MAP No.

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ASSESSMENT REPORT [X]
PROSPECTUS [ ]
CONFIDENTIAL [X]
OPEN FILE [ ]

DOCUMENT NO.: 091760
MINING DISTRICT: DAWSON
TYPE OF WORK: Geophysical

REPORT FILED UNDER: Mark Management Ltd.

DATE PERFORMED: 10 Nov. '86 - 25 Jan. '87 DATE FILED: 3 August 1987

LOCATION	
LAT.	63° 55'N
LONG.	139° 20'W

AREA: Bonanza Creek, Eldorado Creek

CLAIM NAME & NO.

Q 1-5	YA88185-189
RON 1-40	YA10300-339
DN 1-33	YA32782-784; YA47890-896; YA32946-961; YA47083-087; YA47604-605

VALUE $ 120,893.75

(See Reverse for continuation)

WORK DONE BY: Z. Dvorak (Aerodat Ltd.)

WORK DONE FOR: Mark Management Ltd.

DATE TO GOOD STANDING

REMARKS: #90 DAWSYND,
#38 LONE STAR

DNF, DN1F, DN2F	YA47088, 090-091
ND 11-22	YA49735-745
DE 1-14	YA55250-263
VI 1-15	YA55285-299
RJ 1-70	YA64216-247, YA65595-616; YA65618-619; YA65621-626
AC 1-35	YA64270-281; YA65627-650
REX 1-51	YA84183-233
REEF 1-197	YA88228-237, YA88396-402
PLINC 1-68	YA84100-167
WILLIAM 1-8	YA79377-384
98 1-60	YA79549-608
SYNDICATE 1-83	YA79198-280
98-1 PLUS, 98-3 PLUS	YA84260-61
WILD 1	YA79609
WILD CARD	YA79610
FILLER 1-6	YA84252-259
83 31-40	YA79539-548
HAWK 1-154	YA79989-YA80127, YA80797-811
KH 1-10	YA80506-515

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YUKON TERRITORY

REPORT ON
COMBINED HELICOPTER BORNE ELECTROMAGNETIC, MAGNETIC, AND VLF-EM SURVEY
BONANZA-ELDORADO CREEK AREA
YUKON

NTS 115/014
Latitude 63°55'; Longitude 139°20'

091760

for
MARK MANAGEMENT LTD.
by

AERODAT LIMITED

For a List of Claims Surveyed & Operators
(See Next Page)

July 1987

RECEIVED
AUG 3 - 1987
MINING RECORDER
DAWSON, Y.T.
I.A. & N.D.

J8642

Zybnek Dvorak
Consulting Geophysicist

091760

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 120 893.75.

D D'Emond

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

LIST OF CLAIMS SURVEYED

CLAIMS	OPERATORS
Q 1-5	ARBOR RESOURCES
RON 1-40	"
DN 1-33	"
DNF, DN1F, DN2F	"
ND 11-22	"
DE 1-14	"
VI 1-15	"
RJ 1-70	"
AC 1-35	"
REX 1-51	"
REEF 1-197	DAWSON SYNDICATE
PLINC 36-68	CREAM SILVER MINES
WILLIAM 1-8	EBONY GOLD
98 1-60	KANGELD RESOURCES
SYNDICATE 1-83	KLONDIKE GOLD
98-1 PLUS, 98-3 PLUS	"
PLINC 1-35	"
WILD 1	"
WILD CARD	"
FILLER 1-6	"
83 31-40	"
HAWK 1-154	"
KH 1-10	"

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APPENDIX I - General Interpretive Considerations

APPENDIX II - Anomaly List

APPENDIX III - Certificate of Qualifications

APPENDIX IV - Cost Statement

LIST OF MAPS

(Scale 1:10,000)

MAPS: (As listed under Appendix "B" of the Agreement)

I. PHOTOMOSAIC BASE MAP;
prepared from an uncontrolled photo laydown, showing registration crosses corresponding to NTS co-ordinates on survey maps.

II. FLIGHT LINE MAP;
showing all flight lines and fiducials.

III. AIRBORNE ELECTROMAGNETIC SURVEY INTERPRETATION MAP;
showing flight lines, fiducials conductor axes and anomaly peaks along with inphase amplitudes and conductivity thickness ranges for the 4600 Hz coaxial coil system.

IV. TOTAL FIELD MAGNETIC CONTOURS;
showing magnetic values contoured at 5 nanoTesla intervals, flight lines and fiducials.

V. VERTICAL MAGNETIC GRADIENT CONTOURS;
showing magnetic gradient values contoured at 0.5 nanoTeslas per metre.

VI. APPARENT RESISTIVITY CONTOURS;
showing contoured resistivity values, flight lines and fiducials.

LIST OF MAPS CONT'D

VII. VLF-EM TOTAL FIELD CONTOURS;
showing relative contours of the VLF Total Field response, flight lines and fiducials.

VIII(a) ELECTROMAGNETIC PROFILES;
Showing inphase and quadrature amplitudes of 935 Hz coaxial data (solid lines) and 32,000 Hz coplanar data (dashed lines) along the flight lines.

(b) ELECTROMAGNETIC PROFILES;
Showing inphase and quadrature amplitudes of 4600 Hz coaxial data (solid lines) and 4175 Hz coplanar data (dashed lines) along the flight lines.

1. INTRODUCTION

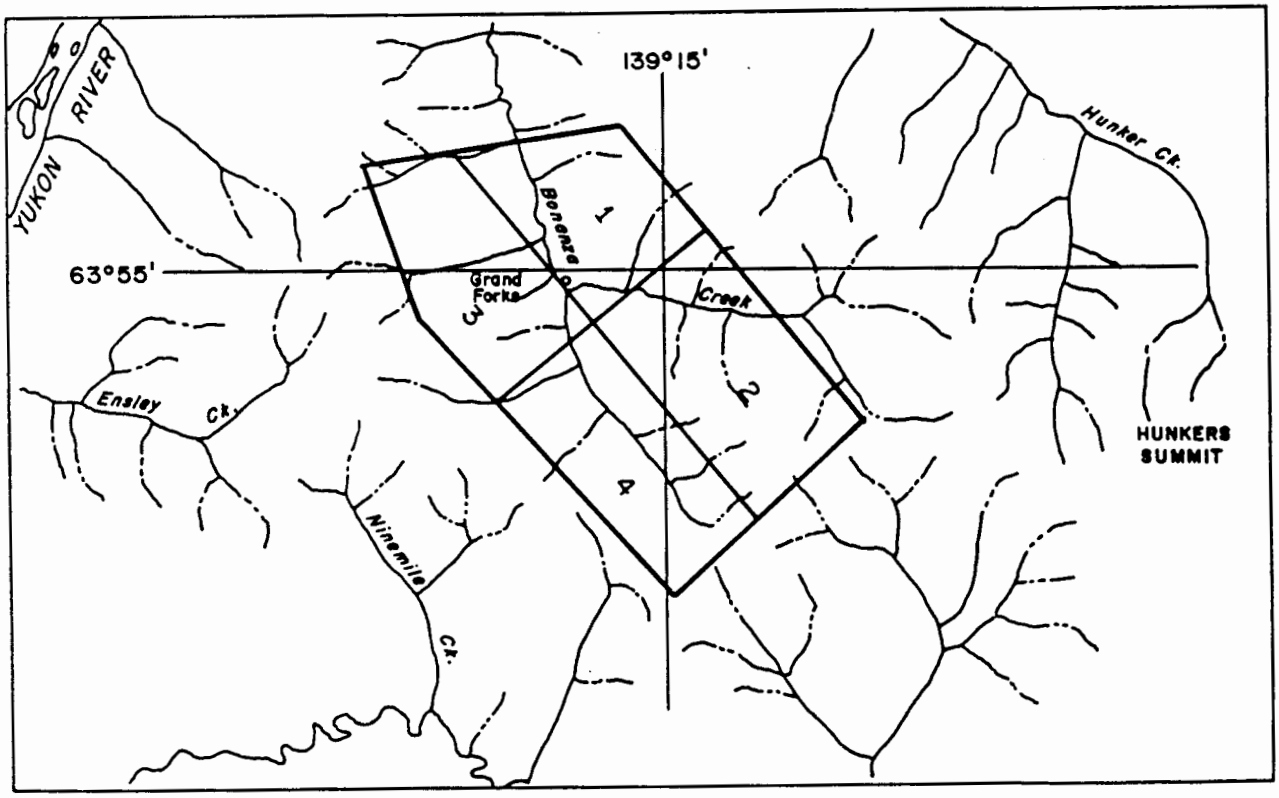
This report describes an airborne geophysical survey carried out for Mark Management Ltd. on behalf of Arbor Resources Inc. and Kangelo Resurces Ltd. by Aerodat Limited. Equipment operated during the survey included a four frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a two frequency VLF-EM system, a video flight-path tracking film camera, and an altimeter. Electromagnetic, magnetic and altimeter data were recorded in both digital and analog forms. Positioning data was recorded on film as well as being marked on the flight path mosaic by the operator while in flight.

The survey comprised of an irregularly shaped block of ground in the Bonanza - Eldorado Creek area, south of Dawson, Yukon Territory. It is centered approximately 8 kilometres south of Dawson, and was flown between January 17 and January 25, 1987. Twelve flights were required to complete the survey. The flight line direction was northeast-southwest, and the nominal line spacing was 100 metres.

The purpose of the survey was to record airborne geophysical data over and around ground that is of interest to Arbor Resources Inc. and Kangelo Resources Ltd. A total of 1335 line kilometres of data were compiled in map form, which are presented as part of this report according to specifications outlined by Mark Management Ltd.

2. SURVEY AREA LOCATION

The survey area is depicted on the location map shown below. The area is centred at Latitude 63 degrees, 54 minutes north, Longitude 139 degrees, 17 minutes west, approximately 8 kilometres south of Dawson City, Yukon Territory (NTS REference Map No. 115O/14).



3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

An Aerospatiale A-Star 350D helicopter, (C-GNSM), owned and operated by Maple Leaf Helicopters Limited, was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a mean terrain clearance of 60 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 4-frequency system. Two vertical coaxial coil pairs were operated at 935 Hz and 4600 Hz and two horizontal coplanar coil pairs at 4175 Hz and 32,000 Hz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 3 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the helicopter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz Totem 2A. This instrument measures the total field and quadrature components of two selected transmitters, preferably

oriented at right angles to one another. The sensor was towed in a bird 12 metres below the helicopter. The transmitters monitored were Cutler, Maine broadcasting at 24.0 kHz for the Line station and Jim Creek, Washington broadcasting at 24.8 kHz for the Orthogonal station.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW-2321 H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.25 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG-2 proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A Hoffman HRA-100 radar altimeter was used to record

terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

3.2.6 Video Tracking Camera

An Aerodat Video Tracking camera was used to record flight path on VHS cassettes. Manual fiducials and time were imprinted on the margin of the Video for cross-reference to the analogs and digital data.

3.2.7 Analog Recorder

An RMS dot-matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data were recorded:

Channel	Input	Scale
00	Low Frequency Coaxial Inphase	2.5 ppm/mm
01	Low Frequency Coaxial Quadrature	2.5 ppm/mm
02	High Frequency Coaxial Inphase	2.5 ppm/mm
03	High Frequency Coaxial Quadrature	2.5 ppm/mm
04	Low Frequency Coplanar Inphase	10 ppm/mm
05	Low Frequency Coplanar Quadrature	10 ppm/mm
06	High Frequency Coplanar Inphase	20 ppm/mm
07	High Frequency Coplanar Quadrature	20 ppm/mm

08	Powerline Monitor	
09	VLF-EM Total Field, Line	2.5%/mm
10	VLF-EM Quadrature, Line	2.5%/mm
11	VLF-EM Total Field, Ortho	2.5%/mm
12	VLF-EM Quadrature, Ortho	2.5%/mm
13	Altimeter (150 m at top of chart)	10 ft./mm
14	Magnetometer, fine	1.0 nT/mm
15	Magnetometer, coarse	10.0 nT/mm

3.2.8 Digital Recorder

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

Equipment	Recording Interval
EM system	0.1 seconds
VLF-EM	0.5 seconds
Magnetometer	0.25 seconds
Altimeter	0.5 seconds

4. DATA PRESENTATION

4.1 Base Map

A photomosaic base at a scale of 1:10,000 was prepared from a photo lay down map, supplied by Aerodat, on a screened mylar base.

4.2 Flight Path Map

Recovery of the flight path is carried out by comparing the displayed Video, to identifiable features on the photomosaic. Coincident features are picked and plotted on exact copies of the stable mosaic base map on which the final results are drafted. Points are picked at an average of 1 kilometre.

4.3 Airborne Electromagnetic Survey Interpretation Map

The electromagnetic data were recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events and to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a

computer algorithm searches out and rejects the major sferic events.

The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction applied is a linear function of time that ensures the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and levelled data were used in the interpretation of the electromagnetics.

An interpretation map was prepared showing peak locations of anomalies and conductivity thickness ranges along with the Inphase amplitudes (computed from the 4600 Hz coaxial response) and conductor axes. The anomalous responses of the three coil configurations along with the interpreted conductor axes were plotted on a Cronaflex copy of the photo base map.

4.4 Total Field Magnetic Contours

The aeromagnetic data were corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation was applied. The corrected profile data were interpolated onto a regular grid at a 20 metre true scale interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 5 nanoTesla interval.

The contoured aeromagnetic data have been presented on a Cronaflex copy of the photomosaic base map.

4.5 Vertical Magnetic Gradient Contours

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

4.6 Apparent Resistivity Contours

The electromagnetic information was processed to yield a map of the apparent resistivity of the ground.

The approach taken in computing apparent resistivity was to assume a model of a 200 metre thick conductive layer (i.e., effectively a half space) over a resistive bedrock. The computer then generated, from nomograms for this model, the resistivity that would be consistent with the bird elevation and recorded amplitude for the high frequency coplanar pair used. The apparent resistivity profile data were interpolated onto a regular grid at a 20 metres true scale interval using a cubic spline technique.

The contoured apparent resistivity data were presented on a Cronaflex copy of the photomosaic base map with the flight path.

4.7 VLF-EM Total Field Contours

The VLF-EM signals from NAA, Cutler, Maine and NLK, Jim Creek, Washington, broadcasting at 24.0 and 24.8 kHz respectively, were compiled in contour map form and presented on a Cronaflex copy of the photomosaic base map.

5. INTERPRETATION

5.1 Geology

The Dawson City area has been subjected to intense prospecting and mining activity since the Klondike rush of 1896. Until recently, most of the work has been focused on placer mining of the numerous streams and creeks in the area. With the advent of newer, more sophisticated techniques, the Dawson area has been subjected to renewed exploration activity.

There are numerous published reports and maps pertaining to the geology of the survey area. No attempt has been made, therefore, to describe the local geology herein. Instead, this report provides brief interpretation of the geophysical data collected during the present survey.

Location of auriferous deposits, which are too sparsely disseminated to directly yield geophysical response, is an "indirect" exploration exercise based on mapping and delineation of favourable horizons. Such horizons may include contacts, zones of deformation, altered rock units, weakly conductive sulphide zones which may be associated with gold, etc.

5.2 Survey Results

The electromagnetic results have been presented as anomaly maps and as colour profiles. The latter may prove to be more valuable than the former in the case of very weak conductors. The reason is that the EM anomalies have been picked primarily from the mid-frequency of 4,600 Hz coaxial data. Extremely weak conductors will be more evident on the 34,000 Hz coplanar data.

Resistivity maps (contours and colour maps) have been prepared from the high frequency coplanar data. These maps show the conductive properties of the survey area and should locate even very weak conductive features which may not be seen on the EM maps. These weak conductors can be of equal or greater significance than the stronger conductors. In addition, the coplanar resistiviyy data should outline flat-lying or shallow dipping zones which may not yield clearly defined EM anomalies on the 4,600 Hz coaxial data.

The magnetic data have been presented as colour products and contour maps of the total magnetic field using a contour interval of 5 nT. These maps show the magnetic properties of the rock units underlying the survey area, and often permit delineation of geologic contacts. In addition, vertical

magnetic gradient has been calculated from the total field data and presented as contour and colour maps. These maps minimize the effects of regional gradients while enhancing the magnetic anomalies which originate near the surface. The zero contour usually approximates the limits of magnetic bodies and thus provides better definition of the individual units.

The VLF-EM data are shown as colour and contour maps of the total VLF field using a basic contour interval of 2%. Patterns are generally quite broad and in many cases, appear to be influenced by topographic depressions. The VLF-EM data provides additional information in resistive areas and indicates several possible faults or zones of weakly conductive material.

The following paragraphs describe some of the more conductors defined by the present survey. Although most conductors are weak, they were included because they are considered important. Auriferous mineralization is often associated with disseminated mineralization which can yield very low conductance values. It is, therefore, impossible to assess the relative merits of anomalies on the basis of their conductivity-thickness product (i.e., conductance) alone. All conductors

shown on the EM maps are considered to be potential exploration targets and as such, they should be investigated. Some may be due to old, abandoned man made objects, such as pipelines, while others could reflect narrow zones of conductive overburden. Additional work is required to determine the probable cause of these numerous anomalies.

Sheet 1

The magnetic patterns are generally quite bland with the exception of four distinct linear lows. These lows may be due to alteration zones or non-magnetic (felsic or sedimentary) units. Three of these linears strike in a southerly direction from the eastern ends of lines 1271, 1380 and 1680. The fourth magnetic low strikes west-southwest from the centre of line 1740, about 200 metres south of a similar trending VLF-EM anomaly. This latter feature is nearly perpendicular to the geologic strike inferred from the magnetics.

The most westerly magnetic low occurs on the western side of Bonanza Creek, and marks the eastern edge of a broad zone of moderately high conductivity. This conductive unit, best seen on the resitivity map, yields values less than 50 ohm-m on line 1330. This is in sharp contrast to the 5,000 ohm-m values calculated only a few hundred metres to the east and west.

This conductive unit is not located within the Bonanza Creek valley, and is therefore attributed to a conductive rock unit. Most of the major EM conductors on sheet 1 are contained within this zone.

There is a definite difference in strike direction between the magnetic low which terminates this conductive feature on the east, and the conductors contained within this feature. The magnetic low strikes north-south while the conductor axes are oriented in a northwest-southwesterly direction. One weak conductor is coincident with the magnetic low near the western end of lines 1440 to 1460. Coverage is incomplete to the northwest, but conductors here do not appear to extend beyond Adams Creek. This would suggest that the latter may be fault controlled.

Most of the other conductors in this sheet are associated with Bonanza Creek and the ground immediately to the east of the valley. North of line 1500, strikes are northwest-southeasterly. These conductors are also associated with conductive zones, the eastern limit of which is terminated by the second major magnetic low. South of line 1500, strikes appear to swing to the south, following Bonanza Creek.

