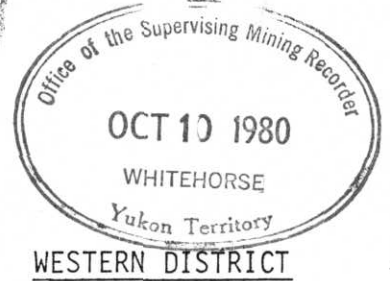
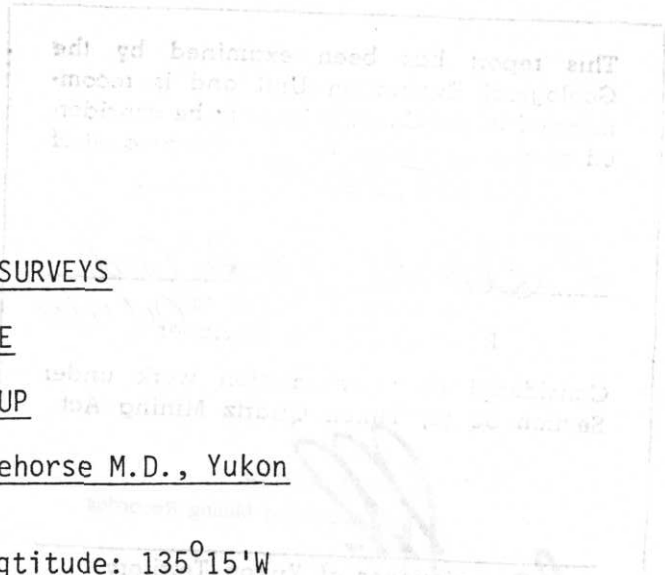


COMINCO LTD.



EXPLORATION

NTS: 105L-11 & 14



GEOPHYSICAL SURVEYS

ON THE

TUM GROUP

Pelly River Area, Whitehorse M.D., Yukon

Latitude: 62°45'N; Longitude: 135°15'W

Work Performed: May 31 - July 2, 1980

Claims covered: TUM 31-66
108,109,112,114,115
118 to 156
192, 194-198



SEPTEMBER 1980

090665
INGO JACKISCH

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$ 85,951.00

L. Sebicki / A. Reg Geol
Resident Geologist
Resident Mining Engineer *Oct 17/80*

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

[Signature]
B. R. BAXTER
Supervising Mining Recorder

[Signature]
Commissioner of Yukon Territory



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ATTACHMENTS

Plate 178-80-1	Location Map
178-80-2	Claim and Grid Map - North Grid
178-80-3	Claim and Grid Map - South Grid
178-80-4	Magnetic Field Contour Plan - North Grid
178-80-5	Gravity Profiles - North Grid
178-80-6	Gravity Profiles - South Grid
178-80-7	EM Profiles at 1777 Hz - North Grid
178-80-8	EM Profiles at 1777 Hz - North Grid
178-80-9	EM Profiles at 1777 Hz - North Grid
178-80-10	EM Profiles at 1777 Hz - South Grid
178-80-11	EM Profiles at 1777 Hz - South Grid
178-80-12	EM Profiles at 100 m coil separation - North Grid
178-80-13	EM Profiles at 50 m coil separation - North Grid
178-80-14	EM Profiles at 100 m coil separation - South Grid

COMINCO LTD.

EXPLORATION
NTS: 105L-11

WESTERN DISTRICT
30 September 1980

GEOPHYSICAL SURVEYS

ON THE

TUM GROUP

INTRODUCTION

During the period May 31 - July 2, 1980, a four man Cominco geophysical crew completed approximately 85 km of Max Min horizontal loop electro-magnetics over two separate grids on the TUM property. A magnetometer survey was conducted across a portion of one of the grids, as well as EM detailing and gravity profiles over selected EM anomalies.

The exploration objective is the massive sulphide type of deposit, similar to that on the adjacent DUO CK property, belonging to CONWEST.

This report describes the procedure and results of the EM, mag., and gravity surveys completed on the TUM GROUP. Of the 2 grids surveyed, the larger one lies to the north of the Pelly River and is called the NORTH GRID, and the other which lies to the south of the Pelly River, is called the SOUTH GRID.

LOCATION AND ACCESS

The TUM GROUP is located near the intersection of the Tummel River and the Pelly River, Yukon Territory, approximately 83 km. NE of Carmacks and 235 km. north of Whitehorse.

There are two airstrips nearby: the public one at Detour Lakes is approximately 25 km. to the east, whereas the private airstrip (belonging to Getty Mines) is only a few km. to the NE. Our camp was flown in from Whitehorse to the Detour Lakes airstrip, where a helicopter from Carmacks rendezvoused for the final stretch. Trans North Turbo Air has a Jet Ranger permanently stationed at Carmacks.

GEOPHYSICAL SURVEYS

Horizontal Loop Electromagnetics (HLEM):

Two Apex Max Min II electromagnetometers were used for the HLEM survey. Initial reconnaissance survey of all the grid lines was with a coil separation of 150 metres and a station interval of 25 metres. For the first few survey lines, the offset connections for constant coil separa-

tion and coplanarity were computed from a chaining and inclinometer survey. As this greatly reduced the rate of progress for this reconnaissance phase, a procedure of estimating offsets and slopes was adopted for the bulk of the survey. Any errors resulting from this rough technique will tend to show up in the in phase values.

As 2 Max Min units were used simultaneously, care had to be taken that the receiver of one unit was not affected by the transmitter of the other. The instruments were never closer than 1 km apart, which was found to be adequate for the 150 meter coil separation.

Anomalies at the 150 meter coil separation were followed up with 50 and 100 meter coil lengths.

The 150 meter coil separation HLEM data at 1777 Hz was plotted in profile form on a plan map of the grid by a computer plotter. The NORTH GRID is broken into 3 parts on plates 178-80-7,8, and 9 and the SOUTH GRID in 2 parts, plates 178-80-10 and 11. The other coil separations are plotted together on plates 178-80-12,13,14.

The anomalies have been marked as definite, probable, and possible, which refer to clearly defined conductors, inferred conductors, and poorly defined conductors respectively.

Magnetics Survey:

A Scintrex MP-2 total field proton precession magnetometer was used for the magnetics survey, which was done over a portion of the North grid. Readings were taken at a 25 meter interval with the operator facing north for all readings (a drop of over 50 gammas was noticed when facing south). The base station became inoperational after the first day so diurnal drift corrections were done by tying in to stations along the baseline every hour or two. Readings were taken only on days when the magnetic noise was extremely quiet because the small change in readings would not otherwise have been detectable.

Gravity Survey:

A Worden master gravimeter was used for the gravity survey. Because independent EM anomalies which were a long distance from each other were surveyed, no attempt was made to tie the levels survey of the various lines to one another. The numerical values of the elevations and the gravity readings can therefore only be related along an individual profile, but not across different lines. Drift corrections were calculated by ending at the starting point and assuming the drift to be linear within this time period. Stations were read at a 50 meter interval on the north grid and at a 25 meter spacing on the south grid.

DESCRIPTION OF RESULTS

North Grid:

The numbering of stations was very unreliable on the ground so all plotted

stations were numbered with respect to their distance from the 100N baseline.

It is difficult to set any definite pattern to the abundant multiple zone HLEM anomalies occurring east of line 156W. Anomaly A is by far the largest with a 400 meter length, 50 to 80 meter width, and a conductivity thickness ranging from 3.3 to 6.0 mhos at 1777 Hz. The lines do not continue far enough to the south to be able to give a good dip estimate, although it appears the structure is dipping to the south. The smaller conductors on lines 148W and 140W could be continuations of A.

A conductive horizon of basement volcanics and/or sediments breaking through overburden sediments could explain the occurrence of anomaly A. A sharp topographic high is coincident with the conductor, thus strengthening this argument.

It is not obvious how the conductors east of line 142W fit together, although anomalies B,C, and D are isolated exceptions. It is interesting to note the conductors from line 132W to 120W occur as pairs, similar to what one might expect from the edge effects of a flat lying sheet.

There is a sudden change in response from line 150W to 148W and again on the north portions of lines 138W, 136W, and 134W, possibly due to a change in rock type. The lines west of 150W have generally flat responses which change very rapidly at 148W and continue right through to 100W. Large changes in overburden depth could account for these fluctuations.

The magnetometer survey, plate 178-80-4, and gravity survey, plate 178-80-5, give no correlation with the EM conductors.

South Grid:

The HLEM results are presented on plates 170-80-10 and 170-80-11 along with the gravity and topography profiles on plate 170-80-6.

The location of HLEM anomaly E correlates well with a known fault. Calculations show it subcrops only 5 to 10 meters below the surface, dips at a shallow angle of 40° to 50° to the north, is approximately 20 to 80 meters thick (depending on the line), and has a conductivity thickness in the 5 to 10 mhos range at 1777 Hz.

