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Report #261-1

DIGHEM^{III} SURVEY
OF THE
McKENZIE ISLAND NORTH PROPERTY
RED LAKE AREA, ONTARIO
N.T.S. 52 N/4

FOR

NORAMCO EXPLORATIONS INC.

BY

DIGHEM SURVEYS & PROCESSING INC.

MISSISSAUGA, ONTARIO
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AD-PAS-201

SUMMARY AND RECOMMENDATIONS

A total of 160 km (100 miles) of survey was flown with the DIGHEM^{III} system on August 16, 1986, over the McKenzie Island North property in the Red Lake area, Ontario, for Noramco Explorations Inc.

The survey outlined numerous definite bedrock conductors in addition to several weak conductors of possible bedrock origin, many of which show direct or flanking correlation with moderate to strong magnetic anomalies. Most of the conductors described in Section 1 of this report appear to warrant further investigation using appropriate surface exploration techniques. Areas of interest may be assigned priorities for follow-up work on the basis of supporting geological and/or geochemical information, and by comparing conductors with magnetic trends which should aid in mapping the geological units and structural breaks within the survey area.

The survey area exhibits excellent potential as a host of conductive material such as pyrrhotite and/or graphite and disseminated mineralization. Most of the stronger anomalies reflect parallel, linear conductors, which occur in the southern portion of the survey block.

Consideration should be given to additional processing of existing geophysical data, in order to extract the maximum amount of information available from the survey results. Coloured total field magnetic maps often permit differentiation of various lithologic units, while enhanced and/or shadowed presentations usually provide better resolution and definition of structural deformation of geologic units. Resistivity maps are particularly useful in showing the conductive properties of the survey area.

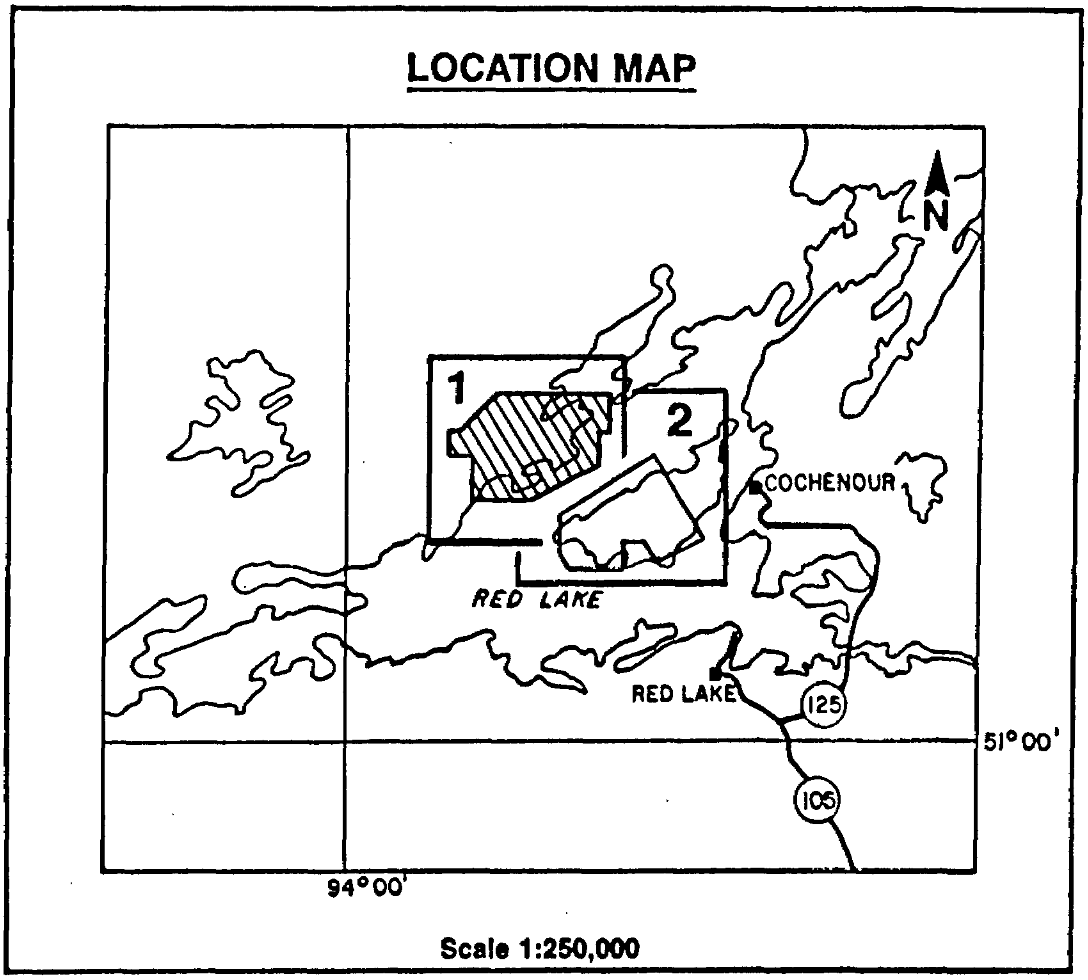

FIGURE 1

THE SURVEY AREA

McKENZIE ISLAND NORTH PROPERTY

CON 52N04SW0031 2.9817 DOME TWP 010C

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INTRODUCTION

A DIGHEM^{III} electromagnetic/resistivity/magnetic/VLF* survey totalling approximately 160 line-km was flown with a 100 m line-spacing for Noramco Explorations Inc., on August 16, 1986. Survey coverage consisted of a single survey grid with traverse lines flown in an azimuthal direction of 155°/335°. The 160 km total includes two tie lines.

The survey results have been presented on separate map sheets for each parameter. The McKenzie Island North property is located on N.T.S. map sheet 52N/4 (See Figure 1).

An Aerospatiale AS-350B turbine helicopter (Registration C-GFHS) was provided by Frontier Helicopters Limited. The helicopter flew at an average airspeed of 115 km/h with an EM bird height of approximately 30 m. Ancillary equipment consisted of a Sonotek PMH 5010 magnetometer with its bird at an average height of 45 m, a Sperry radio altimeter, a Geocam sequence camera, an RMS GR33 digital graphics recorder, a Sonotek SDS 1200 digital data acquisition system, a Herz Industries Totem-2A

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* Although VLF data were recorded, they do not constitute deliverable products under the terms of the survey agreement. VLF maps can be provided on request.

VLF-electromagnetometer with its sensor towed at an average height of 52 m, and a DigiData 1640 9-track 800-bpi magnetic tape recorder. The analog equipment recorded four channels of EM data at approximately 900 Hz, two channels of EM data at approximately 7200 Hz, four channels of VLF-EM (total field and quadrature components), two ambient EM noise channels (for the coaxial and coplanar receivers), two channels of magnetics (coarse and fine count), and a channel of radio altitude. The digital equipment recorded the EM data with a sensitivity of 0.20 ppm at 900 Hz and 0.40 ppm at 7200 Hz, the VLF field to 0.1%, and the magnetic field to one nT (i.e., one gamma). The VLF-EM receivers were tuned to 21.4 kHz (Annapolis, Md. - NSS) as the primary station and 24.8 kHz (Seattle, Washington - NLK) an alternate transmitter source.

In addition to the above equipment, a Del Norte Flying Flagman navigation system was employed to track the aircraft's progress across the ground. This information was recorded in a range-range mode to an accuracy of 3 metres with a once-per-second update.

Appendix A 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 DIGHEM system nevertheless can be flown under wind conditions that seriously degrade other AEM systems.

In areas where EM responses are evident primarily on the quadrature components, zones of poor conductivity are indicated. Where these responses are coincident with strong 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.

Anomalies which occur near the ends of the survey lines 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.

SECTION I: SURVEY RESULTS

General Discussion

The survey covered a single grid with 160 km of flying. Table I-1 summarizes the EM responses in the survey area, with respect to conductance grade and interpretation.

Anomalous electromagnetic responses were picked and analysed by computer to provide preliminary electromagnetic anomaly maps. The resulting maps were used in conjunction with the computer processed digital data profiles during the interpretation stage.

The anomalies shown on the electromagnetic anomaly maps are based on a near-vertical, half plane model. This model best reflects "discrete" bedrock conductors. Wide bedrock conductors or flat-lying conductive units, whether from surficial or bedrock sources, may give rise to very broad anomalous responses on the EM profiles. These may not appear on the electromagnetic anomaly map if they have a regional character rather than a locally anomalous character. These broad conductors, which more closely

TABLE I-1

EM ANOMALY STATISTICS OF THE McKENZIE ISLAND NORTH PROPERTY

CONDUCTOR GRADE	CONDUCTANCE RANGE	NUMBER OF RESPONSES
6	> 99 MHOS	12
5	50-99 MHOS	25
4	20-49 MHOS	71
3	10-19 MHOS	60
2	5- 9 MHOS	36
1	< 5 MHOS	146
X	INDETERMINATE	85
TOTAL		435

CONDUCTOR MODEL	MOST LIKELY SOURCE	NUMBER OF RESPONSES
D	DISCRETE BEDROCK CONDUCTOR	131
B	DISCRETE BEDROCK CONDUCTOR	130
S	CONDUCTIVE COVER	145
E	EDGE OF WIDE CONDUCTOR	29
TOTAL		435

(SEE EM MAP LEGEND FOR EXPLANATIONS)

approximate a half space model, will be maximum coupled to the horizontal (coplanar) coil-pair and should be more evident on the resistivity parameter. A resistivity map, therefore, may be more valuable than the electromagnetic anomaly map, in areas where broad or flat-lying conductors are considered to be of importance. A contoured resistivity map, based on the 7200 Hz coplanar data, is not included as a deliverable product, but can be processed from existing data.

Excellent resolution and discrimination of conductors was made possible by using a relatively 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" parameter permits differentiation of bedrock and surficial conductors, even though they exhibit extremely weak conductance in many cases.

As previously mentioned in the introduction to this report, the effects of magnetite can reduce the positive amplitude of the inphase responses and can yield negative inphase responses in poorly conductive areas. It should be reiterated that the effects of magnetite can yield higher (overstated) apparent resistivities, lower (understated) EM conductance values, and erroneously shallow depth estimates. Furthermore, the apparent dips of conductors may also be incorrect if they are flanking, or contained within, magnetite-rich units.

Magnetics

A Geometrics 826 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 corrected data were interpolated onto a regular grid at a 2.5 mm interval using a cubic spline technique. The resulting grid provided the basis for presenting the magnetic contours.

Although there was no correction applied to the magnetic data for local variations in the IGRF field across the survey grid, the background levels have been related to the mean IGRF value for the survey area.

The total field magnetic data have been presented as contours on the photomosaic base map using a contour interval of 10 nT where gradients permit. The maps show the magnetic properties of the rock units underlying the survey area.

The total field magnetic information has also been subjected to a processing algorithm which enhances near-surface magnetic units and suppresses regional gradients. This procedure not only provides better definition and resolution of magnetic units, but also develops weak magnetic features which may not be clearly evident on the total field map. Although the enhancement procedure emphasizes positive magnetic anomalies, it does not directly highlight relative magnetic lows which may be due to non-magnetic units, faults or alteration zones. Such features are more evident on the total field magnetic map.

The contoured magnetic data show the survey area is underlain by at least seven narrow, subparallel magnetic units, extending in a general east-northeasterly direction across the sheet. The four northern features reflect units of intermediate to mafic material contained within the more felsic granodiorites or non-magnetic sandstone units. The three units south of tie line 19010 are more magnetic and conductive, and may be due to pyrrhotite.

Total magnetic relief is moderate, ranging from a background level of approximately 60,400 nT, to a high of more than 63,500 nT on line 10450. The magnetic units are of particular interest in this area in that they may host auriferous mineralization. Most of the stronger bedrock conductors are associated with the three magnetic units south of tie line 19010.

Although there is little evidence on the magnetic maps to suggest the area has undergone major deformation or alteration, there are several minor displacements which may be due to faulting and/or folding. These structural complexities are evident on the contour maps as offsets or changes in strike direction.

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 maps. 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 lithologic 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 area.

Electromagnetics

The EM anomalies resulting from this survey appear to fall within one of two general categories. The first type consists of anomalies which yield positive inphase responses and give rise to resistivity lows. Most anomalies which fall into this category are attributed to concentrations of conductive sulphides or graphite and have been given a "B" or "D" interpretive symbol.

The second class of anomalies generally comprises weak or 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 "S?" interpretive symbol. The lack of a difference channel response usually implies a poorly conductive broad source such as overburden.

The following section provides a brief description of the more interesting anomalies, some of which are associated with magnetite. Even weak conductors may be of economic significance in this area. A proper assessment and evaluation of these anomalies, therefore, 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.

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 for follow-up planning, consult the anomaly listings appended to this report to ensure that none of the conductors are overlooked.

CONDUCTORS IN THE SURVEY AREA

As economic mineralization within the area may be associated with weakly disseminated sulphides, 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 generated data profiles which are supplied as one of the survey products.

Where several anomalies or conductive trends exhibit similar characteristics, or appear to be related to a common geological unit or stratigraphic horizon, these have been grouped into "Zones" for purposes of discussion. The zone outline shown on the electromagnetic anomaly map approximates the 100 ohm-m resistivity contour.

Zone A

Zone A, shown on the EM anomaly map, is a low resistivity zone which hosts most of the bedrock conductors in this area. The northern limit of this zone appears to be related to the contact between mafic metavolcanic flows to the south and non-magnetic, non-conductive clastic metasediments to the north, as indicated on OGS map 2407[1].

This zone contains several parallel, linear conductors which reflect narrow sources. Apparent dips vary from steeply north to steeply south, suggesting this area has been tightly folded and/or overturned. A possible anticlinal axis may extend near the lakeshore just south of tie line 19010.

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(1) Ontario Geological Survey Map 2407
Fairley township. Scale 1:12,000

The strong plug-like magnetic anomaly centered on anomaly 10450C is also highly conductive.

All anomalies in Zone A are considered to be attractive geophysical targets (probably primarily due to pyrrhotite) although initial follow-up work may be focused on areas where structural breaks or deformation can be inferred from the magnetic data.

