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Report on 3D Geo-electric Survey of the Uduk Lake property, BC, on the

Uduk Lake Property,
Omineca Mining Division
NTS 93 E/9, F/12
Latitude: 53° 38' N
Longitude: 126° 00' W

for Atna Resources Ltd. and Gold Mountain Resources Ltd.

September 15, 1997

by

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GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,136

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1. INTRODUCTION

1.1 Location and Access

The Uduk Lake property is located approximately 300 kilometres west of Prince George and 65 kilometres south of Burns Lake in west central British Columbia (Fig. 1.1). The approximate center of the property is situated at latitude 53o 38' North and longitude 126o 00' West; within the Omineca Mining Division and on the NTS map sheets 93E/9E and 93F/12W. The Ootsa Lake part of Alcan's Nechako hydroelectric reservoir is located 8 kilometres north of the property and the eastern boundary of Tweedsmuir Provincial Park is located 5 kilometers to the west.

Access to the Uduk Lake property is by gravel logging roads that connect to highway 37 at the towns of Vanderhoof, Burns Lake, or Houston. From any of these towns head south to West Fraser Mills ferry across Ootsa Lake at Intata Reach, approximately 25 kilometres east of Grassy Plains. From the south shore of Ootsa Lake proceed west for 20 kilometres and then turn south onto the Wolf Spur road for an additional 10 kilometres, at which point a spur road leads to a clear cut that covers the north side of the Duk 1 and Duk 2 claims, providing direct access to much of the property.

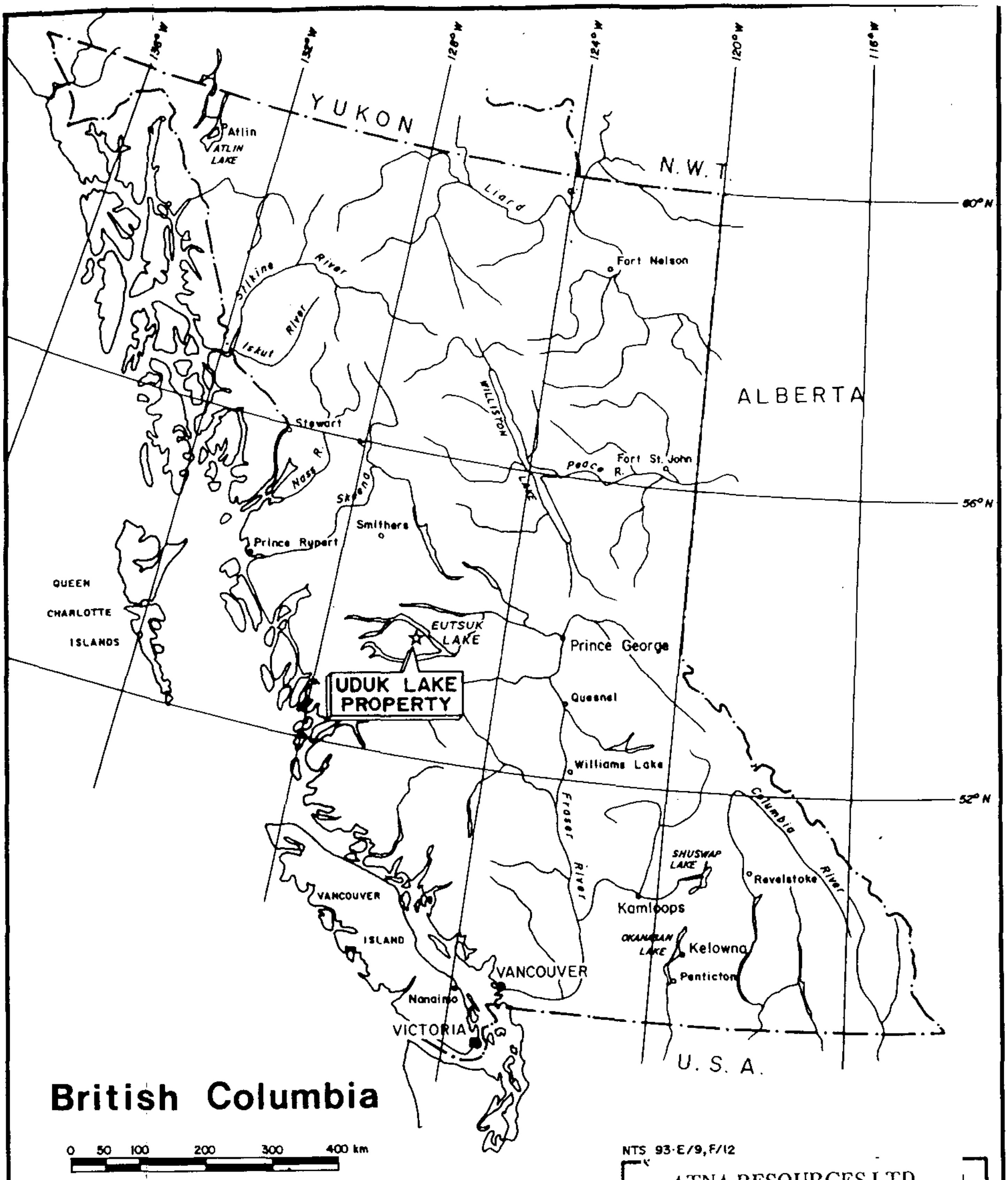
West Fraser Sawmills operates a full camp facility near its ferry landing on the north side of Ootsa Lake.

1.2 Climate and Physiography

Climate of the Uduk Lake area is typical of the northern interior of British Columbia with long, relatively dry winters and short, relatively wet summers. Snow can fall at any time but usually begins in late October and lasts until late March. Snow accumulation ranges from 0.7 to 1.5 metres.

The Uduk Lake property is within the Francois Lake Highlands of the Nechako Plateau. Topography is relatively subdued with elevations ranging from 1,090 to 1,220 metres above sea level. The area has been extensively glaciated and all of the present land forms, which consist primarily of drumlins, are features of glaciation. Much of the area is covered by glacial till and glacial-fluvial outwash. Outcrop is restricted to less than 2% of the area. The clay content of the till cover results in large swamp areas.

The property area hosts natural second growth to mature stands of spruce, with pine in areas of drier soil. Extensive wind fall is common, possibly due to the thin soil cover over the clay rich till. The spruce stands are tightly spaced and undergrowth is minimal. The northern parts of the Duk 1 and Duk 2 claims were clear cut by West Fraser Sawmills in the winter of 1997. No additional cutting on the claims is planned for the foreseeable future but areas immediately south of the property are slated to be cut in 1998.



NTS 93-E/9, F/12

ATNA RESOURCES LTD.

UDUK LAKE PROPERTY
Omineca M.D., B.C.

General Location Map

Scale	Date	Figure
noted above	Oct. 1994	1

2.3 Claims Status and Property Ownership

The Uduk Lake Property consists of nine claims totalling 83 units and covering an area of 2,075 hectares. Claim status is given in Table 1.1 below:

Table 1.1 Summary of Claim Data

Claim Name	*Tenure #*	*Units*	*Year Recorded*	*Expiry Date**
Duk 1	238805	16	1984	20/6/2003
Duk 2	238806	16	1984	20/6/2003
Duk 3	238807	15	1984	20/6/2001
Duk 4	239904	4	1988	18/3/2001
Duk 7	319352	20	1993	16/7/2000
Duk 8	319353	4	1993	14/7/2001
Duk 9	319354	6	1993	15/7/2001
Duk 10A	319348	1	1993	15/7/2001
Duk 10B	319349	1	1993	15/7/2001

* Subject to the approval of this report.

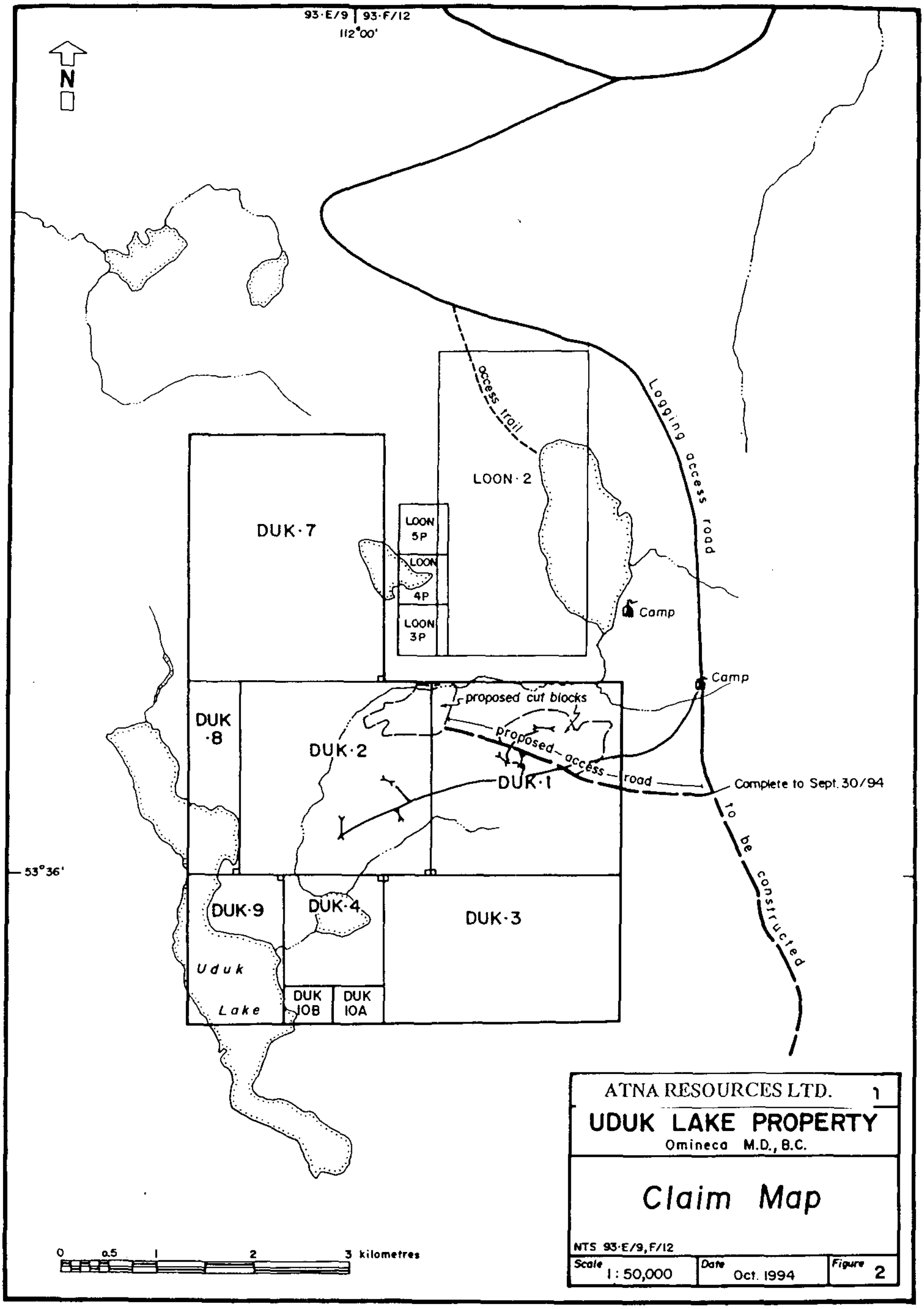
All of the Duk claims are owned by Atna Resources Ltd. and are under option to Gold Mountain Resources who have the right to earn a 60% interest by making cash payments of $60,000 and incurring exploration expenditures of $600,000 over an approximate 3 year period. If Gold Mountain completes its option requirements, Atna has the right to elect to earn back an additional 10% interest by incurring exploration expenditures of $250,000 within one year of Gold Mountain exercising its option. Atna retains a 1.5% NSR. Atna is currently the operator of the project via a service contract with Gold Mountain.

1.4 Exploration History

The Duk property was originally staked in 1980 by Amax Exploration Ltd. who carried out reconnaissance mapping and sampling and subsequently allowed the claims to lapse. In 1984 the property was restaked by S. Travis and optioned to Asitka Resources Corporation who conducted rock and soil geochemical sampling in 1985 and 78 metres of "Winkie" drilling in three holes in 1986. These holes intersected a quartz stringer/stockwork zone with values ranging from 20 to 1,450 ppb gold.

Pacific Comox Resources Ltd. optioned the property from Travis in 1987 and in 1988, sub-optioned the property to Chalice Mining Inc. Chalice conducted a program of line cutting, geological and geochemical surveys, an Induced Polarization geophysical survey and 358 metres of diamond drilling in 5 holes. Chalice did not exercise their option and the property reverted to Pacific Comox with Travis retaining a 1.5% NSR.

Pioneer Metals Corporation optioned the property from Pacific Comox in 1993 and carried out a program consisting of geochemical sampling of C-horizon soils. In 1994 Pioneer carried out a program that included in-fill geochemical sampling, prospecting, geological mapping and



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1

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Omineca M.D., B.C.

Claim Map

NTS 93·E/9, F/12

Scale	Date	Figure
1:50,000	Oct. 1994	2

backhoe trenching. Pioneer's work confirmed and enhanced the previously defined gold and silver geochemical anomalies and linked these anomalies to glacial dispersion trains emanating from zones of silicification within weakly to intensely altered rhyolite flows and breccias. The backhoe trenching identified numerous, widespread silicified zones with low grade gold and silver mineralization. While only narrow zones from 1 to 4 metres exceeded grades of 1 g/t gold, wide areas of up to 20 metres ranged up to 550 ppb gold and 10g/t silver. The character of the mineralization and alteration is indicative of a high level epithermal system. Due to budgetary constraints Pioneer was not able to meet the continuing terms of the option agreement and the property again reverted to Pacific Comox.

In early 1997, Atna Resource Ltd. purchased Pacific Comox's interest in the Uduk Lake property and granted an option to Gold Mountain Resources Ltd. to earn a 60% interest. Subsequently, Atna purchased the underlying 1.5% NSR.

1.5 **Description of Current Exploration Program**

As described above, previous exploration work on the property has identified high level epithermal gold-silver mineralization associated with altered rhyolite flows and breccias. The mineralization is widespread over an area of several square kilometres and prospecting has produced grab samples from rather inocuous looking rock of up to 5 g/t Au, all of which provides reason to evaluate the property for bulk tonnage epithermal gold mineralization. The property displays many features similar to Echo Bay's Round Mountain deposit in Nevada and Phelp Dodge's McDonald deposit in Montana. The McDonald deposit provides a compelling exploration model for the Uduk Lake property. At the McDonald deposit (375 million tons grading 0.67 g/t gold at a cut-off grade of 0.27 g/t gold, (Bartlett et al, 1996)), initial exploration focused on surface areas where low grade quartz chalcedony stockwork zones were intermittently exposed, however the real potential of the deposit was not discovered until extensive drilling had been completed and higher grade areas corresponding to porous tuff units were identified at depth. Gold mineralization at depth was found to correspond well with zones of high resistivity due to silicification. The geology, alteration and mineralization of the McDonald deposit host rocks have many similarities with the Ootsa Lake Volcanic rocks underlying the Uduk Lake property.

In order to effectively and efficiently evaluate the potential of the Uduk Lake property where most of the bedrock is covered with an extensive blanket of glacial till a 3-dimensional resistivity geophysical survey technique provided by Premier Geophysics was chosen. This survey would map out zones of resistivity in three dimensions and chargeability in two dimensions. The depth component or third dimension of the resistivity survey was important as it was anticipated that silicified and mineralized areas may form irregular shaped and dipping pipe-like bodies that would be difficult to drill test with only knowing their surface or two-dimensional expression. This report describes the program and results of a 3-D geo-electric survey conducted on the property from June 4th through to June 20, 1997.

2. GEOLOGY

The rocks in the area of Uduk Lake are described by Tipper (1962) and Woodsworth (1990) and range in age from late Paleozoic to Recent. The Upper Cretaceous to Eocene Ootsa lake Group felsic volcanic rocks are the principal lithology present on the Uduk Lake property.

2.1 Regional Geology

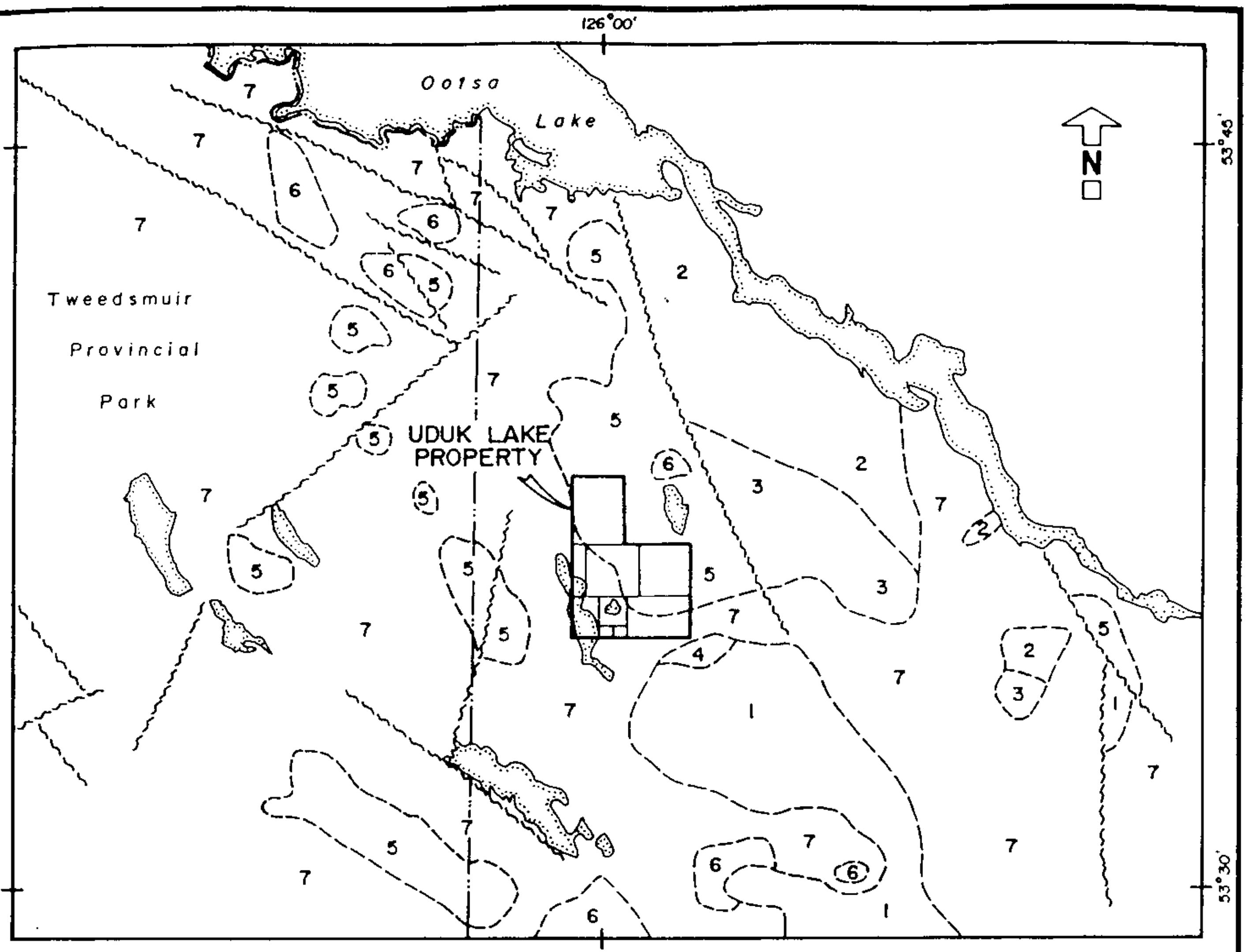
The following summary of the regional geology (Figure 3) as given by Tipper (1962).

> The Upper Triassic and Lower Jurassic Takla Group is characterized by basic volcanic flows, breccias and tuffs with interbedded black argillite, fine greywacke, and minor limestone beds. The marine Middle Jurassic Hazelton group rests unconformably on the Takla Group and similarly is made up of basic volcanic rocks but differs in that the interbedded sedimentary rocks are mainly chert - pebble conglomerates, greywacke, and minor shale or argillite. Upper Jurassic shale and argillite underlie a very small area. The non-marine, Upper Cretaceous to Eocene, Ootsa Lake Group, resting with angular discordance on Jurassic or Triassic rocks, is divisible into two units - a lower andesite and an upper rhyolite. The Ootsa Lake Group is overlain unconformably by the non-marine, late Tertiary Endako Group, and an essentially undeformed succession of basaltic and andesitic lavas, breccias, and tuffs.
>
> The area was overridden by Pleistocene glacier ice which, in it's final phases, moved across the area in a direction varying from N40° E to east. Granitic, granodioritic, and dioritic rocks of the Topley Intrusions were emplaced in Early Jurassic time. Late Jurassic or early Cretaceous granitic rocks intrude rocks of the Hazelton and Takla Groups.

2.2 Property Geology

2.2.1 Lithology

Glacially derived overburden obscures more than 98% of the bedrock geology on the Uduk Lake property. The only bedrock lithologies observed on the property are trachyte to rhyolite and dacite rocks forming dome-flow-breccias complex of the Eocene Ootsa Lake Group. Feldspar phyric andesitic rocks were observed in some of the old drill core and would appear to occur at depth in the southwestern part of the property.



QUATERNARY

7 Pleistocene & Recent
glacial, alluvial, & fluvial deposits

TERTIARY

6 Eocene to Lower Miocene
ENDAKO GROUP
massive, vesicular, and amygdaloidal basalt and andesite; minor breccia and tuff

CRETACEOUS (?) & TERTIARY

5 Maestrichtian(?) to Eocene
OOTSA LAKE GROUP
rhyolite and dacite flows, breccia, and tuff; minor andesite, basalt and conglomerate

UPPER JURASSIC and/or CRETACEOUS

4 *granite , quartz diorite, granodiorite & diorite*

MIDDLE and (?) LOWER JURASSIC

3 **HAZELTON GROUP**
andesite, related tuffs & breccias, chert pebble conglomerate, shale & sandstone.

UPPER TRIASSIC and LOWER JURASSIC

2 **TAKLA GROUP**
red & brown shale, conglomerate, & greywacke

1 *andesitic & basaltic flows, tuffs, & breccias; interbedded argillite & minor limestone.*

Compiled from : GSC Memoir 324 (H.W. Tipper)
GSC O.F. 708 (G.J. Woodsworth)

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Regional Geology Map

Scale	Date	Figure
1:250,000	Oct. 1994	3

2.2.2 Structure

Based on work by Tupper and Dunn (1994) the main regional structural trends are 130° and 160° . These trends have been offset by northeast trending structures at 50° with a minor trend at 10°. On a property scale, in Trench 94 - 1, a 6° to 15° joint and vein set is most prominent. In Trench 94 - 3 this northerly trend is present but an east - west series of aphanitic quartz stringers are most prominent. In Trench 94 - 4 the northerly trend is dominant. The resistivity data from the 3-D geo-electric survey show a strong northeasterly structural control on some of the highly resistive zones. Further trenching , with detailed mapping, will be needed to arrive at a clear picture of structural controls on the property. A magnetometer/VLF survey may be beneficial in aiding a property-scale structural interpretation.

2.23 Mineralization

The main mineralization of interest on the Uduk Lake property is silicification associated with pyrite and sericite. Many areas have undergone two or three stages of silicification. Cryptocrystalline and chalcedonic quartz replacement is followed by progressively coarser grained quartz and quartz stringers. Pyrite is present in all stages, but pyrite content does not correlate with gold content. Maximum pyrite content is 2% but, generally, it is much lower, less than 0.5% . Some K-feldspar has also been introduced, mainly as rims on plagioclase. Sericite is present as an alteration mineral and also introduced, in veinlets with quartz. Clay (kaolinite) occurs has a halo to the silicified areas within the felsic rocks.

In summary, gold - silver - arsenic mineralization appears to be associated with areas of more intense, multiple stage silicification and brecciation. Sulphide mineralization, mainly pyrite, with very minor bornite, does not correlate with better gold silver values (Tupper and Dunn, 1994).

3. GEOPHYSICAL SURVEY

3.1 Introduction

In June 1997, Premier Geophysics Inc. of Vancouver, BC, conducted a 3D geo-electric survey over the 97-1 grid on the Uduk Lake property of Atna Resources Ltd. and Gold Mountain Resources Ltd. True earth resistivity was computed and is presented herein as plan and section views through the earth. Induced polarization (IP) results are presented as four contoured pseudo-depth plan plots of apparent chargeability.

Pre-survey discussion of the known geology of the property provided the basis for choosing an emphasis on resistivity mapping, to map the distribution of known silicic mineralization under cover. IP data were to be acquired during the course of resistivity measurements, on a best available basis, without extending the sampling time and costs as would have to be done if IP was the primary emphasis of the survey.

The results of the 3D survey are described in terms of general explanations of possible causes for the anomalies observed. Technical limitations and some caveats are described for viewing and using 3D geo-electric results in general. It is beyond the scope of this report to provide direct correlation of these results with known site geology.

3.2 Survey Procedure

The property was subjected to a standard 3D multiple pole-pole survey in the style developed by Premier Geophysics Inc., with the assistance of the Geological Survey of Canada, in the period 1976-1981, and employed in commercial 3D field survey programs worldwide since 1982. The field survey technique delivers multidirectional, full potential field data appropriate for advanced 3D inversion processing. The 3D data processing employs a conjugate gradient inversion (CGI) algorithm, whose fundamentals were researched and partially developed in the period 1987-1992 at the Geophysical Inversion Facility of the University of British Columbia, initially in a program of research co-sponsored by Premier Geophysics Inc. and the Natural Sciences and Engineering Research Council of Canada. CGI routines operated by Premier Geophysics since 1992 were replaced in 1996 by a new generation of 3D CGI developed under the auspices of Premier Geophysics Inc., and applied commercially to all 3D survey data since mid-1996.

The survey grid area was wired in advance to provide computer-addressable measurement electrodes across the entire area on a 200m grid basis. DC electrical current was injected at each of these 200m grid stations in turn, and the resulting potential field was recorded at 20 to 35 other measurement stations on the grid. In addition, current was injected at every 100m grid station within the core area, and the resulting potential field was recorded at 12 to 25 measurement stations on the grid.

Using principles of reciprocity to restate potentials as currents and vice versa, the collected measurements were reformatted into a series of maps of the potential field derived from each of the 200m grid stations sites, at a resolution of the 100m grid stations. Each potential field represents the surface voltage manifestation of the distortions to current flow caused by subsurface earth conductivity distributions within the area traversed by the injected current. These highly-resolved, overlapping potential fields are the data feedstock required by the 3D inversion program.

The measurements made at each grid point are absolute potentials in volts, each referenced to a second potential electrode located at a fixed point at electrical infinity, several miles distant from the property. Tellurics and SP effects are removed from the signal by digital post-processing of the recorded waveform.

Current injection occurs between the electrode at the grid station selected at the time, and a fixed current electrode located at electrical infinity, also several miles from the property and also several miles from the other (potential) infinite electrode.

All survey grid co-ordinates were recorded in three dimensions. All measurements and calculations were made in three dimensional space. Corrections were made to the nominal grid geometry to accommodate known grid irregularities. The 3D mesh cell dimension in the N-S axis was reduced to 33.3 m from 50 m to better accommodate angled lines.

Observed field data were inverted using a conjugate gradient inversion to produce a 3D model of an earth resistivity regime, which is reported herein. The computed result is presented in four series of slices through the 3D earth model. In one series, horizontal slices at increasing depths below surface topography may be useful to view the effects of varying cover, or the effects of weathering or other depth-from-surface mechanisms that may be present. In a second series, plan plots at decreasing absolute elevations allow viewing of adjacent features which may have had a common hydrologic, hydrothermal or stratigraphic elevation in a possible pre-erosional regime. A third sequence of plots shows true vertical sections facing grid north, in which the present topographic surface is shown, and on which existing/proposed drill loci or geologic section data can be plotted. The fourth sequence is the same as the third, but faces grid east.

Induced polarization (IP) measurements were also accumulated for electrode spacings up to 300 metres. The sample stacking rate, at 7 samples (half-waveforms), was extended from the minimum of 5 samples necessary for the resistivity survey, but was held short of the 11 to 15 samples that would have been stacked if IP was a priority. IP was thus obtained on an "as available" basis as an adjunct to the resistivity measurements, while maintaining the cost-effectiveness of the resistivity-optimized survey parameters.

3.3 Technical Specifications

Because Premier's proprietary, automated acquisition system is different in many respects from conventional survey instrumentation, and because the establishment and use of a large number of electrodes over an extended period of time introduces factors not necessarily relevant in conventional survey operations, we present extended annotation of technical specifications for the interest of users and their consultants. The two promotional plots included after the appendices may provide some additional perspective to these technical notes and other references in the report. Questions and discussion are always welcome,- direct them to Greg Shore at the contact numbers on the title page.

Transmitted current waveform: The transmitted waveform is a crystal-clocked cycle of DC pulses, each cycle consisting of 0.5 seconds + DC current, 0.5 seconds off time, 0.5 seconds - DC current, 0.5 seconds off time. Current levels on this project ranged from 35 milliamperes (70 mA peak-peak) to 950 milliamperes (1.9 amperes peak-peak). Transmitter power requirements were consistently less than 1 kilowatt.

Transmitted current measurement: The transmitted output waveform is digitized using precisely the same integration window timing specifications as are used for the Vp primary voltage measurement at the potential electrode, to a resolution of 0.01 mA, using a Hewlett-Packard 5.5 digit DVM employing auto-zeroing to an internal calibration reference before and after every measurement.

Transmitted current synchronization: A Premier Mark III Current Imager provides a precise low-voltage replica of the output waveform to the DVM, and also detects the edges of the transmitted DC pulses, generating corresponding DVM synchronizing pulses. The Imager rides the high voltage transmitter output, and delivers the synchronization and waveform image through optical coupling to the measurement instruments. Synchronization is maintained at precise levels with no drift. Periodic re-synchronization or calibration is not necessary.

Measured signal: The primary voltage (Vp) was measured between each selected potential electrode site and the fixed potential electrode located at electrical infinity (the "potential infinite"), located some miles from the grid. Measurement is by 5.5 digit HP DVM identical to that used for the transmitted current measurement.

A settling time of at least 10 hours occurs after installation to allow the steel[1] electrode to equilibrate electrochemically, and to allow the electromechanical effects of ground insertion to dissipate (usually 10 to 45 minutes). For each potential electrode connection, a measurement system circuit settling time of 1.5 seconds is allowed before any measurement take place. The primary voltage is measured at a selected number of windows over the duration of the transmitted + or - pulse, starting with a delay time (Td) from pulse start. The Vp value is measured over a specified period (Tp) following Td, and stored as a digital value. A number of consecutive Vp values can be measured and stored. In this case, we used a Td of 120 milliseconds, followed by 8 equal-period integration windows of 16.7 milliseconds[2] paced at 20 millisecond intervals. A digital integration of the 5th through 7th period was computed and stored as the nominal Vp for processing purposes.

Monitoring and correction for potential electrode contact resistance error. The problem: In most conventional resistivity/IP surveys, the electrode contact resistance is measured using an ohm-meter circuit prior to a survey measurement. Since the electrode is in place only for a short time, there can be some confidence that the contact resistance will not change significantly. With the 3D survey array electrodes in place for 5 to 10 days, there are no such

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[1] Unless copper - copper sulphate ionic interface electrodes are employed, where the settling time requirement is zero. Steel electrodes are the norm, having been proven effective, provided settling time is allowed, in side-by-side IP survey tests. The problems sometimes reported in using steel electrodes for IP are generally non-existent after allowing a sufficient settling time, and provided that no disturbance is delivered in the form of ohm-meter test voltages just prior to measurement. The settling time is free - the setup of the initial survey grid over 2-3 days provides for ample settling time without having to schedule it or wait for it.

[2] 16.7 milliseconds is ten 60 Hz power line cycles. Integration times set as multiples of power line cycle periods automatically null out these AC effects, allowing operation near or under high power lines.

assurances, and changes in electrode contact must be presumed to occur. Periodic checks of contact resistance are therefore necessary. Ohm-meter tests employ up to 1.5 volts across the electrode circuit, driving significant current and in some soil-electrode interface conditions, setting up electrochemical conditions that can interfere with precise measurements for up to several hours. In conditions of marginal top poor contact resistance, this effect is amplified. Further, it has been observed that the contact resistance value obtained from a 1.5 volt low impedance source can be greatly different from that actually known to be in effect for survey signal levels that are 3 to 6 orders of magnitude smaller.

Premier's solution: Premier developed a means of routinely checking contact resistance (as often as once for every measurement taken, if desired) which utilizes the measured survey signal itself to assure an undistorted measurement of contact resistance. The contact resistance measurement that is obtained is sufficiently accurate that the amount of signal lost across the electrode contact can be computed and restored to any data originating from a high contact resistance site, making such data relevant and useful. In areas of dry talus, dry sand, bare or fresh flow rocks or glacier ice, the correction may be a doubling or tripling of the observed value, indicating the extent to which results can be distorted by these rock types. This passive, non-distorting contact monitoring and correction system allows use of the 3D array in virtually any surface conditions without concern about the loss of data coverage or the generation of false anomalies due to contact problems.