Anomaly E ends suddenly between lines 134W and 132W. This coincides with a background response apparent conductivity change between these lines of .002 mhos/m (from 136W westwards) to .005 mhos/m (from 132W eastwards). In addition, there is a lake and many sudden topographical highs and lows at the north end of 132W. All these facts lead to the possibility of a north-south fault existing between 134W and 132W.

The background amplitudes of the HLEM data all indicate a homogenous half space on the phasor diagram, with the exception of the 6 lines from 140W to 150W which give values closer to a 2 or 3 layer case.

Anomaly F has been kept separate from anomaly E because it has a lower amplitude response. The ratio of out-of-phase to in-phase is similar between the 2 anomalies, however, and F could be a deep seated continuation of E because conductivity thickness is identical. The width of F is hard to calculate, but estimates of 10 meters make it much narrower than E.

The anomalies on 124W and 122W require detailing to determine if they are related. Extending lines 126W to 120W to the south would establish if multiple conductors are present on these lines.

Lines 116W to 108W are extremely flat compared with the profiles to either side. Faulting or a change in rock type could be responsible for this.

Response on lines 106W to 101W change drastically from 108W. Several isolated conductors occur on 106W as well as anomalies G and H which continue for 2 or more lines. Extensions of these lines should be carried out to define the extent of these conductors. A fill-in line at 107 would also be advisable.

The gravity profiles of plate 178-80-6 show no correlation of gravity highs to HLEM conductors.

CONCLUSIONS

An HLEM, gravity, and magnetometer survey was undertaken on the TUM GROUP from May 31 to July 2, 1980, by a Cominco geophysical crew.

The magnetometer and gravity surveys were in the form of individual profiles over selected anomalies. No coincident magnetic field or gravity highs to HLEM conductors were detected. However, not all anomalies have been followed up and gravity profiling is recommended on those remaining anomalies. Additionally, some HLEM fill in lines and extensions have been recommended in this report.

Respectfully submitted by: Ingo Jackisch
Ingo Jackisch
Geophysicist

Alan Scott
Alan Scott
Geophysicist

Approved for release by: W. J. Wolfe for
G. Harden
Manager, Western District

Distribution:

Mining Recorder (2)
Western District (1)
Geophysics File (1)

COMINCO LTD.

EXPLORATION
NTS: 105L-11

WESTERN DISTRICT
30 September 1980

APPENDIX I

CERTIFICATION

I, INGO JACKISCH, OF 424 SOMERSET STREET, IN THE CITY OF VANCOUVER,
IN THE PROVINCE OF BRITISH COLUMBIA, DO HEREBY CERTIFY THAT:

- (1) I GRADUATED FROM THE UNIVERSITY OF B.C. IN 1975 WITH A B.Sc. IN
GEOPHYSICS;

- (2) I AM REGISTERED WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF
B.C. AS AN ENGINEERING PUPIL, AND AM A MEMBER OF THE B.C. GEOPHY-
SICAL SOCIETY;

- (3) I HAVE BEEN PRACTISING MY PROFESSION FOR THE PAST NINE YEARS.

Signed: Ingo Jackisch
Ingo Jackisch
Geophysicist

C A N A D A
YUKON TERRITORY
TO WIT:


STATUTORY DECLARATION

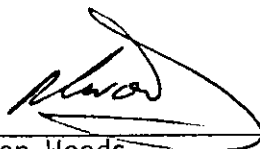
I, ROBIN LAWSON WOODS, of the District of North Vancouver, in the Province of British Columbia, DO SOLEMNLY DECLARE THAT:

1. I am the Supervisor, Exploration and Foreign Accounting for Cominco Ltd., 2300 - 200 Granville Street, Vancouver, British Columbia, and, as such have knowledge of the facts deposed to herein.
2. Attached to this Statutory Declaration, as Schedule A, is a statement of expenditures indicating the expenditures charged by Cominco Ltd. to the Tum Group account for the period January 1, 1980 to August 31, 1980.
3. The statement of expenditures referred to in paragraph 2 is true and accurate to the best of my knowledge, information and belief.
4. This Statutory Declaration is made in support of an application for a Certificate of Work pursuant to the Yukon Quartz Mining Act.

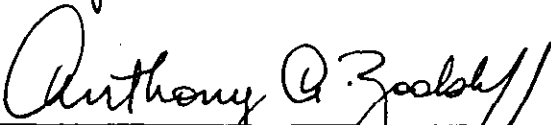
AND I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

DECLARED before me at the City)
of Vancouver in the Province)
of British Columbia, this 12th)
day of September 1980)


A Notary Public in and for the
Province of British Columbia


Robin Lawson Woods

This is Schedule A referred to
in the Statutory Declaration
of ROBIN LAWSON WOODS
Declared before me this 12th day
of September, 1980


A Notary Public in and for the
Province of British Columbia

STATEMENT OF EXPENDITURES

TUM GROUP


WHITEHORSE M.D., YUKON TERRITORY

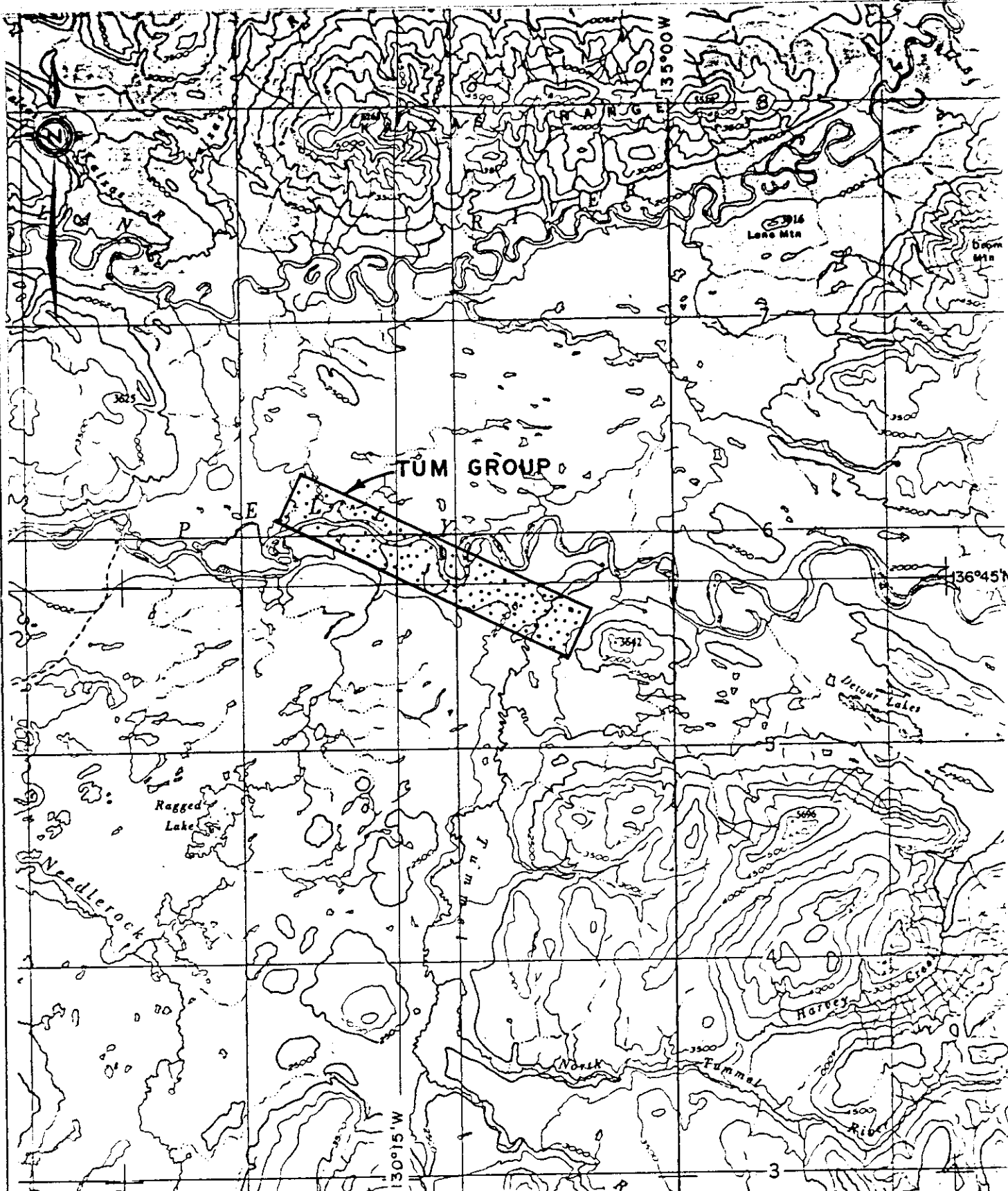
JANUARY 1, 1980 TO AUGUST 31, 1980

Geology	\$ 7,487
Linecutting	22,528
Geophysics	23,695
Transportation	11,155
Drafting and reproduction	4,780
Camp costs	620
Tenure	7,872
Administrative services	7,814
	<u>\$85,951</u>

