.5	49	1	72	60	39	0
H 2050H	5	10	6	19	38	37	2.2	9	1	25	340	0	0
LINE 40200	(FLIGHT		9)										
A 2165H	7	10	6	19	8	62	3.6	17	1	40	220	0	0
B 2147H	1	2	1	2	2	4	-	-	-	-	-	-	0
C 2138H	4	4	4	3	9	14	4.9	61	1	89	200	42	0
D 2131H	6	6	3	6	18	14	6.3	40	1	67	126	28	0
E 2109H	1	2	1	2	2	4	-	-	-	-	-	-	0
LINE 40210	(FLIGHT		9)										
A 2191H	10	11	9	35	99	128	6.6	24	1	25	130	0	0
B 2214H	2	9	2	14	38	26	0.8	5	1	35	239	0	0
C 2225H	4	6	5	9	21	30	2.9	42	1	75	103	38	0
D 2246H	3	3	13	25	4	23	3.6	53	1	207	1006	0	0
LINE 40220	(FLIGHT		9)										
A 2373H	4	6	2	6	13	15	3.3	26	1	38	173	0	0
B 2369H	3	5	3	8	10	9	2.5	20	1	35	154	0	0
C 2353H	2	3	2	7	33	29	2.2	37	1	38	205	0	0
D 2327H	5	7	18	38	35	14	3.3	11	8	145	1	138	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 1094 HZ		COPLANAR 875 HZ		COPLANAR 8174 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 40220	(FLIGHT	9)											
E 2316H	5	9	26	43	4	2	2.6	4	1	186	1006	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.

23012

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Maps

TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

23,012

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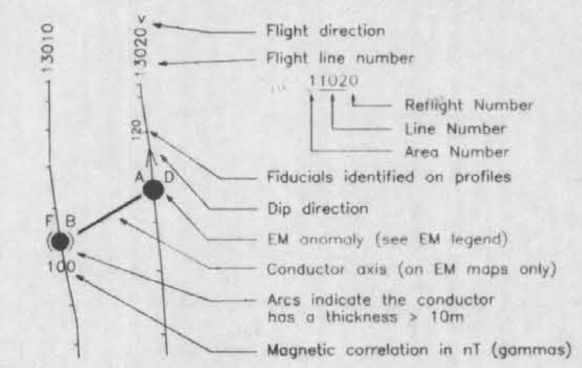
ELECTROMAGNETIC ANOMALIES

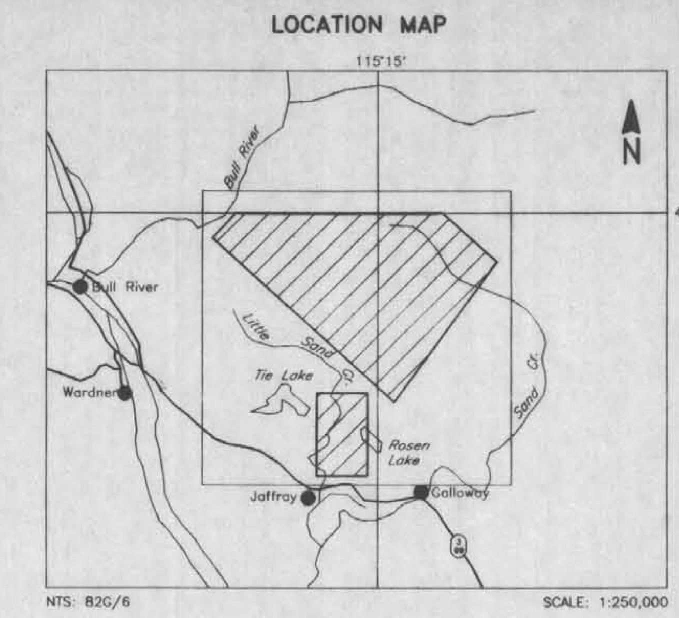
Grade	Anomaly	Conductance
7	●	>100 siemens
6		50-100 siemens
5		20-50 siemens
4	⊕	10-20 siemens
3	⊕	5-10 siemens
2	○	1-5 siemens
1		< 1 siemens
-	*	Questionable anomaly

Anomaly identifier — Interpretive symbol
Depth is greater than: 15 m, 30 m, 45 m, 60 m
Inphase and Quadrature of coaxial coil is greater than: 5 ppm, 10 ppm, 15 ppm, 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES





BUL RIVER MINERAL CORPORATION LTD.
BIG BEAR PROPERTY

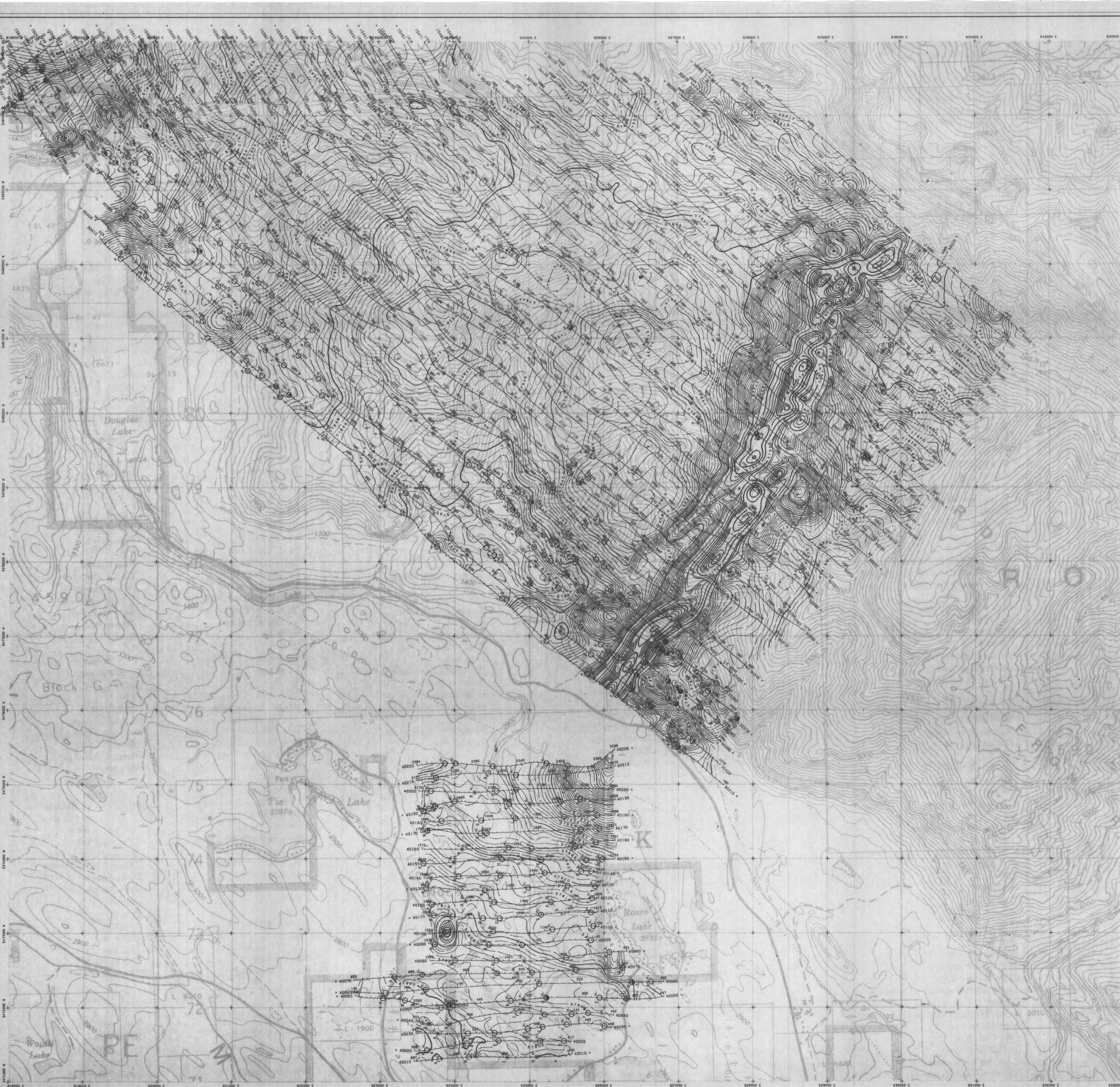
ELECTROMAGNETIC ANOMALIES

DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem



TECHNICAL SUMMARY

Navigation . . . . Del Norte UHF electronic positioning
Data reduction grid interval . . . 50 metres
Terrain clearance . . . . Helicopter 60 m
Electromagnetic sensor 30 m
Magnetometer. VLF receiver 40 m
Data sampling interval . . . . . . 0.1 second
Magnetometer / sensitivity . . . . Scintrex cesium / 0.01 nT
VLF receiver / sensitivity . . . . . Herz 2A / 1%
Electromagnetic system . . . . . . DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

N

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ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	⊕	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	< 1 siemens
–	✳	Questionable anomaly

Anomaly identifier — Interpretive symbol
Depth is greater than: 15 m, 30 m, 45 m, 60 m
Inphase and Quadrature of coaxial coil is greater than: 5 ppm, 10 ppm, 15 ppm, 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES

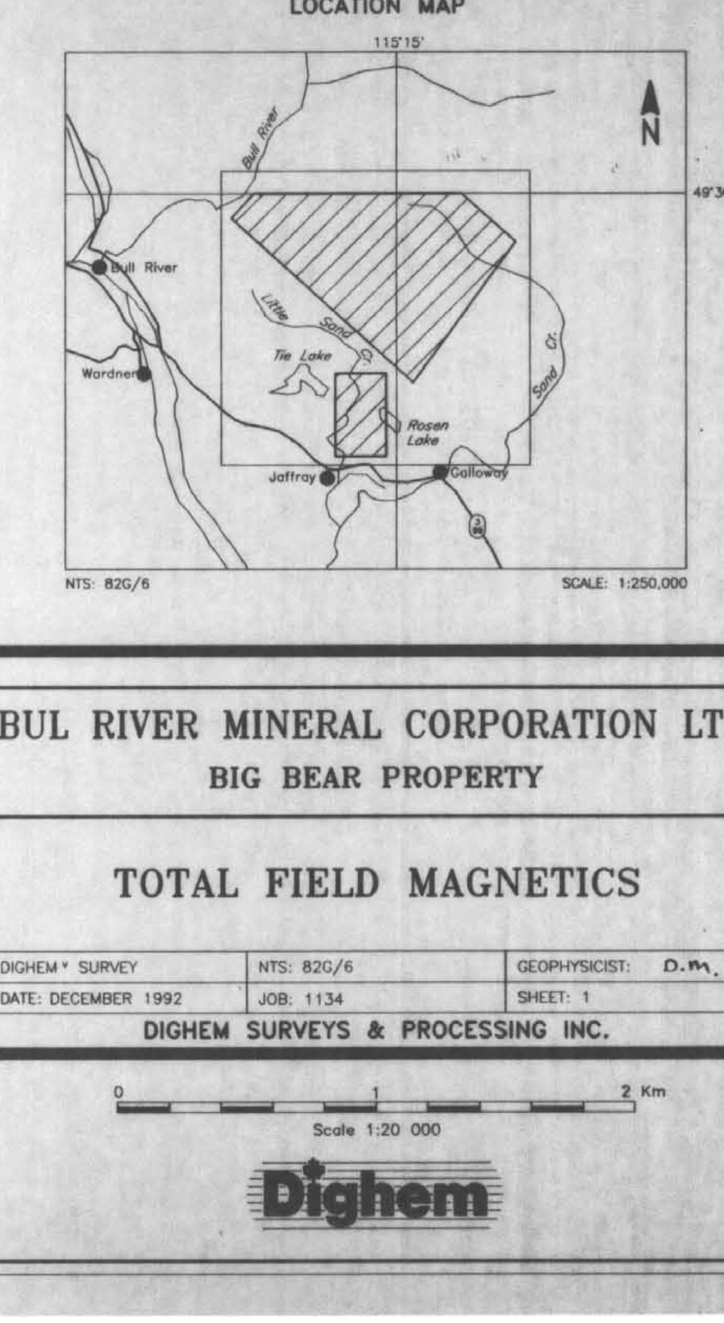
13010
13020 <
Flight direction
Flight line number
11020
Reflight Number
Line Number
Area Number
120
Fiducials identified on profiles
A D
Dip direction
F B
EM anomaly (see EM legend)
100
Conductor axis (on EM maps only)
Arcs indicate the conductor has a thickness > 10m
Magnetic correlation in nT (gammas)