Some of the stronger conductors in Zone A are non-magnetic, and it is possible that these conductors reflect graphitic horizons which are contained within the magnetic rock unit which dominates the southern portion of the survey area.

In addition to the strong conductors contained within Zone A, there are several weaker, poorly defined responses which may reflect bedrock conductors in the northern portion of the survey block. Most of these have been given a "B?" interpretive symbol, and may be due to weak conductors which are partially obscured by magnetite and/or conductive overburden.

These anomalies may also be interesting targets, as they may reflect disseminated sulphides which could host auriferous mineralization. These weak conductors, some of which are listed below, may warrant investigation on a moderate priority basis.

10031xB, 10050xB, 10070E, 10080G-10120F, 10100E-10110I, 10120xD-10150xC, 10200xD, 10210F, 10230E, 10230xF-10280C, 10280B-10321xD, 10370A, 10380xA, 10400xG, 10410B, 10430C, 10460A, 10460xB-10470xA, and 10490xA'

Included in the above list, are several anomalies which have been given an "E" interpretive symbol. These anomalies are attributed to "edge effects", i.e., resistivity contrasts between rock units or between resistive rocks and conductive overburden.

SECTION II: BACKGROUND INFORMATION

Section II provides background information on products which are available from your survey data. Those products not obtained as part of the survey contract may be generated later from raw data which is available on your archive digital 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.

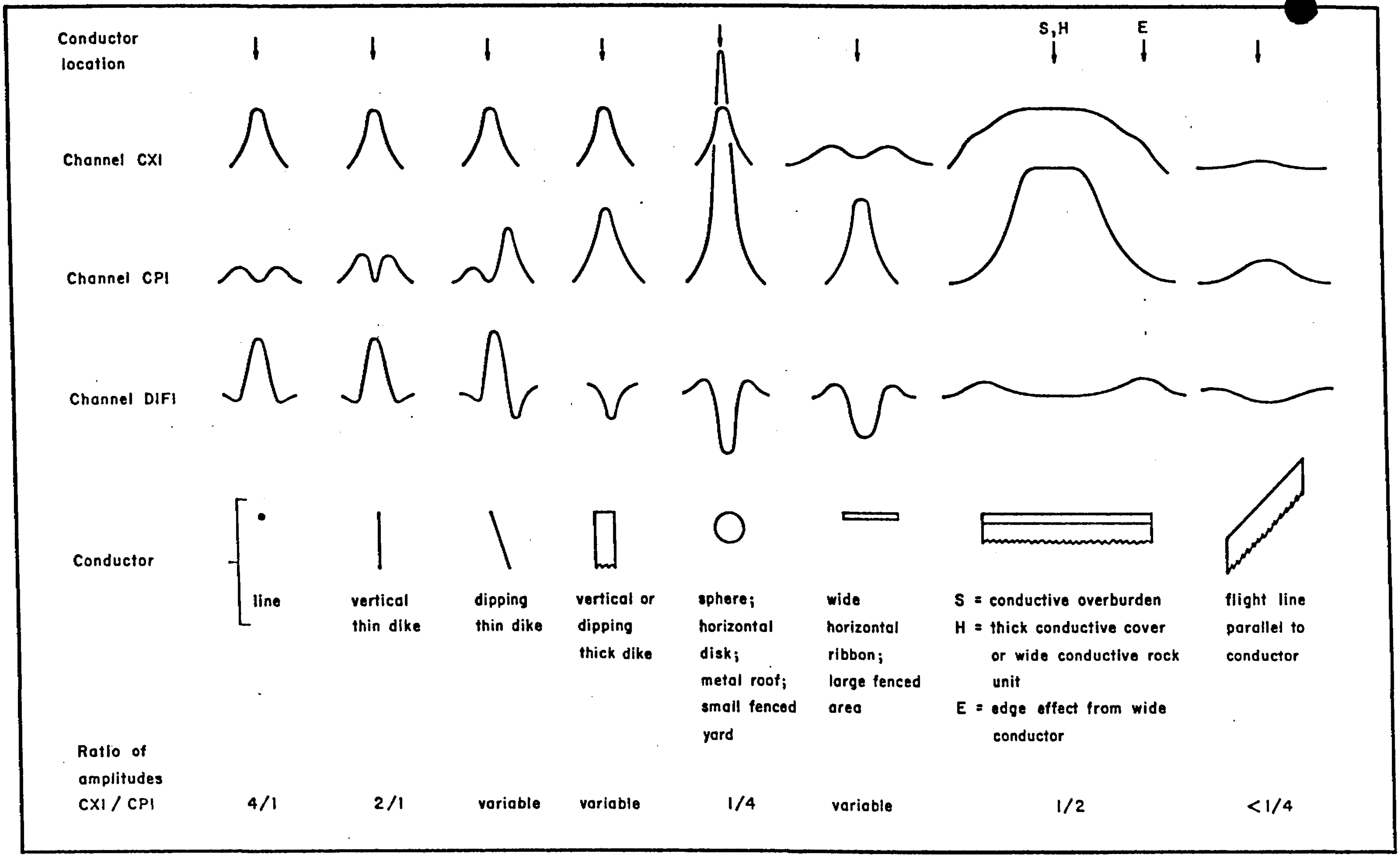
The conductive earth (half space) model is suitable for broad conductors. Resistivity contour maps result from the use of this model. A later section entitled Resistivity Mapping describes the method further, including the effect of using it on anomalies caused by discrete conductors such as sulfide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

Geometric interpretation

The geophysical interpreter attempts to determine the geometric shape and dip of the conductor. Figure II-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 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



Typical DIGHEM anomaly shape

electrical quality of the conductor increases, regardless of its true shape. DIGHEM anomalies are divided into six grades of conductance, as shown in Table II-1. The conductance in mhos is the reciprocal of resistance in ohms.

Table II-1. EM Anomaly Grades

Anomaly Grade	Mho Range
6	> 99
5	50 - 99
4	20 - 49
3	10 - 19
2	5 - 9
1	< 5

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.[1] 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

[1] This statement is an approximation. DIGHEM, with its short coil separation, tends to yield larger and more accurate conductance values than airborne systems having a larger coil separation.

resistive areas can yield discrete anomalies with a conductance grade (cf. Table II-1) of 1, or even of 2 for conducting clays which have resistivities as low as 50 ohm-m. In areas where ground resistivities can be 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, G and sometimes E on the map (see EM legend).

For bedrock conductors, the higher anomaly grades indicate increasingly higher conductances. Examples: DIGHEM's New Insco copper discovery (Noranda, Canada) yielded a grade 4 anomaly, as did the neighbouring copper-zinc Magusi River ore body; Mattabi (copper-zinc, Sturgeon Lake, Canada) and Whistle (nickel, Sudbury, Canada) gave grade 5; and DIGHEM's Montcalm nickel-copper discovery (Timmins, Canada) yielded a grade 6 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 5 and 6) are characteristic of massive sulfides or graphite. Moderate conductors (grades 3 and 4) typically reflect graphite or sulfides of a less massive character, while weak bedrock conductors (grades 1 and 2) can signify poorly connected graphite or heavily disseminated sulfides. Grade 1 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 1 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 and 2). 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 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 (see below). 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.

X-type electromagnetic responses

DIGHEM maps contain x-type EM responses in addition to EM anomalies. An x-type response is below the noise threshold of 3 ppm, and reflects 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 crescents. 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 profile (see table in Appendix A) and the resistivity contour map present the apparent resistivity using the so-called pseudo-layer (or buried) half space model defined by Fraser (1978)[2]. This model consists of a resistive layer overlying a conductive half space. The depth channel (see Appendix A) gives 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

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

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 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. (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[3]. 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.

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

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. The processing of DIGHEM data, however, produces six channels which contribute significantly to the recognition of bedrock conductors. These are the inphase and quadrature difference channels (DIFI and DIFQ), and the resistivity and depth channels (RES and DP) for each coplanar frequency; see table in Appendix A.

The EM difference channels (DIFI and DIFQ) eliminate up to 99% of the response of conductive ground, leaving responses from bedrock conductors, cultural features (e.g., telephone lines, fences, etc.) and edge effects. An edge effect arises when the conductivity of the ground suddenly changes, and this is 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 (DIFI and DIFQ) and the two resistivity channels (RES). The most favourable situation is where anomalies coincide on all four 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 both 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 above that the EM difference channels (i.e., channel DIFI for inphase and DIFQ 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 DIFI. 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 response and magnetic permeability response. 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 channel FEO (see Appendix A) which displays apparent weight percent magnetite according to a homogeneous half space model.[4] 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 steeply 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

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

factor of 2 when the magnetite is fairly uniformly distributed. EM magnetite maps can be generated when magnetic permeability is evident as indicated by anomalies in the magnetite channel FEO.

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.

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 CXS and CPS (see Appendix A) measure 50 and 60 Hz radiation. An anomaly on these channels shows that the conductor is radiating cultural power. Such an indication is normally a guarantee that the conduc-

tor 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.[5] When the flight crosses the cultural line at a high angle of intersection, the amplitude ratio of coaxial/coplanar (e.g., CXI/CPI) 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 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

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5 See Figure II-1 presented earlier.

small fenced yard.[6] 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.[6] 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, 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. If, instead, a center-peaked coplanar anomaly occurred, there would be concern that a thick geologic conductor coincided with the cultural line.

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[6] It is a characteristic of EM that geometrically identical 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.

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 CXS and CPS, and on the camera film.

TOTAL FIELD MAGNETICS

The existence of a magnetic correlation with an EM anomaly is indicated directly on the EM map. 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 one nT (i.e., one gamma). The digital tape is processed by computer to yield a total field magnetic contour map. When warranted, the magnetic data also may 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 II-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

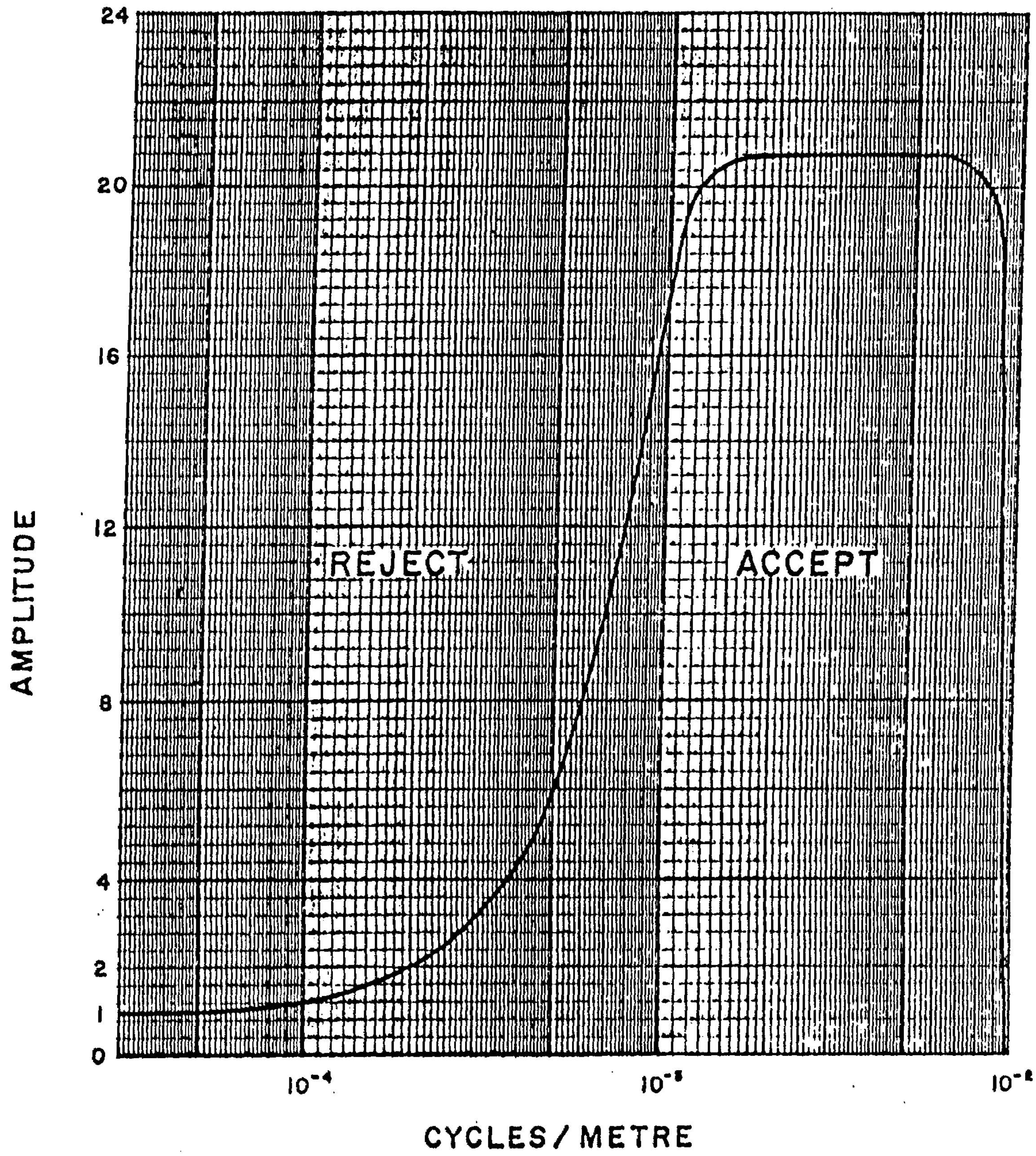

Figure 2 Frequency response of magnetic operator.

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.

MAPS ACCOMPANYING THIS REPORT

Three map sheets at a scale of 1:10,000 accompany this report, as listed in the table below:

ELECTROMAGNETIC ANOMALIES	1 map sheet
TOTAL FIELD MAGNETICS	1 map sheet
ENHANCED MAGNETICS	1 map sheet

Respectfully submitted,
DIGHEM SURVEYS & PROCESSING INC.

P.A. Smith
Geophysicist

AD-PAS-201

APPENDIX A

THE FLIGHT RECORDS

Both analog and digital flight records were produced. The analog profiles were recorded on chart paper in the aircraft during the survey. The digital profiles were generated later by computer and plotted on electrostatic chart paper at a scale of 1:10,000. The analog and digital profiles are listed in Tables A-1 and A-2 respectively.