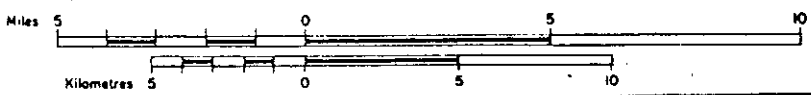
Cominco Ltd.
Vancouver Office
September 12, 1980

Copies: Mining Recorder (2)
Manager, Administration Exploration
File (2)


R.L. Woods
Supervisor, Exploration
& Foreign Accounting



Scale 1:250,000 or 1 inch = 4 miles (approximately)



TUM GROUP

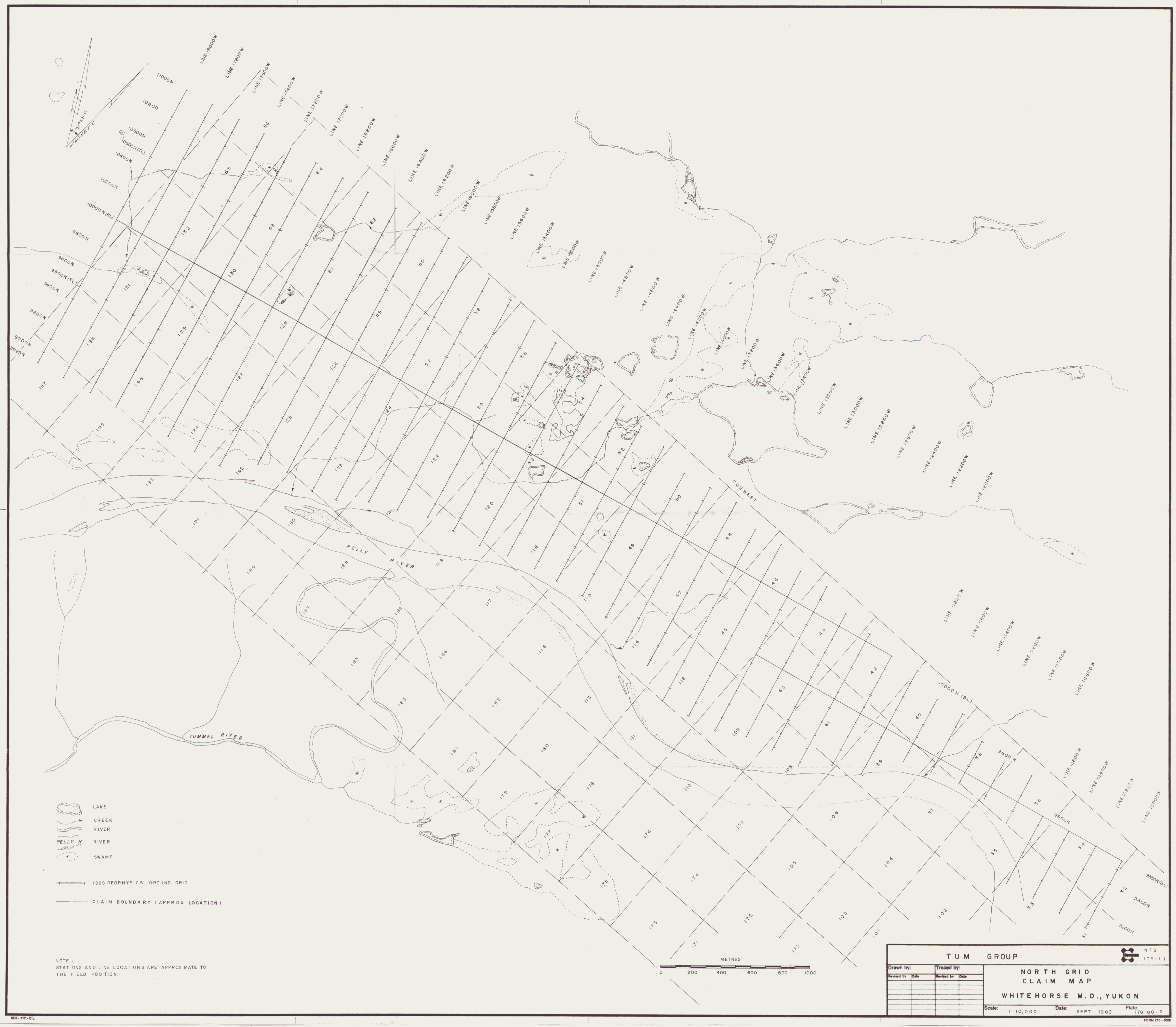


NTS
105 L

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Revised by	Date	Revised by	Date

LOCATION MAP
WHITEHORSE M.D., YUKON

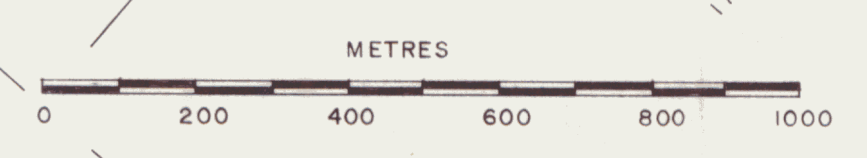
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- RIVER
- PELLY R
- SWAMP


- 1980 GEOPHYSICS GROUND GRID
- CLAIM BOUNDARY (APPROX LOCATION)

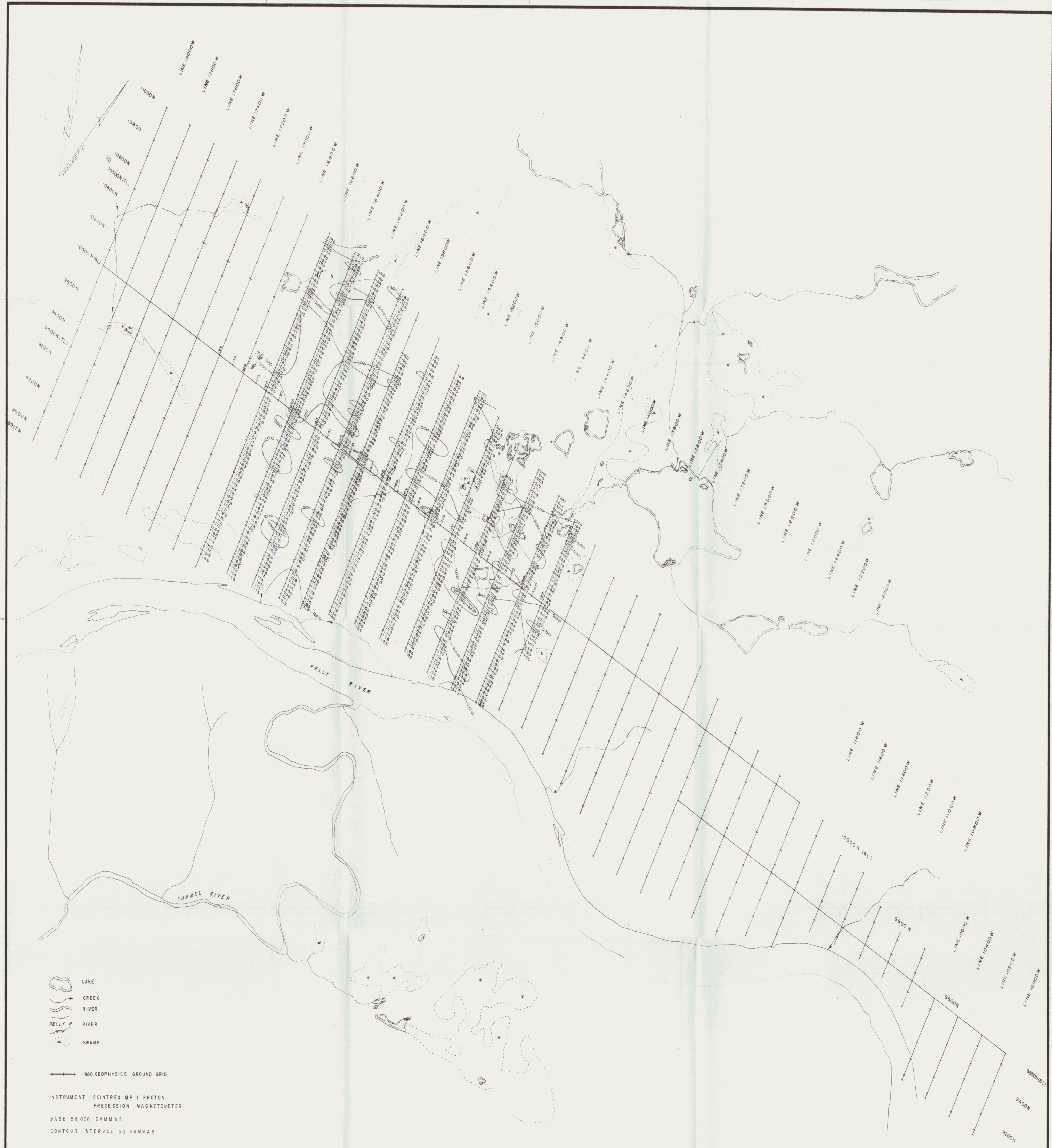
NOTE:
STATIONS AND LINE LOCATIONS ARE APPROXIMATE TO
THE FIELD POSITION



TUM GROUP				NTS 105-L-I
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Revised by	Date	Revised by		Date
				Scale: 1:10,000
				Date: SEPT 1980
				Plate: 178-80-2



