

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 82-F/1

GEOPHYSICAL REPORT
ON
UTEM SURVEY ON THE
HAWK 1 TO 3 CLAIMS
FORT STEELE MINING DIVISION, B.C.
- ASSESSMENT REPORT -

Latitude: 49°04'N
Longitude: 116°04'W

Work Performed by: Syd J. Visser & Mike H. Rogers
between Sept. 22 - 29, 1983

Claim Owner & Operator: COMINCO LTD.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

12,193

APRIL 1984

Syd J. VISSER

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COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

GEOPHYSICAL REPORT
ON
UTEM SURVEY ON THE
HAWK 1 TO 3 CLAIMS

LIST OF CLAIMS

Cominco Interest - 100%

The claims listed below are covered or partly covered by the UTEM grid.

<u>Name</u>	<u>Number</u>	<u>Record No.</u>	<u>Date Work Due</u>
Hawk 1	20	1044	August 5, 1985
Hawk 2	20	1789	June 7, 1985
Hawk 3	6	1790	June 7, 1987

INTRODUCTION

The Hawk claims are located one kilometre south of Yahk, B.C. (see Plate 261-84-1). Access is via a logging road, along Hawkins Creek, which passes through the survey area.

The claims are underlain by the clastic sediments of the Aldridge Formation of Proterozoic age. The sediments of the Aldridge formation are known to host the Sullivan orebody near Kimberley, B.C.

This report describes a UTEM electromagnetic survey which had the objective of localizing anomalies which may be caused by economic mineralization.

DESCRIPTION OF THE UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer". The system was developed by Dr. Y. Lamontagne (1975) while he was a graduate student at that University.

The field procedure consists of laying out a large loop of single-strand insulated wire and energizing it with a transmitter powered by a motor generator. The loop is generally square shaped, wherever possible, with sides between 500 metres and 1,500 metres long. In this survey, the loop dimensions varied due to topography and accessibility (see Plate 261-84-2). Survey lines were located outside the loop and are generally oriented perpendicular to the longest side of the loop. The field procedure is very similar to Turam, a better known electromagnetic surveying method.

The transmitter loop is energized with a triangular current at a carefully controlled frequency (30.974 Hz for this survey). The receiver consists of one sensor coil, associated electronics, and a facility for digital recording on a cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units.

The receiver sensor coil measures the vertical or horizontal component of the magnetic field and it responds to the time derivative of the magnetic field. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square form in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin.

The UTEM receiver gathers and records eight channels of data at each station. The later number channels (7-8-9) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulphides or graphite will produce a response on all nine channels.

It was mentioned above that the UTEM receiver records data digitally on a cassette. This tape is played back into a mini computer at the base camp. The mini computer processes the data and controls the plotting on a small (11" x 15") graphics plotter. Data are portrayed as profiles of each of the eight channels, shown for each survey line of each transmitter loop. These profiles, and an interpretive plan are appended to this report.

FIELD WORK

The UTEM survey described in this report, covers an area of about 2,500 x 2,500 metres.

A line spacing of 500 metres with station spacing of 50 metres was used for the majority of the grid.

A total of 14.5 kilometres of lines were surveyed. The vertical component (Hz) was acquired and plotted at each station.

All surveying was done in the period from Sept. 22 - 29, 1983.

DATA PRESENTATION

The results of the survey are presented in the UTEM grid and compilation map, and the data sections.

The maps are listed as follows:-

Plate 261-84-1 (in envelope)	Claim and Grid Location Map Scale 1:50,000
Plate 261-84-2 (in envelope)	UTEM Grid and Compilation Map Scale 1:24,000

Legends for both the UTEM compilation map and the data sections are also attached.

The data sections are arranged in order of loop number (Loops 600, 601).

In order to reduce the field data, the theoretical primary field of the loop must be computed at each station. The normalization of the data is as follows:-

a) For channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P}{P} \times 100\%$$

where P is the primary field from the loop at the station and Ch.1 is the observed amplitude of Channel 1

b) For the remaining channels (n = 2 to 9)

$$\% \text{ Ch.n anomaly} = \frac{(\text{Ch.n} - \text{Ch.1})}{\text{Ch.n}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n (2 to 8)

INTERPRETATION

All field results are displayed in the data sections on 9 diagrams, with the compilation of all relative points on Plate 261-84-2.

A few weak type anomalies (down to Ch.5 or Ch.4) were observed in the data, and are interpreted as being due to change in local geology or overburden thickness. These poorly conductive zones are outlined as Zone A and Zone B on Plate 261-84-2.

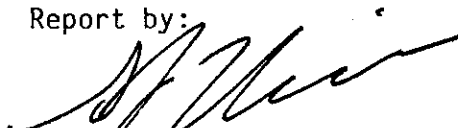
No strong anomalies indicating a mineralized conductive zone, were noted in the data.

CONCLUSIONS

The UTEM survey outlined two poorly conductive zones which are probably due to a change in geology or overburden thickness.


Considering that no strong anomalies indicating a mineralized zone were noted, no further UTEM work is recommended for this grid.

Report by:



Syd J. Visser
Geophysicist
Cominco Ltd.

Endorsed by:



John M. Hamilton
Chief Geologist, Cominco Ltd.
Kimberley

Approved for
Release:



G. Harden
Manager, Exploration
Western District
Cominco Ltd.

SJV/jel

DISTRIBUTION:

Mining Recorder	(2)
Kootenay Exploration	(2)
Western District Expl.	(1)
Geophysics Group	(1)

REFERENCE

- Lamontagne, Y., 1975 Application of Wideband, Time Domain EM
Measurements in Mineral Exploration: Doctoral
Thesis, University of Toronto

APPENDIX I

LEGEND

UTEM DATA SECTIONS

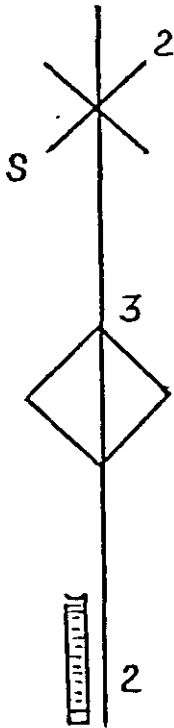
ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

SYMBOL	CHANNEL	MEAN DELAY TIME	
		15 Hz	30 Hz
	1	25.6 ms	12.8 ms
/	2	12.8	6.4
\	3	6.4	3.2
□	4	3.2	1.6
Σ	5	1.6	0.8
△	6	0.8	0.4
7	7	0.4	0.2
⊗	8	0.2	0.1
△	9	0.1	0.05
◇	10	0.05	0.025

LEGEND

UTEM COMPILATION MAPS

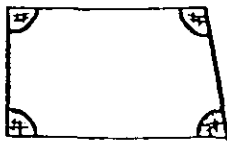


Axis of a crossover anomaly. The number indicates the latest anomalous channel.