It is possible that some of these conductors are due to metallic objects (pipelines, etc.) as the creek area has been subjected to extensive placer operations. (Note, for example, the strong dipolar magnetic anomaly which is coincident with a short but strong conductor near fiducials 24 on line 1500.)

A moderately strong conductor occurs near the eastern end of lines 1390 to 1410, within a moderately conductive unit. This feature also occurs in high ground and is attributed to a bedrock conductor.

In the southeast corner of the sheet, just west of Gauvin Gulch, there is a group of anomalies contained within a north-south trending resistivity anomaly. The resistivity low is also coincident with one of the magnetic lows mentioned earlier.

One of the strongest conductors on this sheet is located at fiducial 169 on line 1900. This conductor, which is a single-line response, is within Bonanza Creek near its junction with Gauvin Gulch. It is of interest as it is associated with a moderately strong VLF-EM anomaly. The north-south strike of the VLF trend appears to intersect the inferred geological strike at a shallow angle. It is also possible that this

conductor is due to a man made object.

Sheet 2

Magnetic relief on sheet 2 arises from a low of 57,700 nT at the western end of line 2440, to a high of more than 57,940 nT at the eastern end of line 2480. Two north-south striking lows are evident. One strikes through fiducial 140 on line 1920, the other through fiducial 99 on line 2150. The geologic strike is not clearly defined by the magnetic data, but it appears to be approximately northwest-southeasterly. There is a gentle increase of the field toward the northeast.

The strongest magnetic anomaly is located near the eastern end of line 2480. The most pronounced anomalies, however are located near the centre of the map sheet, between lines 2380 and 2470. This complex and interesting magnetic feature is situated in relatively high ground, approximately one kilometre east of Victoria Gulch. The negative inphase responses observed on lines 2400 to 2440, indicate moderately strong concentrations of magnetite in this area.

The strongest conductors on sheet 2 are located approximately 600 metres southwest of the magnetic anomalies. The two conductor segments strike southeast from fiducial 142 on line

2370 to line 2580, with an apparent offset in the vicinity of line 2420. The conductor is due to a narrow, non-magnetic source, possibly graphite. The strongest portion is on line 2470. This interesting conductor should be investigated on ground.

There are several other moderately strong conductors of shorter strike length which should also be followed up. These occur near the centre of lines 2090, 2100, 2690 and 2740 to 2760.

The resistivity map outlines several zones of conductive material. The most prominent feature is the sharp resistivity gradient which strikes in an easterly direction along Bonanza Creek from fiducial 194 on line 1880. This trend shows a marked contact between resistive rocks to the south and more conductive rocks to the north. Some of the stronger lows may be due to an old rail line which follows the eastern part of the creek on its north side.

The VLF-EM results show several broad anomalous features, most of which strike approximately north-south. One of these VLF conductors is associated with the main EM conductor described earlier. It is interesting to note that it is almost

completely encircled by an oval shaped ring of relative lows. This corresponds to a band of resitive material which is also seen on the resistivity map.

The photomosaic map shows old mine workings near the western half of line 2280. There are three weak anomalies in the immediate vicinity which may prove to be interesting targets. They seem to show a north-south alignment which correlates loosely with a VLF-EM trend and a linear magnetic low.

Sheet 3

Magnetic values on sheet 3 range from a low of 57,715 nT on line 1890 to a high of more than 57,890 nT at the eastern end of line 1080. The weak magnetic relief makes it difficult to determine the local geologic strike although there is a general increase in background magnetic values from south to north.

There are several relative magnetic lows which outline elongated zones of non-magnetic rocks. Most of these strike approximately NNW-SSE, except for the low centred at fiducial 65 on line 1460. This non-magnetic unit strikes roughly east-west, along Adams Creek. It is coincident with similarly trending resistivity contrasts which suggests that

Adams Creek is probably related to a major faulted contact.

Similar magnetic lows with NNW-SSE strikes are evident in the vicinity of fiducial 172 on line 1540, near the centre of lines 1670 and 1730, near fiducial 58 on line 1820, and in the eastern corner of the sheet striking SSE from fiducial 220 on line 1700 to the southeastern sheet boundary.

The latter feature is the most prominent on the sheet and is possibly due to a fault zone or a narrow felsic intrusion. This low is paralleled by a similar magnetic low, approximately 500 metres to the east. The relative high between these two lows is associated with Eldorado Creek, just south of Grand Forks.

An isolated magnetic high occurs near the western end of line 1290. There is a strong, narrow dipolar magnetic anomaly approximately 500 metres to the northeast of this interesting magnetic high. The latter anomaly does not appear to be due to noise, and is attributed to remanent magnetization. It is also weakly conductive, making it an attractive target.

The VLF-EM results on sheet 3 show several moderately broad anomalous trends, most of which strike NNW-SSE. These

anomalies show good correlation with the strong conductors defined by the EM data. The VLF-EM contours also outline several zones of weak conductivity which may be of interest. Resistivity data shows the area is underlain by highly resistive to highly conductive rocks. Values range from less than 100 ohm-m to more than 7,000 ohm-m. At least ten conductive units are identified by the 1,000 ohm-m contour, most of which are attributed to bedrock conductors, rather than to surficial conductive material. There are also several sharp resistivity gradients, similar to the east-west trend along Adams Creek which are probably due to geologic contacts. Nearly all of the bedrock conductors defined by the present survey are contained within the 1,000 ohm-m resistivity contour.

Additional exploration work should be carried out in the vicinity of the conductive zone which occurs near the middle of lines 1090 to 1110; over the multiple conductive unit which extends along the eastern sheet boundary from line 1210 to line 1510; over the group of isolated conductors near fiducial 22 on line 1500; in the area of the eastern portion of lines 1650 to 1770; and over the strong linear conductor which strikes in a southeasterly direction from fiducial 210 on line 1710.

The first conductive zone described above appears to be truncated at its southeastern end by a fault or contact associated with Boulder Creek. The last conductor in the group is due to a thin, highly conductive source which dips to the southwest. It is contained within a moderately broad magnetic unit, near a possible fault or felsic intrusion toward the northeast. The strongest conductance values occur on lines 1420 and 1500. Although these areas may reflect concentrations of conductive material, they do not necessarily constitute the most attractive targets.

All conductors on this sheet should be viewed in conjunction with the other geophysical data, in order to determine which of the target areas should be assigned the highest priority.

Sheet 4

The geophysical results on sheet 4 are similar to those obtained on the other sheets, although there are very few bedrock conductors. Magnetic relief varies from a low of less than 57,690 nT to more than 57,810 nT. The strongest magnetic unit occurs in the northern portion of the sheet. This unit appears to be terminated on the southeast by French Creek. It is also intersected by two parallel magnetic lows, one which follows Eldorado Creek, and a second feature which parallels

it approximately 500 metres to the east.

There are a few elongated anomalies comprising both magnetic highs and lows. Most of these strike NNW-SSE. One exception is the east-west trending low which intersects French Creek at a moderately shallow angle.

Nearly all of the interesting conductors on sheet 4 occur within the valleys hosting Eldorado Creek and French Creek. The only conductor which is more than 400 metres away from a major valley, is the moderately strong feature which strikes southeast from line 2390 to line 2500. This conductor is situated approximately 500 metres northeast of Eldorado Creek and is coincident with a strong VLF-EM anomaly.

The resistivity data shows a major gradient associated with Eldorado Creek, with the southeastern side of the valley being highly resistive. Normally, one would expect the low-lying areas to be more conductive because of the accumulation of stream sediments. Note for example, the well defined resistivity lows which appear to be associated with the northeast and southwest flanks of Eldorado Creek, between lines 2000 and 2050. Both of these zones are considered to be due to bedrock conductivity.

There are several other isolated resistivity lows which are defined by the 1000 ohm-m resistivity contour. These are also considered to be moderately attractive targets even though they are often not sufficiently conductive to yield distinct EM responses.

5.3 Conclusions and Recommendations

The survey detected several conductors and conductive zones which are all deemed to be of exploration interest. Some appear to be contained within magnetic rock units while others are associated with non-magnetic units. These conductors should be investigated in detail, in order to determine their causative sources.

It is recommended that the geophysical data be combined with all available geological and geochemical data, to select the higher priority areas for follow-up work. The survey block is considered to be a potential host for both massive sulphide deposits and zones of auriferous mineralization.

Some of the anomalies on sheet 2 and 4 are significant because of their location with respect to older placer workings. The conductors associated with the southeast end of Eldorado Creek, for example, may have led to concentrations of

auriferous material downstream. Even though extensive work has been carried out in the past, this interesting area should be subjected to further investigation using ground geophysical techniques.

Z. Dvorak

Zbynek Dvorak
Consulting Geophysicist
for
AERODAT LIMITED
July, 1987

J8642

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat three frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results

in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the

depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical

conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic

bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measureable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only

relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like

conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical cross-over shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX II

ANOMALY LIST

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
14	1060	A	0	2.0	13.9	0.0	0	32
14	1080	A	0	3.1	7.6	0.1	0	63
14	1090	A	0	6.2	18.8	0.1	0	28
14	1090	B	0	6.1	18.2	0.1	0	21
14	1100	A	0	2.4	12.1	0.0	0	40
14	1110	A	0	2.6	13.1	0.0	0	33
14	1200	A	0	6.3	7.4	0.6	0	55
14	1210	A	0	9.2	11.4	0.7	0	45
14	1210	B	0	7.1	8.3	0.7	0	48
14	1210	C	0	4.6	7.9	0.3	0	55
13	1220	A	1	6.6	3.7	1.9	0	75
13	1220	B	1	12.3	8.9	1.7	0	40
13	1230	A	0	15.1	19.4	0.8	0	31
13	1230	B	1	17.9	18.7	1.1	0	36
13	1230	C	0	13.0	17.5	0.7	0	30
13	1230	D	0	20.9	27.1	0.9	0	28
13	1241	A	0	3.6	8.1	0.2	0	25
13	1241	B	0	15.0	20.0	0.8	0	29
13	1241	C	0	13.4	27.0	0.4	0	23
13	1241	D	2	51.9	32.5	3.3	0	40
13	1241	E	1	36.7	31.5	1.9	0	33
13	1241	F	2	43.6	29.2	2.9	0	37
13	1251	A	2	22.4	14.2	2.5	0	38
13	1251	B	2	23.5	16.8	2.1	0	56
13	1251	C	3	35.6	14.8	5.0	0	51
13	1251	D	0	8.6	15.2	0.4	0	26
13	1251	E	0	17.7	22.5	0.9	0	31
13	1261	A	0	10.1	10.9	0.9	0	54
13	1261	B	2	12.4	6.2	2.8	0	77
13	1261	C	2	33.9	17.9	3.6	0	53
13	1271	A	2	35.8	19.2	3.6	0	50
13	1271	B	1	30.6	25.5	1.9	0	37

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
13	1271	C	2	36.5	21.9	3.1	0	41
13	1271	D	1	14.3	12.3	1.4	0	50
12	1280	A	1	33.0	38.0	1.3	0	27
12	1280	B	2	29.4	23.0	2.0	0	29
12	1280	C	2	12.1	7.7	2.0	0	26
12	1280	D	2	32.8	25.3	2.2	0	31
12	1280	E	1	27.1	25.7	1.5	0	27
12	1280	F	1	43.6	54.8	1.2	0	21
12	1280	G	2	27.8	18.8	2.4	0	32
12	1290	A	1	49.0	54.6	1.5	0	17
12	1290	B	2	82.7	66.3	2.8	0	20
12	1290	C	2	85.3	57.6	3.5	0	20
12	1290	D	1	18.9	19.9	1.2	0	24
12	1290	E	1	23.1	23.6	1.3	0	24
12	1290	F	1	29.7	31.2	1.4	0	24
12	1290	G	2	48.1	43.0	2.0	0	19
12	1290	H	2	40.9	30.8	2.4	0	15
12	1290	J	2	33.3	23.5	2.4	0	32
12	1300	A	2	62.0	52.6	2.4	0	25
12	1300	B	2	45.4	34.6	2.4	0	26
12	1300	C	2	57.3	51.3	2.1	0	25
12	1300	D	1	45.5	47.5	1.6	0	24
12	1300	E	1	40.7	51.3	1.2	0	22
12	1300	F	1	33.4	36.5	1.4	0	24
12	1300	G	1	23.9	21.5	1.6	0	32
12	1300	H	2	22.4	14.6	2.4	0	46
12	1300	J	2	25.1	16.1	2.5	0	45
12	1310	A	1	38.3	36.7	1.7	0	30
12	1310	B	2	64.4	46.2	3.0	0	28
12	1310	C	1	40.9	43.3	1.5	0	21
12	1310	D	1	40.9	50.4	1.2	0	20
12	1310	E	1	57.1	59.3	1.8	0	20
12	1310	F	2	59.6	39.0	3.3	0	26
12	1310	G	2	64.0	37.9	3.8	0	26
12	1310	H	1	19.6	20.7	1.2	0	29
12	1320	A	0	6.2	26.0	0.1	0	15
12	1320	B	1	21.3	16.4	1.9	0	38
12	1320	C	2	23.5	17.8	2.0	0	37
12	1320	D	2	67.9	40.7	3.8	0	33
12	1320	E	1	67.6	89.5	1.4	0	24

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
12	1320	F	1	45.6	50.8	1.5	0	27
12	1320	G	2	46.9	37.7	2.3	0	34
12	1320	H	1	39.5	35.0	1.9	0	35
12	1320	J	2	12.0	6.0	2.7	0	60
12	1320	K	0	4.7	6.6	0.4	0	57
12	1330	A	2	28.8	23.1	2.0	0	35
12	1330	B	2	51.5	30.6	3.5	0	30
12	1330	C	0	19.0	27.9	0.7	0	36
12	1330	D	2	47.7	37.6	2.4	0	26
12	1330	E	1	40.7	46.7	1.4	0	24
12	1330	F	1	59.3	65.8	1.6	0	25
12	1330	G	2	62.0	38.5	3.5	0	27
12	1330	H	2	25.5	18.2	2.2	0	32
12	1330	J	1	20.5	17.4	1.6	0	33
12	1330	K	0	2.6	20.6	0.0	0	16
12	1340	A	0	3.9	13.4	0.1	0	19
12	1340	B	2	40.3	31.8	2.2	0	31
12	1340	C	2	60.9	56.9	2.1	0	28
12	1340	D	1	48.3	47.9	1.8	0	28
12	1340	E	1	18.4	21.9	1.0	0	38
12	1340	F	2	27.1	15.7	3.0	0	38
12	1340	G	2	34.9	17.5	3.9	0	36
12	1350	A	2	58.7	50.3	2.3	0	22
12	1350	B	2	84.2	70.5	2.6	0	17
12	1350	C	2	82.7	61.4	3.1	0	18
12	1350	D	1	25.0	28.3	1.2	0	29
12	1350	E	2	42.3	31.0	2.5	0	28
12	1350	F	2	40.3	26.7	2.8	0	37
12	1350	G	2	31.1	19.3	2.8	0	38
12	1360	A	1	29.3	26.2	1.7	0	34
12	1360	B	0	20.0	34.5	0.6	0	32
12	1360	C	0	6.3	21.2	0.1	0	28
12	1360	D	0	5.6	27.6	0.0	0	24
12	1360	E	0	10.7	11.3	0.9	0	26
12	1360	F	2	39.9	34.2	2.0	0	28
12	1360	G	2	35.9	30.5	2.0	0	32
12	1360	H	1	19.8	19.3	1.3	0	43
12	1360	J	0	7.6	13.5	0.4	0	37
12	1370	A	0	7.6	17.9	0.2	0	37
12	1370	B	0	10.6	18.8	0.4	0	32

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
12	1370	C	1	33.4	30.5	1.7	0	24
12	1370	D	0	6.2	27.2	0.1	0	28
12	1370	E	0	19.8	42.8	0.4	0	23
12	1370	F	1	40.7	54.9	1.1	0	22
12	1370	G	1	33.6	44.5	1.1	0	23
12	1380	A	1	28.3	28.3	1.4	0	31
12	1380	B	2	44.7	35.6	2.3	0	29
12	1380	C	1	12.9	9.1	1.7	0	48
12	1380	D	0	6.9	11.1	0.4	0	37
12	1390	A	0	2.5	25.1	0.0	0	18
12	1390	B	0	12.1	17.2	0.6	0	36
12	1390	C	2	39.3	31.8	2.1	0	30
12	1390	D	1	29.7	27.3	1.6	0	34
12	1400	A	1	18.3	16.5	1.4	0	42
12	1400	B	1	25.8	20.7	1.9	0	38
12	1400	C	0	10.1	13.0	0.7	0	47
12	1400	D	0	8.7	15.4	0.4	0	47
12	1400	E	0	2.8	16.2	0.0	0	36
12	1410	A	0	2.7	24.1	0.0	0	26
12	1410	B	0	17.4	43.4	0.3	0	29
12	1410	C	0	28.9	55.5	0.6	0	25
12	1410	D	2	31.9	25.7	2.0	0	37
12	1410	E	2	35.1	28.8	2.0	0	32
12	1420	A	1	12.6	8.5	1.8	0	38
12	1420	B	2	40.4	27.5	2.7	0	37
12	1420	C	0	13.1	62.9	0.1	0	20
12	1420	D	0	14.2	17.6	0.8	0	31
12	1430	A	0	5.1	9.1	0.3	0	32
12	1430	B	0	5.2	9.8	0.3	0	51
12	1430	C	1	23.3	20.2	1.6	0	35
12	1430	D	2	23.3	17.2	2.0	0	36
12	1440	A	1	21.0	15.7	1.9	0	35
12	1440	B	1	31.6	29.9	1.6	0	36
12	1440	C	0	2.0	21.2	0.0	0	23
12	1440	D	1	10.0	7.5	1.4	0	56
12	1450	A	0	16.9	21.7	0.8	0	39
12	1450	B	0	8.5	13.5	0.5	0	40