Note that while measurement contact resistance problems can severely distort measured signals, the same surface conditions will also be contributing to operational difficulties with the transmitted current. It will be difficult to deliver sufficient current to generate measurable signals. Also, there may be irregularities in each current pulse, as current is delivered at high voltage in a fluctuating combination of electronic/ionic flow from electrode to soil/rock, and arcing through air/vapor gaps left as the current flow area heats up. These conditions are unavoidable in many terranes, and are sometimes managed by high-cost measures such as installing salt water mud and tinfoil contacts. The Premier 3D approach mitigates both of these concerns. First, by investing in the wiring required to measure absolute voltages (referenced to the distant potential infinite) derived from a single local current injection point (connected to a second remote infinite electrode, for current), the signal available for the 3D survey is 100 times larger than the signal that would be measured by a dipole-dipole array at an equivalent nominal depth of investigation characteristic (NDIC). This means that where a dipole-dipole survey requires 2 amperes of input current[3] to achieve measurable signal, the 3D survey requires only 20 milliamperes. This signal advantage makes it much easier to get sufficient current even in very difficult contact conditions. Second, variations in input current steadiness are fully accommodated by the precise matching of measurement integration times for both the current input and the measured signal, as explained in the paragraph below.

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[3] High voltages are required to drive current through high contact resistances. Transmitters will often exceed their power limitations in the attempt to deliver adequate signal. For example, if a dipole-dipole survey requires (to achieve adequate signal) 2.0 amperes of input current through a 2000 ohm electrode contact, the transmitter must deliver 4000 volts, at a power level (power = current squared x resistance) of 16,000 watts. For the same measured signal level at the same nominal depth of investigation, the pole-pole array employed by Premier's 3D survey requires only 20 milliamperes, driven by the transmitter with only 40 volts, at a total power requirement (I^2R) of only a few watts. The much lower voltage requires less electrode preparation time and materials, less expensive wire, and is also safer for humans and animals, and less likely to leak (arc) to ground.

Needing 100 times less current also means that lower voltages can be used, with less heating and drying of the resistive contact, resulting in less arcing[4] and irregular current waveforms.

Correction for current level drift. Injected current levels can drift as electrode contact areas heat up and dry out, both during an individual current pulse and on a longer term as the pulse train continues. This drift can exceed the ability of a constant-current transmitter to maintain steadiness. These difficulties are rendered immaterial from a resistivity standpoint by measuring and recording the transmitted output current over precisely the same time intervals that the Vp is measured, providing normalization of the Vp for true real-time current on each and every sampled pulse. This effectively eliminates error related to current drift or irregular pulse characteristics caused by arcing, and relieves the operator from any monitoring or mitigation concerns in the field.

SP buckout; removal of tellurics. SP, or Self Potential, is managed by using a wide dynamic range DVM to digitize the entire signal waveform, SP and all. Real-time post-processing eliminates the SP through digital filtering. Tellurics are voltages derived from sunspot activity, which vary over time periods from a fraction of a second to 10 to 15 seconds or more. Digital filtering also removes these effects from the digitized waveform, presenting to the operator a report on stacked signal clarity in real time, so that adjustments can be made to the sampling intensity and/or duration when particularly noisy conditions are seen.

3.4 Processing Procedure

The measured field data set is designed to meet the requirements of a 3D Conjugate Gradient Inversion (CGI) program for the determination of 3D earth geo-electric characteristics.

The field data are reviewed and culled of obvious technical deficiencies using a number of logical and observational tests. The few erroneous data which are typically not detected at this stage will be automatically rejected during inversion when their mathematical misfit with the bulk of the other overlapping data isolates them from the process.

A topographic surface is derived from the electrode data, and is used to construct the 3D earth model (3D mesh) topography. The 3D mesh used for this inversion employs cells that are 50 m by 33.3 m, with thickness of cells ranging from 10 m near surface to >50 m at depth.

The CGI program uses the uniformly multi-directional E-SCAN field data set, and itself requires no prior parameterization or pre-processing constraining. The process, and therefore the result, is objective, generating an earth model with as many conductive and resistive bodies as may be required to reproduce the observed field data set. Each body may be of any shape, intensity, lateral position, juxtaposition, orientation, and depth of burial, with all bodies independent of each other, and independent of terrain effects, conductive cover or other sources of distortion.

The over-riding mandate of the CGI process is to resolve the simplest model that fits the observed data. This means that where a single block anomaly would satisfy the results to the

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[4] If arcing and ragged current pulses are the best available delivery of current, the matched integration and normalization of current allows a fully uncompromised survey to proceed.

same degree as a sequence of close-spaced narrow or thin features, the single block will be generated. The end user of the data results should consult the 3D geophysicist regarding these aspects on a property-by-property basis

The result of the CGI processing is a file describing the 3D earth mesh, with an assignment of a resistivity value for each cell. From this file, the values required for various 3D images and 2D section views can be extracted and displayed or printed. A set of such views is presented in this report.

3.5 Results - 3D RESISTIVITY

The 3D resistivity results are presented in the four large plots that are folded and stored in the pocket of this report.

In the plan views (Figures UDKa-100-RS.1 and UDKa-100-RA.1), the plot in the upper left corner shows the property grid 97-1 as presently understood. The red lines trace the grid lines from end-point to end-point, with an assumption that they are straight between these points. It is also assumed (for processing purposes) that the stations are equally distributed along these lines, and can be read off from the scaling at the edge of the plot. For purposes of locating the ground position of any feature for physical testing, scale off the N-S axis distance between enclosing grid lines for a relative position to be reproduced in the field. On the E-W axis, use the station numbers as shown at the plot edge. Where the area of interest needs to be compared with exploration data acquired earlier on the previous grid, refer to the appended IP plots which show the 97-1 grid lines and stations plotted with the location of the prior grid on a single 1:10,000 scale map.

The "marginal data area" shown on all plots denotes an area of lower resolution and greater potential ambiguity of result. This is because results located in the marginal data area are more loosely constrained by measured data than those located more centrally. There are fewer measured data near the edge of the grid. Of these, the larger-spacing (deeper-probing) measurements tend to be unidirectional, necessarily aligned with the edge of the grid. Finally, in the process of 3D data inversion, the model being developed in the marginal data area is unconstrained on one side due to the lack of measured data outside the grid. The inversion routine can assign any values to this outside area, without having to match observed data. As an example, anomalous features which extend into the marginal data area tend to be terminated by the inversion, in the absence of measured data to force recognition of a feature's continuation beyond the grid. The terminated feature may be the simplest model which meets the constraints of the data set, and so it will be presented. In reality, the feature may or may not terminate as shown. In addition, the presented feature may be poorly positioned or shaped, again due to a lack of high density constraining data. Any time an exploration decision involves a feature in a marginal data area, the advice of a geophysicist experienced in the method should be obtained.

At depth there is a similar diminishing of data constraints due to the absence of measurements below a certain depth of investigation. The inversion can therefore satisfy itself that all data have been accommodated by leaving the deeper extensions of features unresolved, usually fading back to nominal background values at depth. A second limiting factor regarding downward extension of features is the increasing distance from the electrode plane, and the dilution of responsiveness inherent in that increasing distance. As with any potential field method, the greater the distance from the stimulation and measurement points, the larger/stronger the anomaly needs to be to be remain detectable. The 3D inversion of high density data sets is not immune from this fact. As a result, the lower edge of the resistive and conductive features in the present results should be interpreted as being effectively unresolved. There is in effect nothing to contra-indicate the continuation of similar widths and strengths of anomaly to depth, not to mention the possibility of narrower deep extensions of similar or stronger anomalous characteristics.

In a background of approximately 200 ohm-metres, several anomalies are apparent.

A. Resistive bodies The two strong resistivity anomalies (>1000 ohm-metres) centered at 48+50 N, 36+00W and at 42+00N, 39+00W imply locally less permeable rock conditions. There are several possible causes for a locally decreased permeability:

1. The anomaly is the same rock type as surrounding unit, but is more resistive due to locally lower permeability/fracture density, unrelated to alteration effects.
2. The anomaly is the same or a different rock type, with alteration precipitate sealing fractures and reducing permeability, causing elevated resistivity by exclusion of connected moisture.
3. The anomaly is a different rock unit, having inherently less permeability (due to less fracture density and/or less inherent rock porosity) than the surrounding rock unit, and therefore greater resistivity, with or without the effects of alteration or deformation.

The resistive anomaly at 48+50 N, 39+00 W appears to lie close to surface. Section views show elevation of resistivities from starting background values over more than 200 vertical metres. This suggests that the feature is at least that thick. Its termination or its continuation downward can not be resolved with the present data.

The second major anomaly is located at the south edge of the center of the grid, in the marginal data area. While a resistive feature is unquestionably indicated as existing in that area, neither the true intensity of the anomaly, nor its shape and depth extent can be reliably quantified due to the limited raw field data obtained in this area. This feature likely extends beyond the edge of survey coverage.

Either of these two anomalies could be a compound geophysical response from a now-sealed conduit structure (part 1), surrounded by host rocks whose many or few fractures have been sealed by precipitate from fluid leakage for some distance from the conduit (part 2 of the compound signature). Thus, target testing for each anomaly should consider the possibility of two or more sub-zones of distinct alteration type and intensity, each with potentially different mineralization characteristics and economic significance. Compound anomalies of this type are common in the Toodoggone area (e.g. AGB, Duke's Ridge, Phoenix deposits).

Recommendations: The possibility of a NW trend (indicated elsewhere in the survey coverage) should be noted when planning drilling. A drill hole should cross any apparent trend to test for a pipe-like or sheet-like conduit which could lie anywhere within the zone (not just at the center). The central anomaly appears to lie at or close to subcrop; trenching might be possible to facilitate examination of the feature.

B. Resistive linear An E-NE trending linear resistive feature, centered at 44+50N, 44+00W, appears as at least twice background resistivity, and up to 100 metres wide. With a grid spacing of 100 metres, this response could also arise from a narrower (5-20 metre wide) zone of much greater resistivity. Discrimination of the exact width or internal details of the feature would require smaller survey grid spacings. The potential causes for this anomaly are the same as above, with a less-permeable dike or a silicified fault/shear being likely candidates. The width of the indicated anomaly could also be a combined response to a narrow shear zone and surrounding silicified (sealed) host unit, presenting a single broad resistive zone.

Recommendations: Drilling or trenching should be oriented NW to cross the zone. Trenching should start at the center of the imaged width and extend outward NW and SE until the regime is understood. Drilling should be collared well back from the signature to penetrate the zone from side to side, testing for a sheet-like conduit.

C. Other resistive zones Several other resistive zones appear in the survey area, with anomaly intensities similar to that of the E-NE linear (B). These may warrant investigation if the E-NE linear (B) can be associated with potentially economic mineralization or processes.

D. Conductive zones Some conductive zones also occur, some with NE and NW trending orientations. Because of the distribution of relative high and low resistivities throughout the survey area, it is not possible to suggest, on a statistical basis, a given resistivity level which might represent the general unaltered host rock background signature. The survey results allow two possibilities for the conductive zones:

1. The conductive zones (40-75 ohm-metres) may represent the unaltered background signature of the upper 200 metres of bedrock, with all resistive zones representing anomalous conditions resulting from geologic processes or localized presence of more resistive rock types. The case for a background resistivity signature of 150 to 200 ohm-metres is suggested visually in plots Zs14 through Zs20 of Figure UDKa-100-RS.1. However, the upper 100 to 200 metres of rock could have a different background signature, i.e. 40-75 ohm-metres. Neither model can be confirmed within the present (complex) shallow data set.
2. The conductive zones could be anomalies within a more resistive background host signature of 150 to 200 ohm-metres, potentially representing lower-temperature alteration surrounding core areas of resistive (silicic?) mineralization. View plots Zs7 and Zs8 of Figure UDKa-100-RS.1 for a graphic suggestion to this effect, with the conductive areas appearing to surround the resistive highs.

Recommendations: If geological mapping can not confirm an alteration cause for the conductive zones, some limited trenching or drilling could be undertaken to test the lower-temperature alteration halo model, particularly if the high resistivity centers are found to result from hydrothermal activity.

3.6 Results - INDUCED POLARIZATION

Presentation. The results are presented in pseudoplan view as apparent resistivity, in appended plots IPZ-LN-1 through 4. In each plot, dark gray lines (vectors) signify IP values plotted midway between and aligned with the two grid electrodes (pole-pole array) responsible for the measurement. The orientation of the vector also indicates the nominal orientation of current flow through the sampled area. Higher IP values are indicated by a greater length of vector. In plot IPZ-LN-1, the data originate from current-potential electrode separations of 65 to 165 metres, providing a nominal depth of investigation (NDIC) of 55 to 140 metres. Plot IPZ-LN-2 data come from C-P separations of 140 to 250 metres (NDIC 120 to 215 m). Plot

IPZ-LN-3 data come from C-P separations of 220 to 300 metres (NDIC 190 to 260 m). Plot IPZ-LN-4 shows all data from separations 65 to 300 m.

The IP values have been gridded using a random gridding (non-directional) program, and subjected to smoothing (several passes of a Hanning filter) to produce the coloured portion of each plot. The contours were computed from the filtered grid data, and represent 0.5% contour intervals.

(In the black and white graphics of the report copies submitted for assessment credit, the coloured aspects of all graphics have been rendered in greyscale.)

Note that any contoured anomaly resulting from a single vector is suspect, as there is no way to verify that the value is not simply a noisy reading. Where a long vector is contradicted by a shorter vector(s) of similar orientation and position, noise is indicated and the higher value should (usually) be disregarded. Where an anomaly appears to originate solely from a group of vectors associated with a single common electrode position, caution is again indicated due to the possibility of a noisy electrode connection causing a group of spurious values.

The existence of subgroups of single-variable (common electrode, or common orientation/location) data is a source of powerful near-surface mapping logic, and of verification of data credibility when data density is sufficiently high. In this case (Uduk Lake survey), IP data were gathered at low density on an as-available basis during a survey optimized for 3D resistivity survey. Nonetheless, even at low data density, the multi-directional nature of the simple, deep-sampling pole-pole data makes the pseudo-plan views of the results significantly more straightforward and informative than the results available from a conventional collinear-array survey operated along (but not across or between) the grid lines.

Observations. The induced polarization (IP) survey data provide a generally elevated IP response in the northeast quadrant of the grid. Some single-datum anomalies are present, and usually represent noise. Where other measurements of similar C-P separation (sampling the same area) produce conflicting lower results, those lower results will usually be correct, and the single higher value should be rejected. Where there are no comparative data (often the case on the shortest C-P spacing plot), the anomalous reading represents either noise or a discrete area of elevated IP located between (but not including) the sites of the C and P electrodes responsible.

The magnitude of response for pole-pole array IP responses is substantially muted compared with dipole-dipole responses. Therefore, an anomaly of 3% in a background of <1% is a significant IP anomaly, to be considered in the ballpark with a moderate Newmont anomaly of 15 to 20 milliseconds in a 3-5 millisecond background.

The contoured areas should not be considered as an interpreted zone of elevated IP, but should be treated as *apparent* resistivity in the same way that diagonal features on an apparent resistivity pseudosection are understood not to directly represent an equivalent shape of structure or zone. The anomalous IP reported here indicate only that elevated values are associated with the general area of the electrodes involved. The source-location uncertainty increases as the C-P separations increase, as these pseudo-plan views represent the equivalent of plan-contouring increasingly larger "n" spacings of pseudosection data[5]. Any area of potential exploration interest should be evaluated by an experienced 3D geophysicist to

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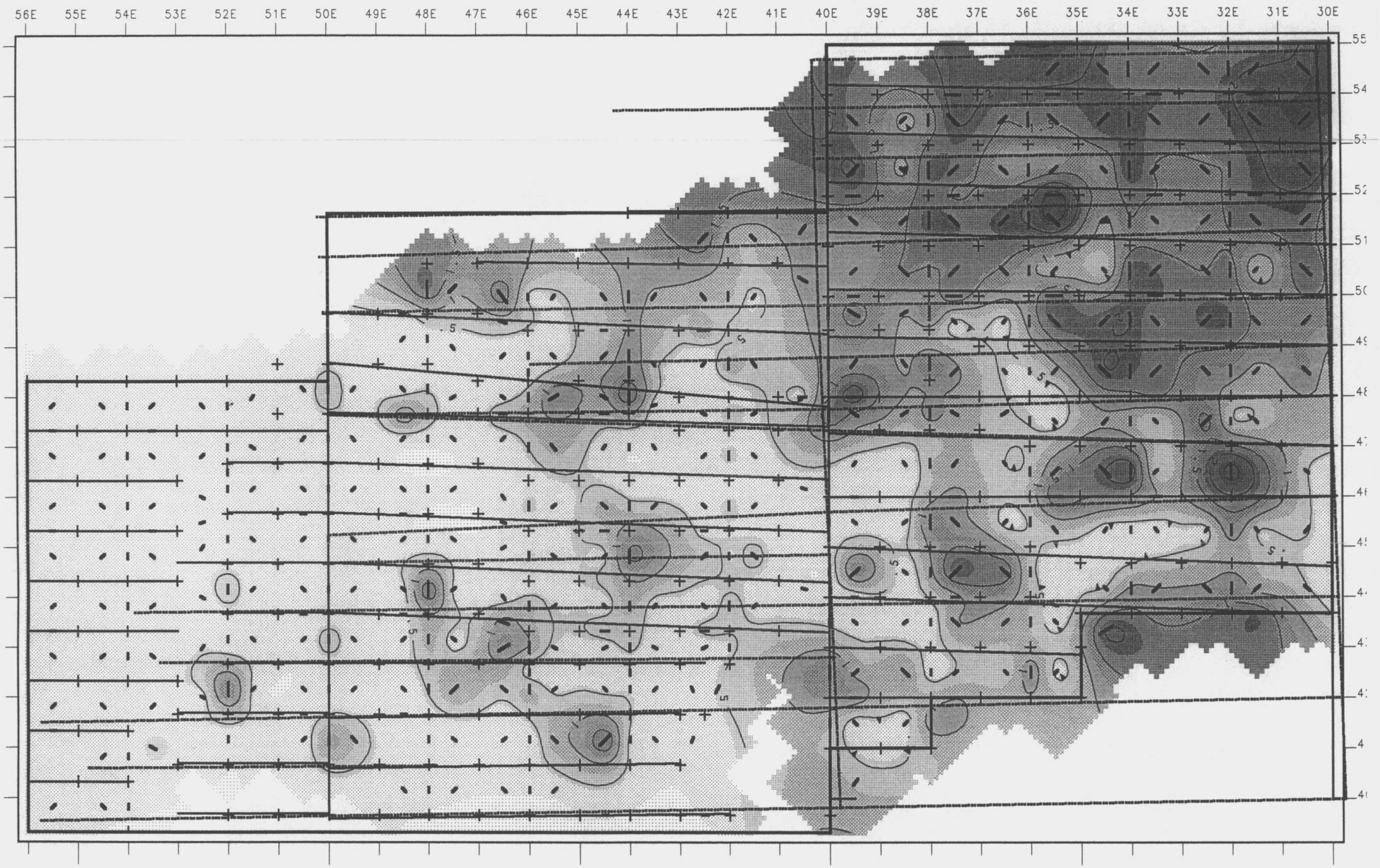
[5] Contouring increasingly lower parts of a "pantleg" diagonal response obviously results in a greater displacement of the contoured result from the true near-surface cause of the "pantleg".

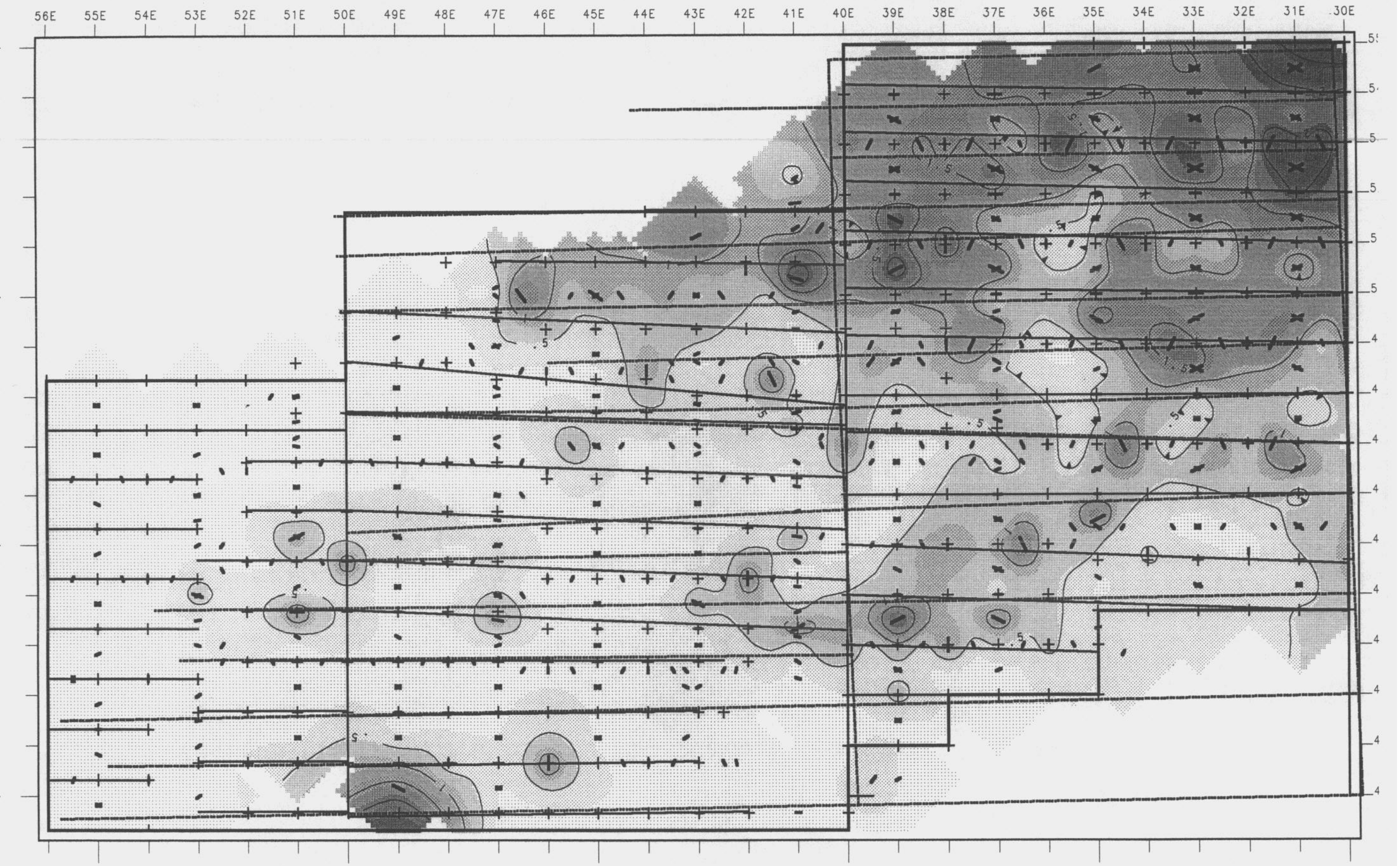
determine the probable physical location(s) of the source(s) of the anomaly, before locating trenching or drill programs.

Correlation of the IP results with known property geology is beyond the present scope of this report.



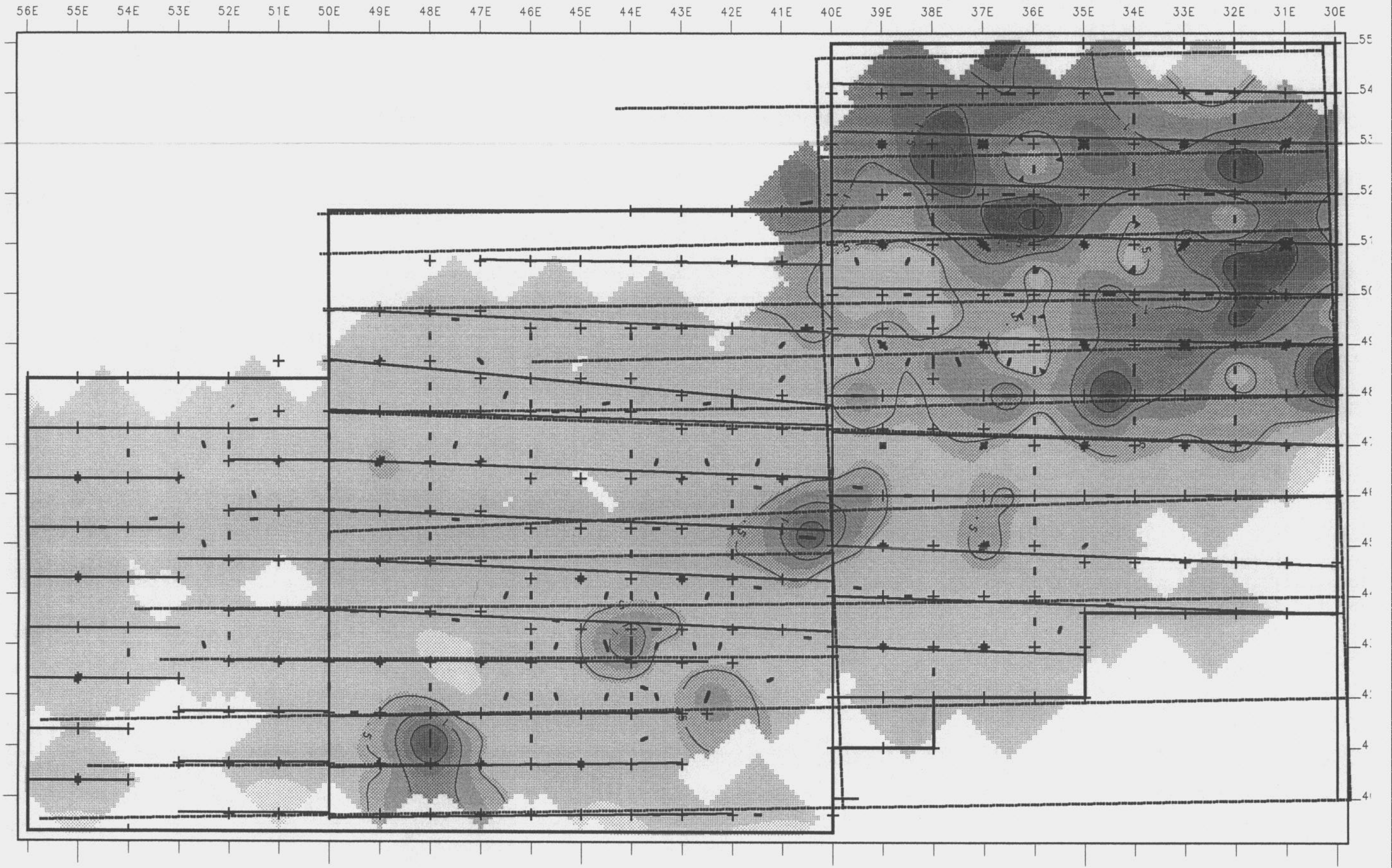
Uduk Lake Property, 1997 : Pseudoplan view IPZ-LN-1, C1-P1 separations: 65 to 165 metres
Induced Polarization (IP) raw data: apparent chargeability in %, as Vs/Vp x 100%
Individual observed data plotted as vectors between C and P electrode positions.
over linear gridding/contouring.

Red grid lines are the new 97-1 grid used
for the 1997 3D survey. + indicates the
nominal electrode station position employed.
Dotted black lines show the prior survey grid.



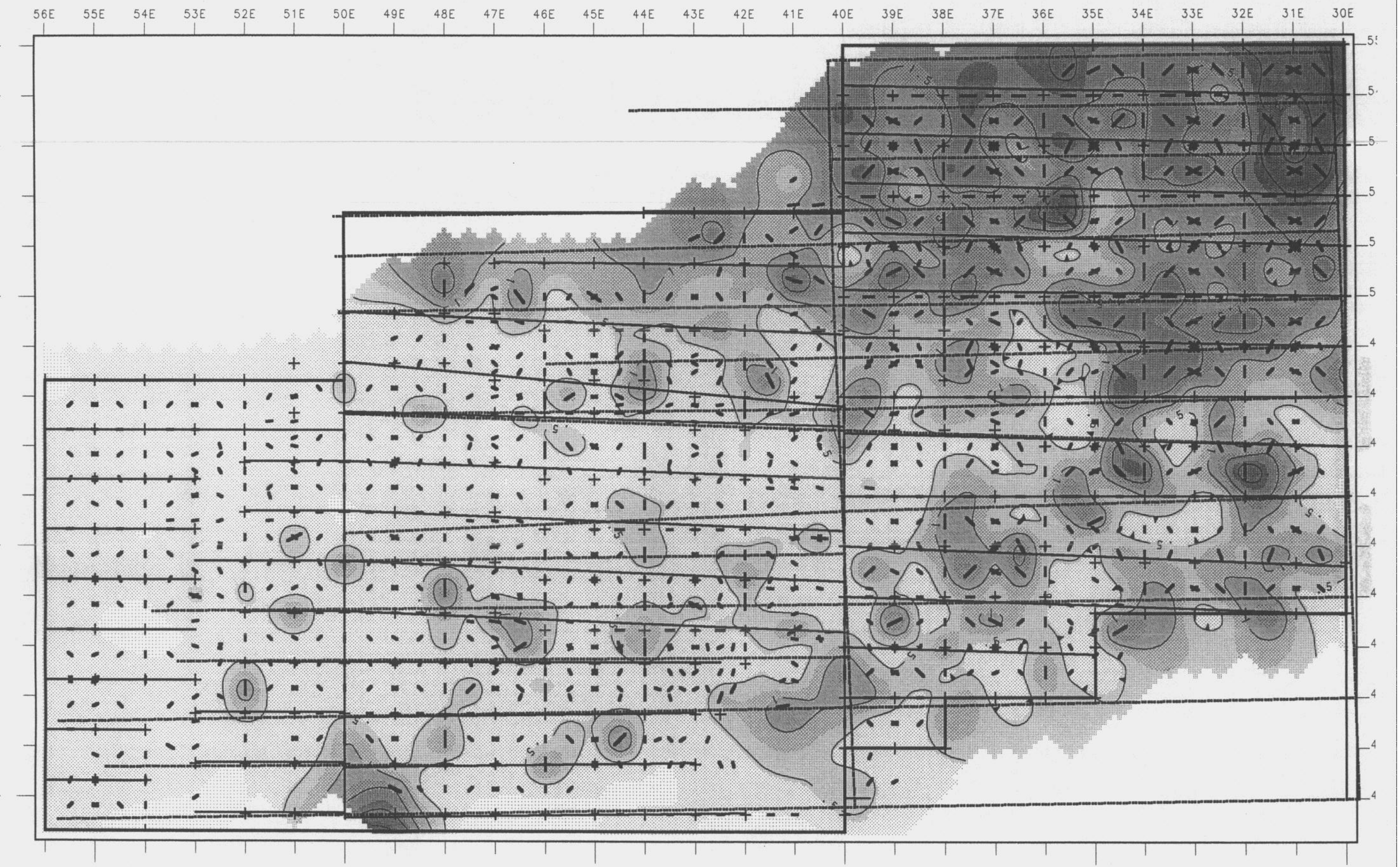
Uduk Lake Property, 1997 : Pseudoplan view IPZ-LN-2, C1-P1 separations: 140 to 250 metres
Induced Polarization (IP) raw data: apparent chargeability in %, as Vs/Vp x 100%
Individual observed data plotted as vectors between C and P electrode positions.
over linear gridding/contouring.

Red grid lines are the new 97-1 grid used
for the 1997 3D survey. + indicates the
nominal electrode station position employed.
Dotted black lines show the prior survey grid.



Uduk Lake Property, 1997 : Pseudoplan view IPZ-LN-3, C1-P1 separations: 220 to 300 metres
Induced Polarization (IP) raw data: apparent chargeability in %, as Vs/Vp x 100%
Individual observed data plotted as vectors between C and P electrode positions.
over linear gridding/contouring.

Red grid lines are the new 97-1 grid used
for the 1997 3D survey. + indicates the
nominal electrode station position employed.
Dotted black lines show the prior survey grid.



Uduk Lake Property, 1997 : Pseudoplan view IPZ-LN-4, C1-P1 separations: 65 to 300 metres
Induced Polarization (IP) raw data: apparent chargeability in %, as Vs/Vp x 100%
Individual observed data plotted as vectors between C and P electrode positions.
over linear gridding/contouring.

Red grid lines are the new 97-1 grid used
for the 1997 3D survey. + indicates the
nominal electrode station position employed.
Dotted black lines show the prior survey grid.