TOTAL FIELD MAGNETIC CONTOURS

(heavy solid line)	50 nT
(solid line)	10 nT
(thin solid line)	2 nT
(dashed line)	1 nT
(ellipse)	magnetic low

Magnetic inclination within the survey area: 73 degrees

LOCATION MAP



BUL RIVER MINERAL CORPORATION LTD.
BIG BEAR PROPERTY

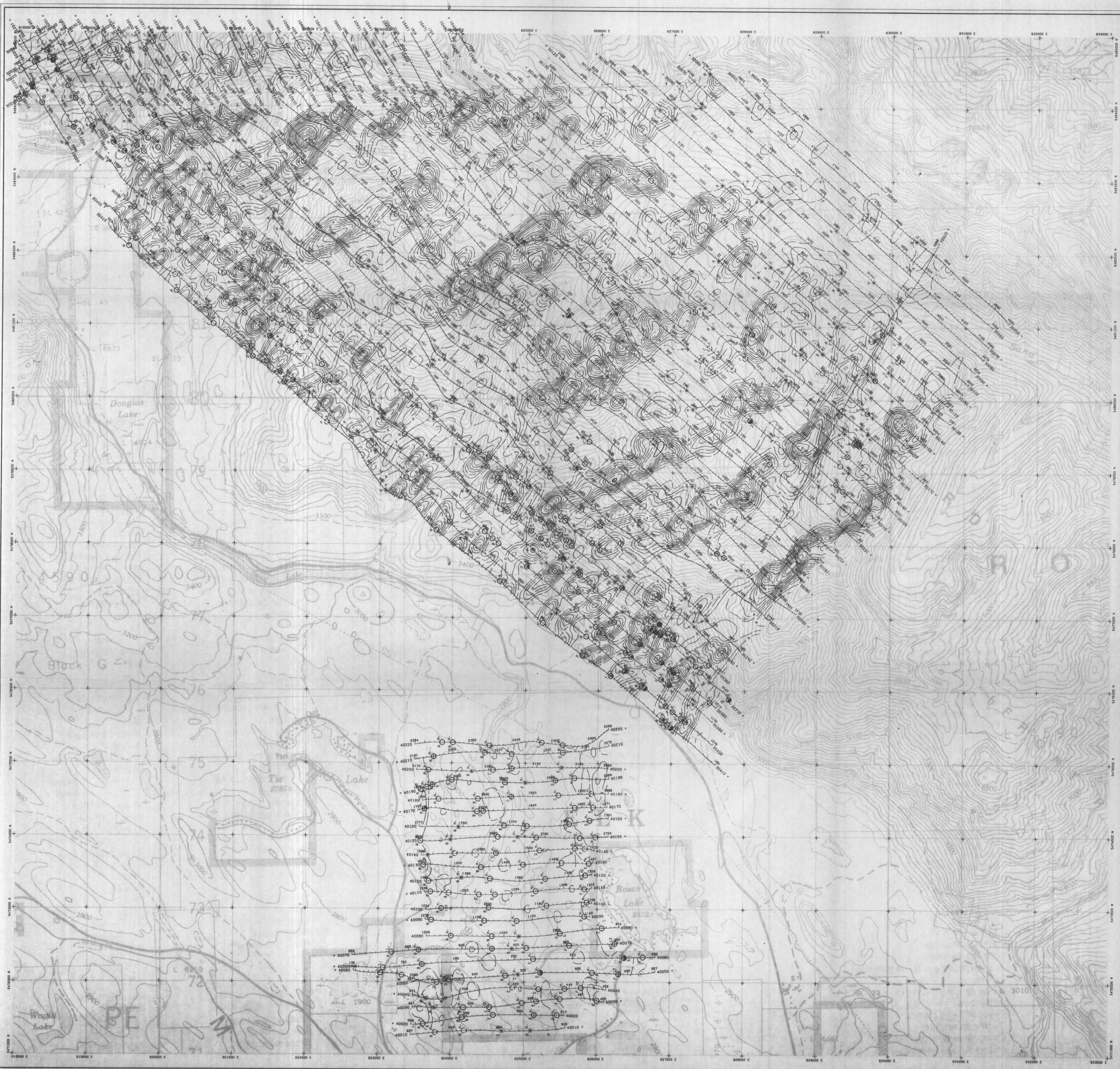
TOTAL FIELD MAGNETICS

DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem



TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM[V]

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
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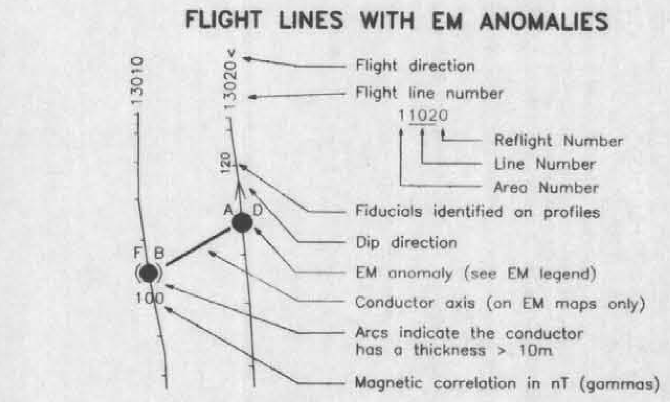
ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	⊖	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	< 1 siemens
–	✳	Questionable anomaly