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
12	1450	C	0	4.3	17.7	0.0	0	34
12	1450	D	0	3.7	15.7	0.0	0	30
12	1450	E	1	34.7	47.0	1.0	0	25
12	1450	F	1	39.4	42.8	1.5	0	25
12	1450	G	1	31.8	39.3	1.1	0	25
12	1460	A	0	19.6	24.3	0.9	0	37
12	1460	B	1	21.5	25.4	1.0	0	39
12	1460	C	2	33.4	23.9	2.4	0	44
12	1460	D	0	3.9	24.2	0.0	0	23
12	1460	E	0	3.2	21.9	0.0	0	25
12	1460	F	0	9.1	40.7	0.1	0	14
12	1470	A	0	8.9	26.7	0.2	0	21
12	1470	B	1	28.2	26.9	1.5	0	34
12	1470	C	0	7.6	14.6	0.3	0	34
12	1480	A	1	12.1	10.6	1.3	0	30
12	1480	B	2	36.8	29.2	2.2	0	36
12	1490	A	0	2.9	9.7	0.0	0	40
12	1490	B	1	21.5	24.0	1.1	0	36
12	1490	C	1	11.9	12.5	1.0	0	36
12	1490	D	1	16.1	13.8	1.4	0	31
12	1500	A	2	49.9	27.6	3.8	0	46
12	1500	B	1	32.3	27.9	1.8	0	36
12	1500	C	0	20.8	28.7	0.8	0	26
12	1500	D	1	27.6	36.6	1.0	0	31
12	1500	E	1	30.3	39.5	1.0	0	28
12	1500	F	0	6.9	19.7	0.1	0	25
12	1500	G	0	8.8	24.2	0.2	0	28
12	1500	H	0	4.0	30.3	0.0	0	26
12	1500	J	0	14.9	36.0	0.3	0	33
12	1500	K	0	22.2	45.1	0.5	0	39
12	1510	A	0	6.3	58.0	0.0	0	16
12	1510	B	0	4.5	21.7	0.0	0	24
12	1510	C	2	117.4	118.6	2.3	0	17
12	1510	D	1	67.2	85.1	1.4	0	20
12	1510	E	2	20.5	11.9	2.7	0	59
12	1510	F	1	12.0	11.0	1.2	0	19
11	1520	A	0	6.8	10.4	0.4	0	36
11	1520	B	0	7.1	9.5	0.5	0	49

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
11	1520	C	0	12.8	36.1	0.2	0	36
11	1530	A	0	10.6	30.2	0.2	0	32
11	1530	B	0	16.6	34.1	0.4	0	31
11	1530	C	0	11.7	15.2	0.7	0	29
11	1530	D	0	13.8	15.5	0.9	0	29
11	1540	A	0	13.9	18.9	0.7	0	20
11	1540	B	0	7.3	10.8	0.5	0	56
11	1540	C	0	4.2	12.0	0.1	0	50
11	1550	A	1	11.0	9.2	1.3	0	46
11	1560	A	0	5.3	5.6	0.7	0	64
11	1570	A	0	14.2	21.4	0.6	0	29
11	1580	A	0	2.9	4.9	0.2	0	61
11	1590	A	0	11.1	13.7	0.7	0	44
11	1600	A	0	1.3	24.9	0.0	0	24
11	1600	B	2	35.7	24.3	2.6	0	37
11	1600	C	1	18.6	17.7	1.3	0	48
11	1610	A	1	20.9	15.5	1.9	0	45
11	1610	B	2	38.9	25.0	2.9	0	31
11	1610	C	2	37.5	26.1	2.6	0	30
11	1620	A	0	11.7	28.6	0.3	0	31
11	1620	B	0	8.6	11.7	0.6	0	44
11	1620	C	1	11.3	8.8	1.4	0	67
11	1620	D	1	13.8	12.1	1.3	0	44
11	1630	A	1	7.2	6.6	1.0	0	74
11	1630	B	1	19.9	15.8	1.7	0	38
11	1630	C	1	9.1	7.9	1.1	0	28
11	1640	A	0	9.5	17.0	0.4	0	38
11	1640	B	0	7.7	7.5	0.9	0	66
11	1650	A	1	12.4	9.0	1.6	0	67
11	1650	B	1	45.0	45.4	1.7	0	19
11	1650	C	1	55.2	62.6	1.6	0	20
11	1660	A	1	9.0	6.0	1.6	0	77

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.

J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
11	1670	A	0	9.4	9.9	0.9	0	55
11	1670	B	0	11.8	15.0	0.7	0	39
11	1680	A	0	4.8	12.5	0.1	0	45
11	1690	A	0	5.7	8.3	0.4	0	44
11	1690	B	0	10.2	18.8	0.4	0	22
10	1700	A	0	4.5	10.1	0.2	0	36
10	1710	A	0	7.7	15.9	0.3	0	21
10	1710	B	0	12.9	19.0	0.6	0	26
10	1720	A	0	26.2	36.0	0.9	0	26
10	1720	B	0	13.5	18.9	0.7	0	26
10	1730	A	0	9.6	16.2	0.4	0	33
10	1730	B	0	9.5	17.3	0.4	0	22
10	1730	C	1	19.7	19.9	1.2	0	33
10	1740	A	1	22.9	25.0	1.2	0	33
10	1740	B	0	12.4	29.4	0.3	0	29
10	1750	A	0	7.9	15.2	0.3	0	30
10	1750	B	1	17.0	14.4	1.5	0	38
10	1750	C	0	10.8	11.7	0.9	0	42
10	1760	A	0	7.4	9.1	0.6	0	40
10	1760	B	0	4.4	17.2	0.0	0	33
10	1760	C	0	7.3	35.3	0.0	0	26
10	1770	A	0	7.5	33.6	0.1	0	25
10	1770	B	0	4.7	13.2	0.1	0	28
10	1770	C	1	11.9	10.9	1.2	0	42
10	1780	A	1	32.8	31.0	1.6	0	37
10	1780	B	0	4.7	27.1	0.0	0	20
10	1780	C	0	4.3	29.6	0.0	0	20
10	1780	D	0	4.9	15.9	0.1	0	33
10	1790	A	0	4.4	15.7	0.1	0	29
10	1790	B	1	18.9	17.8	1.3	0	24
10	1800	A	1	20.2	19.6	1.3	0	33

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J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
10	1800	B	0	5.5	18.3	0.1	0	29
10	1810	A	0	11.7	56.1	0.1	0	18
10	1810	B	1	18.3	20.5	1.0	0	31
10	1820	A	0	17.7	25.0	0.7	0	33
10	1830	A	0	14.9	20.5	0.7	0	31
10	1840	A	0	11.0	19.1	0.4	0	39
10	1850	A	0	5.5	14.6	0.1	0	28
10	1850	B	1	14.7	14.4	1.2	0	35
10	1860	A	0	12.0	16.9	0.6	0	43
10	1860	B	0	3.9	19.7	0.0	0	30
10	1860	C	0	2.5	11.2	0.0	0	27
10	1870	A	0	0.3	12.6	0.0	0	33
10	1870	B	0	4.6	12.3	0.1	0	32
10	1870	C	0	8.4	14.9	0.4	0	31
9	1880	A	0	3.9	7.1	0.2	0	44
9	1880	B	0	4.5	7.3	0.3	0	31
9	1890	A	0	3.0	22.5	0.0	0	22
9	1890	B	0	5.8	10.0	0.3	0	16
9	1890	C	0	10.9	15.7	0.6	0	29
9	1900	A	0	9.7	18.2	0.4	0	27
9	1900	B	2	13.6	6.5	3.0	0	14
9	1940	A	0	10.6	22.7	0.3	0	26
9	1940	B	0	5.8	12.3	0.2	0	35
9	1950	A	0	12.4	13.8	0.9	0	21
9	1950	B	0	8.0	14.8	0.3	0	26
9	1950	C	0	4.3	7.9	0.2	0	54
9	1960	A	1	16.8	18.5	1.0	0	32
9	1960	B	0	12.5	25.8	0.4	0	21
9	1960	C	0	15.5	33.5	0.4	0	19
9	1970	A	0	11.5	19.9	0.5	0	27
9	1970	B	0	8.9	15.2	0.4	0	39

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J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
9	1970	C	1	18.8	17.1	1.4	0	28
9	2000	A	0	2.0	13.4	0.0	0	13
9	2000	B	0	2.7	16.7	0.0	0	28
9	2010	A	0	4.2	10.3	0.1	0	35
9	2020	A	0	4.9	11.7	0.2	0	39
9	2030	A	0	9.9	17.8	0.4	0	35
8	2040	A	0	6.9	14.2	0.3	0	28
8	2050	A	1	10.6	10.8	1.0	0	31
8	2060	A	1	2.4	1.5	1.1	0	77
8	2070	A	1	7.1	5.9	1.1	0	42
8	2080	A	0	3.9	15.9	0.0	0	26
8	2090	A	0	2.6	11.0	0.0	0	29
8	2090	B	0	2.0	10.5	0.0	0	15
8	2100	A	0	4.6	16.2	0.1	0	27
8	2110	A	0	2.8	13.1	0.0	0	36
8	2110	B	1	9.5	9.4	1.0	0	36
8	2130	A	0	2.8	11.4	0.0	0	17
8	2130	B	0	16.5	21.3	0.8	0	35
8	2130	C	0	12.0	12.9	0.9	0	48
8	2130	D	1	12.4	12.4	1.1	0	33
8	2140	A	0	6.8	7.3	0.7	0	57
8	2140	B	1	16.9	17.7	1.1	0	35
8	2150	A	0	2.1	14.3	0.0	0	32
8	2160	A	0	4.2	14.4	0.1	0	30
8	2170	A	0	2.4	12.3	0.0	0	25
8	2170	B	0	2.2	11.3	0.0	0	37
8	2180	A	0	3.6	10.1	0.1	0	42

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J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
8	2180	B	0	3.5	11.7	0.1	0	32
8	2190	A	0	3.8	10.1	0.1	0	34
8	2200	A	0	5.5	15.8	0.1	0	29
8	2210	A	0	2.4	10.9	0.0	0	24
7	2240	A	0	3.7	9.3	0.1	0	33
7	2250	A	0	6.4	23.6	0.1	0	16
7	2270	A	0	3.8	13.1	0.1	0	26
7	2280	A	0	3.5	11.6	0.1	0	26
7	2280	B	0	2.3	11.7	0.0	0	22
7	2290	A	0	2.2	8.3	0.0	0	31
7	2290	B	0	2.5	13.5	0.0	0	25
7	2290	C	0	4.4	9.3	0.2	0	39
7	2300	A	0	2.3	2.7	0.4	0	34
7	2300	B	0	2.3	6.8	0.1	0	29
6	2310	A	1	7.7	6.1	1.2	0	43
6	2350	A	0	0.8	13.4	0.0	0	24
6	2360	A	0	3.1	13.1	0.0	0	32
6	2370	A	0	7.8	10.4	0.6	0	37
6	2370	B	0	1.3	9.3	0.0	0	42
6	2380	A	0	8.8	12.9	0.5	0	34
6	2390	A	0	4.1	17.1	0.0	0	28
6	2390	B	0	2.5	12.7	0.0	0	30
6	2390	C	0	5.9	9.0	0.4	0	49
6	2400	A	0	4.5	11.0	0.2	0	26
6	2400	B	1	25.6	30.9	1.1	0	12
6	2400	C	0	3.9	41.2	0.0	0	17
6	2400	D	0	2.6	16.4	0.0	0	23
6	2410	A	0	2.8	12.9	0.0	0	32

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J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
6	2410	B	0	6.0	8.4	0.5	0	47
6	2420	A	0	11.5	16.7	0.6	0	19
6	2420	B	0	3.4	24.2	0.0	0	26
6	2430	A	0	5.4	21.7	0.1	0	42
6	2430	B	0	5.4	9.3	0.3	0	28
6	2440	A	0	8.0	11.9	0.5	0	17
6	2440	B	0	9.8	11.0	0.8	0	33
6	2440	C	0	1.3	12.6	0.0	0	36
6	2450	A	0	5.2	11.6	0.2	0	35
6	2450	B	0	3.9	5.8	0.3	0	26
6	2450	C	0	4.6	7.1	0.3	0	26
6	2461	A	2	20.5	13.6	2.2	0	52
5	2470	A	0	2.3	15.4	0.0	0	19
5	2470	B	0	3.6	11.8	0.1	0	31
5	2470	C	0	3.5	22.2	0.0	0	20
5	2470	D	2	81.6	61.5	3.0	0	18
5	2480	A	2	16.5	10.9	2.1	0	49
5	2480	B	0	6.0	10.1	0.3	0	52
5	2480	C	0	1.9	8.6	0.0	0	26
5	2491	A	0	4.0	3.6	0.8	0	63
5	2491	B	2	23.2	13.8	2.7	0	33
5	2500	A	1	20.3	18.0	1.5	0	31
5	2500	B	0	5.2	10.6	0.2	0	36
5	2510	A	0	2.3	17.5	0.0	0	22
5	2510	B	1	9.5	7.6	1.3	0	38
5	2520	A	0	10.5	12.3	0.8	0	37
5	2530	A	0	5.7	5.3	0.8	0	48
5	2540	A	0	5.9	7.8	0.5	0	42
5	2540	B	0	2.5	11.9	0.0	0	31
5	2550	A	1	12.2	11.2	1.2	0	37
5	2560	A	1	31.0	26.5	1.8	0	28

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J8642

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
5	2570	A	0	6.8	14.6	0.2	0	31
5	2570	B	0	15.2	21.0	0.7	0	32
5	2580	A	0	15.8	22.8	0.7	0	32
5	2580	B	0	4.2	12.2	0.1	0	38
5	2580	C	0	3.2	9.9	0.1	0	27
5	2590	A	0	4.0	10.5	0.1	0	25
5	2590	B	0	7.1	10.9	0.4	0	41
5	2610	A	0	5.3	9.9	0.3	0	26
5	2610	B	0	7.2	17.2	0.2	0	21
4	2670	A	0	3.5	12.8	0.0	0	38
4	2680	A	0	6.3	19.7	0.1	0	29
4	2690	A	0	6.5	31.9	0.0	0	18
4	2690	B	0	5.9	23.0	0.1	0	26
4	2690	C	0	3.2	11.7	0.0	0	25
4	2690	D	0	2.0	16.4	0.0	0	23
4	2690	E	0	8.5	18.2	0.3	0	28
4	2690	F	0	9.1	16.0	0.4	0	22
4	2701	A	0	2.8	6.6	0.1	0	39
4	2701	B	0	5.6	15.6	0.1	0	34
4	2701	C	0	6.8	14.5	0.2	0	31
3	2711	A	0	4.9	16.7	0.1	0	23
3	2711	B	0	5.5	14.8	0.1	0	42
3	2720	A	0	1.3	9.4	0.0	0	27
3	2720	B	0	5.7	12.1	0.2	0	35
3	2731	A	0	4.8	10.6	0.2	0	31
3	2740	A	0	8.2	15.1	0.4	0	29
3	2750	A	2	12.6	6.1	2.9	0	50
3	2750	B	0	1.9	11.0	0.0	0	21
3	2760	A	0	8.8	11.5	0.6	0	46
3	2781	A	0	3.3	11.1	0.1	0	23

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

APPENDIX III

CERTIFICATE OF QUALIFICATIONS

1. I hold a PhD in Geophysics from Charles University, Czechoslovakia having graduated in 1967.

2. I reside at 146 Three Valleys Drive, in the town of Don Mills, Ontario.

3. I have been continuously engaged in both professional and managerial roles in the minerals industry in Canada and abroad for the past 17 years.

4. I have been an active member of the Society of Exploration Geophysicists since 1978 and hold a membership in KEGS since 1978.

5. The accompanying report was prepared from information published by government agencies, materials supplied by Mark Management Limited and from a review of the proprietary airborne geophysical survey flown by Aerodat Limited for Mark Management Limited. I have not personally visited the property.

6. I have no interest, direct or indirect, in the property described nor do I hold securities in Mark Management Limited.

Signed,

Z. Dvorak

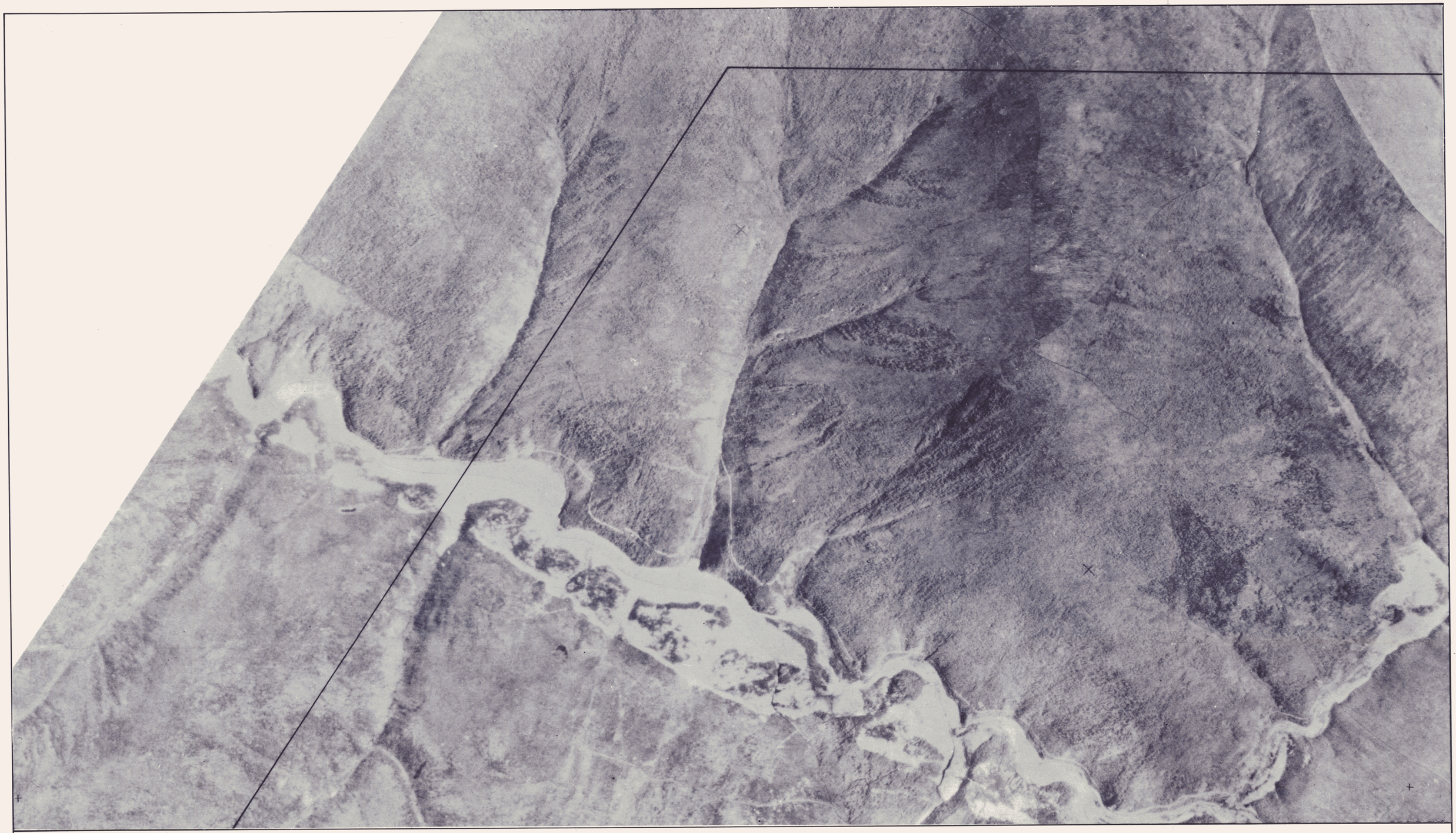
Don Mills, Ontario
July, 1987

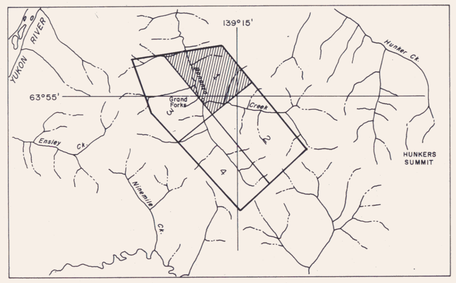
Zbynek Dvorak
Consulting Geophysicist

APPENDIX IV

COST STATEMENT
BONANZA-ELDORADO GRID
AIRBORNE GEOPHYSICAL SURVEY
10 November 1986 - 25 January 1987

AERODAT LIMITED 1335 LKm @ $75.00		$100,125.00
Mobilization/Demobilization		5,000.00
MARK MANAGEMENT LTD.		
Planning, Supervision, Reporting		15,768.75
	TOTAL	**$120,893.75**





MARK MANAGEMENT LTD.

