Assessment Report:

Horizontal Co-Planar Loop

Electromagnetic Geophysical Surveys

on the

Tree 29-56 Claims

Long. 132°25'W; Lat. 61°38'N
NTS 105F/9
Watson Lake Mining District

for

Atna Resources Ltd.
Vancouver , B.C.

Survey: July 18 - 24, 1998

by

Grant A. Hendrickson, P.Geo.
Geophysicist

introduction by

Rob G. Wilson, P.Geo.
Peter H. Daubeny
Atna Resources Ltd.
December 31, 1998

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3500.00.

for ... Exploration and
... Commissioner

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1. Introduction

In 1997 Atna Resources Ltd. discovered the Wolf massive sulphide deposit within Mississippian volcanics in Pelly-Cassiar Platform rocks, central Yukon Territory. The deposit contains a significant thickness of zinc, lead, and silver bearing massive sulphide over the 500m strike length and 250m down dip extent tested to-date. As a follow-up to this discovery, Atna acquired several other properties along the volcanic belt including the Fire-Char-Tree property. The property was surveyed by airborne EM, Magnetic and VLF geophysics and ground horizontal co-planar loop electromagnetic (max-min) geophysics. The results of the airborne survey were detailed in a separate and previously submitted assessment report titled Helicopterborne EM, Magnetic and VLF Survey on the Fire 1-12, Char 1-30 and Tree 1-56 Claims. The results of the ground geophysical survey is the subject of this report.

1.1 Location and Access

The Fire and Tree claim groups consist of 72 claims located on map sheet NTS 105F/9, Cloutier Creek map sheet, centered at approximately 61°38'N 132°26'W (UTM 6836000 N, 636000 E) Figure 1.1. During the 1998 field season, access to the claim group was gained by helicopter based in Ross River, located approximately 40 km to the north, or from the Ketza River mine site located approximately 15 km to the southeast.

1.2 Claims

The Fire-Char claims are on option to Atna Resources Ltd. from Eagle Plains Resources and Miner River Resources Ltd. The claims are a re-staking of the Chzerpnough property, worked in the late 1970's by Cyprus Anvil Mining Corporation. The Tree claims are 100% owned by Atna Resources Ltd. Figure 1.2 shows the claim locations.

The following table lists relevant data concerning the property over which the airborne and ground geophysical surveys were conducted.

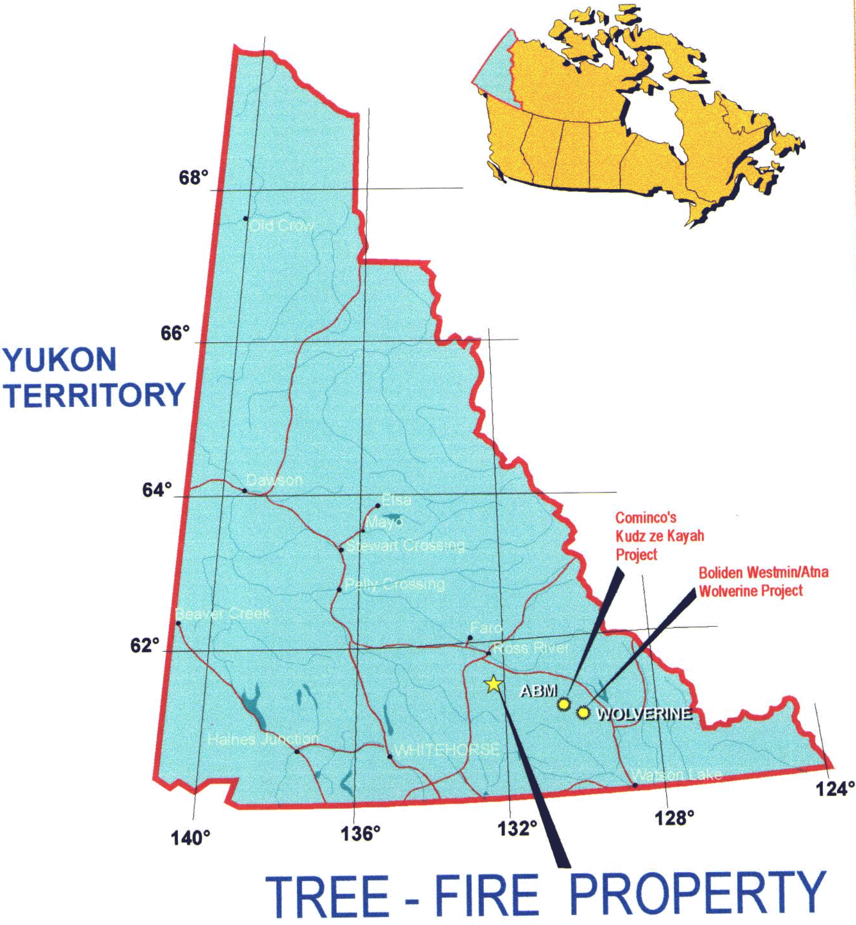
Table 1: Claim Data

Claim	Tenure.	Expiry	Pending	Mining Div	NTS
Char 01	YB84517	20-Jun-00	P*	Watson Lake	105F/09
Char 02	YB84518	20-Jun-00	P*	Watson Lake	105F/09
Char 03	YB84519	20-Jun-00	P*	Watson Lake	105F/09
Char 04	YB84520	20-Jun-00	P*	Watson Lake	105F/09
Char 05	YB84521	20-Jun-00	P*	Watson Lake	105F/09
Char 06	YB84522	20-Jun-00	P*	Watson Lake	105F/09
Char 07	YB84523	20-Jun-00	P*	Watson Lake	105F/09

Char 08	YB84524	20-Jun-00	P*	Watson Lake	105F/09
Char 09	YB84525	20-Jun-00	P*	Watson Lake	105F/09
Char 10	YB84526	20-Jun-00	P*	Watson Lake	105F/09
Char 11	YB84527	20-Jun-00	P*	Watson Lake	105F/09
Char 12	YB84528	20-Jun-00	P*	Watson Lake	105F/09
Char 13	YB84529	20-Jun-00	P*	Watson Lake	105F/09
Char 14	YB84530	20-Jun-00	P*	Watson Lake	105F/09
Char 15	YB84531	20-Jun-00	P*	Watson Lake	105F/09
Char 16	YB84532	20-Jun-00	P*	Watson Lake	105F/09
Char 17	YB84533	20-Jun-00	P*	Watson Lake	105F/09
Char 18	YB84534	20-Jun-00	P*	Watson Lake	105F/09
Char 19	YB84535	20-Jun-00	P*	Watson Lake	105F/09
Char 20	YB84536	20-Jun-00	P*	Watson Lake	105F/09
Char 21	YB84537	20-Jun-00	P*	Watson Lake	105F/09
Char 22	YB84538	20-Jun-00	P*	Watson Lake	105F/09
Char 23	YB84539	20-Jun-00	P*	Watson Lake	105F/09
Char 24	YB84540	20-Jun-00	P*	Watson Lake	105F/09
Char 25	YB84541	20-Jun-00	P*	Watson Lake	105F/09
Char 26	YB84542	20-Jun-00	P*	Watson Lake	105F/09
Char 27	YB84543	20-Jun-00	P*	Watson Lake	105F/09
Char 28	YB84544	20-Jun-00	P*	Watson Lake	105F/09
Char 29	YB84545	20-Jun-00	P*	Watson Lake	105F/09
Char 30	YB84546	20-Jun-00	P*	Watson Lake	105F/09
Fire 01	YB74411	02-Feb-02		Watson Lake	105F/09
Fire 02	YB74412	02-Feb-02		Watson Lake	105F/09
Fire 03	YB74413	02-Feb-02		Watson Lake	105F/09
Fire 04	YB74414	02-Feb-02		Watson Lake	105F/09
Fire 05	YB74415	02-Feb-02		Watson Lake	105F/09
Fire 06	YB74416	02-Feb-02		Watson Lake	105F/09
Fire 07	YB74417	02-Feb-02		Watson Lake	105F/09
Fire 08	YB74418	02-Feb-02		Watson Lake	105F/09
Fire 09	YB74419	02-Feb-02		Watson Lake	105F/09
Fire 10	YB74420	02-Feb-02		Watson Lake	105F/09
Fire 11	YB74421	02-Feb-02		Watson Lake	105F/09
Fire 12	YB74422	02-Feb-02		Watson Lake	105F/09
Tree 01	YB70076	11-Oct-05	P	Watson lake	105F/09
Tree 02	YB70077	11-Oct-05	P	Watson Lake	105F/09
Tree 03	YB70078	11-Oct-05	P	Watson Lake	105F/09
Tree 04	YB70079	11-Oct-05	P	Watson Lake	105F/09
Tree 05	YB70080	11-Oct-05	P	Watson Lake	105F/09
Tree 06	YB70081	11-Oct-05	P	Watson lake	105F/09
Tree 07	YB70082	11-Oct-05	P	Watson Lake	105F/09
Tree 08	YB70083	11-Oct-05	P	Watson Lake	105F/09
Tree 09	YB70084	11-Oct-05	P	Watson Lake	105F/09
Tree 10	YB70085	11-Oct-05	P	Watson Lake	105F/09
Tree 11	YB70086	11-Oct-05	P	Watson Lake	105F/09
Tree 12	YB70087	11-Oct-05	P	Watson Lake	105F/09
Tree 13	YB70088	11-Oct-05	P	Watson Lake	105F/09
Tree 14	YB70089	11-Oct-05	P	Watson Lake	105F/09
Tree 15	YB70090	11-Oct-05	P	Watson Lake	105F/09