In Table A-2, the log resistivity scale of 0.06 decade/mm means that the resistivity changes by an order of magnitude in 16.5 mm. The resistivities at 0, 33 and 67 mm up from the bottom of the digital flight record are respectively 1, 100 and 10,000 ohm-m.

FLIGHT PATH RECOVERY

Aircraft positioning and post-survey recovery of aircraft position was accomplished through the use of a Del Norte Flying Flagman positioning system. This electronic navigation system operates in the 8 gHz band and is therefore range limited by hills and by the curvature of the earth.

Table A-1. The Analog Profiles

Channel Name	Parameter	Sensitivity per mm	Designation on digital profile
01	coaxial inphase (900 Hz)	2.5 ppm	CXI (900 Hz)
02	coaxial quad (900 Hz)	2.5 ppm	CXQ (900 Hz)
03	coplanar inphase (900 Hz)	2.5 ppm	CPI (900 Hz)
04	coplanar quad (900 Hz)	2.5 ppm	CPQ (900 Hz)
05	coplanar inphase (7200 Hz)	5.0 ppm	CPI (7200 Hz)
06	coplanar quad (7200 Hz)	5.0 ppm	CPQ (7200 Hz)
09	altimeter	3 m	ALT
00/10	magnetics, coarse	10 nT	MAG
11	magnetics, fine	2 nT	
12	VLF-total: Annapolis	2%	
13	VLF-quad: Annapolis	2%	
14	VLF-total: Seattle	2%	
15	VLF-quad: Seattle	2%	

Table A-2. The Digital Profiles

Channel Name (Freq)	Observed parameters	Scale units/mm
MAG	magnetics	20 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
CXS (900 Hz)	ambient noise monitor (coaxial receiver)	2 ppm
CPI (900 Hz)	horizontal coplanar coil-pair inphase	2 ppm
CPQ (900 Hz)	horizontal coplanar coil-pair quadrature	2 ppm
CPI (7200 Hz)	horizontal coplanar coil-pair inphase	2 ppm
CPQ (7200 Hz)	horizontal coplanar coil-pair quadrature	2 ppm
	Computed Parameters	
DIFI (900 Hz)	difference function inphase from CXI and CPI	2 ppm
DIFQ (900 Hz)	difference function quadrature from CXQ and CPQ	2 ppm
CDT	conductance	1 grade
RES (900 Hz)	log resistivity	.06 decade
RES (7200 Hz)	log resistivity	.06 decade
DP (900 Hz)	apparent depth	6 m
DP (7200 Hz)	apparent depth	6 m

The Flying Flagman uses two ground based transponder stations which transmit distance information back to the helicopter. The onboard Central Processing Unit then takes the two distances and determines the helicopter position relative to the two ground stations. This is accomplished once every second. The ground stations are set up well away from the survey area and are positioned such that the signals cross the survey blocks at an angle between 30° and 150°. After site selection, a baseline is flown at right angles to a line drawn through the transmitter sites to establish an arbitrary coordinate system for the survey area. The distance from each ground transmitter site (range-range) is continuously recorded digitally.

The range-range data is transposed during data processing into an arbitrary x-y coordinate system based on the location of the two transmitter sites. This x-y grid is transferred to the base map by correlating a number of prominent topographical features to the navigational data points. The use of numerous visual tie-in points serves two purposes: to correct for distortions in the photomosaic (if any) and to accurately relate the navigation data to the map sheet.

APPENDIX B

STATEMENT OF QUALIFICATIONS

I, Paul A. Smith, of the City of Scarborough, Province of Ontario, do hereby certify that:

1. I am a geophysicist, residing at 65 Dogwood Crescent, Scarborough, Ontario M1P 3N5.

2. I have graduated from DeVry Technical Institute, Toronto (Electronics - 1962) and the Nova Scotia Land Survey Institute, (Cartography - 1966).

3. I have been actively engaged in geophysical exploration since 1962.

4. I am presently employed by Dighem Surveys & Processing Inc.

5. The statements made in this report represent my best opinion and judgment.

Dated at Toronto this 16th day of December, 1986.

Paul A. Smith
Geophysicist

AD-PAS-201

APPENDIX C

STATEMENT OF COST

Date: December 16, 1986 JOB NO. 261-1

Noramco Explorations Inc.
1275 Main Street West
North Bay, Ontario
P1B 2W7

IN ACCOUNT WITH
DIGHEM SURVEYS & PROCESSING INC.

To: Dighem flying of Agreement dated August 1, 1986, pertaining to an Airborne Geophysical Survey in the Red Lake area, Ontario

Survey Charges

130 km of flying @ $78.95/km	$10,263.50
Two colour maps @ $400.00 per map	$ 800.00
	$11,063.50

Allocation of Costs

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

DIGHEM SURVEYS & PROCESSING INC.

P.A. Smith
Geophysicist

AD-PAS-201

APPENDIX D

LIST OF PERSONNEL

The following personnel were involved in the acquisition, processing, interpretation and presentation of data, relating to a DIGHEM^{III} airborne geophysical survey carried out for Noramco Explorations Inc., over a property in the Red Lake area, Ontario.

Bill Blight	Survey Operations Supervisor
Bill Cooke	Senior Geophysical Operator
Ben Rook	Pilot (Frontier Helicopters Ltd.)
Paul Bottomley	Computer Processor
Paul Smith	Interpretation Supervisor
Reinhard Zimmermann	Draftsman
Jayne Crawford	Word Processing Operator

The survey consisted of 160 km of coverage, flown on August 16, 1986. Geophysical data were compiled utilizing a VAX 11-780 computer.

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

DIGHEM SURVEYS & PROCESSING INC.

P.A. Smith
Geophysicist

Ref: Report #261-1

AD-PAS-201

A P P E N D I X   E

EM ANOMALY LIST

	COAXIAL 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10031 (FLIGHT 3)												
A 301 S?	0	2	-1	3	6	21	1	0	1	36	1338	0
LINE 10050 (FLIGHT 3)												
D 417 S?	2	4	1	7	20	57	2	10	1	65	586	0
E 427 D	31	13	10	6	30	22	34	9	2	76	35	46
F 430 D	12	2	14	6	30	17	59	31	2	65	29	39
LINE 10060 (FLIGHT 3)												
D 469 S	1	3	1	6	17	33	1	0	1	83	985	0
E 467 S	3	5	0	6	11	38	2	6	1	63	882	0
F 457 D	32	20	11	29	53	108	15	7	1	61	57	30
H 455 D	12	7	15	12	53	53	18	24	2	58	36	32
I 452 D	11	2	15	3	38	14	82	29	2	65	48	34
LINE 10070 (FLIGHT 3)												
D 541 S?	3	7	2	10	36	53	2	5	1	59	376	10
E 544 B?	1	3	1	5	12	40	1	27	1	94	563	21
F 547 S	2	3	9	4	15	31	1	0	1	28	372	1
G 550 D	27	14	18	19	78	24	21	7	2	63	44	33
H 552 D	13	4	8	6	20	29	30	33	2	64	29	38
LINE 10080 (FLIGHT 3)												
F 594 S?	3	5	2	7	29	52	3	0	1	54	462	0
G 593 B?	3	4	2	6	29	52	3	8	1	59	895	0
H 585 S	2	3	2	5	17	37	1	0	1	26	358	0
I 582 D	23	11	5	18	65	34	15	9	2	62	39	33
J 579 D	10	5	13	8	40	41	19	25	2	68	24	43
L 576 B	14	6	13	7	27	42	26	28	1	60	61	29
LINE 10090 (FLIGHT 3)												
B 750 S?	2	7	1	12	50	75	1	0	1	41	790	0
D 752 B?	2	10	2	12	50	75	1	0	1	60	387	12
E 758 S?	3	6	1	7	50	50	2	3	1	67	838	0
F 761 D	33	12	9	29	65	51	19	16	1	55	72	24
G 764 D	20	8	4	17	55	76	14	24	2	64	24	40
LINE 10100 (FLIGHT 3)												
B 809 S?	1	8	0	13	57	84	1	0	1	25	741	0
C 807 B?	3	8	1	12	57	84	1	0	1	59	773	0
E 800 E	1	7	2	11	41	73	1	0	1	78	866	0
F 799 S?	1	6	2	11	41	73	1	0	1	45	714	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 900 HZ REAL PPM	COAXIAL 900 HZ QUAD PPM	COPLANAR 900 HZ REAL PPM	COPLANAR 900 HZ QUAD PPM	COPLANAR 7200 HZ REAL PPM	COPLANAR 7200 HZ QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M
LINE 10100 (FLIGHT 3)												
G 795 D	13	17	20	20	65	32	9	12	2	66	35	39
H 792 D	14	4	5	9	45	46	19	31	2	66	27	41
I 791 B	14	4	5	10	45	48	20	32	3	69	20	45
K 789 D	15	7	10	4	4	48	30	30	1	58	55	28
LINE 10110 (FLIGHT 3)												
B 941 S?	0	3	1	3	6	28	1	0	1	20	1508	0
C 948 S?	2	10	1	19	93	123	1	0	1	13	628	0
E 957 E	3	14	2	32	147	197	1	0	1	29	501	0
F 961 D	26	14	38	33	126	142	21	15	2	56	34	30
G 962 D	26	20	38	33	126	142	17	13	2	57	27	33
H 965 D	16	8	13	21	84	125	13	26	2	70	23	46
I 965 D	15	10	13	21	84	125	11	26	2	65	27	41
J 967 D	17	6	16	21	84	125	18	26	1	64	57	33
LINE 10120 (FLIGHT 3)												
B 1026 S?	0	2	0	2	5	16	1	0	1	42	1688	1
C 1015 S?	4	4	0	11	54	58	2	0	1	38	817	0
D 1005 S?	3	7	1	13	92	91	2	0	1	35	696	0
F 1002 B	11	5	20	6	51	10	33	19	1	44	158	6
G 1000 B	21	9	18	12	56	49	27	16	2	63	39	34
H 999 D	21	9	18	12	56	49	26	20	2	75	34	46
I 996 D	13	9	8	15	66	96	11	24	2	78	27	52
J 995 D	14	9	8	15	66	96	11	25	2	73	24	48
K 993 D	9	1	14	15	66	96	22	32	1	73	59	40
LINE 10130 (FLIGHT 3)												
A 1079 S?	1	2	1	2	6	12	1	0	1	61	1131	20
B 1088 E	3	8	1	14	75	80	2	0	1	67	932	0
C 1089 S?	4	7	1	14	75	80	2	0	1	20	660	0
F 1103 D	30	13	20	24	110	135	22	9	3	66	17	43
G 1108 D	6	3	5	17	74	42	5	15	2	78	37	48
H 1108 B	5	3	5	17	74	42	5	19	2	68	45	37
J 1111 D	7	2	6	4	74	42	27	45	1	63	79	29
LINE 10140 (FLIGHT 3)												
C 1275 E	4	10	2	14	89	121	2	0	1	19	685	0
D 1276 S?	4	10	0	14	89	121	1	0	1	32	735	0
F 1286 B?	5	9	23	4	19	14	1	0	1	24	74	8
G 1288 B	15	9	25	14	63	98	22	9	2	68	35	38
H 1289 D	15	9	25	14	63	82	22	6	4	70	11	48

* 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 900 HZ REAL PPM	COAXIAL 900 HZ QUAD PPM	COPLANAR 900 HZ REAL PPM	COPLANAR 900 HZ QUAD PPM	COPLANAR 7200 HZ REAL PPM	COPLANAR 7200 HZ QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M
LINE 10140	(FLIGHT 3)											
I 1293 B	4	3	1	13	16	14	3	1	2	84	46	50
K 1296 B	9	7	6	3	18	21	14	29	1	65	78	30
LINE 10150	(FLIGHT 3)											
F 1337 D	22	7	20	9	60	97	44	2	4	79	12	56
G 1332 D	4	5	3	8	36	37	4	18	1	66	79	30
I 1329 B	6	6	8	10	42	47	7	25	1	62	66	29
LINE 10160	(FLIGHT 3)											
B 1423 S?	3	5	0	9	44	66	2	0	1	58	850	0
C 1428 S?	2	7	0	7	31	60	1	0	1	40	747	0
E 1436 B	48	18	55	35	159	145	41	8	4	58	8	40
F 1436 D	48	11	55	35	159	144	55	8	4	74	8	55
G 1440 B	7	5	5	12	62	55	7	25	2	67	37	39
H 1441 B	8	5	4	11	62	55	8	27	2	69	41	40
J 1444 D	10	2	12	7	32	44	44	38	2	72	38	43
K 1445 B	9	2	12	7	32	42	36	36	1	71	79	36
LINE 10170	(FLIGHT 3)											
D 1487 S	0	4	1	7	24	53	1	0	1	57	874	0
E 1478 D	24	8	26	16	75	88	36	0	3	67	14	44
F 1472 B	13	5	19	14	4	27	24	6	4	69	11	47
G 1471 B	13	7	19	14	75	91	19	9	4	71	10	50
H 1470 B	10	6	13	18	26	74	10	19	2	75	38	45
J 1467 B	14	3	12	9	6	14	36	35	2	73	39	44
K 1465 B	16	4	12	2	4	10	68	33	1	63	69	31
LINE 10180	(FLIGHT 3)											
E 1570 S	3	3	0	5	23	34	3	26	1	102	1035	0
F 1571 S	1	3	0	5	22	34	1	0	1	39	263	15
G 1575 S	1	1	1	2	8	15	1	0	1	46	488	16
H 1577 S	1	1	0	3	14	26	1	0	1	46	384	18
I 1583 D	29	10	34	20	79	62	39	1	4	63	8	43
J 1589 D	15	3	17	10	42	40	45	0	5	61	7	42
K 1590 B	15	0	17	6	8	10	159	16	3	82	22	55
L 1593 D	15	7	16	13	9	0	21	21	2	75	35	46
M 1594 D	15	6	16	13	49	47	22	21	1	70	72	35
LINE 10190	(FLIGHT 3)											
C 1757 S?	2	4	0	5	21	43	2	0	1	95	1035	0
D 1755 S?	1	3	-1	4	16	43	1	0	1	33	422	6