BASE MAP

DAWSON AREA

YUKON TERRITORIES

(15.61)

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

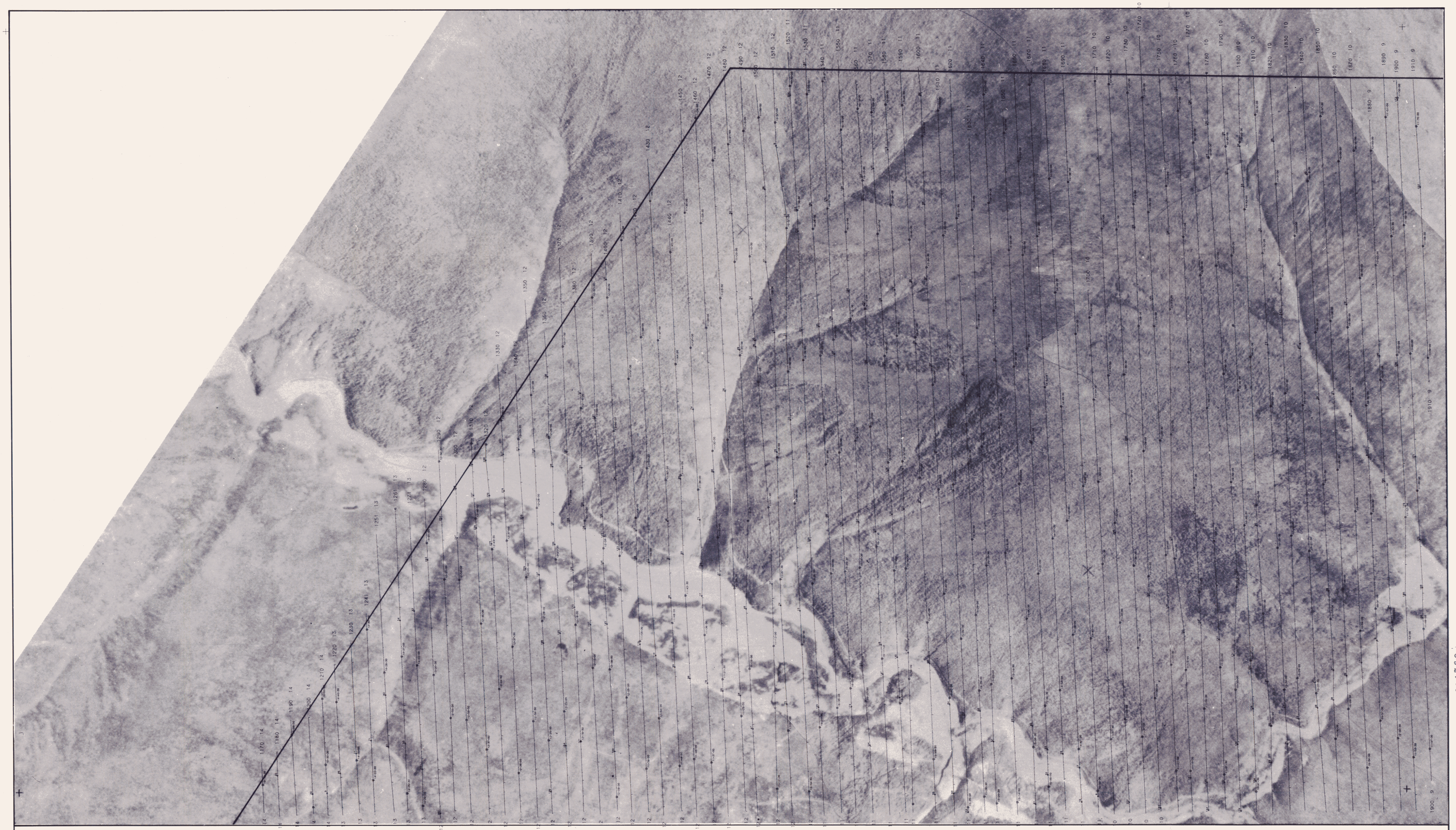
DATE: January, 1987

N.T.S. No: 115·O & N(E 1/2)

MAP No: 1 - 1

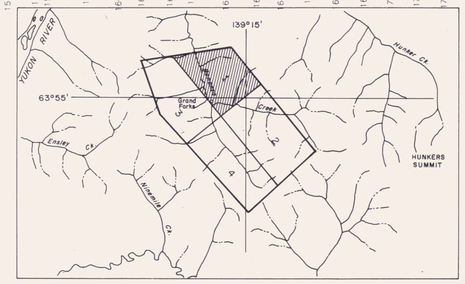
J 8642

091760



Positioning ..... VIDEO TRACKING FILM

Mean flight line spacing ..... 100 metres



MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY

DAWSON AREA

YUKON TERRITORIES

(1562)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE:	January, 1987
N.T.S. No:	115-O & N(E 1/2)
MAP No:	1 - 2

J 8642

091760

Positioning ..... VIDEO TRACKING FILM
Mean EM sensor elevation ..... 30 metres
Mean flight line spacing ..... 100 metres

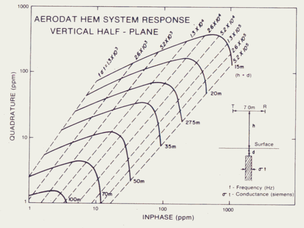
INTERPRETATION LEGEND

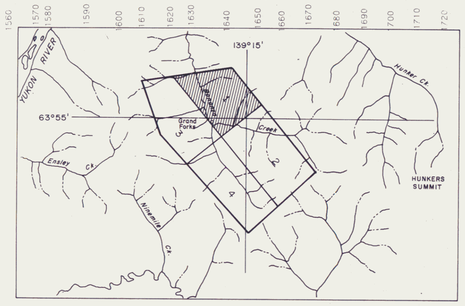
- EM Anomaly — Conductivity thickness range 2 (see code)
- Interpreted bedrock conductor axis
- Possible bedrock conductor axis
- Conductive Zone

EM RESPONSE

Conductivity thickness in mhos

7	60 - 120
6	30 - 60
5	15 - 30
4	8 - 15
3	4 - 8
2	2 - 4
1	1 - 2
0	0 - 1





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY INTERPRETATION

DAWSON AREA

YUKON TERRITORIES

(1560)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

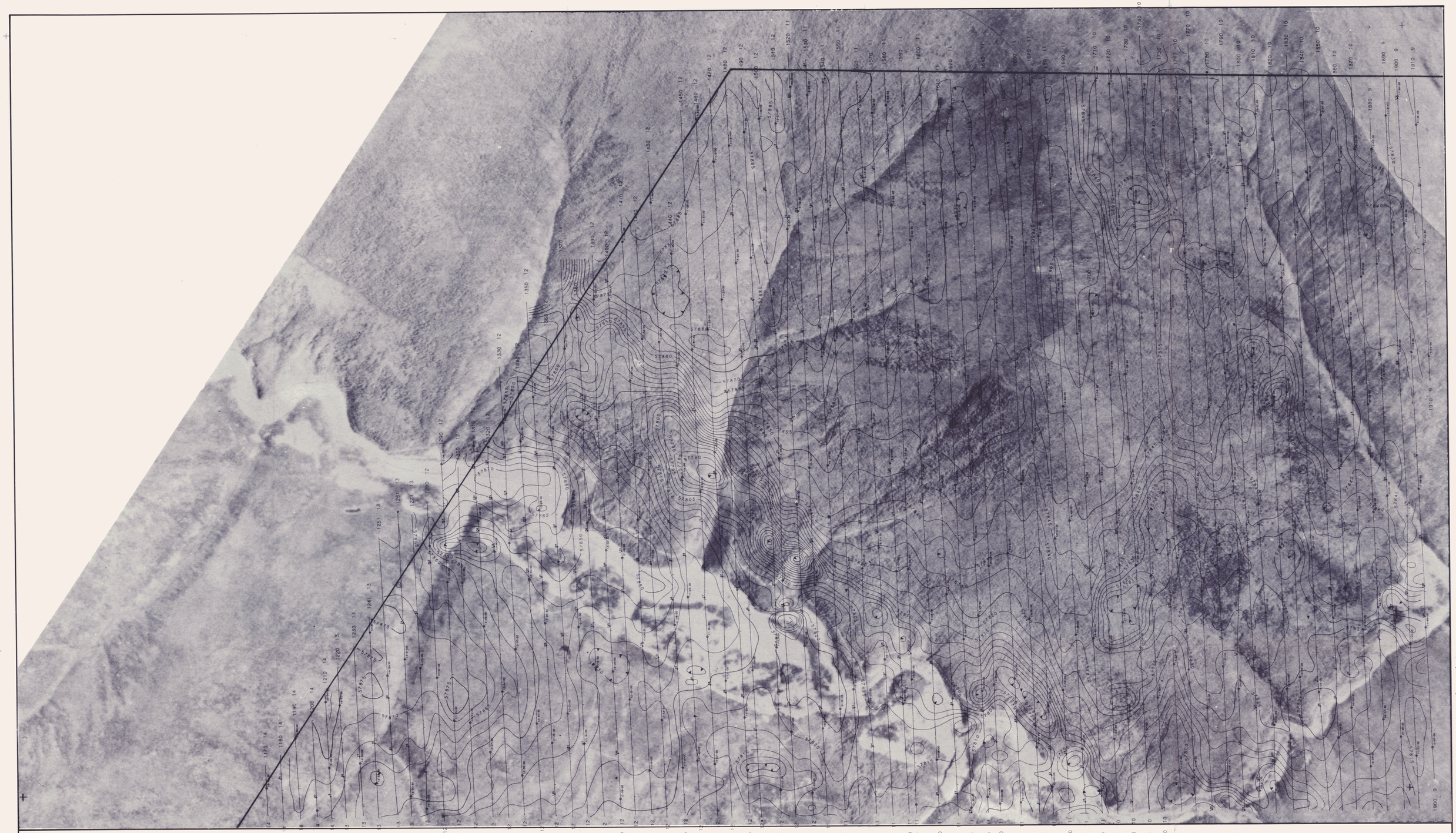
AERODAT LIMITED

DATE: January, 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 1 - 3

J 8642



TOTAL FIELD MAGNETIC CONTOURS

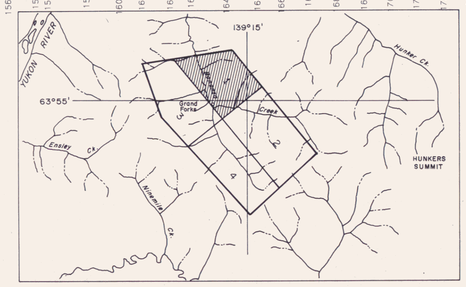
MEAN MAGNETOMETER SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL: 5 gammas

125 gammas

25 gammas

5 gammas



MARK MANAGEMENT LTD.

TOTAL FIELD MAGNETIC CONTOURS

DAWSON AREA

YUKON TERRITORIES

1559

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

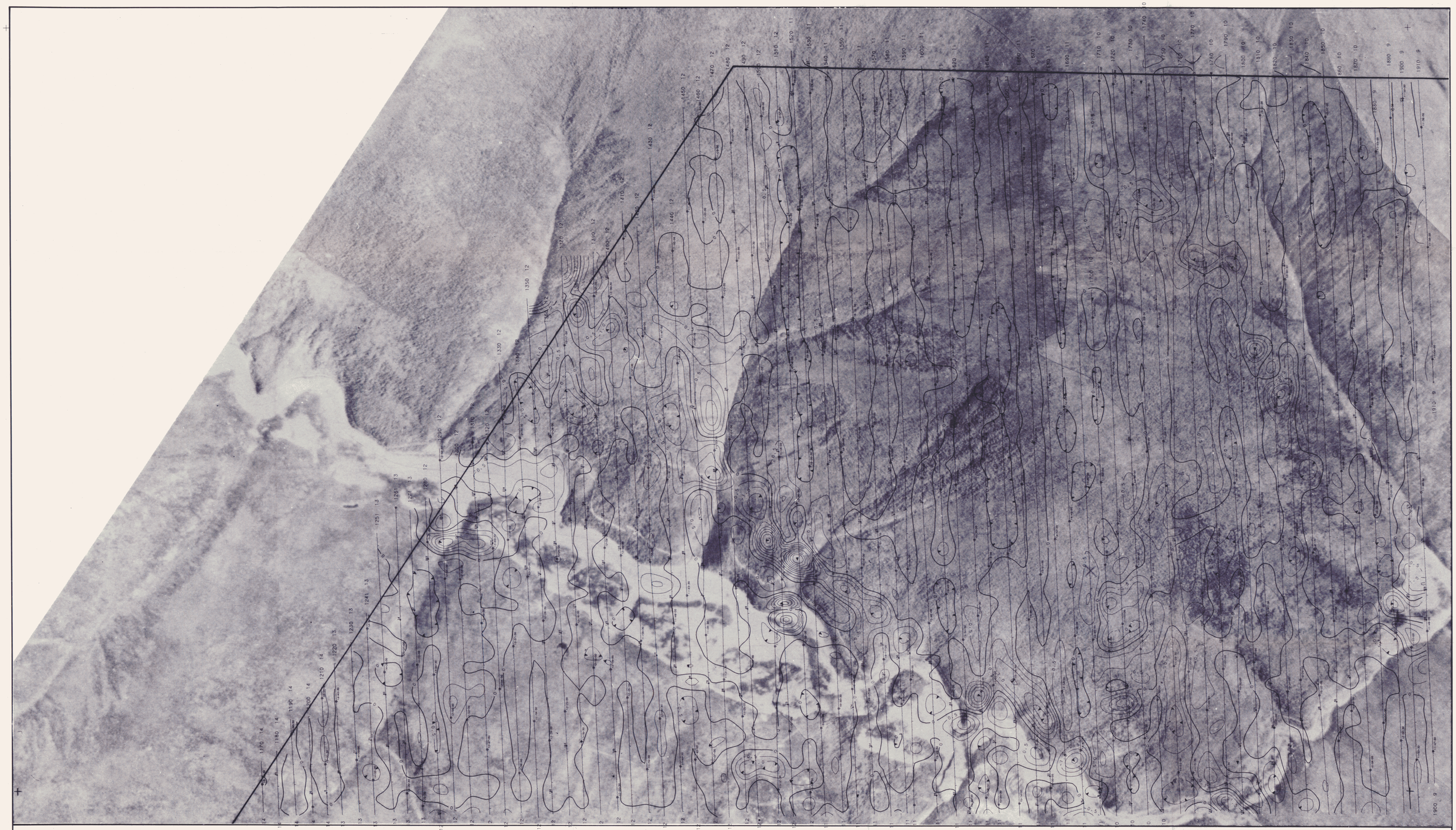
DATE: January, 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 1 - 4

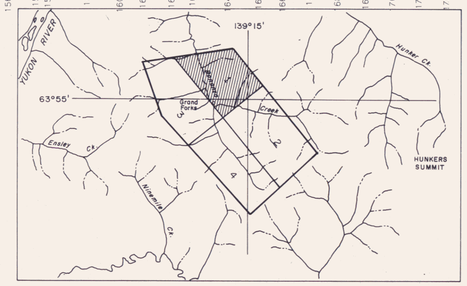
J 8642

091760



VERTICAL MAGNETIC GRADIENT
(CALCULATED FROM TOTAL MAGNETIC FIELD)
CONTOUR INTERVAL:

1.0 gammas / metre .....
2.5 gammas / metre .....
0.5 gammas / metre .....



MARK MANAGEMENT LTD.

COMPUTED VERTICAL MAGNETIC GRADIENT CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1563)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January, 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 1 - 5

J 8642

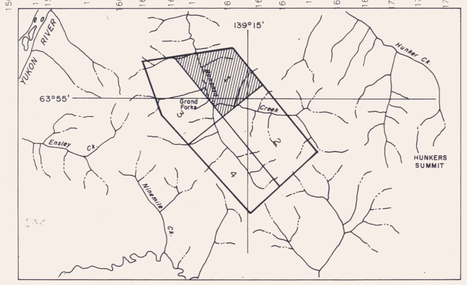
091760



APPARENT RESISTIVITY CONTOURS

Calculated assuming 200 m conductive layer
(using 34 K Hz coplanar data).

$10^{N.0}$ OHM-M	N = 1,2,3, ...9
$10^{N.M}$ OHM-M	M = 1,2,3, ...9
$10^{N.MP}$ OHM-M	P = 0.5



MARK MANAGEMENT LTD.