Tree 16	YB70091	11-Oct-05	P	Watson Lake	105F/09
Tree 17	YB88907	23-Dec-02	P	Watson Lake	105F/09
Tree 18Fr	YB88908	23-Dec-02	P	Watson Lake	105F/09
Tree 19	YB88909	23-Dec-02	P	Watson Lake	105F/09
Tree 20	YB88910	23-Dec-02	P	Watson Lake	105F/09
Tree 21	YB88911	23-Dec-02	P	Watson Lake	105F/09
Tree 22	YB88912	23-Dec-02	P	Watson Lake	105F/09
Tree 23	YB88913	23-Dec-02	P	Watson Lake	105F/09
Tree 24	YB88914	23-Dec-02	P	Watson Lake	105F/09
Tree 25	YB88915	23-Dec-02	P	Watson Lake	105F/09
Tree 26	YB88916	23-Dec-02	P	Watson Lake	105F/09
Tree 27	YB88917	23-Dec-02	P	Watson Lake	105F/09
Tree 28	YB88918	23-Dec-02	P	Watson Lake	105F/09
Tree 29	YB89899	12-Sep-02	P**	Watson Lake	105F/09
Tree 30	YB89900	12-Sep-02	P**	Watson Lake	105F/09
Tree 31	YB89901	12-Sep-02	P**	Watson Lake	105F/09
Tree 32	YB89902	12-Sep-02	P**	Watson Lake	105F/09
Tree 33	YB89903	12-Sep-02	P**	Watson Lake	105F/09
Tree 34	YB89904	12-Sep-02	P**	Watson Lake	105F/09
Tree 35	YB89905	12-Sep-02	P**	Watson Lake	105F/09
Tree 36	YB89906	12-Sep-02	P**	Watson Lake	105F/09
Tree 37	YB89907	12-Sep-02	P**	Watson Lake	105F/09
Tree 38	YB89908	12-Sep-02	P**	Watson Lake	105F/09
Tree 39	YB89909	12-Sep-02	P**	Watson Lake	105F/09
Tree 40	YB89910	12-Sep-02	P**	Watson Lake	105F/09
Tree 41	YB89911	12-Sep-02	P**	Watson Lake	105F/09
Tree 42	YB89912	12-Sep-02	P**	Watson Lake	105F/09
Tree 43	YB89913	12-Sep-02	P**	Watson Lake	105F/09
Tree 44	YB89914	12-Sep-02	P**	Watson Lake	105F/09
Tree 45	YB89915	12-Sep-02	P**	Watson Lake	105F/09
Tree 46	YB89916	12-Sep-02	P**	Watson Lake	105F/09
Tree 47	YB89917	12-Sep-02	P**	Watson Lake	105F/09
Tree 48	YB89918	12-Sep-02	P**	Watson Lake	105F/09
Tree 49	YB89919	12-Sep-02	P**	Watson Lake	105F/09
Tree 50	YB89920	12-Sep-02	P**	Watson Lake	105F/09
Tree 51	YB89921	12-Sep-02	P**	Watson Lake	105F/09
Tree 52	YB89922	12-Sep-02	P**	Watson Lake	105F/09
Tree 53	YB89923	12-Sep-02	P**	Watson Lake	105F/09
Tree 54	YB89924	12-Sep-02	P**	Watson Lake	105F/09
Tree 55	YB89925	12-Sep-02	P**	Watson Lake	105F/09
Tree 56	YB89926	12-Sep-02	P**	Watson Lake	105F/09

P = Pending acceptance of previously submitted report.
P* = Pending acceptance of the airborne report.
P** = Pending acceptance of this report.



LOCATION MAP

TREE - FIRE CLAIMS
PELLY MOUNTAINS REGION
YUKON TERRITORY

Figure 1.1

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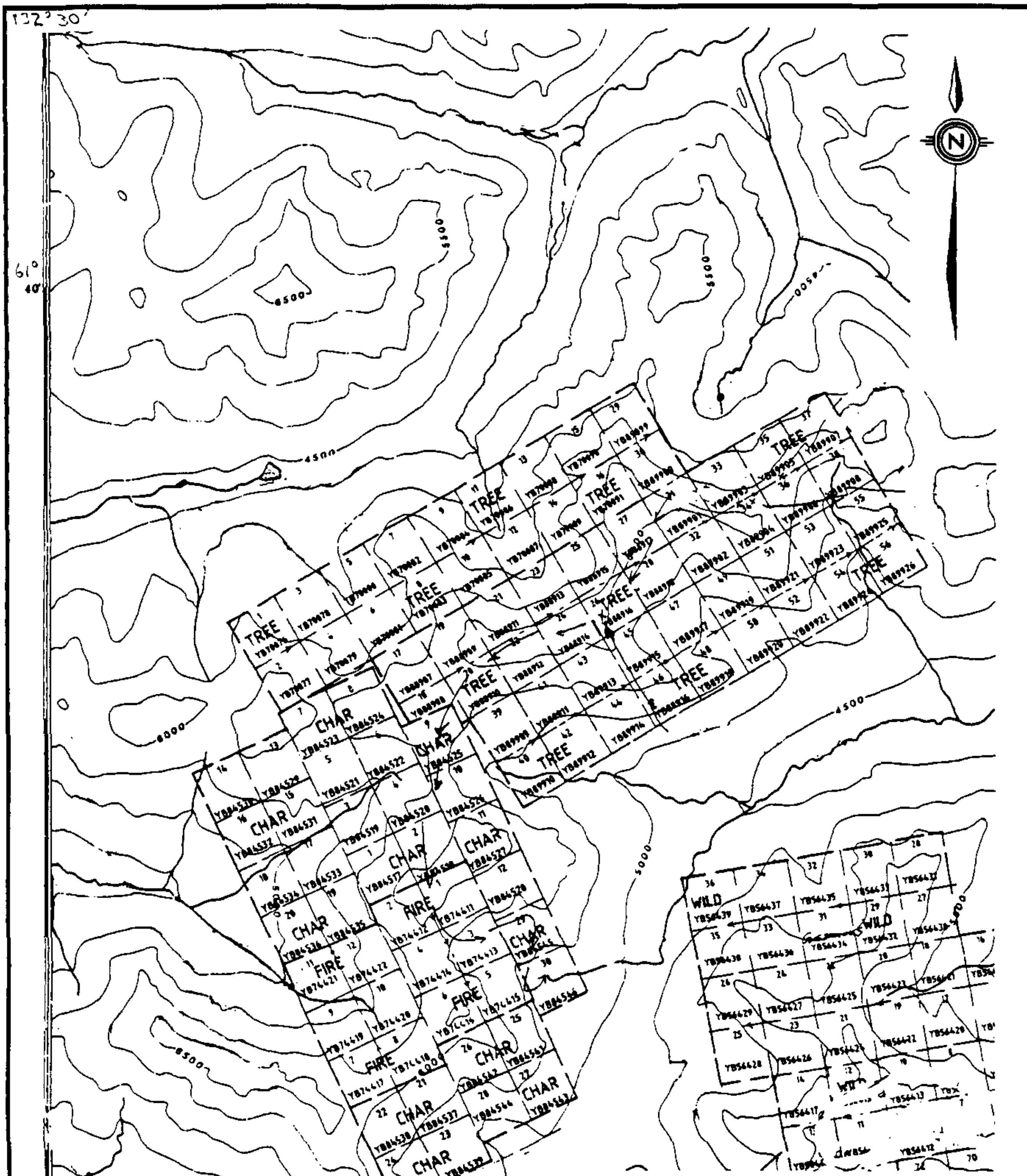
RESOURCES LTD.



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PELLY PROJECT

Fire - Char - Tree Claims

Claims Location

NTS Yukon			Date May /98
Scale As Shown	DWG by		Figure 1.2

1.3 Survey

At the request of Atna Resources Ltd. ground horizontal co-planar loop electromagnetic (Max-Min) geophysical surveying was completed over the Tree claims by Delta Geophysics Ltd. The surveys were conducted on the Tree #2 grid. A total of six kilometers of grid surveying was completed between July 23 and 24, 1998 on the grid. A report on the surveying authored by Grant A. Hendrickson, P.Geo. is included as Appendix I. Figure 1.3 shows the position of Grids #2 relative to the claim boundaries.

1.4 Regional Geology

The regional geology of the Pelly Mountains has been described by Abbott (1986), Hunt (1998), Mortensen (1982), and Tempelman-Kluit (1976). The following summary is drawn from these sources.

The area encompassing the Tree/Fire claims is known as the Pelly Mountains district. The oldest rocks in this area are a late Proterozoic through to Silurian, dominantly clastic sequence that was deposited at the western edge of ancestral North America. During the latter part of this time span the Cassiar platform, a narrow shelf of shallow water clastic and carbonate deposition, developed parallel to, but separated from the North American miogeoclinal sequence, figure 2.1. At the same time, deep water shales and cherts of the Selwyn basin accumulated between the Cassiar platform and the North American craton margin. Late Devonian to Upper Mississippian tectonism resulted in extensive up lift, block faulting and erosion in the Selwin basin. In the Pelly Mountains region, deep water sedimentation accompanying this tectonism, extended across the Cassiar platform. This sequence also contains extensive deposits of continental rift related intermediate to felsic volcanic rocks. Associated with these volcanic rocks are at least 2 VMS deposits (the Wolf and the MM) and a number of showings, including the Chzerpnough (Fire/Tree claims) and the Bnob (Ice claims). Later, in Upper Paleozoic through to Triassic time, sedimentation continued when calcareous argillites were deposited above the shale-volcanic sequence.

Complicating these stratagraphic relationships is extensive thrust faulting, folding and associated metamorphism. This is thought to be related to imbrication beneath a large, overriding ophiolitic slab (Anvil allochthon) in middle Mesozoic times. Emplacement of Cretaceous batholiths and strike-slip faulting along the Tintina fault zone round out the Mesozoic and Cenozoic history of the region.

1.5 Property Geology

Property mapping on the Tree/Char/Fire claims defined eight rock units including five volcanic or volcaniclastic units and three sedimentary units. Field studies determined that the most economically prospective unit underlying the Tree/Fire property is a yellow weathering, altered and mineralized, volcanic ± exhalative horizon that forms a mappable unit occurring at various structural or stratigraphic positions over much of the property. This unit is named the Yellow Trachyte Horizon. Rocks interpreted to be primary volcanic flows were lumped into two units consisting of unmineralized Trachyte and undifferentiated Volcanic Flows. Most of the volcaniclastic rocks are classified as a single unit with the exception of a distinctive, purple weathering, volcaniclastic unit located at the north end of the Tree claims.

