Geophysical Report on Induced Polarization, Magnetic, Mise-a-la-Masse Surveys on the Tas Project for Black Swan Gold Mines Ltd.

N.T.S. 93 K/16 Omineca Mining Division

Latitude: ~~55° 52'~~ 54° 55' N Longitude: 124° ~~16'~~ 20' W

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Survey Dates: Sept. 1 - 23, 1989

Report Date: Oct. 12, 1989

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SUMMARY

A geophysical program including induced polarization, mise-a-la-masse, magnetic and gradiometer surveying was conducted across two grids, totalling 19.3 km, on the Tas Property in September, 1989. The focus of the present exploration is on gold and sulphide veins driven off from a diorite intrusion through a complex shear and fracture system. It was the intention of these surveys to detail two regionally defined anomalous areas and assist in the planning of a diamond drill program.

The 61 grid area contains a large, northeasterly trending band of high chargeability material flanking a dioritic intrusion. There is evidence of faulting in the area and sulphide mineralization has been observed in drill core and float.

The east ridge grid contains three large areas of increase chargeability. There are indications that the largest zone is comprised of numerous small north to north-northeasterly trending bands or veins, similiar to the geological environment mapped across the main ridge showings.

INTRODUCTION

Frontier Geosciences was commissioned by R. Somerville Geological & Mining Engineering Ltd. (RSGM) on behalf of Black Swan Gold Mines Ltd. to conducted a program of induced polarization, mise-a-la-masse, total field magnetic and gradient magnetic surveys across a portion of the Tas Project properties in central B.C. These surveys were being conducted as part of a larger exploration program with the intention of assisting in the planning of a fall drill program.

The focus of present exploration is on a package of strongly hornfelsed siltstone/tuff, andesite and hornblende augite porphyry units which host elevated gold mineralization in shear and fracture zones. Three zones have been outlined by previous exploration along an east-west trending ridge: the east zone, the mid zone and the west pit zone. Based on reconaissance geophysical and geological evidence, two proximal areas were selected for detail surveying: the east ridge grid, located immediately east of the east zone, and the 61 grid, located some 400 metres south of the west pit zone.

Some 9.1 line kilometres of induced polarization, total field magnetic and gradient magnetic surveying was completed on the east ridge grid. The 61 grid was covered by 10.2 kilometres of induced polarization, total field magnetic and gradient magnetic surveying and 7.8 kilometres of mise-a-la-masse surveying.

LOCATION AND ACCESS

The Tas property is situated approximately 50 km north of the town of Fort St. James and 150 km northwest of Prince George. It lies within the Omineca Mining Division and N.T.S. 93 K/16W. The approximate geographical coordinates are latitude 55° 52' N and longitude 124° 16' W. (Fig 1.)

The property can be directly accessed by two wheel drive vehicle on the all weather Inzana Lake logging road from Fort St. James. Access to various parts of the property are via rough logging roads and clear cuts.

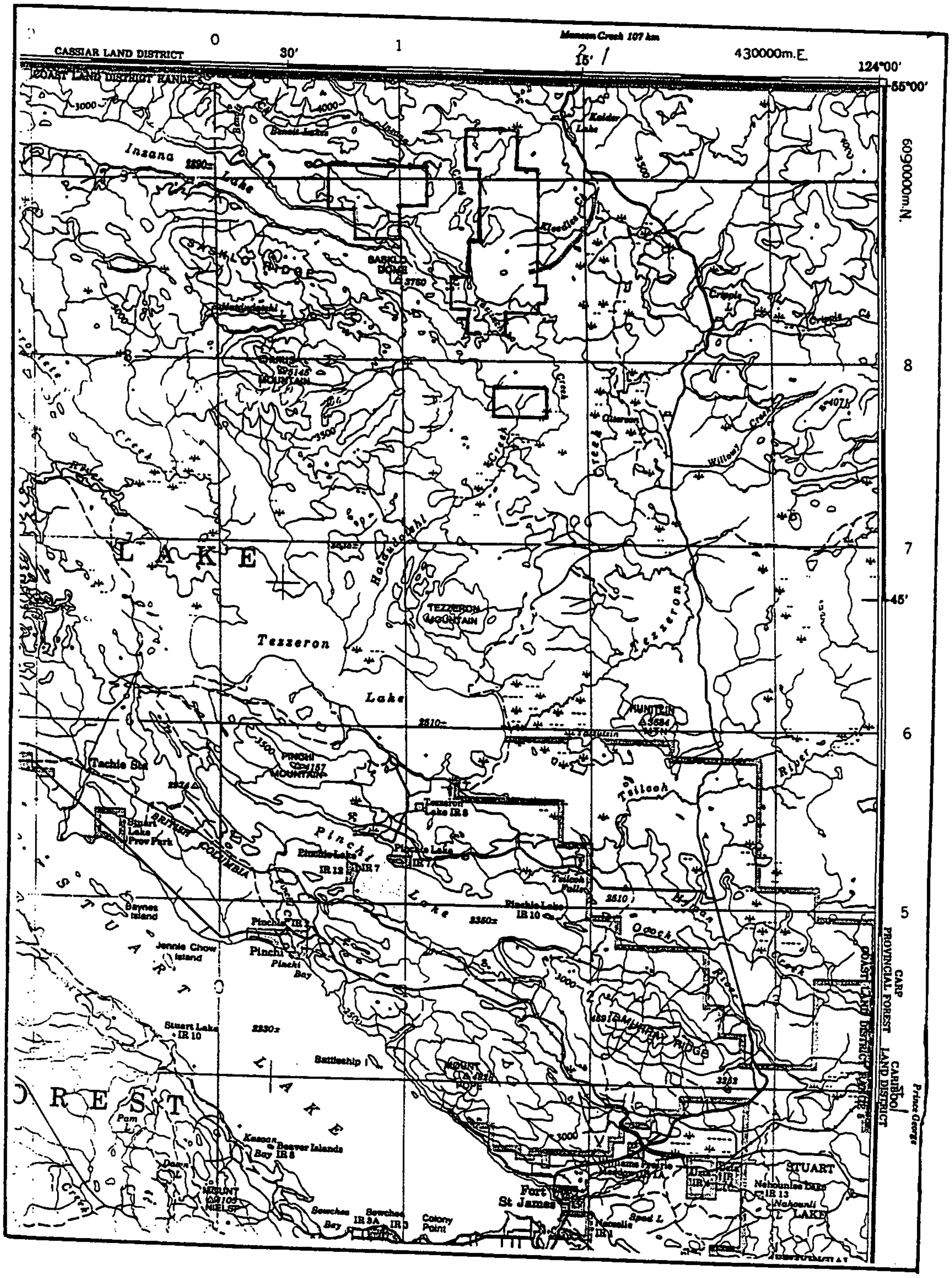
PROPERTY

The Tas Project claims, as provided to the author by RSGM, are listed below in TABLE I and illustrated on Figure 2.

TABLE I

NAME	UNITS	RECORD#	RECORD DATE	DUE	AREA (Ha)
Ha 1	18	7705	Jun 30	1991	450
Tas 1	9	8142	Jan 27	1991	225
Tas 2	12	7448	Dec 30	1990	300
Tas 3	9	7449	Dec 30	1990	225
Tas 4	12	7450	Dec 30	1990	300
Tas 5	8	7451	Dec 30	1990	200
Tas 6	15	7700	Jun 24	1991	375
Tas 7	20	7701	Jun 24	1991	500
Tas 8	20	7702	Jun 24	1991	500
Tas 9	20	7703	Jun 24	1991	500
Tas 10	15	7704	Jun 24	1991	375
Tas 11	20	7959	Sep 17	1991	500
Zana 2	20	8099	Dec 4	1989	500
Zana 3	20	8100	Dec 4	1989	500
Zana 4	15	8101	Dec 4	1989	375
Zana 5	20	8247	Mar 24	1990	500

It is understood by the author that these claims are currently under option by Black Swan Gold Mines Ltd. from Noranda Exploration Co. Ltd. however details of this option agreement have not been provided.



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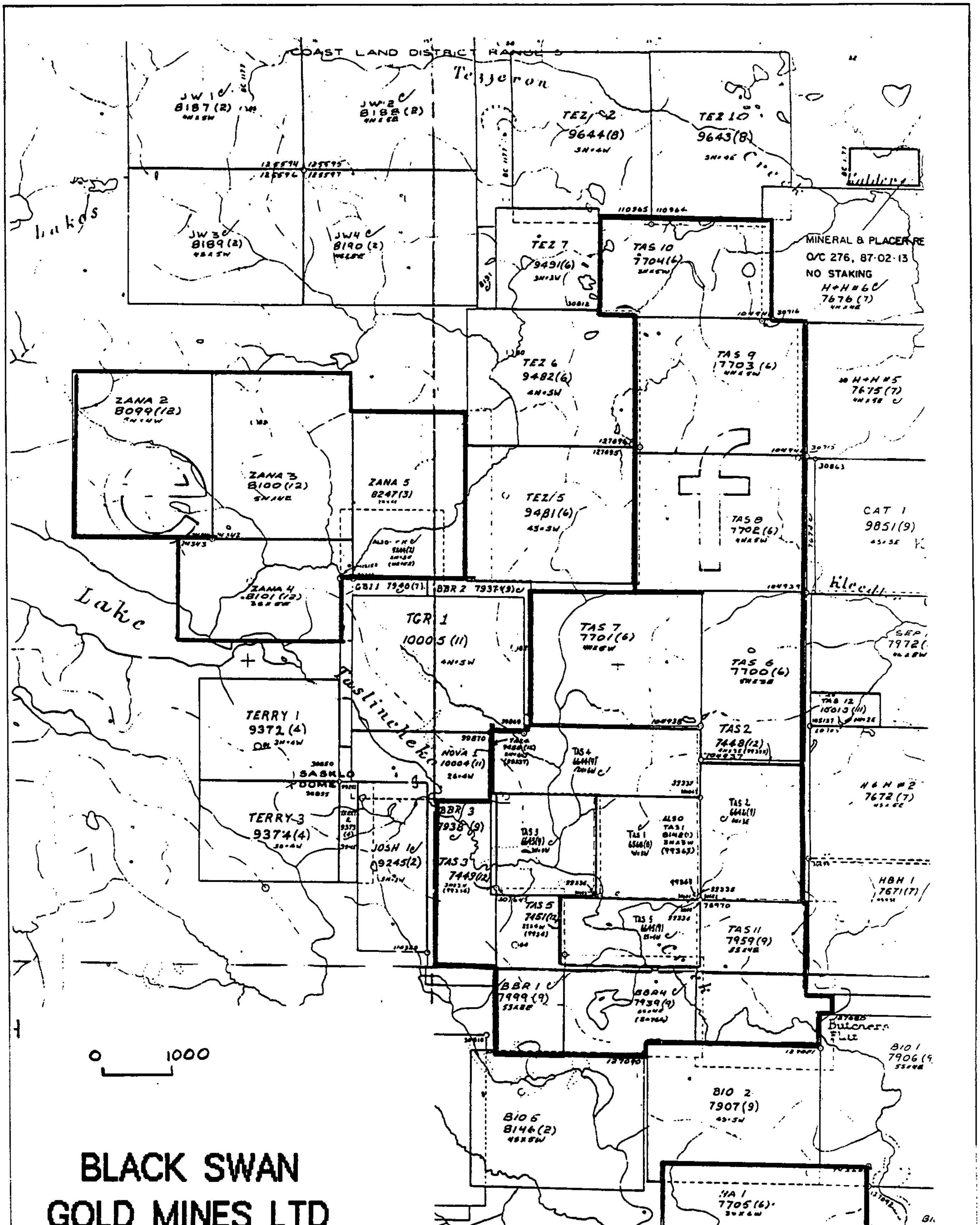
TAS PROPERTY

LOCATION MAP

FIGURE 1

Frontier Geosciences Inc.



BLACK SWAN GOLD MINES LTD

TAS PROPERTY CLAIM MAP

FIGURE: 2

Frontier Geosciences Inc.

TOPOGRAPHY AND VEGETATION

The area is characterized by pine flats, swampy areas and gently rolling hills. The flat areas include layered glacial debris, sandy plains and small eskers. The gently rolling hills consist mainly of resistant rock outcrop area.

Vegetation consist of mature stands of spruce, pine and balsam, which is presently being logged off in some areas. Undergrowth is mainly alder with some devil's club.

REGIONAL GEOLOGY

The regional geological description contained in this report has been copied from a Noranda Report authored by Gordon Maxwell and Lyndon Bradish, dated February, 1988.

> "The area has most recently been described by J.E. Armstrong in the G.S.C. Memoir 252, Fort St. James Map area, in 1949. The area has also been covered on G.S.C. Map 971A by H.M.A. Rice in 1949 (Geology of Smithers-Fort St. James Area).
>
> The Tas project lies in a broad northwest trending package of rocks known as the Quesnel Trough. These include Upper Triassic to Lower Jurassic Takla Group volcanics and sediments which have been intruded by a series of felsic to ultramafic stocks and batholiths, ranging in age from Upper Triassic to Lower Cretaceous.
>
> The Takla group volcanics and sediments include andesitic to basaltic flows, tuffs, tuff breccia and agglomerates interbedded with conglomerates, greywacke, shales and limestones. The intrusive rocks include the Hogem batholith and several other Omineca intrusions consisting of granite, syenite, granodiorite, quartzdiorite, diorite, gabbro and pyroxenite.
>
> The area is cut by numerous fault structures usually trending northwest, parallel to the Pinchi Fault. These may be subparallel splay faults with tensional or transverse structures trending east-west."

LOCAL GEOLOGY

The following local geology has been condensed from the 1988 Noranda Report described above.

The TAS property appears to be underlain by a strongly hornfelsed series of siltstone/tuff, andesite and hornblende-augite porphyry. This hornfelsing is believed to be a result of emplacement of the diorite stock in the area of the Freegold Zone. Gold mineralization appears to have been driven off from either the diorite or another source, through a complex shear and fracture system in the silstone/tuff.

Trenching outlined three main trends of gold mineralization: the east zone, mid zone and west pit zone. Gold mineralization in the east zone occurs as massive to stringer pyrite, pyrrhotite chalcopyrite and magnetite in what appears to be a prominent shear trending 350°.

The mid zone (250 metres west of the east zone) consists of a series of narrow sulphide filled shears, generally trending 030°.

The west pit zone is a strong shear zone which can be traced for almost 100 metres trending 350°. Gold mineralization occurs in bands of massive to stringer pyrite, pyrrhotite and chalcopyrite in widths up to 2 metres.

The most frequently encountered unit on the property is a hornfelsed siltstone or fine ash tuff, which has been cut by a weakly porphyritic diorite and a hornblende-augite porphyry. These intrusive units occur usually as large to small stocks or dykes. All units in the ridge area have been moderately to intensely fractured. The following units have been identified:

1: Hornfelsed siltstone or fine ash tuff... moderately to intensely fractured...trace to 10% pyrite, pyrrhotite and chalcopyrite.
2. Siltstone/shale ... locally hornfelsed.
3. Hornblende-augite porphyry occurs as small stocks and dykes cutting unit 1 ... weakly to moderately fractured ... 1-5% pyrite, pyrrhotite and chalcopyrite.
4. Hornblende porphyry .. occurs as narrow dykes cutting all units except 5.
5. Weakly porphyritic quartz diorite to diorite. Most prominnt intrusive in area. In ridge area occurs as small stocks and dykes cross cutting all units....diorite in Freegold area characterized by strong high mag signature.
6. Feldspar porphyry.. moderately to strongly chlorite altered.
7. Altered fault zone... strongly schistose with intense chlorite/clay alteration... 2-3% disseminated pyrite.
8. Quartz/carbonate altered zone... highly weathered ... 1-2% disseminated pyrite and 1-25% quartz and calcite veins.
9. Main host of gold mineralization in the Ridge area consists of stringer to massive sulphides, usually hosted in shears or heavily fractured siltstone/tuff or hornblende-augite porphyry... 5-80% pyrite, pyrrhotite and chalcopyrite in stringers and semi-massive to massive sulphide bands, ranging from 1 cm to 30 cm in thickness. Stringers are found in moderately to strongly brecciated and fractured areas immediately adjacent major shears containing thin, massive to semi-massive sulphide bands.

PROPERTY HISTORY AND PREVIOUS WORK

The following property history has been copied from a Noranda report authored by Gordon Maxwell and Lyndon Bradish, dated February, 1988.

> "In 1969, the N.B.C. Syndicate acquired the HAT claims to cover a copper occurence on the HA 1 claim and followed up with VHEM, mag and detail geology surveys. The area was covered by an airborne EM and Mag survey flown by Questor in 1981, contracted by Selco Exploration. The Sask claims, immediately north of the HA 1 were subsequently staked and followed up by ground HLEM and mag surveys. Two diamond drill holes were drilled in 1982 to the HLEM conductors.
>
> In 1982, the Inzana Lake forest access road was constructed through the area and during construction, a cat opened up disseminated copper mineralization near the Freegold zone. This area was staked by Alex Leggate and later allowed to lapse. The claims were then re-staked by A. Halleran of Fort St. James after receiving geochemically anomalous gold values in rock samples from the Freegold area. Visible gold was discovered in quartz/carbonate veins, not far from the original copper discovery by Noranda personnel on a routine property examination.
>
> The property weas optioned in 1985 and a small follow up program was initiated, including soil sampling, detail magnetometer survey, I.P. and recon geologic mapping. The I.P. lines were extended to cover part of the Ridge area, where a strong chargeability signature was encountered. In the spring of 1986, soil sampling over the Ridge area outlined strong gold geochem over a 1.5 km strike length. Subsequent hand trenching and cat stripping discovered numerous sulphide zones containing strong gold mineralization."

Additional geophysical surveys include 44 km of Vlf-em, 28 km of IP and 124 km of magnetics.

The Vlf-em survey utilized a Geonics EM-16 using the Seattle (NLK) transmitter station and measured dip and phase angle. The survey was conducted in July 1987 across the Ridge Grid with 25 metre stations. The results showed some broad crossovers indicating overburden changes and a couple of "conductors" which lacked any good quadrature response. This data is considered supportive of the IP resistivity data.

Magnetometer surveys were run during 1985, 1986 and 1987. They were useful in delineating some areas of high magnetic susceptibility with well defined boundaries, typical of an intrusive body. They showed the ridge grid to be underalin by a magnetically uniform package punctuated by small isolated zones of high magnetic susceptibility. The predominant magnetic strike was observed at 140°-160° as well as a subsidiary at 090°. A magnetic contact featured was identified at 045°.

The induced polarization survey utilized a Phoenix Geophysics frequency domain system with 1.2 kW Tx. In the early part of 1986 the same transmitter was used with a Huntec Mark IV time domain receiver and a two second cycle time. The system was configured in a dipole-dipole array. A dipole length 25 metres and n = 4 was used in detail applications while a 50 metre length with n = 3 was used on reconnaissance. Frequencies of 0.25 and 4.0 Hz were used measuring PFE and apparent resistivity. The IP data shows the ridge area to be underlain by relatively high (4-9%) PFE with localized highs. Both the PFE and resistivity data sets show a weak trend of 140°-160° which is supported somewhat by the magnetic survey. The resistivity data shows a number of high resistivity units, in particular a major package which runs in an East-West direction. Other areas have coincident resistivity and PFE highs and appear to be of small dimensions.

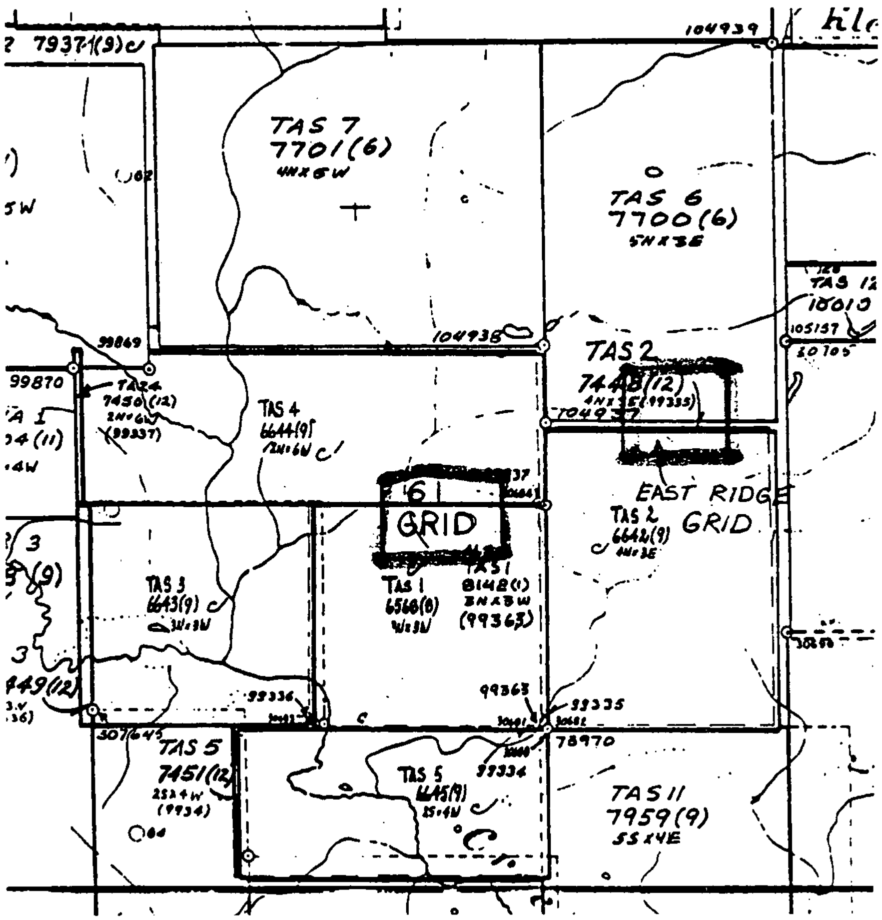
The 1988 Noranda report documents a further 4253 B-horizon soil samples collected on four separate grids. Approximately 6000 square metres of cat trenching was completed over the areas of strongest gold geochem. A small diamond drill program totalling 1188 metres in 17 holes was completed between June and August, 1987. In addition 11 percussion drillholes totaling 390 metres were also completed.