4. CONCLUSIONS AND RECOMMENDATIONS

The Uduk Lake property contains widespread gold and silver soil geochemical anomalies and scattered low to moderate grade precious metal values associated with silicification in much of what outcrop is exposed. Extensive glacial till cover and consequential lack of outcrop prevents a straight forward evaluation of the economic mineral potential of the property. A 3-D geo-electric survey was carried out over the area of anomalous soil geochemistry in order to identify the three dimensional morphology of the silicified (resistive) zones.

Results from the geophysical survey correspond very well with what is known of the geology and geochemistry of the property. In general highly resistive zones underlie or are slightly offset (up-ice) from areas of anomalous soils. There are three predominant zones of high resistivity: 1) a linear northeasterly trending zone across the middle of the grid area, likely reflecting a structurally controlled zone of silicification; 2) an elliptical, near vertically plunging, pipe-like zone on the northeastern part of the grid area, and 3) a large circular pipe (?) on the southern edge of the grid.

The best trench results from previous work were obtained from an area on the down-ice edge of zone 2. Zone 2 is about 200 to 300 metres in diameter and is flanked by a halo of higher conductivity which likely reflects an area of argillic alteration around a central zone of silicification. Geophysical survey results suggest that resistivity values drop off in the vicinity of 200 to 250 metres below surface which could correspond to the base of the boiling zone.

Zone 3 is located on the edge of the grid in the marginal data area and as such is less defined than the other zones. However, the data indicates a similar feature to zone 2 but with a possible greater size. This area should only be drill tested if favourable results are obtained from zone 2. Trenching in this area would be difficult due to low lying swampy ground.

The survey results do not demonstrate a stratabound zone of silicification at depth which was the case at the McDonald deposit and the high resistivity zones are not of sufficient size to be in the plus 100 million tonne range. The resistive zones do have sufficient size to be in the many to tens of million tonne range and have the morphology and features expected for high level epithermal system. Potential for rapid changes in mineralization grades with depth is a common feature in such systems. It must also be borne in mind that only a small part of the property was geophysically surveyed.

Further exploration should concentrate on testing the defined resistive zones for potential ore grade mineralization. Existing work already indicates that the resistive zones correspond very well with areas of silicification and that these areas contain anomalous to potentially economic grades of precious metals. Additional trenching would provide more surface information about the zones and possibly elucidate some of the internal structural controls that would facilitate future drilling. Work should be concentrated on zone 2 first then zone 1 and finally zone 3.

Drill testing could be conducted without additional trenching but this would add some risk. At least three holes in zone 2 and two holes in the other zones would be required to adequately test the potential. If favourable results are obtained consideration should be given to expanding the areas covered by the geochemical and geophysical surveys.

References

Bartlett, M.W., Stephen, M., Enders, M.S., Volberding, J.E., and Wilkinson, W.H., 1996. The Geology of the McDonald Gold deposit, Lewis and Clark County, Montana, in Coyner, A.R., and Fahey, P.L., eds., Geology and Ore Deposits in the American Cordillera: Geological Survey of Nevada Symposium Proceedings, Reno/Sparks, Nevada, April 1995, p.981-1000.

Tipper, H.W., 1962. GSC Memoir 324, Map 1131A.

Tupper, D.W. and Dunn, D.StC., 1994. Report on the 1994 Geochemical and Trenching Program on the Uduk Lake Property. B.C. Assessment Report.

Woodsworth, G.J., 1990. Geology of the Whitesail Lake Area. GSC Open File 708.

APPENDIX I: STATEMENT OF EXPENDITURES

Re : Uduk Property

PROFESSIONAL FEES AND WAGES :			
Peter Holbek, Chief Geologist			
2.5 days @$425.00/day		$ 1,062.50	
Duncan MacRae, Field Assistant			
10 days @$175.00/day		1,750.00	
Bart Piekarski, Jr. Field Assistant			
10 days @$125.00/day		1,250.00	
Contractor		4,200.00	$ 8,262.50
GEOPHYSICS			54,439.20
GRID & LINE CUTTING - Contractor			14,700.00
EXPENSES :			
Camp accommodation		$ 5,885.00	
Camp supplies		803.14	
Maps & reproductions		19.08	
Miscellaneous		26.41	
Recording Fee		3,720.00	
Telephone		48.10	
Travel Expenses :			
Accommodation	$ 187.08		
Fuel	139.57		
Meals & Groceries	48.43		
Truck rentals	2,233.47	2,608.55	13,110.28
SUB-TOTAL :			$ 90,511.98
MANAGEMENT FEES @10%			9,051.20
			$ 99,563.18
GST @7%			6,969.42
TOTAL :			$ 106,532.60

Payment due upon receipt of this invoice.

APPENDIX II STATEMENT OF QUALIFICATIONS

Certificate of Qualifications

I, Peter M. Holbek with a business address of 1550 - 409 Granville Street, Vancouver, British Columbia, V6C 1T2, do hereby certify that:

1. I am a professional geologist registered under the Professional Engineers and Geoscientists Act of the Province of British Columbia and a member in good standing with the Association of Professional Engineers and Geoscientists of British Columbia.
2. I am a graduate of The University of British Columbia with a B.Sc. in geology 1980 and an M.Sc. in geology, 1988.
3. I have practiced my profession continuously since 1980.
4. I am vice president of Atna Resources having a business address as given above.
5. I supervised the work program conducted on the Uduk Lake property as described in this report.

P. M. HOLBEK

Peter Holbek, M.Sc., P.Geo.
September 15, 1997

PREMIER GEOPHYSICS INC.
8663 206B Street, Walnut Grove
Langley, BC, Canada V1M 3X5
Tel 604 513 3600 Fax 604 513 3602 gashore@ibm.net

Certificate

I, Gregory A. Shore, of 8663 206B Street, Langley, BC V1M 3X5, certify that

- I am a professional geophysicist, and have practiced my profession in positions of responsibility in mineral and geothermal resource exploration and development continuously since 1966,

- I am President and principal geoscientist of Premier Geophysics Inc., of Langley BC.

- I am a Professional Geoscientist in good standing, member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia, registration number 19953.

- I am a member in good standing of the Society of Exploration Geophysicists (SEG) and of the Society for Mining, Metallurgy, and Exploration (SME) of the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME).

- I personally planned. executed and reported on the geophysical survey which is the subject of this report.

- I have no direct or indirect interest in the property on which the survey was done, nor in Atna Resources Ltd. or Gold Mountain Resources Inc.

G. A. SHORE

Gregory A. Shore, PGeo
September 8, 1997

APPENDIX III: GENERAL INTERPRETATION AND VIEWING LIMITATIONS

Hard-copy plots

The survey results are presented as multiple images on large plots, appended.

Plan views are presented at 15 selected levels. Sets of true vertical sections facing east, and facing north, show topography and results to 950 m AMSL

The data displayed in the plots have not been filtered, adjusted, or otherwise changed from the final output of the inversion program. An earlier process of gridding and contouring these data has been abandoned, as the result was inevitably a loss of information, and the occasional creation of images which are artifacts of processing rather than real features. The current presentation of actual cell values as colored blocks provides the opportunity to view subtle data gradations quite effectively (viewing whole plot sheets from a distance often affords useful perspectives on patterns of resistivity), while retaining the ability to observe data quality factors, including the degree of model data smoothness and local repeatability. These quality factors provide the opportunity to identify features which, for example, could benefit from more detailed 3D survey work to resolve unexpectedly narrow features of interest.

Uncertainties regarding anomalies in the marginal data area

The confirmation of the presence, termination, or beginning of any deep feature within the area defined by the outer two measurement grid spacings of the model is subject to extended interpretation procedures involving examination of model cells lying outside the grid area, and possible local reprocessing work. There are three influences contributing to this uncertainty in the marginal data area:

1. The deeper (wider-spacing) raw data measurements are less dense, providing less information and making fewer demands (and offering fewer constraints) on the inversion processing.
2. The deeper measurements tend to be more unidirectional, parallel to the edge of the survey area, providing less information about orientations, and offering fewer constraints.
3. The inversion processing finds no constraints whatever on its behavior beyond the edge of the survey grid. The smooth-model mandate can create values in that uncontrolled adjacent space which will generally result in a smoothing of details within the survey grid area.

The result is that anomalous features within the marginal area may appear subdued, and often will appear to drop off near the edge of the grid when in fact the anomalous unit may extend beyond the survey area. While there are procedures that can be applied to assess the relative merits of each marginal area anomaly, there remains an element of subjectivity to the process, and always the acknowledgment that we are dealing with greatly-reduced measured-data information and constraints.

In every case where an anomaly of potential interest (weak or strong) occurs within the marginal data area, consultation with the 3D geophysicist is appropriate before deciding whether to write it off, drill it, or call for additional survey coverage to resolve it fully.

Deeper anomalies understated

As a general rule in all electrical geophysical methods, to be recognized at greater depths, geo-electric features must possess increasingly greater volume, or be of more anomalous character, or both. Correspondingly, faint trends or features at depths over several hundred metres should be treated as significant features, their true signatures possibly being several times more conductive or more resistive than indicated. Similarly, the lower edge of features, particularly resistive features, will tend to fade and truncate at a shallower depth than is actually the case.

This weakening effect may be increased when narrow grid dimensions result in much of the deep area lying within the marginal data area (zone of limited raw data density), or when high levels of data set noise or terrain variability effectively limit the final resolution of the CGI processing.

Grid spacing controls resolution limits for narrow features.

The grid spacing of 100 metres permits the use of a 3D mesh conservatively constructed on 50 metre square cells, or two cells per grid spacing on both X and Y axes. This can be increased to 3 cells per spacing (33.3 m cells) in some cases to improve very-near-surface resolution, at an overall cost in increased processing time and graphics requirements.

Strong linear features of widths from a few metres to several tens of metres will be represented in the results as broader (50 to 100 metre wide) zones, which is the best the 50 m mesh/100 m grid combination can realistically achieve. More precise imaging of such a conductor would require the application of a 3D survey over the anomaly using, say, a 15 or 30 metre field grid, which would permit a 5 to 10 metre processed mesh resolution. Sometimes it is preferable to move to one side of the diffuse anomaly and drill across it to test for narrow structure. The degree of usefulness of this approach can be learned for a given district, leading to potentially substantial savings in exploration costs by the use of wider-spacing 3D survey followed by application of the learned, locally proven drilling strategy.

Edges of large features (contacts, changes in lithology) are similarly blurred by the wide sample interval employed in large-area mapping. Equal care needs to be applied to make sure any drill or trench testing is positioned appropriately to sample the edge of a feature.

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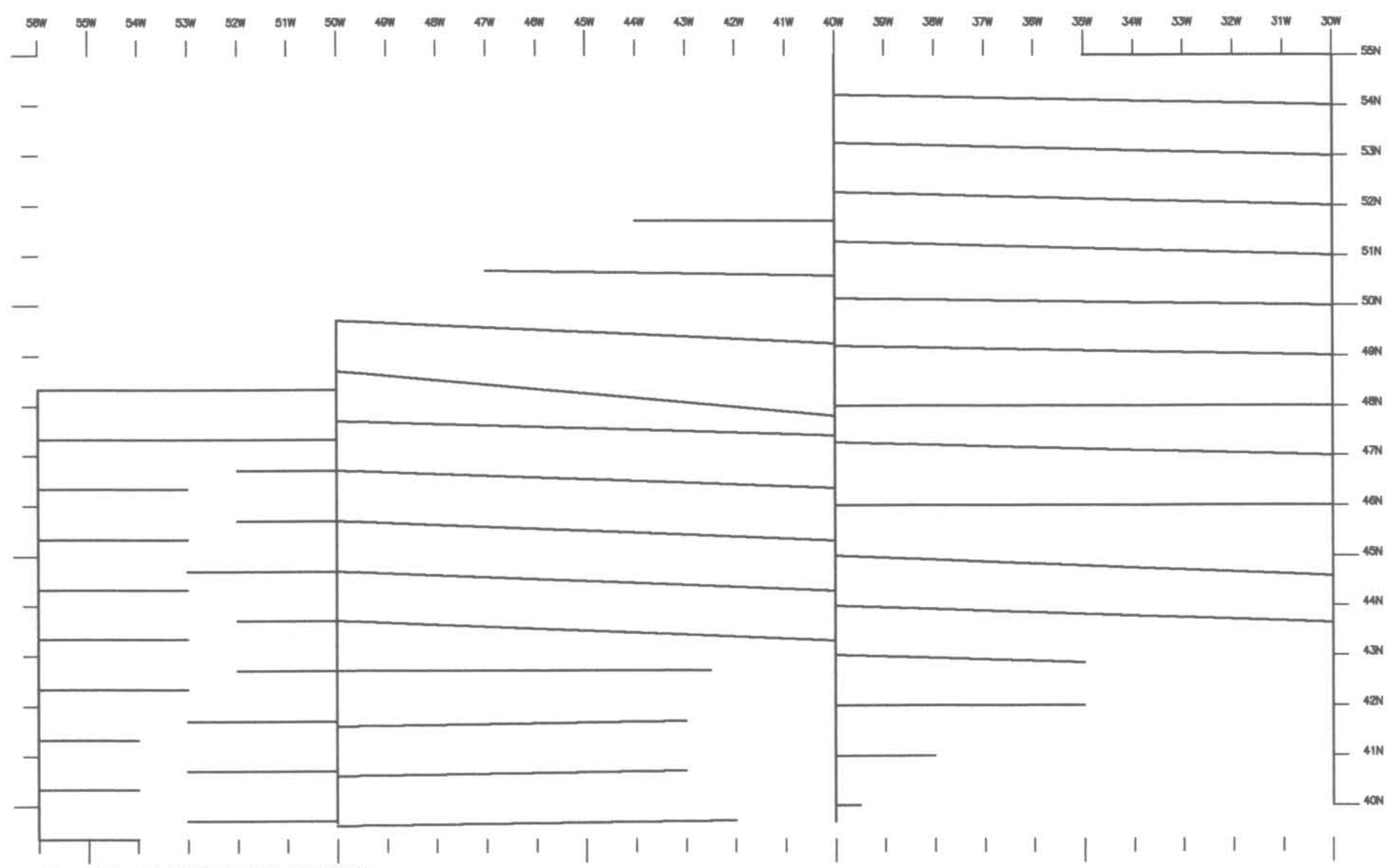


Figure T1: 3D SURVEY GRID LOCATION

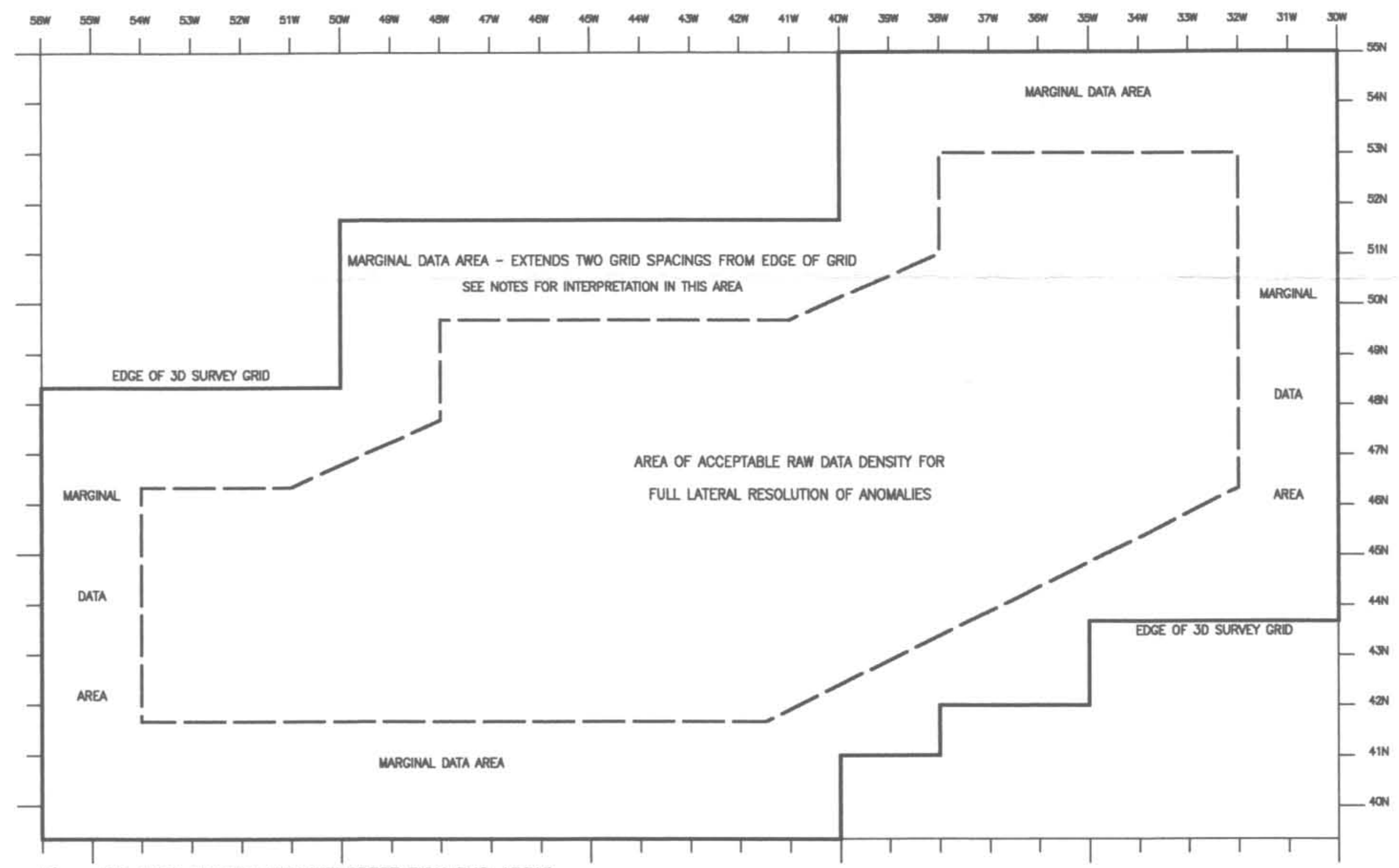
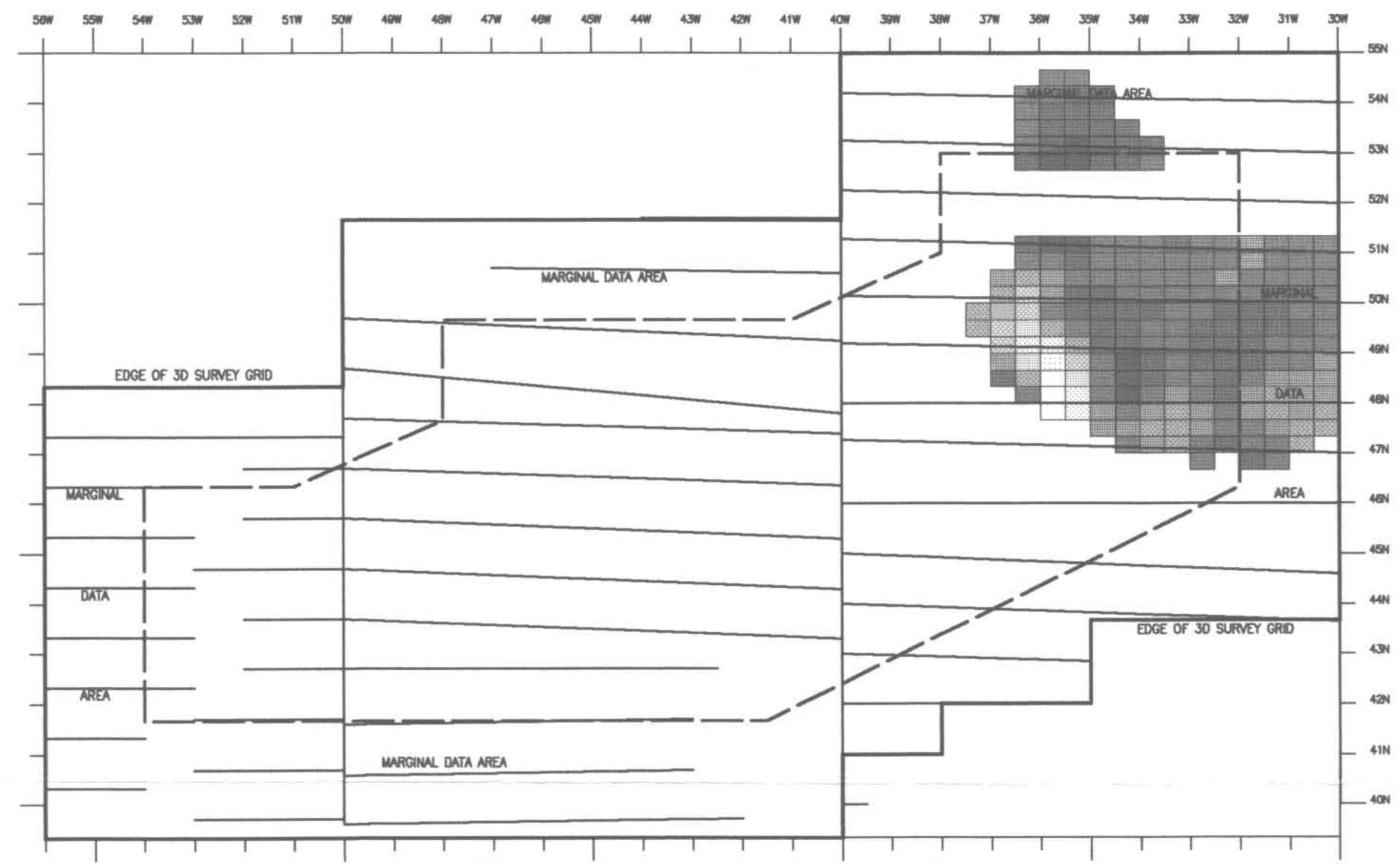
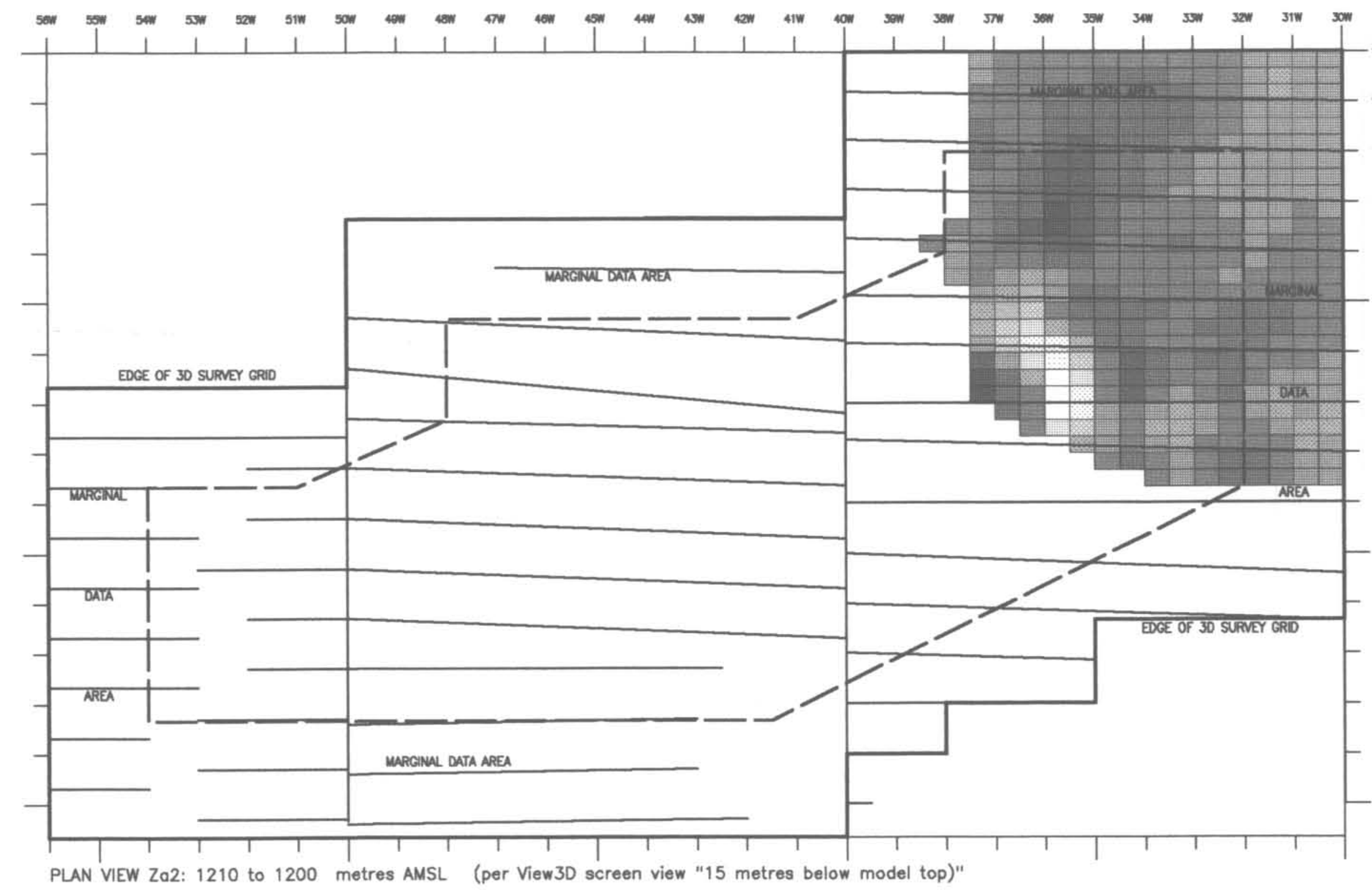


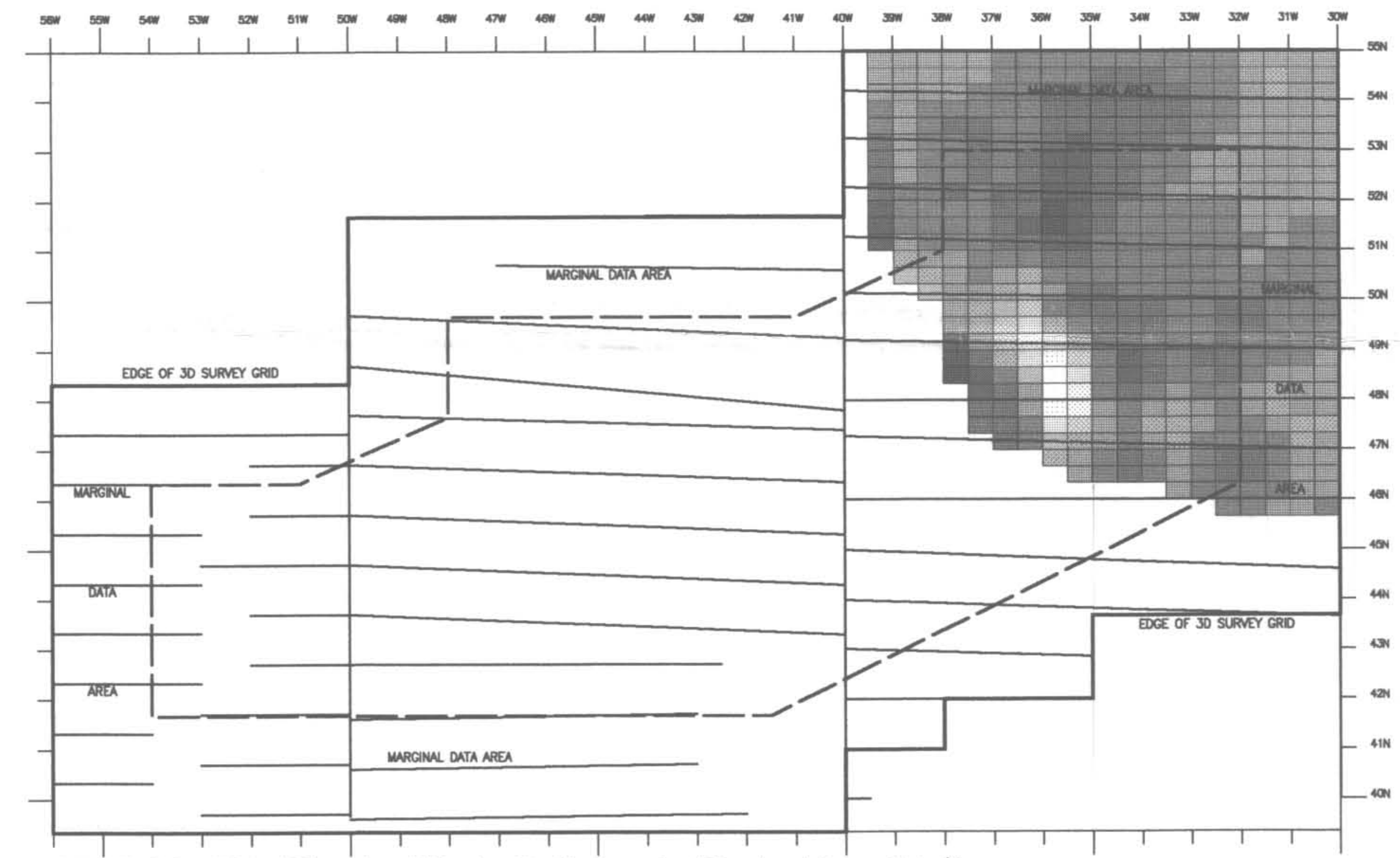
Figure D1: DATA DENSITY AND INTERPRETATION SUB-AREAS



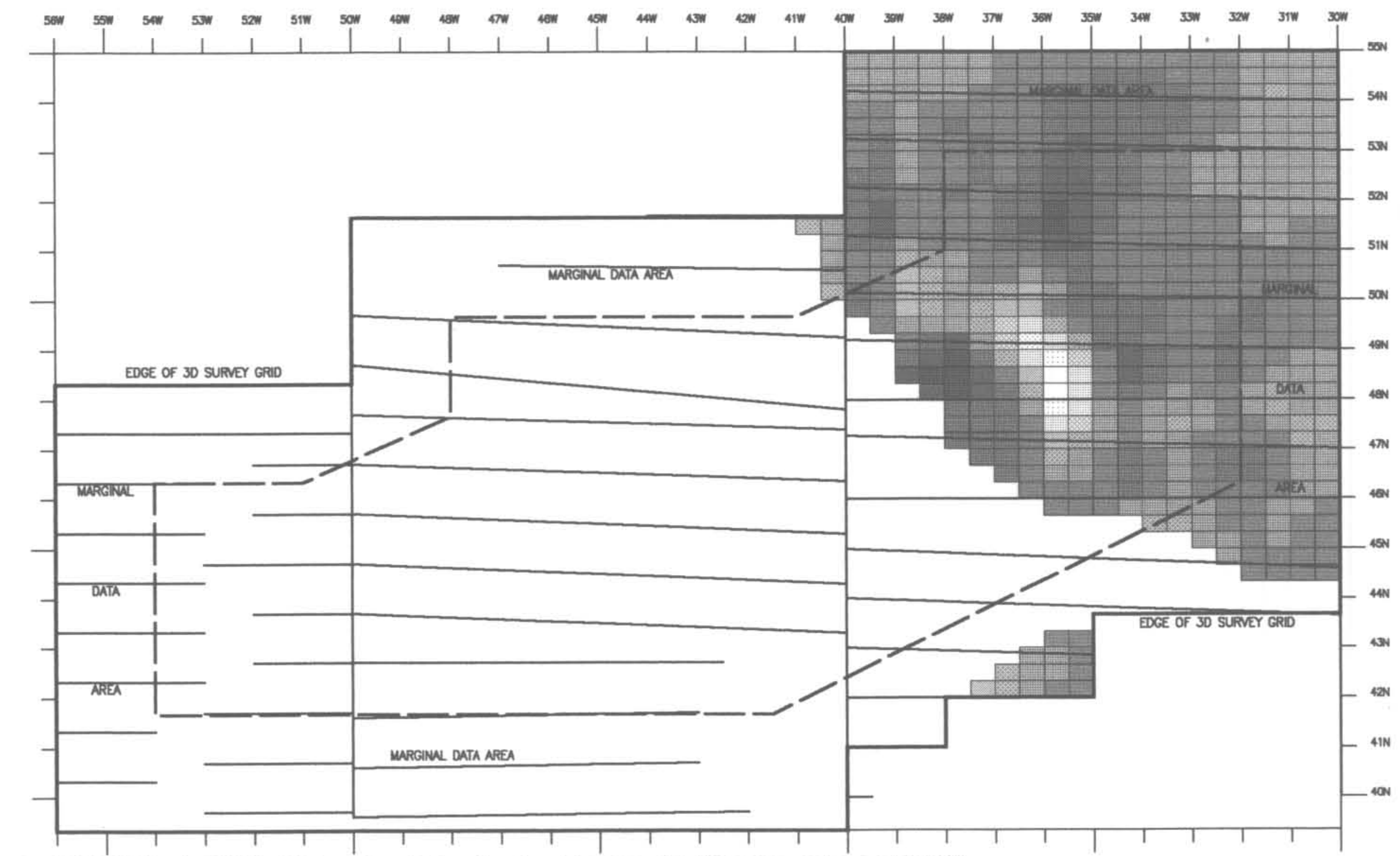
PLAN VIEW Za1: 1220 to 1210 metres AMSL (per View3D screen view "5 metres below model top)"