* 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 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10190 (FLIGHT 3)												
F 1741 B	21	4	26	8	44	27	83	0	5	69	6	50
G 1740 D	15	4	26	8	44	27	58	6	4	87	9	65
H 1736 D	19	9	30	17	62	9	28	8	4	76	10	55
I 1735 B	19	8	30	17	62	18	29	0	6	49	4	33
J 1730 D	14	7	13	7	14	7	26	22	2	72	39	42
K 1729 B	14	5	13	7	14	3	32	22	1	73	59	40
LINE 10200 (FLIGHT 3)												
E 1848 B	26	4	50	10	63	54	151	13	11	71	1	60
F 1848 D	26	4	50	10	63	63	151	12	8	84	3	69
G 1852 D	34	6	60	19	95	10	94	0	8	56	3	42
H 1854 B	11	8	60	19	95	88	39	0	6	71	5	53
I 1857 B	23	9	20	14	33	88	30	18	2	68	35	40
J 1858 D	23	7	20	14	33	88	36	20	2	69	34	42
LINE 10210 (FLIGHT 3)												
B 1913 S?	0	3	0	3	5	21	1	0	1	17	1627	0
D 1905 S?	0	3	0	5	13	48	1	0	1	20	876	0
F 1899 B?	3	3	11	5	28	33	14	16	1	59	721	0
G 1896 B?	22	3	27	4	24	25	1	0	1	57	28	43
H 1895 D	22	3	27	4	24	22	183	16	7	96	4	79
I 1890 D	29	5	57	18	90	8	91	1	9	53	2	41
J 1883 B	11	4	13	8	21	10	26	17	2	70	37	40
LINE 10220 (FLIGHT 3)												
A 1993 S?	0	2	0	4	13	39	1	0	1	32	622	3
B 1996 S?	2	3	1	1	18	26	1	0	1	27	317	2
D 2002 D	32	2	48	12	57	1	222	13	8	73	3	59
E 2008 D	40	6	52	19	83	67	102	0	8	43	3	29
F 2012 B	32	5	26	13	43	82	78	17	2	70	30	43
G 2014 D	32	6	26	13	43	12	68	19	2	75	29	48
LINE 10230 (FLIGHT 3)												
D 2318 S?	2	1	-1	2	2	16	1	0	1	15	3353	0
E 2311 B?	3	5	1	9	44	8	2	1	1	47	782	0
H 2307 D	13	3	16	5	34	39	61	13	4	120	11	95
I 2301 D	11	3	7	9	43	11	19	3	2	94	36	60
J 2300 B	11	3	7	9	43	11	21	6	2	77	31	47
M 2294 B	13	2	10	5	29	2	49	10	2	87	61	49
LINE 10240 (FLIGHT 3)												
E 2400 B?	1	8	4	15	75	94	1	0	1	84	985	0

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		COAXIAL 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP		REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10240	(FLIGHT 3)												
F 2401	S	1	6	8	15	75	94	3	0	1	26	564	0
G 2404	B?	12	3	16	6	33	73	49	6	4	89	11	65
H 2405	D	15	3	16	6	33	41	63	25	3	125	18	96
I 2410	D	12	4	5	13	65	39	15	4	2	90	29	59
M 2415	D	12	5	14	14	65	27	17	18	1	64	63	31
LINE 10250	(FLIGHT 3)												
A 2456	B?	2	8	0	14	79	67	1	0	1	92	1021	0
C 2454	S	3	8	3	14	79	67	2	0	1	24	531	0
D 2451	D	7	3	7	10	48	44	12	0	3	124	25	90
E 2445	D	14	7	9	21	81	41	11	3	2	95	38	62
H 2439	D	12	6	12	8	29	21	21	21	1	57	93	21
LINE 10260	(FLIGHT 3)												
C 2617	S	1	2	0	2	6	20	1	0	1	20	1580	0
D 2608	B?	2	15	10	25	135	137	2	0	1	15	600	0
E 2605	D	14	6	6	21	125	113	10	0	4	104	10	80
F 2600	D	12	4	4	15	66	13	12	4	3	91	23	62
H 2594	D	17	4	9	19	75	23	18	24	1	62	76	28
LINE 10270	(FLIGHT 3)												
E 2702	S?	1	4	0	5	16	42	1	0	1	21	614	0
F 2709	B	4	8	0	4	95	78	3	0	1	64	922	0
G 2711	S?	3	10	29	4	95	78	1	0	1	21	46	7
H 2713	D	24	3	30	14	82	65	76	0	7	72	4	56
I 2718	B	11	5	7	14	54	44	11	0	6	93	6	74
J 2718	B?	9	5	7	22	68	43	7	0	3	90	14	65
L 2722	B?	11	1	16	6	79	44	97	29	1	53	57	23
M 2724	D	13	4	16	5	84	18	52	24	2	65	53	33
LINE 10280	(FLIGHT 3)												
B 2770	S?	3	6	1	8	34	66	2	0	1	69	806	0
C 2762	E	4	12	11	10	151	145	4	8	1	20	553	0
D 2758	D	59	11	100	29	126	145	124	2	7	61	3	47
E 2758	D	59	11	100	29	126	145	124	1	14	48	1	40
F 2755	D	27	3	19	12	39	17	86	15	4	85	9	63
J 2750	B?	8	11	19	12	11	4	11	16	1	52	60	22
L 2748	D	19	5	19	21	51	2	24	13	2	68	55	35
LINE 10290	(FLIGHT 3)												
B 2869	S	0	10	0	17	73	136	1	0	1	25	683	0

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ANOMALY/ FID/INTERP	COAXIAL 900 HZ REAL PPM	COAXIAL 900 HZ QUAD PPM	COPLANAR 900 HZ REAL PPM	COPLANAR 900 HZ QUAD PPM	COPLANAR 7200 HZ REAL PPM	COPLANAR 7200 HZ QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M
LINE 10290 (FLIGHT 3)												
D 2880 D	88	20	131	52	183	133	97	3	9	47	2	36
E 2881 D	88	20	131	52	183	133	97	3	9	47	2	36
F 2883 D	35	4	78	12	41	85	261	13	5	79	6	62
I 2888 B?	12	13	25	32	8	30	9	13	2	50	46	23
K 2891 D	20	8	25	32	64	46	17	13	2	63	43	34
LINE 10300 (FLIGHT 3)												
B 2941 E	2	8	1	15	20	48	1	0	1	50	799	0
C 2939 S	1	8	0	16	20	86	1	0	1	23	670	0
F 2927 D	31	5	43	14	50	64	92	11	5	74	8	54
G 2926 D	29	4	43	14	50	36	102	2	7	66	3	51
H 2924 D	28	0	30	11	44	68	195	13	6	79	5	62
K 2918 B	12	5	13	21	20	8	12	22	1	48	56	19
N 2915 B	15	12	13	1	120	89	21	27	1	52	62	22
LINE 10310 (FLIGHT 3)												
B 3074 S	0	2	2	2	8	18	1	0	1	32	938	0
D 3083 S	1	8	0	14	62	103	1	0	1	35	725	0
F 3093 D	26	9	6	14	31	64	23	18	3	98	19	72
G 3094 B	26	6	6	14	31	35	32	24	6	87	5	71
H 3097 D	17	3	18	22	101	94	24	5	6	89	6	69
J 3102 D	18	6	13	1	43	31	69	34	1	45	55	18
K 3103 B?	3	6	13	40	43	31	3	9	2	44	49	18
L 3104 B	3	15	13	40	43	31	2	1	1	43	58	16
LINE 10320 (FLIGHT 3)												
A 3155 S	0	6	1	10	8	23	1	0	1	41	645	0
B 3146 S	1	4	4	6	27	42	2	1	1	96	177	44
C 3144 D	11	1	17	6	27	42	74	23	2	141	28	107
E 3141 D	23	7	20	8	34	9	52	23	4	108	11	85
G 3139 D	17	1	20	4	45	56	204	13	4	91	10	68
H 3133 D	14	12	11	8	11	26	13	18	1	45	67	15
J 3131 B?	13	12	18	2	11	26	19	26	1	43	57	16
L 3129 B?	15	15	19	3	135	29	1	0	1	36	12	27
LINE 10321 (FLIGHT 3)												
A 3241 S	0	3	0	3	8	20	1	0	1	50	299	20
B 3231 S	1	4	2	9	39	7	1	0	1	49	806	0
LINE 10330 (FLIGHT 3)												
B 3319 S	0	3	1	3	12	32	1	0	1	32	384	3

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ANOMALY/ FID/INTERP	COAXIAL 900 HZ REAL PPM	COAXIAL 900 HZ QUAD PPM	COPLANAR 900 HZ REAL PPM	COPLANAR 900 HZ QUAD PPM	COPLANAR 7200 HZ REAL PPM	COPLANAR 7200 HZ QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M
LINE 10330 (FLIGHT 3)												
D 3330 S?	0	7	1	10	44	60	1	0	1	52	604	0
E 3337 S?	1	5	5	9	35	65	2	4	1	58	368	8
F 3340 D	12	2	19	9	22	54	46	28	3	110	20	82
G 3342 D	25	8	17	9	22	10	44	17	4	106	12	82
H 3345 D	8	2	3	10	52	56	11	9	3	90	17	63
I 3349 D	17	9	11	17	18	46	14	23	1	43	71	14
K 3351 B	5	8	11	7	18	47	8	29	1	43	50	17
N 3354 B	15	6	8	6	36	65	29	29	1	38	66	10
LINE 10340 (FLIGHT 3)												
B 3422 S?	-1	3	0	3	11	25	1	0	1	33	439	3
C 3407 S	0	3	0	5	24	5	1	0	1	39	239	15
F 3396 B?	24	10	16	6	10	8	37	17	4	100	10	78
G 3395 D	24	10	13	7	26	8	33	16	3	104	15	79
I 3393 B	10	2	13	9	43	56	34	6	4	75	11	52
K 3387 D	12	5	8	24	41	27	9	20	1	43	84	13
M 3384 B	14	5	7	40	164	21	7	11	1	44	61	16
LINE 10350 (FLIGHT 3)												
B 3559 S	-2	2	0	2	10	4	1	0	1	53	408	22
E 3578 S	-1	5	0	8	28	52	1	4	1	67	867	0
G 3585 S?	4	5	3	9	47	75	4	24	1	55	366	9
H 3588 D	27	6	23	8	30	44	78	20	4	83	9	63
J 3591 B	16	1	23	11	53	77	75	7	4	74	10	52
M 3597 D	14	1	4	17	19	19	19	27	1	50	79	18
N 3600 B	11	9	17	46	183	63	6	9	1	41	64	13
LINE 10360 (FLIGHT 3)												
A 3676 S?	0	2	1	2	11	12	1	0	1	38	779	5
C 3671 S?	-1	4	1	3	14	13	1	0	1	44	388	14
D 3650 S?	0	5	1	5	9	41	1	0	1	25	220	2
E 3645 S	4	3	2	4	17	37	1	0	1	35	269	10
F 3644 D	4	2	8	4	17	37	16	26	1	98	183	45
G 3641 D	12	5	10	12	34	33	16	19	4	108	10	85
H 3639 B	12	6	10	12	34	16	15	5	3	72	14	48
I 3638 B	12	6	10	12	34	44	15	9	2	70	32	41
K 3634 D	10	1	5	8	22	21	32	32	1	54	88	19
L 3631 D	10	2	8	8	26	18	27	29	1	54	77	21
LINE 10370 (FLIGHT 3)												
A 3729 B?	0	5	0	6	33	54	1	0	1	77	960	0

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	COAXIAL 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10370 (FLIGHT 3)												
C 3735 S?	-1	5	0	7	31	50	2	0	1	74	938	0
D 3755 S	0	4	1	8	20	35	1	0	1	56	860	0
E 3758 S?	7	5	4	6	24	57	8	21	1	65	217	18
F 3759 D	7	4	13	6	24	57	18	23	1	81	249	29
G 3761 B?	14	7	14	4	11	6	1	0	1	73	27	59
I 3762 D	14	7	6	4	13	6	24	23	3	107	22	79
J 3764 D	12	4	6	10	32	48	17	0	3	76	24	47
K 3769 D	12	10	5	14	16	34	8	15	1	49	104	15
L 3774 D	12	7	5	14	67	25	10	23	1	56	74	24
LINE 10380 (FLIGHT 3)												
B 3824 S?	-1	6	0	8	19	42	1	0	1	65	855	0
C 3818 D	7	3	5	2	9	28	28	13	1	130	92	81
D 3813 B	10	8	8	12	51	31	9	4	3	91	16	64
E 3812 D	14	2	8	12	3	4	29	3	2	61	40	30
G 3807 D	6	1	2	6	7	3	16	44	1	54	111	18
H 3802 D	11	9	10	13	52	66	9	23	1	36	164	3
LINE 10381 (FLIGHT 3)												
A 3920 S	0	5	0	11	20	34	1	0	1	48	774	0
B 3915 S?	-1	5	1	11	54	70	1	0	1	46	707	0
LINE 10390 (FLIGHT 4)												
B 249 S	1	5	0	8	26	47	1	0	1	36	771	0
C 245 S	0	6	1	8	46	50	1	0	1	55	652	0
D 243 E	3	6	0	8	46	50	2	0	1	154	1035	0
E 227 S	1	3	0	4	6	20	1	0	1	24	335	0
F 222 S	8	3	3	3	7	20	1	0	1	38	238	11
G 221 D	8	3	7	3	7	20	28	6	1	121	717	2
H 216 B	11	9	7	12	3	28	9	12	3	116	25	85
I 214 B	11	2	5	12	6	4	16	3	2	59	44	26
J 209 D	7	11	4	13	59	9	4	12	1	43	151	7
L 205 B?	8	1	10	2	16	26	1	0	1	32	52	18
M 204 D	8	9	10	2	2	26	12	21	1	48	158	9
LINE 10400 (FLIGHT 4)												
A 320 S?	2	6	0	11	4	0	1	0	1	32	759	0
E 343 S	1	6	0	8	35	69	1	0	1	58	853	0
G 351 D	10	4	8	6	23	9	22	23	1	121	158	68
H 356 D	16	7	16	11	41	29	23	0	4	75	13	51
J 365 B	5	9	14	19	31	2	5	9	1	48	101	14