TUM GROUP				 NTS 105-L-11
SOUTH GRID CLAIM MAP WHITEHORSE M.D., YUKON				
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Revised by	Date	Revised by	Date	
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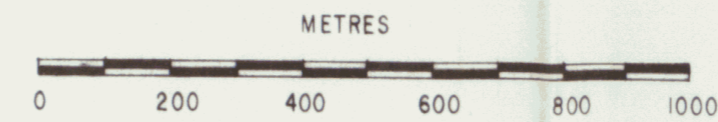


- LAKE
- CREEK
- RIVER
- Pelly R. RIVER
- SWAMP

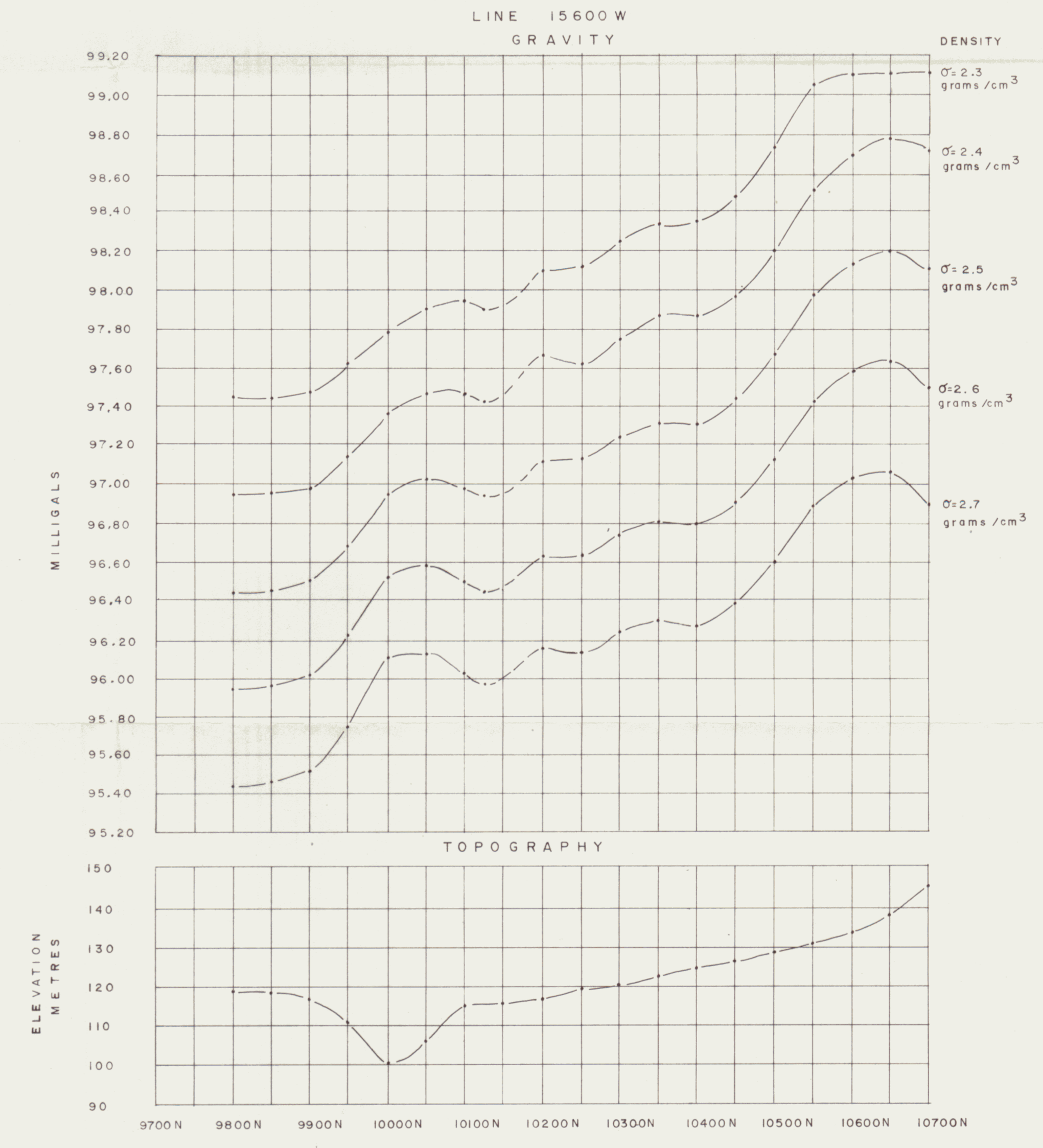
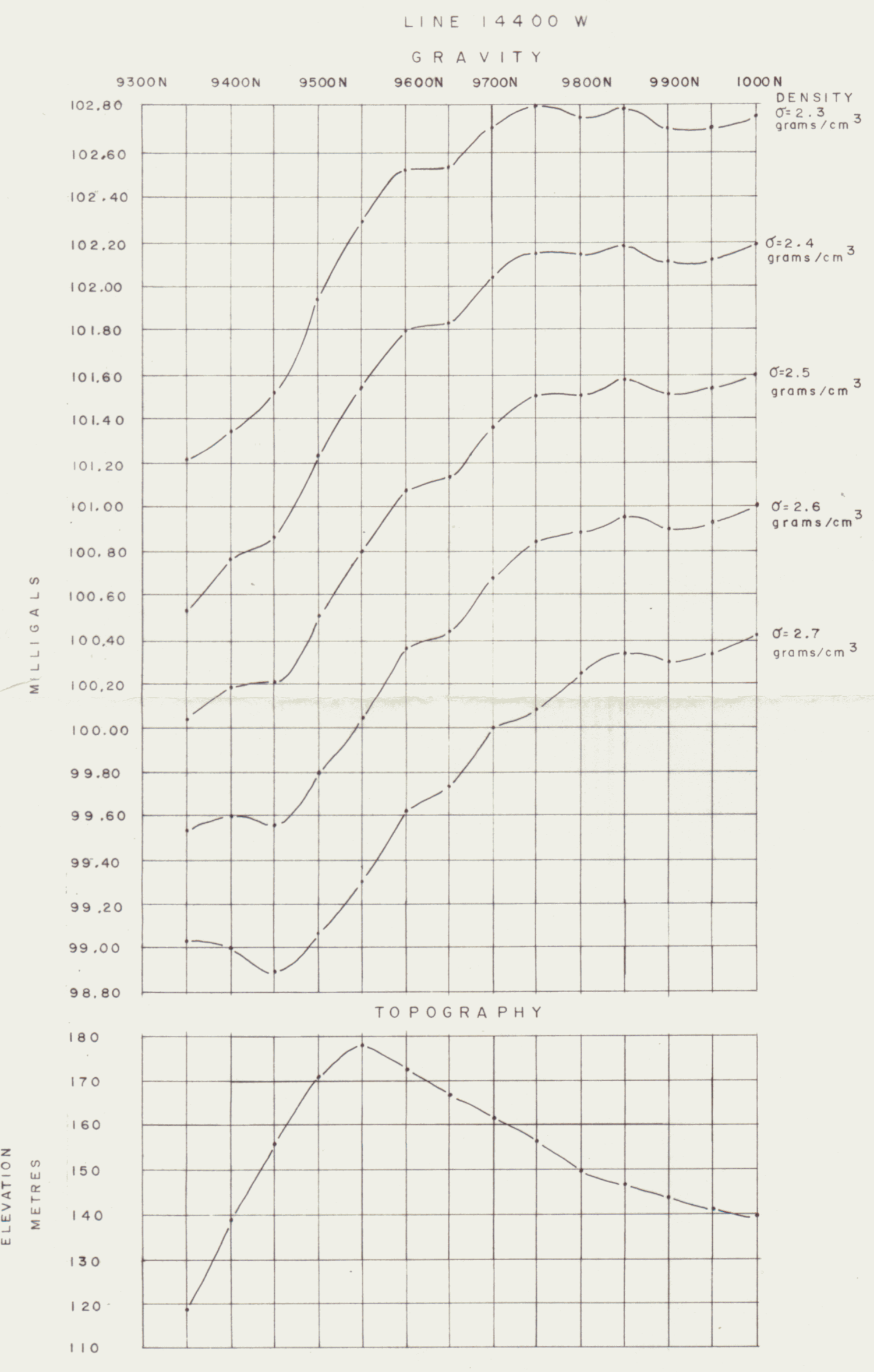
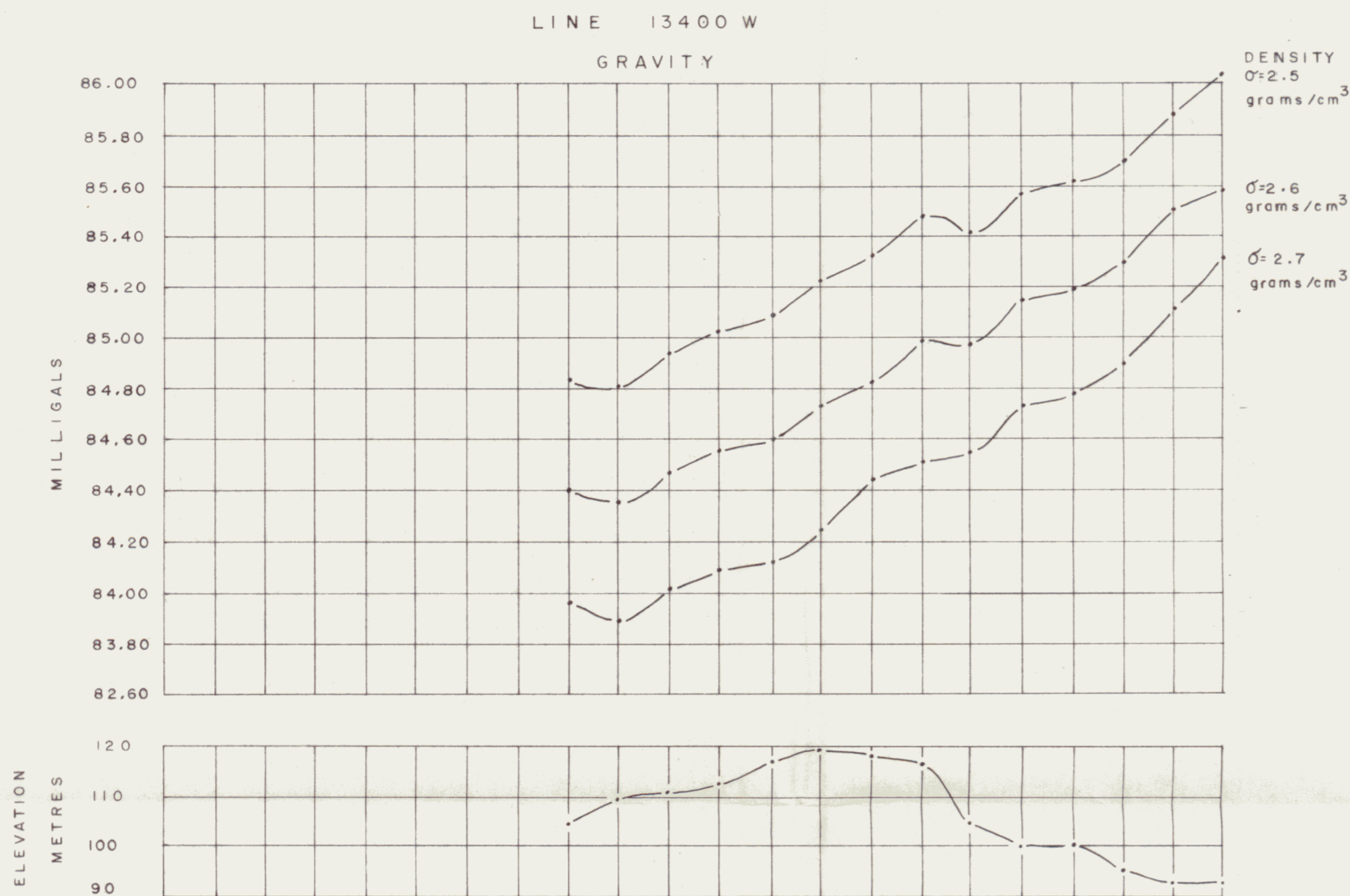
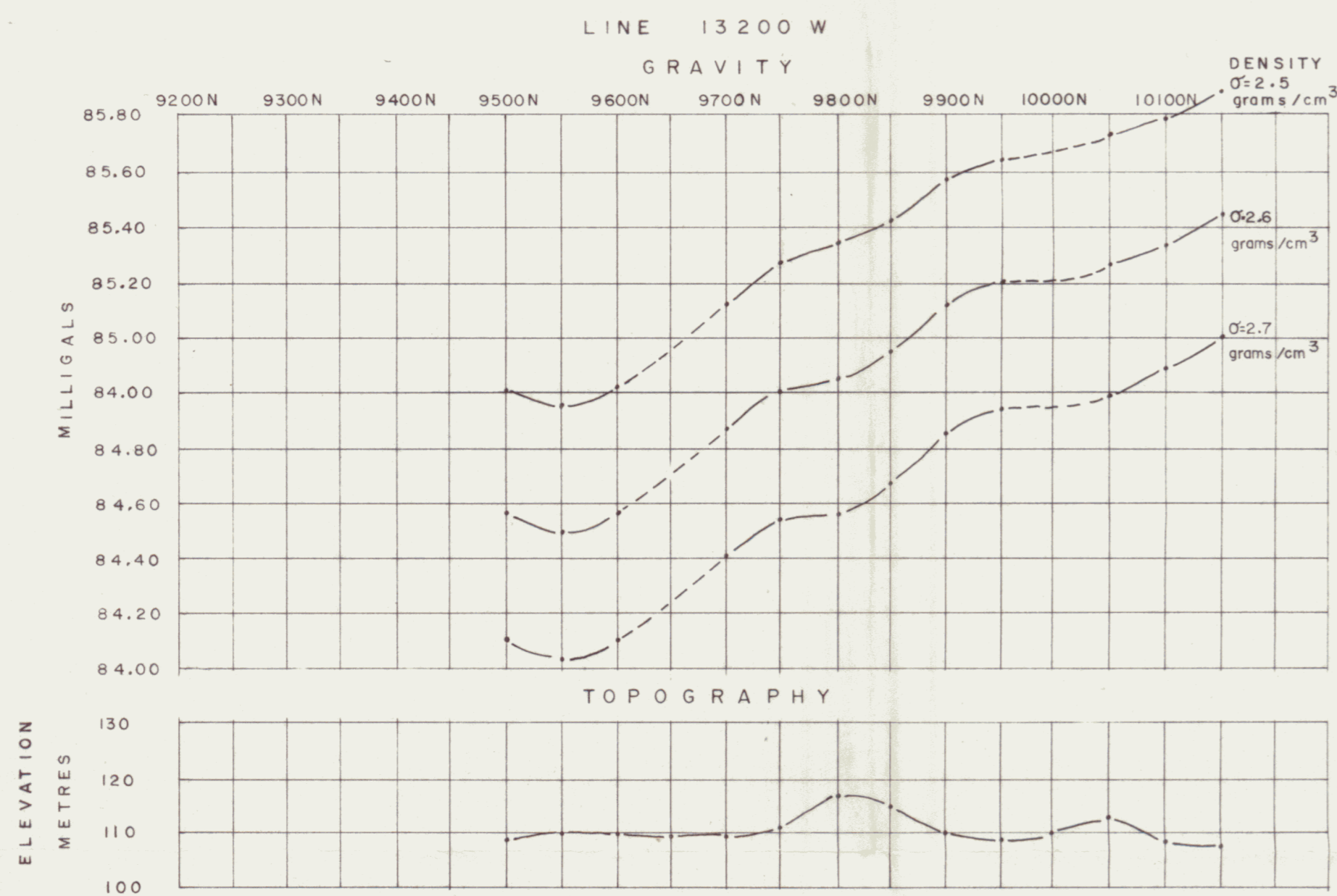
1980 GEOPHYSICS GROUND GRID