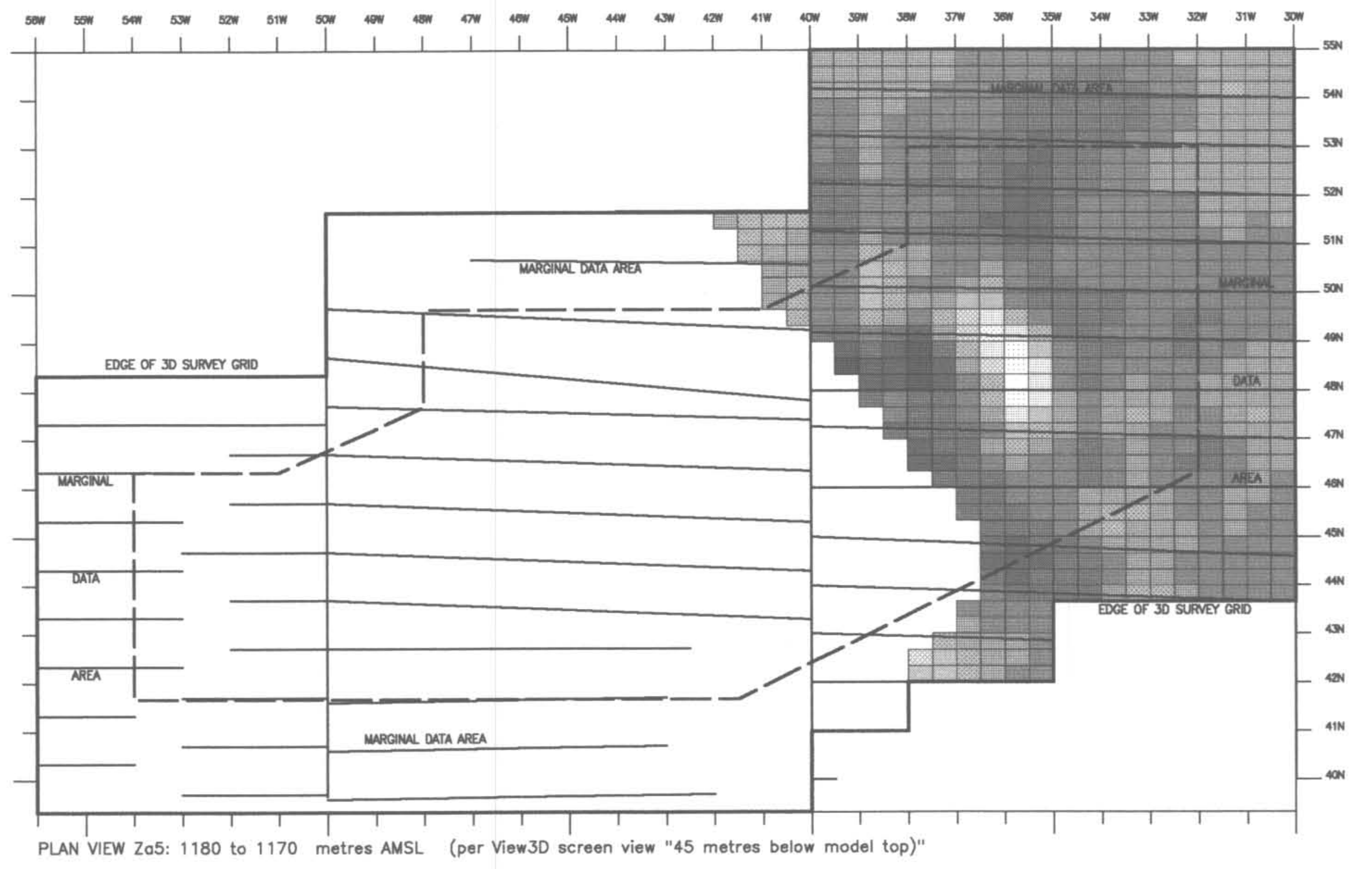
PLAN VIEW Za2: 1210 to 1200 metres AMSL (per View3D screen view "15 metres below model top)"



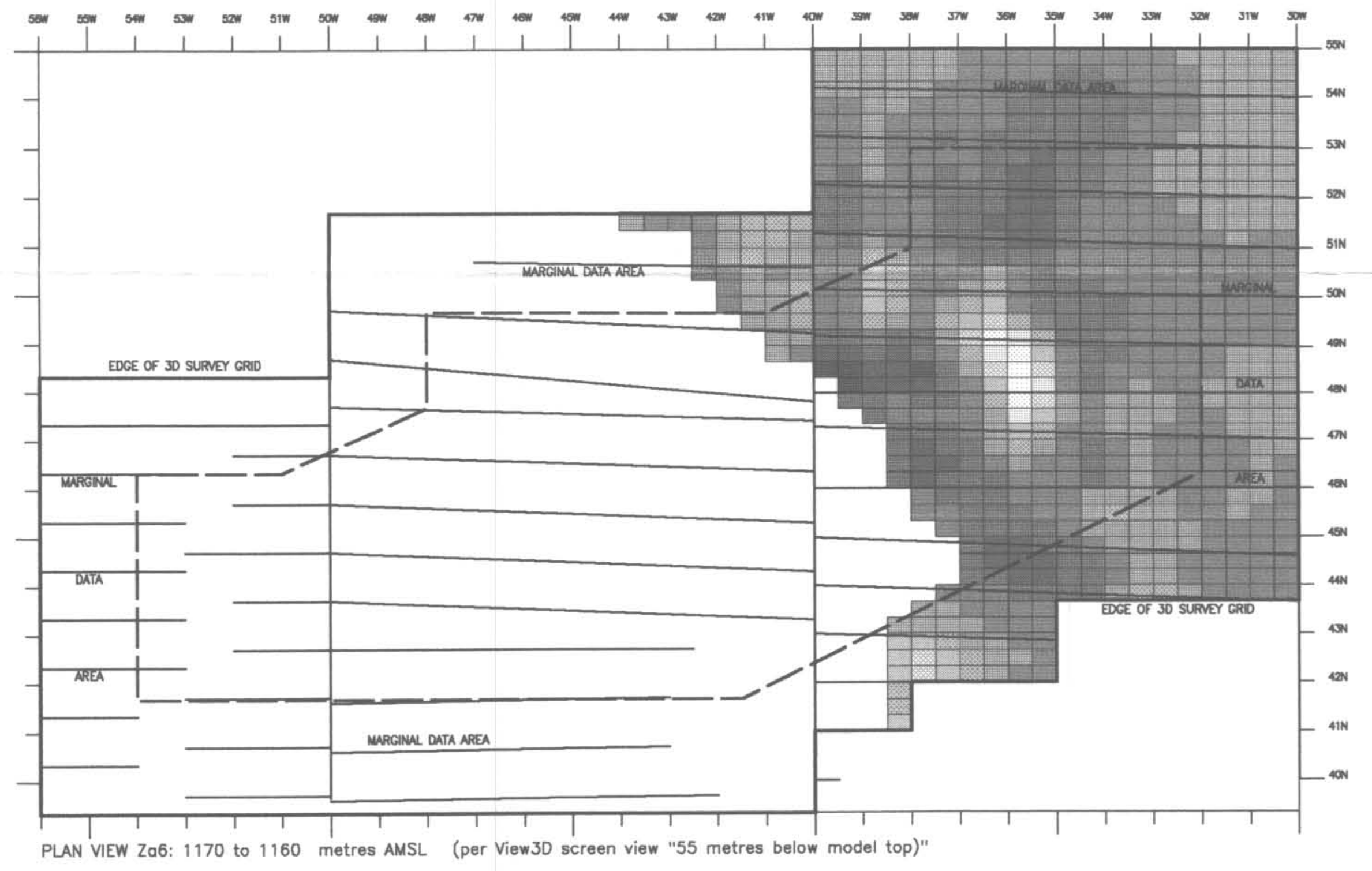
PLAN VIEW Za3: 1200 to 1190 metres AMSL (per View3D screen view "25 metres below model top)"



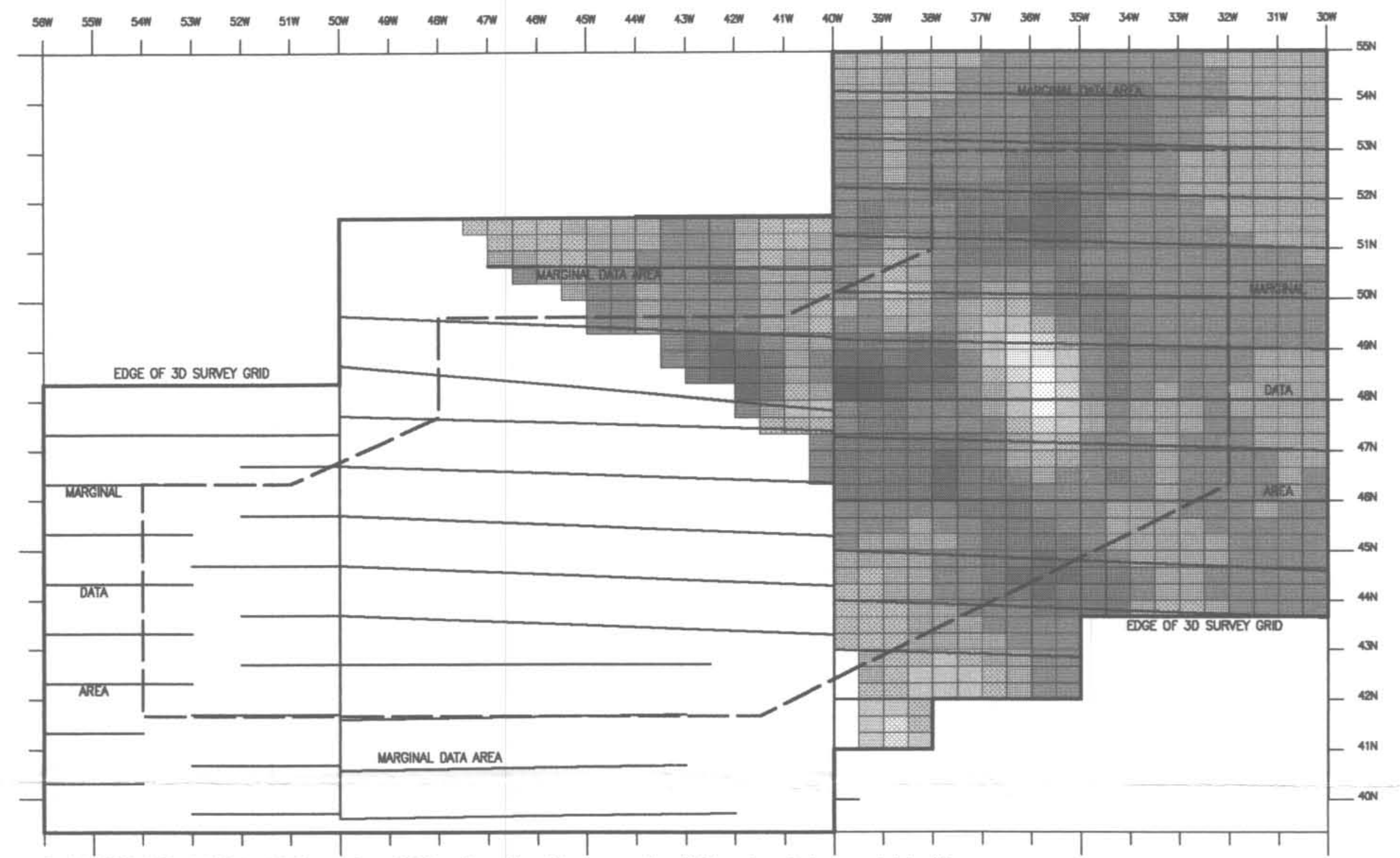
PLAN VIEW Za4: 1190 to 1180 metres AMSL (per View3D screen view "35 metres below model top)"



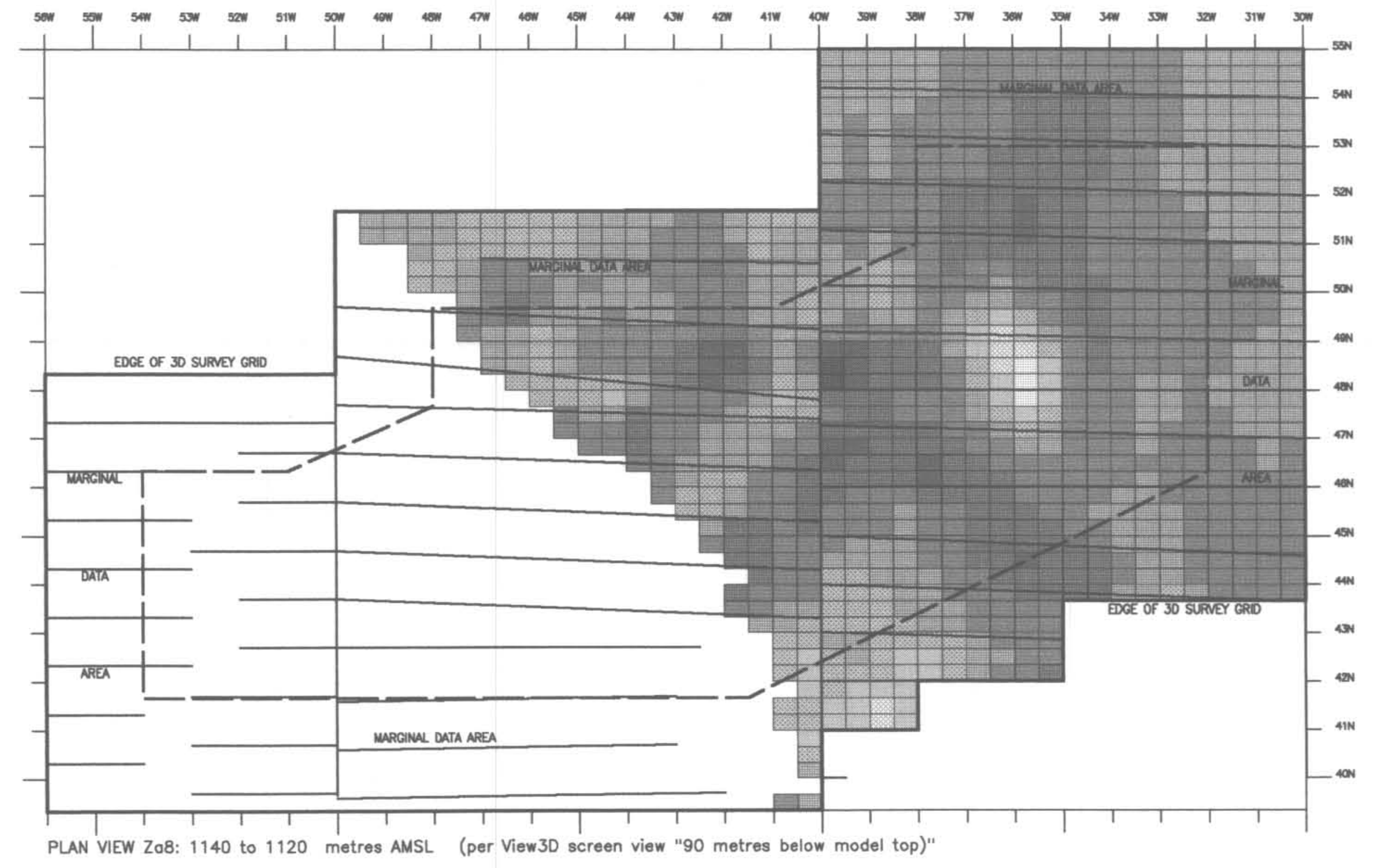
PLAN VIEW Za5: 1180 to 1170 metres AMSL (per View3D screen view "45 metres below model top)"



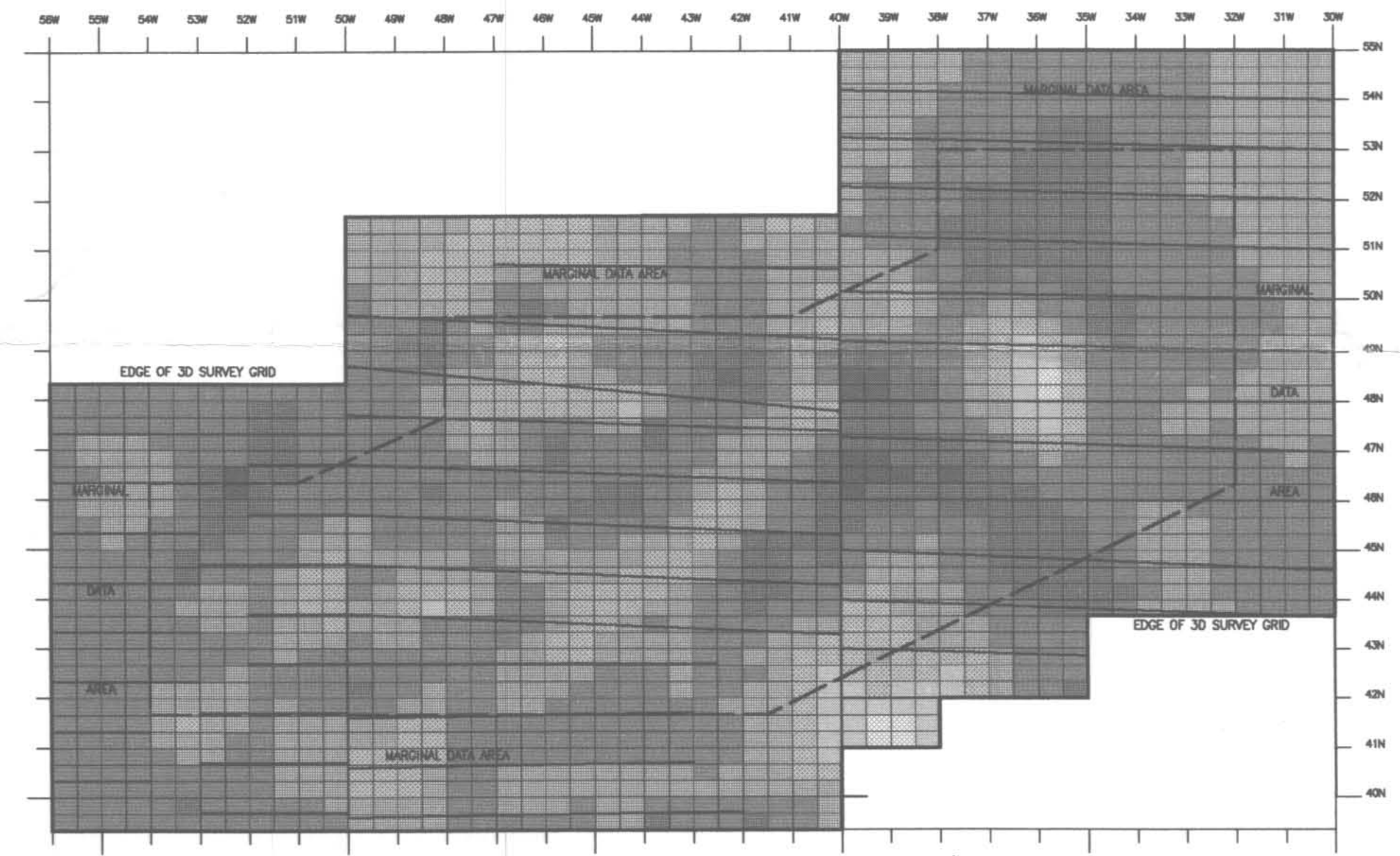
PLAN VIEW Za6: 1170 to 1160 metres AMSL (per View3D screen view "55 metres below model top)"



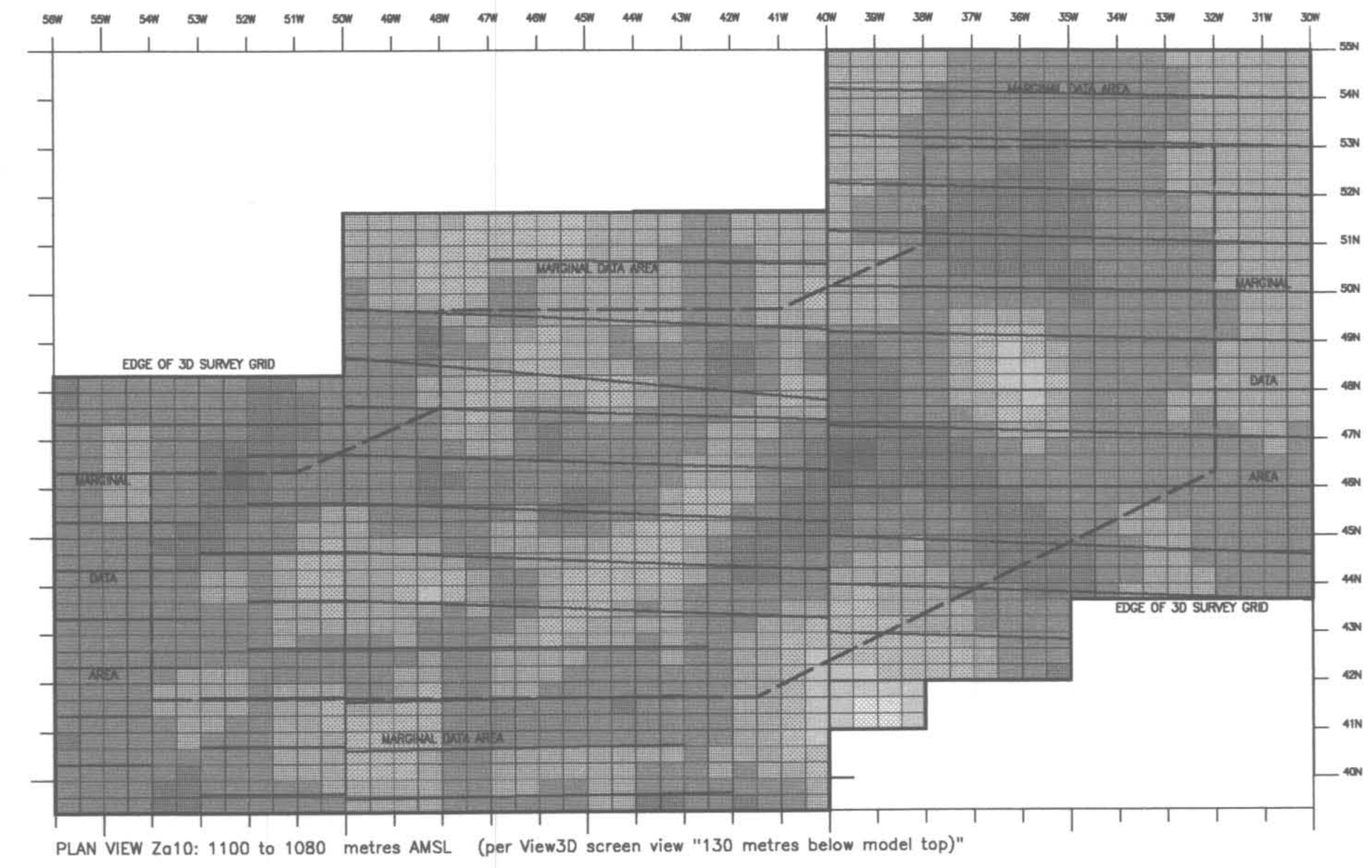
PLAN VIEW Za7: 1160 to 1140 metres AMSL (per View3D screen view "70 metres below model top)"



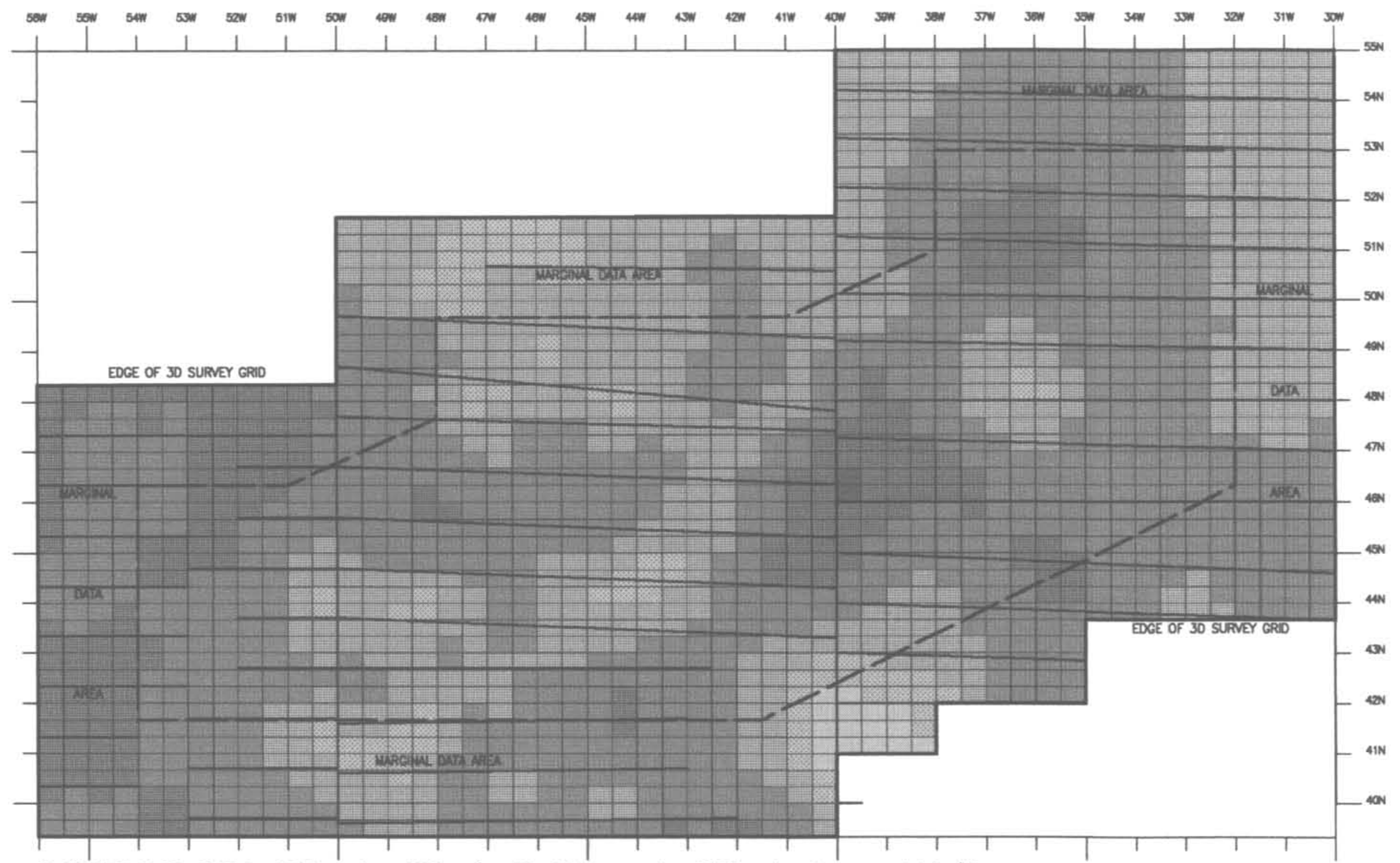
PLAN VIEW Za8: 1140 to 1120 metres AMSL (per View3D screen view "90 metres below model top)"



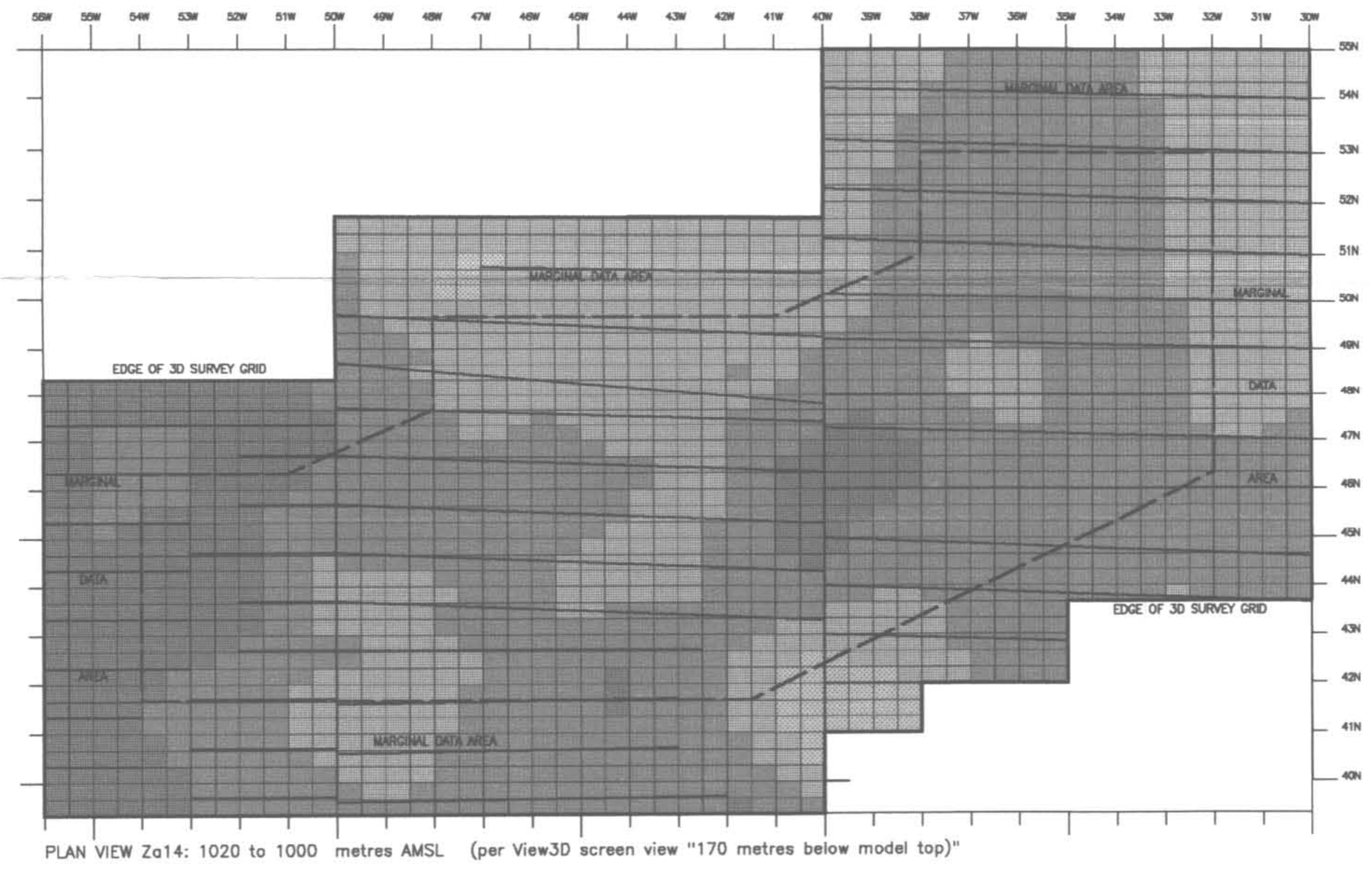
PLAN VIEW Za9: 1120 to 1100 metres AMSL (per View3D screen view "110 metres below model top)"