Sediments comprise the remaining three map units. A thin bedded Limestone intercalated with Argillite unit and a Trachyte Chip conglomerate were both mapped directly overlying the Yellow Trachyte horizon. The final rock type consists of black, occasionally graphitic, argillite that forms inter-volcanic flow sedimentary packages and a basal argillite that underlies all the volcanic stratigraphy mapped on the Tree/Fire claims. Both of these units are designated as Argillite.

2. Discussion

The Max-Min geophysical surveys have outlined a total of 6 bedrock conductors on Grid #2 of the Tree property. Conductors 2 & 3 on Grid #2 occur within a mapped yellow trachyte unit along with a weaker, not numbered conductor. Conductors 1 & 4 are related to graphic sediments. Ground follow-up of the conductors related to the yellow trachyte should be part of further field studies on the property.

3. Conclusions and Recommendations

Airborne geophysical surveys identified several good conductors within the Tree claims area. Some of these were followed up with ground horizontal co-planar loop electromagnetic geophysical surveys where they occurred within areas of favourable geology. A few of the ground geophysical conductors on Grid #2 correspond to the Yellow Trachyte unit identified as the most prospective rock unit on the claims. Conductors 2 and 3 on Grid #2 occur within the surface trace and projection of this trachyte.

Detailed prospecting, mapping, and soil geochemistry should be employed to identify the best drill targets within conductive areas of the Yellow Trachyte.

APPENDIX I

GEOPHYSICAL REPORT:

TREE #2 GRID

GEOPHYSICAL REPORT

TREE/FIRE #2 GRID

YUKON TERRITORY

FOR

ATNA RESOURCES LTD

BY

DELTA GEOSCIENCE LTD

DECEMBER 14, 1998.

GRANT A. HENDRICKSON, P.GEO.

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INTRODUCTION

At the request of Atna Resources Ltd., Delta Geoscience Ltd has conducted horizontal co-planar loop electromagnetic surveys over the Tree/Fire #2 Grid.

These claims are located in the centre of the Yukon, close to the dormant Ketza River mine. As this brief report is to be appended to Atna's geological reports, no location, claim maps or geological discussion will be included.

The Maxmin electromagnetic system developed by Apex Parametrics Ltd was used for this survey. The system utilised was the much improved 1-9 model introduced in the spring of 1998.

Access to the grid was by helicopter from the base camp Atna established at the Ketza mine site.

During the period July 23-24, Delta Geoscience conducted six kilometers of multi-frequency horizontal coplanar loop E.M. survey. To ensure a good depth of investigation a large coil separation was employed for all the basic coverage. Productivity was typically 3 km per day.

The topography of the survey area is quite typical of the Yukon, with rugged alpine terrain. Fortunately most of the survey work was conducted above the tree line. The topography itself presented no problems, however there were numerous significant scree slopes.

PERSONNEL

Grant Hendrickson - Senior Geophysicist-Supervisor.

Kristian von Fersen - Senior Technician.

Jan Dobrescu - Junior Geophysicist.

EQUIPMENT

1 - Apex Parametrics 1998 1-9 Electromagnetic System.

1 - NEC Versa Field Computer.

1 - Hewlett Packard 250C Colour Plotter/Printer.

4 - Spare Coil Separation Cables.

DATA PRESENTATION AND EQUIPMENT DESCRIPTION

The horizontal coplanar loop E.M. data is presented as stacked profile plans of the inphase and quadrature components for each frequency. Basic E.M. coverage was carried out at a coil separation of 250 meters and six frequencies: 220Hz, 440Hz, 880Hz, 1760Hz, 3520Hz and 7040Hz.

All survey maps are presented at 1:5000 scale in this report.

Profile data is presented increasing to the top (north) from a base level (value at the line position). The inphase response is plotted as a solid line, whereas the dashed line shows the corresponding quadrature response.

The manufacturer's specifications and capability sheets for the new 1998 1-9 Maxmin system and related software package follow.

APEX MAXMIN I+9 EM SYSTEM

I+ designation, with improved transmitter efficiency and increased dipole moments, 1998

❏ Designed for groundwater and mineral exploration, and for geoengineering applications, continuing and expanding the concepts of the earlier and highly popular MaxMin models.

❏ Frequency span is extended to nine octavely spaced frequencies from 110 to 28160 Hz, with 11 coil separations from 12.5 to 400 or 10 to 320 metres. These and other developments result in greater performance, more applications and enhanced interpretation.

❏ Advanced spheric and powerline interference rejection is still further improved, resulting in faster and more accurate surveys, particularly at the larger coil separations.

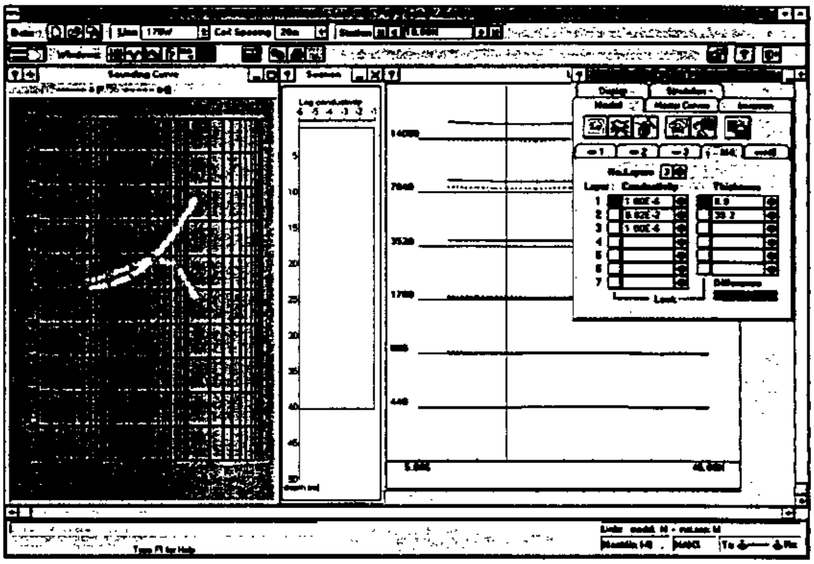
❏ MaxMin Computer or MMC, which is described in a separate data sheet, is offered for digital data processing, display, storage and transfer. The MMC displays and stores the in-phase and quadrature readings, their standard deviations, and the corresponding apparent ground conductivity values. Rough terrain surveys are also simplified with the MMC.

❏ MaxMin Pro data interpretation and presentation software program is available for layered earth parametric soundings and discrete conductor surveys done with MaxMin.

TRANSMITTER

RECEIVER + MMC

Layered earth interpretation:



- Semi-automated curve matching with half-space, 2 and 3 layer models.
- Forward modeling and Inversion.
- Up to 7 layers models.
- Parameter locking or constrained range for inversion.
- Complete inversion statistics output.
- Parametric (frequency), geometric (spacing), or mixed mode sounding.
- Data masking: can reject bad data points or use only quadrature.
- Optional normalization to low frequency in-phase to correct for geometrical errors.

Additional MAXMIN PRO features:

Simplified data input:

- Automatically extracts data and survey information from the .MMD file.
- Graphical entry of plates.

Support for all of the MaxMin maximum coupled modes.

Versatile display and data views:

- In-phase and in-quad vs. frequency sounding.
- Phasor (Argand) diagram.
- Survey map (zoomable).
- Stacked line profile.
- Vertical conductivity section.
- Inversion statistics.
- Persistent display shows several models at once.
- User configurable window placement.

Easy data point selection:

- Tape deck style line and station selectors or
- Selection by mouse click on survey map.

Model data base:

- Automatic creation of a model data base.
- Allows for interpretation in multiple sessions as previous results are saved.

Versatile output capabilities:

- File output, including Geosoft .XYZ format.
- Printed report.
- Windows® clipboard for transfer to other applications.

On-line documentation:

- Full featured Windows® Help hypertext documentation.

Hardware protection:

- Uses a «dongle» rather than software protection.

System requirements: Any xx86 computer running Windows® 3.1 or later, Windows 95®, or Windows NT® 3.5 or later with 2MB of disk space. A mouse or other pointing device is essential. While not absolutely essential, a color monitor of at least SVGA resolution is highly recommended. VGA is the minimum supported resolution. Floating point support is very highly recommended. Printer port is essential for printing and for connecting the hardware protection key.

A DEMONSTRATION PROGRAM IS AVAILABLE ON REQUEST

1998 - 04 - 14

APEX PARAMETRICS LIMITED

Telephone: 1 905 - 852 5875 Fax: 1 905 - 852 9688

P. O. Box 818, Uxbridge, Ontario, Canada L9P 1N2

APEX MAXMIN COMPUTER MMC

❐ The MMC interfaces with MaxMin EM System receivers for digital data processing, display, storage and transfer, enhancing survey productivity and data accuracy.