SURVEY GRIDS

The subject grids are located with respect to the claim boundaries as illustrated on figure 3.

Grid 61 straddles the border between the Tas 1 and Tas 4 claims. It is comprised of 17 north-south lines spaced on 50 metre centres and has stations marked at 25 metre increments along each line. The grid extends from line 9600E to 10400E and from station 9800N to 10400N. Drill hole DH-61 is collared at 10000N/10000E and was drilled at a 45° angle towards 340°. Drill hole DH-60 is collared at 10175N/10150E and was drilled at a 45° angle towards 0°.

The east ridge grid is located along the border between the Tas 2 and Tas 6 claims. This grid is essentially an extension of the existing grid which covers the three ridge showings. It is comprised of 13 east-west lines spaced on 50 metres centres with stations marked at 25 metre intervals. The grid extends from line 10300N to 9700N and from station 50200E to 50900E. This grid starts some 200 metres east of the east gold zone.



BLACK SWAN GOLD MINES LTD.
TAS PROPERTY
GRID LOCATION MAP
FIGURE 3

GEOPHYSICAL SURVEYS

The geophysical surveys conducted during this exercise included induced polarization, mise-a-la-masse, total field magnetics and gradient magnetics.

The induced polarization survey utilized a time domain Scintrex IPC-7/2.5 kW transmitter and Scintrex IPR-8 and IPR-10 receivers. The system was configured in a dipole-dipole array with an array length of 25 metres and was used with separations of n = 1, 2, 3 and 4. Information was gathered at 25 metre intervals along survey lines spaced 50 metres apart to providing measurements of apparent resistivity and chargeability. Calibration corrections necessary to merge the data recorded on the two different receivers were applied prior to data plotting.

The mise-a-la-masse survey is a variation of the three point (gradient) electrode resistivity system where one current electrode is imbedded in a known conductive zone while the other is positioned a long distance away. Potential measurements are gathered about the known conductive zone in order to determine the extent, strike, dip and continuity of the zone. This survey was conducted on the 61 grid where the near current electrode was placed in contact with sulphide mineralization intersected between 75.7 metres and 78.1 metres depth in DH-61.

The magnetic surveys were conducted using a GSM-19 gradiometer and base station. Station intervals of 12.5 metres were used on both survey grids. Total field and gradiometer information was gathered concurrently and the total field data was corrected for diurnal variations as recorded by a base station established on the property.

DATA PROCESSING

The GSM-19 gradiometer and magnetometer stored the field data in digital format during the course of the survey. Diurnal corrections were applied using the GSM-19 system software and the corrected information was downloaded to a peripheral computer each night.

The induced polarization data was recorded on field notes and entered into a digital data base. Data reductions which included instrument calibration and apparent resistivity calculations were applied through GeoSci Data Analysis Ltd. software.

The mise-a-la-masse survey information was also recorded in field notes and hand entered into a digital data base for subsequent processing and plotting.

Magnetic, apparent resistivity and chargeability results are presented in standard contour format at a 1:2500 map scale. This data, as well as IP pseudo sections and mise-a-la-masse potentials are also presented as false colour image mapping in order to clearly delineate the anomalies and trends observed.

DISCUSSION OF RESULTS

61 GRID

Two drill holes, DH-60 and DH-61 were spotted some 750 metres south of the West Pit zone in order to test an induced polarization anomaly observed on a regional survey. This anomaly is situated immediately northwest of a magnetically delineated intrusive body and DH-61 intersected a 2.4 metre interval of massive sulphides from 75.7 metres to 78.1 metres depth. The 61 grid was established across this anomaly and consisted of 17 north-south lines, spaced on 50 metre centres. Survey lines are 600 metres long and have stations flagged at 25 metre increments along their length. Induced polarization, mise-a-la-masse, total field magnetic and gradient magnetic surveys were conducted across this grid in order to detail the regional geophysical data and determine the optimum sites for further drilling programs.

False colour contour maps of chargeability (n = 1 - 4) and apparent resistivity (n = 1 - 4) are presented as figures 4a - 4d and 5a - 5d respectively in the text of this report. Standard contour maps for the n = 4 separation data are presented at a 1:2500 scale as figures 15 and 16. False colour pseudo sections for the apparent resistivity and chargeability data are presented as figures 6 and 7.

The apparent resistivity contour maps delineate three distinct responses which are likely tied to the major geological features. The most prominent is a resistivity high (> 800 ohm-m) located on the southern half of the grid. This feature likely reflects a dioritic intrusion which is also observed in the magnetic and chargeability data. The northern boundary of this intrusive body strikes northeasterly from the southwest corner of the grid and extends to line 10300E. To the northwest of this intrusion is an 045° striking resistivity low (< 500 ohm-m) extending from grid location 9600E/10050N to 9850E/10400N. The area between these two resistivity extremes forms a wedge shaped feature of moderate resistivity which flanks the intrusive body. This area is significant in that it is directly coincident with the zone of anomalous chargeabilities.

Plan maps and pseudo sections of the chargeability data indicate a large area of high chargeabilities which are centred along and trend roughly parallel to the northern flank of the mapped dioritic intrusion. The general trend is outlined by the 20 ms contour however a central core of > 50 ms chargeability values is evident between lines 9900E and 10150E. Local geological evidence suggests sulphide accummulations as the source of the high chargeability readings. Although the centre and highest readings of the anomaly are located immediately adjacent to the interpreted edge of the intrusion, anomalous chargeability values are recorded over the intrusion as well. This indicates that the sulphide mineralization either extends into the intrusion or that the diorite is buried at some depth and the surrounding sulphide halo covers a portion of the intrusion. The chargeability anomaly increases in both areal extend and intensity with depth. Although drill holes DH-60 and DH-61 were drilled on the anomalous trend, both holes missed intersecting the extremely high, central core of it.

Magnetic data was gathered at 12.5 metre intervals along the survey lines. The total magnetic field intensity data is diplayed in false colour format as Figure 8 and in standard contour form on Figure 17. The magnetic intensity varies by some 700 nT across this grid with the dioritic intrusion to the south being clearly outlined by a high magnetic response (> 57000 nT). A magnetic low surrounds the intrusive body however this is more likely related to the intrusion than to an anomalously low magnetic susceptibility unit. At this latitude, the angle of inclination of the primary magnetic field typically produces anomalously low magnetic intensities along the northern flanks of isolated magnetic highs. The magnetic low observed in the extreme southeast corner of the grid is likely related to an intrusion located to the south of the 61 grid. A number of small, isolated magnetic highs located within the magnetic low halo may be reflecting small dykes or stocks splaying off the main intrusion. Of particular interest are the magnetic highs located on lines 9800E and 9850E near station 10050N. These responses form part of a 110° striking lineation which displaces the northeasterly trending magnetic low in the manner of a left lateral fault. Reflections of this same lineation are weakly evident on both the apparent resistivity, chargeability and magnetic gradient maps.

The magnetic data in the northwest corner of the 61 grid exhibit a gradual increase in intensity towards 310°. The contour maps indicate a northeasterly regional strike with the 56900 nT contour directly coinciding the axis of the apparent resistivity low lineation.

A false colour contour map of the magnetic gradient data is presented as Figure 9a. It illustrates two very different magnetic environments. The dioritic intrusion is reflected as an area of extremely sharp magnetic variations. Small areas exhibiting gradients of +/- 25 nT/m are scattered across the intrusion indicating a generally random distribution of pockets of high magnetic susceptibility materials. There are however some hints of continuity to these anomalies in two directions: 110° and 30°. The strongest of these lineations is a positive magnetic gradient which cuts through the intrusion along a direct extension of the 110° fault described above. A two-dimensional filter, biased with a preferred strike orientation of 110°, was passed over the magnetic gradient data and the results are presented as Figure 9b. This display clearly illustrates this anomalous feature. The bulk of the 61 grid is reflected by very quiet magnetic gradients (+/- 1 nT/m) with a couple of noteable exceptions. Anomalous magnetic gradients are observed in the vicinity of grid coordinates 10150E/10175N, 9650E/10100N, 10200E/10350N and 10300E/10160N. The first anomaly is directly coincident with DH-60 and may be related to the casing or other loose metallic debris associated with the abandoned drill pad. The other anomalies may be small outliers of the mapped dioritic intrusion.

The mise-a-la-masse survey utilized the DH-61 sulphide intersection as a near current electrode. A 1.5 amp current was introduced to the ground and a commutating measurement of voltage was recorded at 25 metre intervals along the survey lines. As illustrated on Figure 10, the voltage potentials about the intersected sulphide show a slight ellpitical bias to the southwest. This implies that the sulphide source is a small isolated body, slightly elongated in an 045° direction, parallel to the edge of the dioritic intrusion.

EAST RIDGE GRID

The east ridge grid starts 200 metres east of the East Zone gold and sulphide occurance. The grid is comprised of thirteen east-west lines, spaced 50 metres apart (50300N to 49700N inclusive), extending for 700 metres (50200E to 50900E) with stations flagged at 25 metre increments.

Induced polarization, total field magnetic and gradient magnetic surveys were run across this grid in order to detail the regional geophysical data.

False colour contour maps of the chargeability (n = 1-4) and the apparent resistivity (n = 1-4) are presented as figures 11a - 11d and 12a - 12d respectively in the text of this report. Standard contour maps for the n = 4 data are presented at a 1:2500 scale as figures 18 and 19. False colour pseudo sections for the apparent resistivity and chargeability data are presented as figures 13 and 14.

The apparent resistivity plan maps are dominated by an 030° lineation which, in the shallow (n=1) data, traces the contact between a low resistivity unit to the northwest and a higher resistivity unit to the southeast. As the exploration depth increases, the apparent resistivity high appears to widen at the expense of the resistivity low so that at the n=4 separation the grid is divided into low resistivities to the north and higher resistivities to the south. However, the general 030° strike characteristic is preserved along local lineaments.

Three separate chargeability features are noted on the east ridge grid. In the northwest corner the 10 ms contour outlines a chargeability anomaly which increases in intensity to the north and is considered open in this direction. The chargeability response is interesting in that it is associated with an apparent resistivity high on lines 10150N through 10250N and with an apparent resistivity low on line 10300N. This suggests that we may be seeing the edge effect from a larger anomaly to the north. Further geophysical surveying is necessary to resolve the ambiguity.

The second chargeability feature is located along the eastern ends of lines 50250N to 49950N. It is well defined by the 20 ms contour on the n=4 data and increases in size and intensity with depth. This feature is directly coincident with well defined resistivity low and is considered open to the east.

The third, and largest, chargeability anomaly is the large area occupying the central and south-central portions of the survey grid. The general area of elevated chargeability values is actually composed of a number of smaller anomalies which generally reflect a north to north-northeasterly bias. The zone extends south from line 50150N as outlined by the 18 ms contour on the n=4 plan map (figure 11d). It widens and increases in intensity both to the south and to depth. This same area exhibits apparent resistivities over 500 ohm-metres which is consistant with the amplitudes observed along the northwestern flank of the dioritic intrusion mapped on grid 61. No consistant correlation is observed between chargeability and apparent resistivity anomalies with one noteable exception. A localized chargeability high, centred at grid coordinates 50050N/50550E, is directly coincident with a southerly trending finger of resistivity low values.

The magnetic data was gathered at 12.5 metre increments along the lines and the data is presented in false colour format as figure 15 and in standard contour format as figure 22. The magnetic intensities observed on this grid are much more quiet than those noted on grid 61. The bulk of the data is contained within a 100 nT range between 56900 nT and 57000 nT. Anomalous highs and lows generally form narrow, localized features between 25 metres and 75 metres in length and are typically oriented north or slightly east of north, paralleling the IP defined lineations. As a general observation, the southwest quadrant of the grid exhibits lower magnetic field values while the northern and eastern halves are populated with numerous localized highs. These magnetic highs are relatively weak, typically being some 20 nT higher than the surrounding host. The majority of the anomalies are small and caused by near surface variations, possibly boulders of intrusive material scattered throughout the overburden. The larger anomalies may be reflecting variations in either the depth to bedrock or its' composition.

The gradiometer survey produced inconclusive results. Four lines, 50100N to 49950N inclusive exhibited extremely quiet magnetic gradients, typically +/- 2 nT/m. The remaining lines exhibited extremely noisy data with gradients greater than +/- 20 nT/m being observed. Although this data was repeatable, no consistant correlations were observed between the gradiometer data and either the total magnetic field or IP data.

CONCLUSIONS

61 Grid

The geophysical data gathered across the 61 grid supports the proposed geological model, suggesting that gold and sulphide mineralization has been emplaced in a complex shear and fracture system, proximal to an intrusive body.

Both the magnetic and apparent resistivity data clearly outline the presence of a northeasterly trending intrusion which enters the 61 Grid in its' southwest quadrant. Regional surveys indicate this is a part of a larger dioritic intrusion located to the south of this grid. A zone of anomalously high chargeability flanks the northwestern edge of the intrusive body and although the two drill holes spotted on this grid lie within the anomaly, neither hole has tested its' central core. Geological and drill hole information suggest disseminated to massive sulphide accumulations as being the most likely source of the increased chargeability. The anomalies increase in size and intensity with depth suggesting a corresponding increase in mineralization in this direction. The mise-a-la-masse survey shows the sulphides intersected in drill hole DH-61 are part of a localized body, slightly elongated at 040°, parallel to the dioritic intrusion.

There is both magnetic and induced polarization evidence of a fault striking at 110° across the intrusion and into the surrounding host. Two specific orientations of magnetic lineations are dominant in the gradiometer data: 110° and 030° suggesting a complex fault system is present within and around the intrusion.

Considering the geological environment, it is likely that the large chargeability anomaly is actually reflecting an area containing numerous sulphide rich lenses and veins. Individual zones are unlikely to be resolved by the IP technique and since the economic viability of these types of deposits will depend largely upon the gold concentrations, the fringe areas of the chargeability high are as potentially favourable as the central core.

East Ridge Grid

The geophysical data gathered across the east ridge grid suggests a similiar environment to that observed across the main ridge. No large intrusive mass was detected however there are a number of small magnetic highs which may be delineating small dykes or stocks. A strong apparent resistivity lineation suggests a geological contact strikes at 030° across the northwestern portion of this grid. A large number of small chargeability anomalies have been detected which could be outlining mineralized shears or veins similiar to those observed to the west. The dominant orientation of these small geophysical anomalies is 0° to 030°, similiar to the directions noted on the three known sulphide and gold zones to the west.

RECOMMENDATIONS

61 Grid

Future exploration of this grid should depend largely upon a systematic drilling program to evaluate the large area of interest identified by the geophysical surveys. The most effective exploration procedure will be to drill a fence of holes extending between grid locations 9800E/10250N and 10050E/10000N. This will effectively test both the central core of the anomaly as well as the flanks. The exact location of the drill holes can be determined by local terrain and logistical considerations. No clear indication of geological dip is evident in the IP data and the drilling azimuth and dip should be determined from other criteria.

East Ridge Grid

Three chargeability targets have been identified as priority for continued exploration.

The large chargeability high, associated with a resistivity low located on the eastern ends of lines 50250N to 49950N warrants further investigation. A drill hole is recommended to test the lithology at 50 metres depth beneath grid location 50100N/50800E.

The chargeability high located in the northwest corner of this grid warrants drill testing. A drill hole is recommended to test the lithology 50 metres below grid location 10300N/10350E.

The third chargeability anomaly is the large area occupying the central and south-central portions of the survey grid. The 0° - 30° chargeability, resistivity and magnetic lineations are consistent with the sulphide and gold shear systems mapped across the ridge zones. Drill testing is recommended to test the higher chargeability trends within this zone, with priority being given to the coincident chargeability high and apparent resistivity low extending from 49950N/50525E to 50150N/50575E.

The geophysical data across both the 61 grid and east ridge grid should be reviewed upon completion of the proposed drilling program.

Respectfully submitted,

E. Trent Pezzot, B.Sc.

CERTIFICATE

I, E. TRENT PEZZOT, of the City of Richmond, Province of British Columbia, hereby certify as follows:

- I am a principal of Frontier Geosciences Inc., a company incorporated under the laws of the Province of British Columbia.
- The office of Frontier Geosciences Inc. is located at Suite 7, 84 Lonsdale Ave, North Vancouver, B.C.
- I graduated from the University of British Columbia in 1974 with a BSc. degree in the combined honors Geology and Geophysics program.
- I have practiced my profession continuously from that date.
- I hold no interest, direct or indirect, in Black Swan Gold Mines Ltd. or any of its' affiliates, nor do I expect to receive any.
- I consent to the use of this report or the information contained within it, provided the context is not changed to alter the intended meaning, in or in connection with a Prospectus or in a Statement of Material Facts.

E. Trent Pezzot

BSc. Geophysics/Geology

October 12, 1989

GSM-19 MAGNETOMETER / GRADIOMETER SPECIFICATIONS

Resolution:	0.01 nT, magnetic field and gradient
Accuracy:	0.2 nT over operating range
Gradient Tolerance:	up to 5000 nT/metre
Operating Interval:	4 seconds minimum, faster optional. Reading initiated by keyboard depression, external trigger or F or carriage return via RS-232C.
Input/Output:	6 Pin weatherproof connector, RS-232C, and (optional) analog output.
Power Requirements:	12v 300 mA peak (during polarization). 35 mA standby 600 mA peak in gradiometer mode.
Power Source:	Internal 12v, 1.9 Ah sealed lead-acid battery standard, other optional. External 12v power source can be used.
Battery Charger:	Input: 110/220 VAC, 50/60 Hz and/or 12VDC. Output: 12v dual level charging.
Operating Ranges:	Temperature: -40° C to +60° C Battery Voltage: 10v min. to 15v max.
Dimensions:	Console: 223 x 69 x 240mm. Sensor staff: 4 x 450mm sections. Sensor: 170 x 71mm diameter.
Weights:	Console: 2.1 kg. Staff: 0.9 kg. Sensor: 1.1 kg each.

SPECIFICATIONS

SCINTREX IPC-7/2.5kW

Output current	10 amperes maximum
Output voltage	switch selectable up to 1210 volts D.C.
Automatic cycle timing	T:T:T:T; ON: OFF: ON: OFF
Automatic polarity change	each 2T
Pulse durations	standard: T = 2, 4 or 8 seconds, switch selectable
	optional: T = 1, 2 or 4 seconds, switch slectable
	optional: T = 4, 8 or 16 seconds, switch slectable
Voltage meter	1500 volts full scale logarithmic
Current meter	standard: 10.0 amps full scale logarithmic
	optional: 0.3, 1.0, 3.0 or 10.0 amps. full scale linear. switch selectable
Dimensions	280 mm x 460 mm x 310 mm
Dummy load	mounted in control unit cover
Temperature range	-30°C to +55°C
Weight	30 kg.
Shipping weight	41 kg.

Motor Generator Set

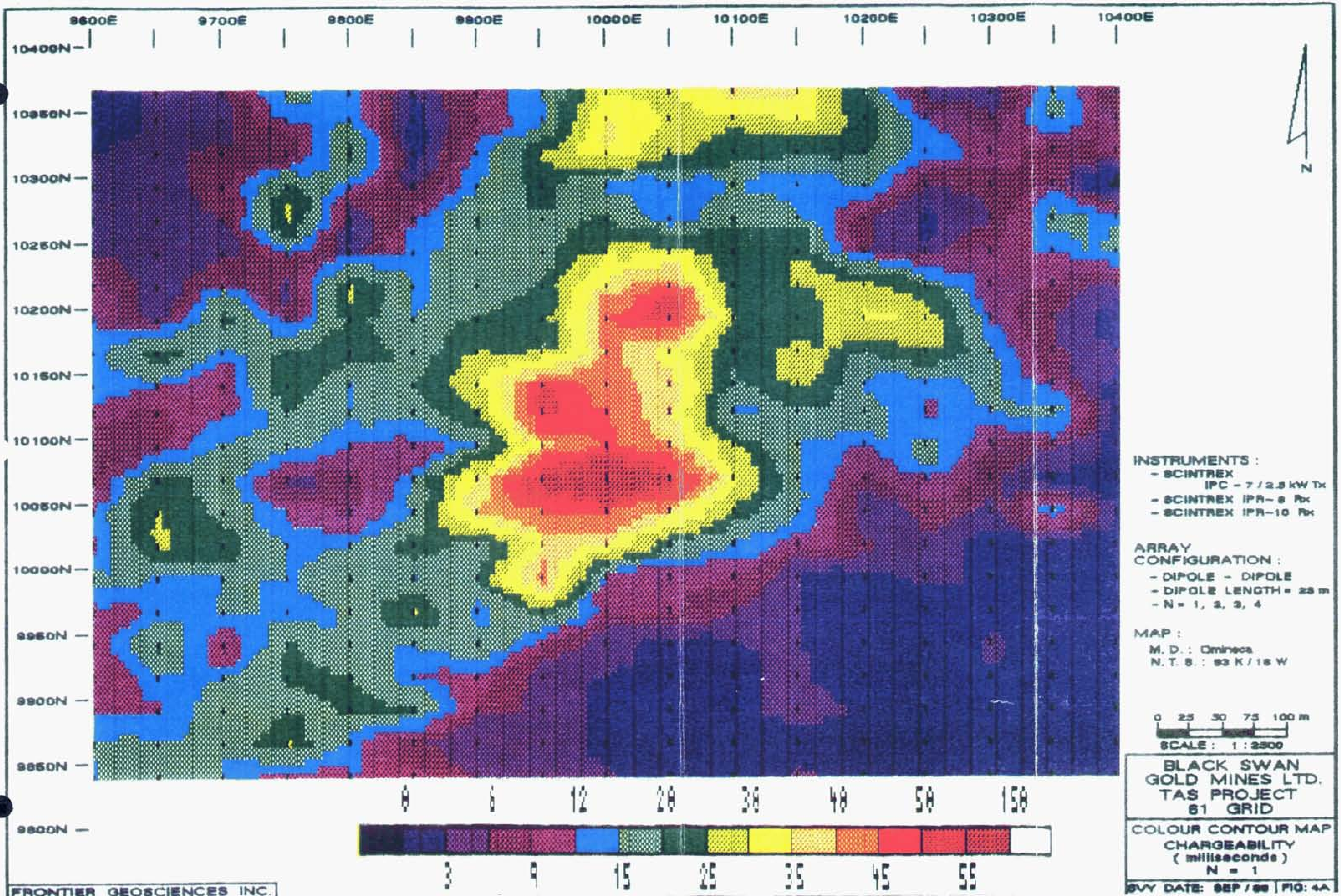
Maximum output power	2.5 KVA, single phase
Output voltage	110 volts, A.C.
Output frequency	400 Hz
Motor	4 stroke, 8 h.p. Briggs and Stratton
Weight	59 kg.
Shipping weight	90 kg.