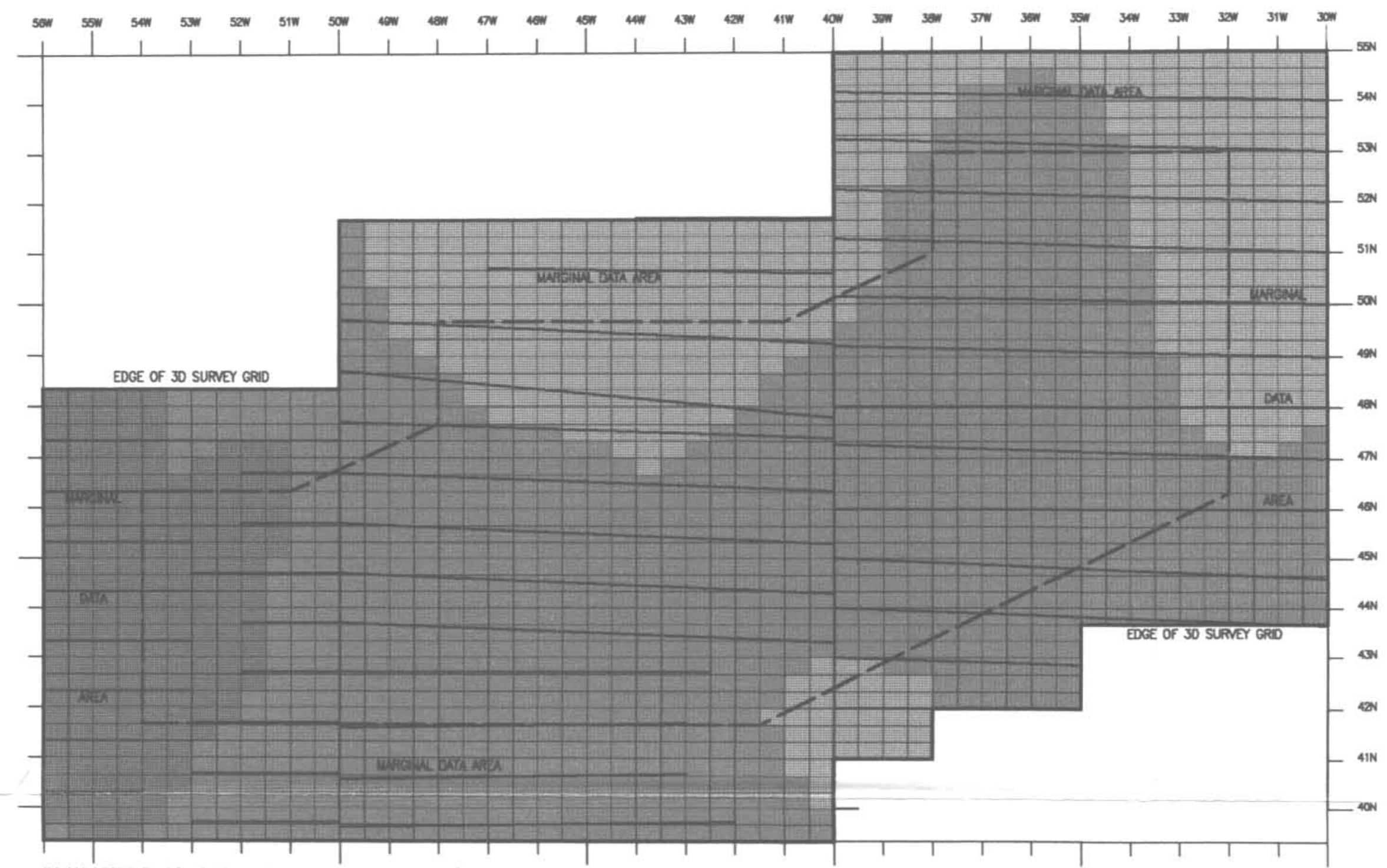
PLAN VIEW Za10: 1100 to 1080 metres AMSL (per View3D screen view "130 metres below model top)"



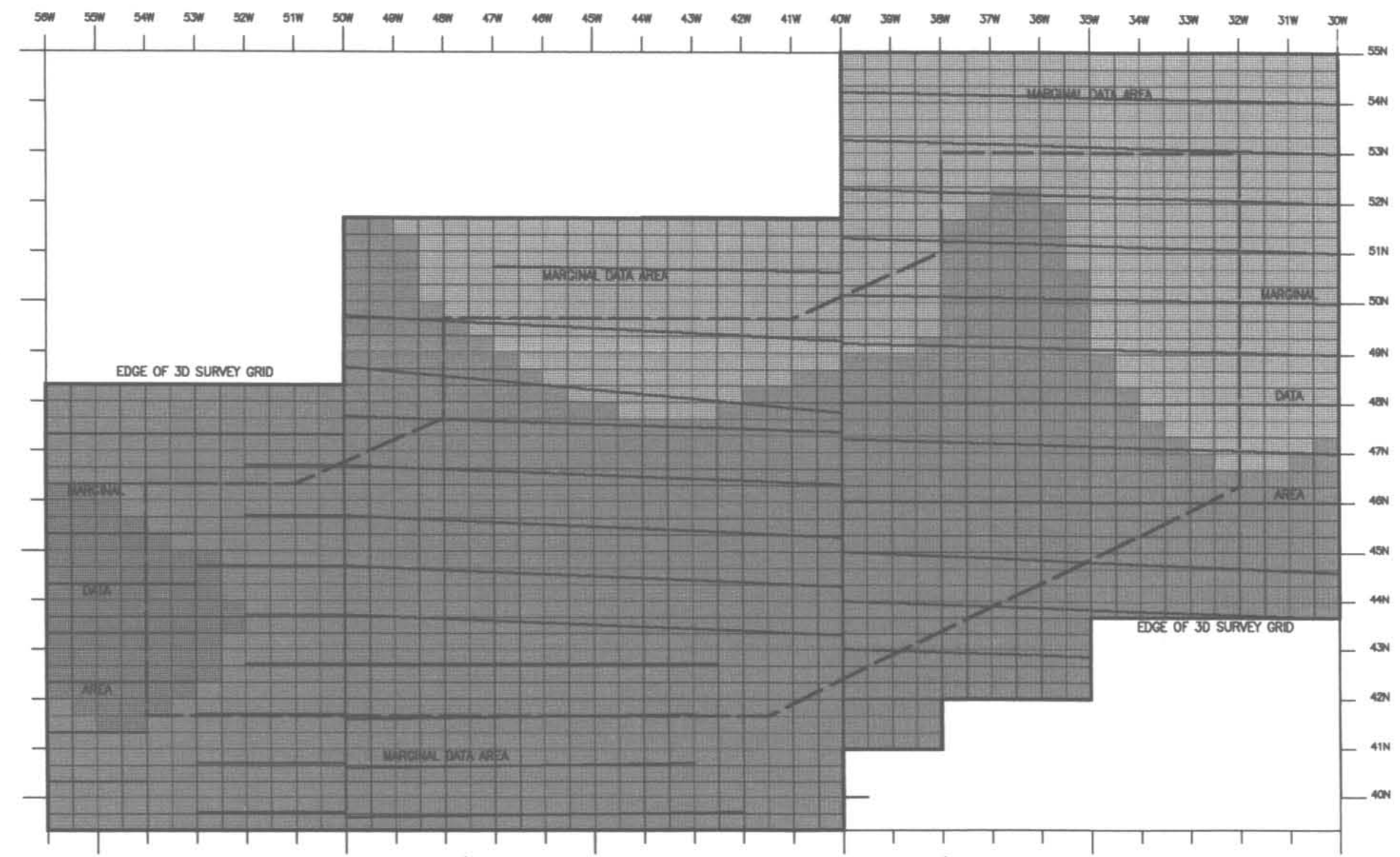
PLAN VIEW Za12: 1060 to 1040 metres AMSL (per View3D screen view "150 metres below model top)"



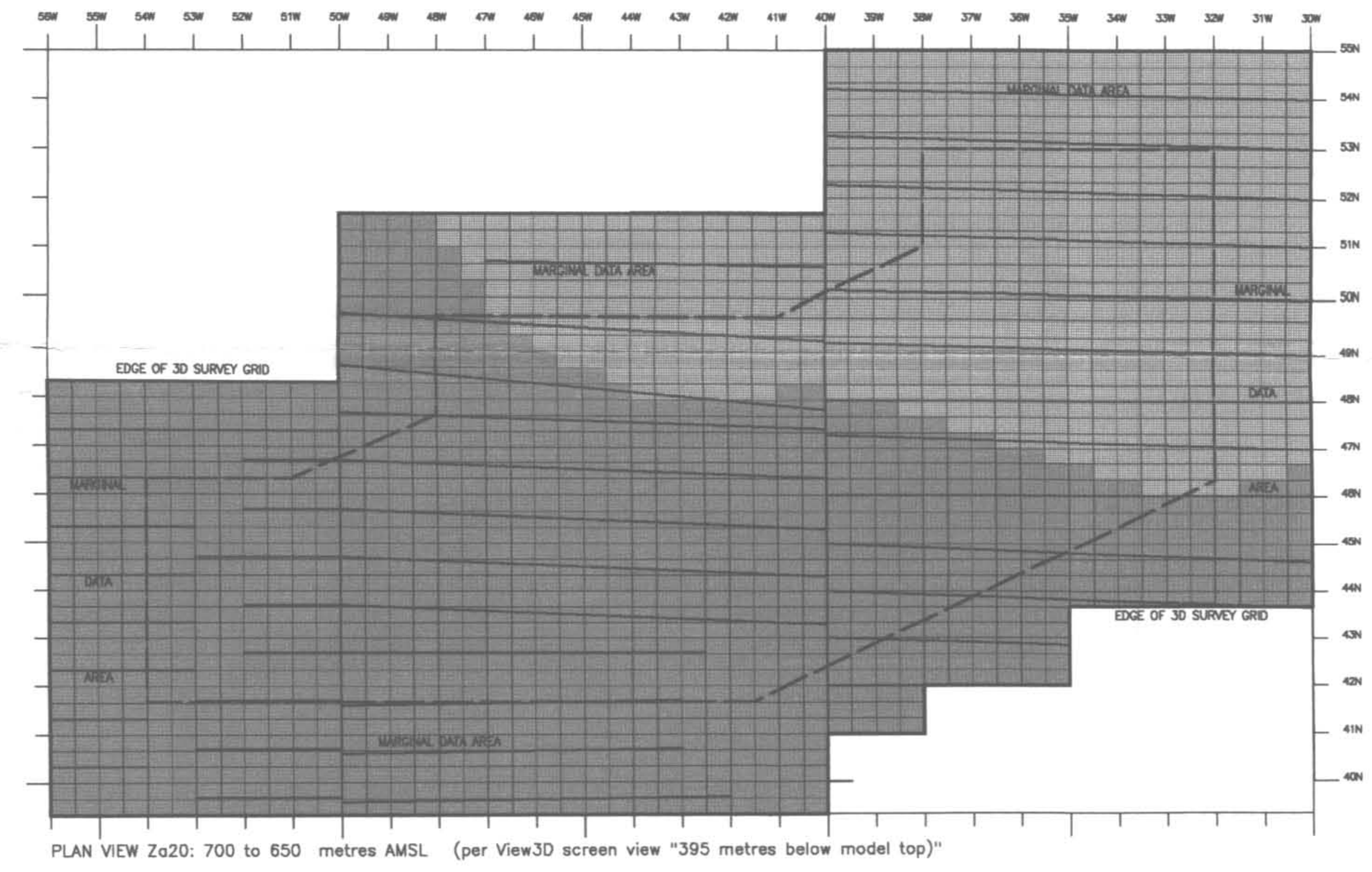
PLAN VIEW Za14: 1020 to 1000 metres AMSL (per View3D screen view "170 metres below model top)"



PLAN VIEW Za16: 900 to 850 metres AMSL (per View3D screen view "210 metres below model top)"



PLAN VIEW Za18: 800 to 750 metres AMSL (per View3D screen view "295 metres below model top)"



PLAN VIEW Za20: 700 to 650 metres AMSL (per View3D screen view "395 metres below model top)"

100/200

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,136 ①

G. A. SHORE

Accompanies 'Report on 3D Geo-electric Survey,
of the Uduk Lake property, BC, grid area # 97-1,
June 1997, for Atna Resources Ltd. and Gold Mountain
Resources Ltd., by Greg A. Shore, PGeo.

more resistive

True Resistivity (Ohm-metres)
4000
2500
1500
1000
700
450
300
200
120
75
50

more conductive

Premier Geophysics Inc.
Vancouver, BC / Reno, NV

rev	date	init	dwg file
v1.0	97/07/12	GAS	UDKa-ra-10

Conjugate gradient inversion
Serial CGI970705125506 Watcom F77
C:200 P:100 s:200 iter:38 mod:19
m:07 sm:7 of:23 err:-4 man

200 0 200 400 600
(metres)

Atna Resources Ltd.
Gold Mountain Resources Ltd.

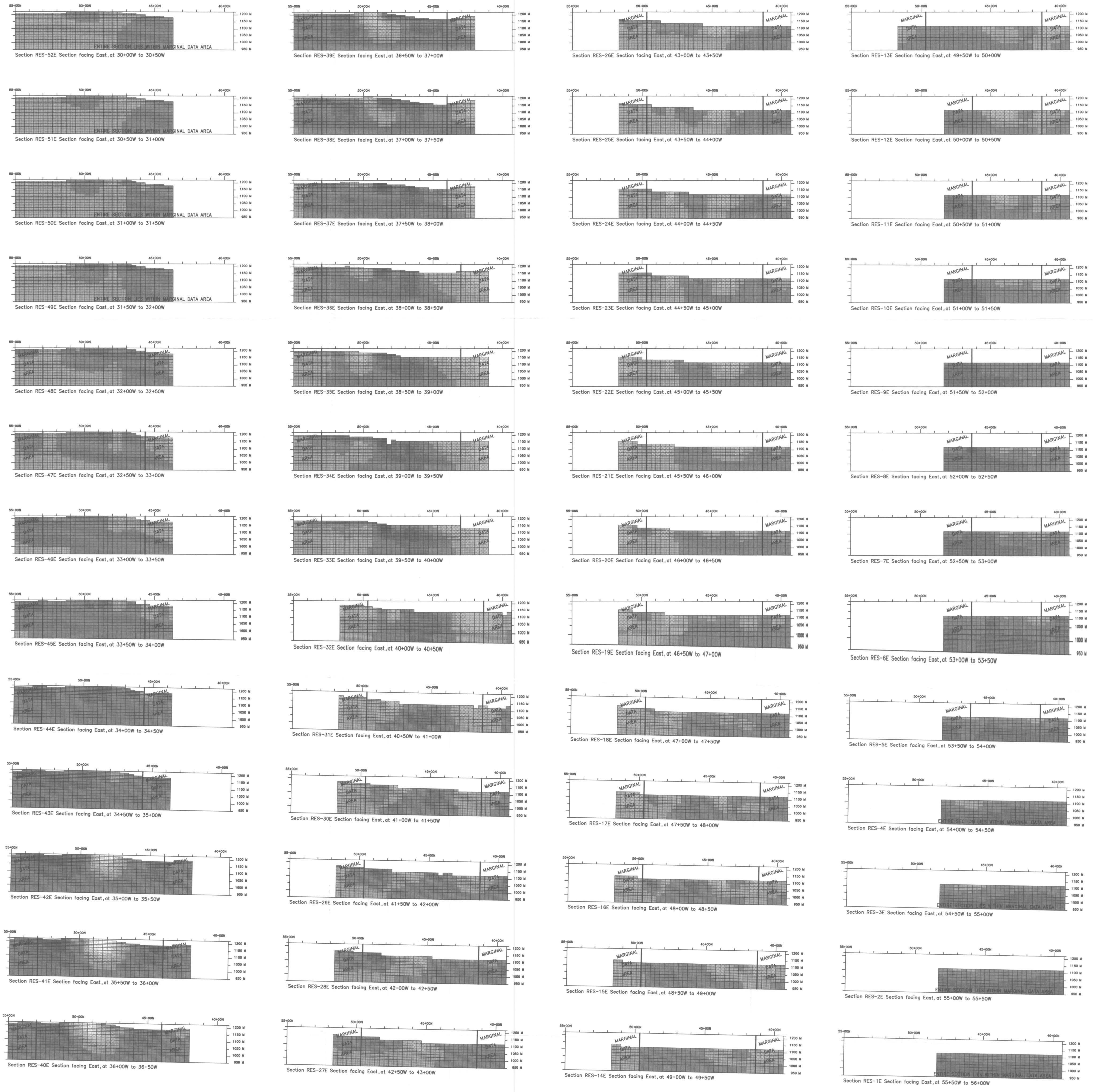
Uduk Lake property, BC: Grid # 97-1
Omineca M D NTS 93E9,F12

3D Geo-electric Survey
June 1997

TRUE RESISTIVITY
Plan views at absolute elevations AMSL.

Figure UDKa-100-RA.1

(2)



Section RES-52E Section facing East,at 30+00W to 30+50W

Section RES-51E Section facing East,at 30+50W to 31+00W

Section RES-50E Section facing East,at 31+00W to 31+50W

Section RES-49E Section facing East,at 31+50W to 32+00W

Section RES-48E Section facing East,at 32+00W to 32+50W

Section RES-47E Section facing East,at 32+50W to 33+00W

Section RES-46E Section facing East,at 33+00W to 33+50W

Section RES-45E Section facing East,at 33+50W to 34+00W

Section RES-44E Section facing East,at 34+00W to 34+50W

Section RES-43E Section facing East,at 34+50W to 35+00W

Section RES-42E Section facing East,at 35+00W to 35+50W

Section RES-41E Section facing East,at 35+50W to 36+00W

Section RES-40E Section facing East,at 36+00W to 36+50W

Section RES-39E Section facing East,at 36+50W to 37+00W

Section RES-38E Section facing East,at 37+00W to 37+50W

Section RES-37E Section facing East,at 37+50W to 38+00W

Section RES-36E Section facing East,at 38+00W to 38+50W

Section RES-35E Section facing East,at 38+50W to 39+00W

Section RES-34E Section facing East,at 39+00W to 39+50W

Section RES-33E Section facing East,at 39+50W to 40+00W

Section RES-32E Section facing East,at 40+00W to 40+50W

Section RES-31E Section facing East,at 40+50W to 41+00W

Section RES-30E Section facing East,at 41+00W to 41+50W

Section RES-29E Section facing East,at 41+50W to 42+00W

Section RES-28E Section facing East,at 42+00W to 42+50W

Section RES-27E Section facing East,at 42+50W to 43+00W

Section RES-26E Section facing East,at 43+00W to 43+50W

Section RES-25E Section facing East,at 43+50W to 44+00W

Section RES-24E Section facing East,at 44+00W to 44+50W

Section RES-23E Section facing East,at 44+50W to 45+00W

Section RES-22E Section facing East,at 45+00W to 45+50W

Section RES-21E Section facing East,at 45+50W to 46+00W

Section RES-20E Section facing East,at 46+00W to 46+50W

Section RES-19E Section facing East,at 46+50W to 47+00W

Section RES-18E Section facing East,at 47+00W to 47+50W

Section RES-17E Section facing East,at 47+50W to 48+00W

Section RES-16E Section facing East,at 48+00W to 48+50W

Section RES-15E Section facing East,at 48+50W to 49+00W

Section RES-14E Section facing East,at 49+00W to 49+50W

Section RES-13E Section facing East,at 49+50W to 50+00W

Section RES-12E Section facing East,at 50+00W to 50+50W

Section RES-11E Section facing East,at 50+50W to 51+00W

Section RES-10E Section facing East,at 51+00W to 51+50W

Section RES-9E Section facing East,at 51+50W to 52+00W

Section RES-8E Section facing East,at 52+00W to 52+50W

Section RES-7E Section facing East,at 52+50W to 53+00W

Section RES-6E Section facing East,at 53+00W to 53+50W

Section RES-5E Section facing East,at 53+50W to 54+00W

Section RES-4E Section facing East,at 54+00W to 54+50W

Section RES-3E Section facing East,at 54+50W to 55+00W

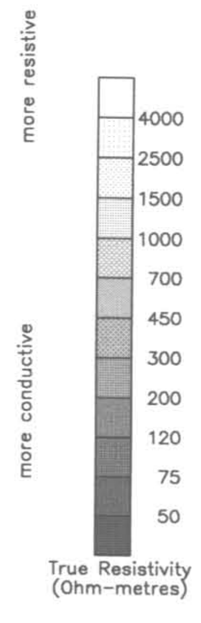
Section RES-2E Section facing East,at 55+00W to 55+50W

Section RES-1E Section facing East,at 55+50W to 56+00W

100/200

Premier Geophysics Inc.
Vancouver, BC / Reno, NV

rev	date	init	dwg file
v1.0	97/07/15	GAS	UDKa-rse-10



True Resistivity
(Ohm-metres)

Conjugate gradient inversion
Serial CGI970705125506 Watcom F77
C:200 P:100 s:200 iter:38 mod:19
m:07 sm:7 of:23 err:-4 man

200 0 200 400 600
(metres)

Atna Resources Ltd.
Gold Mountain Resources Ltd.

Uduk Lake property, BC: Grid # 97-1
Omineca M D NTS 93E9,F12

3D Geo-electric Survey
June 1997

TRUE RESISTIVITY
True section views facing East

Figure UDKa-100-RSE.1

G. A. SHORE

Accompanies 'Report on 3D Geo-electric Survey,
of the Uduk Lake property, BC, grid area # 97-1,
June 1997, for Atna Resources Ltd. and Gold Mountain
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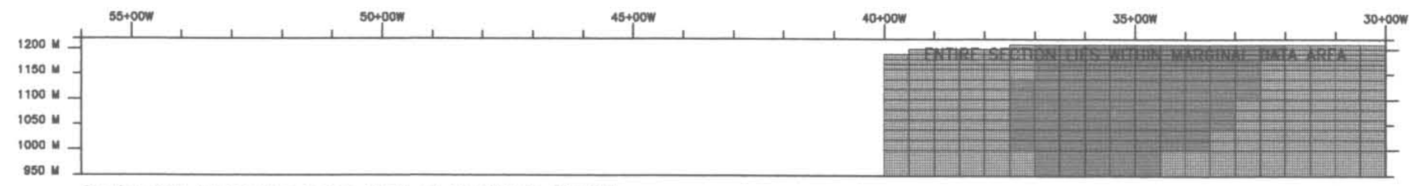
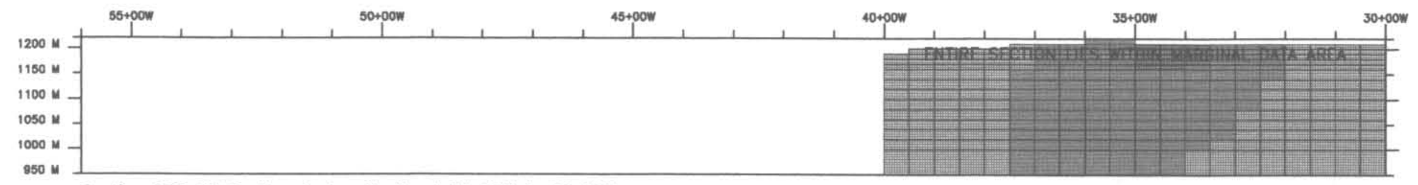
25,136 (2)

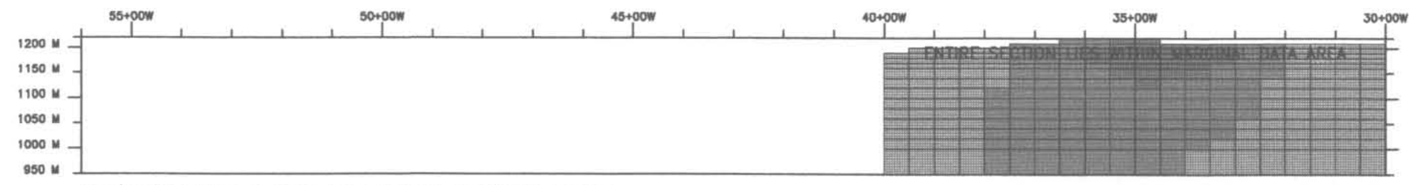
③



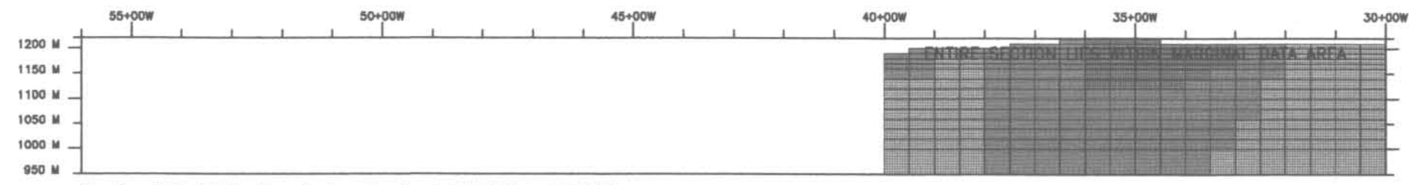
Section RES-1N Section facing North, at 55+00N to 54+67N



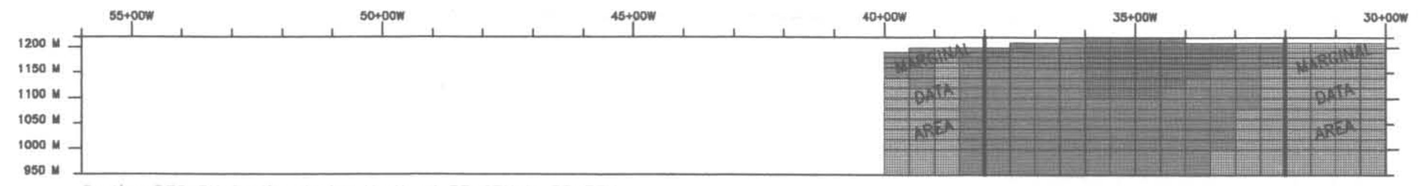
Section RES-2N Section facing North, at 54+67N to 54+33N



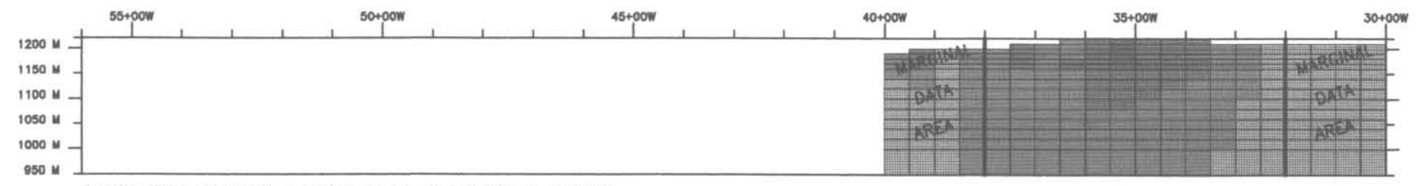
Section RES-3N Section facing North, at 54+33N to 54+00N



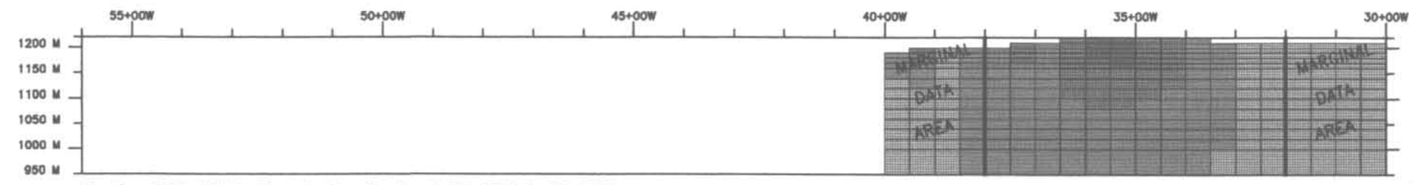
Section RES-4N Section facing North, at 54+00N to 53+67N



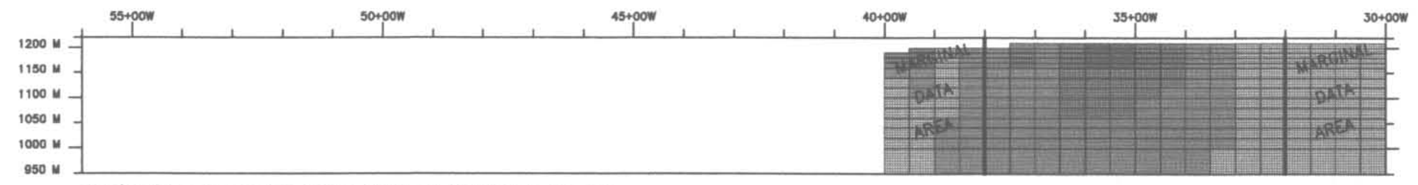
Section RES-5N Section facing North, at 53+67N to 53+33N



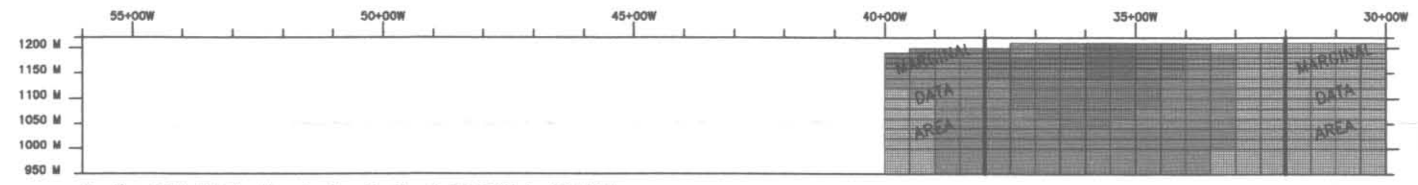
Section RES-6N Section facing North, at 53+33N to 53+00N



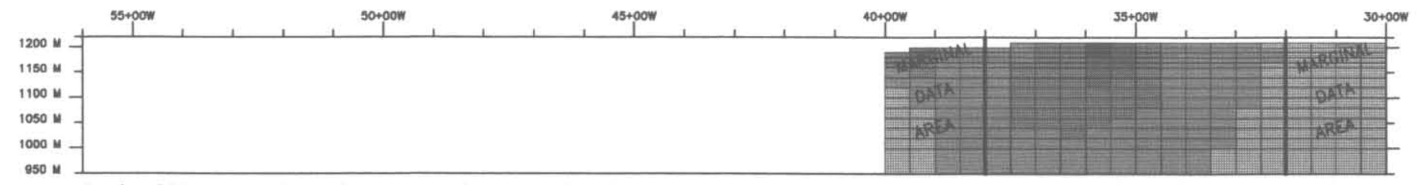
Section RES-7N Section facing North, at 53+00N to 52+67N



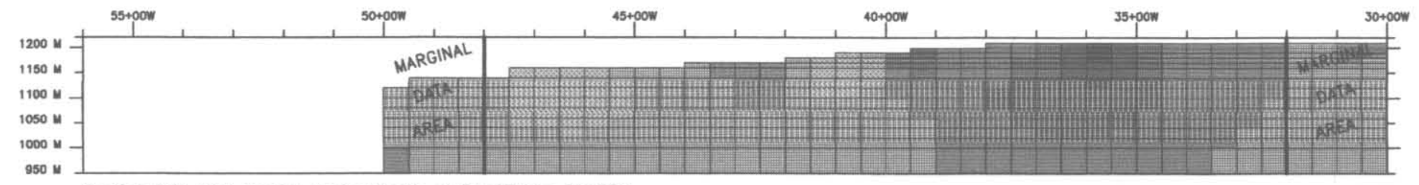
Section RES-8N Section facing North, at 52+67N to 52+33N



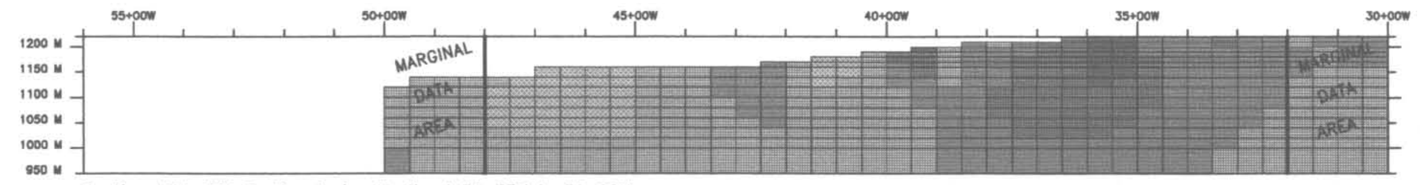
Section RES-9N Section facing North, at 52+33N to 52+00N



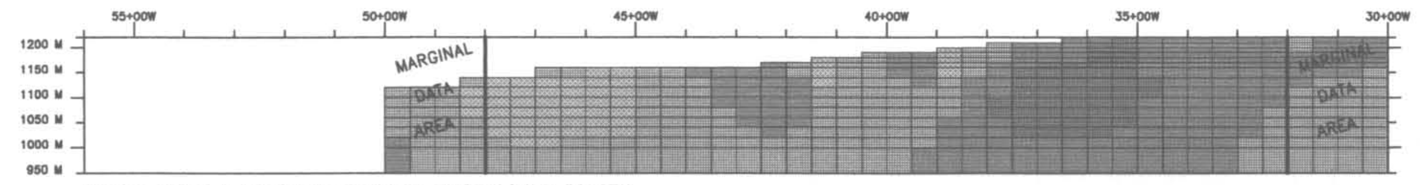
Section RES-10N Section facing North, at 52+00N to 51+67N



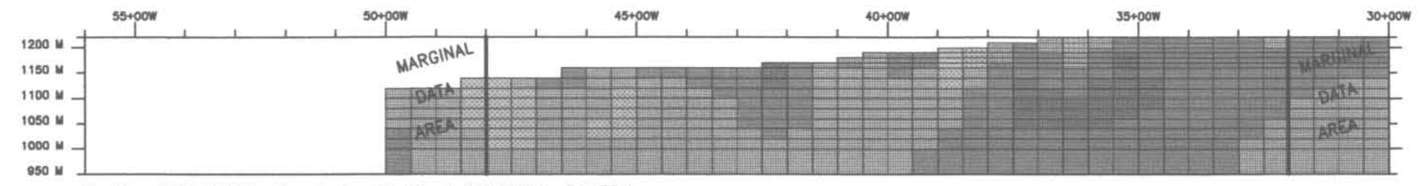
Section RES-11N Section facing North, at 51+67N to 51+33N