Anomaly identifier
Interpretive symbol
Depth is greater than
. 15 m
: 30 m
⋮ 45 m
⁞ 60 m
Inphase and Quadrature of coaxial coil is greater than
. 5 ppm
.. 10 ppm
... 15 ppm
.... 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES

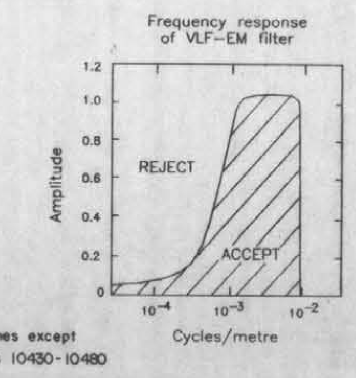


VLF CONTOURS

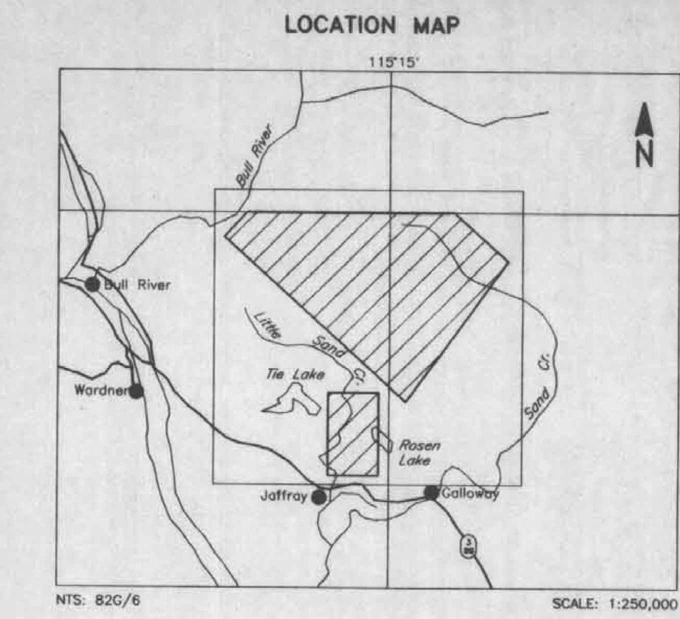
Contours in percent
10
2
1

STATION
NLK (Seattle, Wash.) – 24.8 kHz all lines except
NPM (Lualualei, Haw.) – 23.4 kHz Lines 10430-10480

Frequency response of VLF–EM filter



LOCATION MAP



NTS: 82G/6 SCALE: 1:250,000

BUL RIVER MINERAL CORPORATION LTD.

BIG BEAR PROPERTY

FILTERED VLF

DIGHEM[V] SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem

TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM^V

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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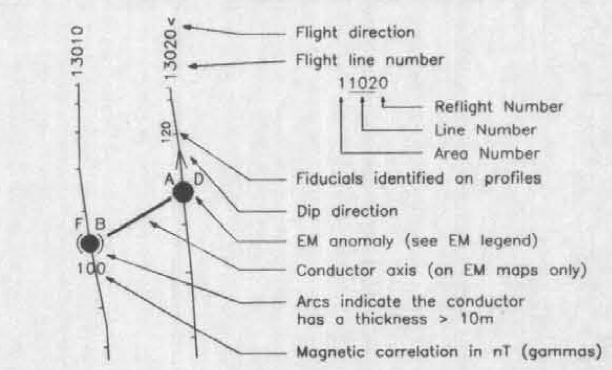
ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	⊕	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	< 1 siemens
–	✳	Questionable anomaly

Anomaly identifier
Interpretive symbol
Depth is greater than
: 15 m
: 30 m
: 45 m
: 60 m
Inphase and Quadrature of coaxial coil is greater than
. 5 ppm
.. 10 ppm
... 15 ppm
.... 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES

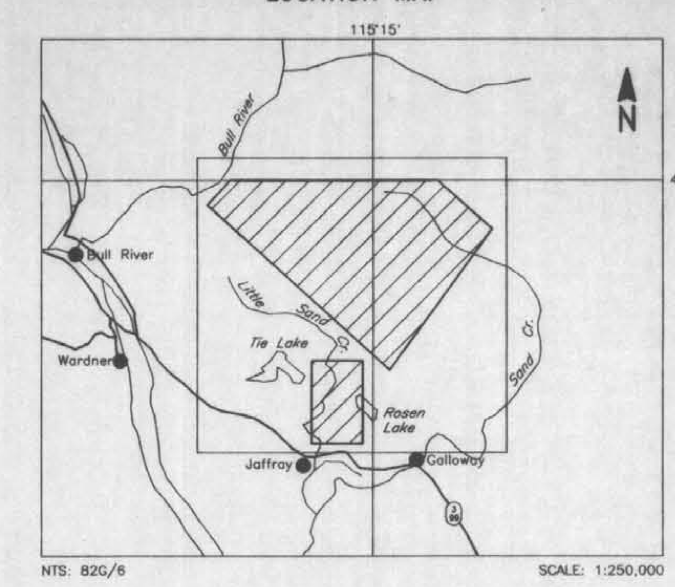


RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 intervals per decade

LOCATION MAP



BUL RIVER MINERAL CORPORATION LTD.