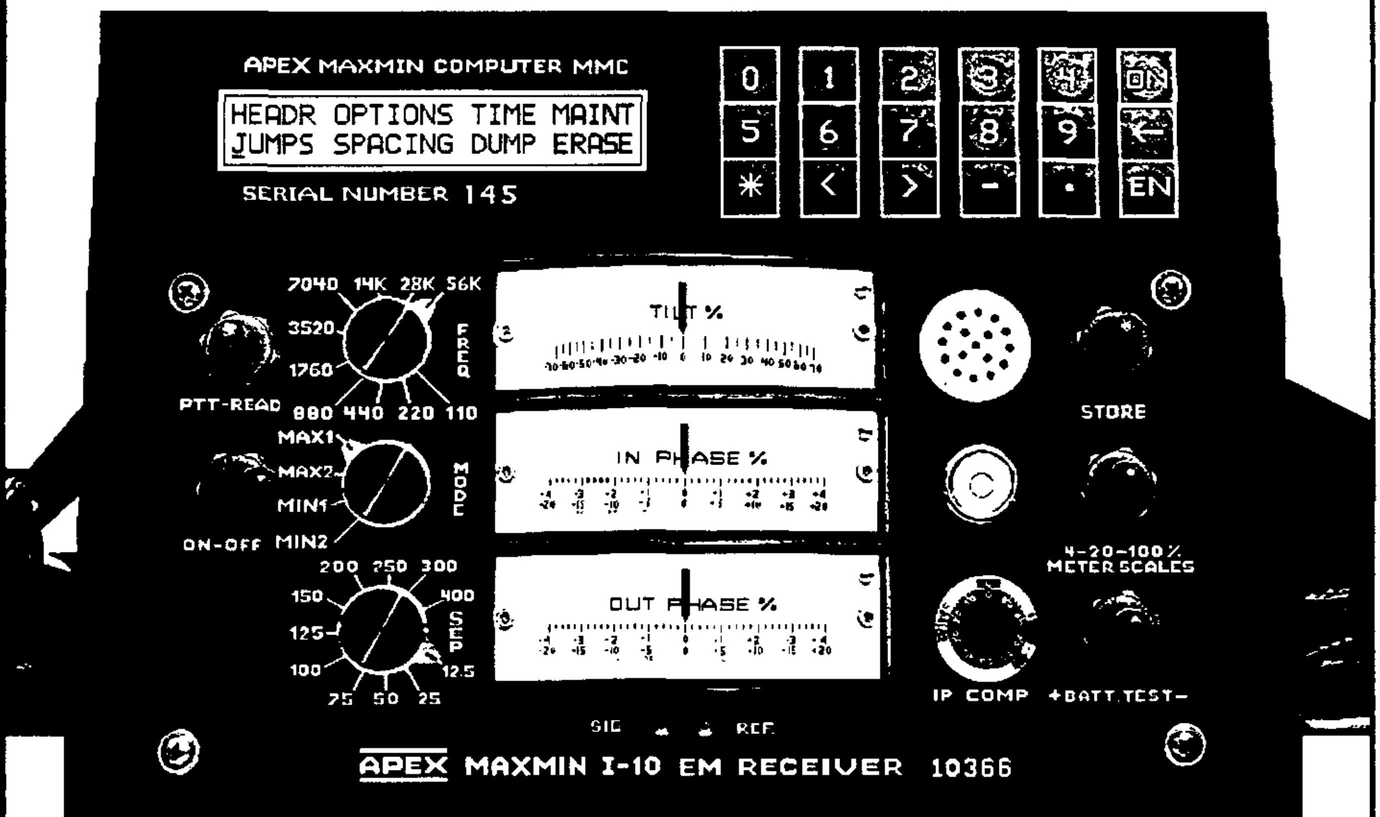
❐ Digital display and logging of in-phase (real) and quadrature (imaginary) readings with standard deviations, the corresponding apparent ground conductivity values, line, station, terrain slope and coil tilt information.

❐ Easy fingertip operation by read and store switches on MaxMin receiver front panel, with digital averaging for improved signal to noise ratio.

❐ Rough terrain surveys are simplified with the use of built-in tilt meter, slope entry and computed coil orientation and separation information.

❐ Data transfer, formatting, correcting and viewing programs are supplied for personal computers. Program for computing multi-frequency best-fit apparent conductivities and fit errors is provided.

❐ MaxMin Pro data interpretation and presentation software program is available for multi-layer parametric or geometric soundings and for discrete conductor surveys done with MaxMin EM and MMC.



MMC INSTALLED WITH MAXMIN I-10 RECEIVER IN THE LEATHER CARRYING CASE

MAXMIN COMPUTER MMC SPECIFICATIONS:

OPERATING SYSTEM:	Menu driven user-friendly hierarchial operating system, interfacing with MaxMin EM System receiver and with personal computers.
DISPLAY:	Extended temperature Liquid Crystal Display, with two lines of 24 alphanumeric characters each.
KEYBOARD:	18 tactile pushbutton keys
BEEPER:	To provide audible operator guidance and to speed up operations, especially in very cold weather.
CLOCK CALENDAR:	Date and Time (year, month, day, hour and minute).
COIL TILT:	Tilt display, with built in tilt sensor and measurement, with 0±99% topographic grade range and with 1% resolution.
IN-PHASE & QUADRATURE:	0±199.9% autoranging programmable gain system with 0.1% resolution for displayed data and 0.01% resolution for stored data.
APPARENT CONDUCTIVITY:	0.1 to 3276 milliSiemens (millimho) per metre available conductivity range, with conductivity arrived at using the quadrature, in-phase, frequency and coil separation data.
PROCESSOR:	16 bit low power CMOS CPU and bus at 6 MHz clock rate.
MEMORY:	ROM: 16 Kb, expandable to 64 Kb. RAM: 256 Kb, static CMOS.
PHYSICAL SIZE:	24.2 x 17.3 x 4.3 cm, to fit inside the MaxMin receiver leather case notebook pocket.
CARRYING WEIGHT:	1.0 Kilogram.
BATTERIES:	Two 9V-0.6Ah alkaline batteries. Battery life 28 hours continuous duty, less in cold weather. Optional 1.2 Ah lithium batteries recommended for very cold temperature operation. One lithium 3 Volt memory back-up battery, type 2032.
CONNECTIONS:	19 pin bayonet connector receptacle to connect to MaxMin receiver with the supplied tubular aluminum connectors. One each of DB25S and DB9S data transfer cords supplied for downloading data to personal computer serial ports.
TEMPERATURE RANGE:	Minus 30 to plus 60 degrees Celsius. Temperature sensing, measurement and display built-in.

Specifications are subject to changes without prior notification.

1998-04-01

Telephone: 1 905 852 5875 Facsimile: 1 905 852 9688

APEX PARAMETRICS LIMITED

P. O. Box 818, Uxbridge, Ontario, Canada L9P 1N2

Airport: Toronto International

APEX MAXMIN PRO DATA INTERPRETATION PROGRAM

LAYERED EARTH INTERPRETATION.

THIN PLATE INTERPRETATION.

ACCEPTS APEX .MMD FILES, COMPATIBLE WITH MAXMIN COMPUTER.

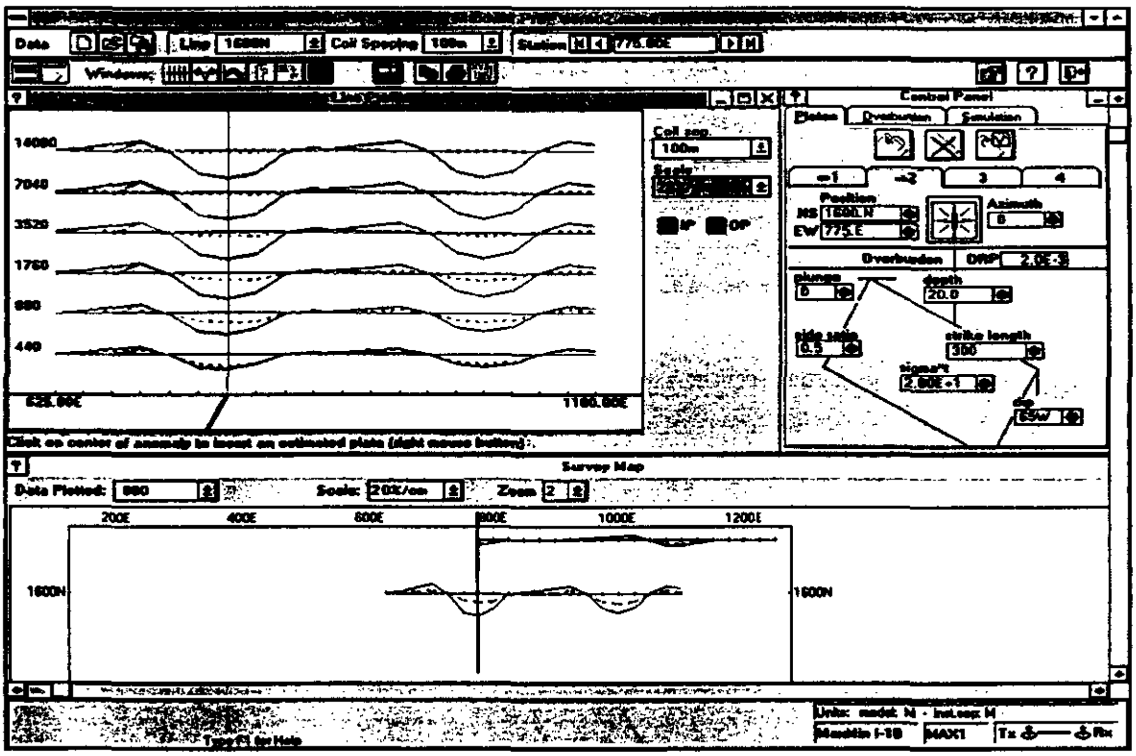
USER-FRIENDLY WINDOWS® BASED OPERATOR INTERFACE.

CLIPBOARD SUPPORT FOR DATA TRANSFER TO OTHER PROGRAMS.

ON-LINE DOCUMENTATION.

PLATE INTERPRETATION:

- Computing engine derived and improved from classical U of Toronto PLATE program.
- Up to 4 plates.
- Graphical insertion of plates.
- Plates positioned in survey grid coordinates.
- Automated curve matching for quick preliminary anomaly interpretation.
- Corrects for overburden conductivity.
- Up to 4 overburden zones.
- Graphical entry of overburden zones.



MAXMIN I+9 ELECTROMAGNETIC SYSTEM SPECIFICATIONS:

FREQUENCIES: 110, 220, 440, 880, 1760, 3520, 7040, 14080 and 28160 Hz.

COIL SEPARATIONS: SET No. 1: 12.5, 25, 50, 75, 100, 125, 150, 200, 250, 300 and 400 metres (the standard set).
SET No. 2: 10, 20, 40, 60, 80, 100, 120, 160, 200, 240 and 320 metres (selected with grid switch inside the receiver).
SET No. 3: 50, 100, 200, 300, 400, 500, 600, 800, 1000, 1200 and 1600 feet (selected with grid switch inside the receiver).