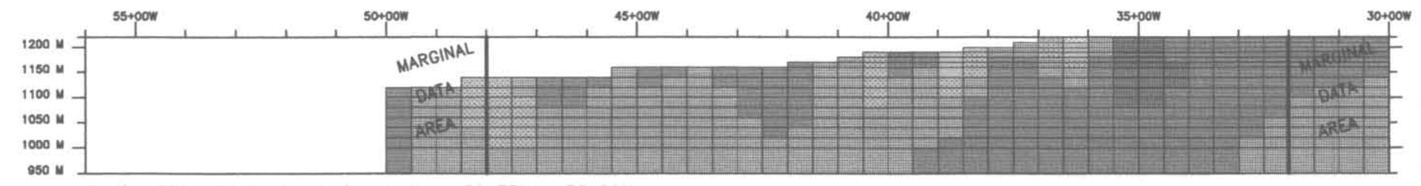
Section RES-12N Section facing North, at 51+33N to 51+00N



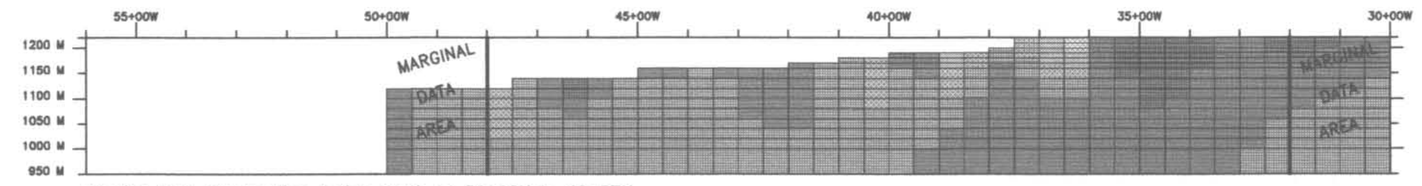
Section RES-13N Section facing North, at 51+00N to 50+67N



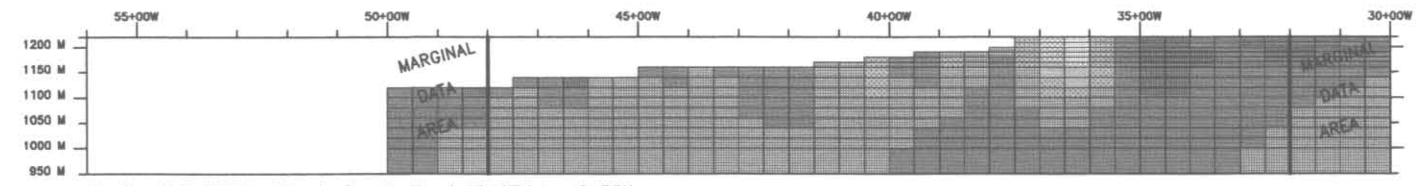
Section RES-14N Section facing North, at 50+67N to 50+33N



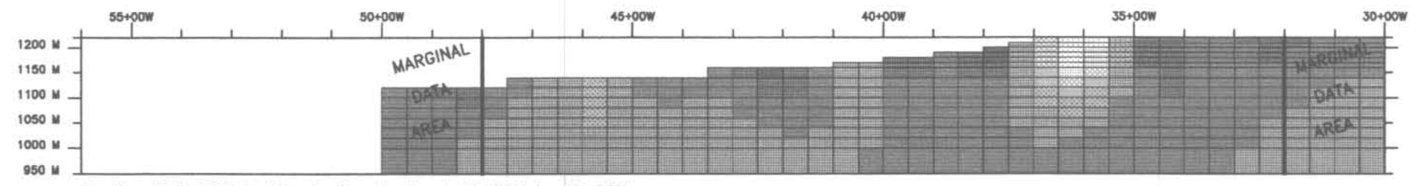
Section RES-15N Section facing North, at 50+33N to 50+00N



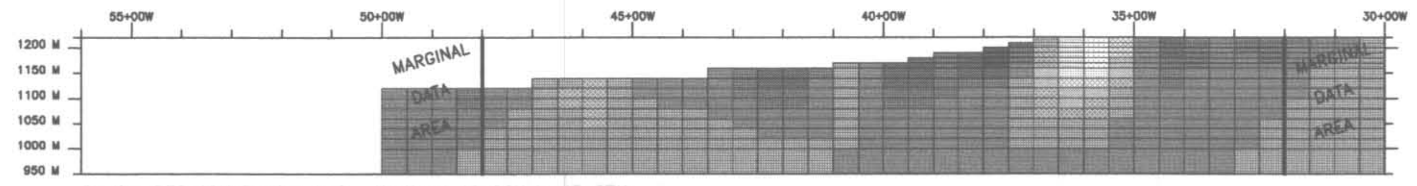
Section RES-16N Section facing North, at 50+00N to 49+67N



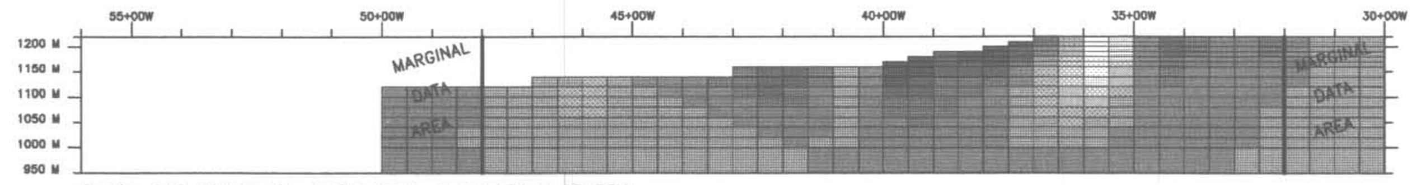
Section RES-17N Section facing North, at 49+67N to 49+33N



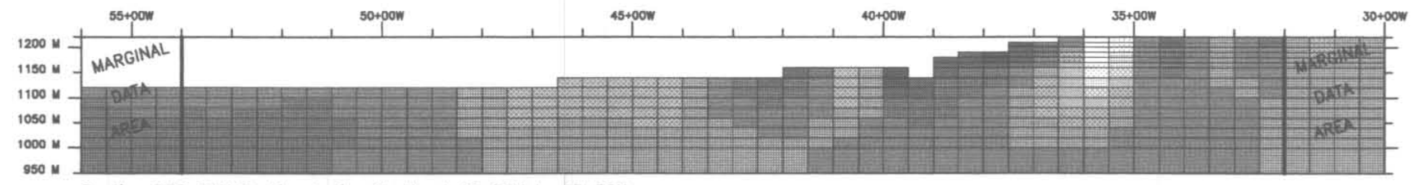
Section RES-18N Section facing North, at 49+33N to 49+00N



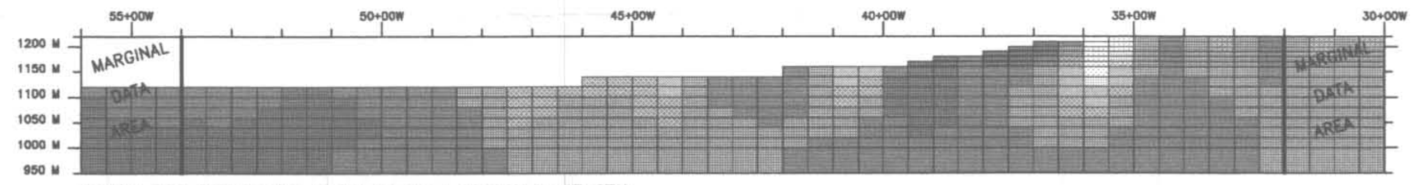
Section RES-19N Section facing North, at 49+00N to 48+67N



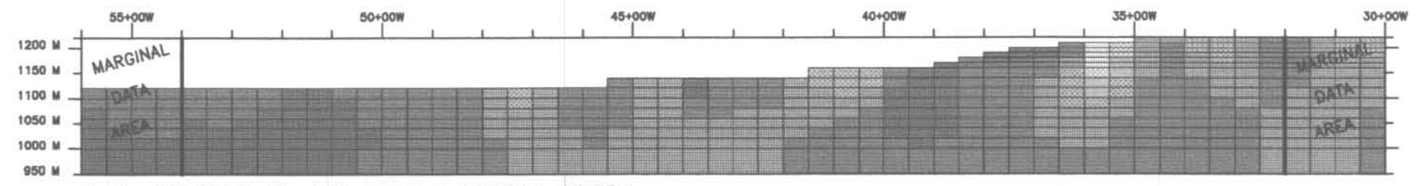
Section RES-20N Section facing North, at 48+67N to 48+33N



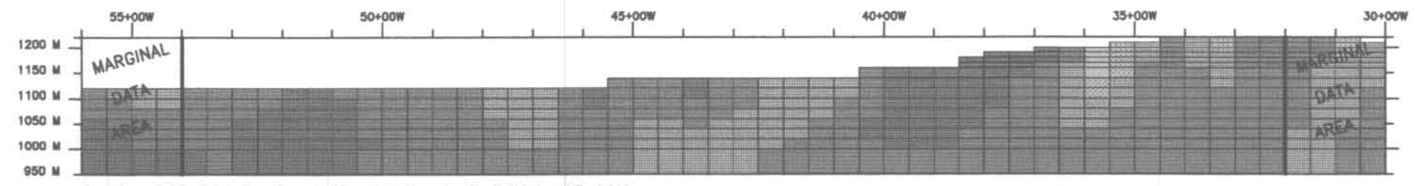
Section RES-21N Section facing North, at 48+33N to 48+00N



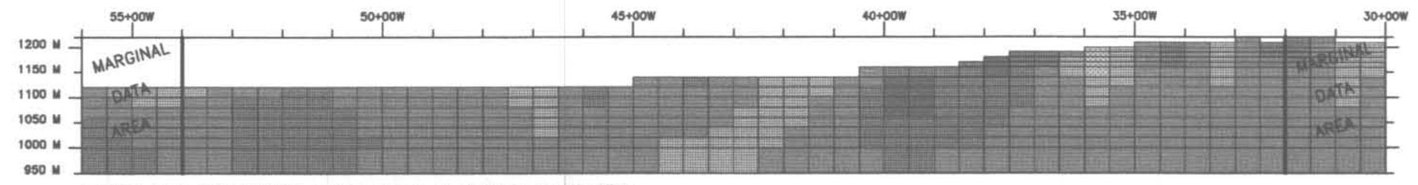
Section RES-22N Section facing North, at 48+00N to 47+67N



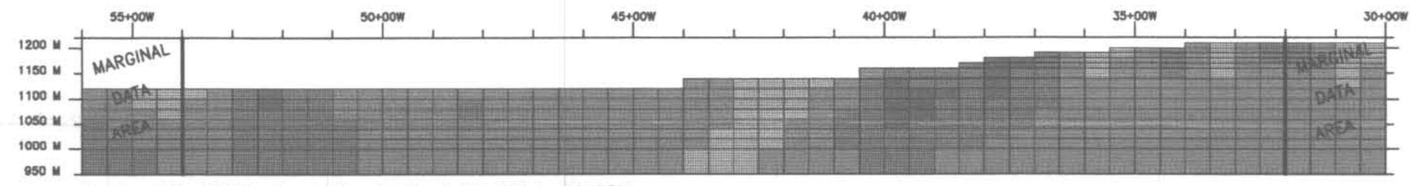
Section RES-23N Section facing North, at 47+67N to 47+33N



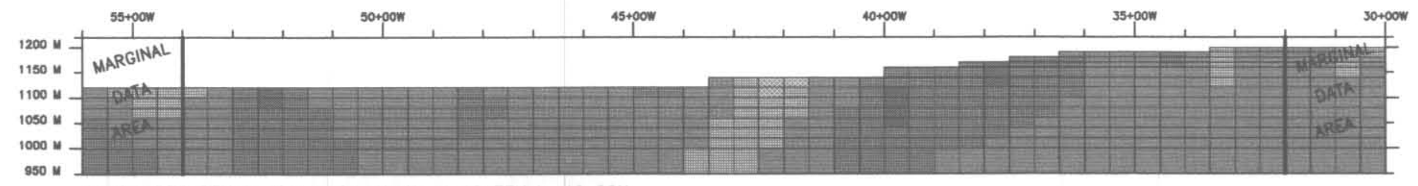
Section RES-24N Section facing North, at 47+33N to 47+00N



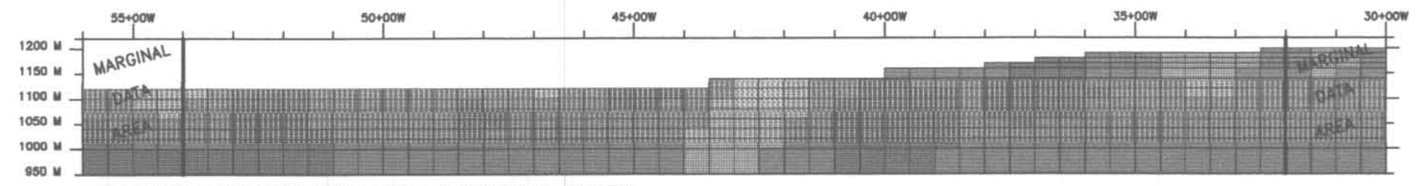
Section RES-25N Section facing North, at 47+00N to 46+67N



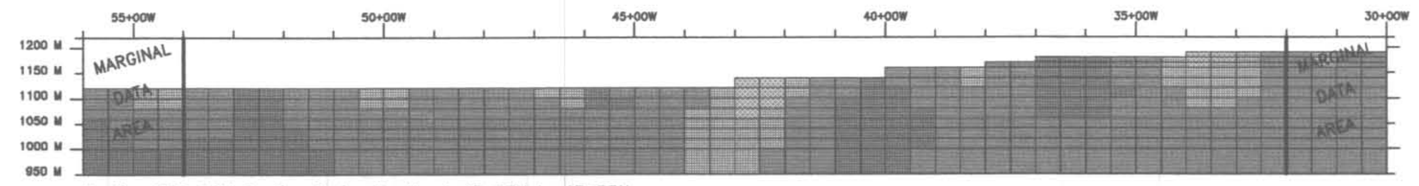
Section RES-26N Section facing North, at 46+67N to 46+33N



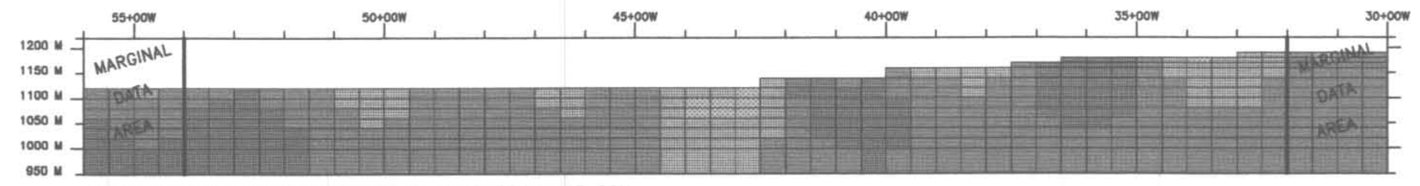
Section RES-27N Section facing North, at 46+33N to 46+00N



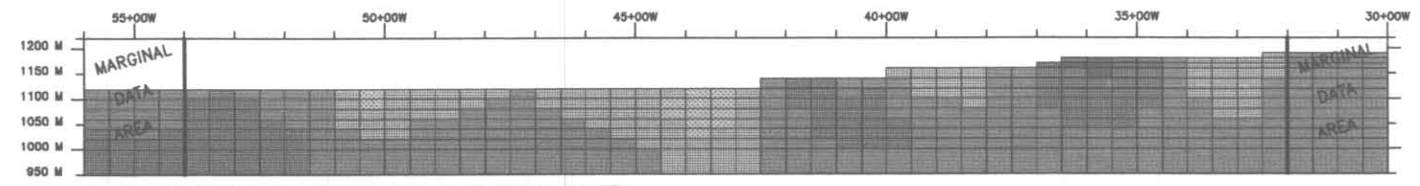
Section RES-28N Section facing North, at 46+00N to 45+67N



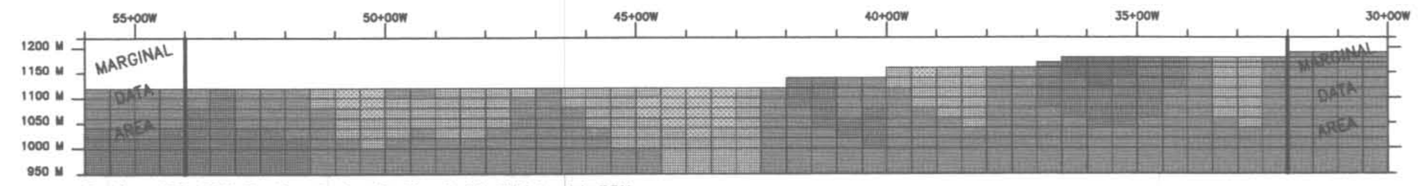
Section RES-29N Section facing North, at 45+67N to 45+33N



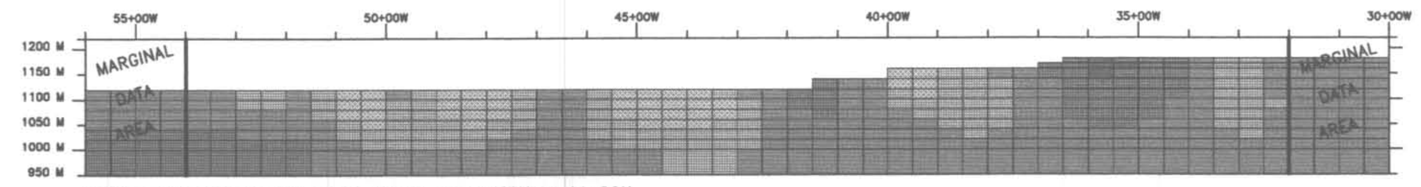
Section RES-30N Section facing North, at 45+33N to 45+00N



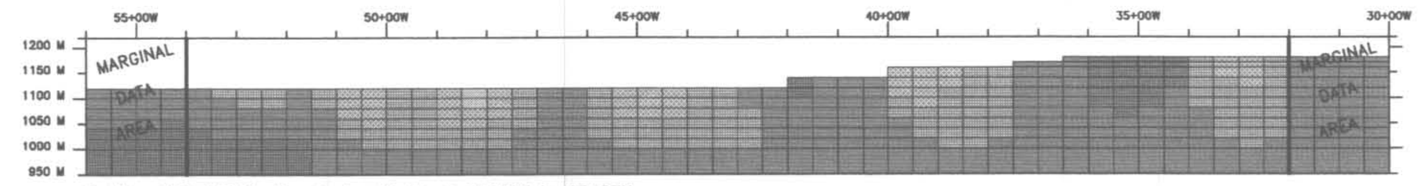
Section RES-31N Section facing North, at 45+00N to 44+67N



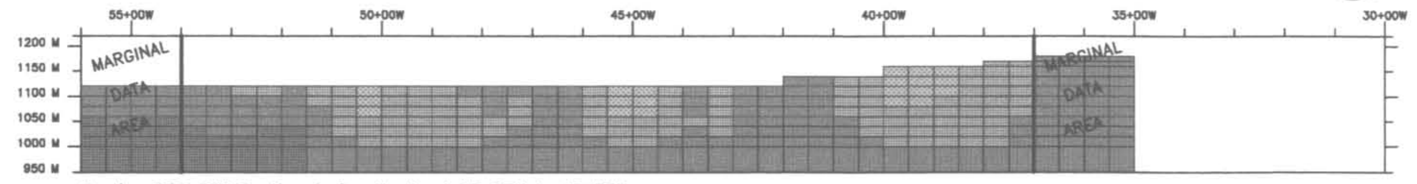
Section RES-32N Section facing North, at 44+67N to 44+33N



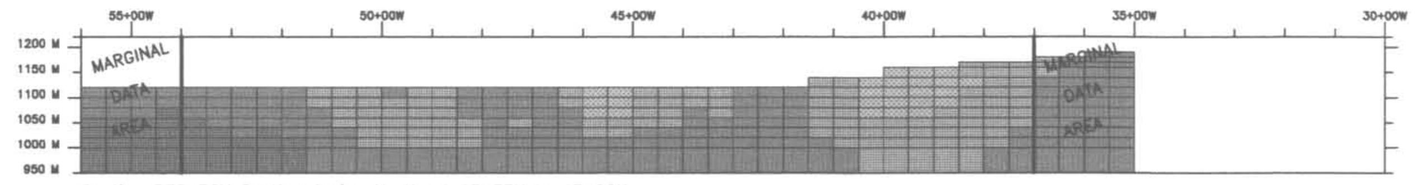
Section RES-33N Section facing North, at 44+33N to 44+00N



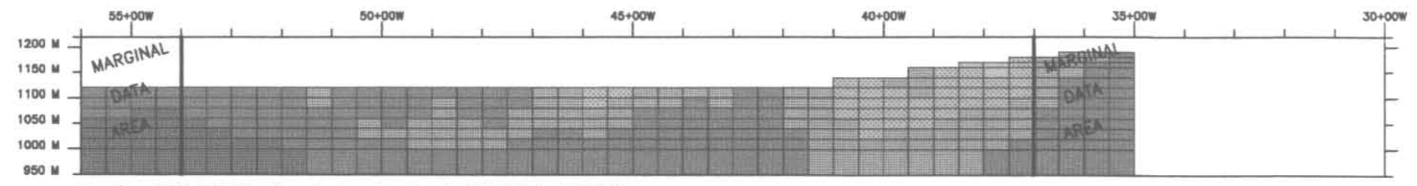
Section RES-34N Section facing North, at 44+00N to 43+67N



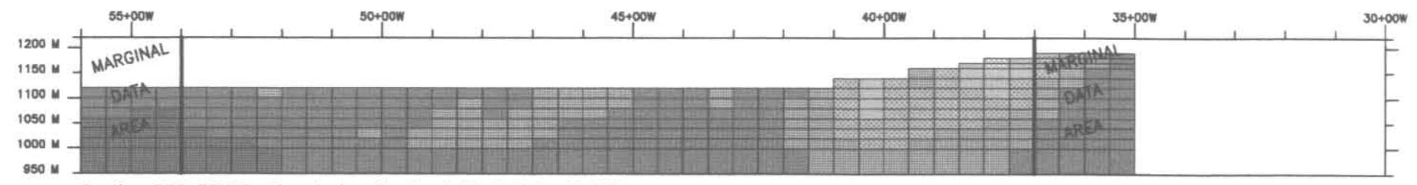
Section RES-35N Section facing North, at 43+67N to 43+33N



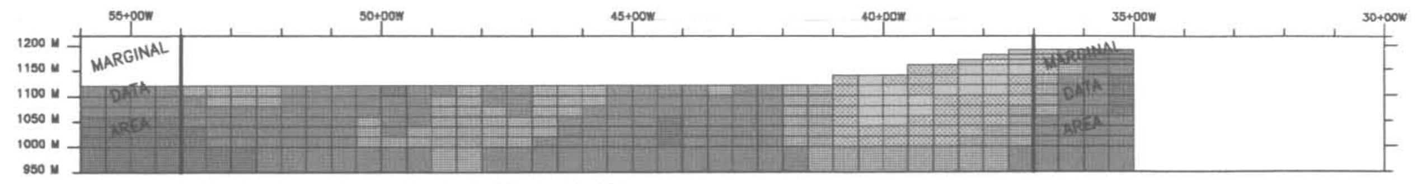
Section RES-36N Section facing North, at 43+33N to 43+00N



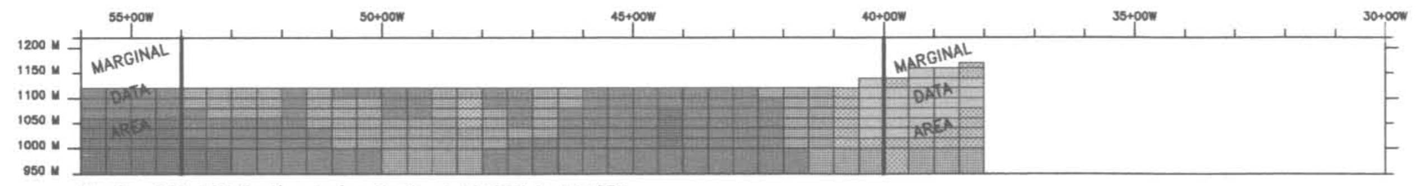
Section RES-37N Section facing North, at 43+00N to 42+67N



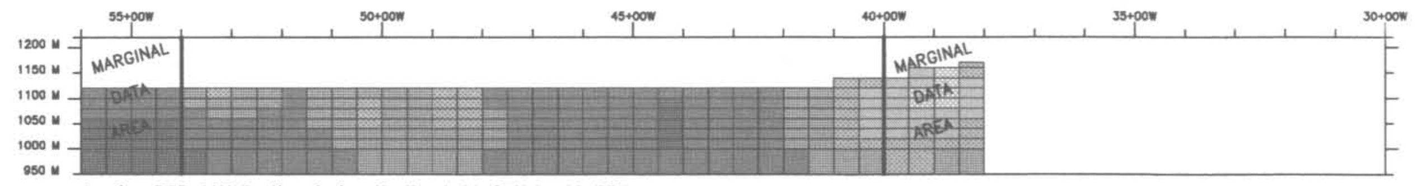
Section RES-38N Section facing North, at 42+67N to 42+33N



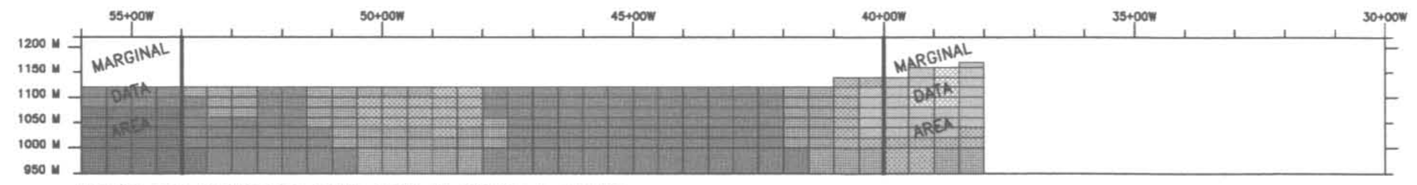
Section RES-39N Section facing North, at 42+33N to 42+00N



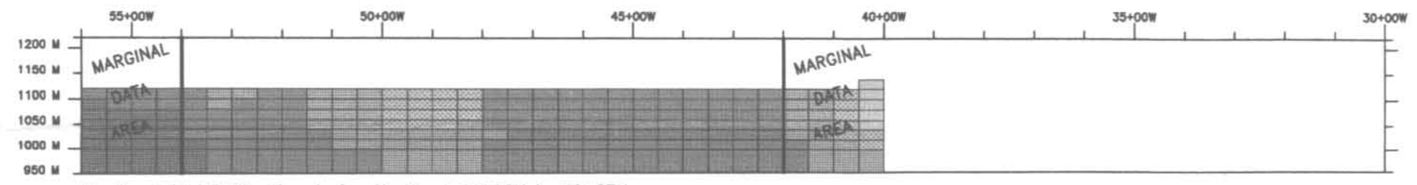
Section RES-40N Section facing North, at 42+00N to 41+67N



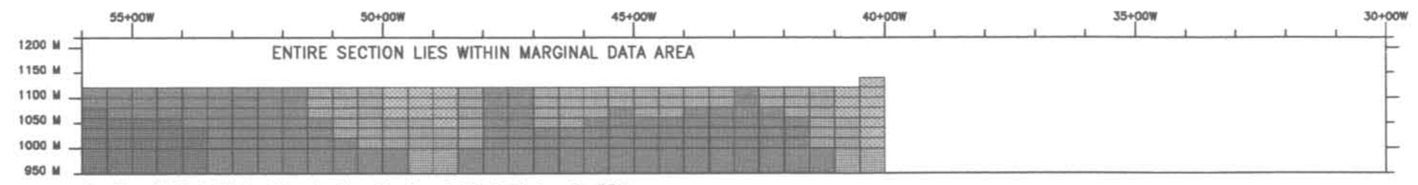
Section RES-41N Section facing North, at 41+67N to 41+33N



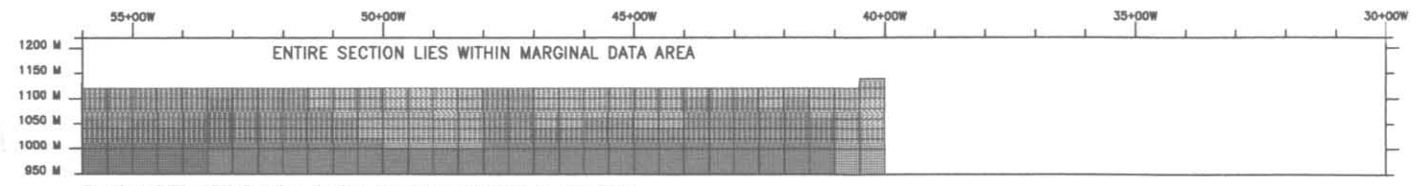
Section RES-42N Section facing North, at 41+33N to 41+00N



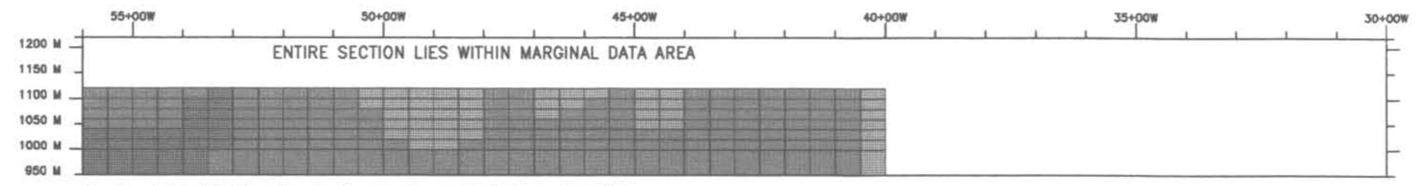
Section RES-43N Section facing North, at 41+00N to 40+67N



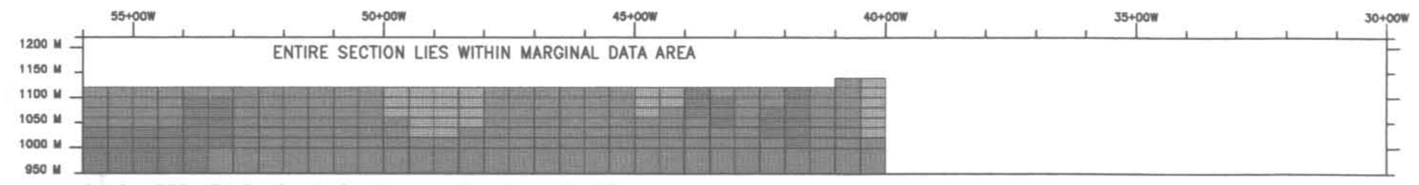
Section RES-44N Section facing North, at 40+67N to 40+33N



Section RES-45N Section facing North, at 40+33N to 40+00N



Section RES-46N Section facing North, at 40+00N to 39+67N



Section RES-47N Section facing North, at 39+67N to 39+33N

GEOLOGICAL SURVEY BRANCH
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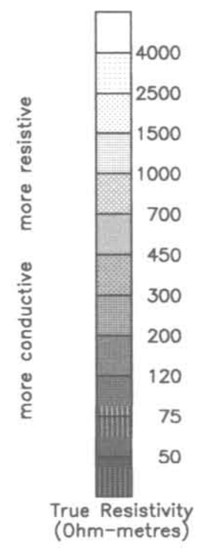
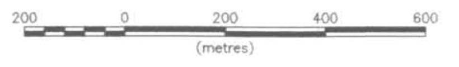
Premier Geophysics Inc.
Vancouver, BC / Reno, NV

rev	date	init	dwg file
v1.0	97/07/15	GAS	UDKa-rsn-10



True Resistivity
(Ohm-metres)

Conjugate gradient inversion
Serial CGI970705125506 Watcom F77
C:200 P:100 s:200 iter:38 mod:19
m:07 sm:7 of:23 err:-4 man



G. A. SHORE

Accompanies 'Report on 3D Geo-electric Survey,
of the Uduk Lake property, BC, grid area # 97-1,
June 1997, for Atna Resources Ltd. and Gold Mountain
Resources Ltd., by Greg A. Shore, PGeo.

Atna Resources Ltd.
Gold Mountain Resources Ltd.