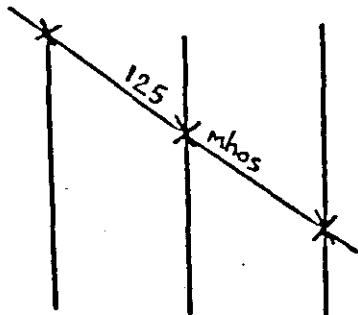
Depth indicated by: S - Shallow (< 50m)
M - Moderate (50-100m)
D - Deep (> 100m)

Axis of reversed crossover anomaly produced when a small conductor dips at less than 70° towards the transmitter. In normal crossover the positive response is towards the transmitter; reversed one, it is away from the transmitter.

Indicates a negative anomaly of width shown by the dash. The latest anomalous channel is shown. Can sometimes be confused with the negative part of a crossover anomaly.



Outline of a transmitter loop.



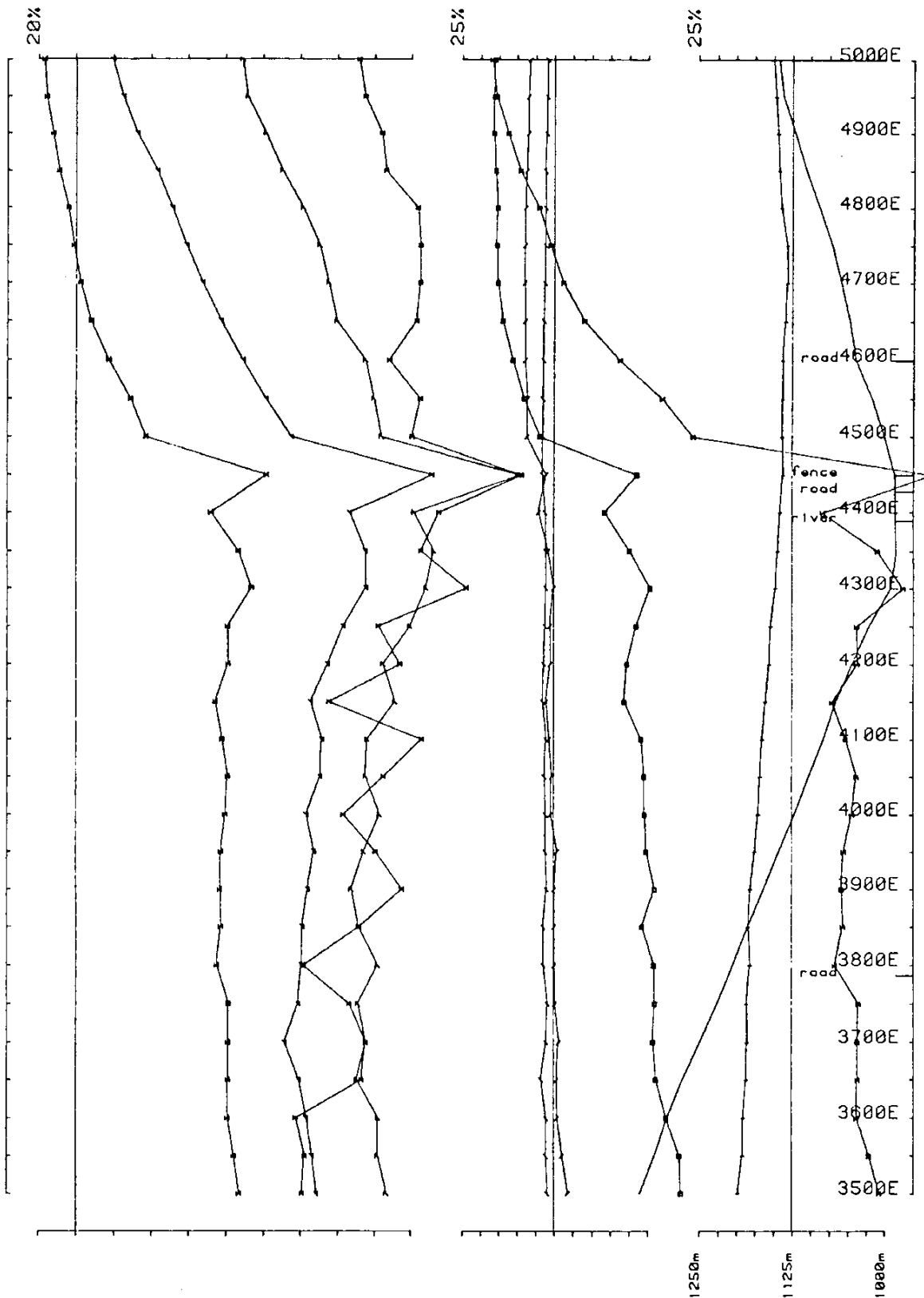
Conductor axis located by crossover anomalies with a conductance determination. The conductance is the interpreted conductivity x thickness of the conductor in mhos (same as Siemens).

Only the principal crossovers are indicated.