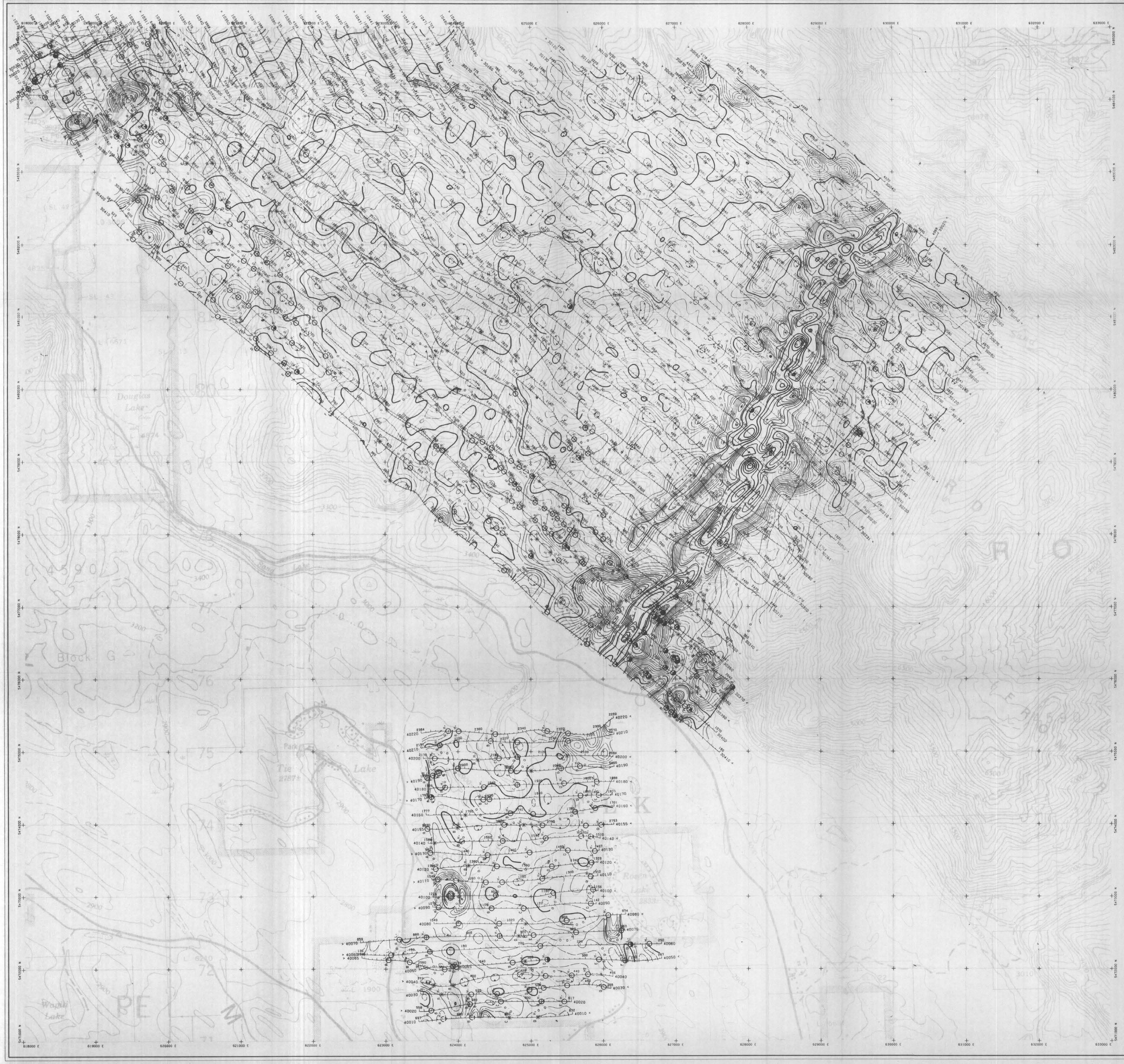
BIG BEAR PROPERTY

RESISTIVITY
5000 Hz COAXIAL

DIGHEM^V SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1
DIGHEM SURVEYS & PROCESSING INC.		

0 1 2 Km
Scale 1:20 000

Dighem



TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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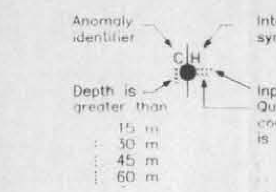
23,012

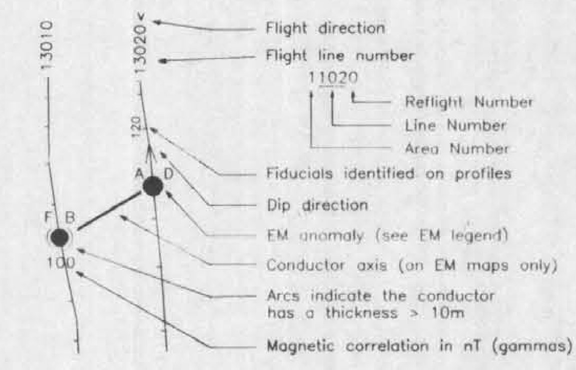
ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	◑	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	<1 siemens
–	✳	Questionable anomaly



Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

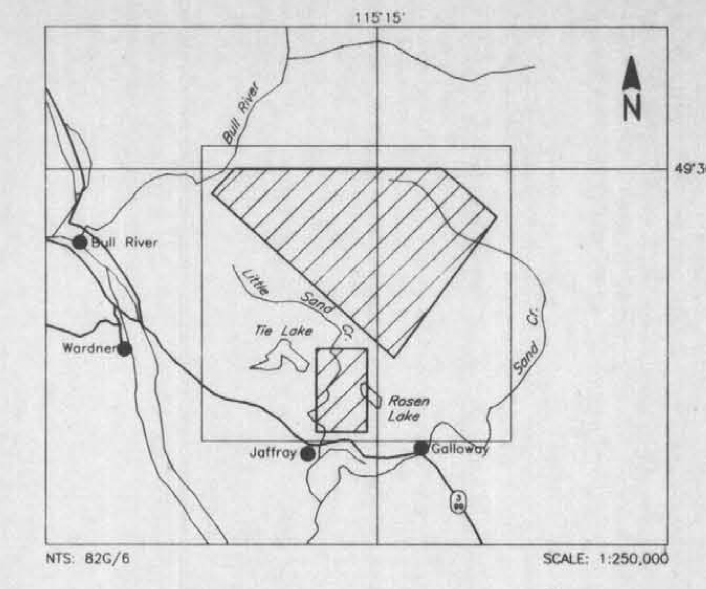
FLIGHT LINES WITH EM ANOMALIES



CALCULATED VERTICAL GRADIENT CONTOURS

———	0.5 nT/metre
———	0.1 nT/metre
———	0.02 nT/metre
— — — —	0.01 nT/metre

LOCATION MAP



BUL RIVER MINERAL CORPORATION LTD.