TRANSMITTER DIPOLE MOMENTS:

110 Hz:	250 Atm²	3520 Hz:	120 Atm²
220 Hz:	245 Atm²	7040 Hz:	60 Atm²
440 Hz:	240 Atm²	14080 Hz:	30 Atm²
880 Hz:	230 Atm²	28160 Hz:	15 Atm²
1760 Hz:	220 Atm²		

MODES OF OPERATION: MAX 1: Horizontal loop or slingram - transmitter and receiver coil planes horizontal and coplanar.
MAX 2: Vertical coplanar loop mode - transmitter and receiver coil planes vertical and coplanar.
MIN 1: Perpendicular mode 1 - transmitter coil plane horizontal and receiver coil plane vertical.
MIN 2: Perpendicular mode 2 - transmitter coil plane vertical and receiver coil plane horizontal.

PARAMETERS MEASURED: In-phase and quadrature componets of the secondary magnetic field, in % of primary field.

READOUTS: Analog direct edgewise meter readouts for in-phase, quadrature and tilt. Additional digital LCD readouts provided in the optional MMC computer. Interfacing and controls are provided for ready plug-in of the MMC.

RANGES OF READOUTS: Switch activated analog in-phase and quadrature scales: 0±4 %, 0±20 % and 0±100 %, and digital 0±199.9 % autorange with optional MMC. Analog tilt 0±75 % and 0±99 % grade with MMC.

RESOLUTION: Analog in-phase and quadrature 0.1 to 1 % of primary field, depending on scale used, digital 0.01 % with autoranging MMC; tilt 1 % grade.

REPEATABILITY: 0.01 to 1 % of primary field, typical, depending on frequency, coil separation and conditions.

SIGNAL FILTERING: Powerline comb filter, continuous spheric noise clipping, autoadjusting time constant, and more.

WARNING LIGHTS: Receiver signal and reference warning lights to indicate potential error conditions.

SURVEY DEPTH PENETRATION: From surface down to 1.5 times coil separation for large horizontal target and 0.75 times coil separation for large vertical target, values typical.

REFERENCE CABLE: Lightweight unshielded 4/2 conductor teflon cable for maximum operating temperature range and for minimum pulling friction.

INTERCOM: Voice communication link provided for operators via the reference cable.

TEMP. RANGE: Minus 40 to plus 60 degrees Celsius, operating.

RECEIVER BATTERIES: Four standard 9 V - 0.6 Ah alkaline batteries. Life 20 hours continuous duty, less in cold weather. Optional 1.2 Ah extended life lithium batteries available (recommended for very cold weather).

TRANSMITTER BATTERIES: Rechargeable gel-type lead-acid 12 V - 14 Ah batteries (4 x 6 V - 7.2 Ah) in nylon belt pack.

TRANSMITTER BATTERY CHARGERS: 14.8 V - 2.5 A nominal output with automatic switching to 13.8 V float mode after battery pack is charged. Operation from 110 - 120 and 220 - 240 VAC, 50/60/400 Hz, and from 10 - 14 VDC supplies.

RECEIVER WEIGHT: 8 Kg carrying weight (including the two ferrite cored receiver coils), 9 Kg with MMC computer.

TRANSMITTER WT: 15 Kg carrying weight.

SHIPPING WEIGHT: 60 Kg plus reference cables at 3 Kg per 100 metre, plus optional items if any. Shipped in two aluminum lined field/shipping cases.

STANDARD SPARES: Spare transmitter battery pack, spare transmitter battery charger, two spare transmitter retractile connecting cords, spare set of receiver batteries.

OPTIONS AND ACCESSORIES, PLEASE SPECIFY:

- MMC, Optional MaxMin Computer
- Data interpretation and presentation programs
- Reference cables, lengths as required
- Reference cable extension adapter
- Handheld inclinometer for rough terrain
- Receiver extended life lithium batteries
- Transmitter ni-cad battery and charger option
- Receiver rechargeable battery & charger option
- Minimal, regular or extended spare parts kit

Specifications are subject to changes without prior notification.

1996 - 04 - 01

Telephone: 1 905 852 5875 Facsimile: 1 905 852 9688
APEX PARAMETRICS LIMITED
P. O. Box 818, Uxbridge, Ontario, Canada L9P 1N2
Airport: Toronto International

SURVEY PROCEDURE

Atna personnel ensured that a grid was established prior to the arrival of the Delta Geoscience crew. Survey lines and stations were established by slope chaining out from tie lines on the east and west sides of the properties. This procedure, while quite rapid, results in some significant mis-ties between lines, particularly when the topography is undulating and locally quite severe. The data was corrected by a software procedure developed by Apex Parametrics for slope chained lines.

The depth of investigation of a horizontal coplanar loop E.M. system (like the Maxmin) is considered to be 1.5 times the coil separation for a large horizontal target and 0.75 times the coil separation for a large vertical target. These figures are for the typical conductivity values seen in Canadian massive sulphide deposits. The depth of investigation for smaller targets and/or poorer conductivity mineralization would of course be proportionally less.

Bear in mind that the response parameter of a horizontal co-planar loop E.M. system is due to the product of the following components: $(\mu_0 \omega l \sigma s)$

where μ_0 = permeability of free space = $4\pi \times 10^{-7}$ henry/m.

ω = $2\pi f$ = rotational frequency.

l = coil separation (meters)

σ = conductivity (Seimens/meter)

s = thickness of conductor (meters)

Note that increases in the coil separation have the same effect as increasing the frequency on the response parameter. With large coil separations the system became more sensitive to deep conductors, although the individual resolution ability for shallow, closely spaced conductors is lessened.

If the response parameter becomes too high, the system becomes unstable (overly sensitive) with large amplitude changes for very minor changes in conductivity. This high frequency problem will occur with large coil separations and weakly conductive host rocks, i.e. argillaceous metasediments. Clearly the conductive host problem limits the ability of any E.M. system to properly evaluate the response of a deep weak conductor. One is obliged to base the interpretation on the lower frequency data. As expected, there was a steady attenuation of the E.M. responses with lower frequencies throughout this survey.

The depth extent of conductors discussed in this report is listed as poor, moderate or good and is relative to the coil separation. Dip resolution is also relative to the coil separation.

The quadrature response of the E.M. system is largely unaffected by coil separation and orientation errors due to bad grid chaining and does respond to the poorer quality conductors better than the inphase. These two facts have proven useful in the evaluation and outlining of the moderate to weak strength conductivity targets detected in this survey. The inphase response will focus on the better conductivity zones within a conductive zone. Good inphase data does however require good quality grid chaining. In mountainous terrain some grid chaining problems are unavoidable. To further eliminate the noise due to chaining errors, the lowest frequency inphase data (220Hz) can be subtracted from the higher frequency in-phase data. This procedure should only be used when the conductors of interest are weak to moderate conductivity, i.e. virtually a zero response on the inphase at 220Hz. This procedure is technically correct since coil separation errors generally have the same amplitude regardless of the frequency. The subtraction process can therefore largely eliminate chaining errors from the more important higher frequency inphase data, without adversely affecting the anomalous bedrock conductor responses. This procedure was not used, nor necessary on the Tree/Fire #2 data due to the slope correction procedures used by the Maxmin and significant inphase amplitudes at the lowest frequency.

The conductor technical parameters listed herein and the areal extent of the conductors shown on the accompanying map are largely based on the 440Hz data. Note however that the estimation of the apparent width, depth and conductivity of the individual conductors is very frequency dependent. The 440Hz frequency does limit somewhat the host response, while still maintaining a significant amplitude response from the conductors of interest.

DISCUSSION OF THE DATA

The surface trace of the conductor is outlined on the 440Hz data plan. An interesting series of generally northeast striking conductors were outlined by this survey. Line to line, continuity between conductors appears poor, possibly due to cross faults and some errors in the tie lines. It's also possible we are trying to correlate structural (fault conductors) with stratiform conductors, i.e. a grid west dipping fault zone interfering at times with restricted strike length stratiform conductors dipping grid east. This possibility is most evident at 7700N, 5300E and again at 6900N, 5250E.

The relatively short lines are also a hindrance when trying to establish the dip. This is particularly true for large coil separation horizontal co-planar loop surveying.

The four main conductive horizons are described below. Note however that the higher frequency data indicates there is a significant sedimentary component to the underlying geology, i.e. broad zones of very weak conductivity.

CONDUCTOR #1:

- centered at 7700N, 5300E. Apparent short strike length 200m?
- the apparent improvement in the conductivity thickness factor that occurs with depth is of interest, i.e. 3 to 32 Seimens (see 220Hz data).
- depth to the top of this conductor is 25 meters, however the conductivity improvement appears to be at a depth of 100 meters.
- dip appears to be moderately steep (60 deg) to grid east.

CONDUCTOR #2:

- centered at 7300N, 5175E.
- requires longer survey line.

- depth to top 10 meters.
- conductivity thickness product 8 Seimens.
- dip appears to be steep to grid west (60 deg).
- strike length at least 400 meters.

CONDUCTOR #3:

- centered at 6900N, 5250E.
- short strike length 200 meters?
- conductivity thickness product 8 Seimens.
- depth to top 30 meters.
- dip uncertain, but appears to be moderately steep to grid east (50 deg).

CONDUCTOR #4:

- a significant conductor only partially outlined by the survey, located at the west end (4875E) of line 6700N.
- conductivity thickness product 11 Seimens.
- depth to top 10 meters.
- dip and width uncertain.

CONCLUSIONS AND RECOMMENDATIONS

Significant bedrock conductors have been outlined by this survey. Close correlation of these conductors with the geology, geochemistry and structural data will establish the better drill targets.

Conductor #1 in particular requires careful study, since there are indications of good conductivity at depth. The apparent short strike length, while negative, may only be a conductor orientation problem.

Grant A. Hendrickson, P.Geo.

PROFESSIONAL
PROVINCE
OF
G. A. HENDRICKSON
BRITISH
COLUMBIA
GEOSCIENTIST

REFERENCES

Apex Parametrics, 1998: Technical Manuals on the Maxmin System.

Ketola, M., and Puranan, M., 1967: Type Curves for the Interpretation of Horizontal Loop E.M. Anomalies over tabular bodies. Geological Survey of Finland, Report on Investigations, N:01.