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	COAXIAL 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10400 (FLIGHT 4)												
L 368 B	10	15	15	19	35	36	7	10	1	43	75	13
LINE 10410 (FLIGHT 4)												
A 528 S	2	11	-2	17	84	101	1	0	1	35	723	0
B 526 B?	2	8	-3	17	84	101	1	0	1	153	1035	0
E 506 S	2	2	-2	24	8	165	1	0	1	27	622	0
F 505 S	2	10	-2	15	8	27	1	0	1	26	610	0
G 504 S	2	9	-2	15	8	27	1	0	1	31	661	0
H 500 D	13	7	9	8	33	93	16	24	1	124	524	34
I 496 D	17	12	12	20	83	110	11	17	1	56	152	18
K 492 B?	2	3	3	2	9	23	1	0	1	33	75	18
L 489 D	6	2	8	16	65	3	7	28	1	34	397	0
N 485 B	13	14	15	30	104	96	7	16	1	36	104	7
LINE 10420 (FLIGHT 4)												
A 566 S	1	8	-2	14	74	37	1	0	1	41	761	0
B 589 S	3	10	-2	35	160	202	1	0	1	15	454	0
C 594 D	23	10	23	18	63	78	25	24	1	62	80	30
D 595 D	7	9	23	18	63	78	11	25	2	92	51	59
E 598 D	14	7	13	10	53	53	20	28	1	71	60	39
G 603 B	5	4	6	8	39	12	6	31	1	59	140	20
H 608 B	10	23	6	30	138	55	3	1	1	33	196	0
LINE 10430 (FLIGHT 4)												
B 732 S	2	0	-1	16	77	108	1	7	1	38	721	0
C 733 B?	1	9	-2	16	77	108	1	0	1	67	853	0
G 754 E	2	10	0	13	179	195	1	0	1	100	999	0
H 756 S	3	10	0	13	179	195	1	3	1	13	462	0
I 757 B?	3	5	1	13	179	195	2	16	1	14	468	0
J 760 D	31	8	35	21	69	39	47	22	2	61	47	33
K 762 D	9	8	35	21	69	39	18	24	2	86	26	59
L 765 D	17	5	13	9	40	23	37	31	2	68	41	40
M 769 D	8	11	9	16	83	74	5	17	1	52	165	14
N 770 B	8	11	6	16	83	74	5	17	1	53	163	16
LINE 10440 (FLIGHT 4)												
B 850 S	3	8	0	12	61	10	2	0	1	49	785	0
E 824 S?	3	1	0	11	15	18	2	27	1	21	606	0
F 820 D	25	7	34	15	50	32	50	20	2	69	33	42
H 819 D	12	7	34	15	50	27	27	23	3	86	17	62
I 816 D	17	5	10	12	46	40	26	30	1	64	88	30

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	COAXIAL 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 10440 (FLIGHT 4)												
M 811 B	7	3	8	7	36	31	15	36	1	34	601	0
LINE 10450 (FLIGHT 4)												
A 880 S?	2	9	0	5	77	82	1	3	1	50	769	0
B 903 B?	5	6	6	7	56	70	6	35	1	13	448	0
C 907 D	19	7	25	12	29	60	36	23	2	63	42	35
D 908 D	17	5	25	12	38	27	38	26	2	78	29	50
E 911 D	21	5	13	15	61	48	31	28	2	70	55	39
I 914 B	6	5	13	12	101	75	10	34	1	41	244	5
LINE 10460 (FLIGHT 4)												
A 988 B?	4	12	0	20	62	98	1	0	1	44	736	0
C 965 S?	5	6	1	26	70	47	2	0	1	21	574	0
G 957 D	17	9	20	17	59	40	19	24	2	81	33	53
H 954 D	17	8	10	16	69	34	16	23	2	74	56	42
I 953 B?	17	8	14	16	69	34	18	23	1	57	64	26
J 950 B	5	8	10	18	87	23	5	14	1	37	514	0
LINE 10470 (FLIGHT 4)												
A 1030 S	1	2	0	2	6	16	1	0	1	34	587	1
C 1042 S	4	16	2	26	9	144	1	0	1	17	518	0
D 1044 S	4	10	3	3	11	2	1	0	1	30	34	18
F 1051 D	21	10	8	7	107	78	24	30	1	61	70	29
G 1054 D	19	8	16	23	101	56	16	23	2	69	46	40
LINE 10480 (FLIGHT 4)												
A 1110 S?	2	5	0	10	41	66	1	5	1	56	801	0
B 1100 S	3	2	2	28	137	9	2	0	1	24	635	0
C 1095 S?	4	1	2	24	24	49	2	16	1	37	144	5
D 1093 D	16	11	7	24	23	49	9	17	1	58	76	26
LINE 10490 (FLIGHT 4)												
B 1149 S?	2	8	-2	9	49	37	1	0	1	60	801	0
E 1152 S?	3	4	0	13	56	104	2	12	1	45	749	0
H 1161 E	2	8	0	18	88	7	1	0	1	52	822	0
J 1167 S	4	2	8	3	4	49	1	0	1	36	27	24
K 1169 D	12	11	9	18	80	66	8	13	1	55	87	21
LINE 10500 (FLIGHT 4)												
A 1220 S?	1	8	0	11	11	51	1	1	1	57	775	0
B 1217 S	4	4	0	2	11	18	1	0	1	28	162	10

* 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 900 HZ REAL PPM	COAXIAL 900 HZ QUAD PPM	COPLANAR 900 HZ REAL PPM	COPLANAR 900 HZ QUAD PPM	COPLANAR 7200 HZ REAL PPM	COPLANAR 7200 HZ QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* M	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH M	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH M
LINE 10500	(FLIGHT	4)										
D 1214 E	4	10	2	14	66	114	2	4	1	42	719	0
F 1205 S	2	11	0	19	94	94	1	0	1	38	719	0
J 1197 D	9	6	9	12	3	9	11	20	1	59	74	25
LINE 10510	(FLIGHT	4)										
C 1497 S	-4	6	-5	10	-14	62	1	0	1	208	1035	0
D 1505 S	-5	5	-5	7	-31	38	1	0	1	204	1035	0
F 1509 S?	1	7	3	9	8	37	1	2	1	204	1035	0
LINE 10520	(FLIGHT	4)										
A 1549 S?	-3	8	-3	10	17	66	1	2	1	210	1035	0
C 1538 S?	0	6	-2	6	5	34	1	0	1	201	1035	0
LINE 10530	(FLIGHT	4)										
A 1591 S	-2	4	-4	6	7	21	1	9	1	208	1035	0
C 1594 S	-4	2	-3	2	-5	13	1	0	1	0	2663	0
D 1605 B?	3	13	7	13	79	76	2	3	1	35	482	0
LINE 19010	(FLIGHT	4)										
B 1765 S?	3	14	6	19	61	165	2	11	2	89	26	62
D 1762 B?	8	9	14	21	90	57	7	25	3	76	18	53
G 1756 B?	4	7	21	29	90	57	6	20	2	64	36	38
H 1755 B	5	9	21	29	90	57	6	20	2	57	22	34
K 1753 B	2	5	21	27	89	40	6	21	2	67	28	42
M 1749 B	8	2	18	6	20	34	49	39	6	65	5	50
N 1746 B?	2	4	13	26	43	19	4	17	4	61	9	42
P 1745 D	13	5	13	26	43	30	11	23	5	61	6	44
Q 1742 B	2	9	19	13	57	114	7	22	5	69	7	52
R 1740 B	4	9	45	13	57	114	23	14	7	76	4	60
S 1737 B	8	5	47	12	73	7	48	30	15	72	1	64
U 1731 B	8	5	35	15	70	22	29	30	10	74	2	62
W 1723 E	9	14	33	25	73	107	11	13	6	67	4	52
Y 1722 B	12	14	33	25	73	107	13	16	4	62	10	44
Z 1720 B?	3	12	28	25	73	107	7	16	4	69	11	49
AA 1717 B	12	13	30	22	8	6	13	12	5	77	6	59
CC 1706 B	4	4	10	8	15	16	9	32	13	125	1	115
FF 1688 B?	4	10	9	14	23	88	4	14	5	113	7	92
II 1681 B	4	2	7	5	14	21	13	48	7	121	4	104
KK 1669 B	6	9	8	4	4	24	7	21	2	63	30	36
LINE 19020	(FLIGHT	4)										
A 1933 S	1	12	0	20	7	134	1	0	1	20	571	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 900 HZ		COPLANAR 900 HZ		COPLANAR 7200 HZ		VERTICAL DIKE		HORIZONTAL SHEET		CONDUCTIVE EARTH	
ANOMALY/ FID/INTERP	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	REAL PPM	QUAD PPM	COND MHOS	DEPTH* M	COND MHOS	DEPTH M	RESIS OHM-M	DEPTH M
LINE 19020 (FLIGHT 4)												
C 1934 S	1	11	-2	21	7	134	1	0	1	21	600	0
E 1948 B?	2	6	-1	12	24	90	1	0	1	119	1035	0
F 1953 S	2	11	-1	2	83	9	1	4	1	26	577	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.

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

W8702.22

#22-87

The Mining ....

52N04SW0031 2.9817 DOME TWP — 900

— Do not use shaded areas below.

Type of Survey(s): Airborne Geophysical Survey W8702.22	Township or Area: Red Lake Area (Fairlie Twp)
Claim Holder(s): Pure Gold Resources Inc.	Prospector's Licence No.: T-4689
Address: 1275 Main Street West, North Bay, Ontario P1B 2W7	
Survey Company: Dighem Survey	Date of Survey (from & to): 16 08 86 / 16 08 86 (Day Mo. Yr.) — Total Miles of line Cut: 160 km
Name and Address of Author (of Geo-Technical report): 228 Matheson Blvd. E., Mississauga, Ontario L4Z 1X1	

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	40
	Magnetometer	40
	Radiometric	

RECEIVED
MAR - 9 1987
MINING LANDS SECTION

Expenditures (excludes power stripping)

Type of Work Performed	
Performed on Claim(s)	

RECEIVED
FEB 27 1987
RED LAKE MINING DIV.

Calculation of Expenditure Days Credits

Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
KRL	869589	80	KRL	869628	80
	869590	80		869629	80
	869591	80		869630	80
	869592	80		869631	80
	869593	80		869632	80
	869594	80		869633	80
	869595	80		869634	80
	869596	80		869635	80
	869597	80		869636	80
	869598	80		869637	80
	869599	80		869638	80
	869600	80		869639	80
	869601	80		869640	80
	869602	80		869641	80
	869603	80		869642	80
	869604	80		869643	80
	869605	80		869644	80
	869606	80		869645	80
	869607	80		869646	80
	869608	80		869647	80
	869625	80		869648	80
	869626	80		869660	80
	869627	80		869661	80

Total number of mining claims covered by this report of work: 59

For Office Use Only		
Total Days Cr. Recorded: 4720	Date Recorded: Feb. 27/87	Mining Recorder: [signature]
	Date Approved as Recorded: 87.3.19	Branch Director: [signature]

Date: Jan. 19/87	Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
Noramco Explorations Inc. 1275 Main Street West, North Bay, Ontario P1B 2W7

KRL 869589	Date Certified: Jan. 19/87	Certified by (Signature): [signature]

1362 (81/9)

#22-87

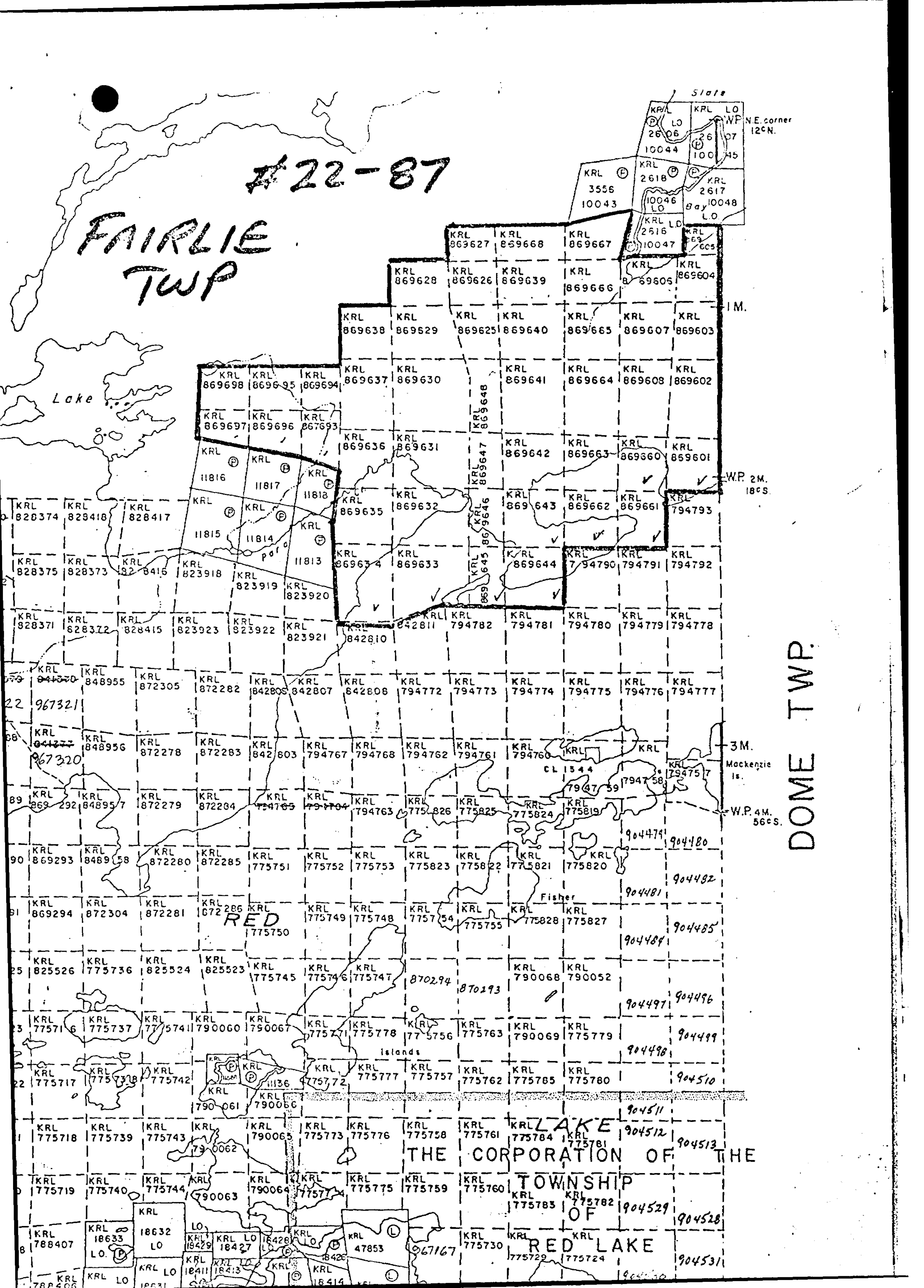
McKENZIE NORTH PROPERTY

CLAIM #s CONTINUED

CLAIM #

KRL869662
KRL869663
KRL869664
KRL869665
KRL869666
KRL869667
KRL869668
KRL869693
KRL869694
KRL869695
KRL869696
KRL869597
KRL869698

RECEIVED
FEB 27 1987
RED LAKE
MINING DIV.