BIG BEAR PROPERTY

CALCULATED VERTICAL GRADIENT MAGNETICS

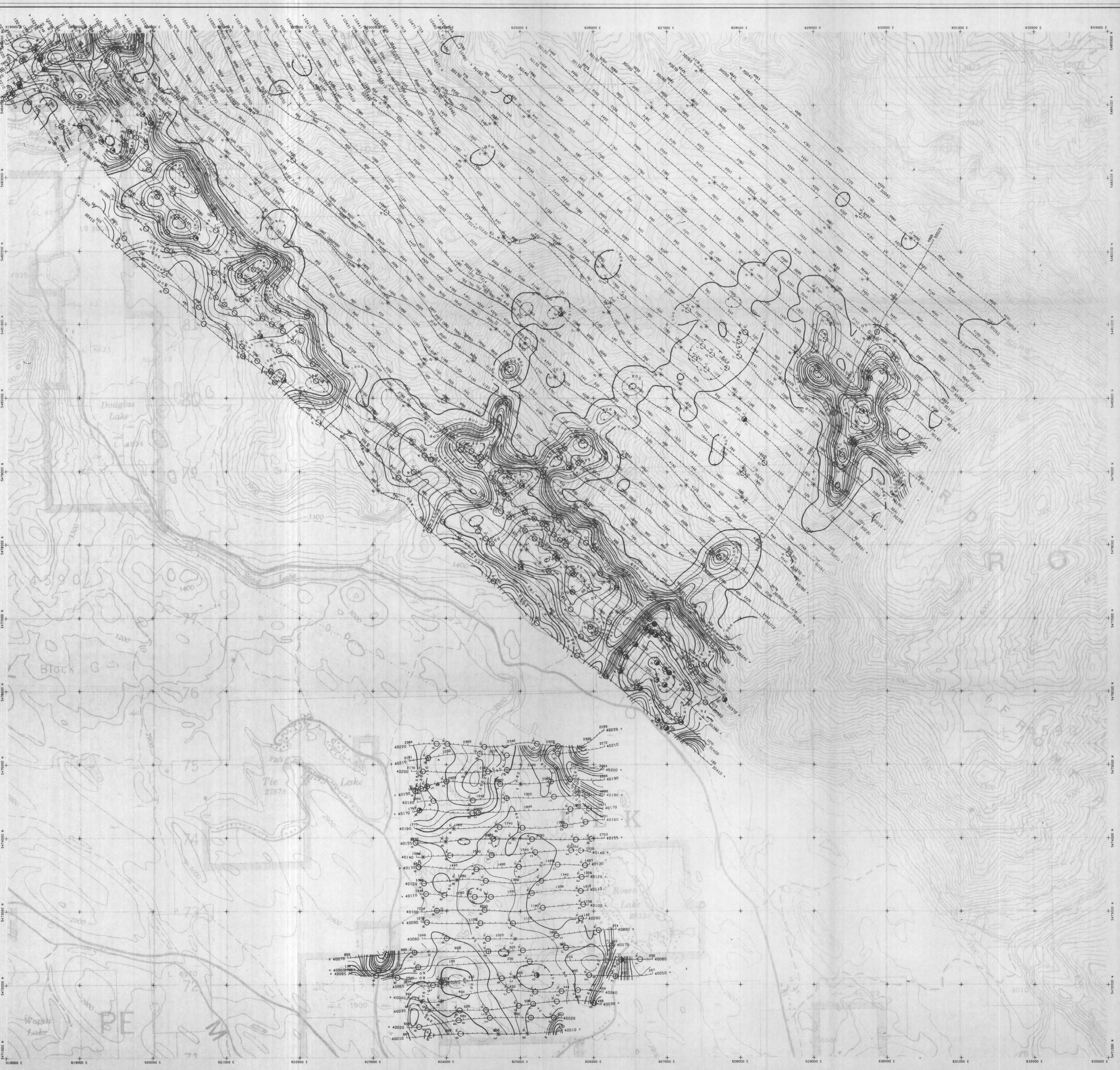
DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km

Scale 1:20 000

Dighem



TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

PART 3 OF 3 23,012

ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7		>100 siemens
6		50–100 siemens
5		20–50 siemens
4		10–20 siemens
3		5–10 siemens
2		1–5 siemens
1		< 1 siemens
–	*	Questionable anomaly

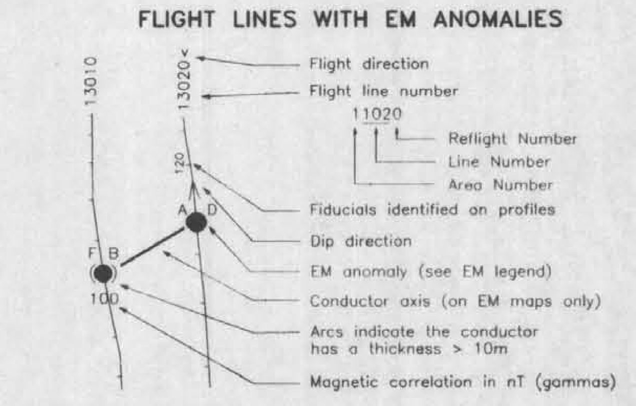
Anomaly identifier — Interpretive symbol