STATEMENT OF QUALIFICATIONS

Grant A. Hendrickson

- B.Science, University of British Columbia, Canada, 1971. Geophysics option.
- For the past 27 years, I have been actively involved in mineral exploration projects throughout Canada, the United States, Europe, Central and South America and Asia.
- Registered as a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of the Province of British Columbia, Canada.
- Registered as a Professional Geophysicist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, Canada.
- Active member of the Society of Exploration Geophysicists, European Association of Geoscientists and Engineers, and the British Columbia Geophysical Society.

Dated at Delta, British Columbia, Canada, this 16 day of DEC, 1998.

Grant A. Hendrickson, P.Geo.

PROVINCE OF G. A. HENDRICKSON BRITISH COLUMBIA GEOSCIENTIST

APPENDIX II

STATEMENT OF COSTS

Statement of Costs

Event Dates

Survey by Aerodat:	November 11, 1997
Report By High Sense:	February 27, 1998
Assessment Report:	May 21, 1998

Survey by Delta Geophysics Ltd. July 18-24, 1998

Costs

Geophysical Survey

Aerodat-High Sense Airborne Geophysical Survey	$15,000.00	
½ cost incurred on the Tree Claims		$ 7,500.00
Delta Geophysics Ltd Ground Max-Min Survey		
2 survey days @ $1325/day	$2650.00	
Mob/Demob: 2/21 of $7737.00	$ 737.00	
Gridding: 6 man-days @ $185.00	$1110.00	
Helicopter:	$1812.00	
	$6039.00	$ 6039.00

Camp Costs

Averaged cost per man-day @ $200.00 for 12 man-days	$ 2400.00

Report Preparation

Geophysical reporting	$ 613.00	
Assessment report additions	$ 400.00	
	$ 1013.00	$ 1013.00

Total Expenditures	$17,222.00

APPENDIX III

GEOLOGIST'S CERTIFICATES

GEOLOGIST'S CERTIFICATE

I, Robert G. Wilson, of 3328 West 15th Ave. Vancouver, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am employed by Atna Resources Ltd. of 1550 - 409 Granville St., Vancouver B.C.

2. THAT I am a graduate of the University of British Columbia with a Bachelor of Science degree in Geology.

3. THAT I am a Professional Geoscientist registered in good standing with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

4. THAT this report is based in part on property work I directly supervised between June 1 and September 3, 1998.

DATED at Vancouver, British Columbia, this 1 st day of March, 1998.

[signature]

Robert G. Wilson, P.Geo.

GEOLOGIST'S CERTIFICATE

I, Peter Daubeny, of 2002-1188 Howe Street, Vancouver, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am employed by Atna Resources Ltd. of 1550 - 409 Granville St., Vancouver B.C.

2. THAT I am a graduate of the University of British Columbia with a Bachelor of Science degree in Geology.

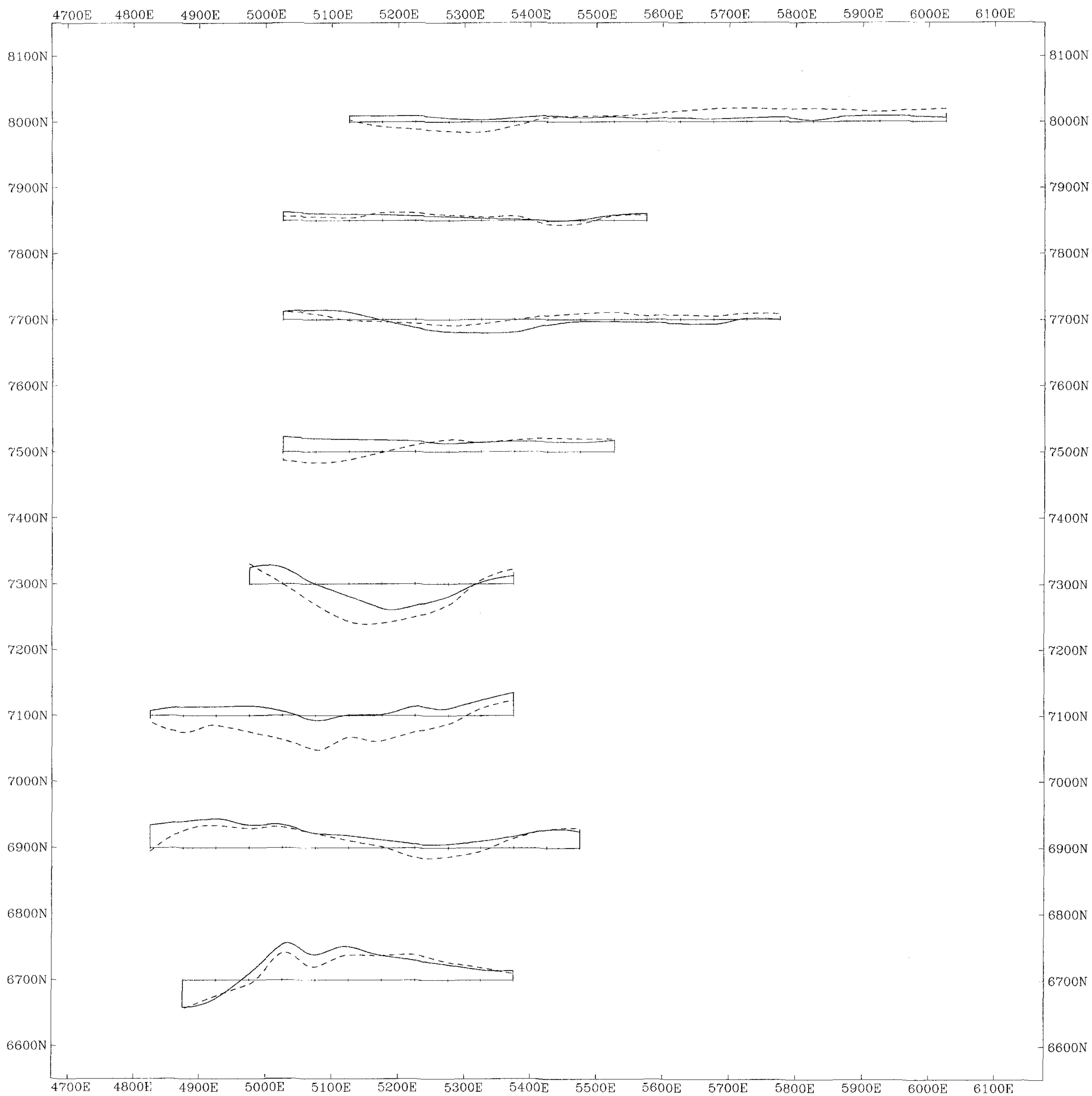
3. THAT this report is based in part on property work I personally completed and/or directly supervised between and 1998.

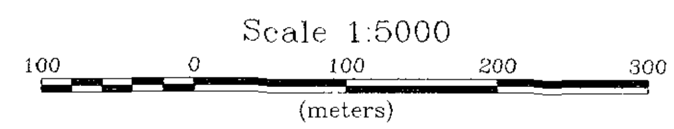
DATED at Vancouver, British Columbia, this 15th st day of January, 1998.

Peter H. Daubeny.


634000 mE
635000 mE
636000 mE
637000 mE
6838000 mN
6837000 mN
6836000 mN
ATNA RESOURCES LTD.
TREE PROPERTY
GEOPHYSICAL SURVEY
GRID #2 LOCATION
Date: 4/3/1999
Author: rgw
Office: VAN, BC
Drawing: 1.3
Scale: 1:10000
Projection: UTM Zone 8 (NAD 83)
0
125
250
500
metres