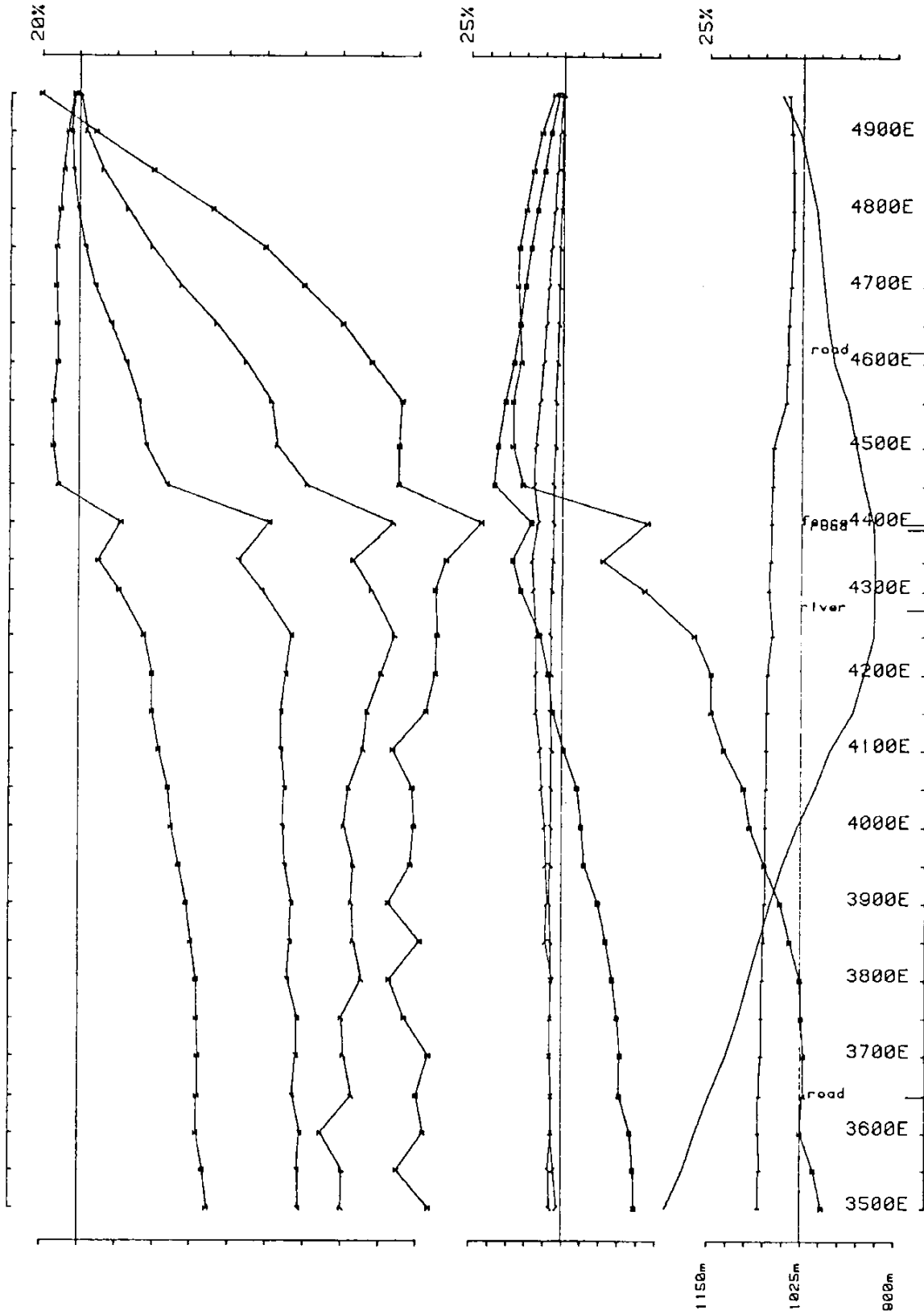
APPENDIX II

DATA SECTIONS

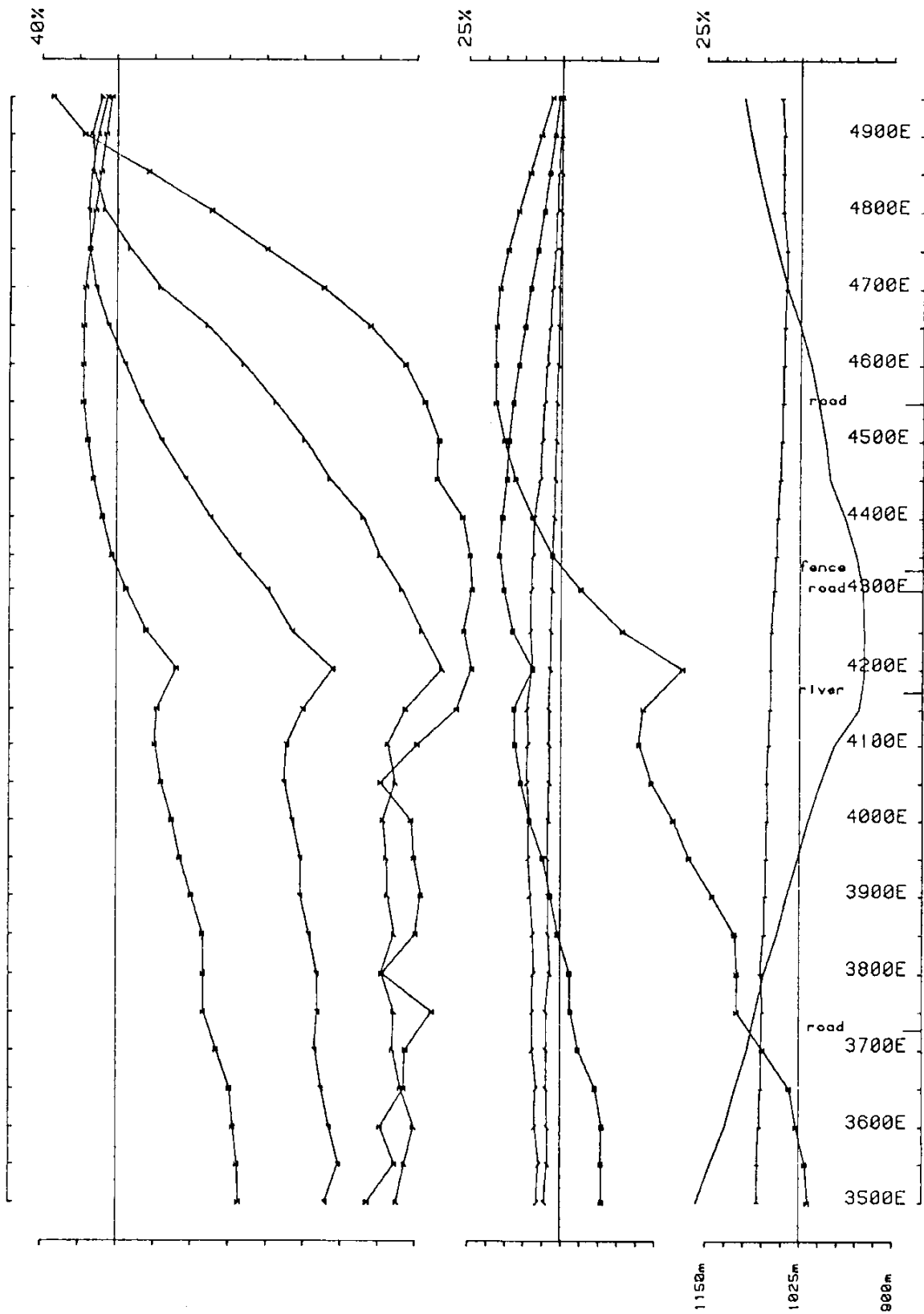
D.S. 1 to 9



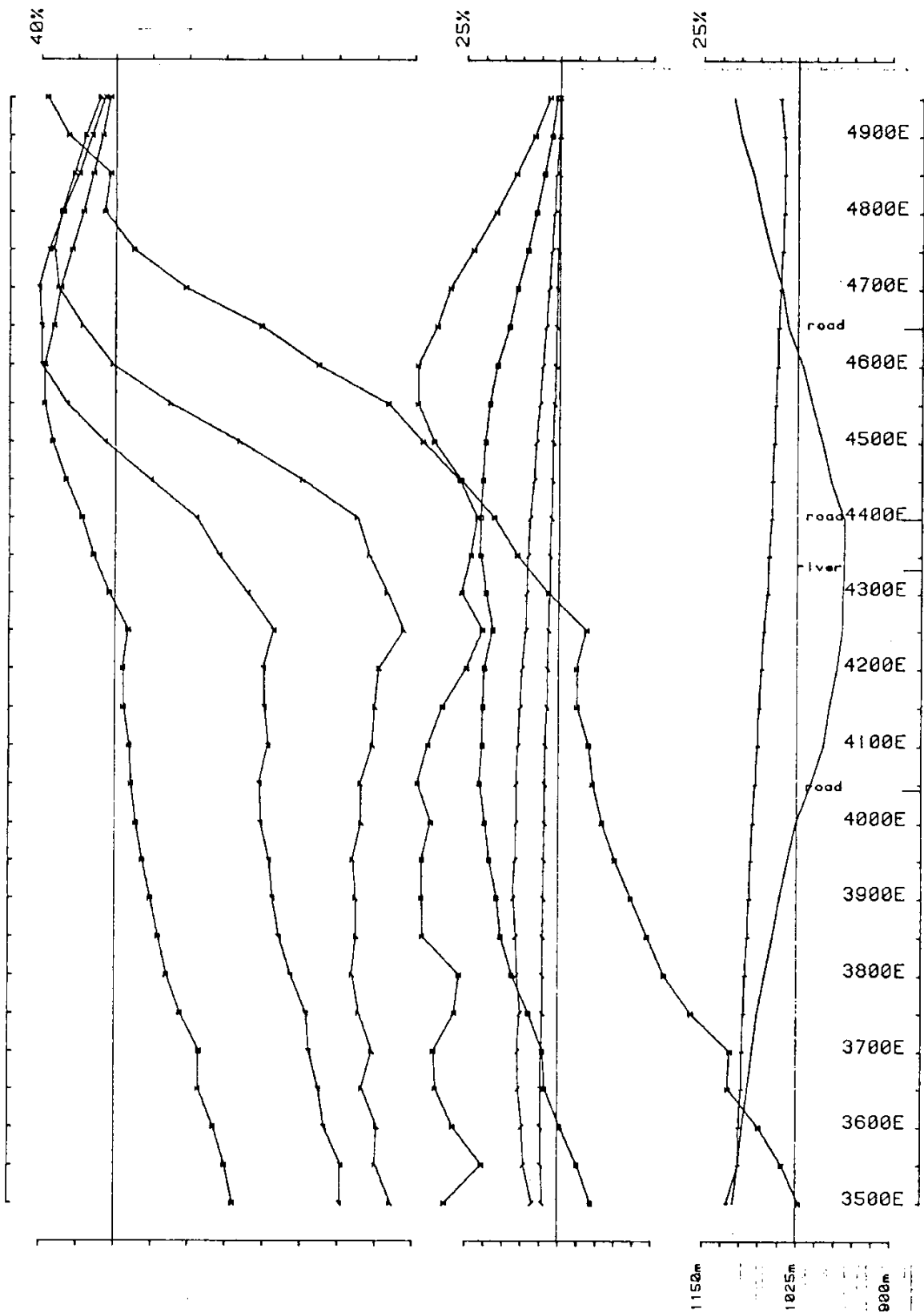
Area Hawk ComInco Ltd. operator Syd & Mike freq(chz) 30.974