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 PRECESSION MAGNETOMETER
 BASE 58,000 GAMMAS
 CONTOUR INTERVAL 50 GAMMAS

NOTE :
 STATIONS AND LINE LOCATIONS ARE APPROXIMATE TO
 THE FIELD POSITION



TUM GROUP				NTS 105-L-1
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Revised by:	Date:	Revised by:	Date:	
Scale: 1:10,000		Date: SEPT 1980		Plate: 178-80-4



INSTRUMENT : WORDEN MASTER

TUM GROUP

NORTH GRID

GRAVITY AND TOPOGRAPHY PROFILES

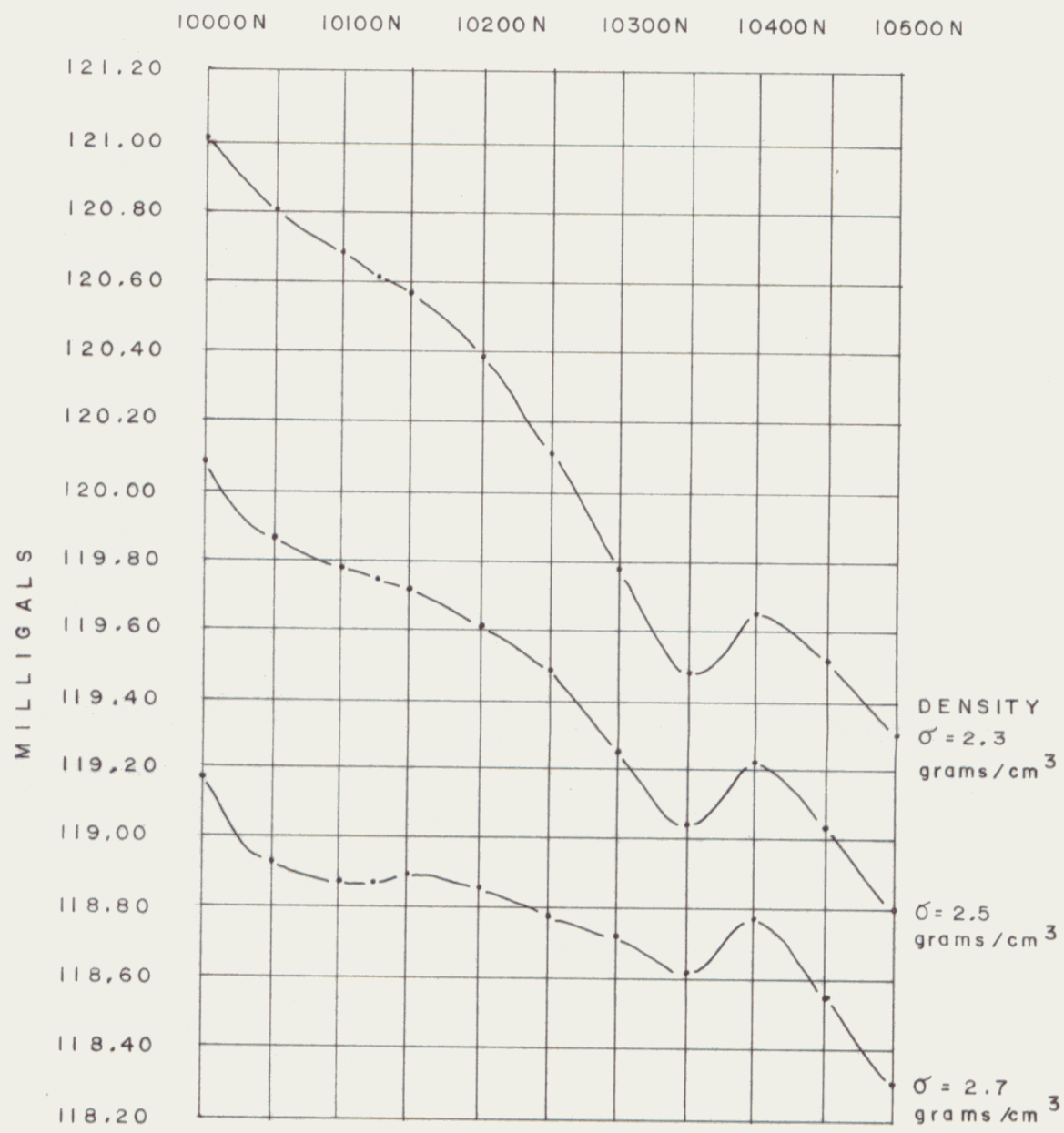
WHITEHORSE M.D., YUKON

Scale: AS SHOWN Date: SEPT 1980 Plate: 178-80-5

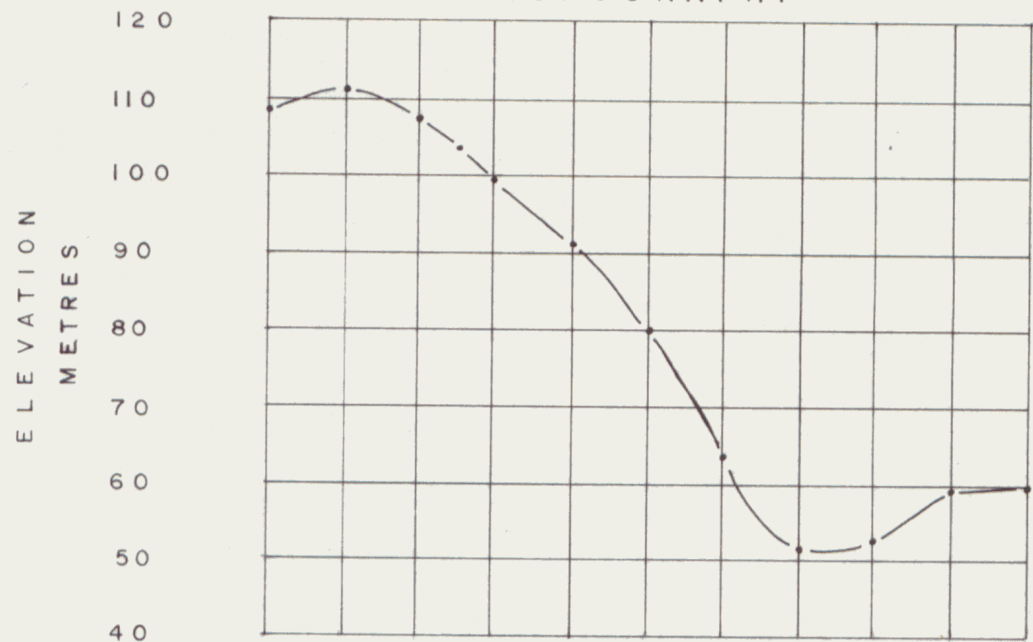
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Revised by Date	Revised by Date