APPARENT RESISTIVITY CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1564)

SCALE 1/10,000

0 330 660 1320 1/2 mile

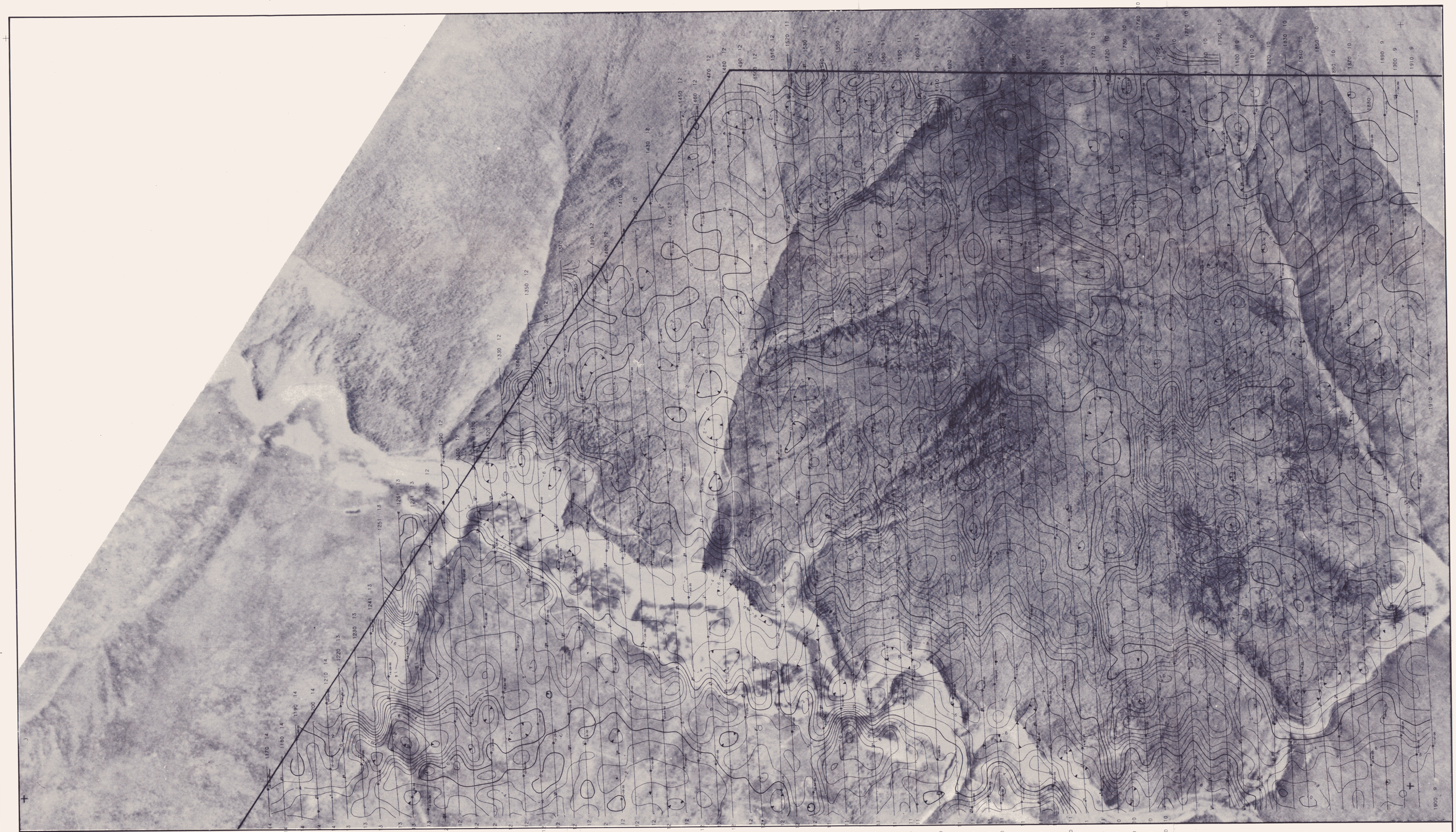
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE:	January, 1987
N.T.S. No:	115-O & N(E 1/2)
MAP No:	1 - 6

J 8642

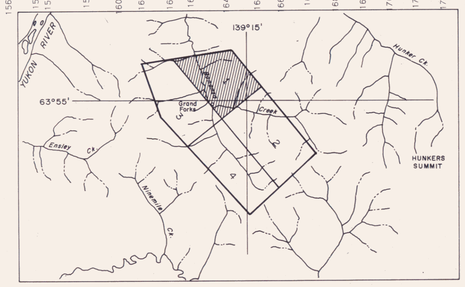
091760



VLF-EM TOTAL FIELD CONTOURS

VLF STATION NLK (Jim Creek, Wash.) 24.8 kHz.
MEAN VLF-EM
SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL:
50% .....
10% .....
2% .....



MARK MANAGEMENT LTD.

VLF-EM TOTAL FIELD CONTOURS

DAWSON AREA
YUKON TERRITORIES

(115/5)

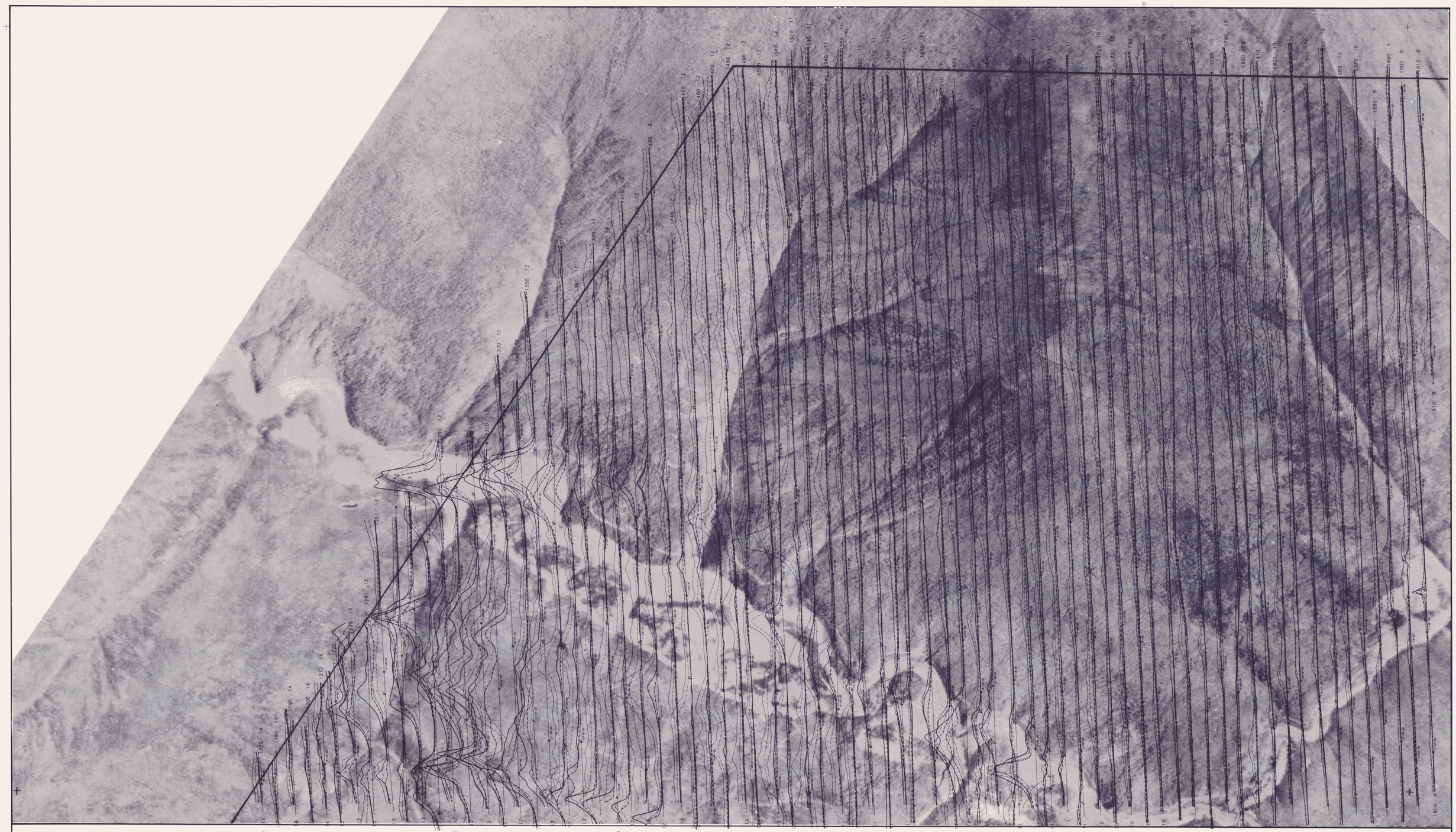
SCALE 1/10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January, 1987
N.T.S. No: 115-O & N(E 1/2)
MAP No: 1 - 7

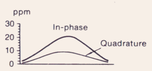
J 8642

091760



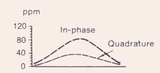
ELECTROMAGNETIC PROFILES-COAXIAL

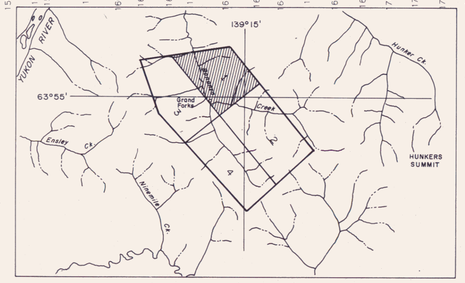
Coil Separation	7 metres
Frequency	4600 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	4175 Hz
Sensor Elevation	30 metres
Vertical Scale	8 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

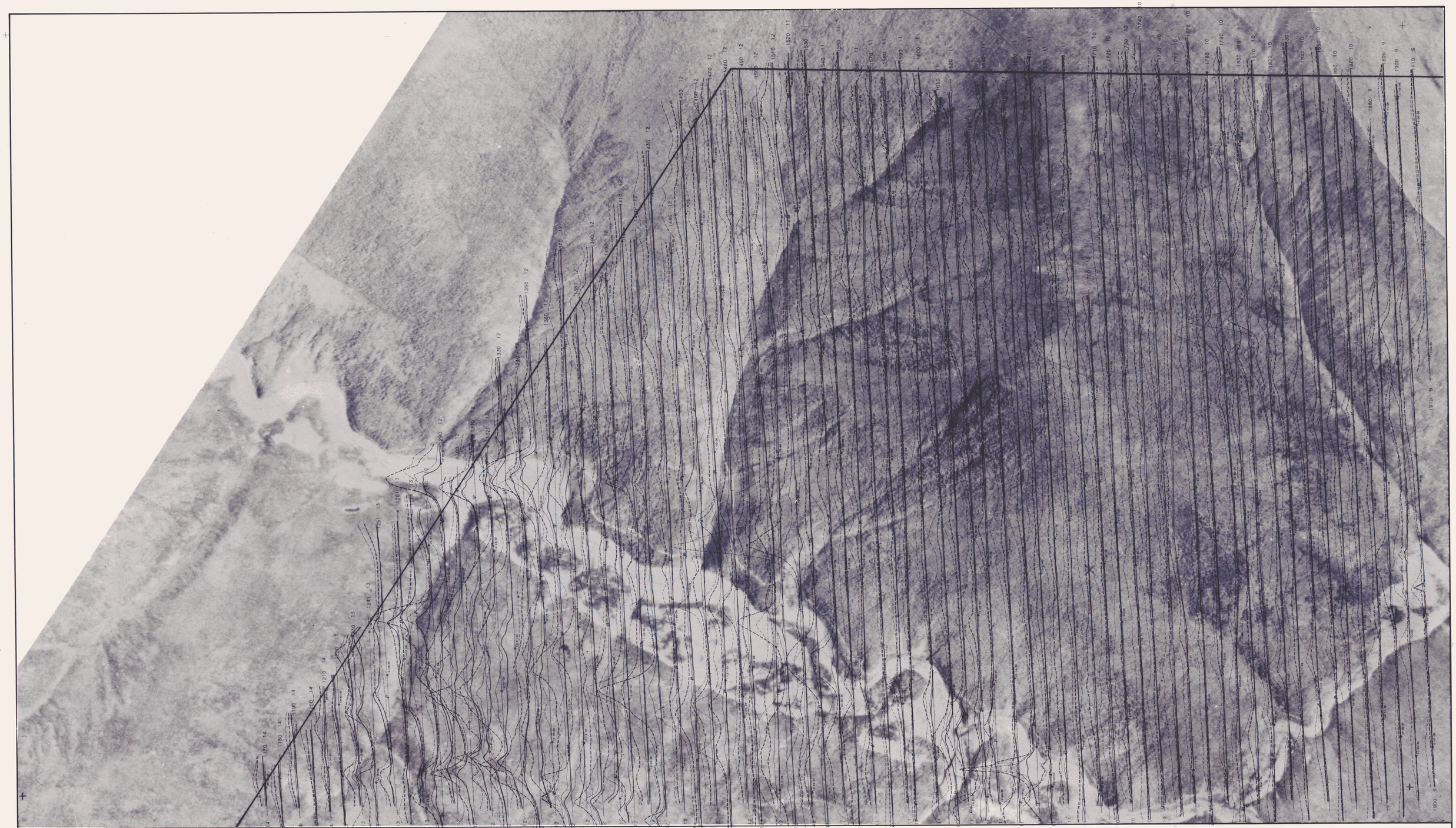
AERODAT LIMITED

DATE: January, 1987

N.T.S. No: 115-O & N(E 1/2)

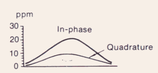
MAP No: 1 - 8a

J 8642



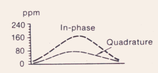
ELECTROMAGNETIC PROFILES-COAXIAL

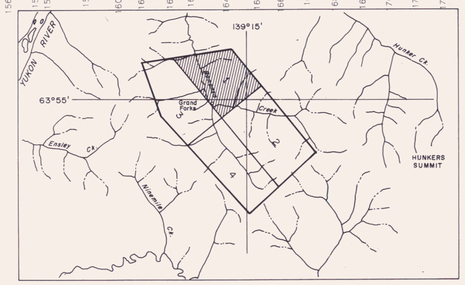
Coil Separation	7 metres
Frequency	935 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	34K Hz
Sensor Elevation	30 metres
Vertical Scale	16 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(1567)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

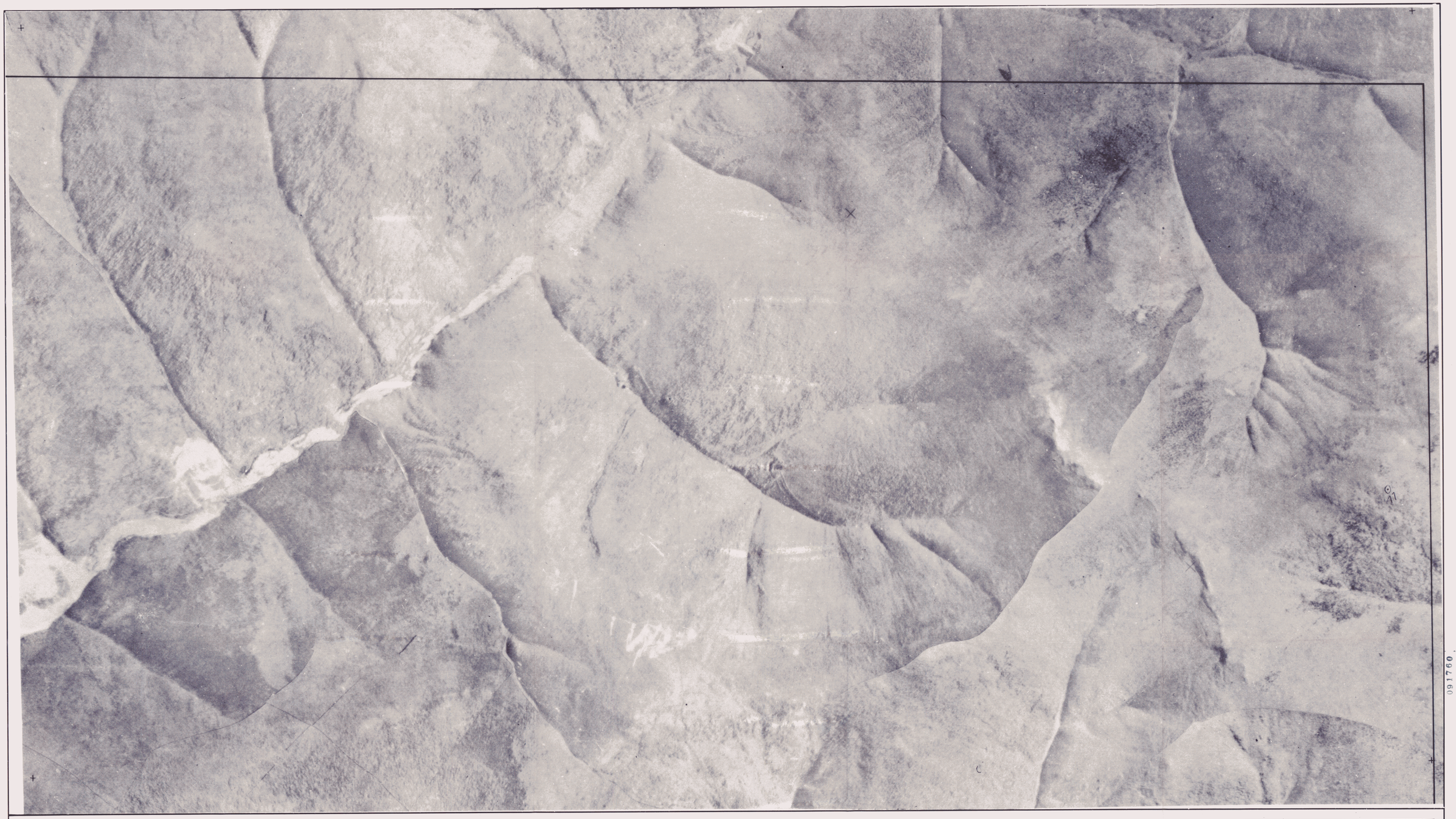
DATE: January, 1987

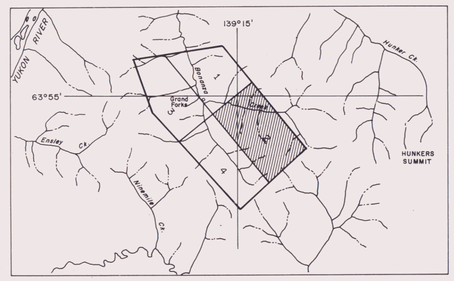
N.T.S. No: 115-O & N(E 1/2)

MAP No: 1 - 8b

J 8642

09160





MARK MANAGEMENT LTD.

BASE MAP

DAWSON AREA

YUKON TERRITORIES

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

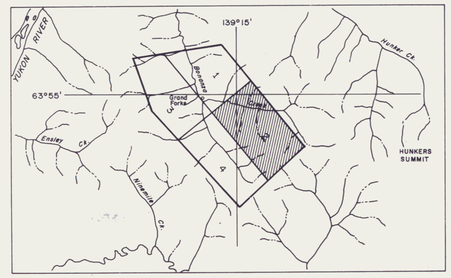
MAP No: 2 - 1

J 8642

091760.