 Loopno 600 Line 4500N component Hz secondary Ch 1 normalized Ch 1 reduced



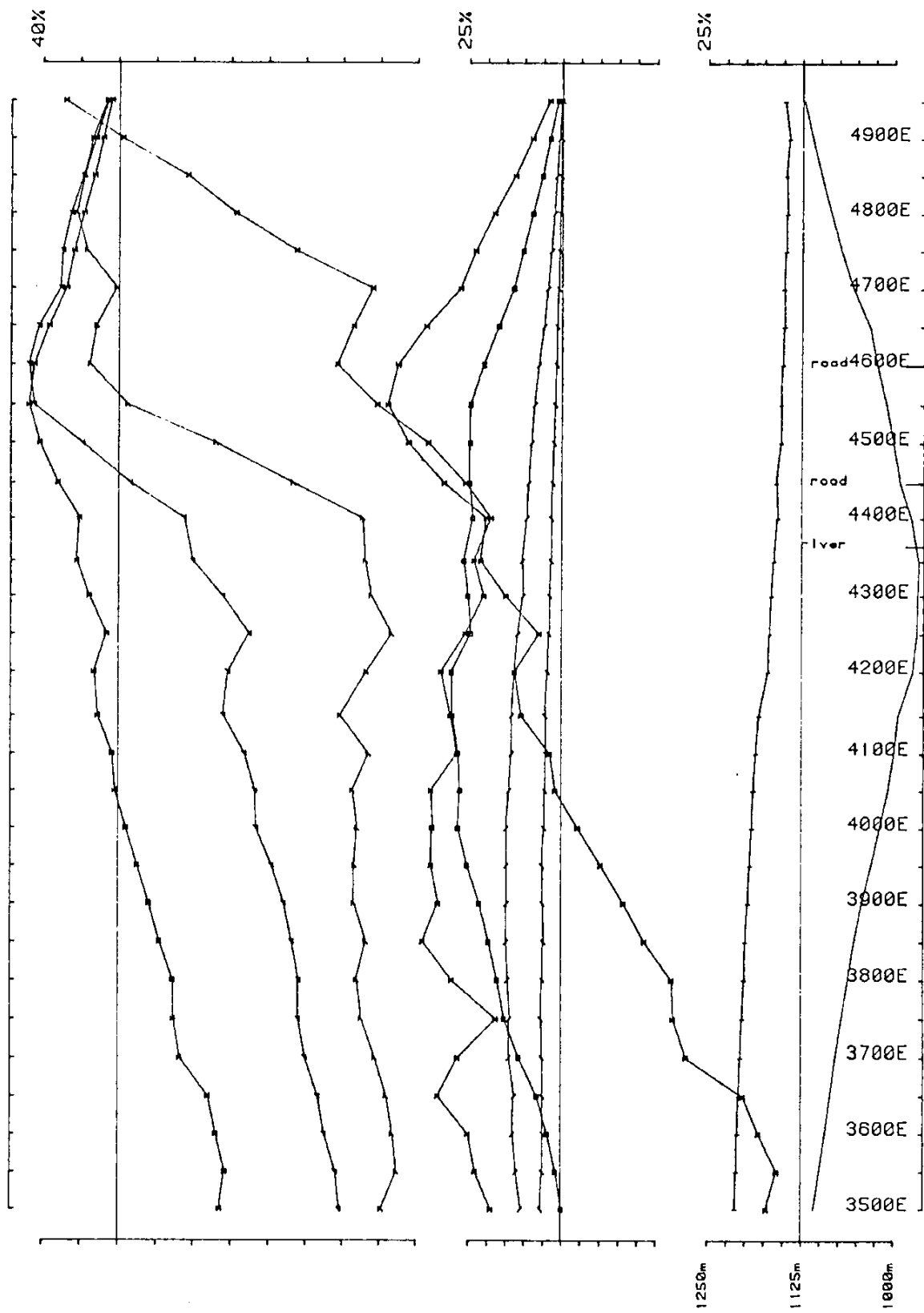
Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 600 Line 4000N component Hz secondary Ch 1 normalized Ch 1 reduced