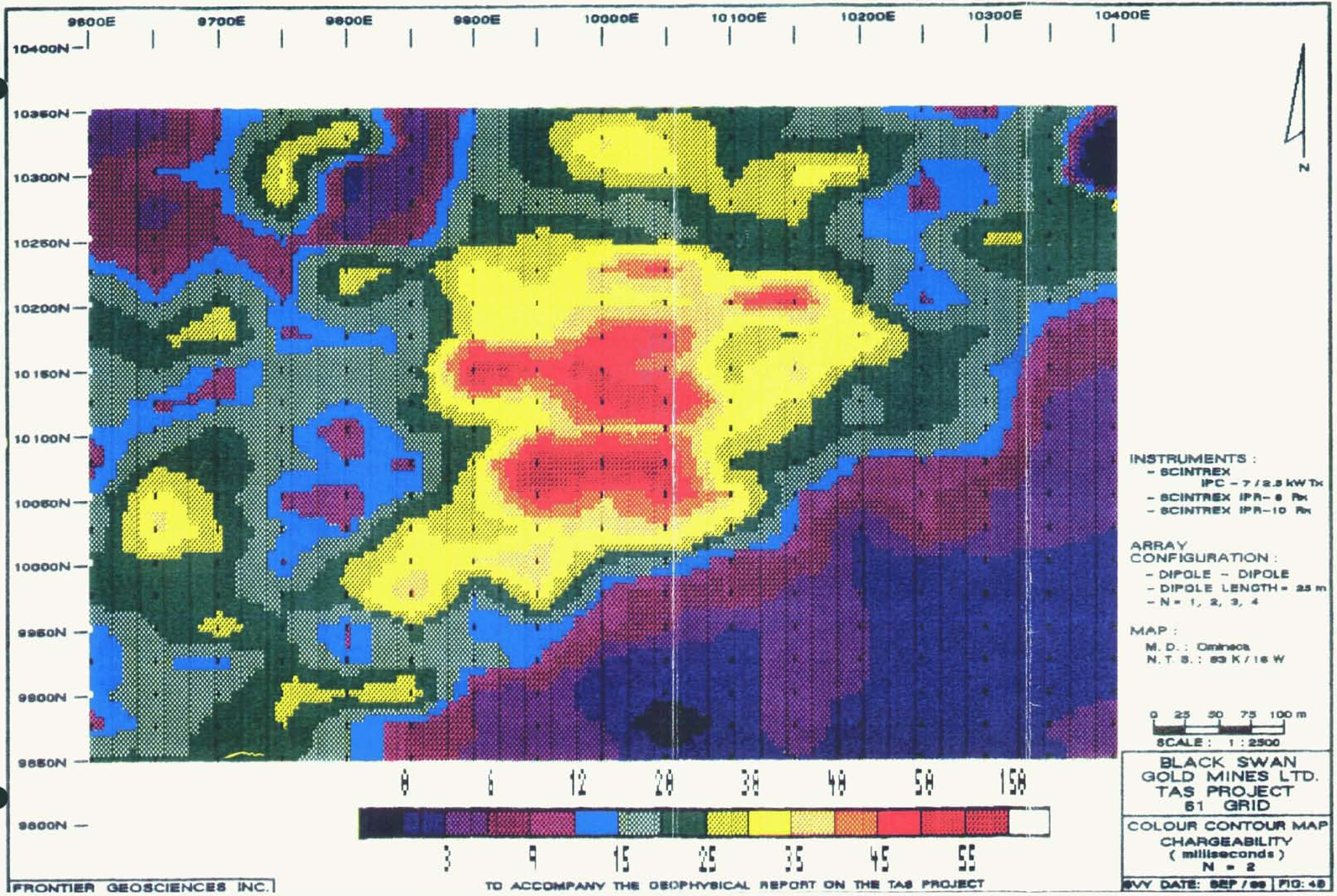
SPECIFICATIONS

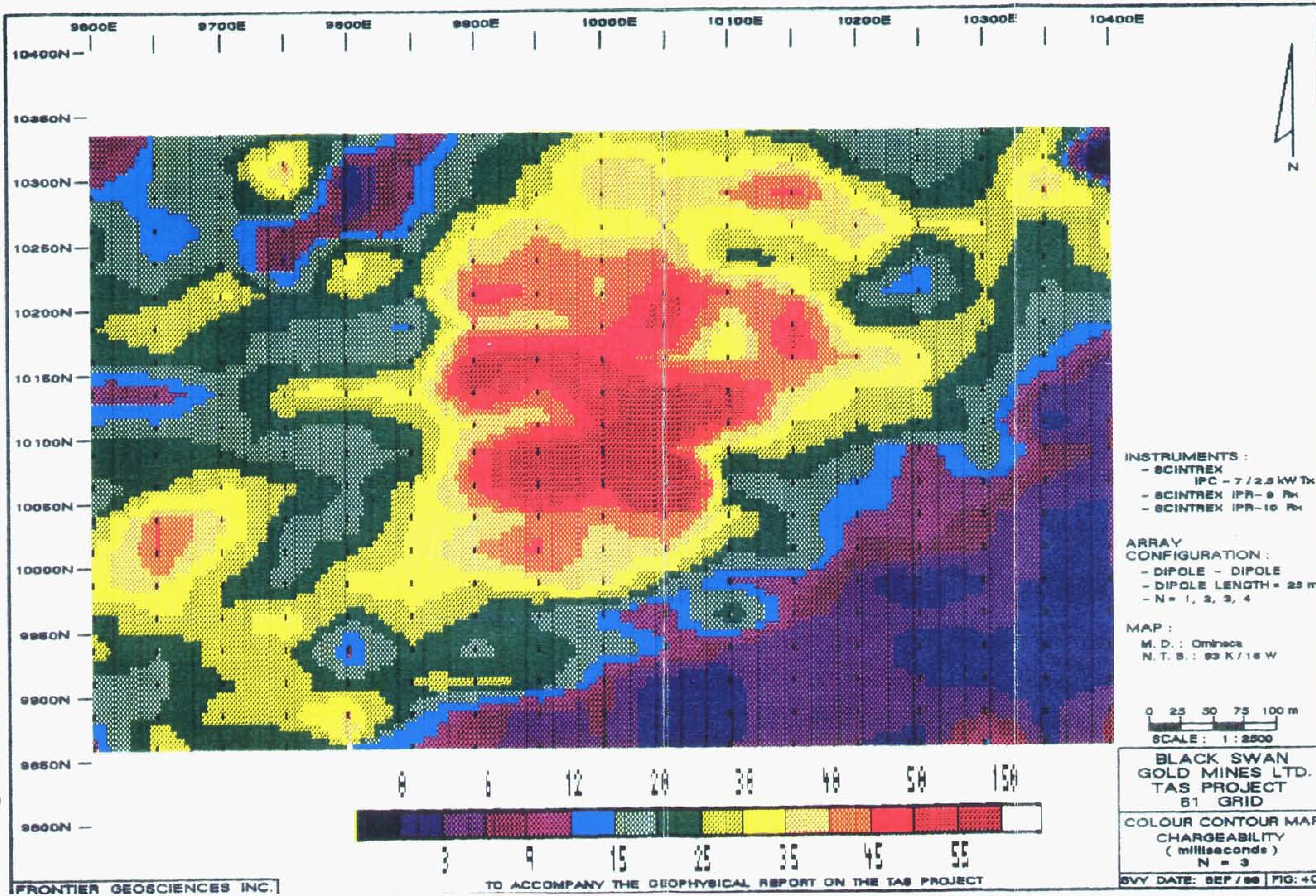
SCINTREX IPR-8

Input Impedance	3 megaohms
Primary Voltage (Vp) Range	300 microvolts full scale to 40 volts full scale in 10 ranges
Accuracy of Vp Measurement	+/- 3% of full scale
Vs/Vp Ranges	20 and 100 mV/V full scale
Vs/Vp Accuracy	+/- 3% of full scale
Primary SP Buckout Range	+/- 1 volt
Accuracy of SP Measurement	+/- 3%, +/- 5% mV
Automatic SP Tracking Range	6 x Vp, maximum +/- 1 volt
Continuity Meter Reading	0 - 500 k ohms
50 or 60 Hz Powerline Rejection	-50 db (300x)*
Low Pass Filter	6 db/octave with fc = 20 Hz and 12 db/octave with fc = 36 Hz
Required Stability of Transmitter Timing	Need only exceed measuring program selected (1 or 2 seconds)
Operating Temperature Range	-30°C to +60°C
Dimensions	320 mm x 135 mm x 160 mm
Weight, Complete with Lid and Batteries	3.6 kg
Power Supply	4 D cells - Eveready No. 1050 or equivalent; estimated battery life 2 months intermittent duty at 25°C. 1 Alkaline cell Eveready No. E91 or equivalent; estimated life 1 year

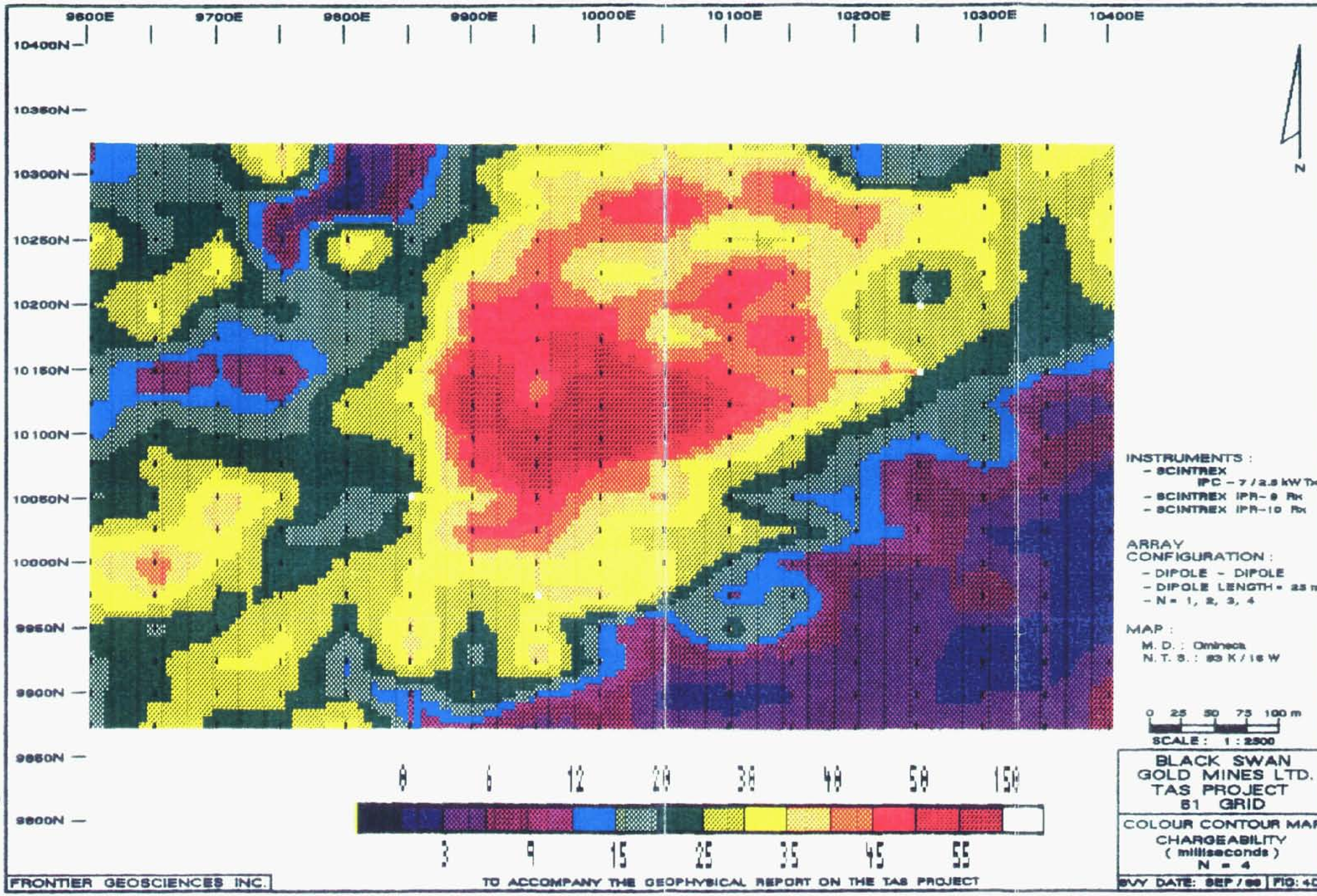
* 50 or 60 Hz depending on power system.

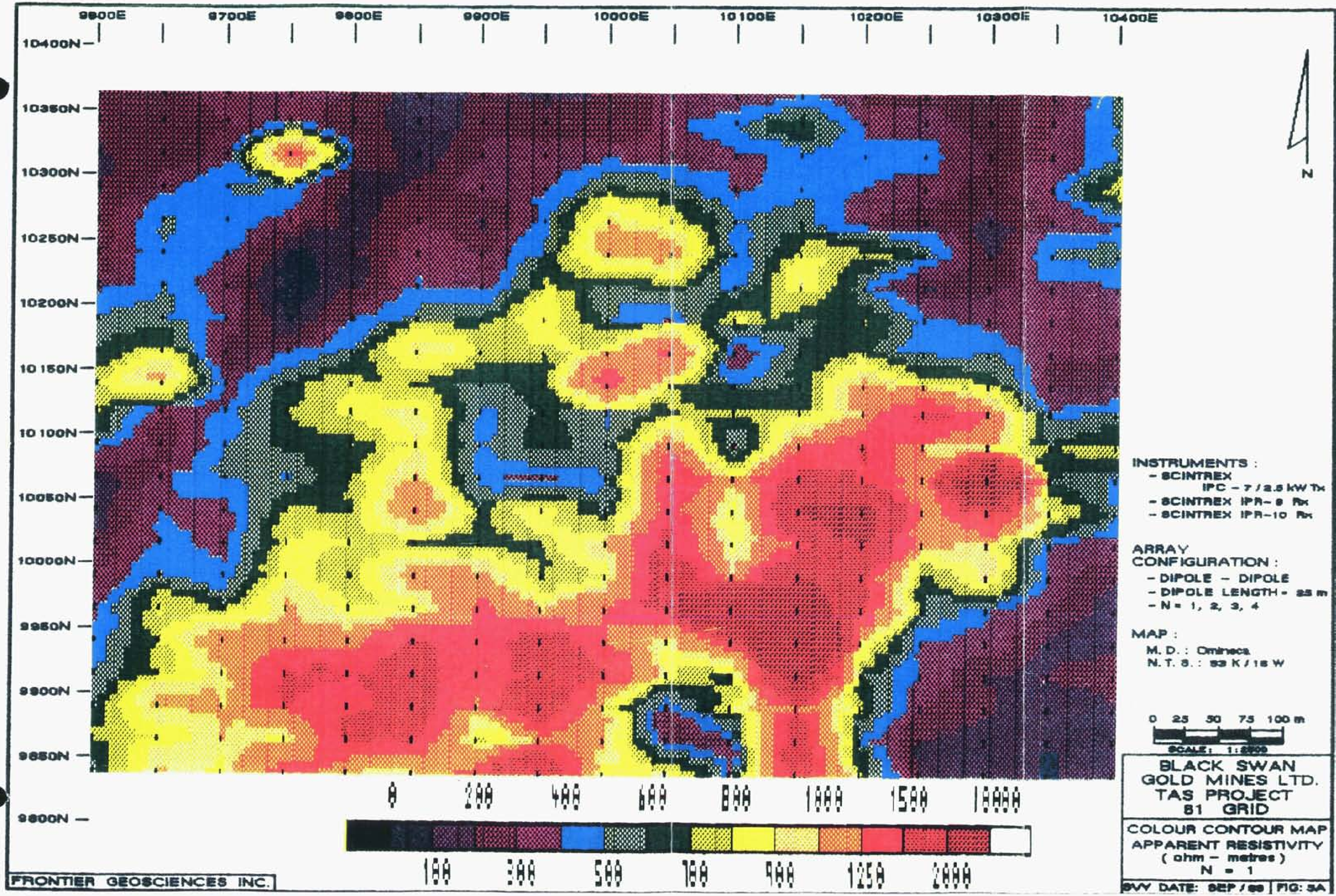

9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
6
12
20
30
40
50
150
3
9
15
25
35
45
55
INSTRUMENTS :
- SCINTREX
IPC - 7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 1
SVY DATE: SEP / 88
FIG: 4A
FRONTIER GEOSCIENCES INC.

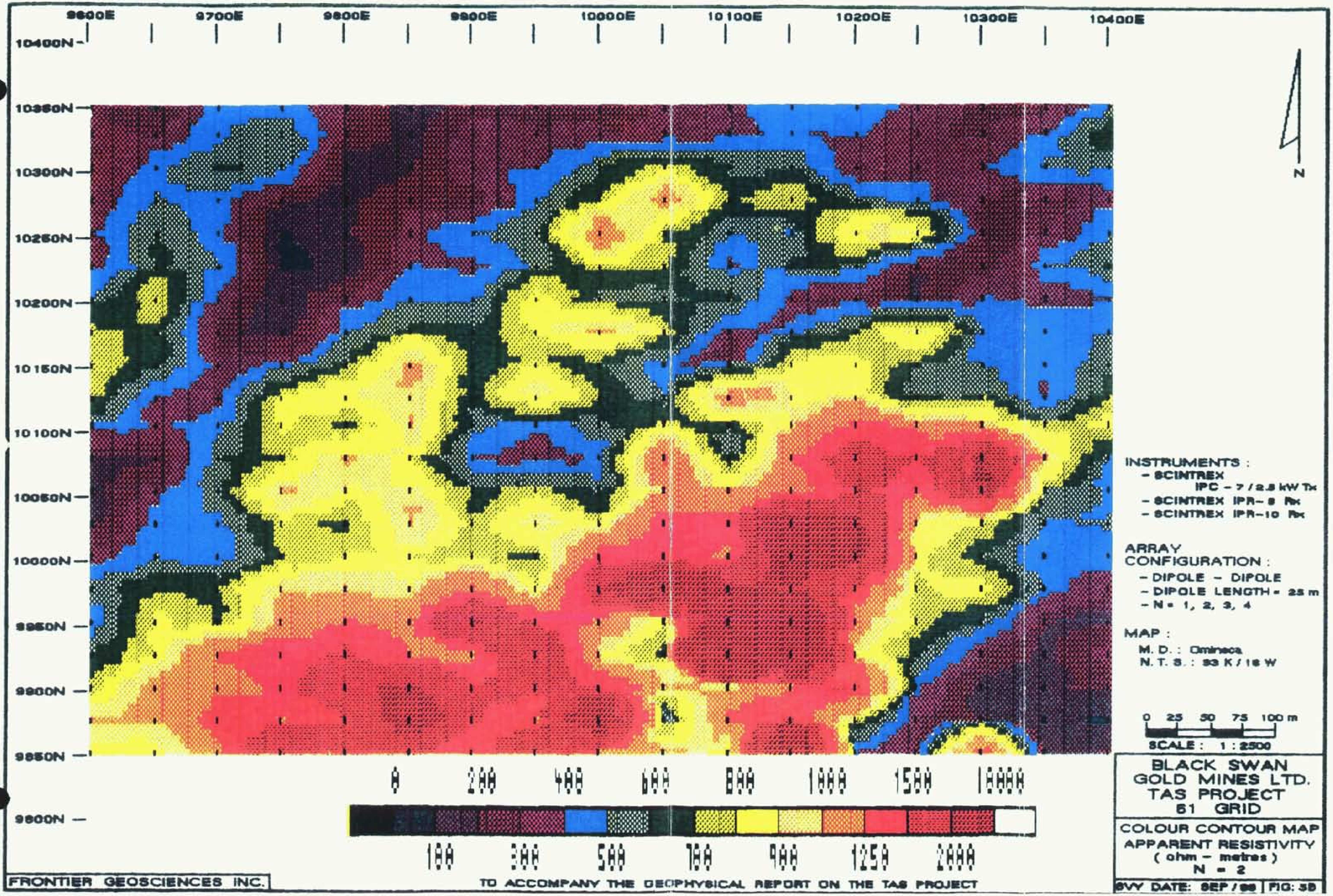

9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
INSTRUMENTS :
- SCINTREX
IPC - 7 / 2.5 kW Tx
ARRAY
CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 2
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