Depth is greater than
15 m
30 m
45 m
60 m

Inphase and Quadrature of coaxial coil is greater than
5 ppm
10 ppm
15 ppm
20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES

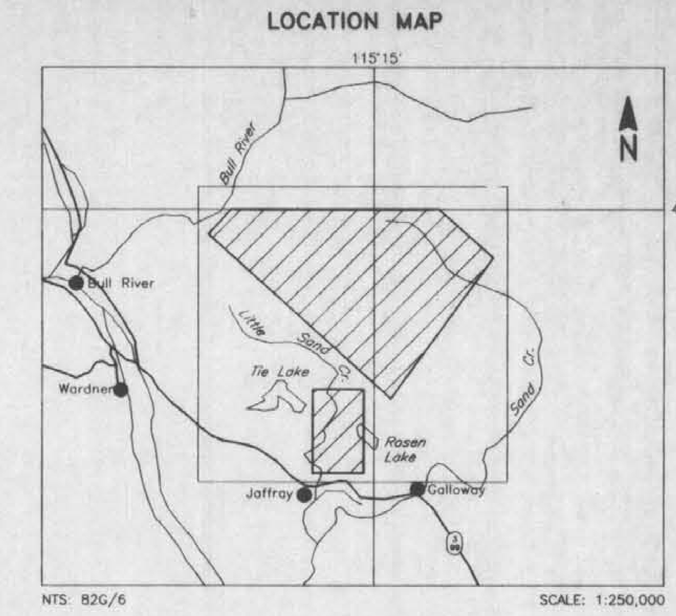


RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 intervals per decade

LOCATION MAP



BUL RIVER MINERAL CORPORATION LTD.
BIG BEAR PROPERTY

RESISTIVITY 900 Hz COPLANAR

DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem

TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer. VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
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900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

PART 3 OF 3 23,012

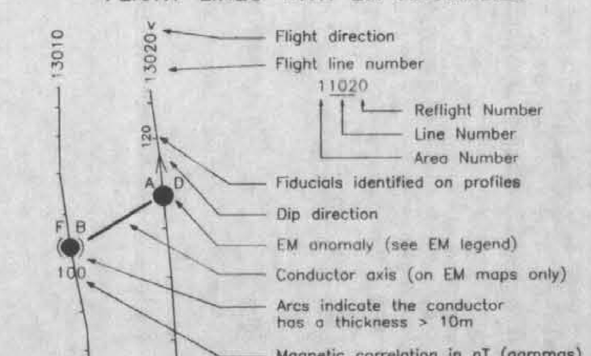
ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	⊕	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	< 1 siemens
–	*	Questionable anomaly

Anomaly identifier
Interpretive symbol
Depth is greater than
: 15 m
: 30 m
⋮ 45 m
⋮ 60 m
Inphase and Quadrature of coaxial coil is greater than
. 5 ppm
.. 10 ppm
... 15 ppm
.... 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES

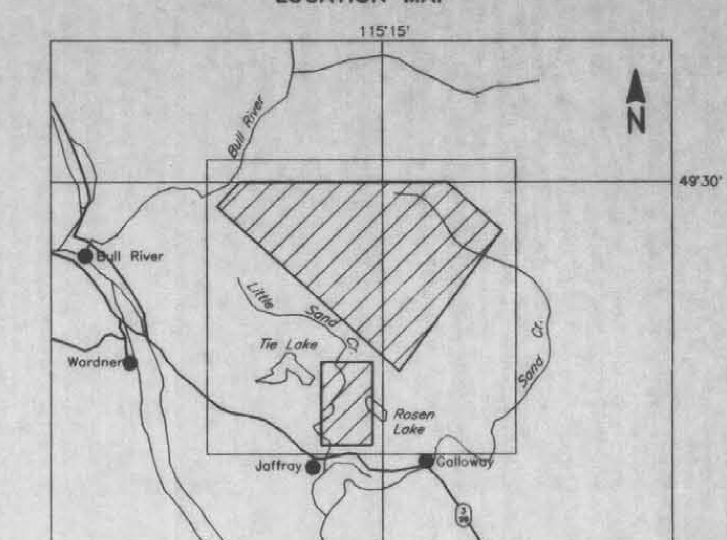


RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 intervals per decade

LOCATION MAP



NTS: 82G/6 SCALE: 1:250,000

BUL RIVER MINERAL CORPORATION LTD.
BIG BEAR PROPERTY

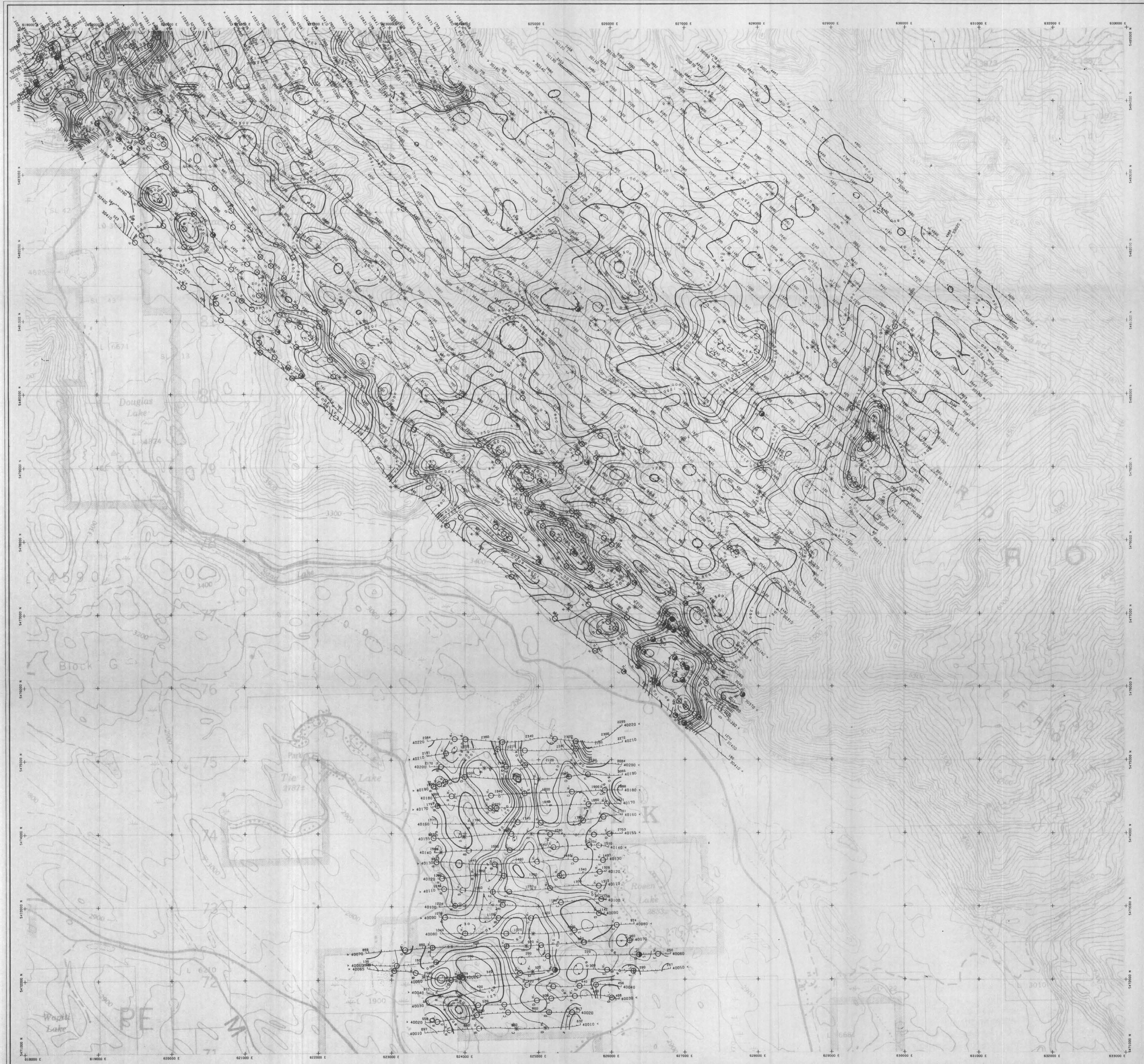
RESISTIVITY
7200 Hz COPLANAR

DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem



TECHNICAL SUMMARY

Navigation	Del Norte UHF electronic positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m
	Electromagnetic sensor 30 m
	Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

Frequency	Sensitivity	Coil Orientation
900 Hz	0.1 ppm	Vertical coaxial
5000 Hz	0.2 ppm	Vertical coaxial
900 Hz	0.1 ppm	Horizontal coplanar
7200 Hz	0.2 ppm	Horizontal coplanar
56000 Hz	1.0 ppm	Horizontal coplanar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

PART 3 OF 3 23,012

ELECTROMAGNETIC ANOMALIES

Grade	Anomaly	Conductance
7	●	>100 siemens
6	◕	50–100 siemens
5	◒	20–50 siemens
4	⊕	10–20 siemens
3	⊕	5–10 siemens
2	○	1–5 siemens
1	◌	< 1 siemens
–	✳	Questionable anomaly

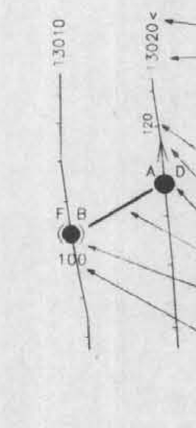
Anomaly identifier — Interpretive symbol — C H

Depth is greater than: 15 m, 30 m, 45 m, 60 m

Inphase and Quadrature of coaxial coil is greater than: 5 ppm, 10 ppm, 15 ppm, 20 ppm

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence

FLIGHT LINES WITH EM ANOMALIES



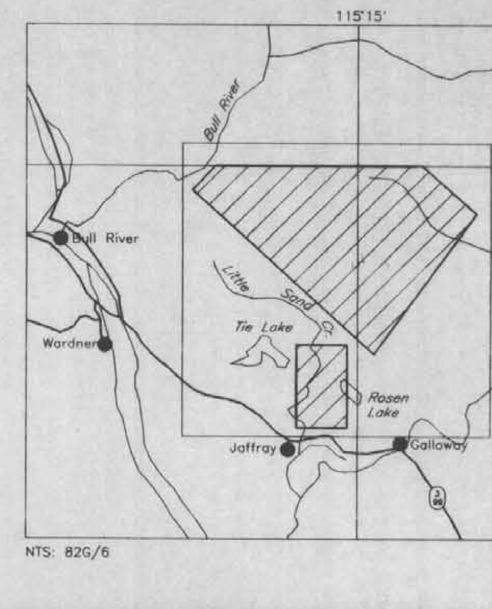
Flight direction
Flight line number
11020 — Reflight Number, Line Number, Area Number
Fiducials identified on profiles
Dip direction
EM anomaly (see EM legend)
Conductor axis (on EM maps only)
Arcs indicate the conductor has a thickness > 10m
Magnetic correlation in nT (gammas)

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 intervals per decade

LOCATION MAP



NTS: 82G/6 SCALE: 1:250,000

BUL RIVER MINERAL CORPORATION LTD.

BIG BEAR PROPERTY

RESISTIVITY
56,000 Hz COPLANAR

DIGHEM* SURVEY	NTS: 82G/6	GEOPHYSICIST: D.M.
DATE: DECEMBER 1992	JOB: 1134	SHEET: 1

DIGHEM SURVEYS & PROCESSING INC.

0 1 2 Km
Scale 1:20 000

Dighem