DWG ①





093938

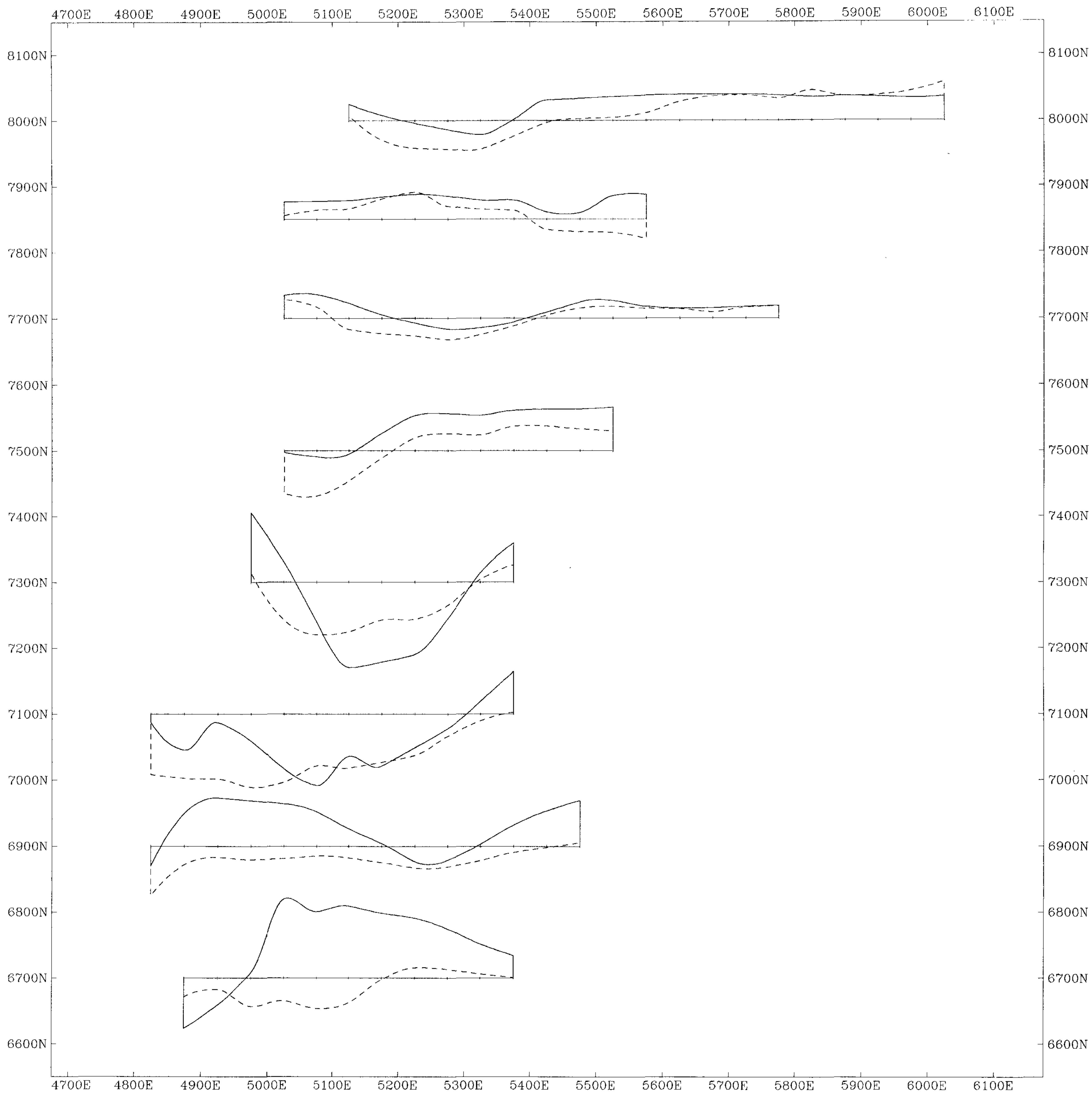
DWG ②

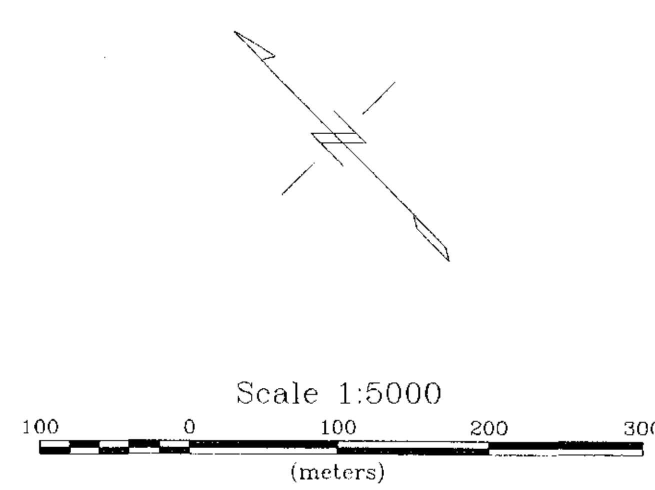
ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 220 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig # 2*





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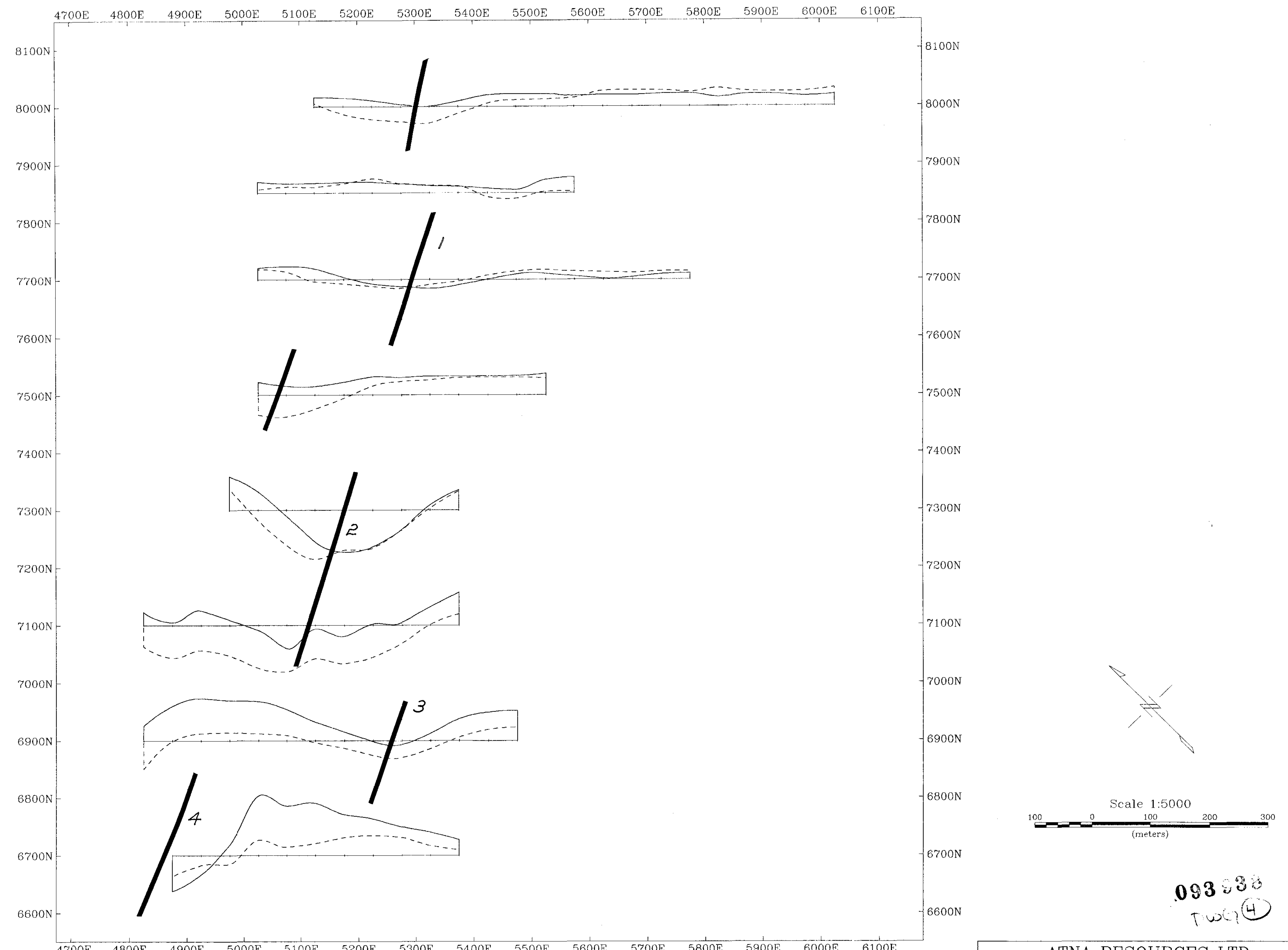
ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 880 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig #* 4

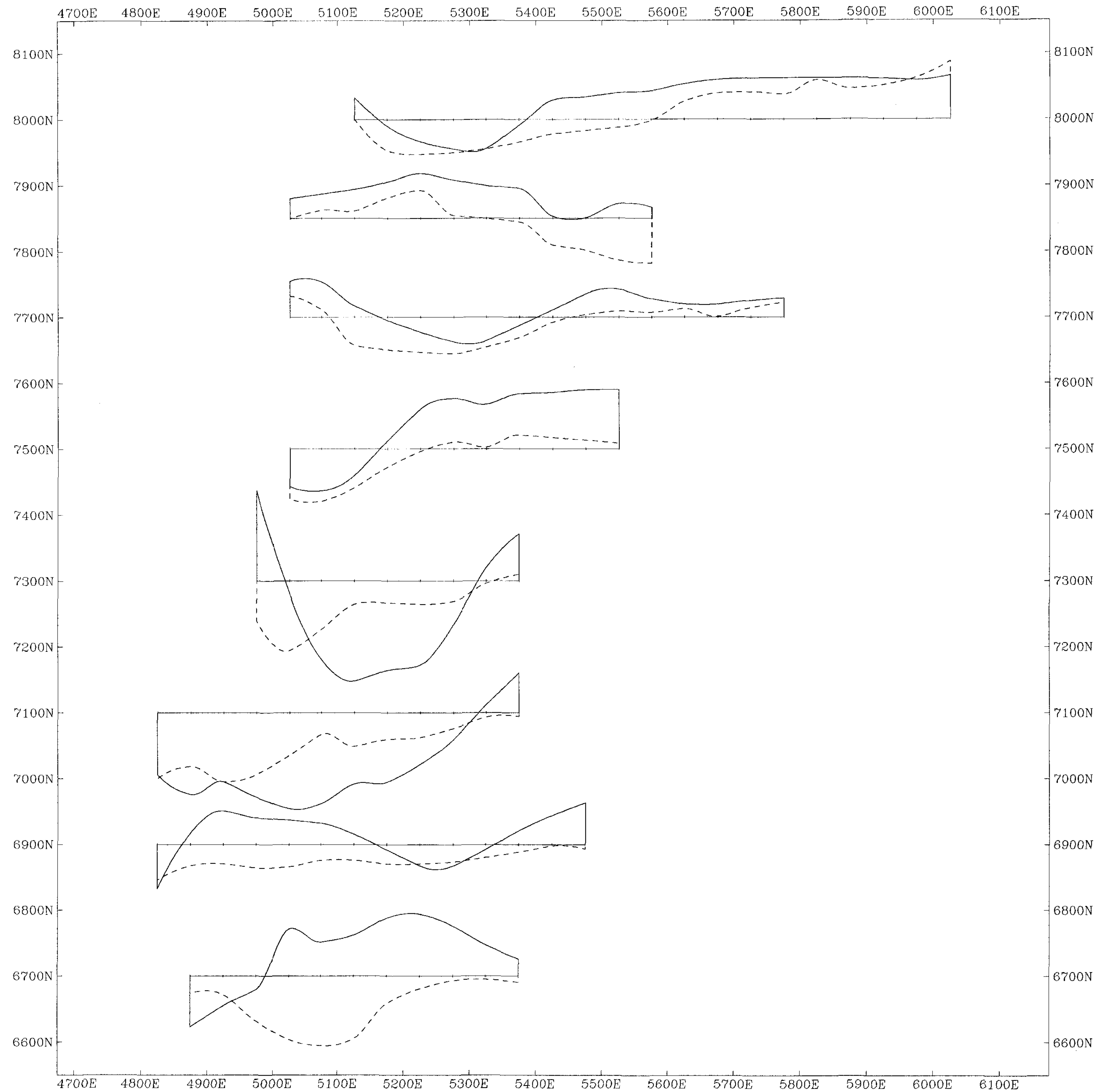


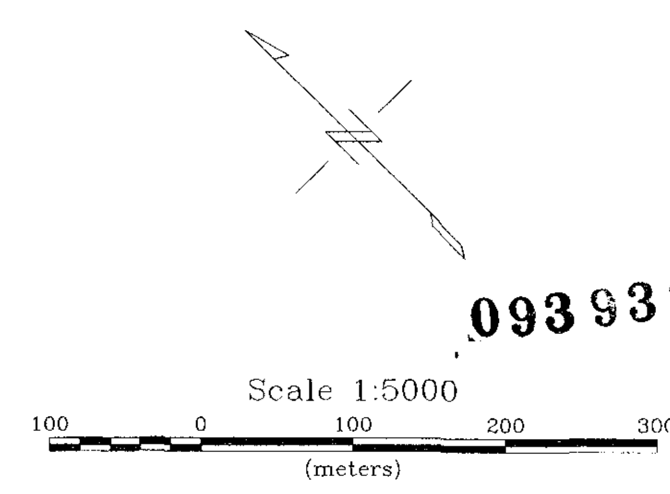
ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 440 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig #* 3