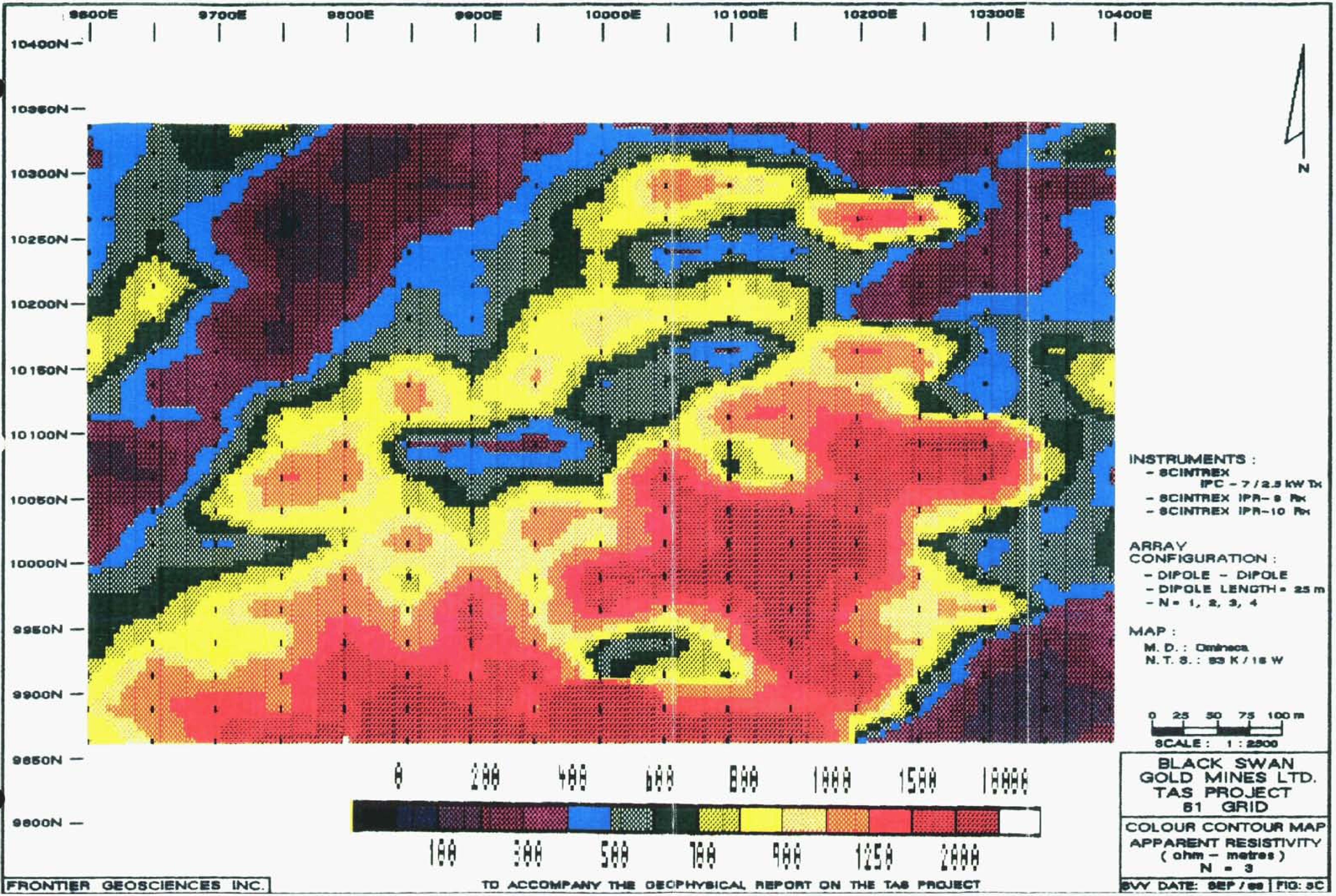
9600E
9700E
00E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
6
12
20
30
40
50
150
3
9
15
25
35
45
55
INSTRUMENTS :
- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR- Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 3
SVY DATE: SEP /
FIG: 4C
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT

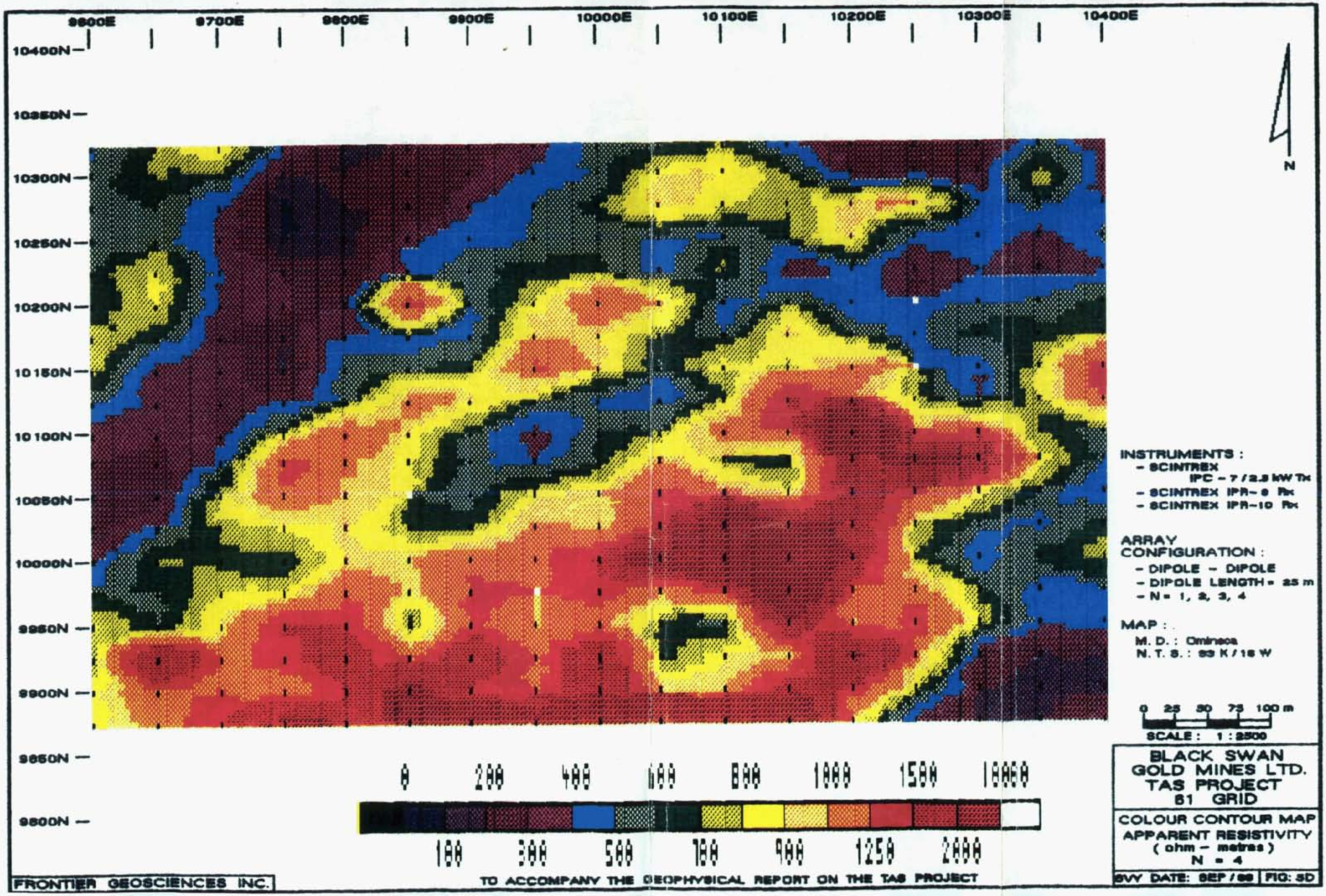

9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
6
12
20
30
40
50
150
3
9
15
25
35
45
55
INSTRUMENTS :
- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR- 8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 4
FIG: 4D
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT

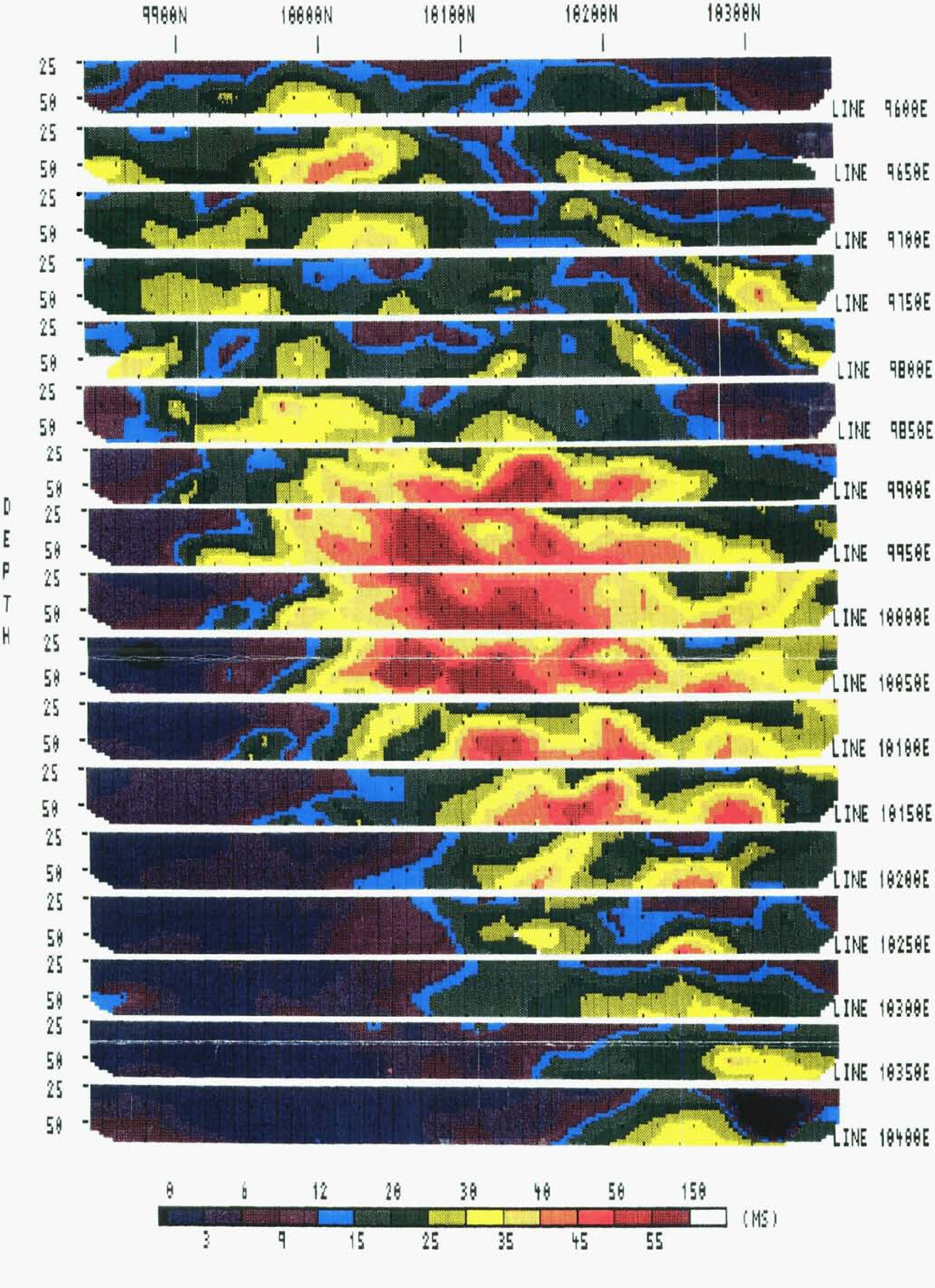

9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
200
400
600
800
1000
1500
10000
100
300
500
700
900
1250
2000
INSTRUMENTS :
- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH - 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
0 25 50 75 100 m
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
81 GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 1
FIG: 5A
FRONTIER GEOSCIENCES INC.



9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
200
400
600
800
1000
1500
10000
100
300
500
700
900
1250
2000
INSTRUMENTS :
- SCINTREX
IPC - 7 / 2.5 kW Tx
- SCINTREX IPR- 8 Rx
- SCINTREX IPR-10 Rx
ARRAY
CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 2
SVY DATE: SEP /
FIG: 5B
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT


9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
200
400
600
800
1000
1500
10000
100
300
500
700
900
1250
2000
INSTRUMENTS :
- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR - 8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 3
SVY DATE: SEP
FIG: 5C
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT

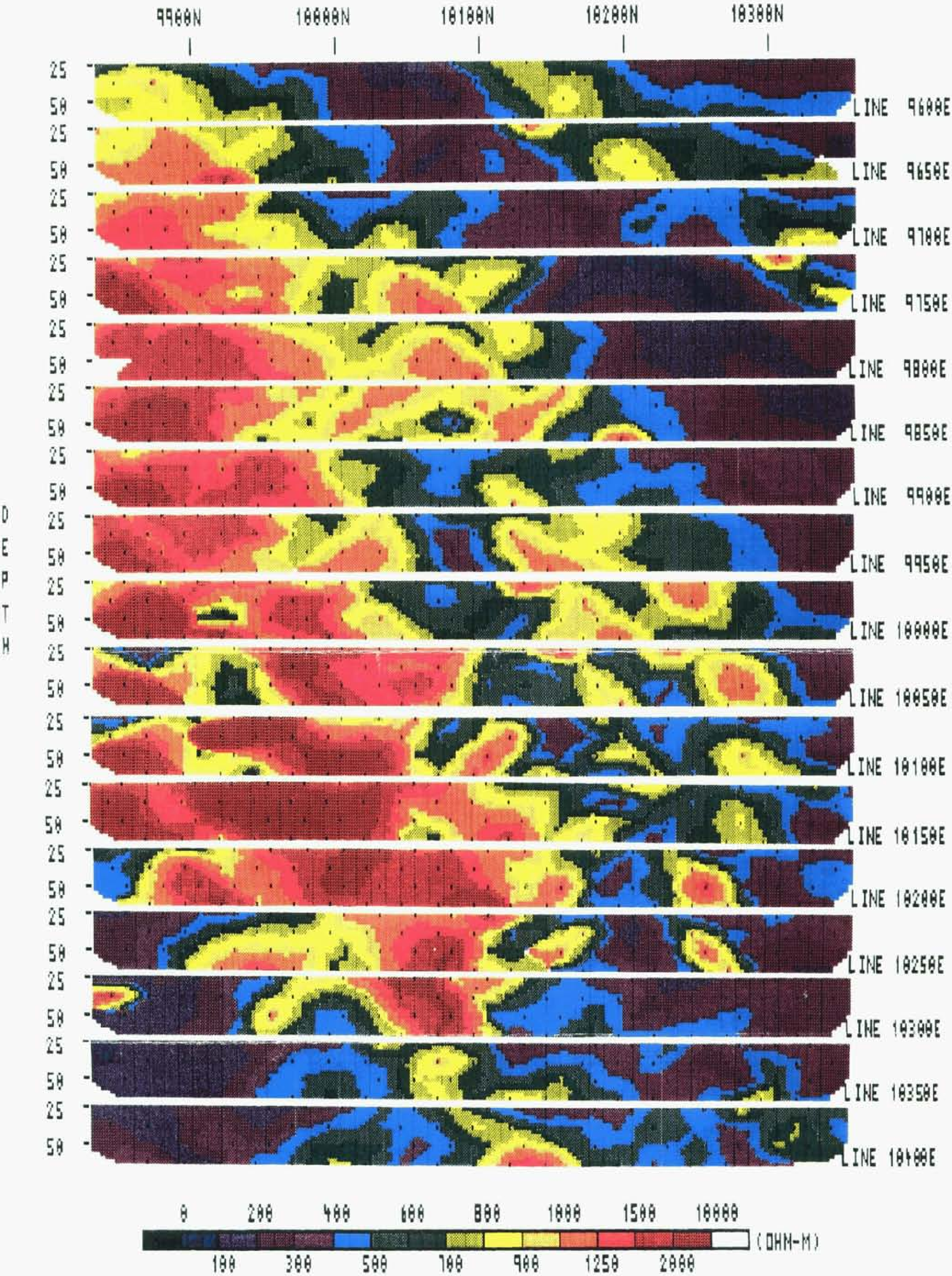

9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
0
200
400
600
800
1000
1500
10000
100
300
500
700
900
1250
2000
INSTRUMENTS :
- SCINTREX
IPC - 7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 4
SVY DATE: SEP /
FIG: 5D
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



61 GRID
INDUCED POLARIZATION PSEUDO - SECTIONS
CHARGEABILITY (milliseconds)
SURVEY DATE: SEPT. / 89

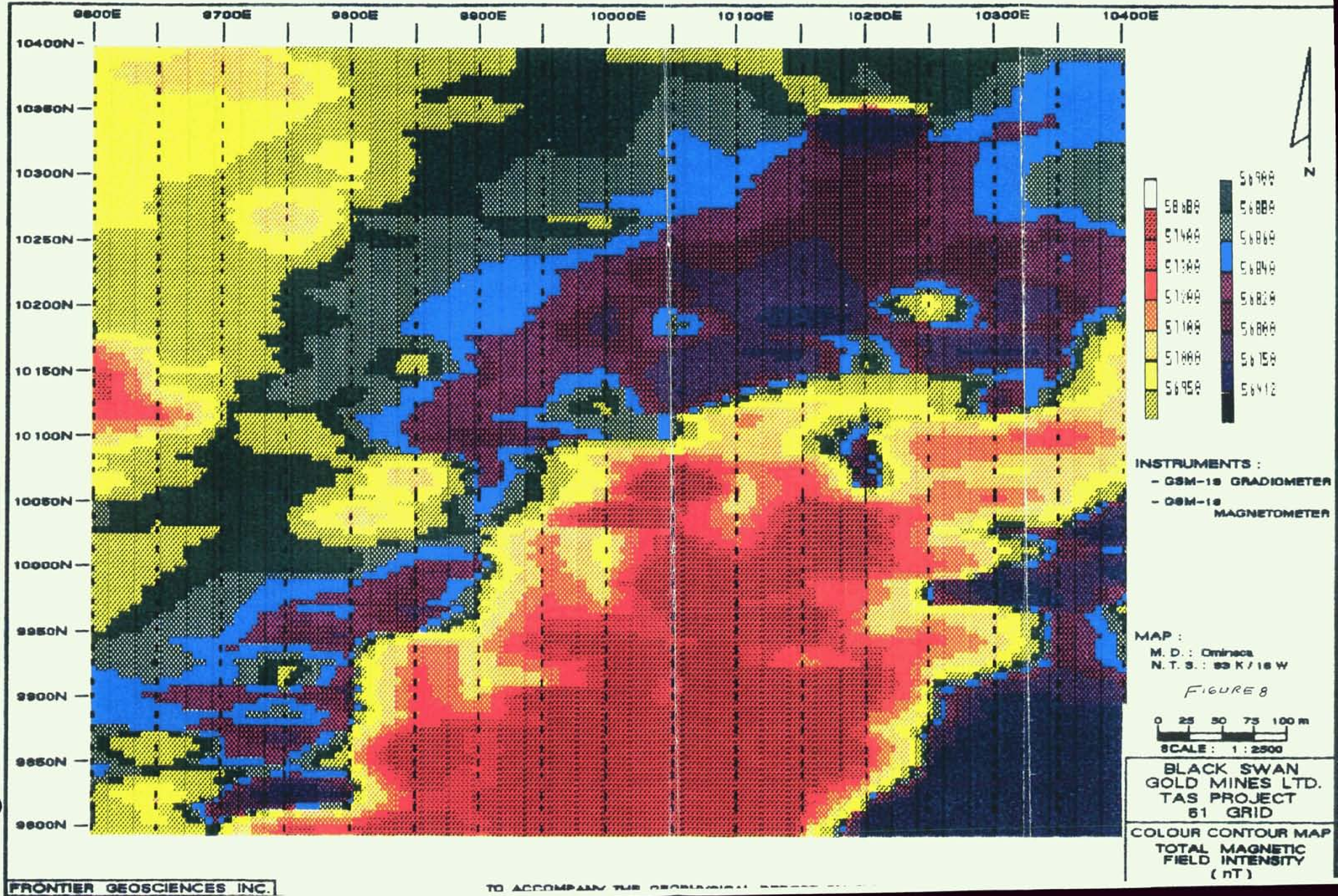
FIG: 6

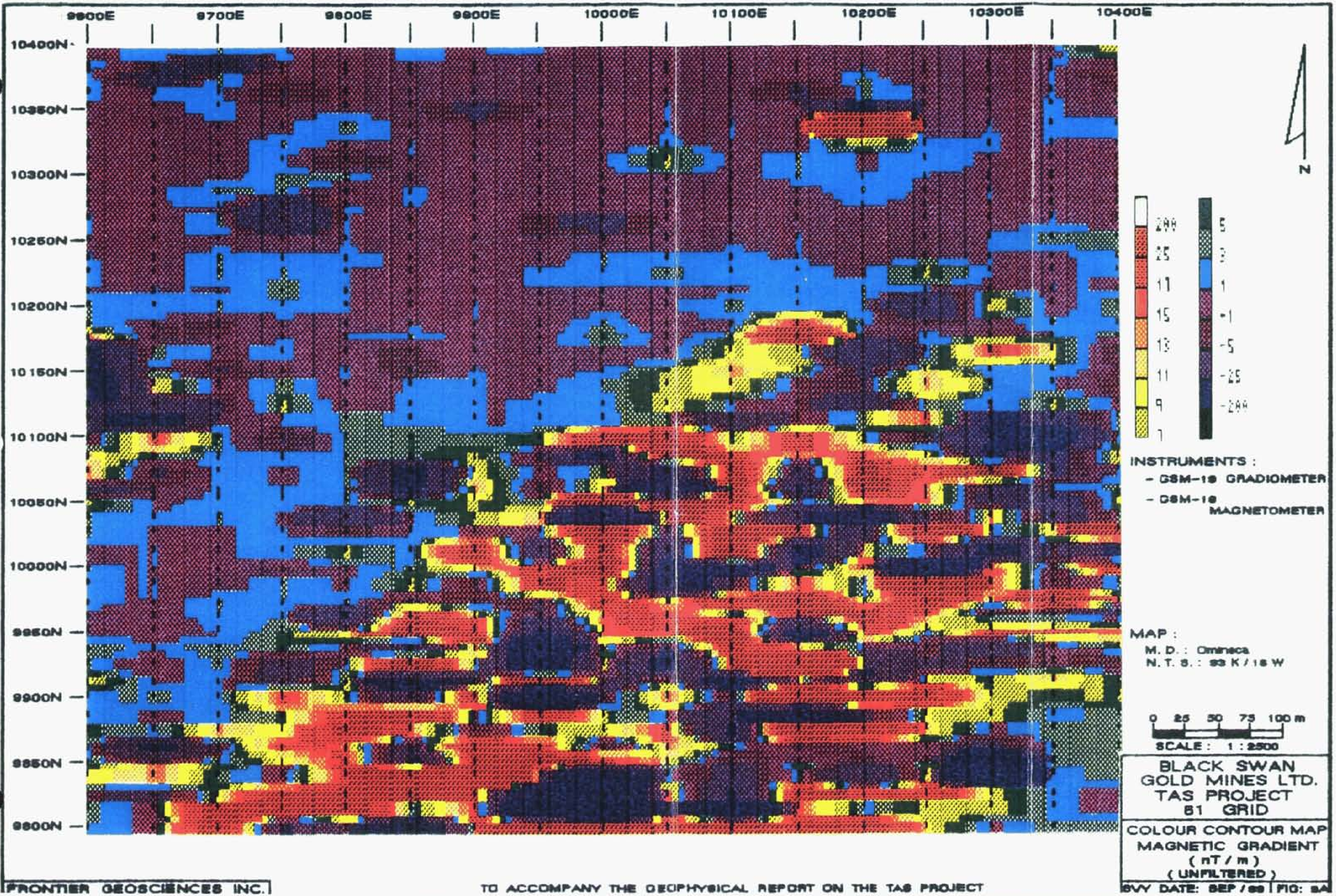
RONTIER GEOSCIENCES INC.