Positioning ..... VIDEO TRACKING FILM

Mean flight line spacing ..... 100 metres



MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY

DAWSON AREA

YUKON TERRITORIES

(1569)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 2-2

J 8642

091760

INTERPRETATION LEGEND

EM Anomaly A.
Conductivity thickness range 2 (see code)

Interpreted bedrock conductor axis

Possible bedrock conductor axis

EM RESPONSE

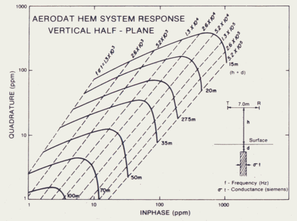
Conductivity thickness in mhos

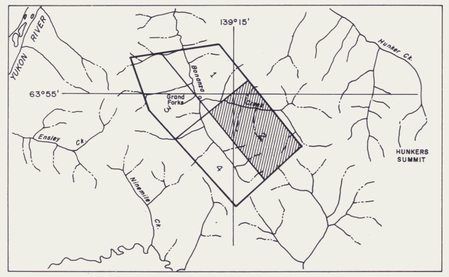
7	60 - 120
6	30 - 60
5	15 - 30
4	8 - 15
3	4 - 8
2	2 - 4
1	1 - 2
0	0 - 1

Positioning ..... **TRACKING FILM**

Mean EM sensor elevation ..... **30 metres**

Mean flight line spacing ..... **100 metres**





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY INTERPRETATION

DAWSON AREA

YUKON TERRITORIES

(1:5000)

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 2 - 3

J 8642

091760

TOTAL FIELD MAGNETIC CONTOURS

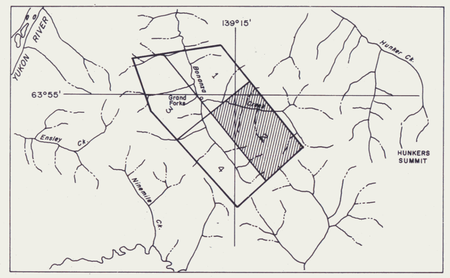
MEAN MAGNETOMETER SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL: 5 gammas

125 gammas.....

25 gammas.....

5 gammas.....



MARK MANAGEMENT LTD.

TOTAL FIELD MAGNETIC CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1571)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

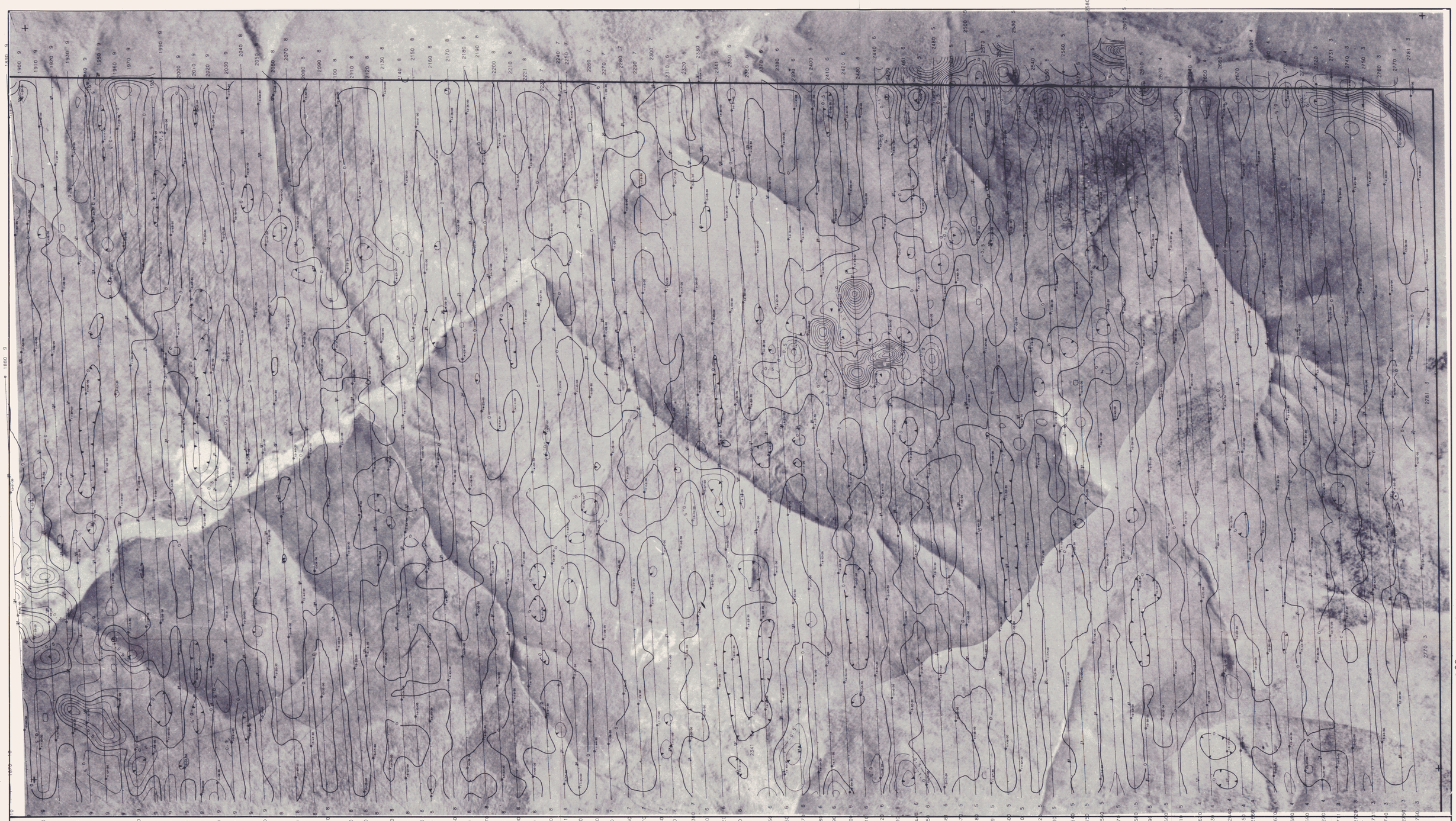
AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

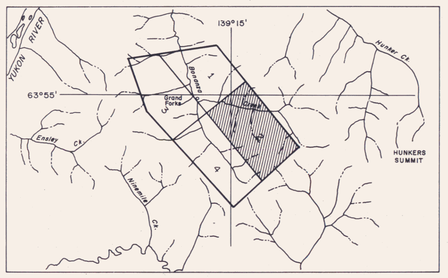
MAP No: 2 - 4

J 8642



VERTICAL MAGNETIC GRADIENT
(CALCULATED FROM TOTAL MAGNETIC FIELD)
CONTOUR INTERVAL:

1.0 gammas / metre .....
2.5 gammas / metre .....
0.5 gammas / metre .....



MARK MANAGEMENT LTD.

COMPUTED VERTICAL MAGNETIC GRADIENT CONTOURS

DAWSON AREA

YUKON TERRITORIES

1573

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 2 - 5

J 8642

091760

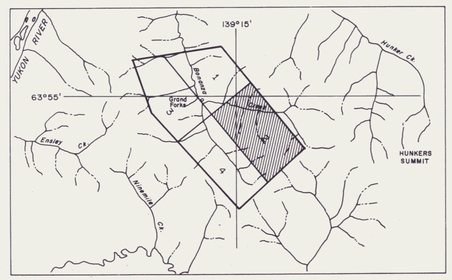
APPARENT RESISTIVITY CONTOURS

Calculated assuming 200 m conductive layer
(using 34K Hz coplanar data).

$10^{N.0}$ OHM-M N = 1,2,3...9

$10^{N.M}$ OHM-M M = 1,2,3...9

$10^{N.MP}$ OHM-M P = 0.5



MARK MANAGEMENT LTD.

APPARENT RESISTIVITY CONTOURS

DAWSON AREA

YUKON TERRITORIES

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

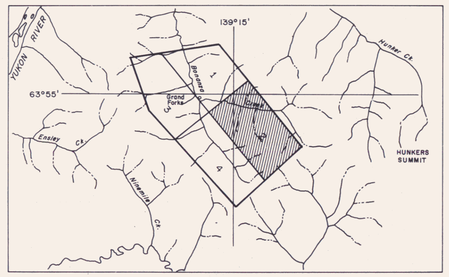
MAP No: 2 - 6

J 8642

VLF-EM TOTAL FIELD CONTOURS

VLF STATION: NLK (Jim Creek, Wash.) 24.8 kHz.
MEAN VLF-EM SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL:
50%
10%
2%



MARK MANAGEMENT LTD.

VLF-EM TOTAL FIELD CONTOURS

DAWSON AREA
YUKON TERRITORIES

(1572)

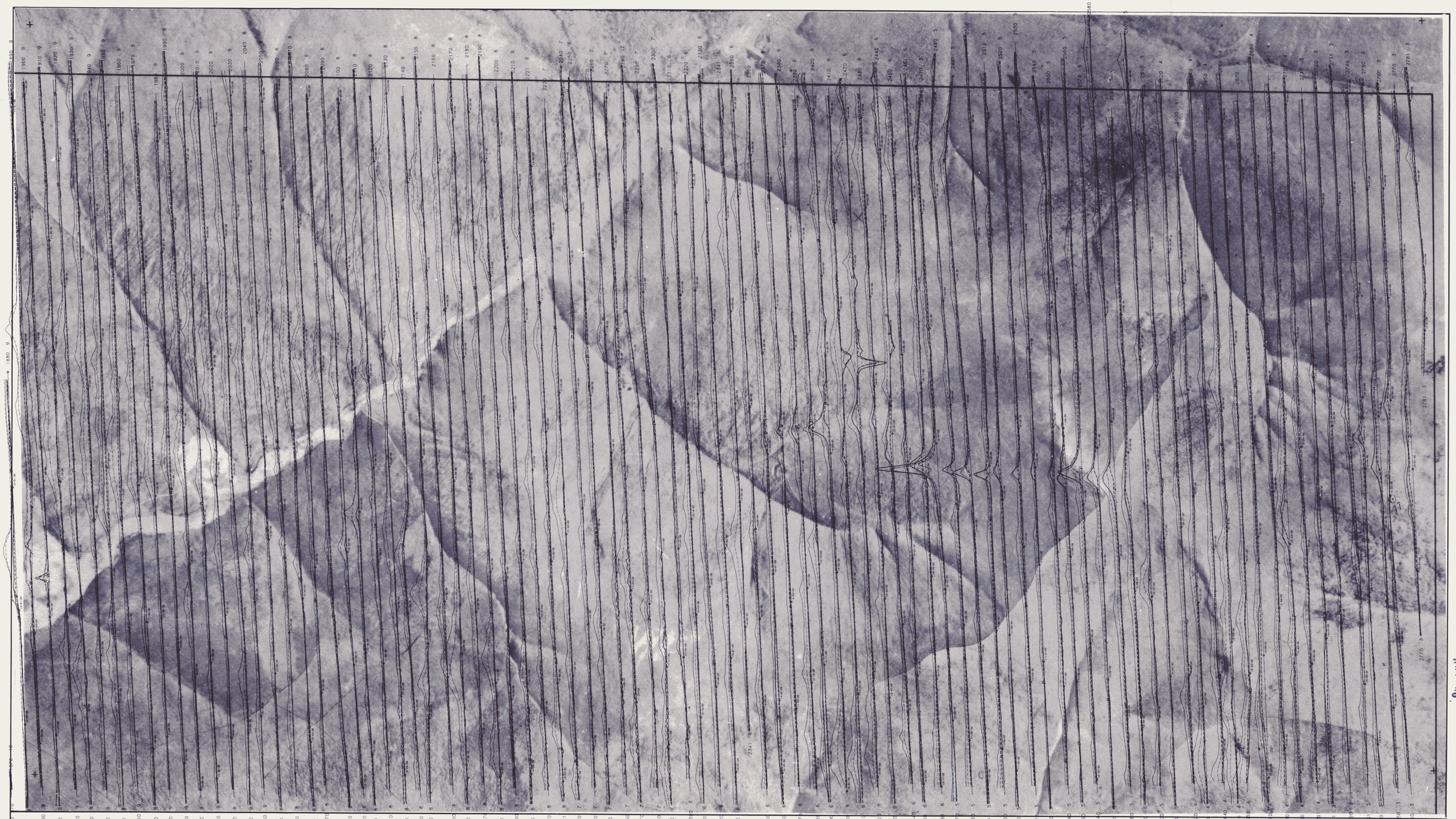
SCALE 1/10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987
N.T.S. No: 115-0 & N(E 1/2)
MAP No: 2 - 7

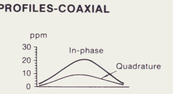
J 8642

091760



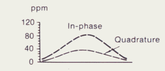
ELECTROMAGNETIC PROFILES-COAXIAL

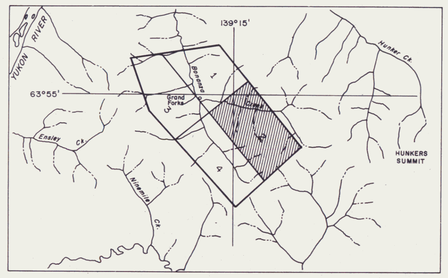
Coil Separation	7 metres
Frequency	4600 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	4175 Hz
Sensor Elevation	30 metres
Vertical Scale	8 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(5.76)

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

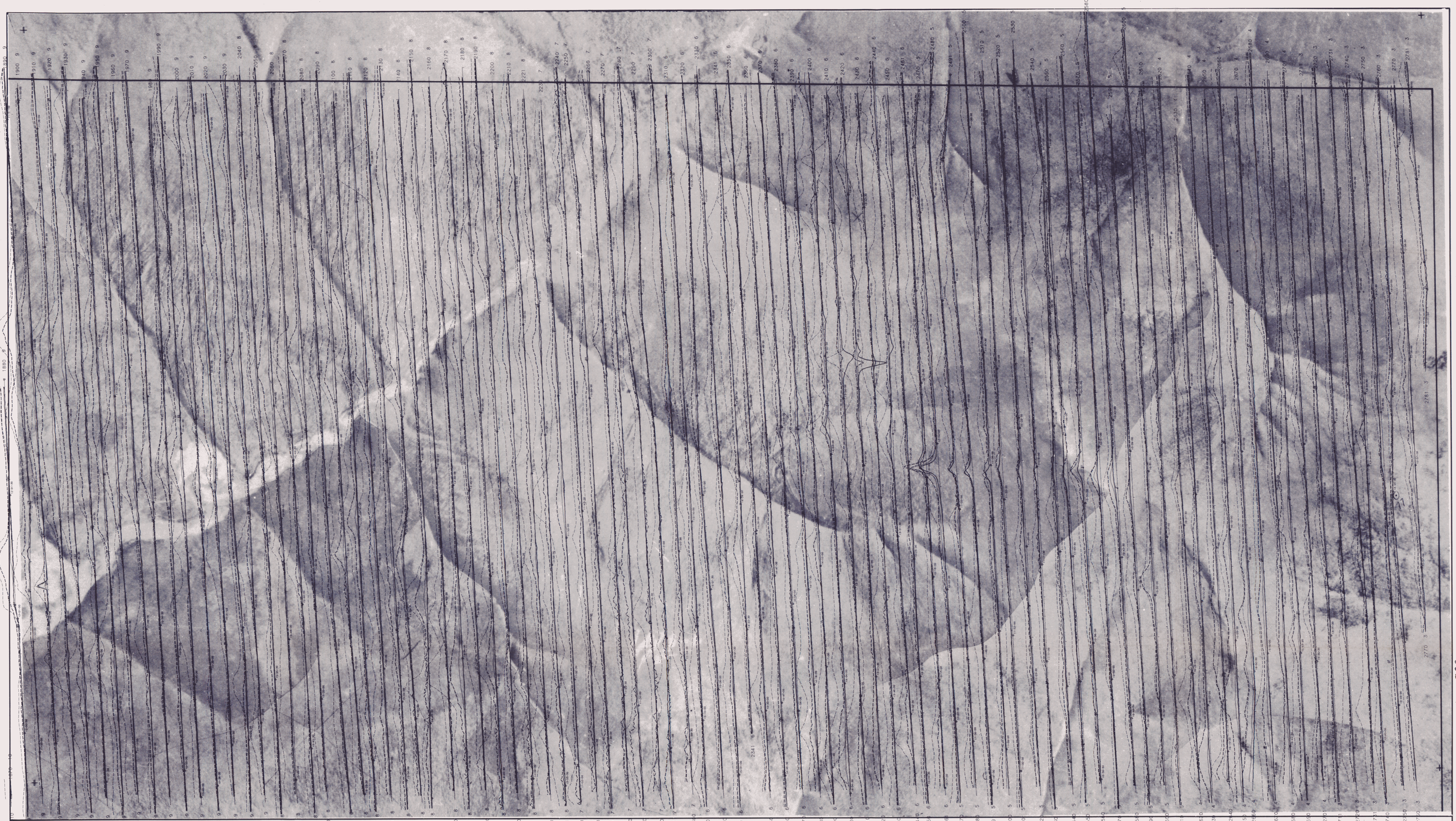
AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

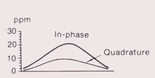
MAP No: 2 - 8a

J 8642



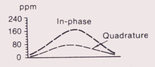
ELECTROMAGNETIC PROFILES-COAXIAL

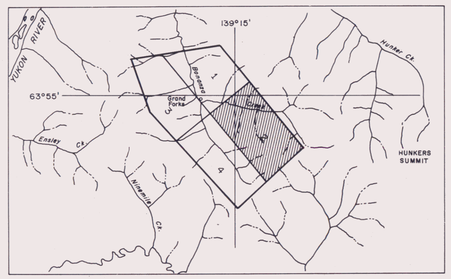
Coil Separation	7 metres
Frequency	935 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	34K Hz
Sensor Elevation	30 metres
Vertical Scale	16 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

1575

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

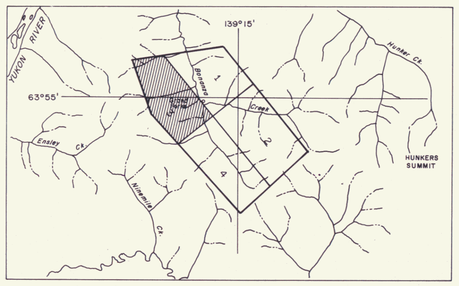
DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 2 - 8b

J 8642





MARK MANAGEMENT LTD.

BASE MAP

DAWSON AREA

YUKON TERRITORIES

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 3 - 1

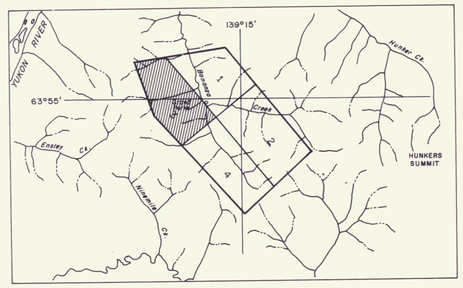
J 8642

091760



Positioning ..... VIDEO TRACKING FILM

Mean flight line spacing ..... 100 metres



MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY

DAWSON AREA

YUKON TERRITORIES

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 3 - 2

J 8642

INTERPRETATION LEGEND

EM Anomaly A.
Conductivity thickness range 2 (see code).