NTS 105-L-II

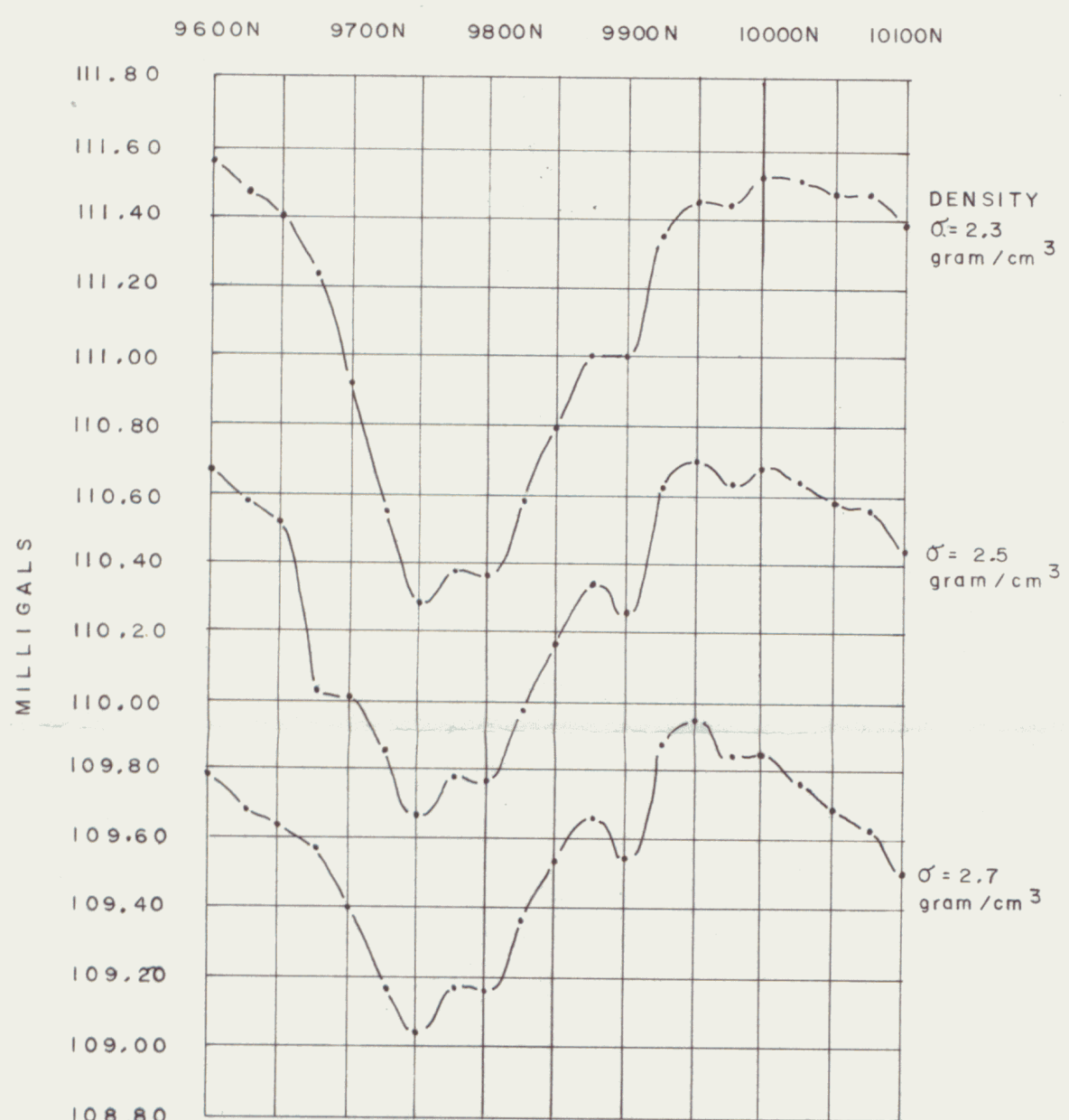
LINE 14000 W
GRAVITY



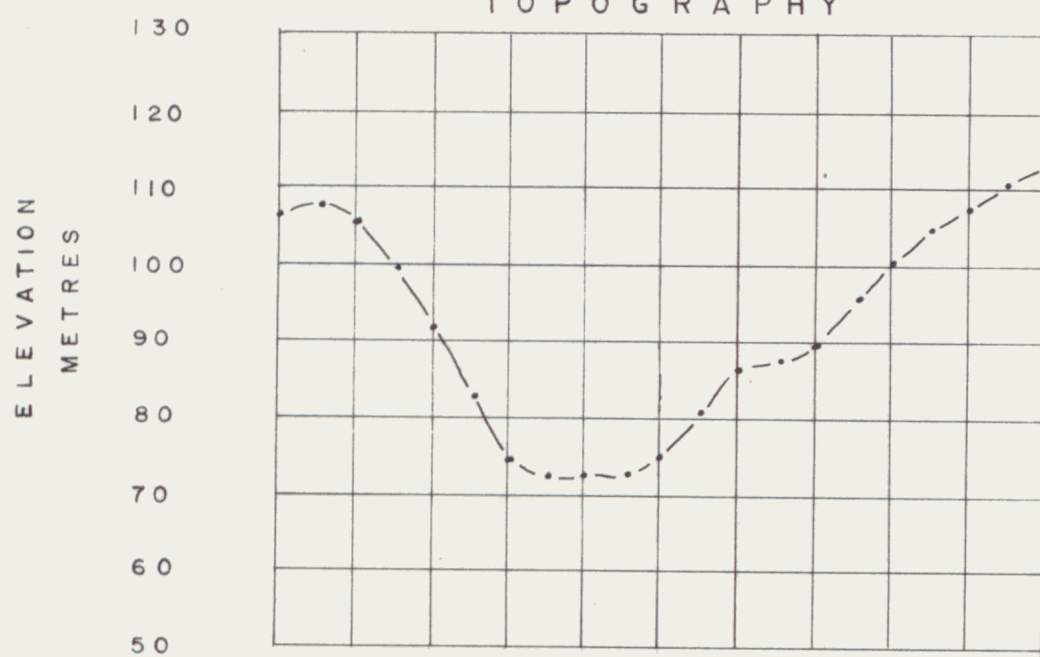
TOPOGRAPHY



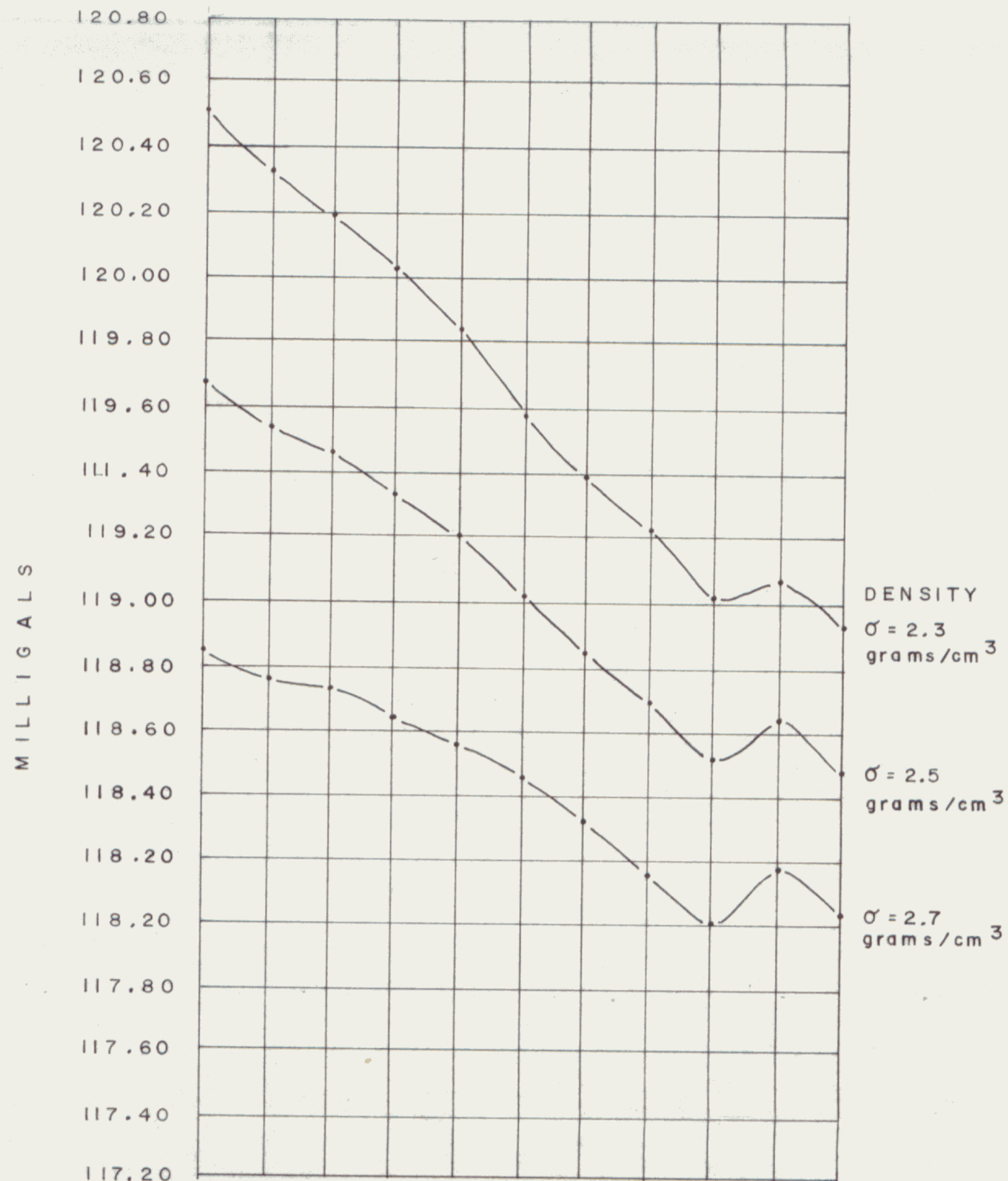
LINE 10200 W
GRAVITY



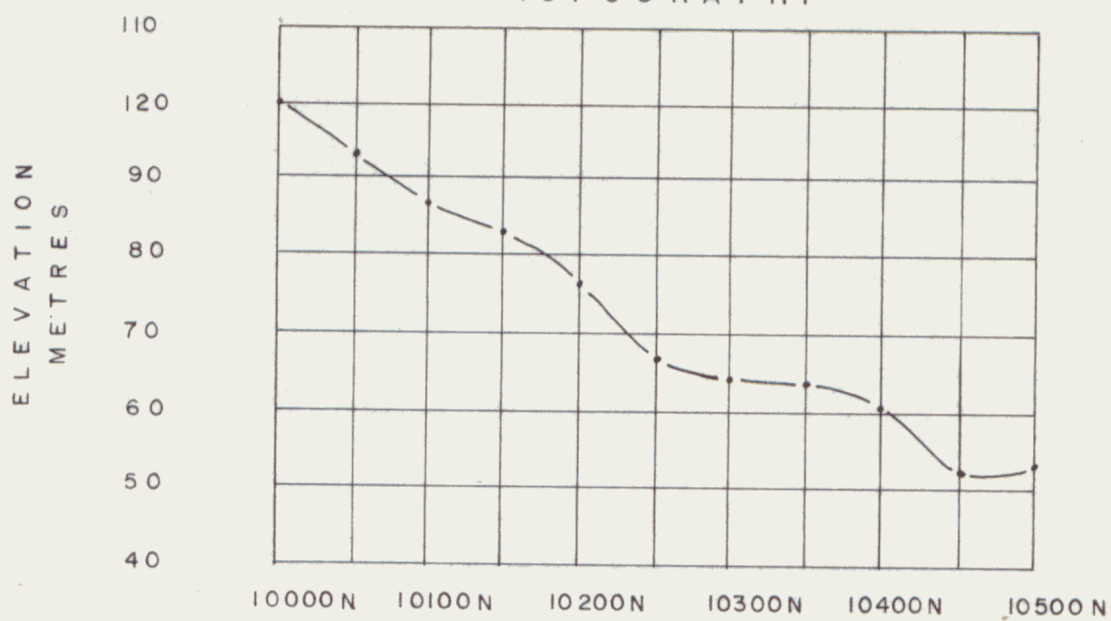
TOPOGRAPHY



LINE 13600 W
GRAVITY



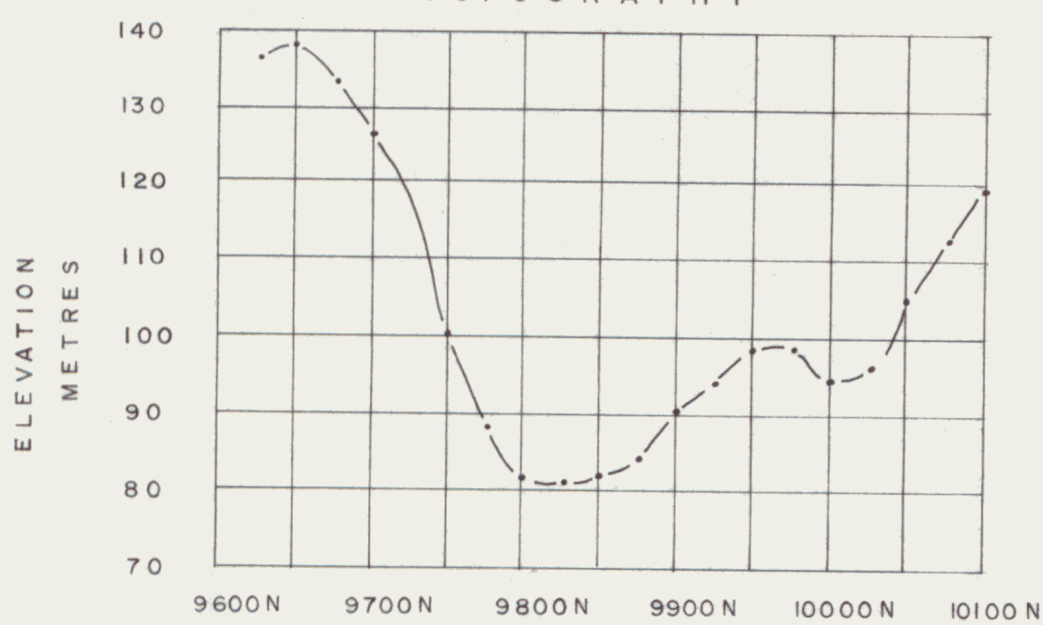
TOPOGRAPHY



LINE 10100 W
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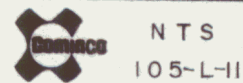


TOPOGRAPHY



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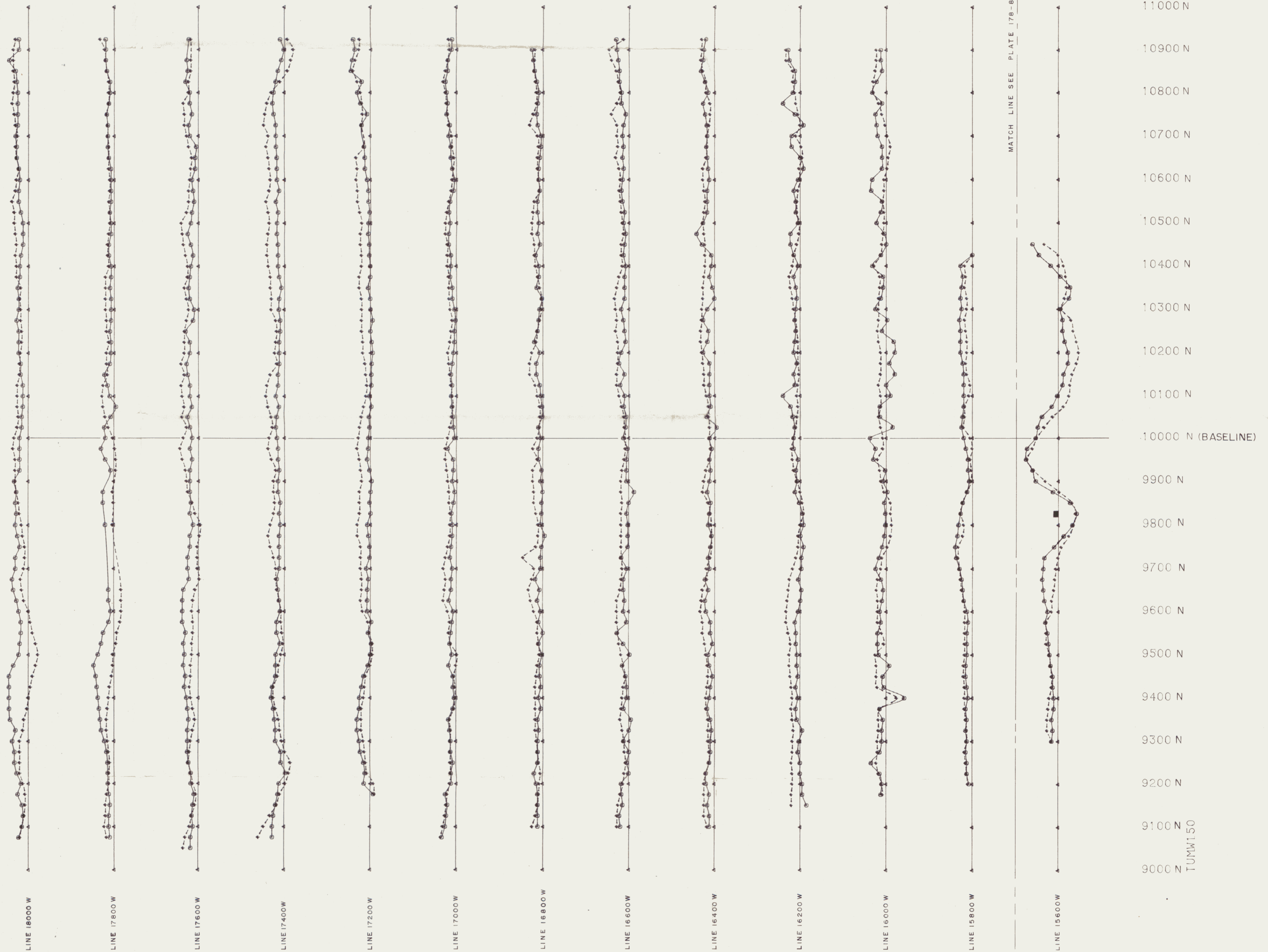