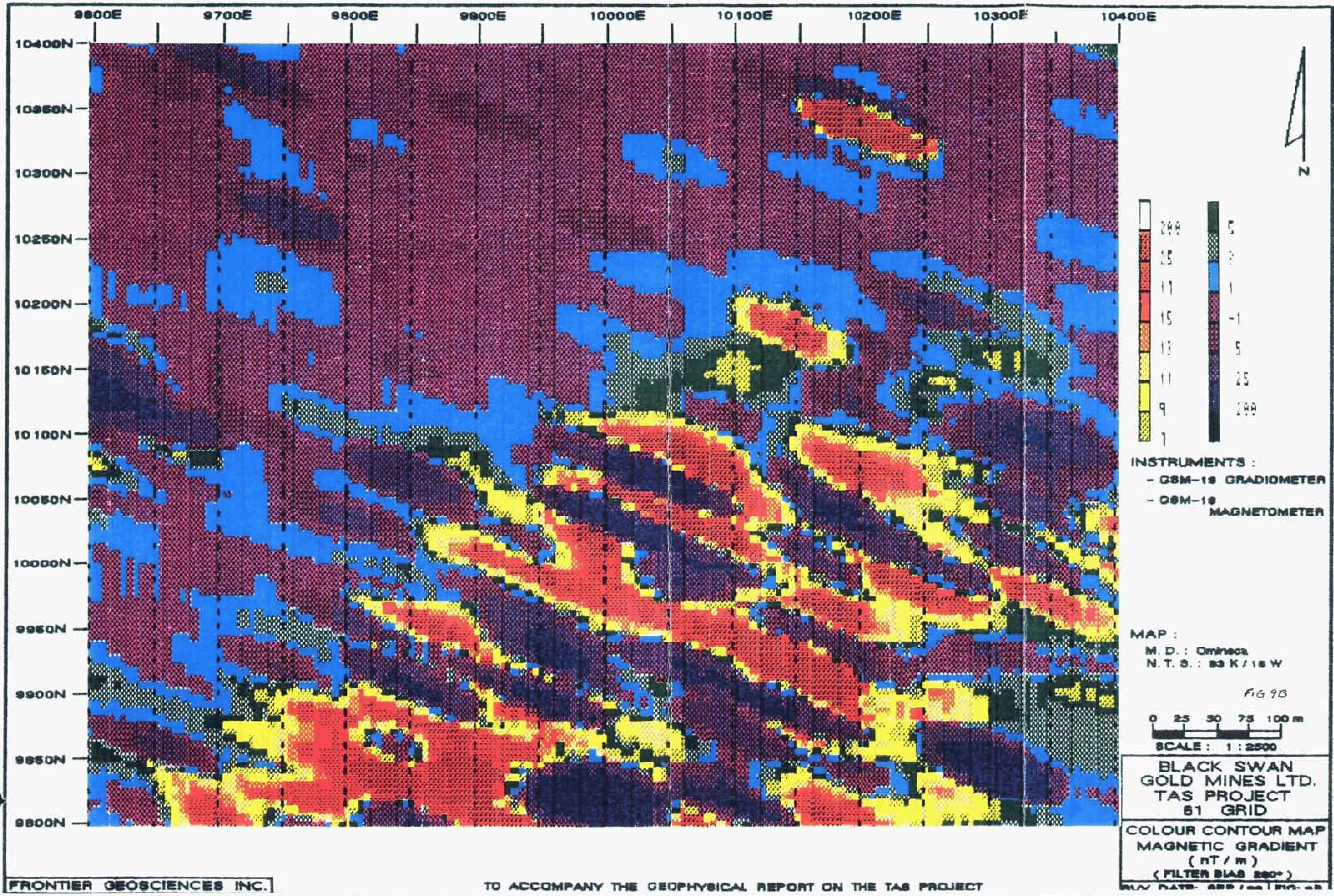
61 GRID
INDUCED POLARIZATION PSEUDO - SECTIONS
APPARENT RESISTIVITY (ohm - metres)
SURVEY DATE: SEPT. / 89
FIG: 7

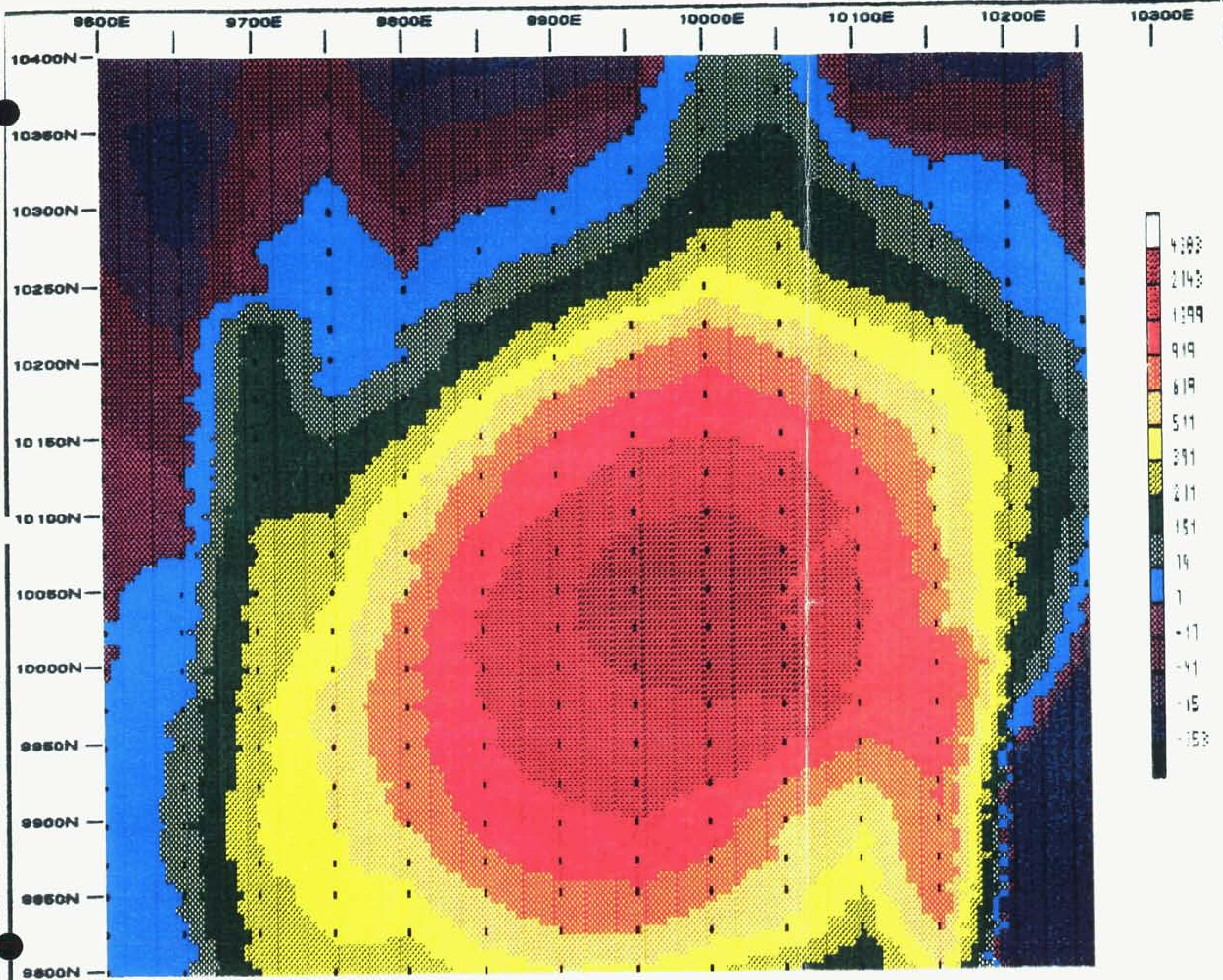
FRONTIER GEOSCIENCES INC.


9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
58600
57400
57300
57200
57100
57000
56950
56900
56880
56860
56840
56820
56800
56750
56412
INSTRUMENTS :
- GSM-19 GRADIOMETER
- GSM-19 MAGNETOMETER
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
FIGURE 8
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
TOTAL MAGNETIC FIELD INTENSITY
(nT)
FRONTIER GEOSCIENCES INC.



9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
200
25
17
15
13
11
9
7
5
3
1
-1
-5
-25
-200
INSTRUMENTS :
- GSM-19 GRADIOMETER
- GSM-19 MAGNETOMETER
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
MAGNETIC GRADIENT
(nT / m)
(UNFILTERED)
SVY DATE: SEP / 88
FIG: 8A
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT


9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10400N
10350N
10300N
10250N
10200N
10150N
10100N
10050N
10000N
9950N
9900N
9850N
9800N
N
INSTRUMENTS :
- GSM-19 GRADIOMETER
- GSM-19 MAGNETOMETER
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
FIG 9B
0 25 50 75 100 m
SCALE : 1 : 2500
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
61 GRID
COLOUR CONTOUR MAP
MAGNETIC GRADIENT
(nT / m)
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



N

INSTRUMENTS :
- SCINTREX
IPC - 7 / 2.5 kW Tx
- SCINTREX IPR- 8 Rx
- SCINTREX IPR-10 Rx

ARRAY CONFIGURATION :
- INFINITY CURRENT
Southeast of grid
- NEAR CURRENT : DH-61
10000 N / 10000 E

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

0 25 50 75 100 m
SCALE : 1 : 2500

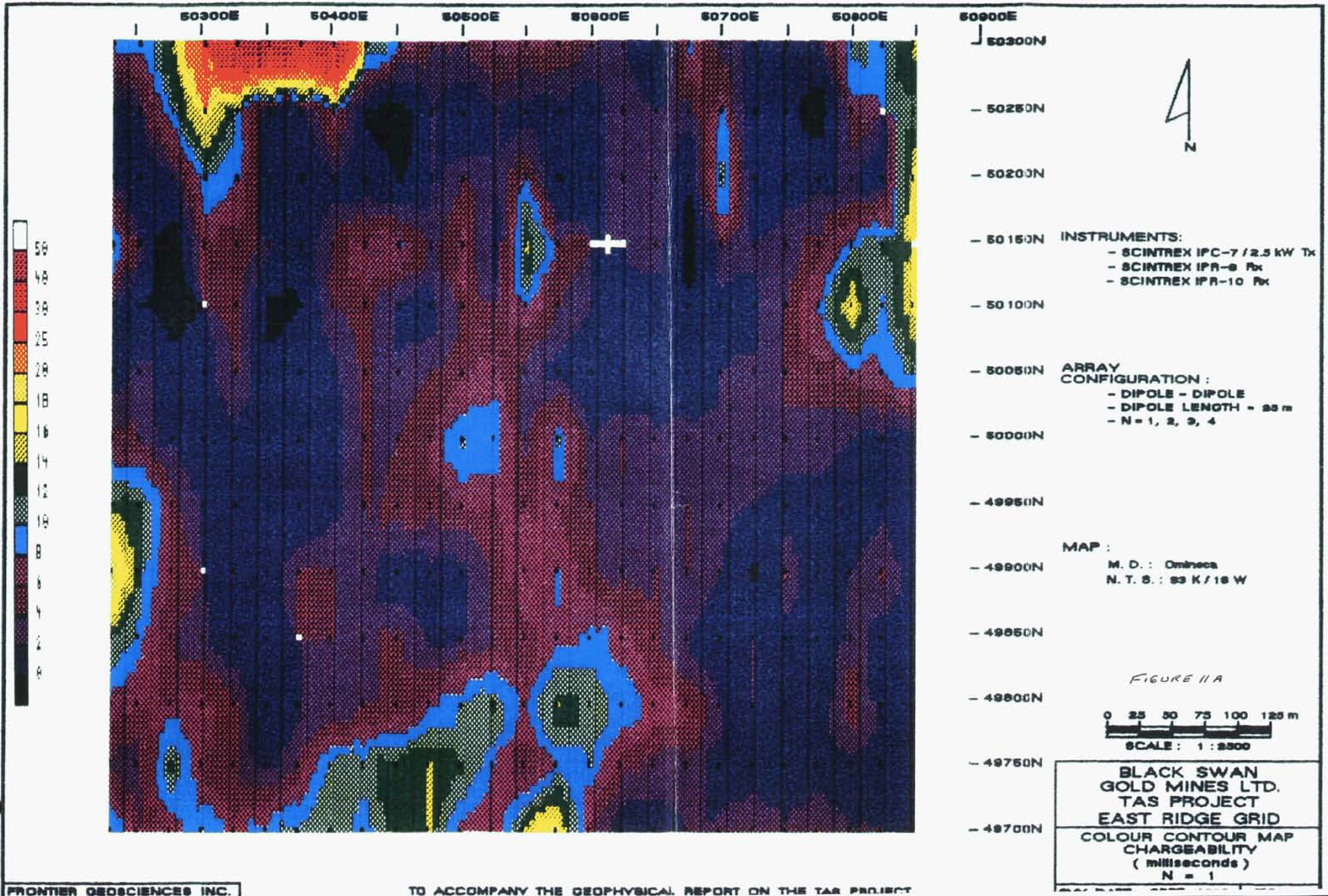
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
61 GRID

COLOUR CONTOUR MAP
MISE - A - LA - MASSE
(millivolts)

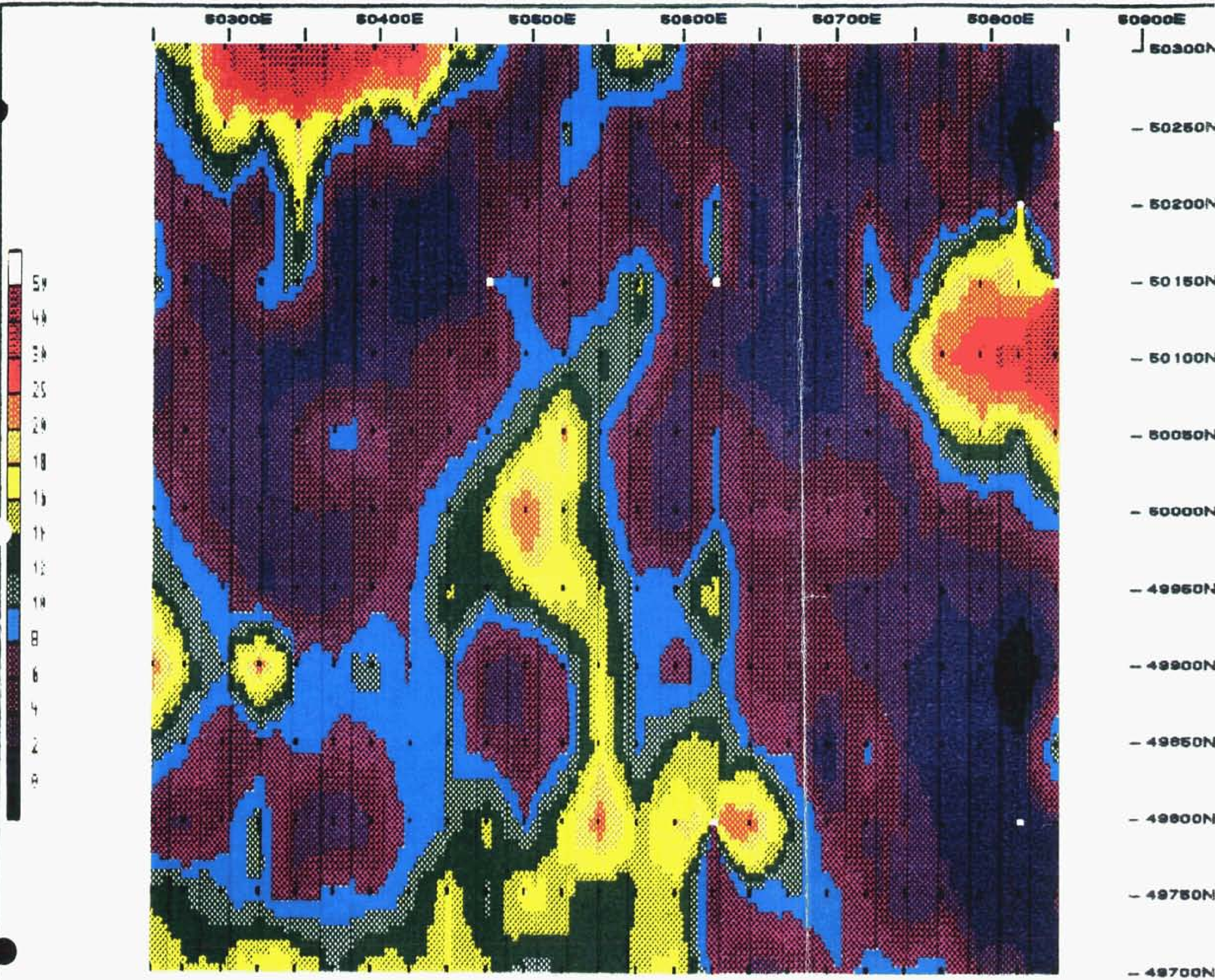
SVY DATE: SEP / 89 | FIG: 10

FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



50300E
50400E
50500E
50600E
50700E
50800E
50900E
50300N
50250N
50200N
50150N
50100N
50050N
50000N
49950N
49900N
49850N
49800N
49750N
49700N
58
48
38
25
20
18
16
14
12
10
8
6
4
2
0
N
INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH - 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
FIGURE 11 A
0 25 50 75 100 125 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 1
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