#22-87
FAIRLIE TWP
DOME TWP
Lake
N.E. corner 12CN.
1M.
W.P. 2M. 18CS.
3M.
Mackenzie Is.
W.P. 4M. 56CS.
CL 1544
Fisher
Islands
RED
LAKE
THE CORPORATION OF THE TOWNSHIP OF RED LAKE

POSITION

GHTS

tion File

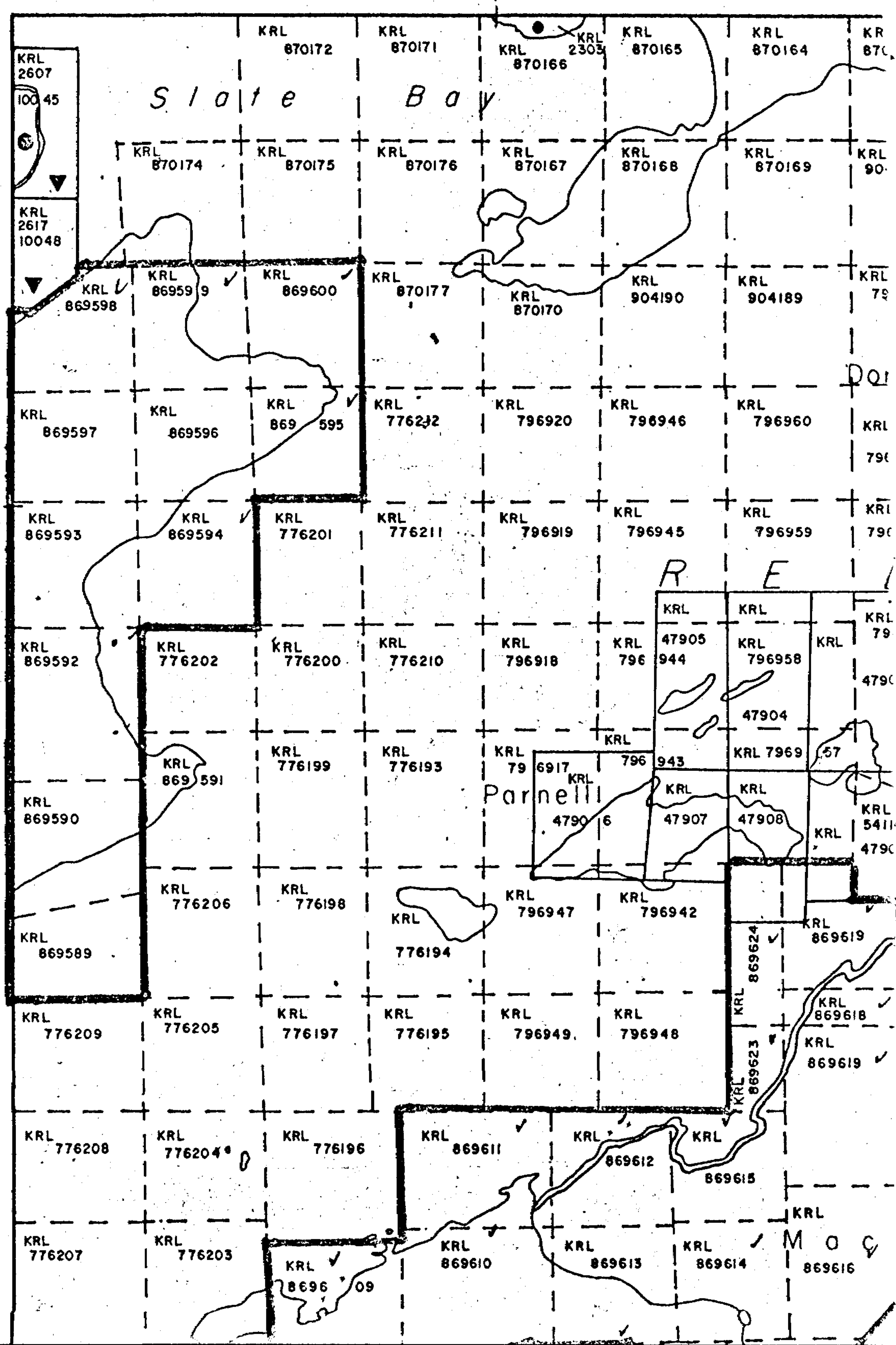
188555

am C.S.T.

Dome Twp.

42-87

41 M



IN AREA

AERODROME,

HIP

Ministry of Northern Development and Mines

Ontario

Geophysical-Geological-Geochemical Technical Data Statement

File 2.9817 + 2.9819

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Airborne Geophysical Survey

Township or Area Fairlie Twp & Dome Twp.

Claim Holder(s) Pure Gold Resources Inc.
1275 Main St. W. North Bay, Ont

Survey Company Dighem Survey

Author of Report P. A. Smith

Address of Author 228 Matheson Blvd. Mississauga.

Covering Dates of Survey Aug 15 - Dec 16/86 (linecutting to office)

Total Miles of Line Cut 196 km flown.

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
—Electromagnetic	
—Magnetometer	
—Radiometric	
—Other	
Geological	
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer 40 Electromagnetic 40 Radiometric ______ (enter days per claim)

DATE: March 4/87 SIGNATURE: M. Dubeau Author of Report or Agent

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

See list attached (McKenzie Island prop.)

If space insufficient, attach list

RECEIVED
MAR - 6 1987
MINING LANDS SECTION

TOTAL CLAIMS 59+37 = 96

OFFICE USE ONLY

Res. Geol. ______ Qualifications ______

Previous Surveys

File No.	Type	Date	Claim Holder

837 (85/12)

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations ______ Number of Readings ______

Station interval ______ Line spacing ______

Profile scale ______

Contour interval ______

MAGNETIC

Instrument ______

Accuracy – Scale constant ______

Diurnal correction method ______

Base Station check-in interval (hours) ______

Base Station location and value ______

ELECTROMAGNETIC

Instrument ______

Coil configuration ______

Coil separation ______

Accuracy ______

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency ______
(specify V.L.F. station)

Parameters measured ______

GRAVITY

Instrument ______

Scale constant ______

Corrections made ______

Base station value and location ______

Elevation accuracy ______

INDUCED POLARIZATION
RESISTIVITY

Instrument ______

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time ______ Frequency ______

– Off time ______ Range ______

– Delay time ______

– Integration time ______

Power ______

Electrode array ______

Electrode spacing ______

Type of electrode ______

SELF POTENTIAL

Instrument ______ Range ______

Survey Method ______

Corrections made ______

RADIOMETRIC

Instrument ______

Values measured ______

Energy windows (levels) ______

Height of instrument ______ Background Count ______

Size of detector ______

Overburden ______
(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey ______

Instrument ______

Accuracy ______

Parameters measured ______

Additional information (for understanding results) ______

AIRBORNE SURVEYS

Type of survey(s) Magnetometer + Electromagnetic surveys.

Instrument(s) Sonotek PMH 5010 magnetometer, Sperry radio altimeter, Sonotek SDS 1200, Totem 2A VLF-EM
(specify for each type of survey)

Accuracy EM = .2 ppm (@900Hz) Mag 1 nT (one gamma)
(specify for each type of survey)

Aircraft used Aerospatiale AS-350 B turbine Hélicopter

Sensor altitude EM = 30 m. Mag = 45 m.

Navigation and flight path recovery method Del Norte Flying Flagman positioning 8 gHz band

Aircraft altitude ______ Line Spacing 100 m

Miles flown over total area 196 km. Over claims only ______

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken ____________________

____

____

Total Number of Samples ____________________

Type of Sample ____________________
(Nature of Material)

Average Sample Weight ____________________

Method of Collection ____________________

____

Soil Horizon Sampled ____________________

Horizon Development ____________________

Sample Depth ____________________

Terrain ____________________

____

Drainage Development ____________________

Estimated Range of Overburden Thickness ____________________

____

____

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis ____________________

____

____

____

General ____________________

____

____

____

____

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____

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____

____

ANALYTICAL METHODS

Values expressed in: per cent ☐ p. p. m. ☐ p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others ____________________

Field Analysis (____________________ tests)

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

Field Laboratory Analysis

No. (____________________ tests)

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

Commercial Laboratory (____________________ tests)

Name of Laboratory ____________________

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

General ____________________

____

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____

____

____

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____

Mckenzie Island / Slate Bay

Record#	AREA	CLAIM NO
100	KRL	869589
101	KRL	869590
102	KRL	869591
103	KRL	869592
104	KRL	869593
105	KRL	869594
106	KRL	869595
107	KRL	869596
108	KRL	869597
109	KRL	869598
110	KRL	869599
111	KRL	869600
112	KRL	869601
113	KRL	869602
114	KRL	869603
115	KRL	869604
116	KRL	869605
117	KRL	869606
118	KRL	869607
119	KRL	869608
120	KRL	869625
121	KRL	869626
122	KRL	869627
123	KRL	869628
124	KRL	869629
125	KRL	869630
126	KRL	869631
127	KRL	869632
128	KRL	869633
129	KRL	869634
130	KRL	869635
131	KRL	869636
132	KRL	869637

Rec.#	Area	Claim No.
133	KRL	869638
134	KRL	869639
135	KRL	869640
136	KRL	869641
137	KRL	869642
138	KRL	869643
139	KRL	869644
140	KRL	869645
141	KRL	869646
142	KRL	869647
143	KRL	869648
144	KRL	869660
145	KRL	869661
146	KRL	869662
147	KRL	869663
148	KRL	869664
149	KRL	869665
150	KRL	869666
151	KRL	869667
152	KRL	869668
153	KRL	869693
154	KRL	869694
155	KRL	869695
156	KRL	869696
157	KRL	869697
158	KRL	869698

Mckenzie Island.

Record#	AREA	CLAIM_NO
1	McK	0
2	KRL	869579
3	KRL	869580
4	KRL	869581
5	KRL	869582
6	KRL	869583
7	KRL	869584
8	KRL	869585
9	KRL	869586
10	KRL	869587
11	KRL	869588
12	KRL	869609
13	KRL	869610
14	KRL	869611
15	KRL	869612
16	KRL	869613
17	KRL	869614
18	KRL	869615
19	KRL	869616
20	KRL	869617
21	KRL	869618
22	KRL	869619
23	KRL	869620
24	KRL	869621
25	KRL	869622
26	KRL	869623
27	KRL	869624
28	KRL	869649
29	KRL	869650
30	KRL	869651
31	KRL	869652
32	KRL	869653
33	KRL	869654
34	KRL	869655
35	KRL	869656
36	KRL	869657
37	KRL	869658
38	KRL	869659
39	KRL	904479
40	KRL	904480
41	KRL	904481
42	KRL	904482
43	KRL	904483
44	KRL	904484
45	KRL	904485
46	KRL	904486
47	KRL	904487
48	KRL	904488
49	KRL	904489
50	KRL	904490

Rec#	Area	Claim#
51	KRL	904491
52	KRL	904492
53	KRL	904493
54	KRL	904494
55	KRL	904495
56	KRL	904496
57	KRL	904497
58	KRL	904498
59	KRL	904499
60	KRL	904500
61	KRL	904501
62	KRL	904502
63	KRL	904503
64	KRL	904504
65	KRL	904505
66	KRL	904506
67	KRL	904507
68	KRL	904508
69	KRL	904509
70	KRL	904510
71	KRL	904511
72	KRL	904512
73	KRL	904513
74	KRL	904514
75	KRL	904515
76	KRL	904516
77	KRL	904517
78	KRL	904518
79	KRL	904519
80	KRL	904520
81	KRL	904521
82	KRL	904522
83	KRL	904523
84	KRL	904524
85	KRL	904525
86	KRL	904526
87	KRL	904527
88	KRL	904528
89	KRL	904529
90	KRL	904530
91	KRL	904531
92	KRL	904532
93	KRL	904533
94	KRL	904534
95	KRL	904546
96	KRL	904547
97	KRL	966939
98	KRL	966940

Ontario

Ministry of
Northern Development
and Mines

February 27, 1987 File: 2.9817

Mining Recorder
Ministry of Northern Development and Mines
P.O. Box 324
Red Lake, Ontario
POV 2MO

Dear Sir:

We received reports and maps on February 24, 1987 for an Airborne Geophysical (Magnetometer and Electromagnetic) Surveys on Mining Claims KRL 869589, et al, in Fairlie Township.

This material will be examined and assessed and a statement of assessment work credits will be issued.

We do not have a copy of the report of work which is normally filed with your office prior to the submission of this technical data. Please forward a copy as soon as possible.

Yours sincerely,

J.C. Smith, A/Manager
Mining Lands Section
Mineral Development and Lands Branch
Mines and Minerals Division

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

SH/mc
cc: Pure Gold Resources Inc
1275 Main Street West
North Bay, Ontario
P1B 2W7

Ontario

Ministry of
Northern Development
and Mines

February 27, 1987 File: 2.9819

Mining Recorder
Ministry of Northern Development and Mines
P.O. Box 324
Red Lake, Ontario
POV 2MO

Dear Sir:

We received reports and maps on February 24, 1987 for an Airborne Geophysical (Magnetometer and Electromagnetic) Surveys on Mining Claims KRL 869579, et al, in Dome Township.