Uduk Lake property, BC: Grid # 97-1
Omineca M D NTS 93E9,F12

3D Geo-electric Survey
June 1997

TRUE RESISTIVITY
True section views facing North

Figure UDKa-100-RSN.1

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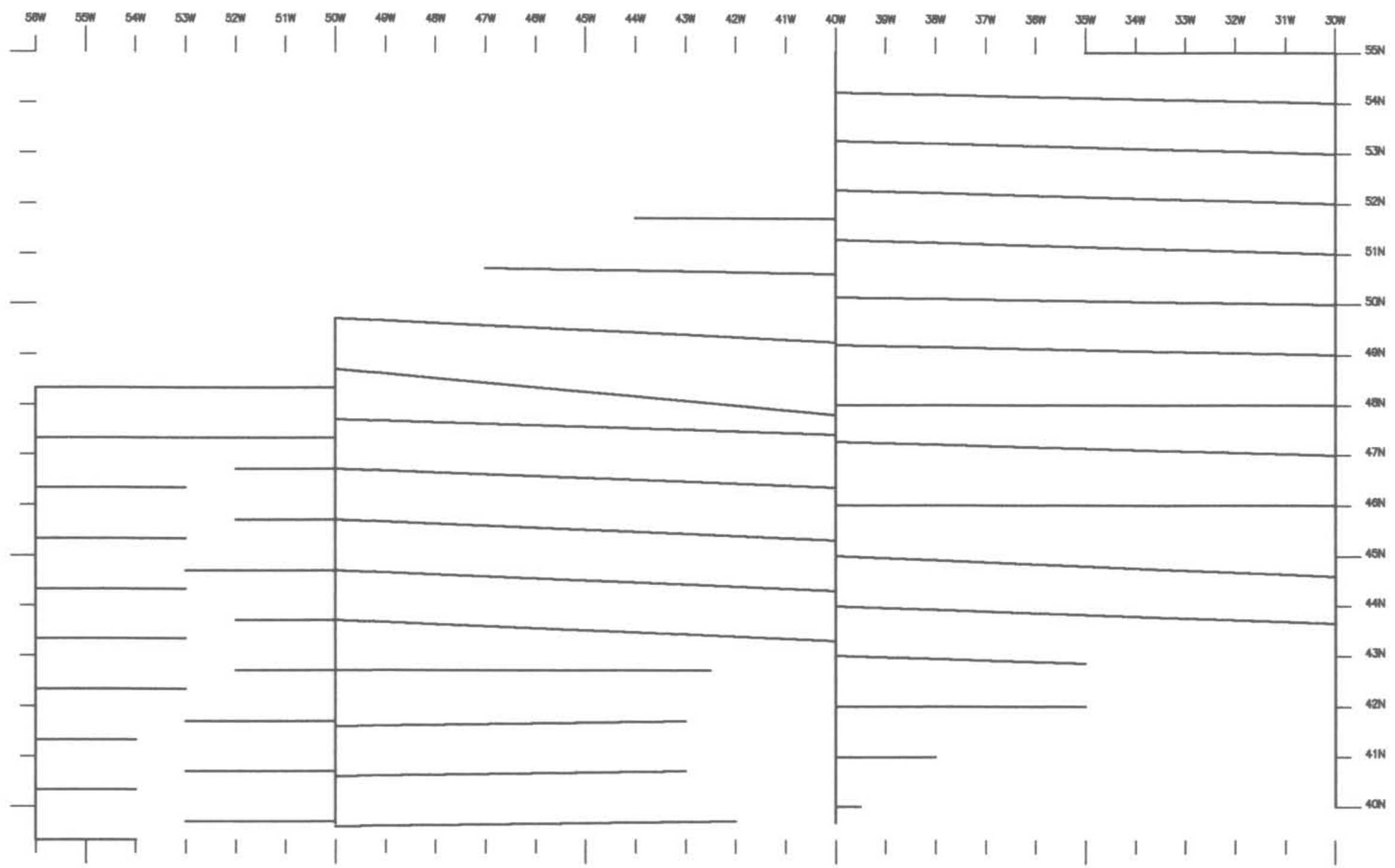


Figure T1: 3D SURVEY GRID LOCATION

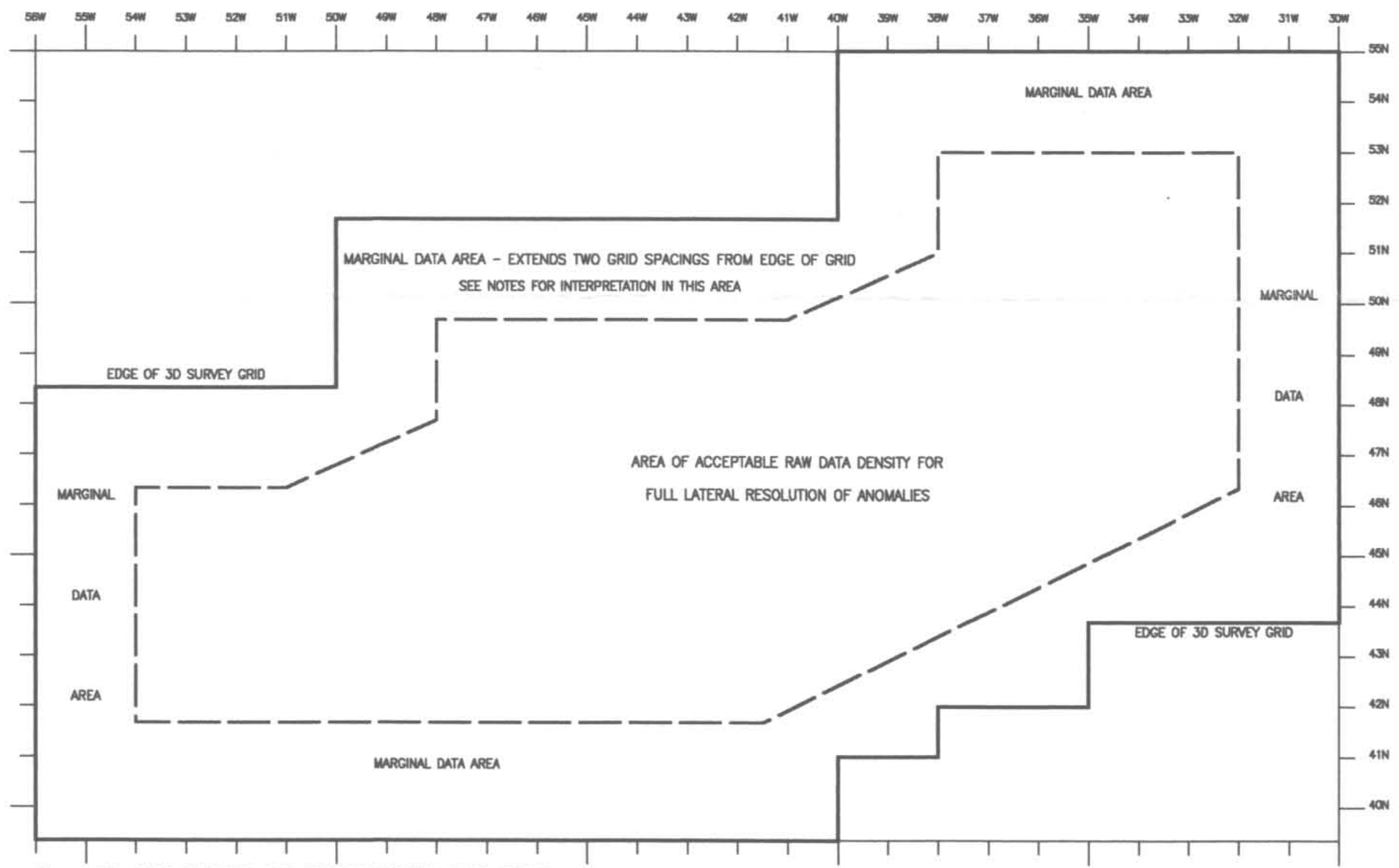
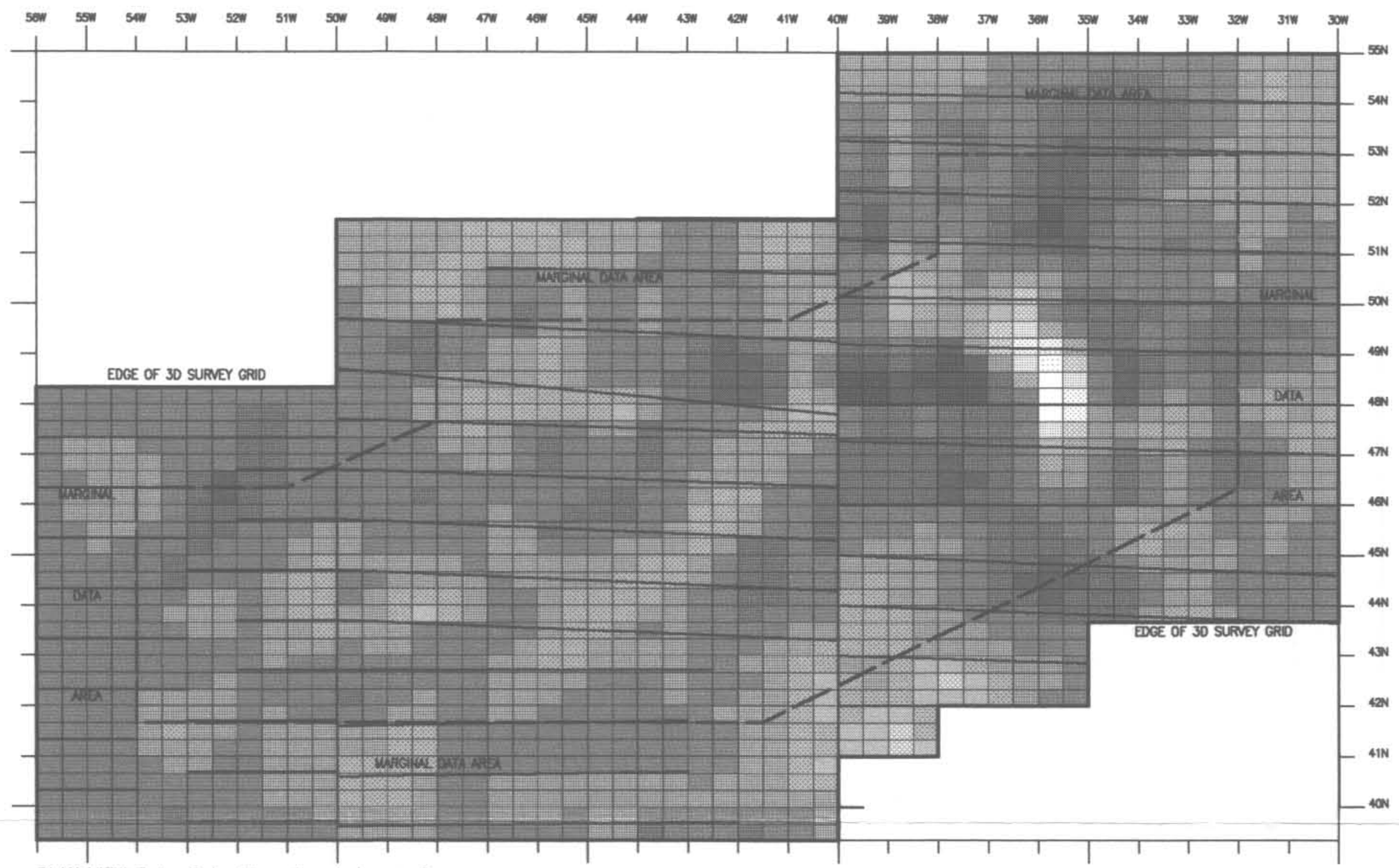
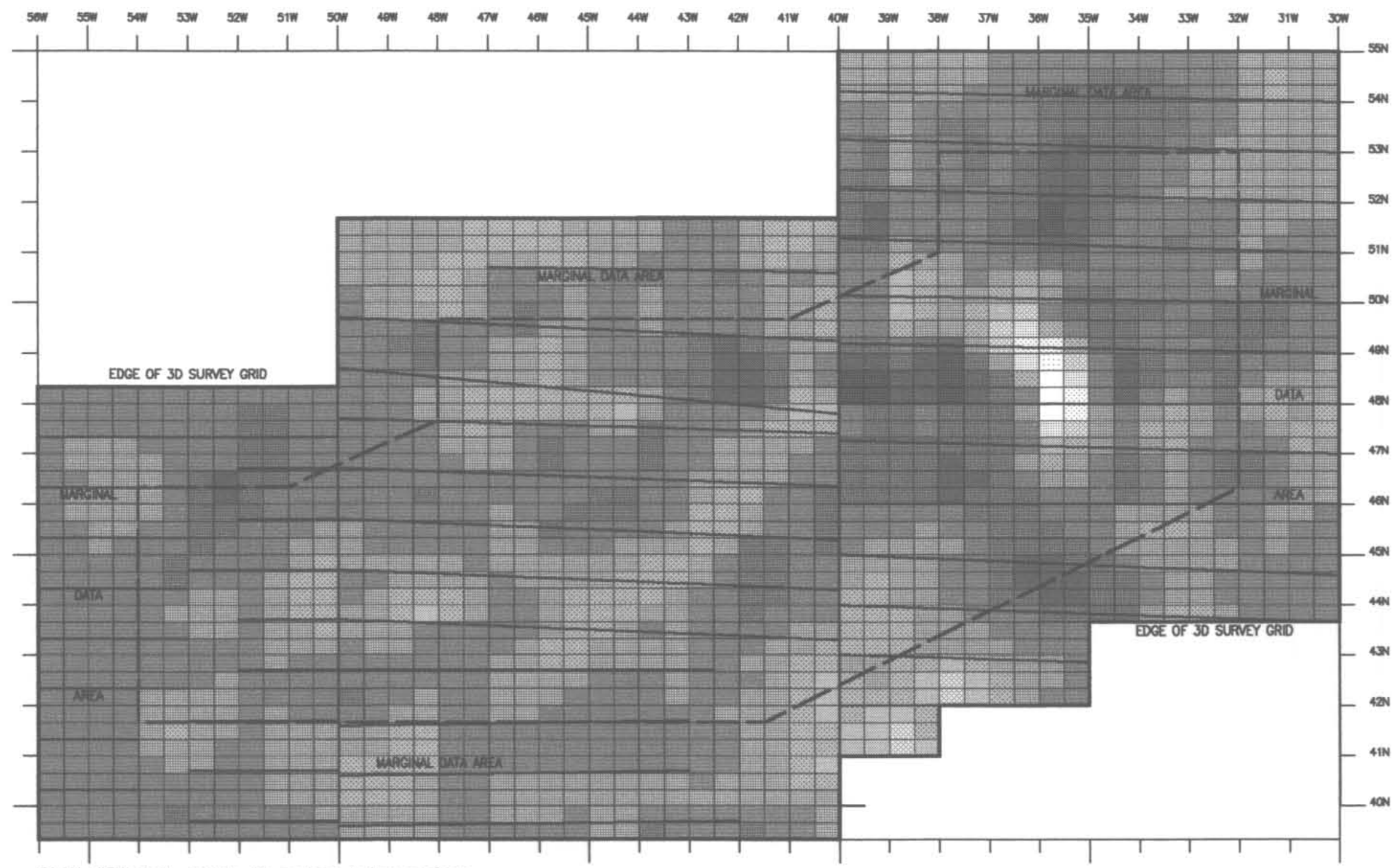


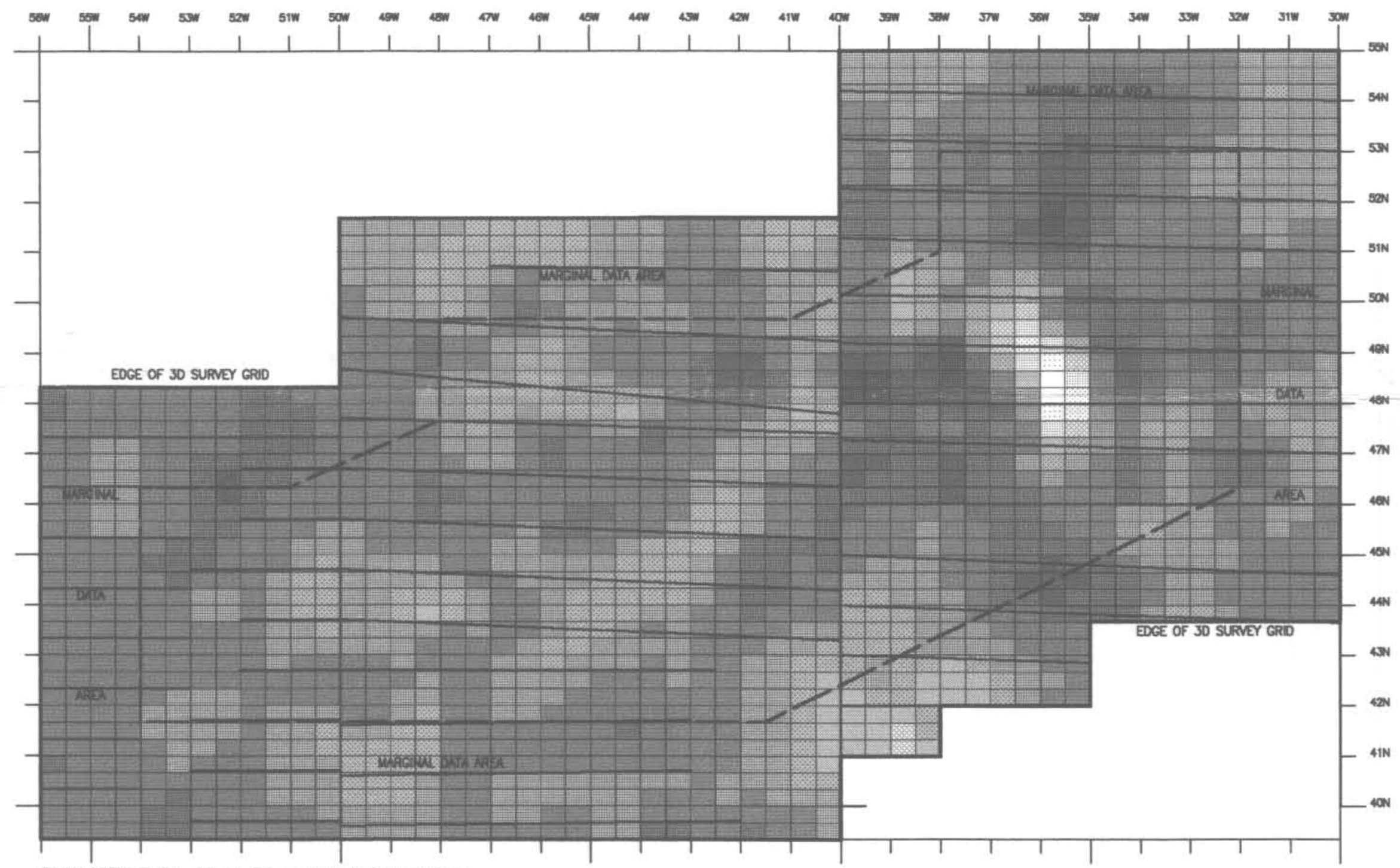
Figure D1: DATA DENSITY AND INTERPRETATION SUB-AREAS



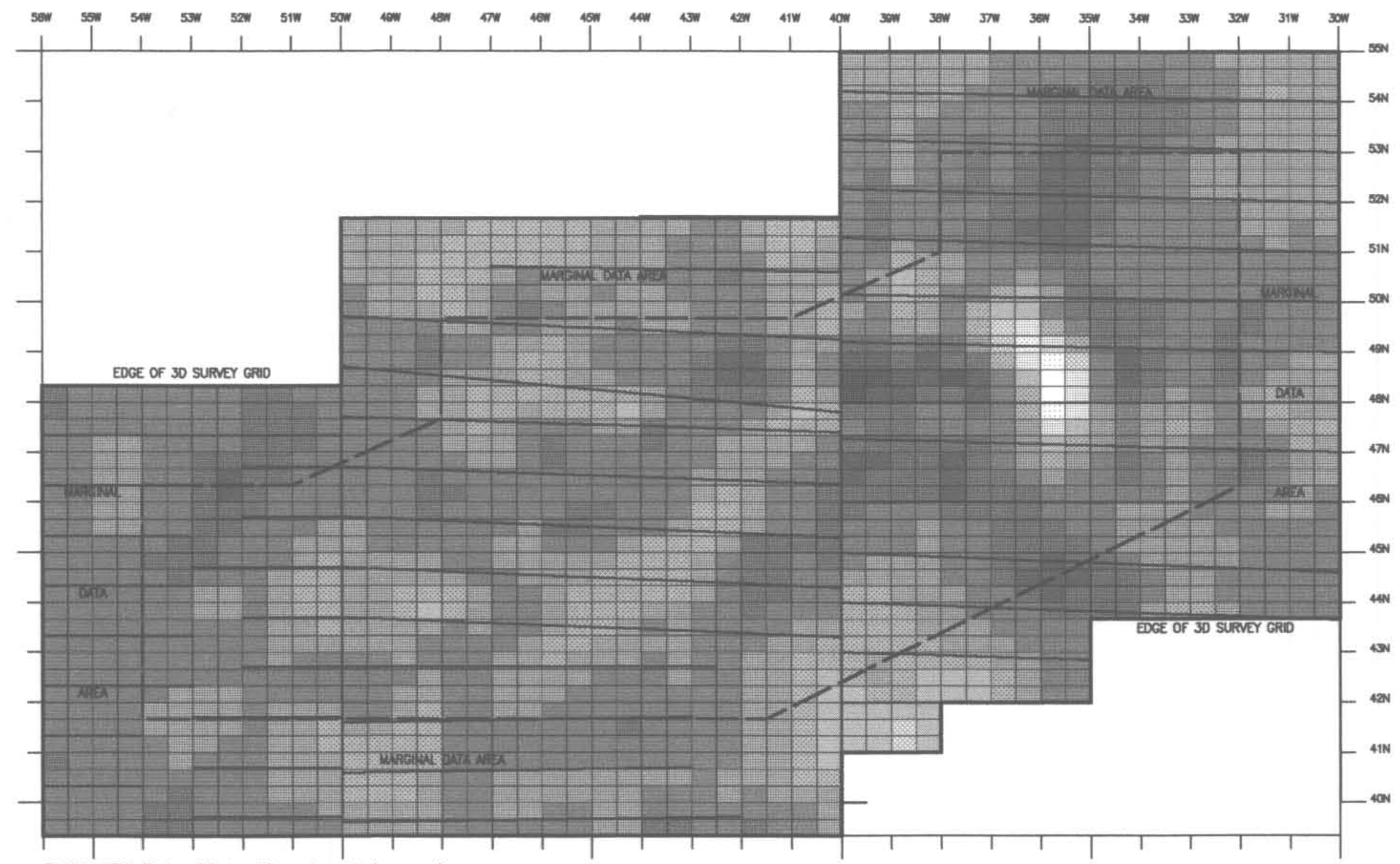
PLAN VIEW Zs1: 0 to 10 metres below surface



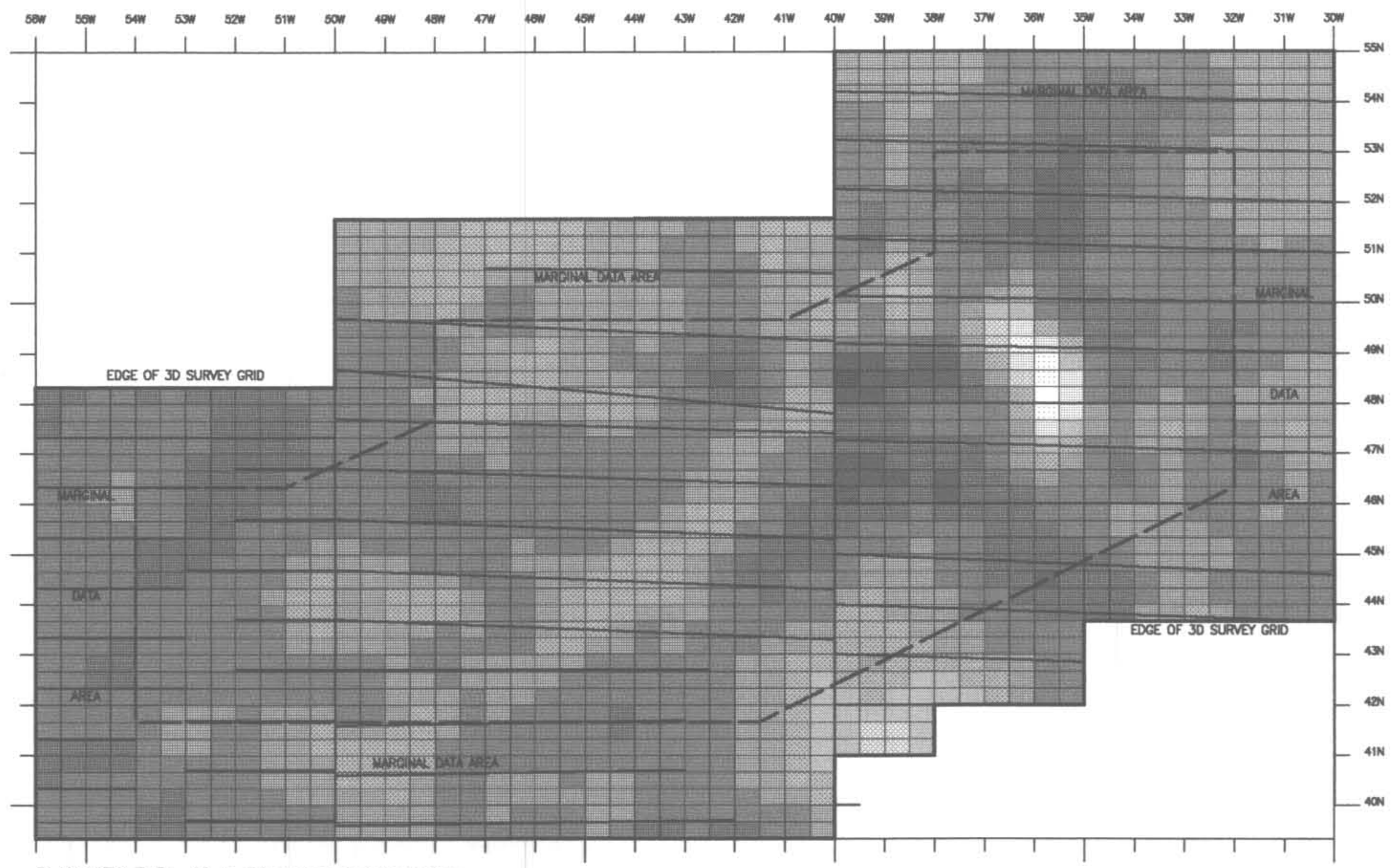
PLAN VIEW Zs2: 10 to 20 metres below surface



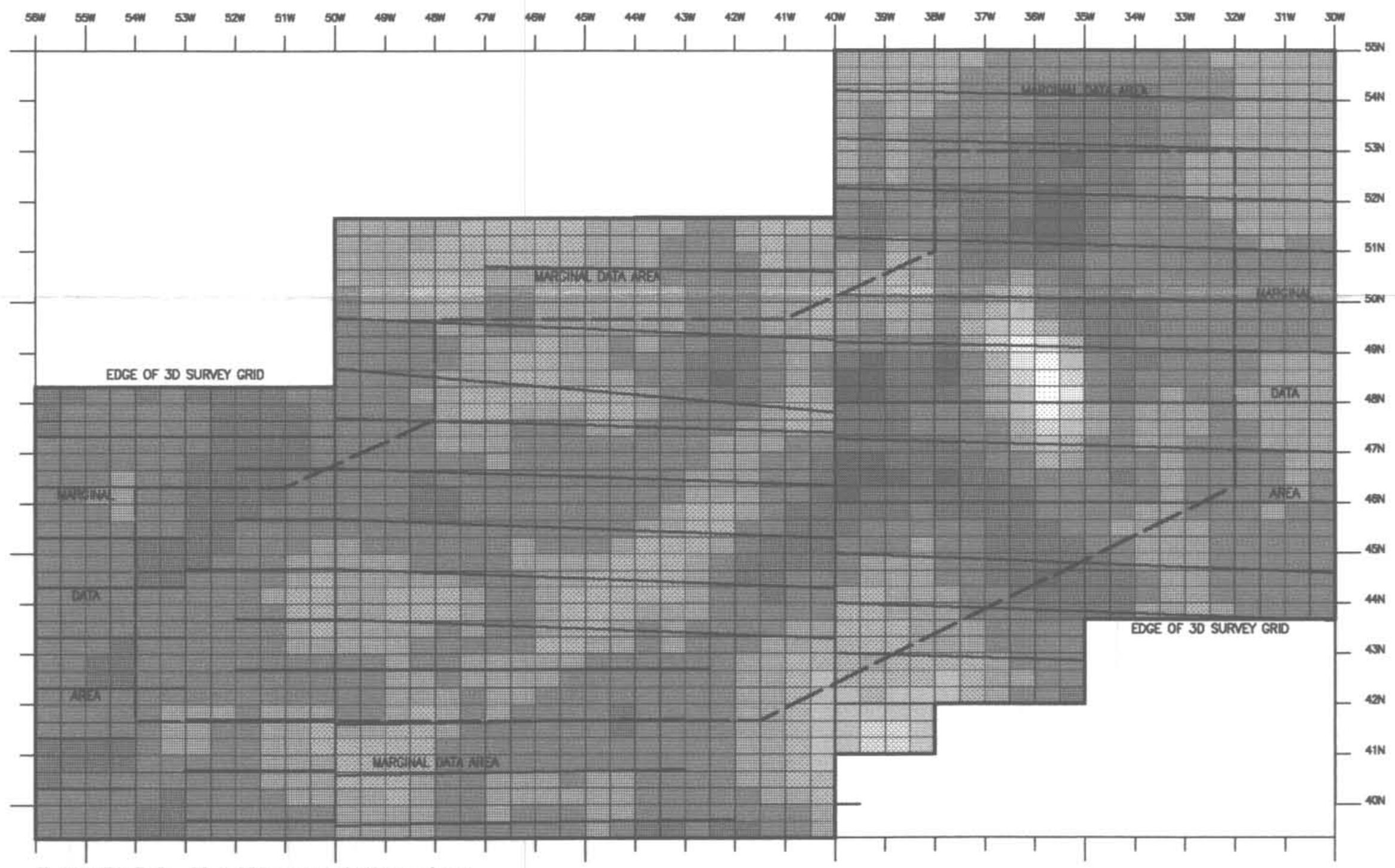
PLAN VIEW Zs3: 20 to 30 metres below surface



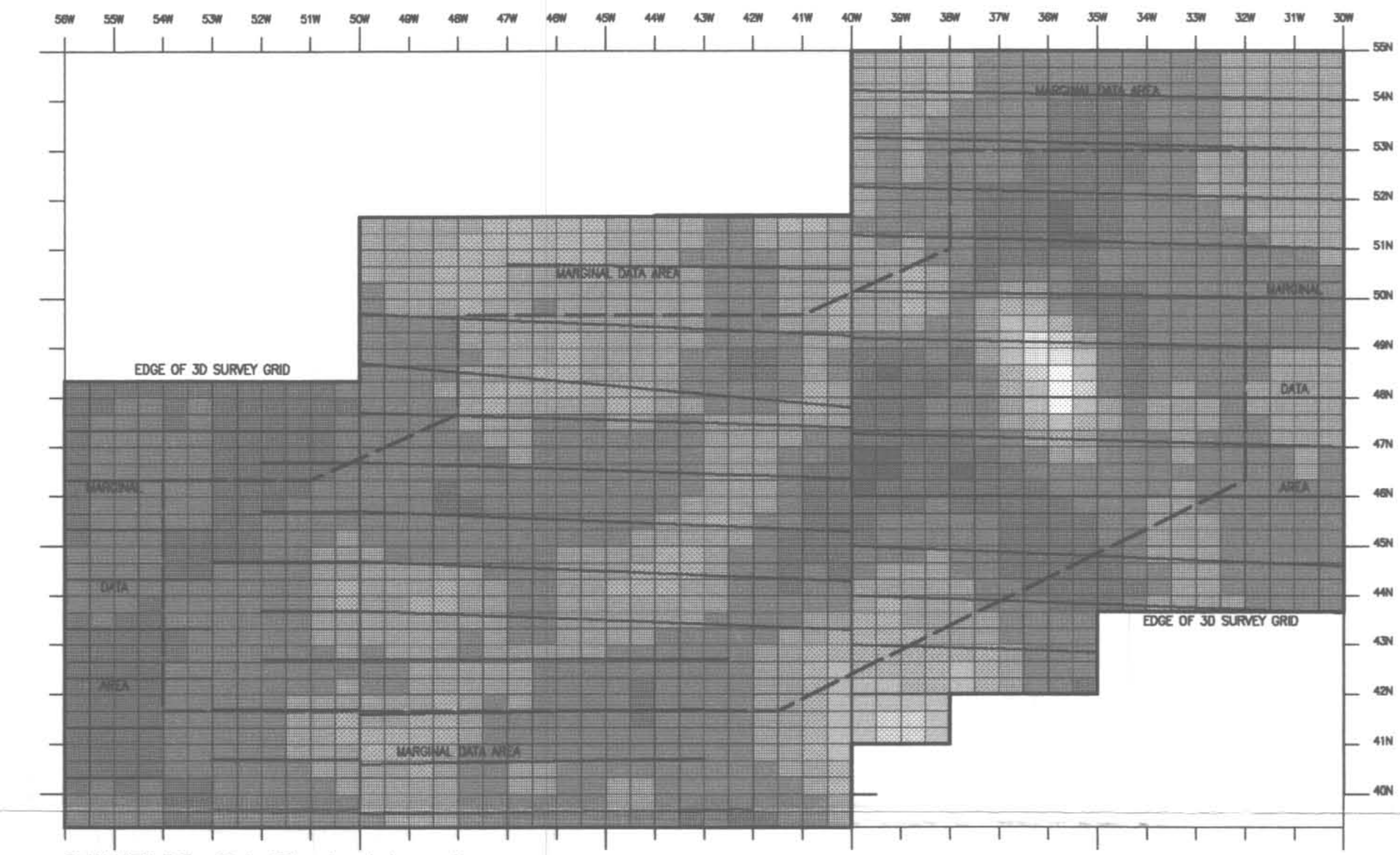
PLAN VIEW Zs4: 30 to 40 metres below surface