N

INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx

ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

Figure 11 B

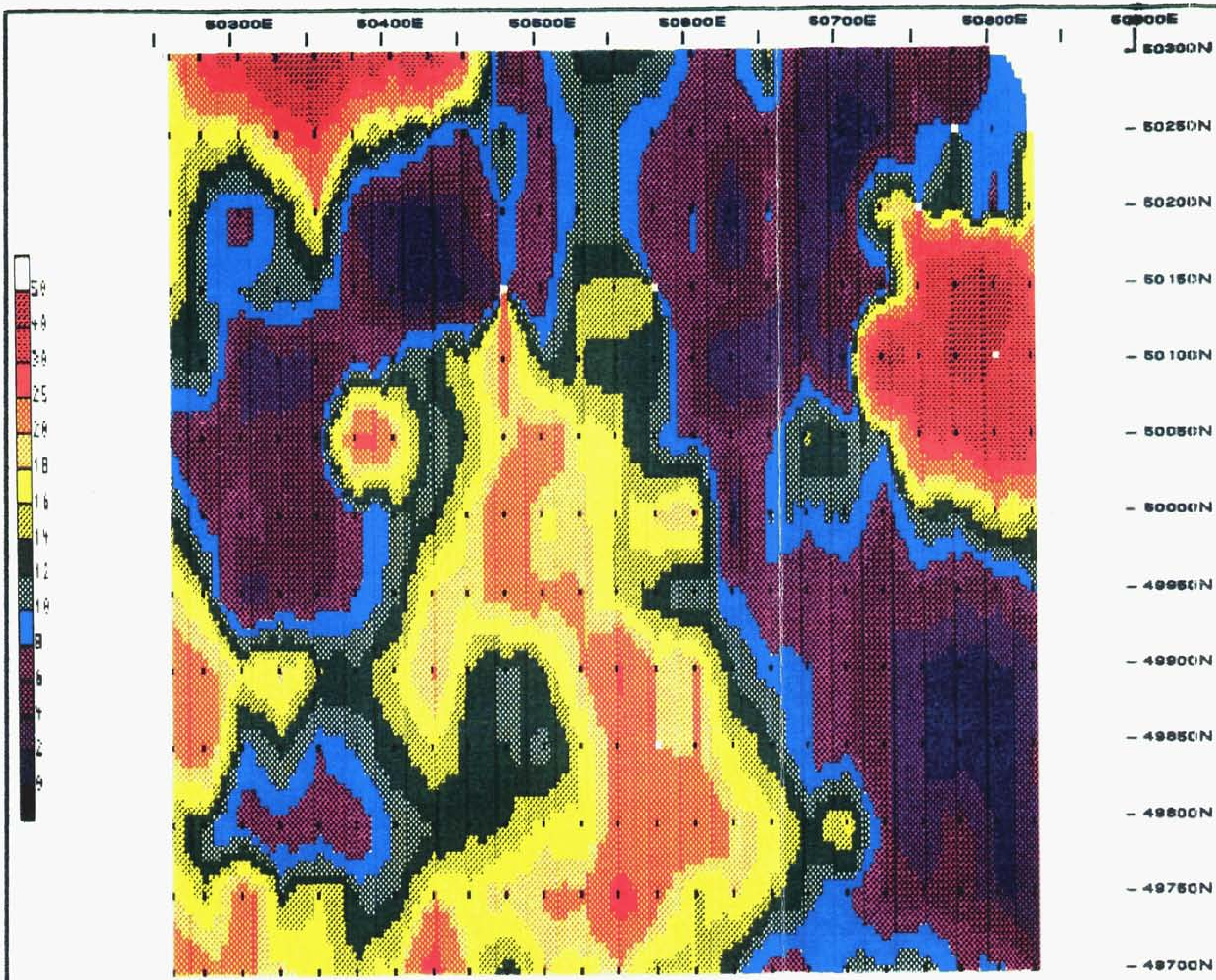
0 25 50 75 100 125 m
SCALE : 1 : 2500

BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 2

FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx

ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

0 25 50 75 100 125 m
SCALE : 1 : 2500

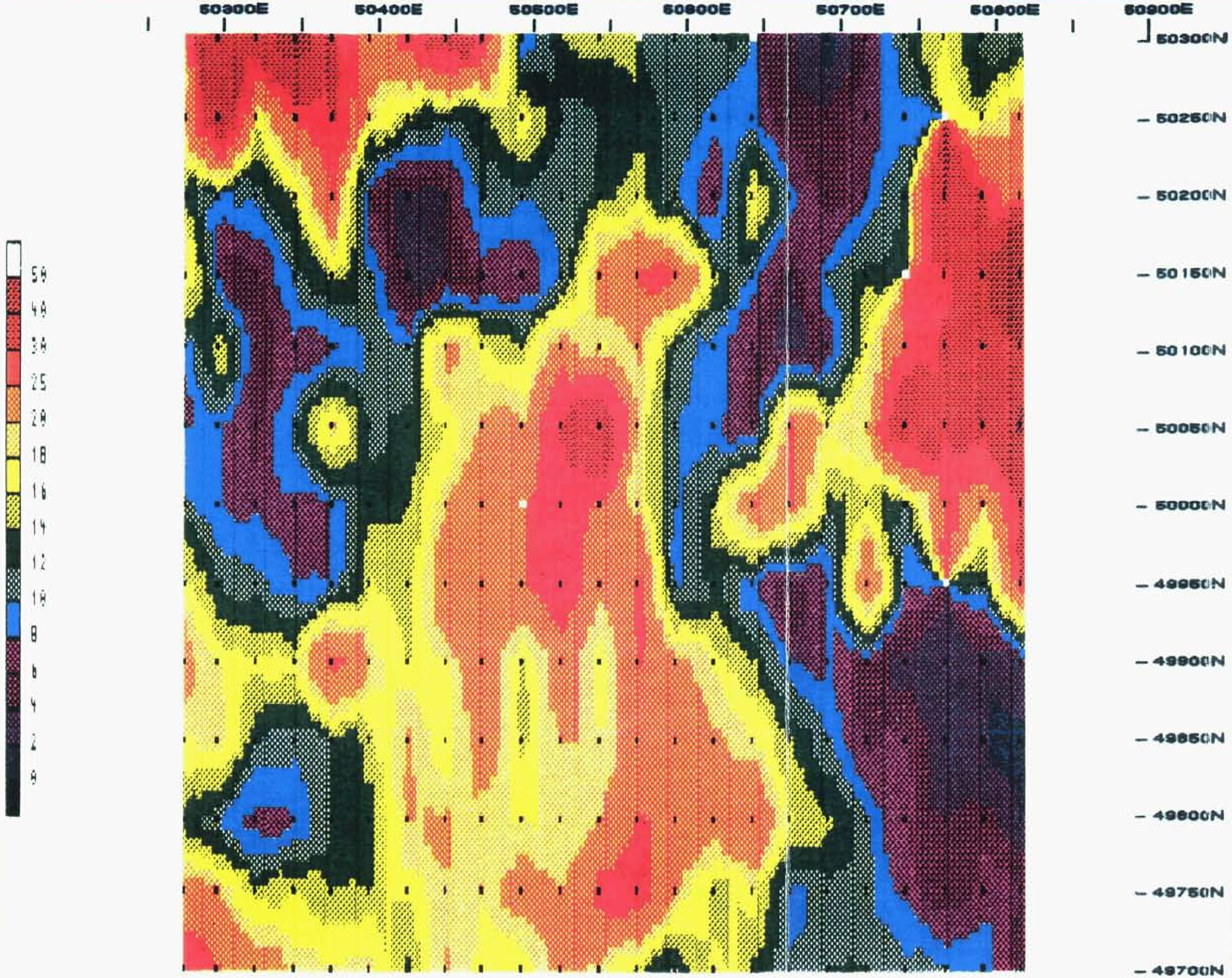
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 3

SVY DATE: SEPT., [illegible] | FIG: 11 C

FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx

ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

0 25 50 75 100 125 m
SCALE : 1 : 2500

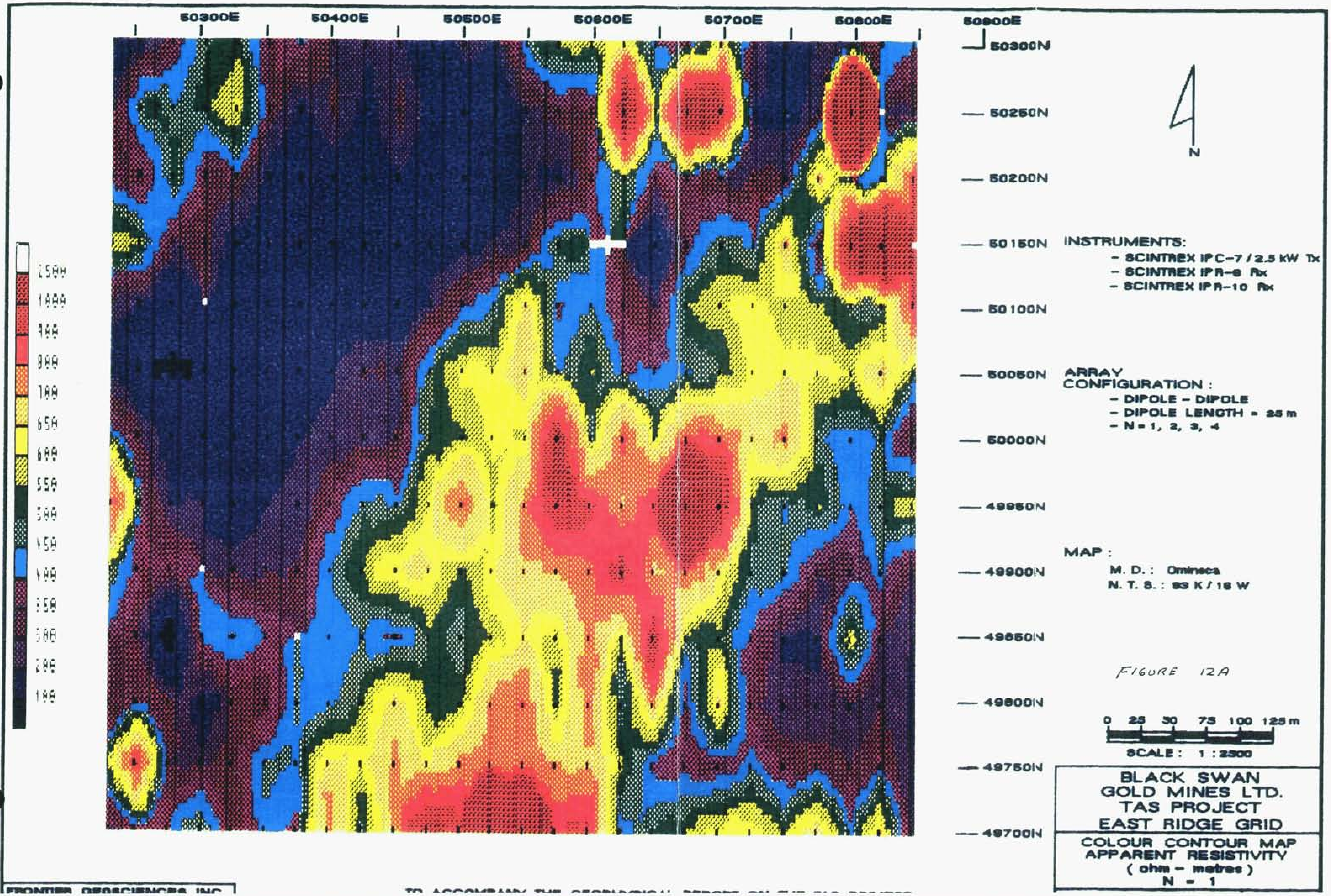
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

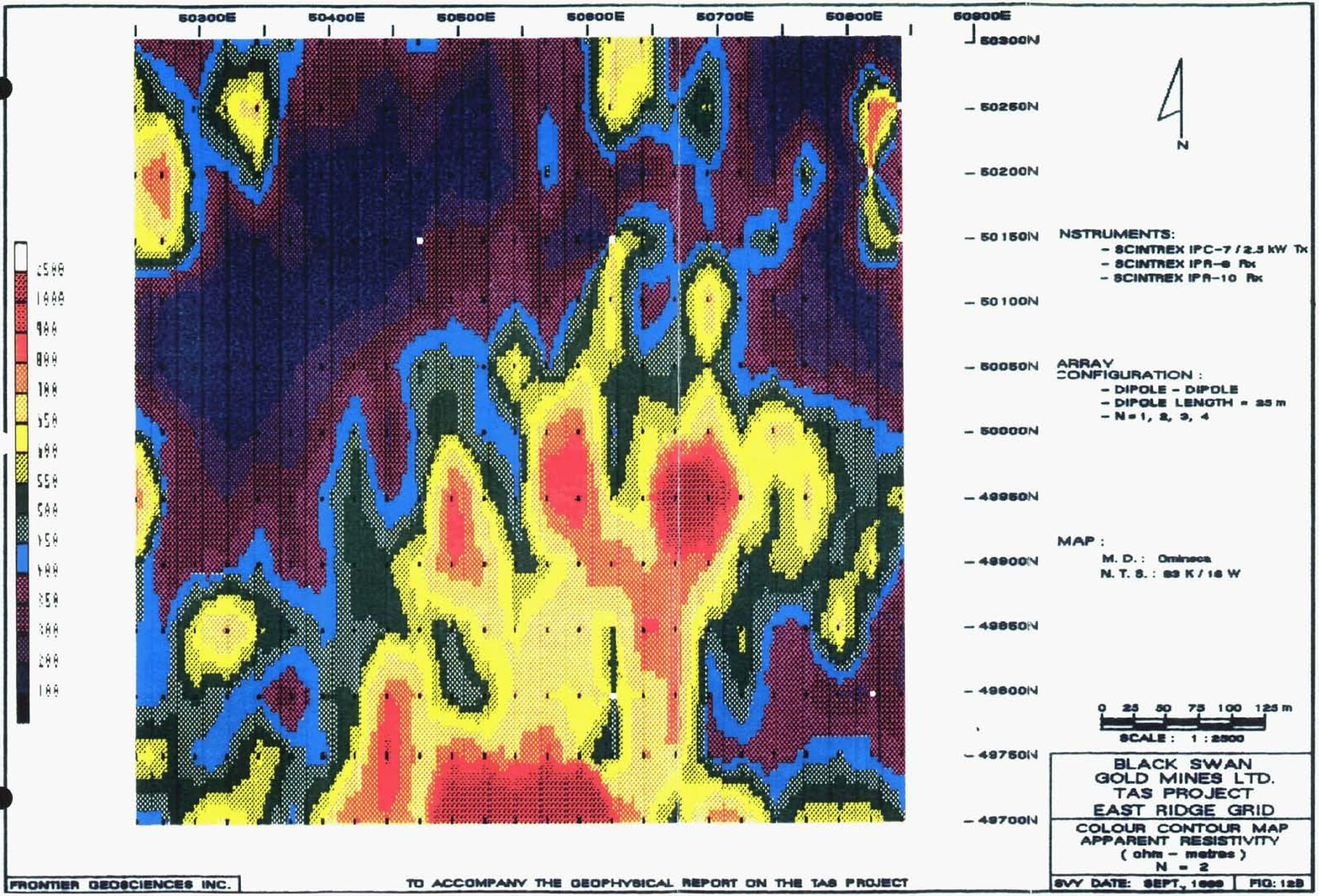
COLOUR CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 4

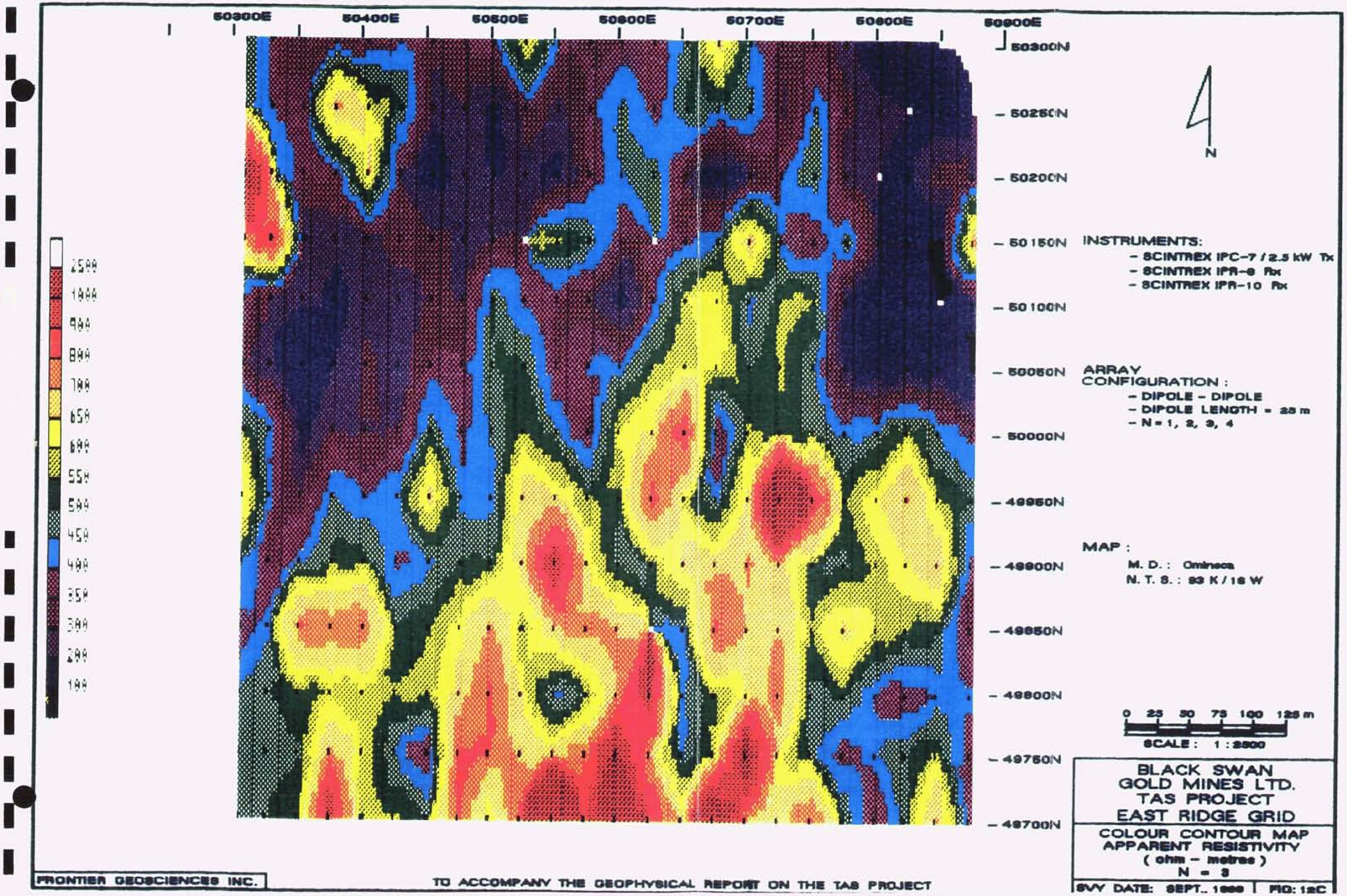
FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT

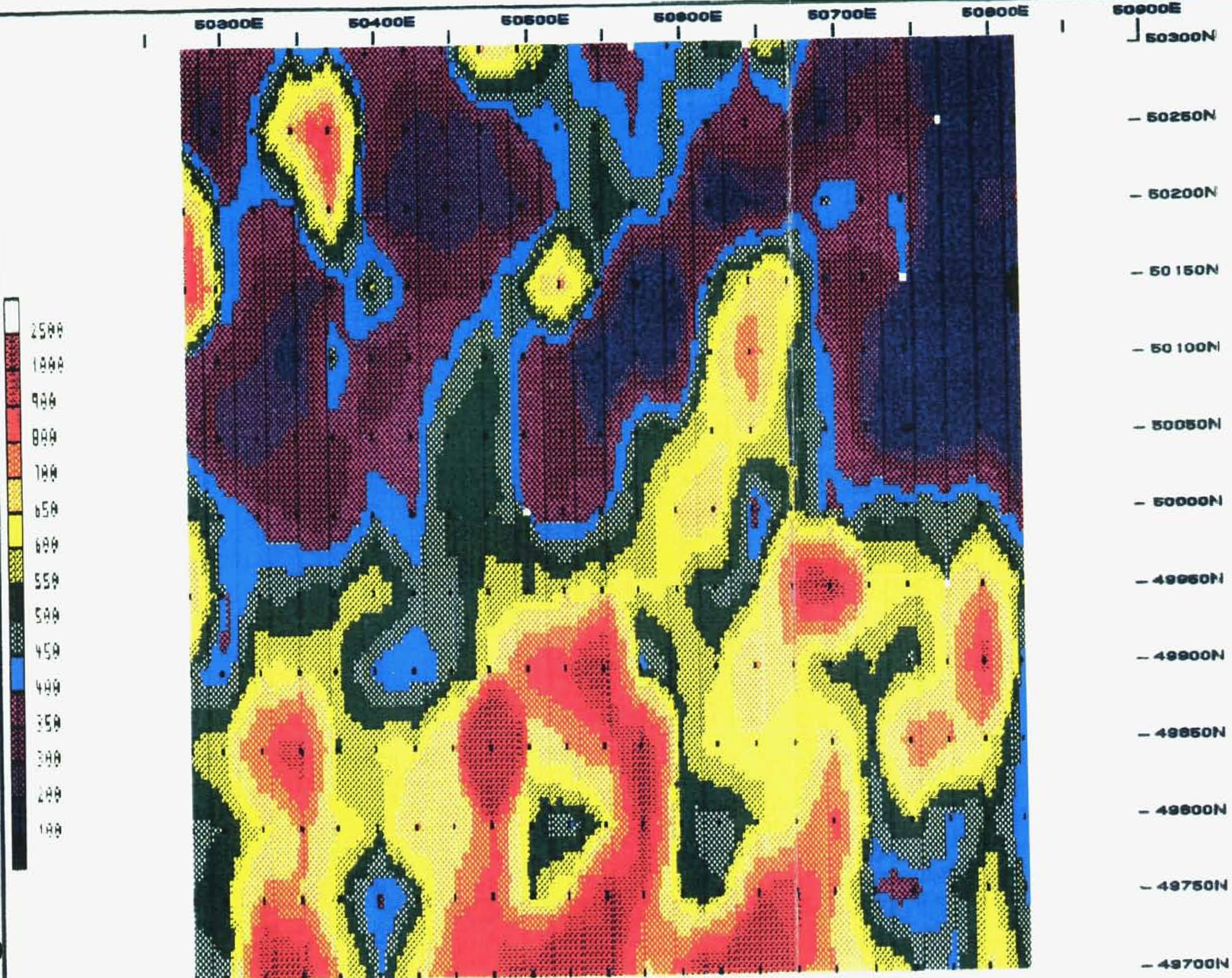
SVY DATE: SEPT., 1988 | FIG: 11 D


50300E
50400E
50500E
50600E
50700E
50800E
50900E
50300N
50250N
50200N
50150N
50100N
50050N
50000N
49950N
49900N
49850N
49800N
49750N
49700N
1000
900
800
700
650
600
550
500
450
400
350
300
200
100
N
INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
FIGURE 12A
0 25 50 75 100 125 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 1