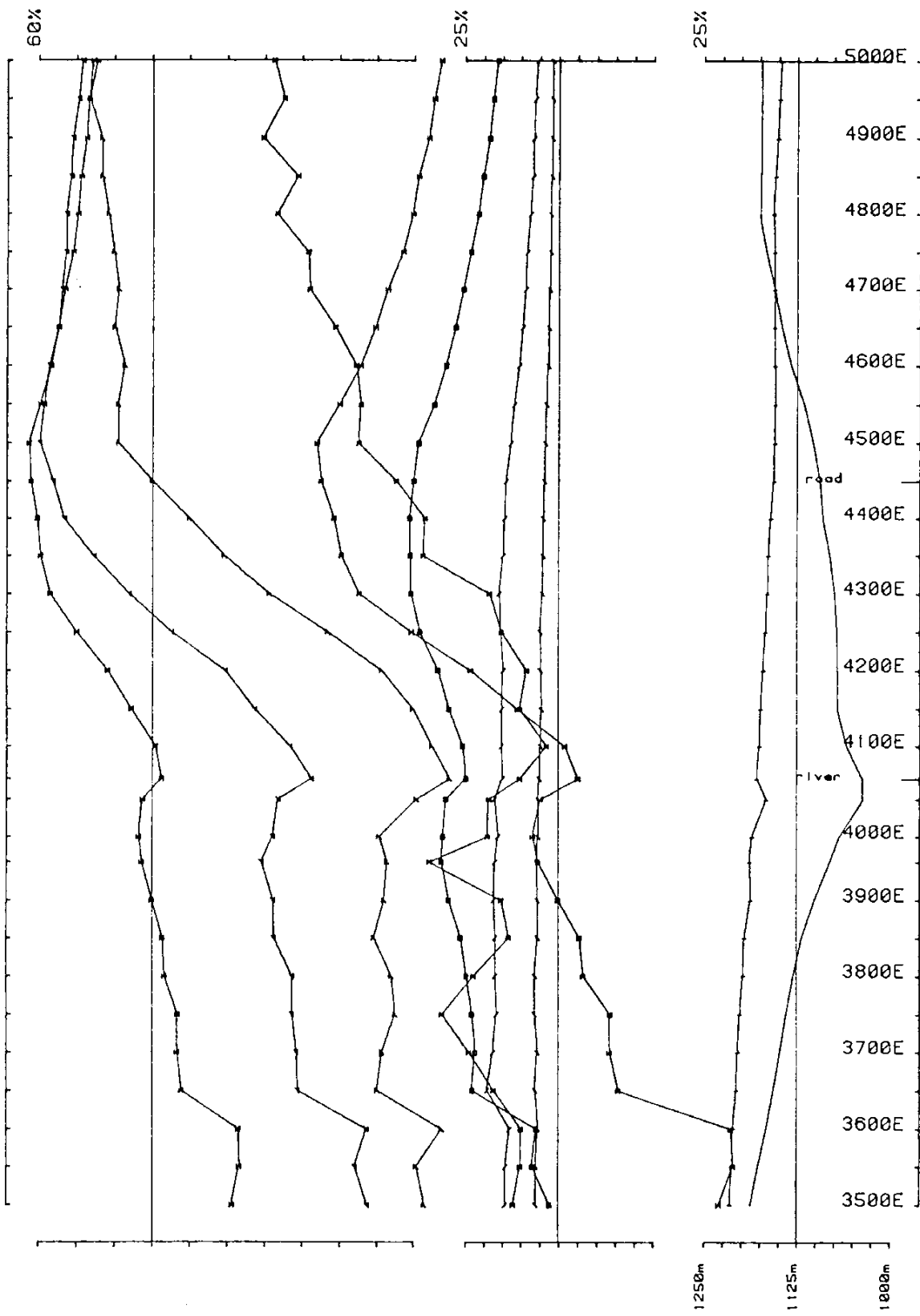
Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 600 Line 3500N component HZ secondary Ch | normalized Ch | reduced



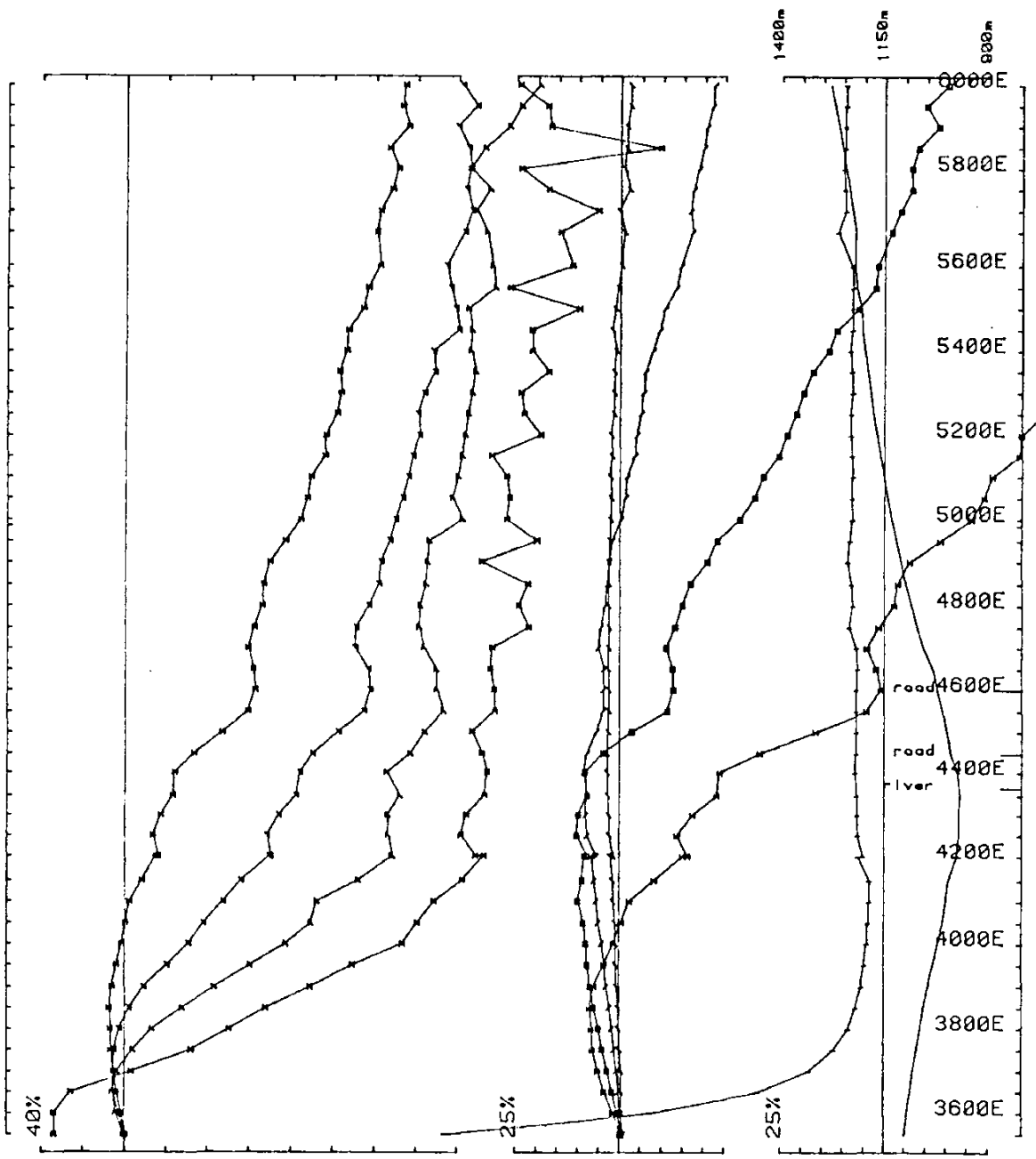
Area Hawk ComInco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 600 Line 3000N component Hz secondary Ch 1 normalized Ch 1 reduced