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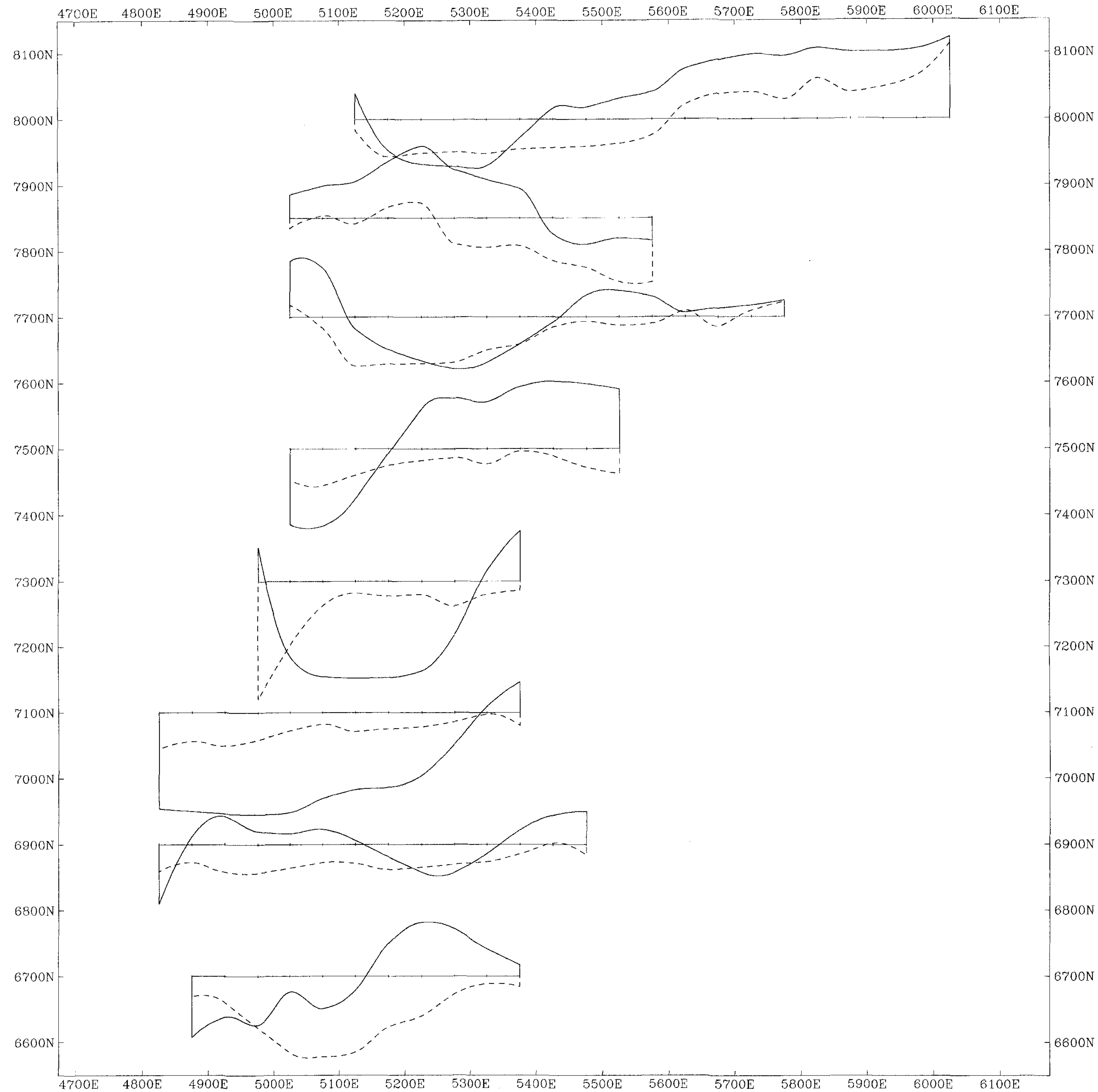
Dwg (5)

ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 1760 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig #*5



093 938

Scale 1:5000

100 0 100 200 300

(meters)

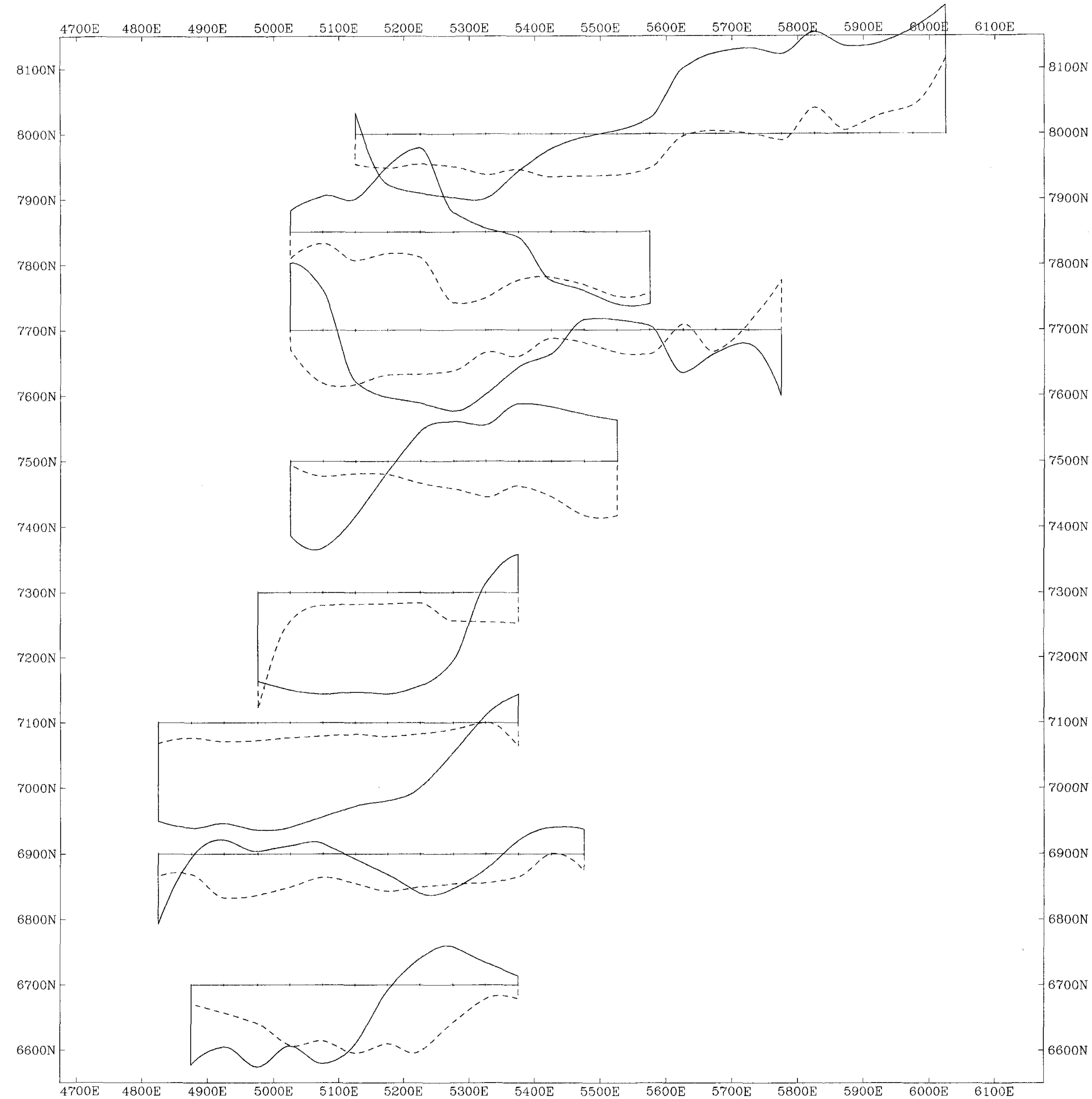
DWG 6

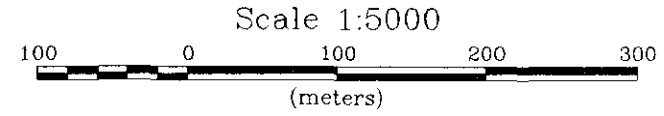
ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 3520 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig #* 6





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DWG (7)

ATNA RESOURCES LTD.

TREE/FIRE GRID #2 PROJECT
YUKON TERRITORY, CANADA
HORIZONTAL COPLANAR LOOP EM, FREQ. 7040 Hz

In-phase solid, Quadrature dashed, 1cm=30%
Coil separation 250m + to top
Apex Parametrics Maxmin instrument 98 1-9
July, 1998

DELTA GEOSCIENCE LTD, *Fig #* 7