50300E
50400E
50500E
50600E
50700E
50800E
50900E
50300N
50250N
50200N
50150N
50100N
50050N
50000N
49950N
49900N
49850N
49800N
49750N
49700N
2500
1000
900
800
700
650
600
550
500
450
400
350
300
200
100
N
NSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 125 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 2
SVY DATE: SEPT.,
FIG: 12B
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



50300E
50400E
50500E
50600E
50700E
50800E
50900E
50300N
50250N
50200N
50150N
50100N
50050N
50000N
49950N
49900N
49850N
49800N
49750N
49700N
2500
1000
900
800
700
650
600
550
500
450
400
350
300
200
100
N
INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx
ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 125 m
SCALE : 1 : 2500
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID
COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 3
SVY DATE: SEPT.
FIG: 12C
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



INSTRUMENTS:
- SCINTREX IPC-7 / 2.5 kW Tx
- SCINTREX IPR-8 Rx
- SCINTREX IPR-10 Rx

ARRAY CONFIGURATION :
- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

0 25 50 75 100 125 m

SCALE : 1 : 2500

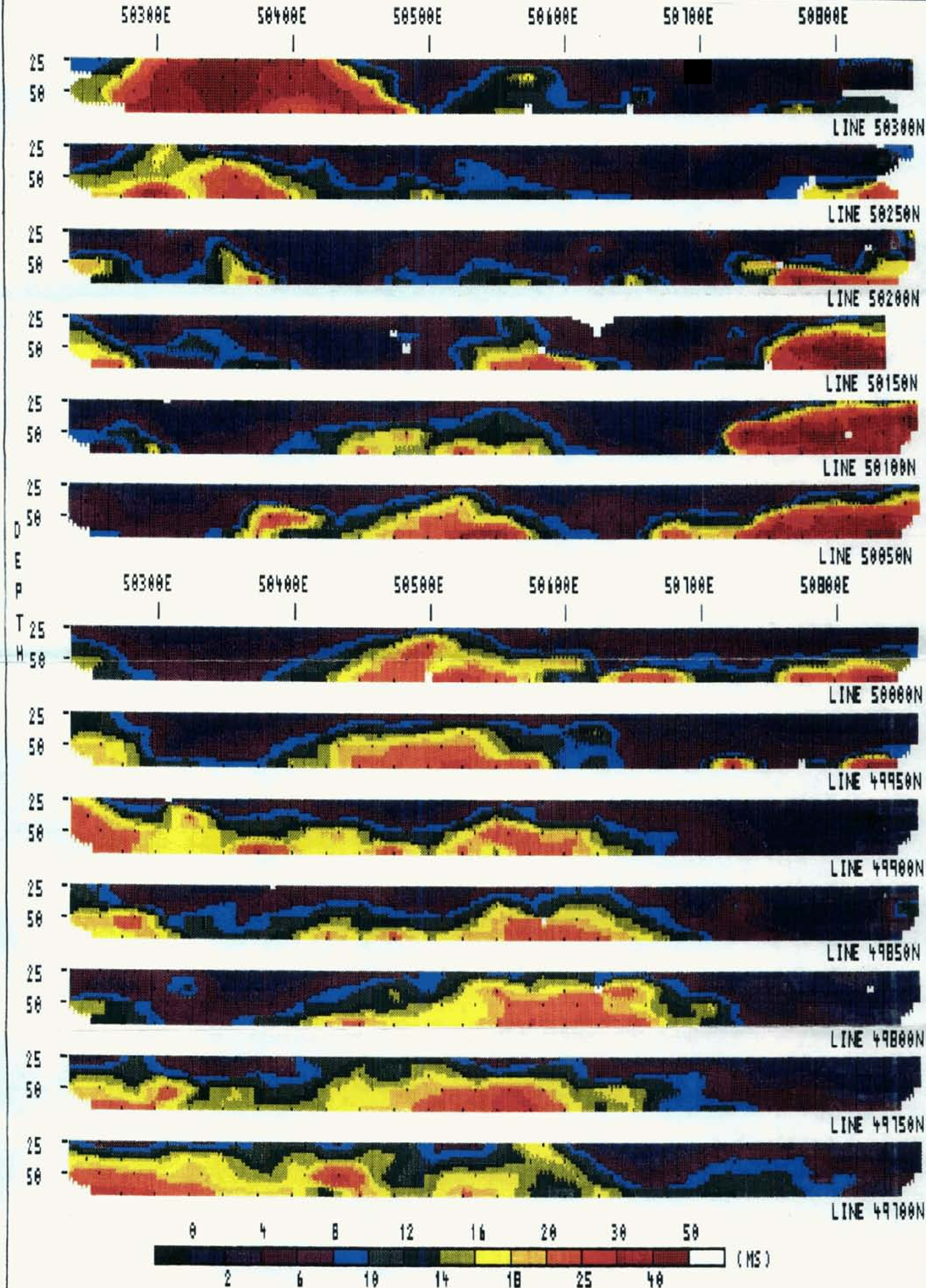
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

COLOUR CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 4

SVY DATE: SEPT., 19[illegible] | FIG: 12 D

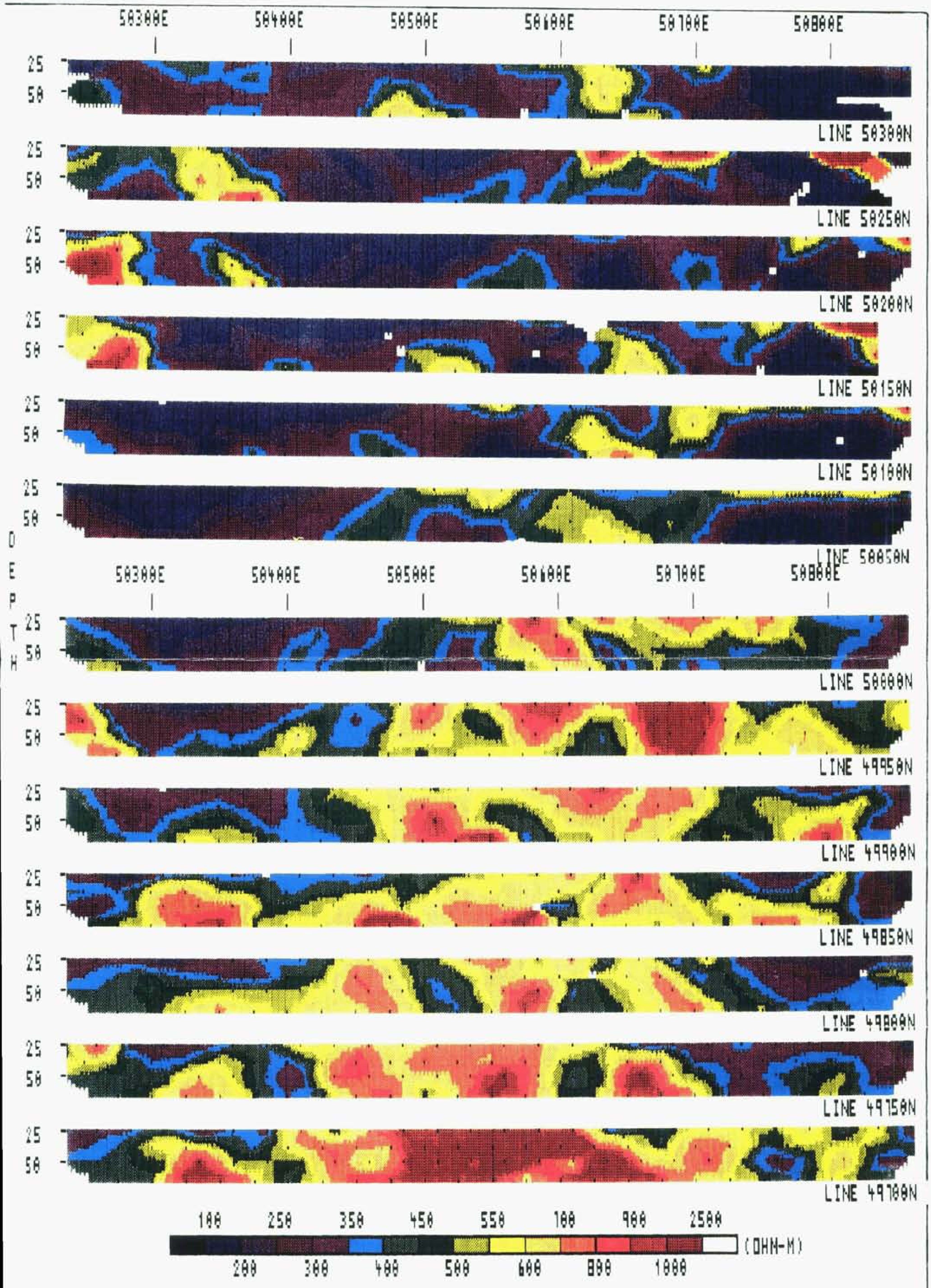
FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



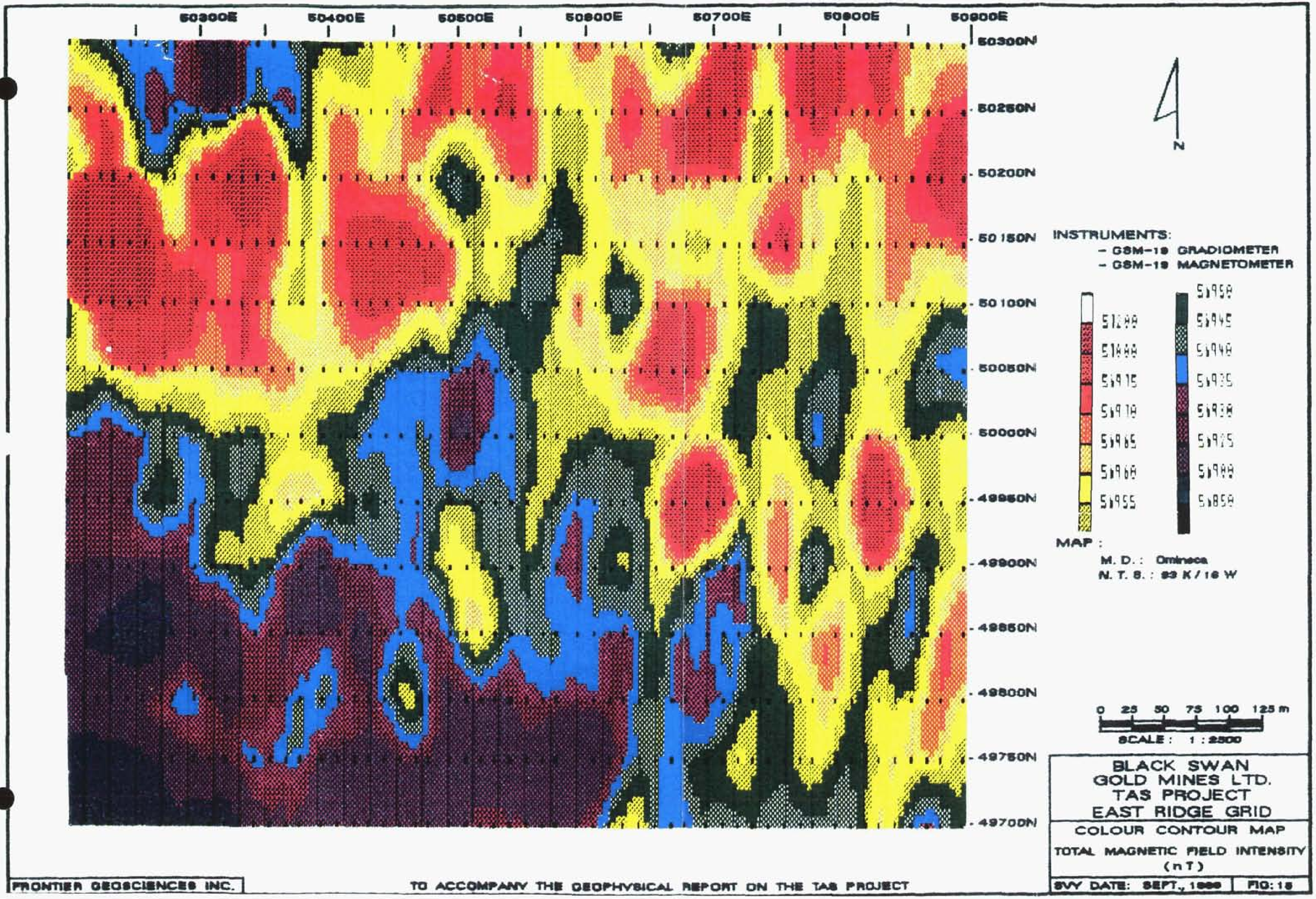
EAST RIDGE GRID
INDUCED POLARIZATION PSEUDO - SECTIONS
CHARGEABILITY (milliseconds)
SURVEY DATE: SEPT. / 89
FIG: 13

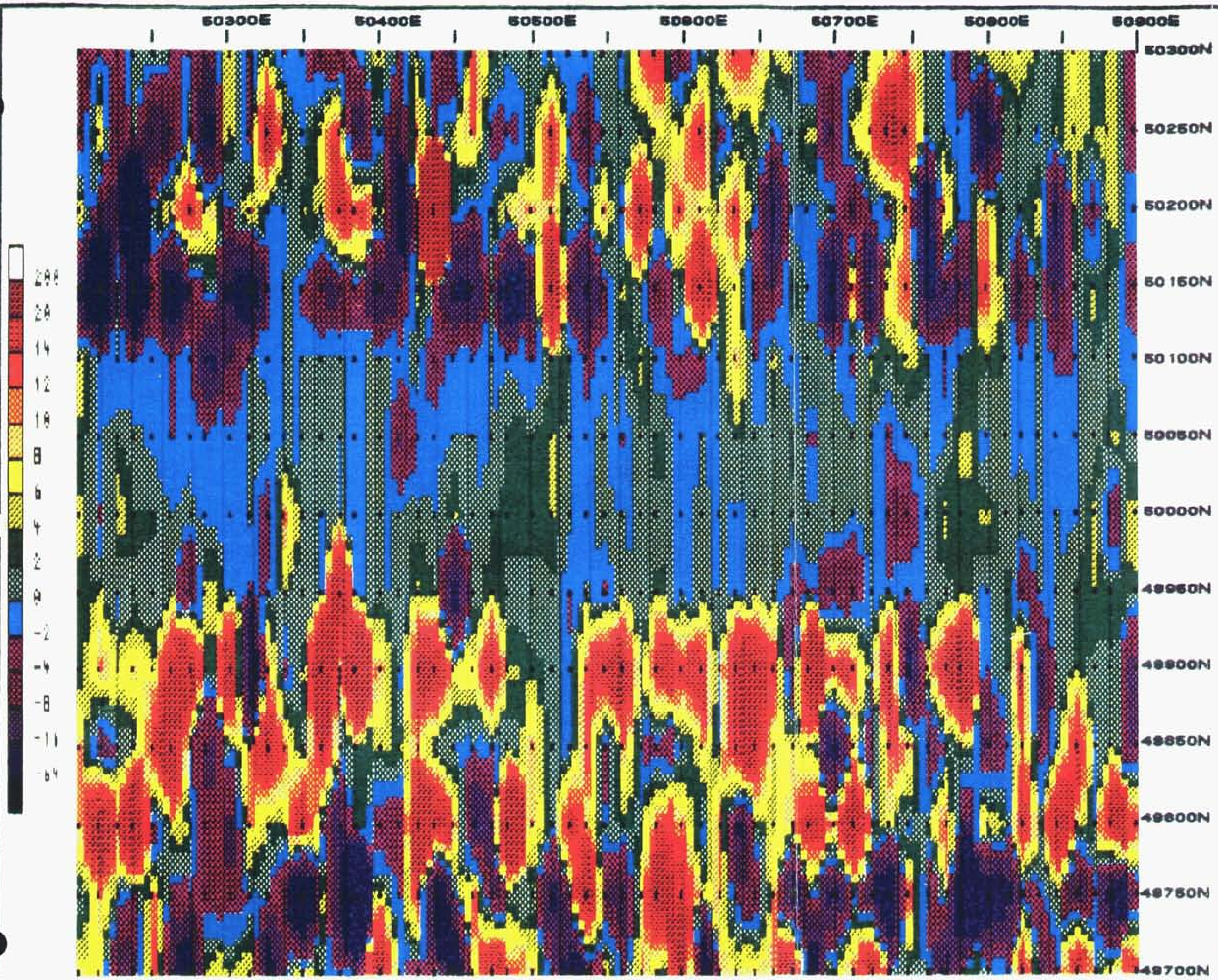
FRONTIER GEOSCIENCES INC.



EAST RIDGE GRID
INDUCED POLARIZATION PSEUDO - SECTIONS
APPARENT RESISTIVITY (ohm - metres)
SURVEY DATE: SEPT. / 89 FIG: 14

FRONTIER GEOSCIENCES INC.


50300E
50400E
50500E
50600E
50700E
50800E
50900E
50300N
50250N
50200N
50150N
50100N
50050N
50000N
49950N
49900N
49850N
49800N
49750N
49700N
N
INSTRUMENTS:
- GSM-19 GRADIOMETER
- GSM-19 MAGNETOMETER
MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W
0 25 50 75 100 125 m
SCALE : 1 : 2500
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID
COLOUR CONTOUR MAP
TOTAL MAGNETIC FIELD INTENSITY
(nT)
SVY DATE: SEPT.,
FIG:
FRONTIER GEOSCIENCES INC.
TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



N

INSTRUMENTS:
- GSM-19 GRADIOMETER
- GSM-19 MAGNETOMETER

MAP :
M. D. : Omineca
N. T. S. : 93 K / 16 W

0 25 50 75 100 125 m

SCALE : 1 : 2500

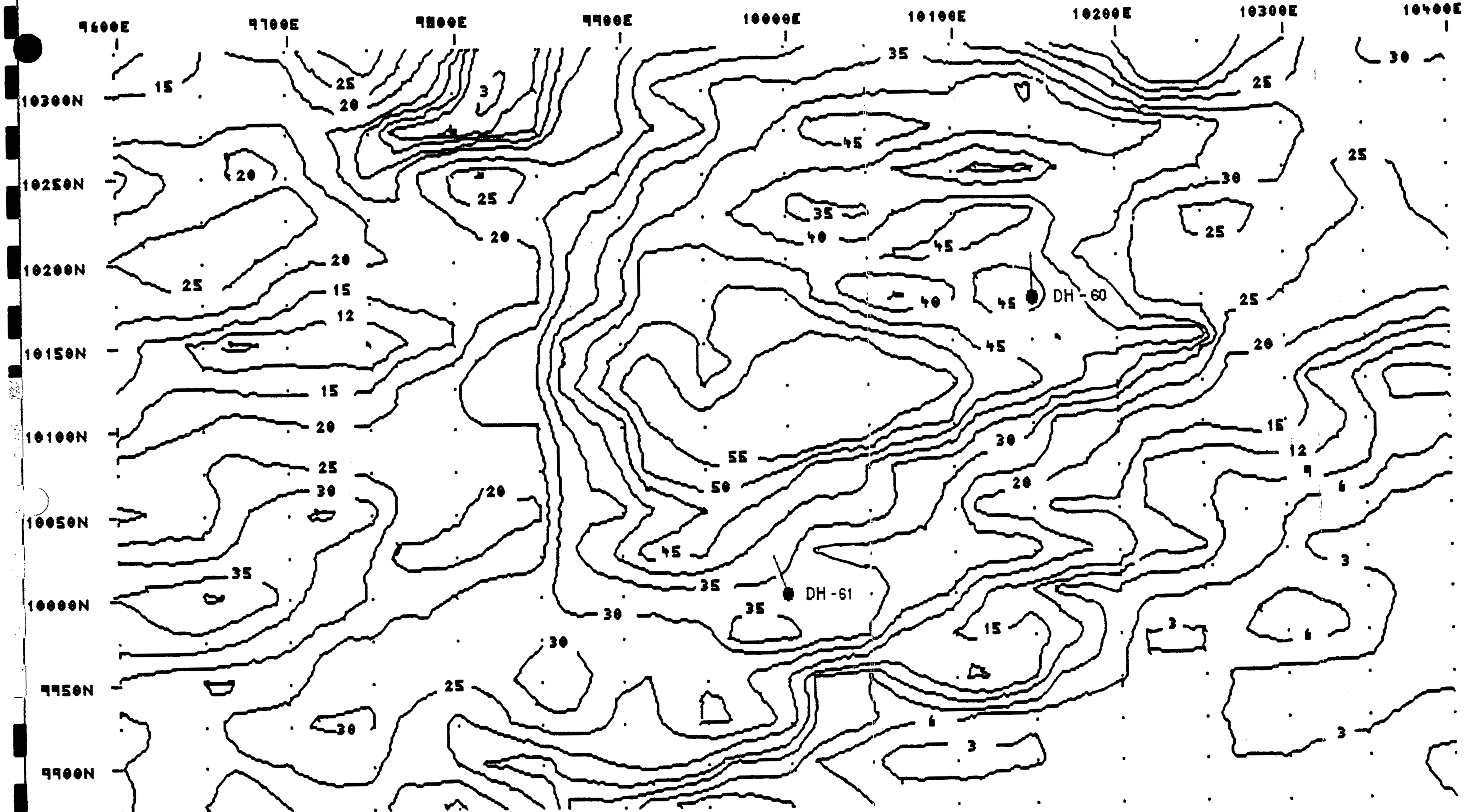
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

COLOUR CONTOUR MAP
MAGNETIC GRADIENT
(nT / m)

SVY DATE: SEPT., 1999 | FIG: 19

FRONTIER GEOSCIENCES INC.