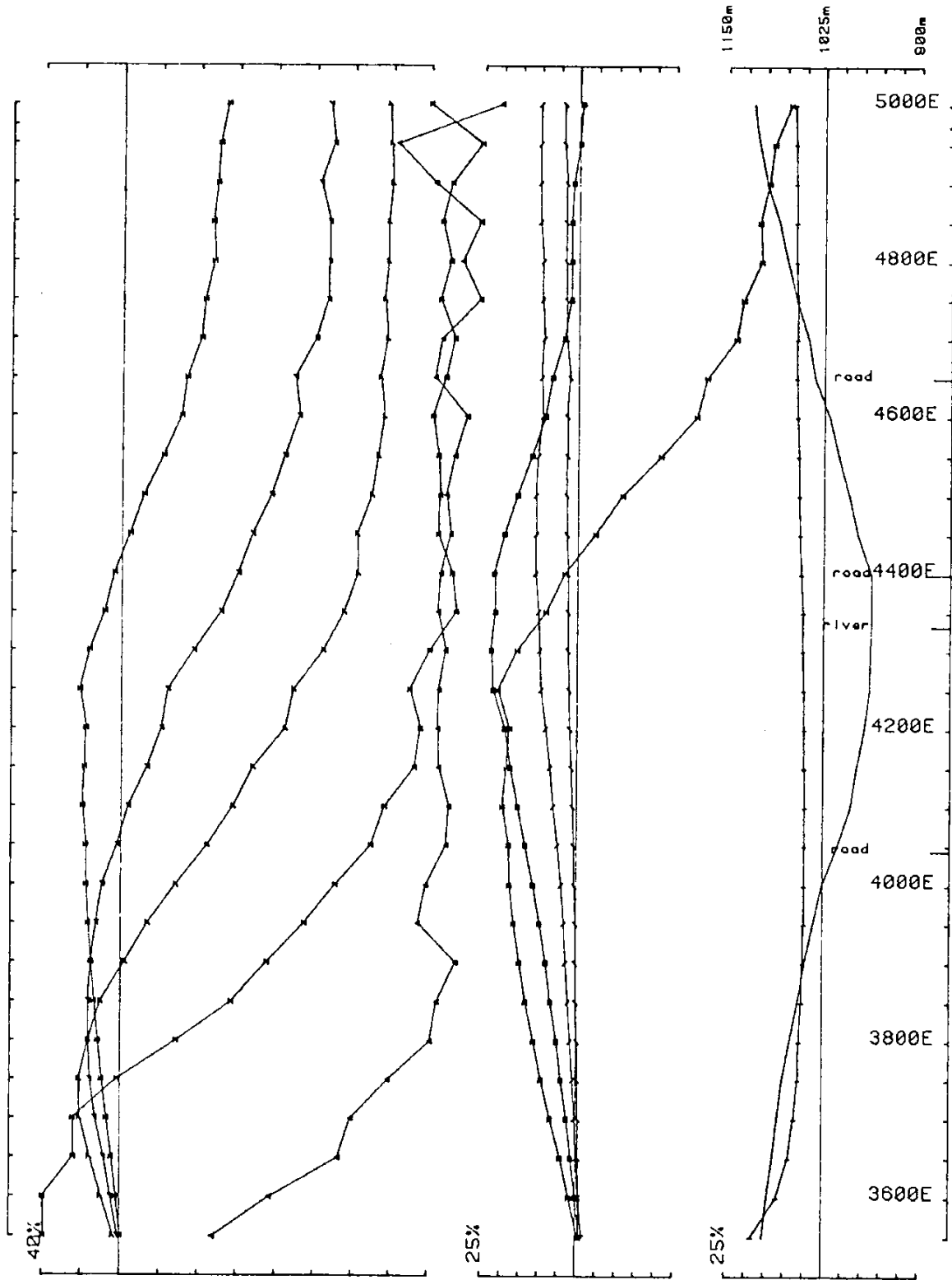
Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 600 Line 2500N component Hz secondary Ch 1 normalized Ch 1 reduced



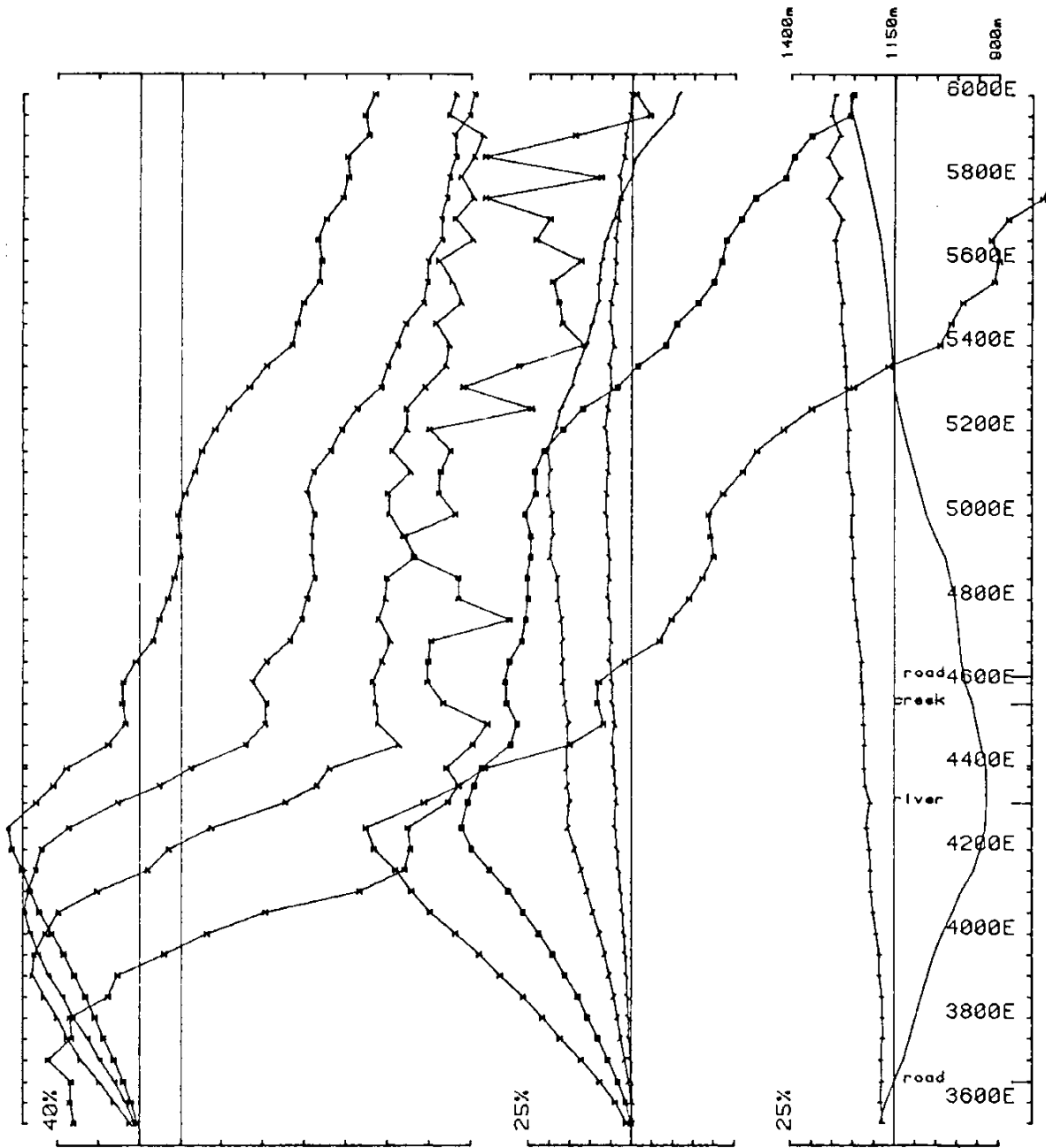
Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 600 Line 2000N component HZ secondary Ch I normalized Ch I reduced