Interpreted bedrock conductor axis

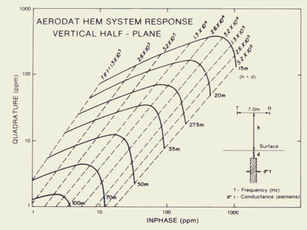
Possible bedrock conductor axis

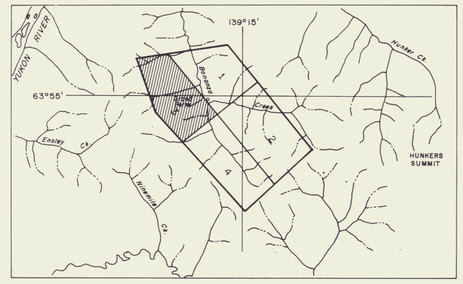
EM RESPONSE

Conductivity thickness in mhos

7	60 - 120
6	30 - 60
5	15 - 30
4	8 - 15
3	4 - 8
2	2 - 4
1	1 - 2
0	0 - 1

Positioning ..... VIDEO TRACKING FILM
Mean EM sensor elevation ..... 30 metres
Mean flight line spacing ..... 100 metres





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY INTERPRETATION

DAWSON AREA

YUKON TERRITORIES

(1579)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

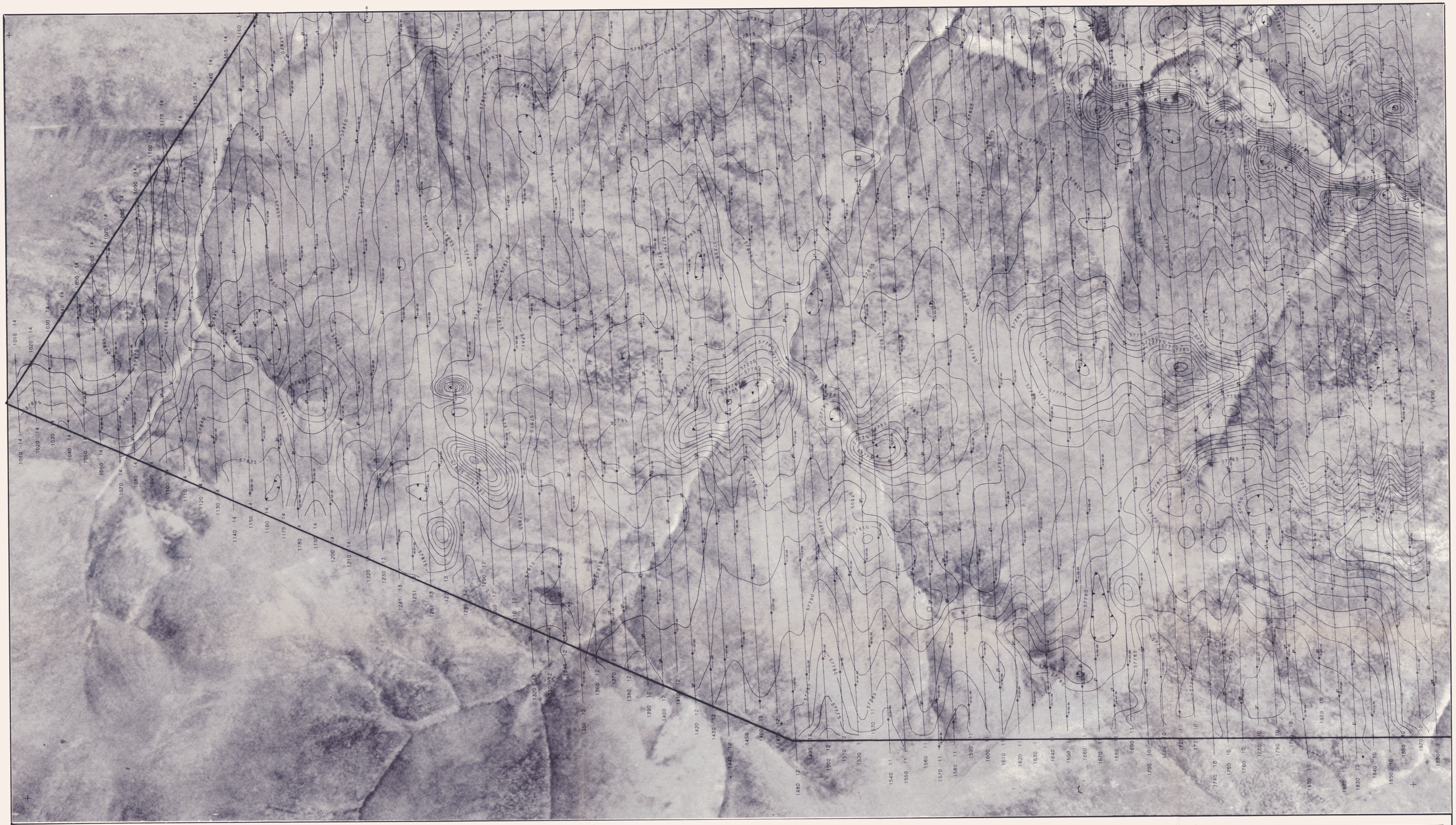
DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 3 - 3

J 8642

091760



TOTAL FIELD MAGNETIC CONTOURS

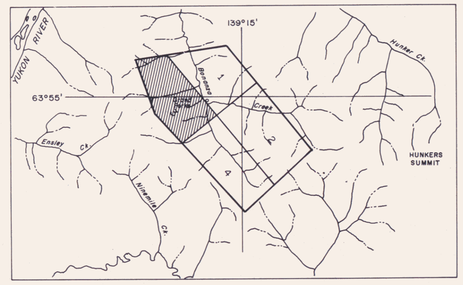
MEAN MAGNETOMETER SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL: 5 gammas

125 gammas

25 gammas

5 gammas



MARK MANAGEMENT LTD.

TOTAL FIELD MAGNETIC CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1580)

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 3 - 4

J 8642



VERTICAL MAGNETIC GRADIENT

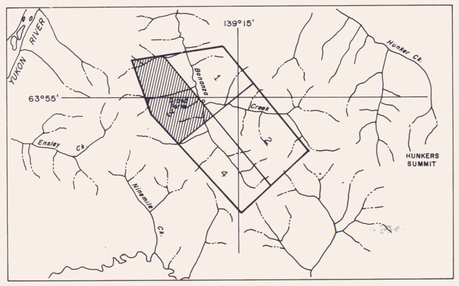
(CALCULATED FROM TOTAL MAGNETIC FIELD)

CONTOUR INTERVAL:

1.0 gammas / metre .....

2.5 gammas / metre .....

0.5 gammas / metre .....



MARK MANAGEMENT LTD.

COMPUTED VERTICAL MAGNETIC GRADIENT CONTOURS

DAWSON AREA

YUKON TERRITORIES

1581

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE:	January 1987
N.T.S. No:	115-O & N(E 1/2)
MAP No:	3-5

J 8642

091760

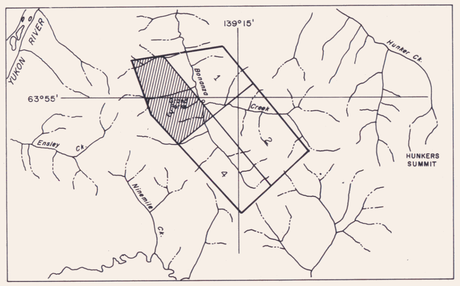
APPARENT RESISTIVITY CONTOURS

Calculated assuming 200 m conductive layer
(using 34K Hz coplanar data).

$10^{N.0}$ OHM-M — N = 1,2,3,...9

$10^{N.M}$ OHM-M — M = 1,2,3,...9

$10^{N.MP}$ OHM-M — P = 0.5



MARK MANAGEMENT LTD.

APPARENT RESISTIVITY CONTOURS

DAWSON AREA

YUKON TERRITORIES

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

MAP No: 3 - 6

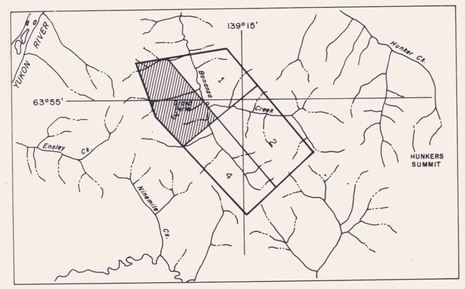
J 8642



VLF-EM TOTAL FIELD CONTOURS

VLF STATION: NLK (Jim Creek, Wash.) 24.8 kHz.
MEAN VLF-EM SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL:
50% .....
10% .....
2% .....



MARK MANAGEMENT LTD.

VLF-EM TOTAL FIELD CONTOURS

DAWSON AREA
YUKON TERRITORIES

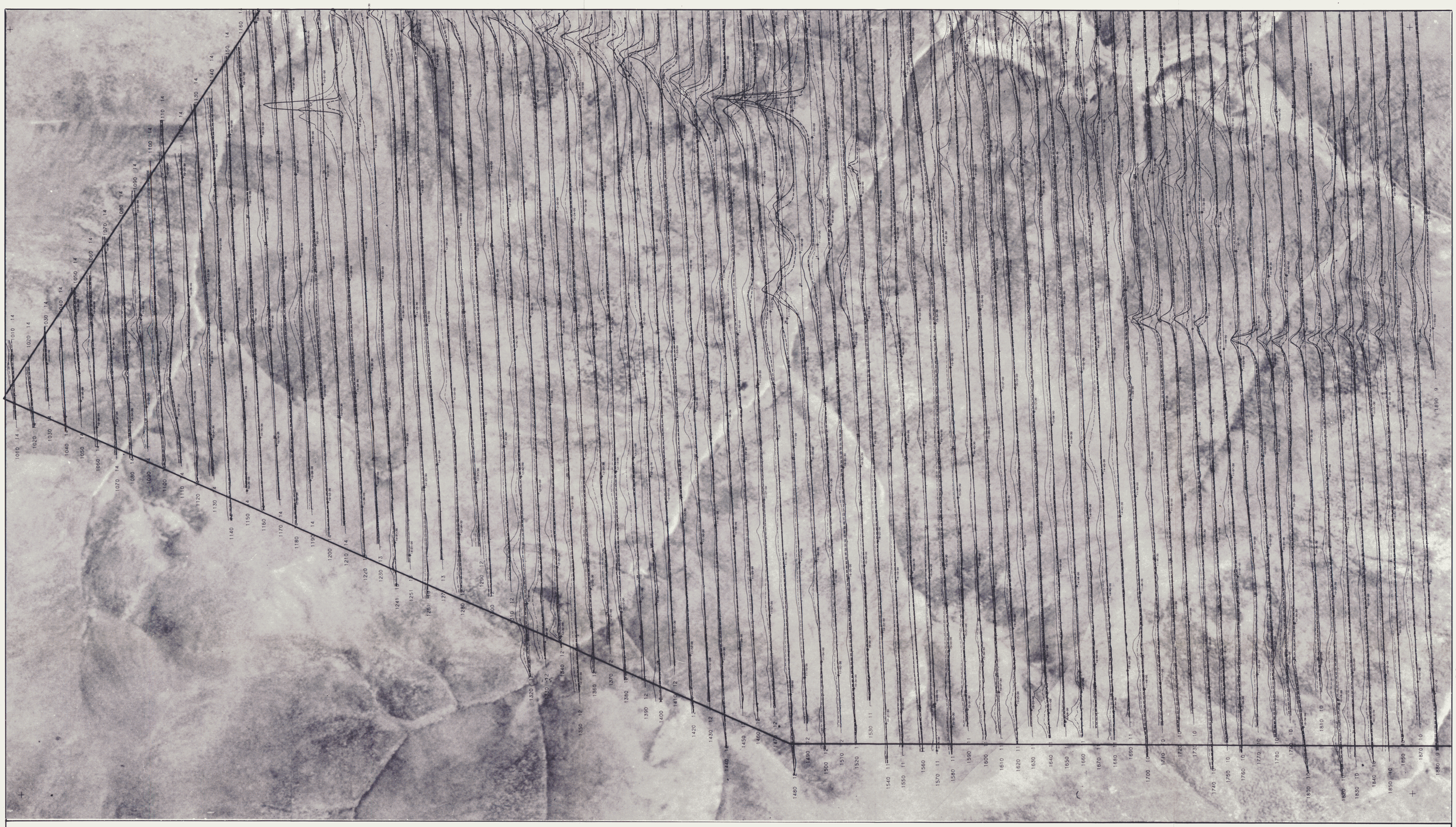
SCALE 1/10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE:	January 1987
N.T.S. No:	115-O & N (E 1/2)
MAP No:	3 - 7

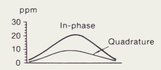
J 8642

091760



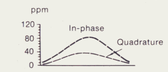
ELECTROMAGNETIC PROFILES-COAXIAL

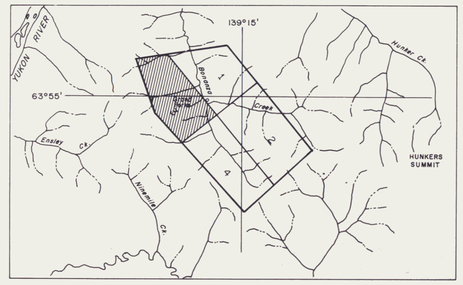
Coil Separation	7 metres
Frequency	4600 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	4175 Hz
Sensor Elevation	30 metres
Vertical Scale	8 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(15.84)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

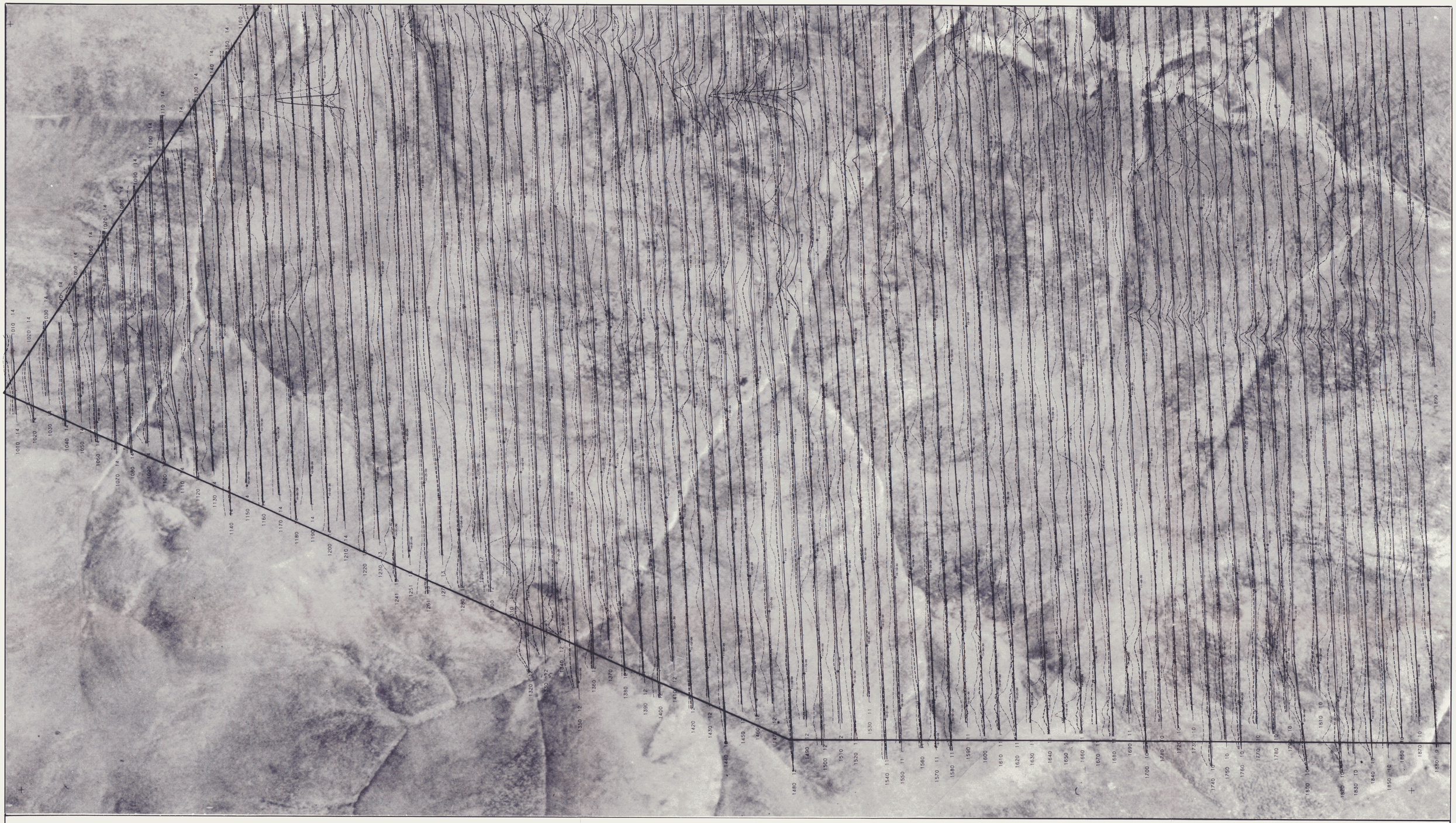
AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

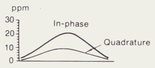
MAP No: 3 - 8a

J 8642



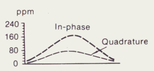
ELECTROMAGNETIC PROFILES-COAXIAL

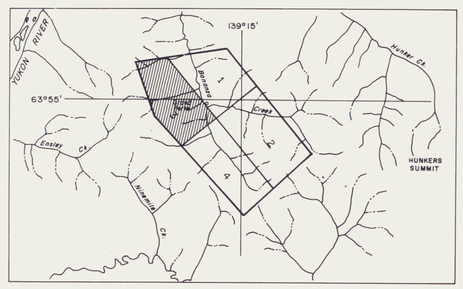
Coil Separation	7 metres
Frequency	935 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	34 K Hz
Sensor Elevation	30 metres
Vertical Scale	16 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(1585)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

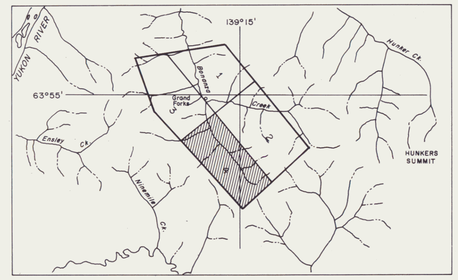
DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 3 - 8b

J 8642

091760



MARK MANAGEMENT LTD.