TO ACCOMPANY THE GEOPHYSICAL REPORT ON THE TAS PROJECT



N

INSTRUMENTS:

- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR - 8 Rx
- SCINTREX IPR - 10 Rx

ARRAY CONFIGURATION:

- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP:

M. D.: Omineca

N. T. S.: 93 K / 16 W

SCALE: 1:2500

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,977

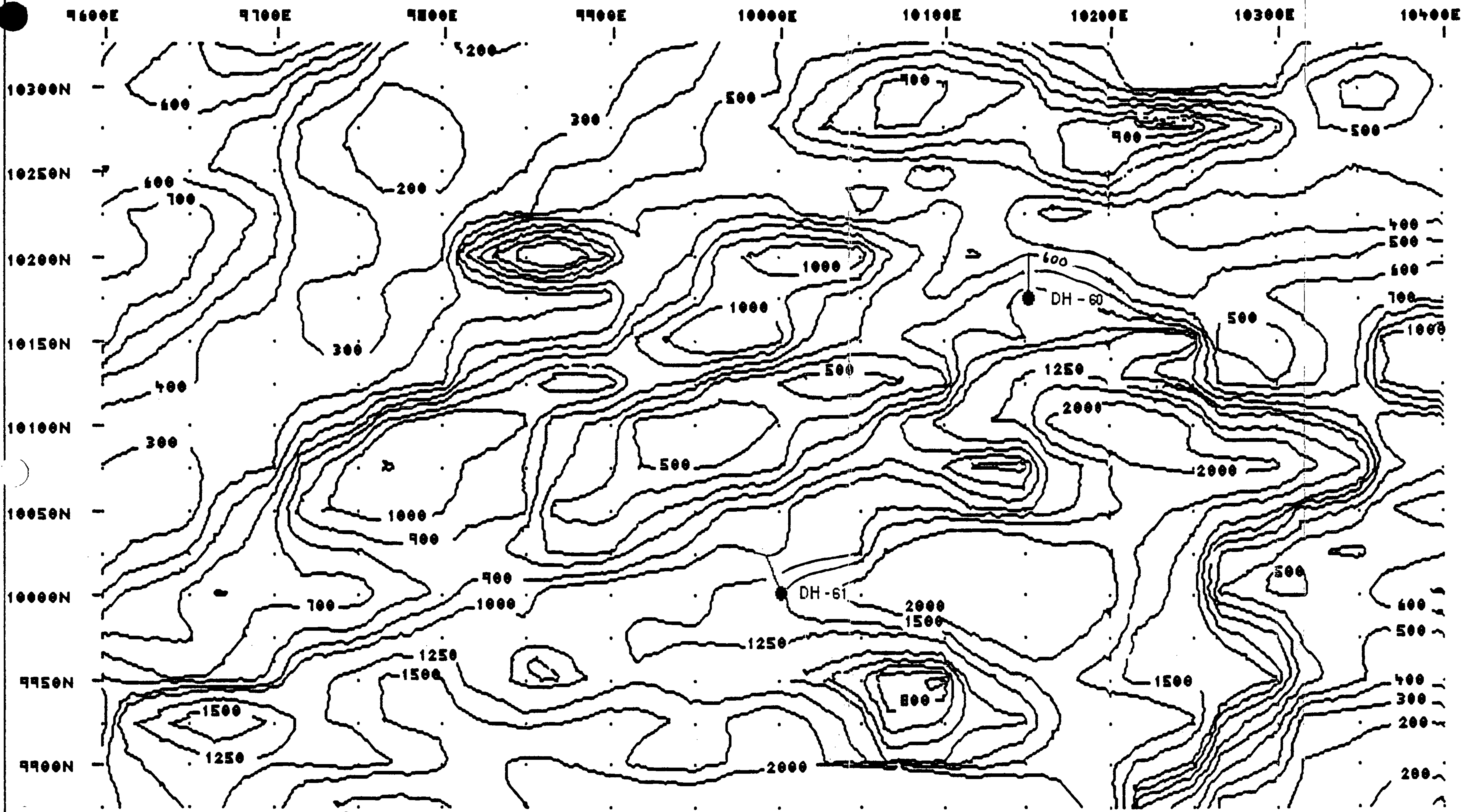
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID

CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 4

SURVEY DATE: SEPT. / 89

FIG: 17

FRONTIER GEOSCIENCES INC.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,977

INSTRUMENTS:

- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR - 8 Rx
- SCINTREX IPR - 10 Rx

ARRAY CONFIGURATION:

- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP:

M. D.: Omineca

N. T. S.: 93 K / 16 W

SCALE: 1:2500

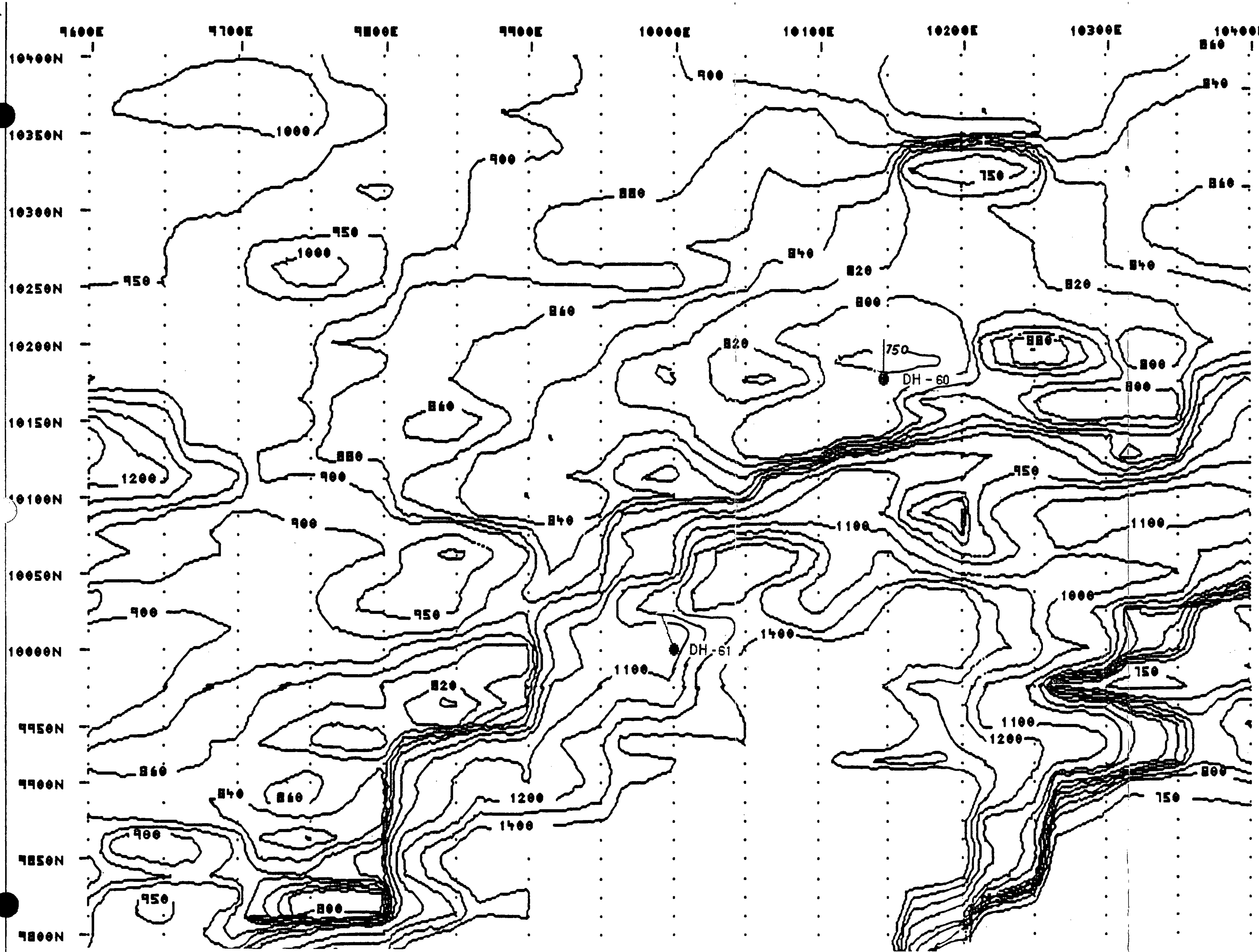
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID

CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 4

SURVEY DATE: SEPT. / 89

FIG: 18

FRONTIER GEOSCIENCES INC.



N

INSTRUMENTS:

- GSM - 19 GRADIOMETER
- GSM - 19 MAGNETOMETER
- MAGNETIC BASE = 56000 nT

MAP:

M. D.: Omineca

N. T. S.: 93 K / 16 W

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,977

SCALE: 1:2500

BLACK SWAN GOLD MINES LTD.
TAS PROJECT
61 GRID

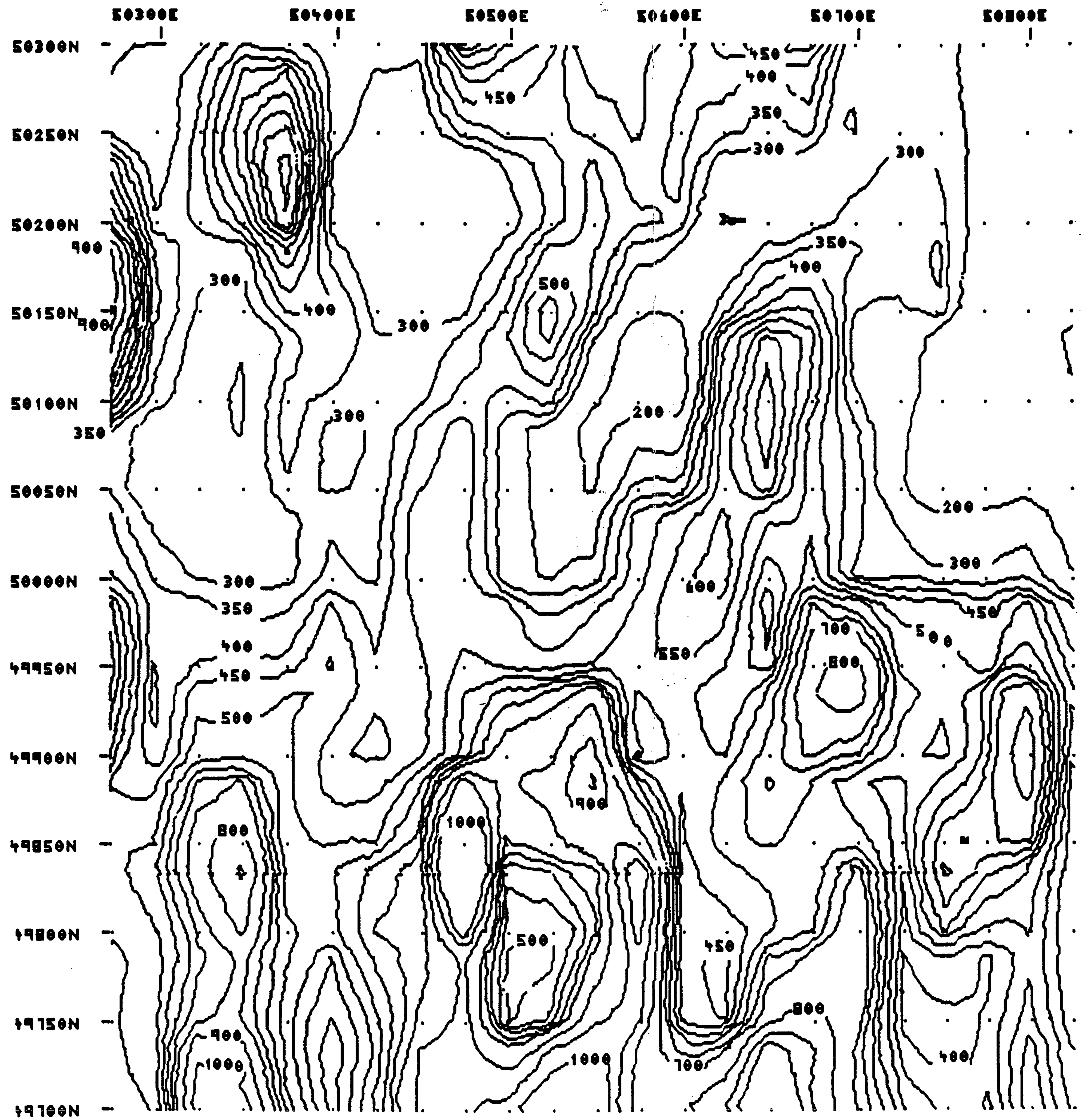
CONTOUR MAP

TOTAL MAGNETIC FIELD INTENSITY (nT)

FRONTIER GEOSCIENCES INC.

SURVEY DATE: SEPT. / 89

FIG: 19



GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,977

INSTRUMENTS:

- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR - 8 Rx
- SCINTREX IPR - 10 Rx

ARRAY CONFIGURATICN:

- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP:

M. D.: Omineca

N. T. S.: 93 K / 16 W

SCALE: 1 : 2500

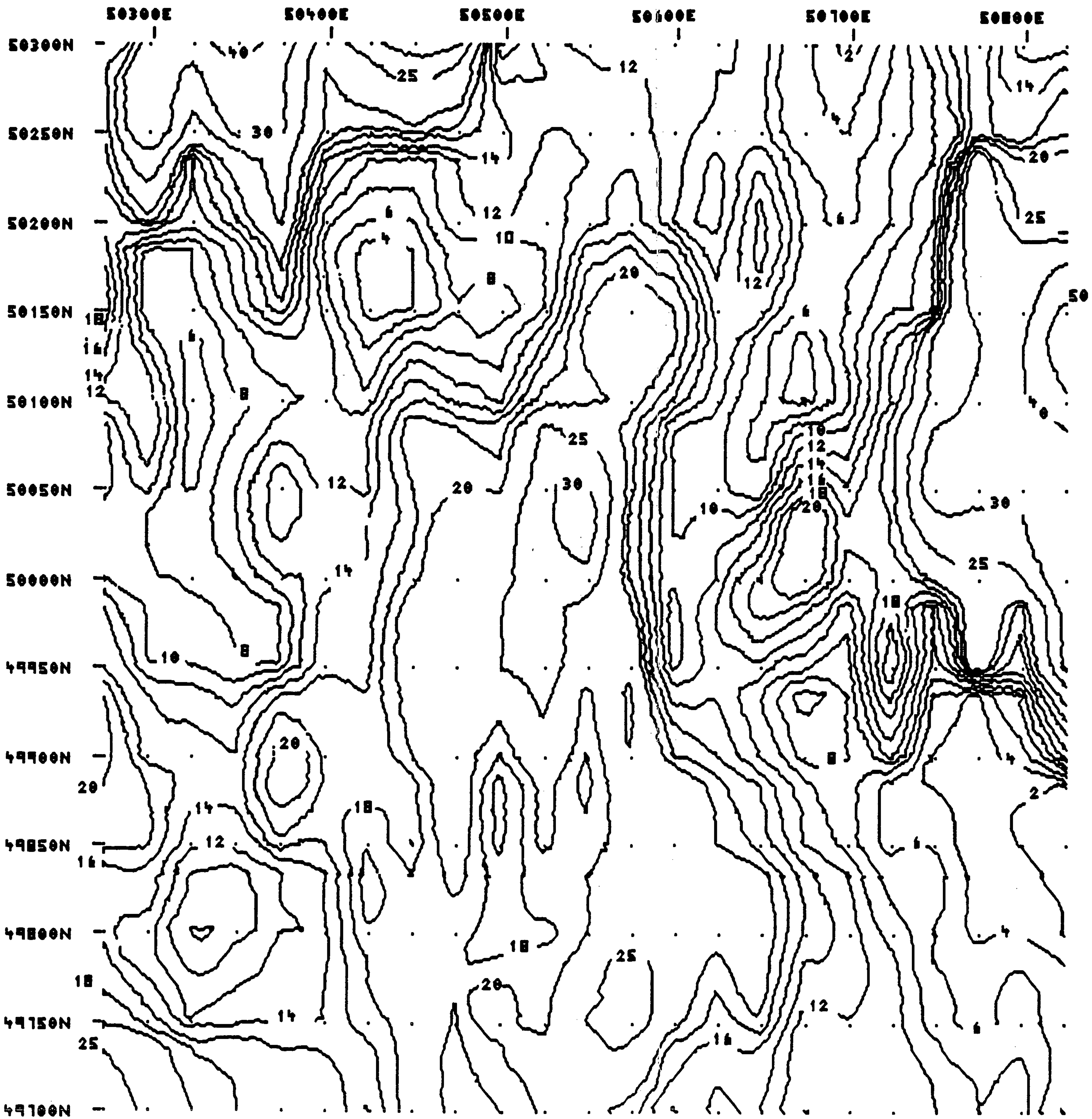
BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

CONTOUR MAP
CHARGEABILITY
(milliseconds)
N = 4

SURVEY DATE: SEPT. / 89

FIG: 20

FRONTIER GEOSCIENCES INC.



N

INSTRUMENTS:

- SCINTREX IPC - 7 / 2.5 kW Tx
- SCINTREX IPR - 8 Rx
- SCINTREX IPR - 10 Rx

ARRAY CONFIGURATION:

- DIPOLE - DIPOLE
- DIPOLE LENGTH = 25 m
- N = 1, 2, 3, 4

MAP:

M. D.: Omineca

N. T. S.: 93 K / 16 W

SCALE: 1:2500

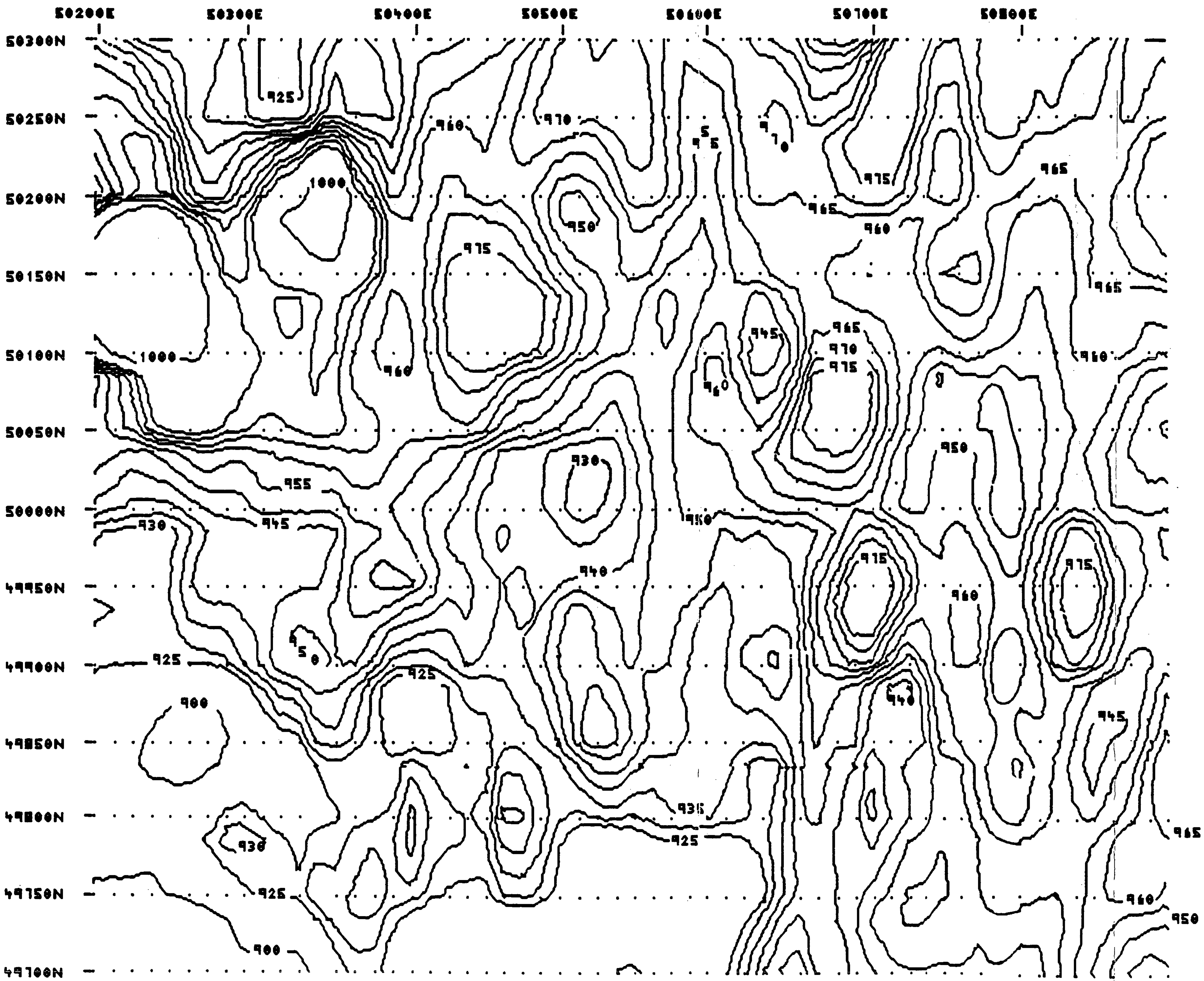
BLACK SWAN GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

CONTOUR MAP
APPARENT RESISTIVITY
(ohm - metres)
N = 4

SURVEY DATE: SEPT. / 89

FIG: 21

FRONTIER GEOSCIENCES INC.



N

INSTRUMENTS:

- GSM - 19 GRADIOMETER
- GSM - 19 MAGNETOMETER
- MAGNETIC BASE : 56000 nT

MAP:

M.D. : Omineca

N.T.S. : 93K / 16 W

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,977

SCALE : 1:2500

BLACK SWAN
GOLD MINES LTD.
TAS PROJECT
EAST RIDGE GRID

CONTOUR MAP

TOTAL MAGNETIC FIELD INTENSITY

(nT)

SURVEY DATE: SEPT. / 89	FIG: 22

FRONTIER GEOSCIENCES INC.