This material will be examined and assessed and a statement of assessment work credits will be issued.

We do not have a copy of the report of work which is normally filed with your office prior to the submission of this technical data. Please forward a copy as soon as possible.

Yours sincerely,

J.C. Smith, A/Manager
Mining Lands Section
Mineral Development and Lands Branch
Mines and Minerals Division

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

AB SH/mc

cc: ✓ Pure Gold Resources Inc
1275 Main Street West
North Bay, Ontario
P1B 2W7

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures) 2.9817

The Mining Act

Instructions: — Please type or print.
— If number of mining claims traversed exceeds space on this form, attach a list.
Note: — Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
— Do not use shaded areas below.

Type of Survey(s): Airborne Geophysical Survey	Township or Area: Red Lake Area (Fairlie Twp)
Claim Holder(s): Pure Gold Resources Inc.	Prospector's Licence No.: T-4689
Address: 1275 Main Street West, North Bay, Ontario P1B 2W7	
Survey Company: Dighem Survey	Date of Survey (from & to): 16 Day 08 Mo. 86 Yr. — 16 Day 08 Mo. 86 Yr.; Total Miles of line Cut: 160 km
Name and Address of Author (of Geo-Technical report): 228 Matheson Blvd. E., Mississauga, Ontario L4Z 1X1	

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Man Days		**Days per Claim**
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		**Days per Claim**
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	40
	Magnetometer	40
	Radiometric	

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures $ ÷ 15 = Total Days Credits

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
KRL	869589	80	KRL	869628	80
	869590	80		869629	80
	869591	80		869630	80
	869592	80		869631	80
	869593	80		869632	80
	869594	80		~~869633~~	80
	869595	80		869634	80
	869596	80		869635	80
	869597	80		869636	80
	869598	80		869637	80
	869599	80		~~869638~~	80
	869600	80		869639	80
	~~869601~~	80		869640	80
	869602	80		869641	80
	869603	80		869642	80
	869604	80		869643	80
	869605	80		869644	80
	869606	80		869645	80
	869607	80		869646	80
	869608	80		869647	80
	~~869625~~	80		~~869648~~	80
	869626	80		869660	80
	869627	80		869661	80

Total number of mining claims covered by this report of work: 59

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder
	Date Approved as Recorded	Branch Director

Date: Jan. 19/87 — Recorded Holder or Agent (Signature)

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: Noramco Explorations Inc. 1275 Main Street West, North Bay, Ontario P1B 2W7

Date Certified: Jan. 19/87 — Certified by (Signature): Michelle Dubeau

McKENZIE NORTH PROPERTY

CLAIM #s CONTINUED

CLAIM #

KRL869662
KRL869663
KRL869664
KRL869665
KRL869666
KRL869667
~~KRL869668~~
KRL869693
KRL869694
KRL869695
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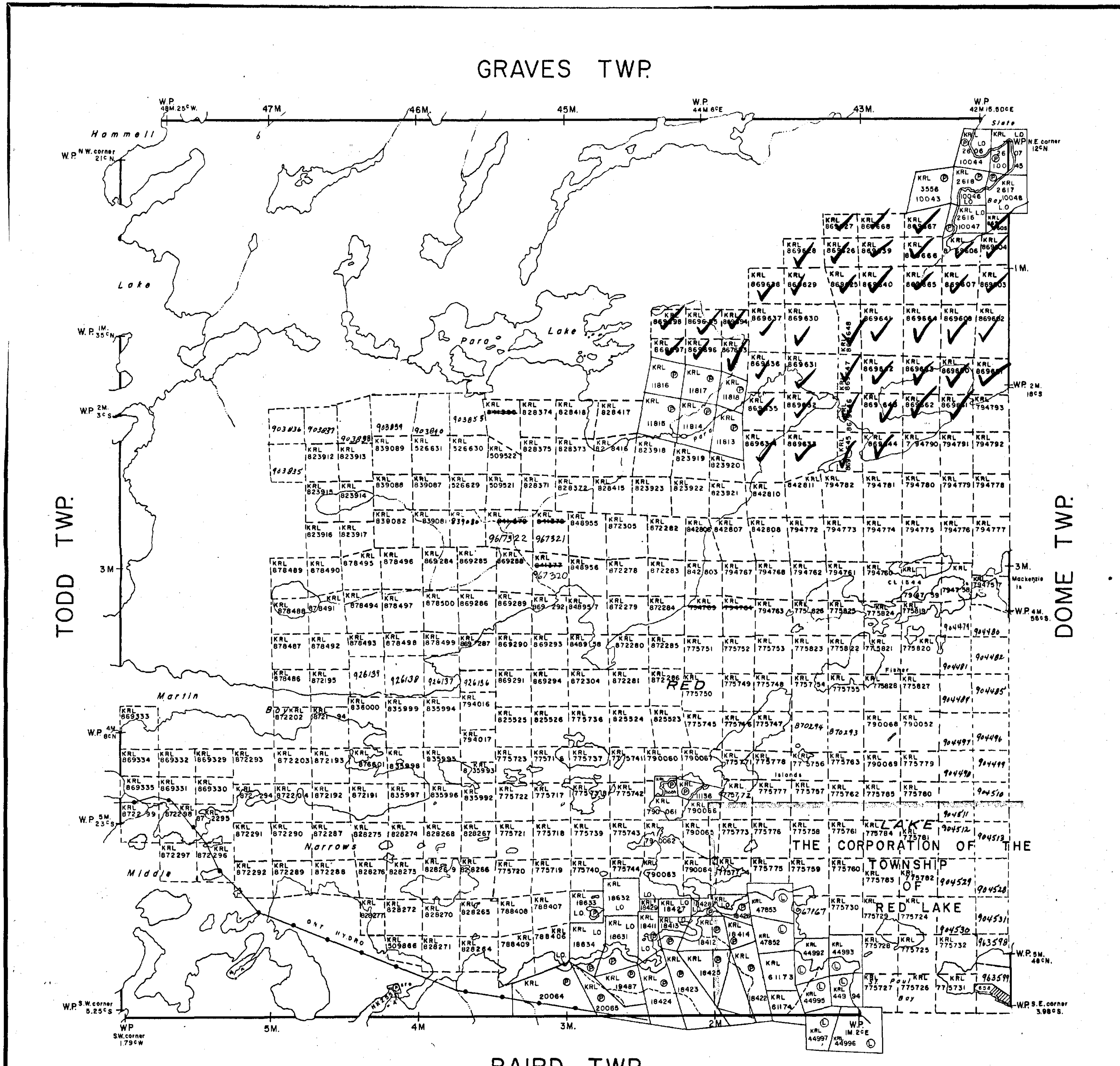
KRL869698



THE TOWNSHIP OF

FAIRLIE

DISTRICT OF KENORA
(PATRICIA PORTION)

RED LAKE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND
CROWN LAND SALE
LEASES
LOCATED LAND
LICENSE OF OCCUPATION
MINING RIGHTS ONLY
SURFACE RIGHTS ONLY
ROADS
IMPROVED ROADS
KING'S HIGHWAYS
RAILWAYS
POWER LINES
MARSH OR MUSKEG
MINES
CANCELLED

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File

RED LAKE MINING DIVISION
FEB 12 1987
RED LAKE, ONTARIO

Ministry of Natural Resources
Ontario

Ministry of Northern Development and Mines

Date: AUGUST, 1986

Number
G-373

52N04SW0031 2.9817 DOME TWP

200

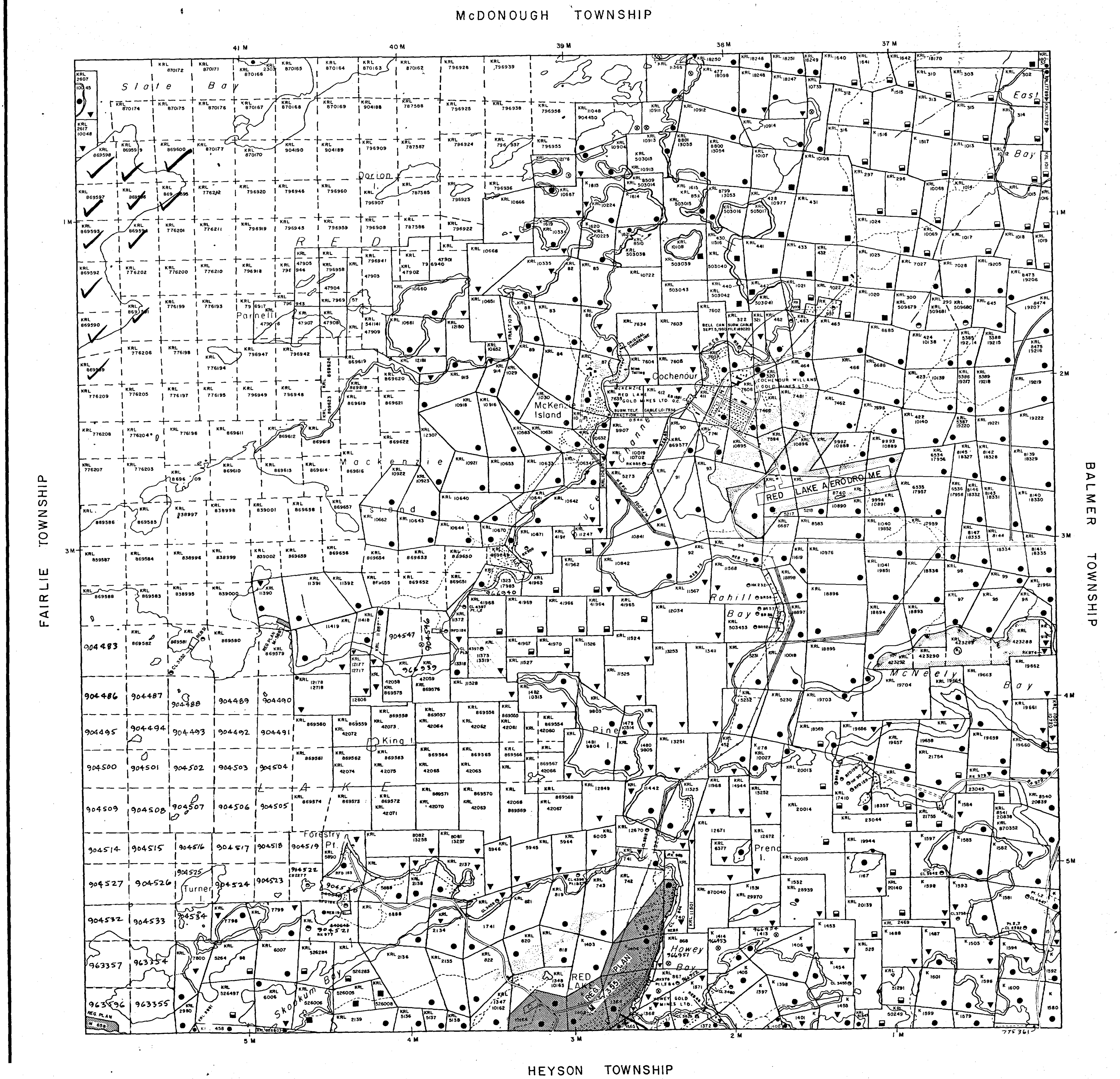
AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
(R1) SEC. 36	W. 52	3/6/86	MRO	188555

area open for staking June 1, 1987 @ 7:00 AM C.S.T.

NOTE: SURFACE RIGHTS TRANSFERRED TO CANADA IN AREA SHOWN THUS AT RED LAKE AERODROME. FILE 61894 REF. 141253 O.C.



LEGEND

HIGHWAY AND ROUTE No
OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIPS, BASE LINES, ETC
LOTS, MINING CLAIMS, PARCELS, ETC
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LAND

TYPE OF DOCUMENT — SYM

PATENT, SURFACE & MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LEASE, SURFACE & MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LICENCE OF OCCUPATION
ORDER IN COUNCIL
RESERVATION
CANCELLED
SAND & GRAVEL

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO M 1913, VESTED IN ORIGINAL PATENTEE BY THE P LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBS

Metres 500 0 1000
Chains 10 0 10 20 30 40 50 60
Feet 500 0 1000 2000 3000 4000

SCALE 1:20 000

RED LAKE MINING DIVISION
JAN 15 1987
RED LAKE, ONTARIO

TOWNSHIP

DOME

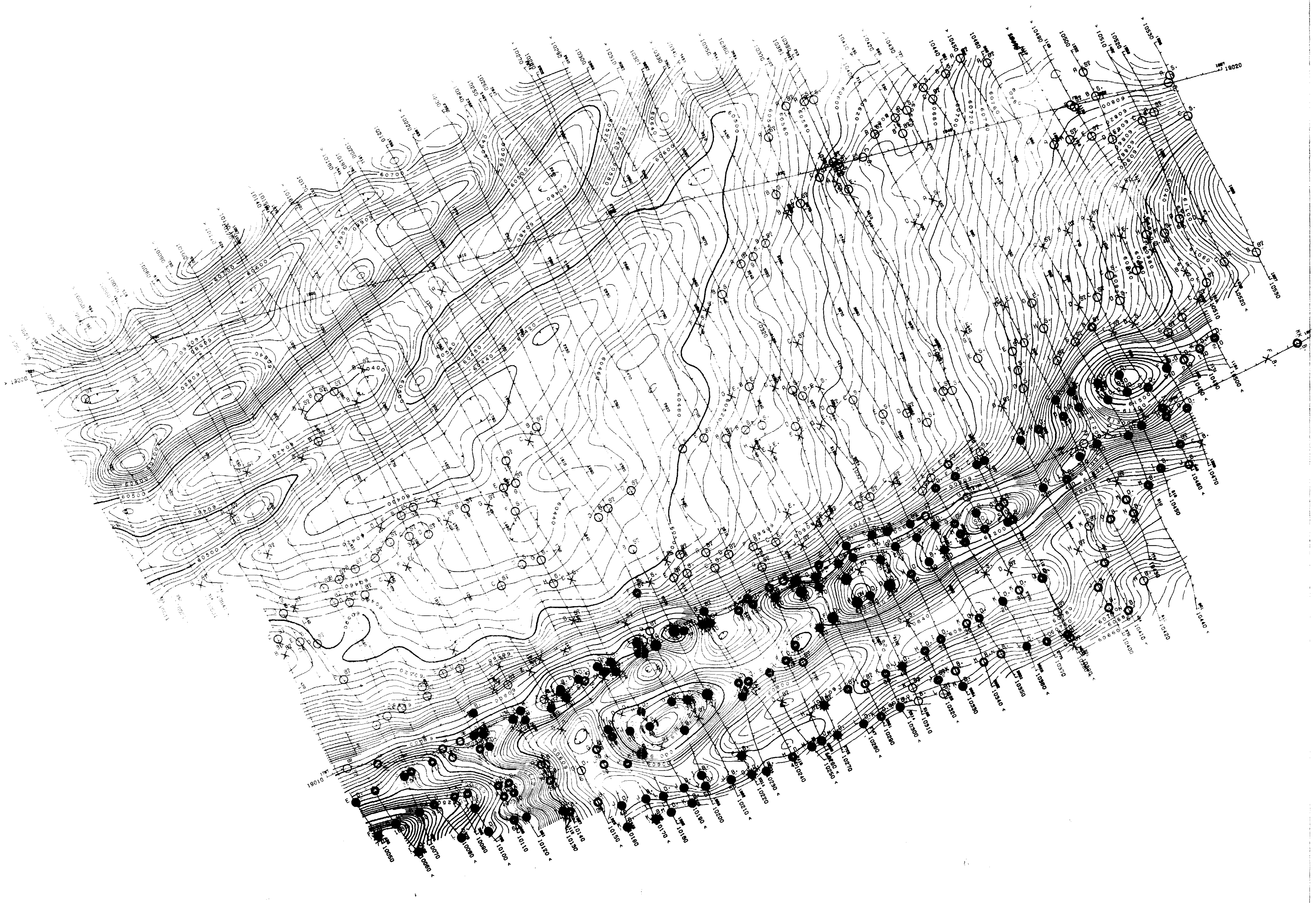
M.N.R. ADMINISTRATIVE DISTRICT
RED LAKE
MINING DIVISION
RED LAKE
LAND TITLES / REGISTRY DIVISION
KENORA / PATRICIA

Ministry of Natural Resources — Ministry of Northern Development and Mines
Ontario

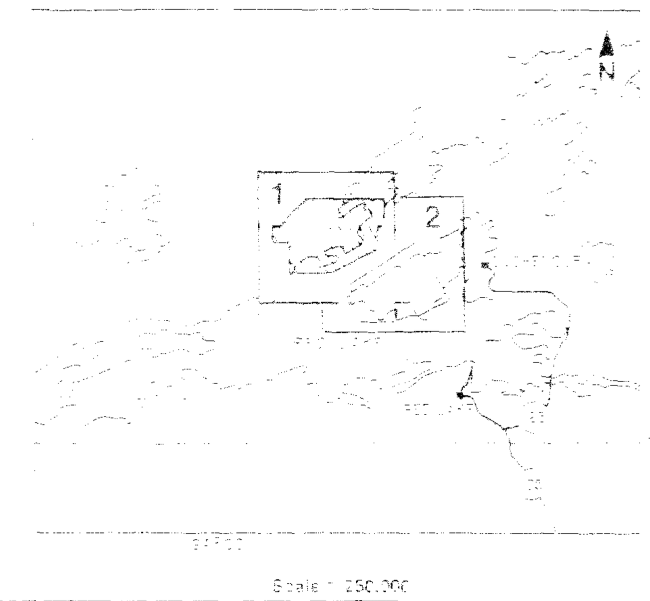
Date: SEPTEMBER 1986 — Number: G-374

52N04SW0031 2.9817 DOME TWP

210



LOCATION MAP



FLIGHT LINES WITH EM ANOMALIES

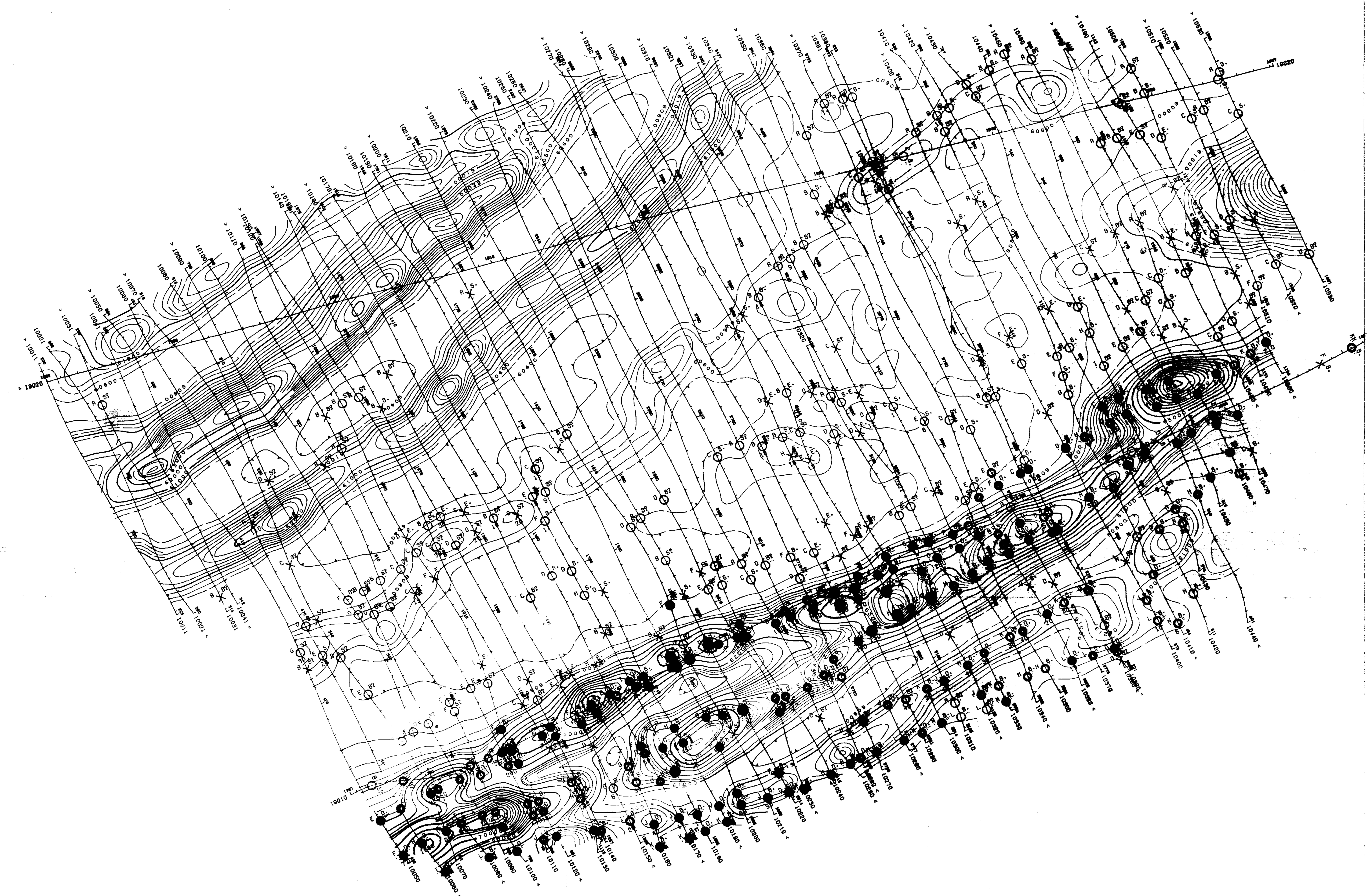
LEGEND

NORAMCO EXPLORATIONS INC.
McKENZIE ISLAND PROPERTY

TOTAL FIELD MAGNETICS
BY DIGHEM SURVEYS & PROCESSING INC.

DIGHEM SURVEY

2-9817



LOCATION MAP

Scale 1:250,000

FLIGHT LINES WITH EM ANOMALIES

LEGEND

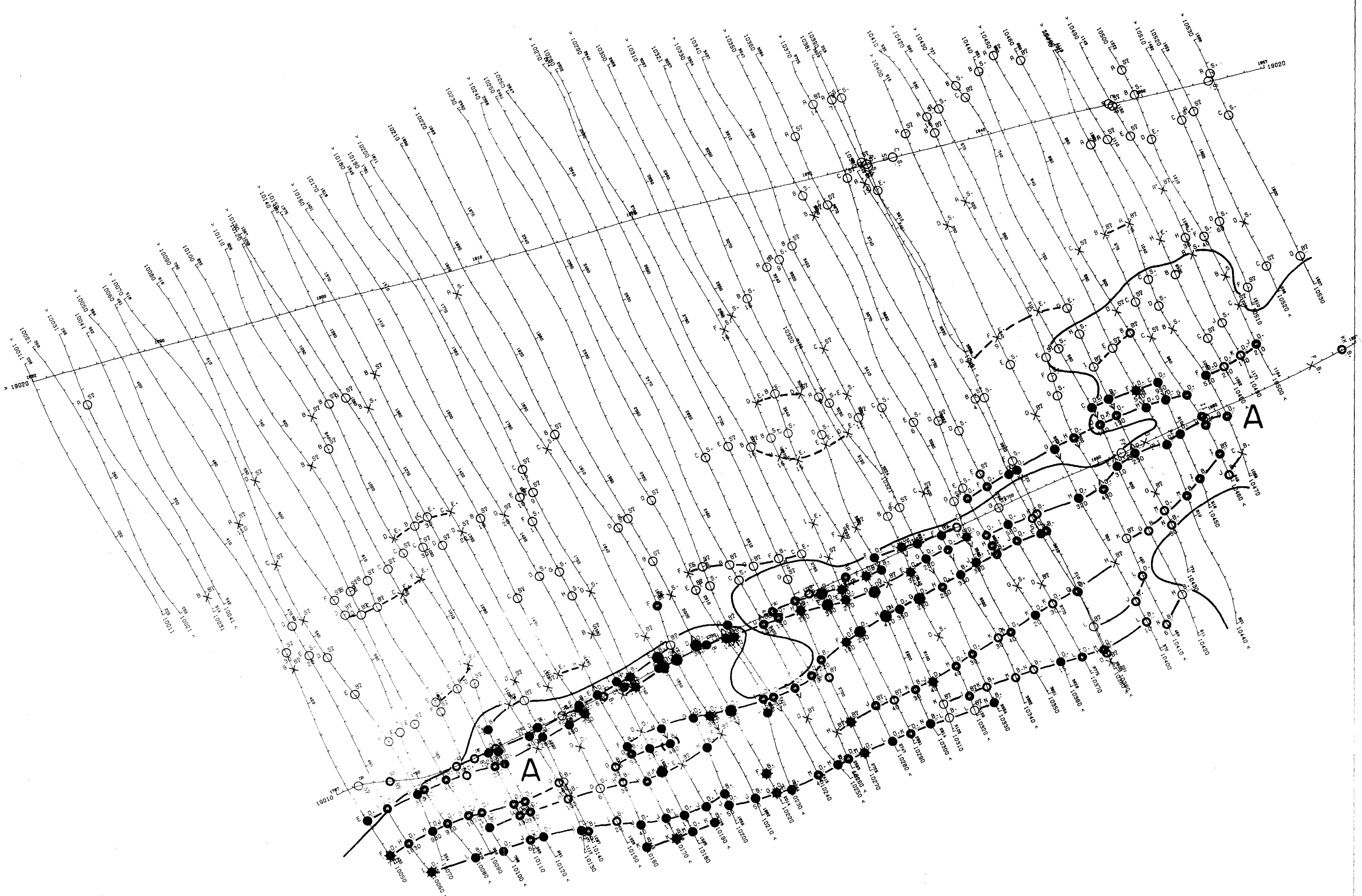
NORAMCO EXPLORATIONS INC.

McKENZIE ISLAND PROPERTY

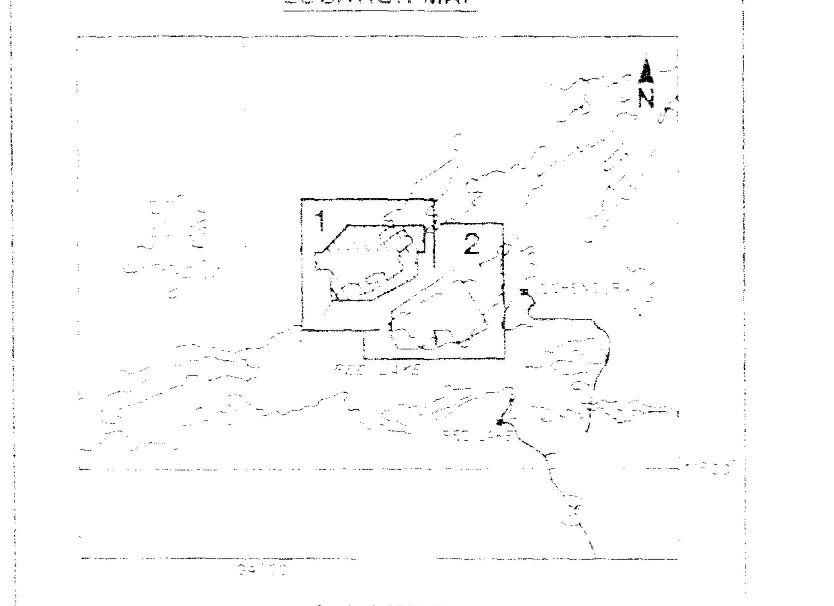
ENHANCED MAGNETICS

BY DIGHEM SURVEYS & PROCESSING INC.

2.9811



LOCATION MAP



Scale 1:250,000

FLIGHT LINES WITH EM ANOMALIES

NORAMCO EXPLORATIONS INC.
McKENZIE ISLAND PROPERTY

ELECTROMAGNETIC ANOMALIES
BY DIGHEM SURVEYS & PROCESSING INC.

2.9819