BASE MAP

DAWSON AREA

YUKON TERRITORIES

(1586)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

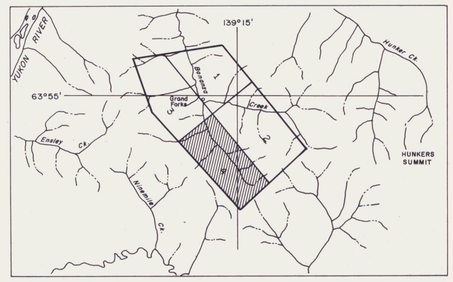
MAP No: 4 - 1

J 8642

00176



Positioning ..... VIDEO TRACKING FILM
Mean flight line spacing ..... 100 metres



MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY

DAWSON AREA
YUKON TERRITORIES

(1567)

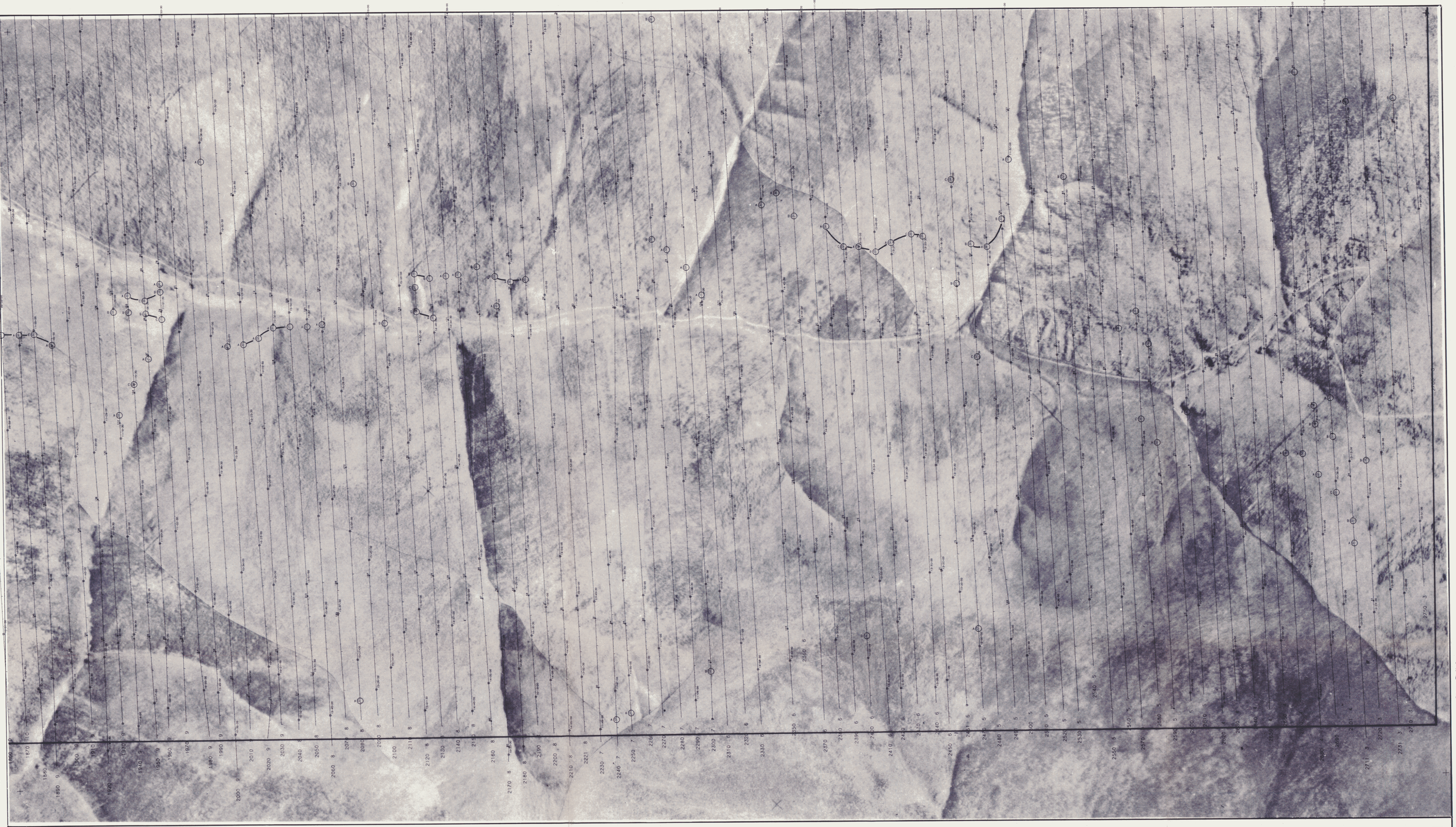
SCALE 1/ 10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987
N.T.S. No: 115-0 & N(E 1/2)
MAP No: 4 - 2

J 8642

.001760



INTERPRETATION LEGEND

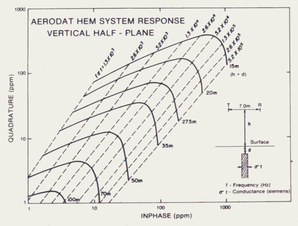
- EM Anomaly A. Conductivity thickness range 2 (see code)
- Interpreted bedrock conductor axis
- Possible bedrock conductor axis

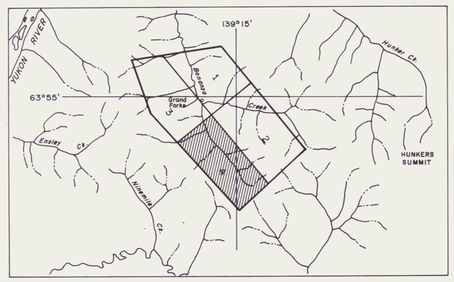
EM RESPONSE

Conductivity thickness in mhos

7	60 - 120
6	30 - 60
5	15 - 30
4	8 - 15
3	4 - 8
2	2 - 4
1	1 - 2
0	0 - 1

Positioning ..... VIDEO TRACKING FILM
Mean EM sensor elevation ..... 30 metres
Mean flight line spacing ..... 100 metres





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY INTERPRETATION

DAWSON AREA

YUKON TERRITORIES

1588

SCALE 1/10,000

0 330 660 1320 1/2 mile

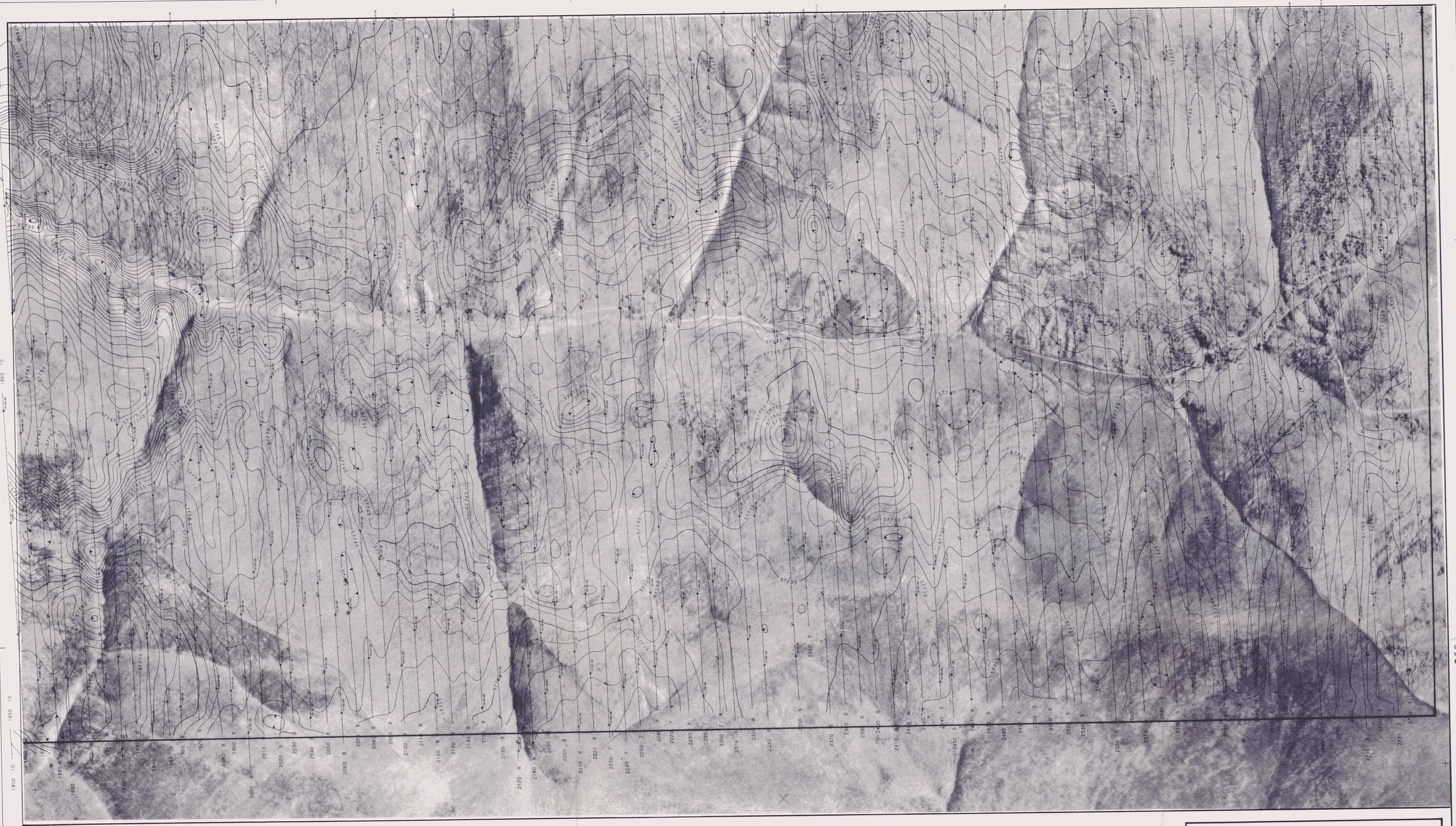
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE:	January 1987
N.T.S. No:	115-0 & N(E 1/2)
MAP No:	4 - 3

J 8642

091760



TOTAL FIELD MAGNETIC CONTOURS

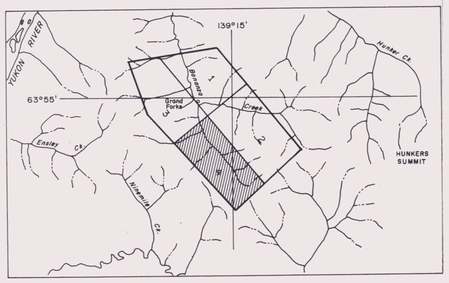
MEAN MAGNETOMETER SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL: 5 gammas

125 gammas

25 gammas

5 gammas



MARK MANAGEMENT LTD.

TOTAL FIELD MAGNETIC CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1589)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

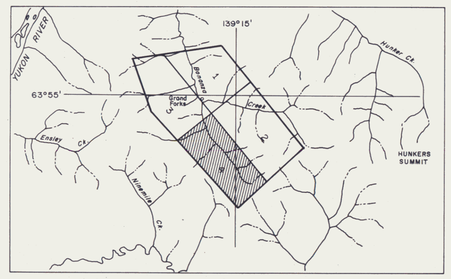
MAP No: 4 - 4

J 8642

VERTICAL MAGNETIC GRADIENT

(CALCULATED FROM TOTAL MAGNETIC FIELD)
CONTOUR INTERVAL:

1.0 gammas / metre .....
2.5 gammas / metre .....
0.5 gammas / metre .....



MARK MANAGEMENT LTD.

COMPUTED VERTICAL MAGNETIC GRADIENT CONTOURS

DAWSON AREA

YUKON TERRITORIES

(1590)

SCALE 1/ 10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

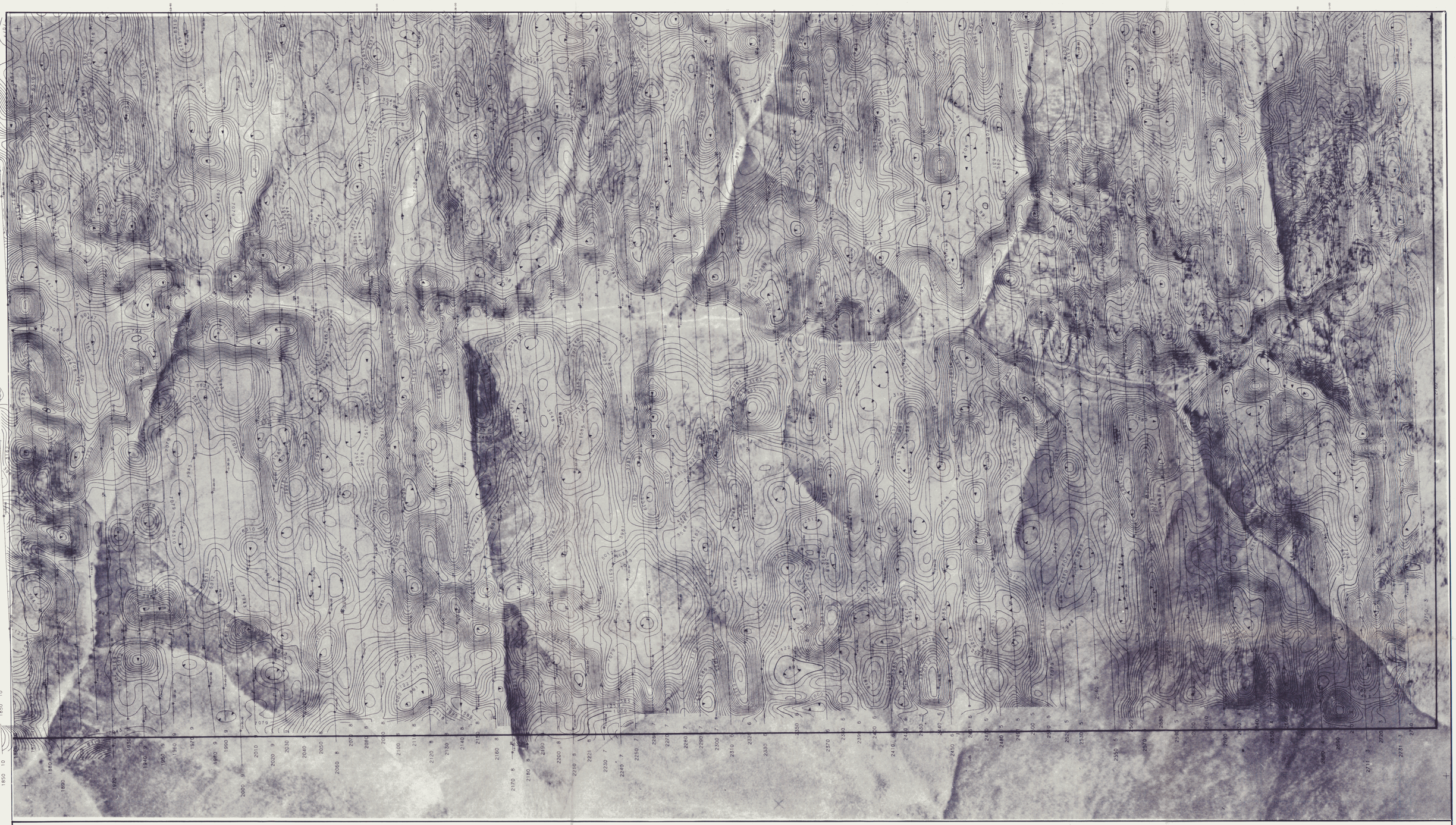
AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 4 - 5

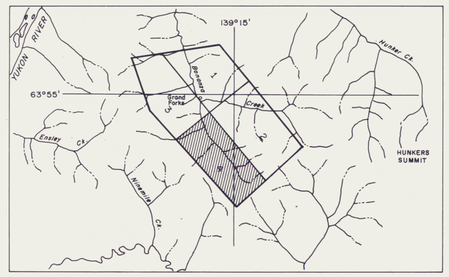
J 8642



APPARENT RESISTIVITY CONTOURS

Calculated assuming 200 m conductive layer
(using 34 K Hz coplanar data).

$10^{N.0}$ OHM-M N = 1,2,3, ... 9
$10^{N.M}$ OHM-M M = 1,2,3, ... 9
$10^{N.MP}$ OHM-M P = 0.5



MARK MANAGEMENT LTD.

APPARENT RESISTIVITY CONTOURS

DAWSON AREA
YUKON TERRITORIES

SCALE 1/10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987
N.T.S. No: 115-0 & N(E 1/2)
MAP No: 4 - 6

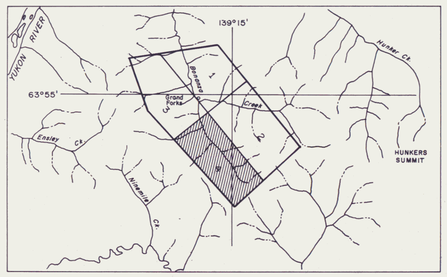
J 8642



VLF-EM TOTAL FIELD CONTOURS

VLF STATION: NLK (Jim Creek, Wash.) 24.8 kHz
MEAN VLF-EM SENSOR ELEVATION: 48 metres

CONTOUR INTERVAL:
50% .....
10% .....
2% .....



MARK MANAGEMENT LTD.

VLF-EM TOTAL FIELD CONTOURS

DAWSON AREA
YUKON TERRITORIES

1592

SCALE 1/10,000
0 330 660 1320 1/2 mile
0 100 200 500 1 Kilometre

AERODAT LIMITED

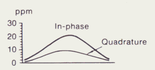
DATE: January 1987
N.T.S. No: 115·O & N(E 1/2)
MAP No: 4 - 7

J 8642



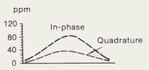
ELECTROMAGNETIC PROFILES-COAXIAL

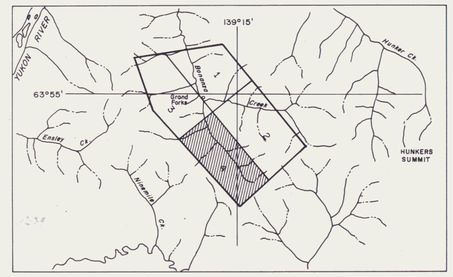
Coil Separation	7 metres
Frequency	4600 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	4175 Hz
Sensor Elevation	30 metres
Vertical Scale	8 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(1593)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-0 & N(E 1/2)

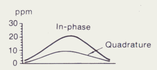
MAP No: 4 - 8a

J 8642



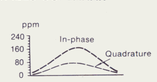
ELECTROMAGNETIC PROFILES-COAXIAL

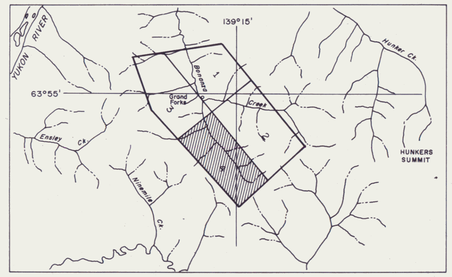
Coil Separation	7 metres
Frequency	935 Hz
Sensor Elevation	30 metres
Vertical Scale	2 ppm/mm



ELECTROMAGNETIC PROFILES-COPLANAR

Coil Separation	7 metres
Frequency	34K Hz
Sensor Elevation	30 metres
Vertical Scale	16 ppm/mm





MARK MANAGEMENT LTD.

ELECTROMAGNETIC SURVEY PROFILES

DAWSON AREA

YUKON TERRITORIES

(1594)

SCALE 1/10,000

0 330 660 1320 1/2 mile

0 100 200 500 1 Kilometre

AERODAT LIMITED

DATE: January 1987

N.T.S. No: 115-O & N(E 1/2)

MAP No: 4 - 8b

J 8642