Area Hawk ComInco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 601 Line 2500N component Hz secondary Ch I normalized Ch I reduced



Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974
 Loopno 601 Line 3000N component Hz secondary Ch 1 normalized Ch 1 reduced



Area Hawk Cominco Ltd. operator Syd & Mike freq(hz) 30.974

Loopno 601 Line 4000N component HZ secondary Ch 1 normalized Ch 1 reduced

APPENDIX III

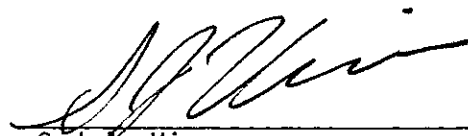
A P P E N D I X III

IN THE MATTER OF THE B.C. MINERAL ACT
AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME
CARRIED OUT ON THE HAWK CLAIMS
LOCATED 1 KM SOUTH OF YAHK, B.C.
IN THE FORT STEELE MINING DIVISION OF THE
PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY
N.T.S. 82-F/1

S T A T E M E N T

I, SYD J. VISSER, of the City of Surrey in the Province of British Columbia, make oath and say:-

1. THAT I am employed as a geophysicist by Cominco Ltd. and as such have a personal knowledge of the facts to which I hereinafter depose;
2. THAT annexed hereto and marked as "Exhibit A", to this statement is a true copy of expenditures incurred on geophysical survey on the HAWK mineral claims;
3. THAT the said expenditures were incurred between September 22 and 29, 1983, for the purpose of mineral exploration of the above-named claims.



Syd J. Visser
Geophysicist
Cominco Ltd.

EXHIBIT "A"

STATEMENT OF GEOPHYSICAL EXPENDITURES - 1983

HAWK CLAIMS

(1) SALARIES

Preparation, Field Work, Mob/Demob,
Interpretation \$ 2,992.50

Geophysicists - Syd J. Visser
M.H. Rogers

Assistants - E. Rickett
R. Gravette

(2) Equipment and Truck Rental 1,545.00

(3) Expense Accounts (Hotels, meals, etc) 1,545.89

(4) Shipping Costs 150.00

\$ 6,233.89

I certify this to be a true Statement of Expenditures for the geophysical survey on the Hawk 1, 2 and 3 claims in 1983.



Syd J. Visser
Geophysicist
Cominco Ltd.