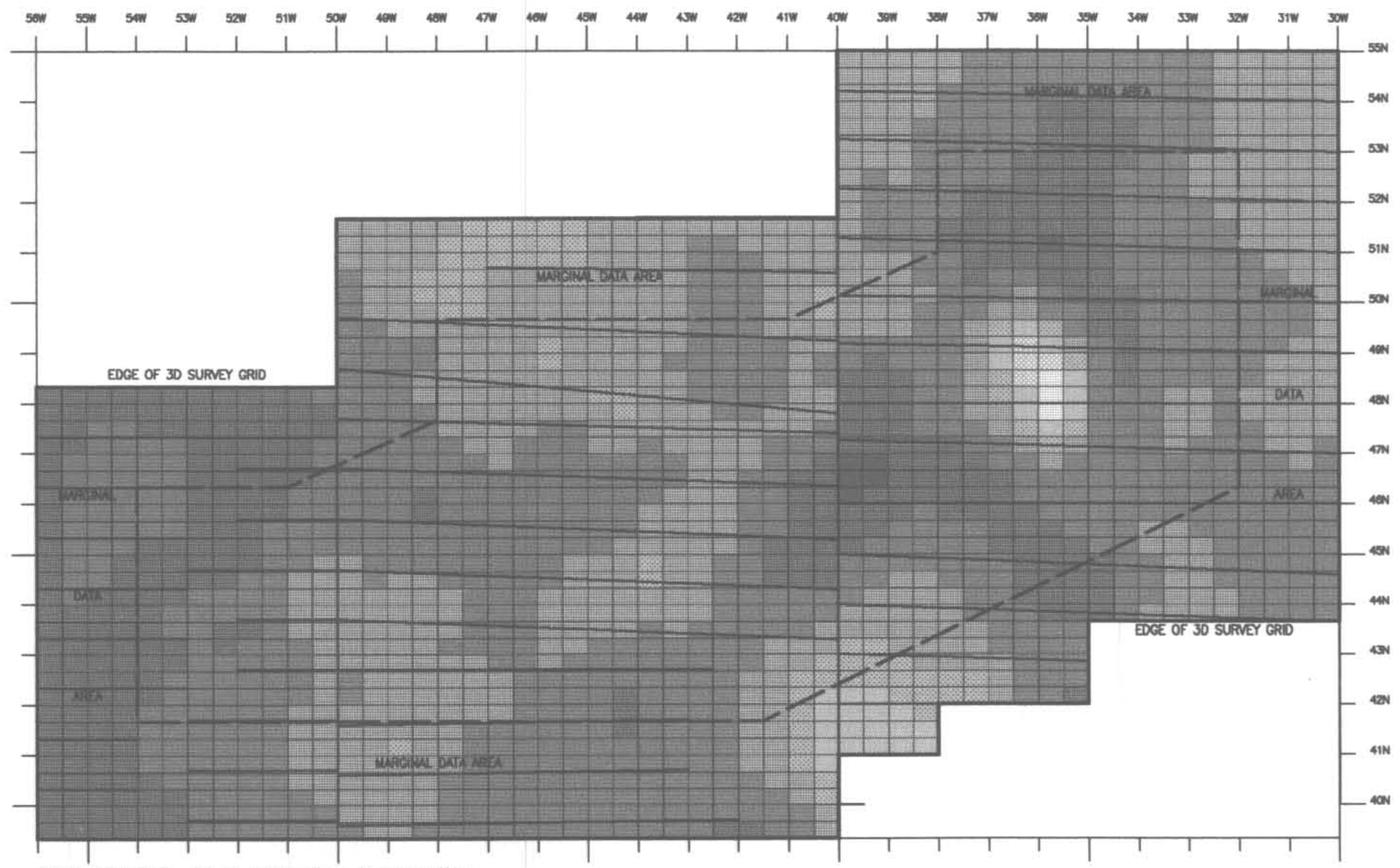
PLAN VIEW Zs5: 40 to 50 metres below surface



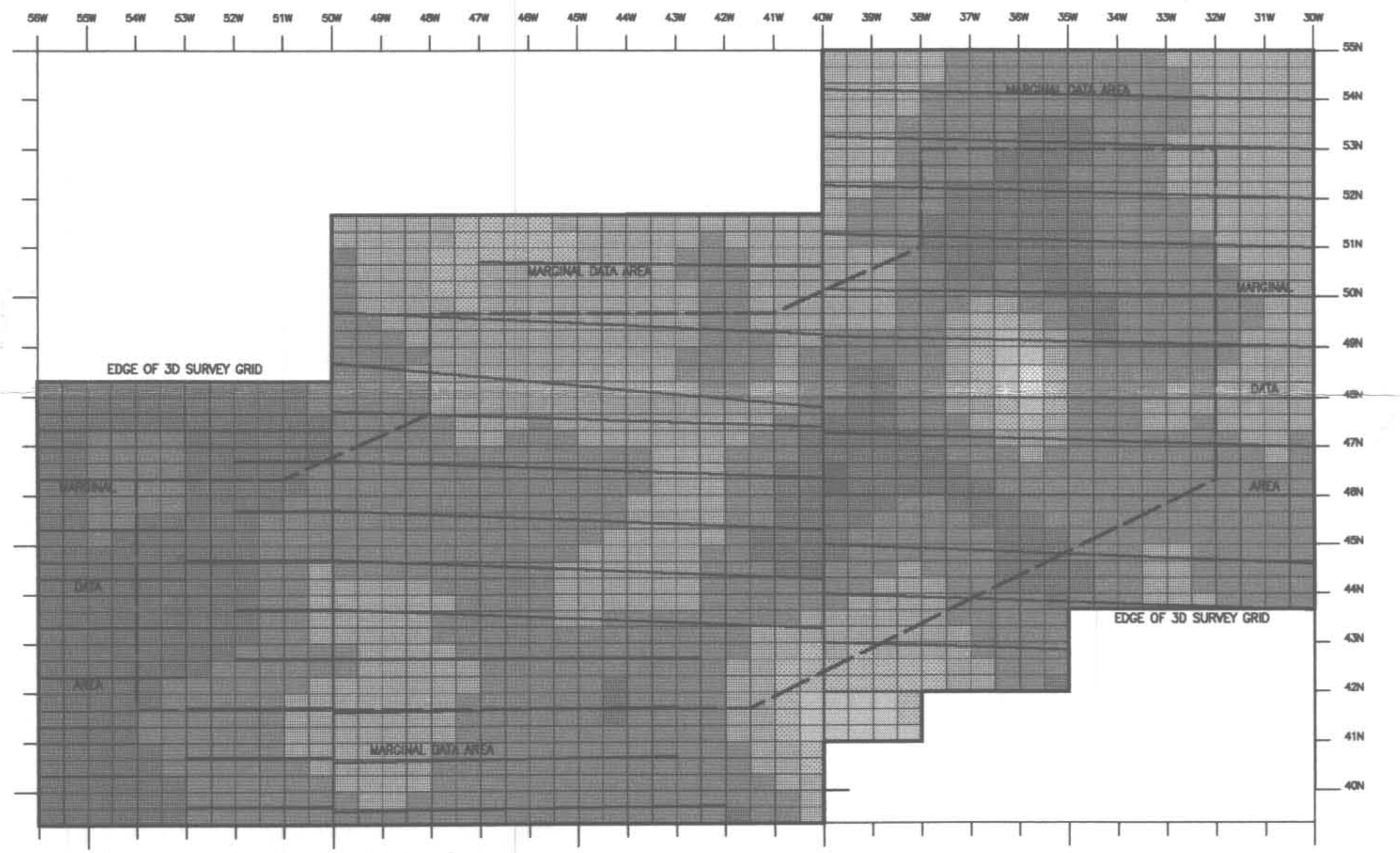
PLAN VIEW Zs6: 50 to 60 metres below surface



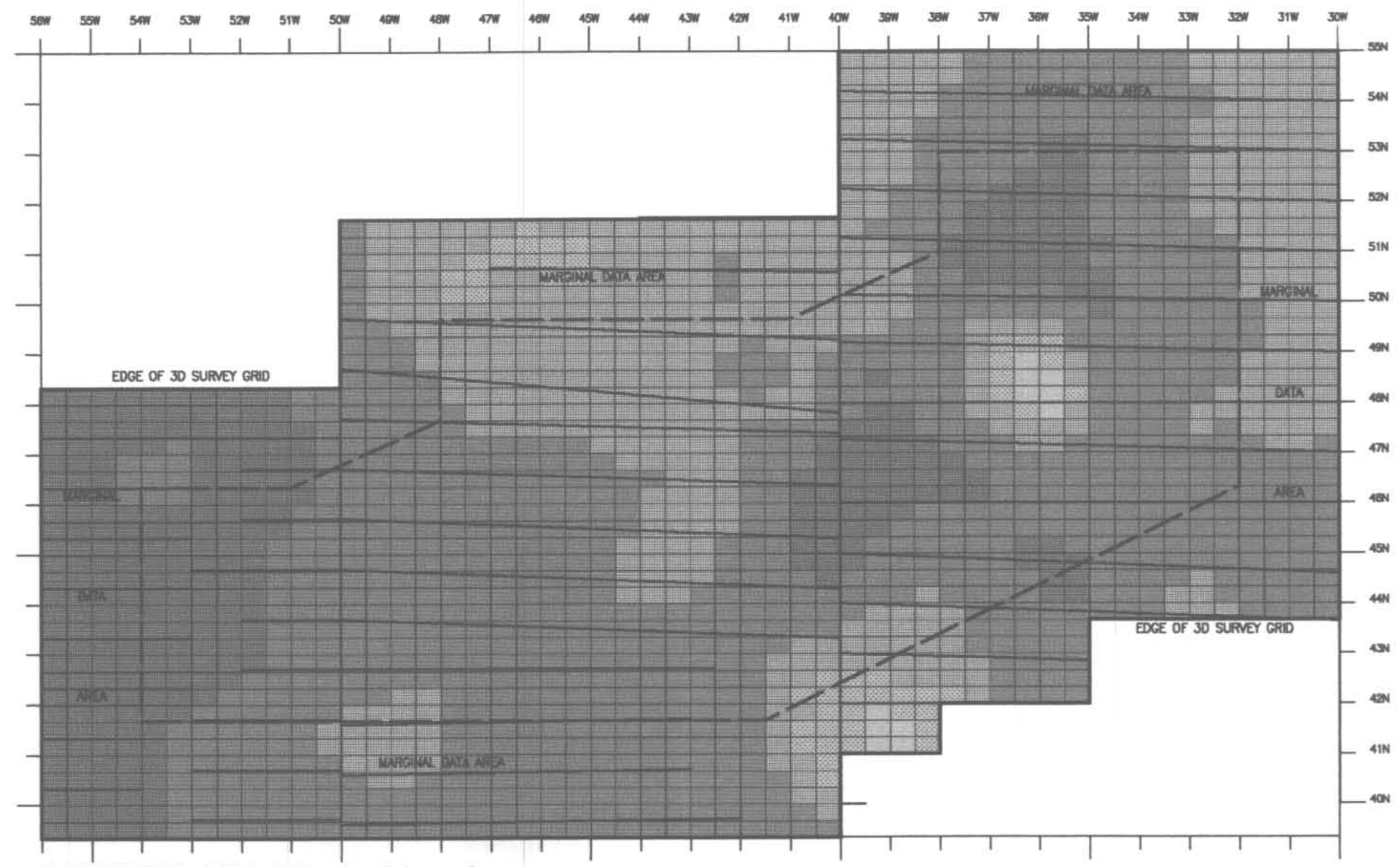
PLAN VIEW Zs7: 60 to 80 metres below surface



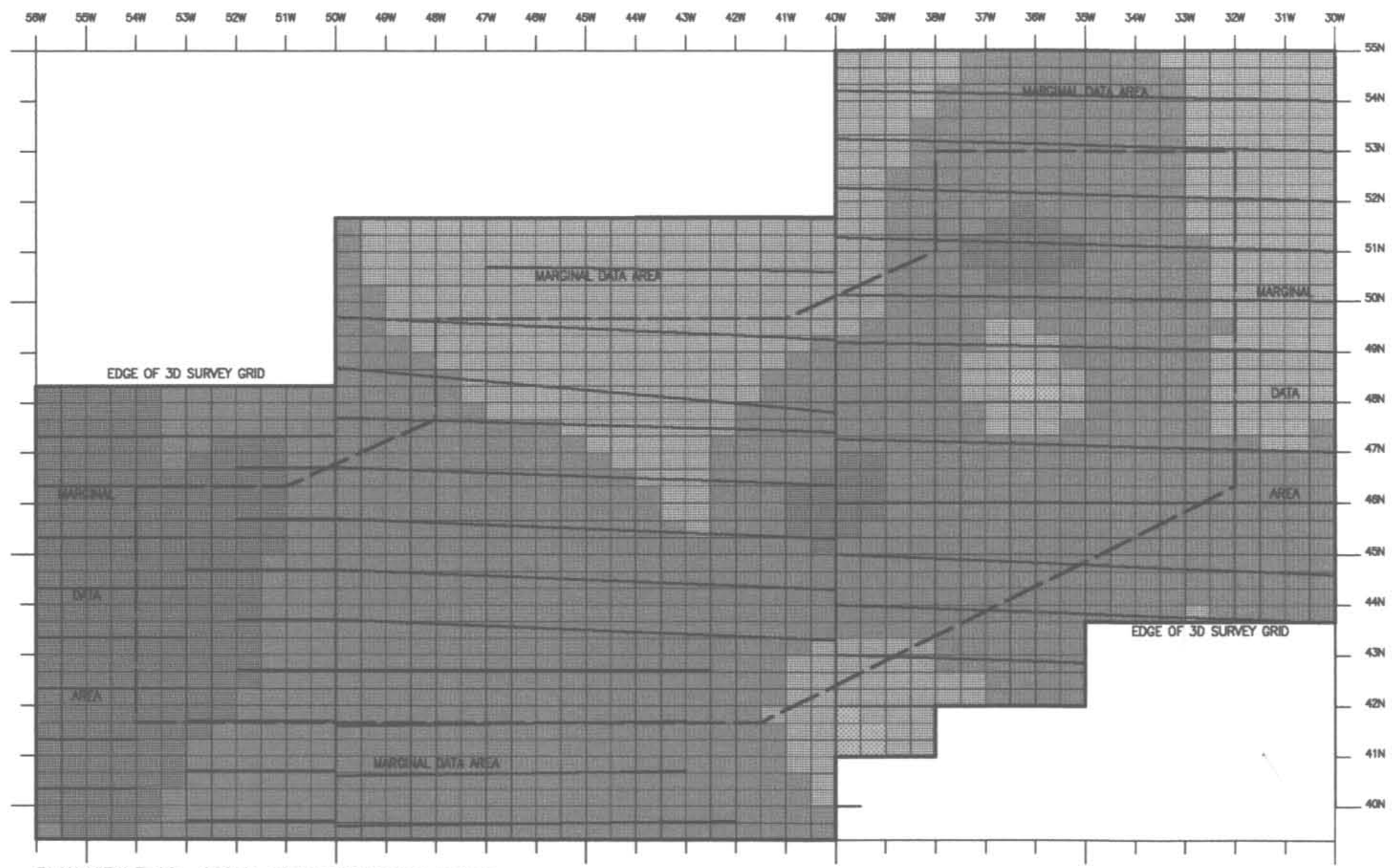
PLAN VIEW Zs8: 80 to 100 metres below surface



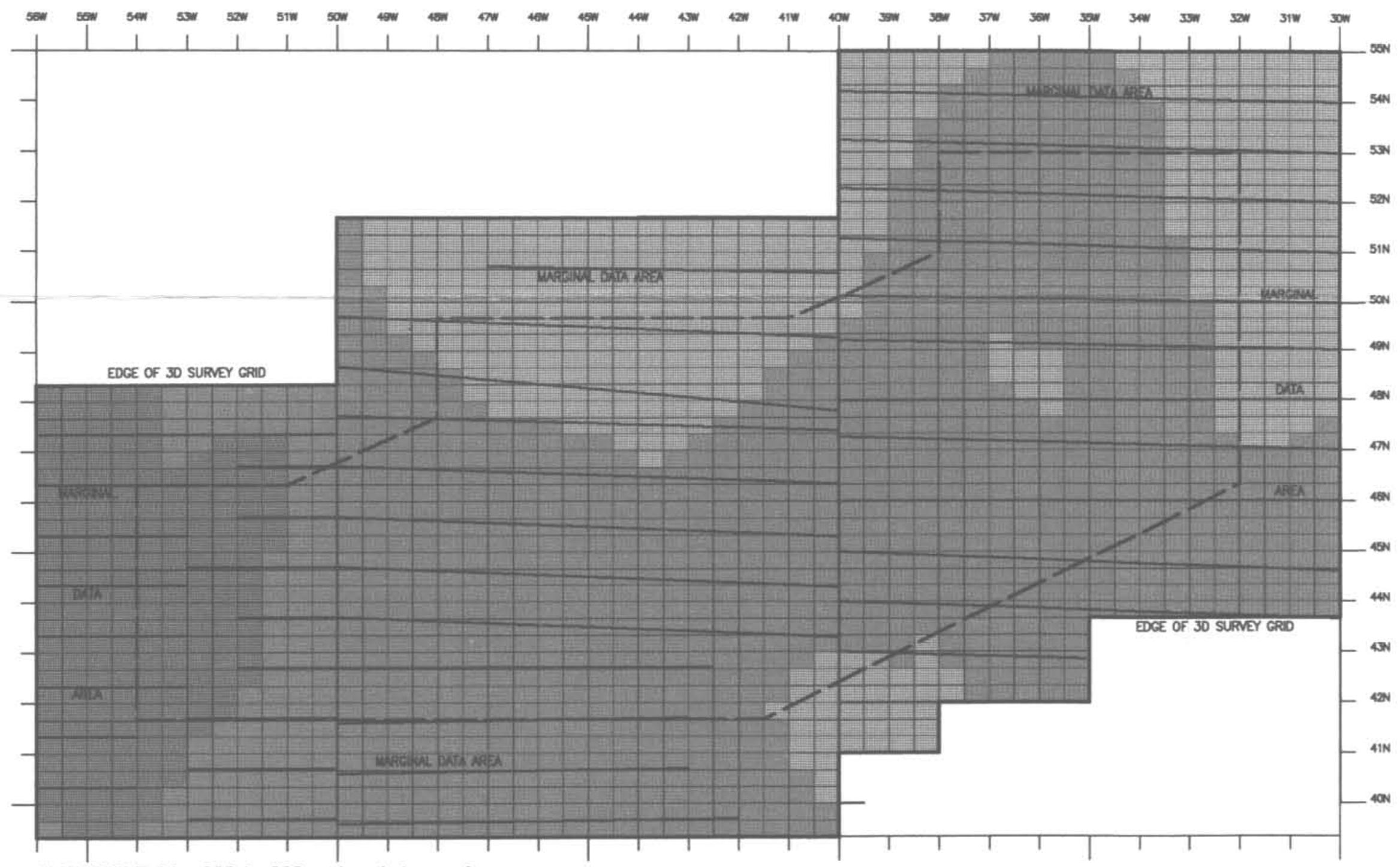
PLAN VIEW Zs9: 100 to 120 metres below surface



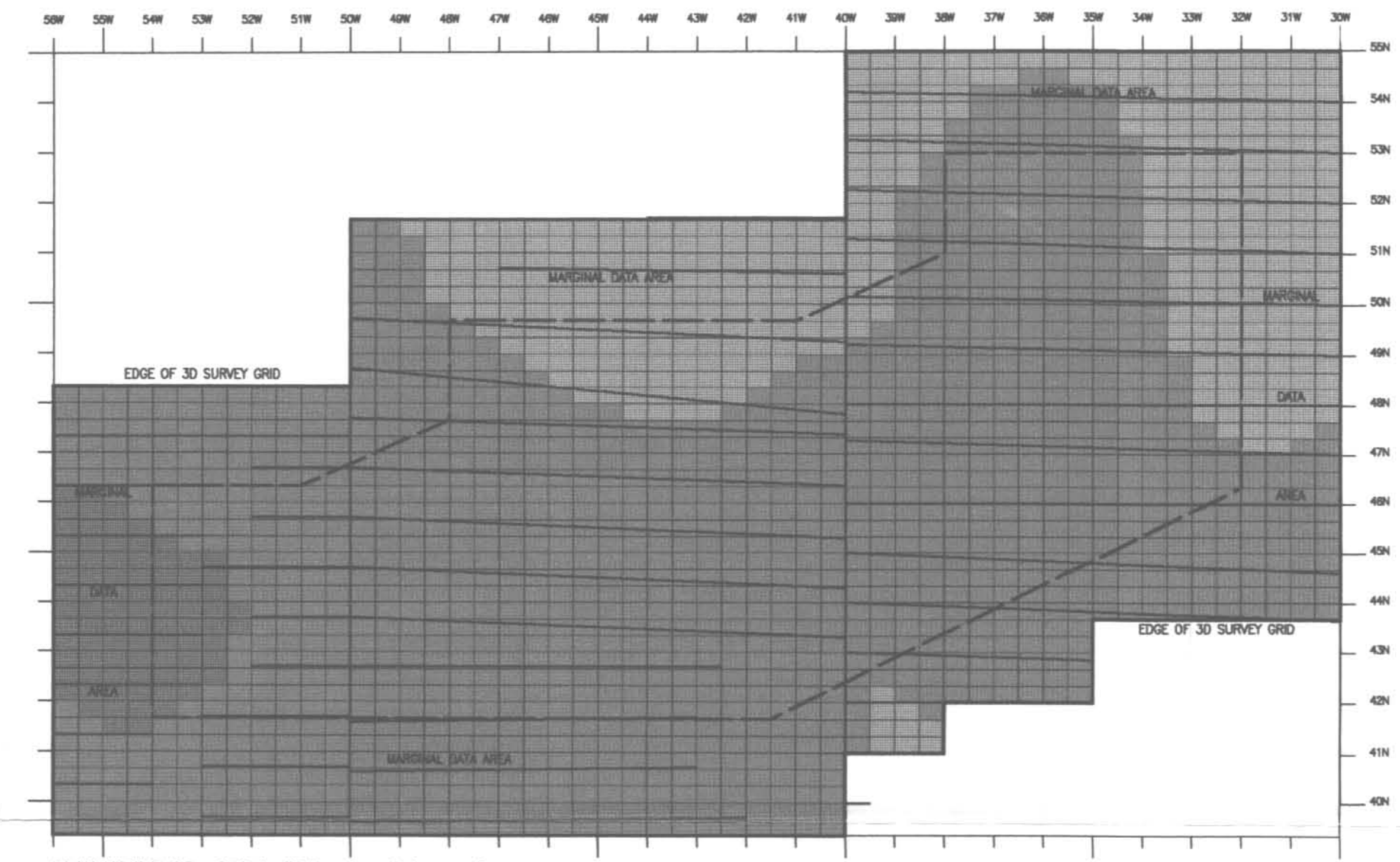
PLAN VIEW Zs10: 120 to 140 metres below surface



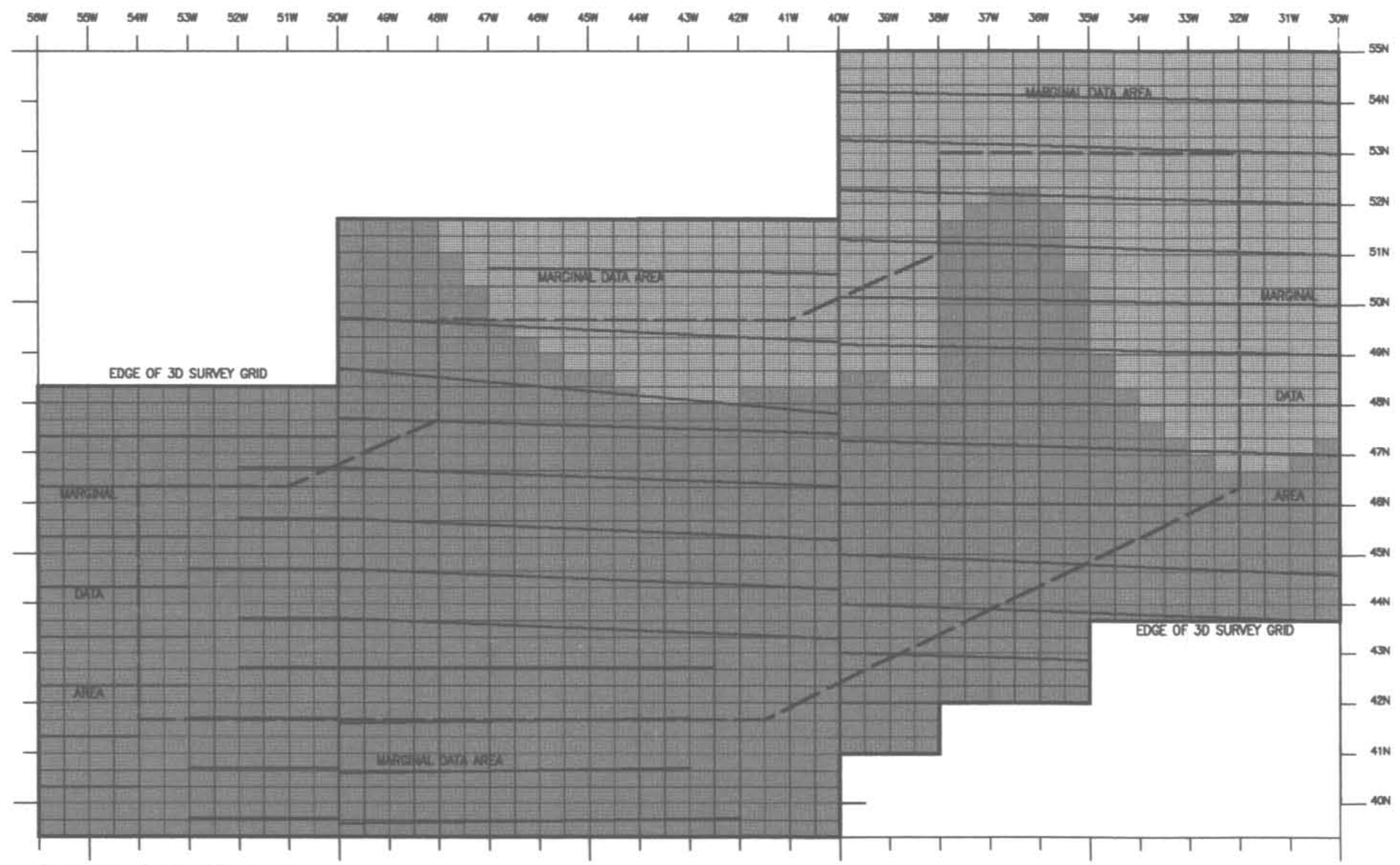
PLAN VIEW Zs12: 160 to 180 metres below surface



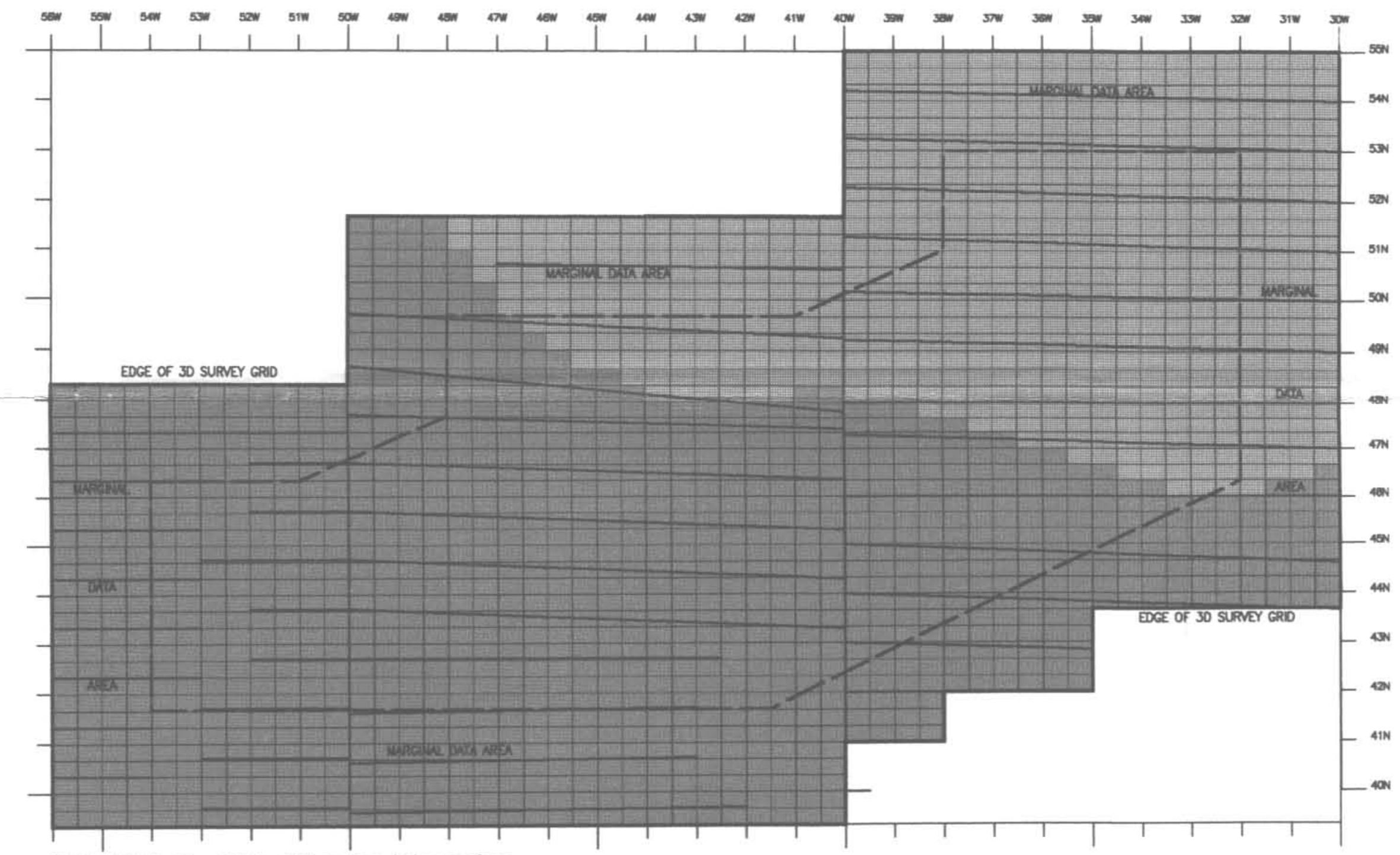
PLAN VIEW Zs14: 200 to 220 metres below surface



PLAN VIEW Zs16: 270 to 320 metres below surface



PLAN VIEW Zs18: 370 to 420 metres below surface



PLAN VIEW Zs20: 470 to 520 metres below surface

GEOLOGICAL SURVEY BRANCH
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G. A. SHORE

Accompanies 'Report on 3D Geo-electric Survey,
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June 1997, for Atna Resources Ltd. and Gold Mountain
Resources Ltd., by Greg A. Shore, PGeo.

more resistive

True Resistivity (Ohm-metres)
4000
2500
1500
1000
700
450
300
200
120
75
50

more conductive

Premier Geophysics Inc.
Vancouver, BC / Reno, NV

rev	date	init	dwg file
v1.0	97/07/12	GAS	UDKa-ra-11

Conjugate gradient inversion
Serial CGI970705125506 Watcom F77
C:200 P:100 s:200 iter:38 mod:19
m:07 sm:7 of:23 err:-4 man

200 0 200 400 600
(metres)

Atna Resources Ltd.
Gold Mountain Resources Ltd.

Uduk Lake property, BC: Grid # 97-1
Omineca M D NTS 93E9,F12

3D Geo-electric Survey
June 1997

TRUE RESISTIVITY
Plan views at increasing depth below surface.

Figure UDKa-100-RS.1