April 1984


APPENDIX IV

A P P E N D I X I V

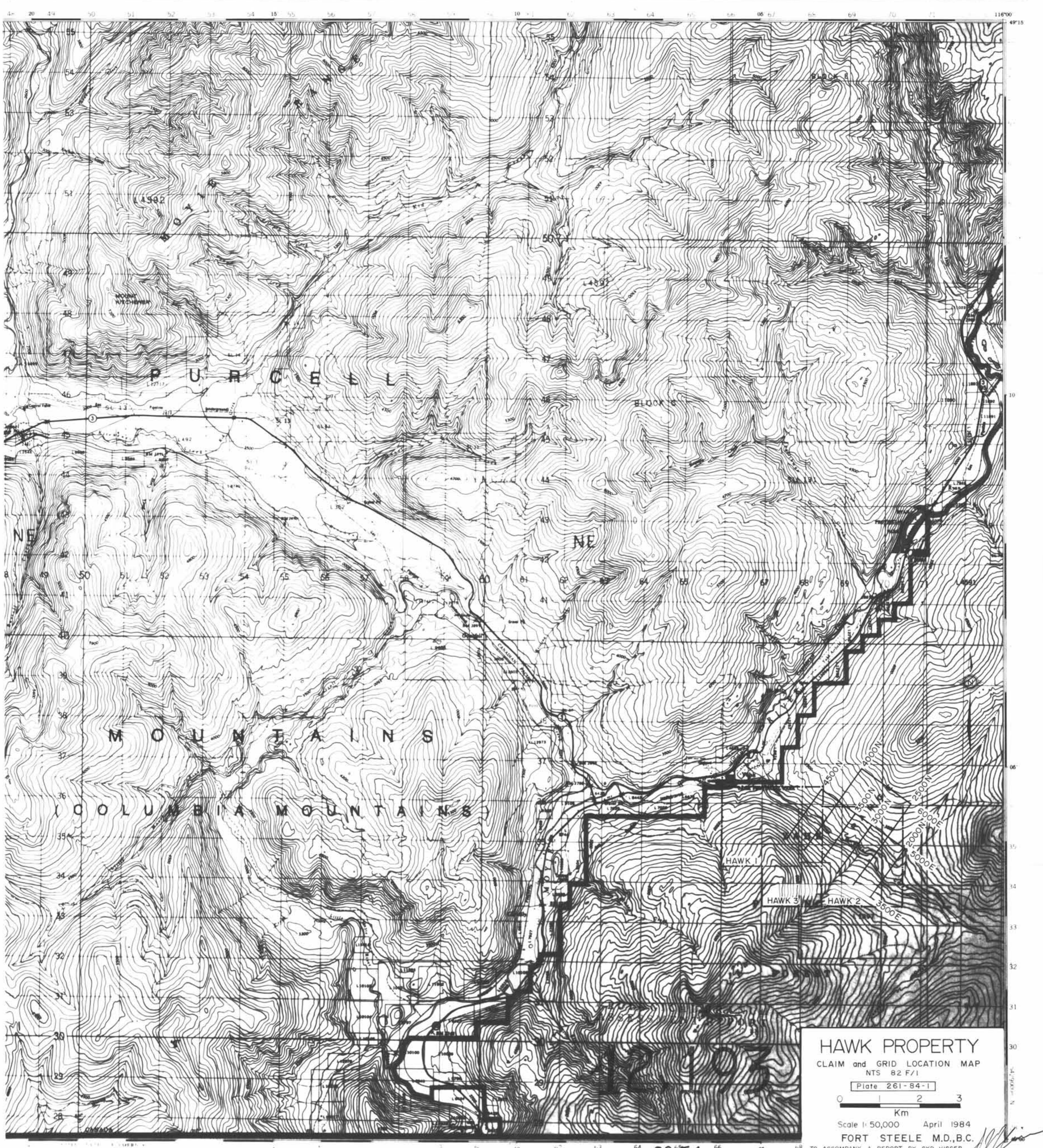
C E R T I F I C A T I O N

I, SYD J. VISSER, of 12627 - 98th Avenue in the City of Surrey, in the Province of British Columbia, do hereby certify that:-

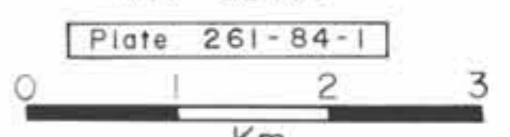
1. I graduated from Haileybury School of Mines in 1971 as a Mining Technician and from the University of British Columbia in 1981 with Honours B.Sc. in Geophysics and Geology.
2. I have worked in mineral exploration since 1968.



Syd J. Visser
Geophysicist
Cominco Ltd.



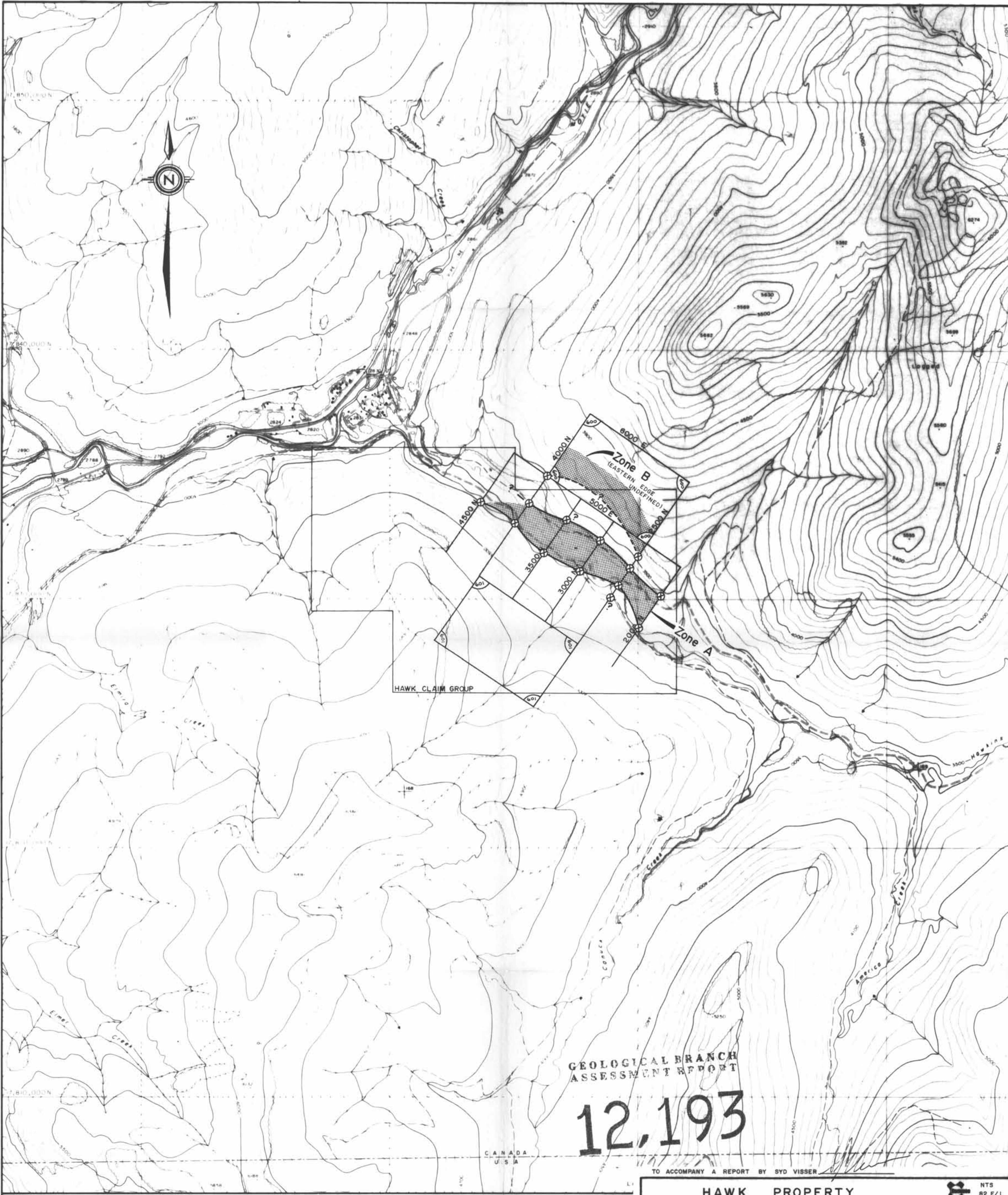
HAWK PROPERTY
CLAIM and GRID LOCATION MAP
NTS 82 F/1



Scale 1:50,000 April 1984
FORT STEELE M.D., B.C.

82 F 1

TO ACCOMPANY A REPORT BY SYD VISSER



GEOLOGICAL BRANCH
ASSESSMENT REPORT

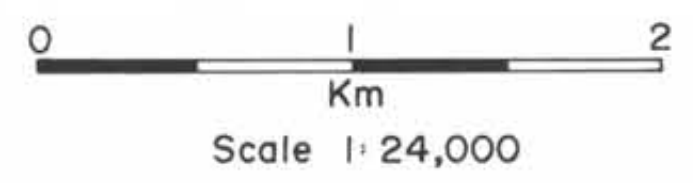
12,193

CANADA
U.S.A.

TO ACCOMPANY A REPORT BY SYD VISSER

HAWK PROPERTY

NTS
82 F/1



⊗ EDGE OF A POORLY CONDUCTIVE ZONE

Drawn by:	Traced by:
Checked by:	Checked by:

UTEM GRID and
COMPILATION MAP

FORT STEELE M.D., B.C.

Scale: 1:24,000 Date: APRIL 1984 Plate: 261-84-2