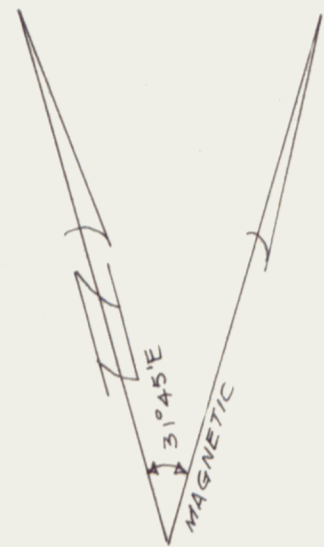
TUM GROUP



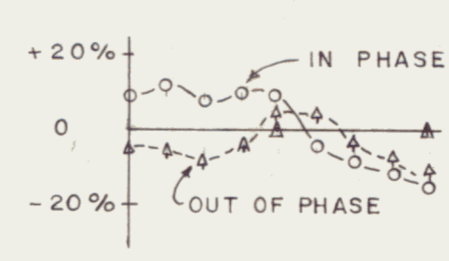
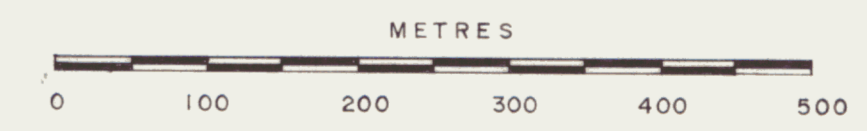
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SOUTH GRID
GRAVITY AND TOPOGRAPHY PROFILES
WHITEHORSE M.D., YUKON

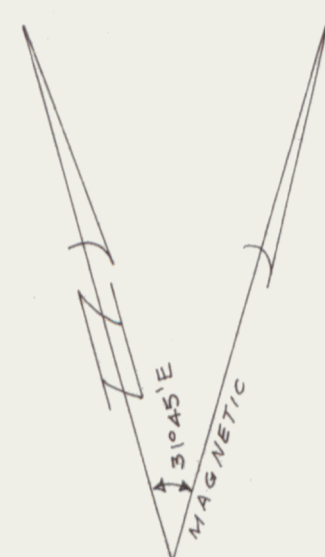
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▲ — ▲ 1980 GEOPHYSICS GROUND GRID
 INSTRUMENT : MAX MIN II
 ○ — ○ IN PHASE
 ▲ — ▲ OUT OF PHASE
 CONDUCTOR LOCATION
 ■■■■■■ DEFINITE
 ■■■■■■ PROBABLE
 ■■■■■■ POSSIBLE
 E
 ——— INDICATED CONDUCTOR

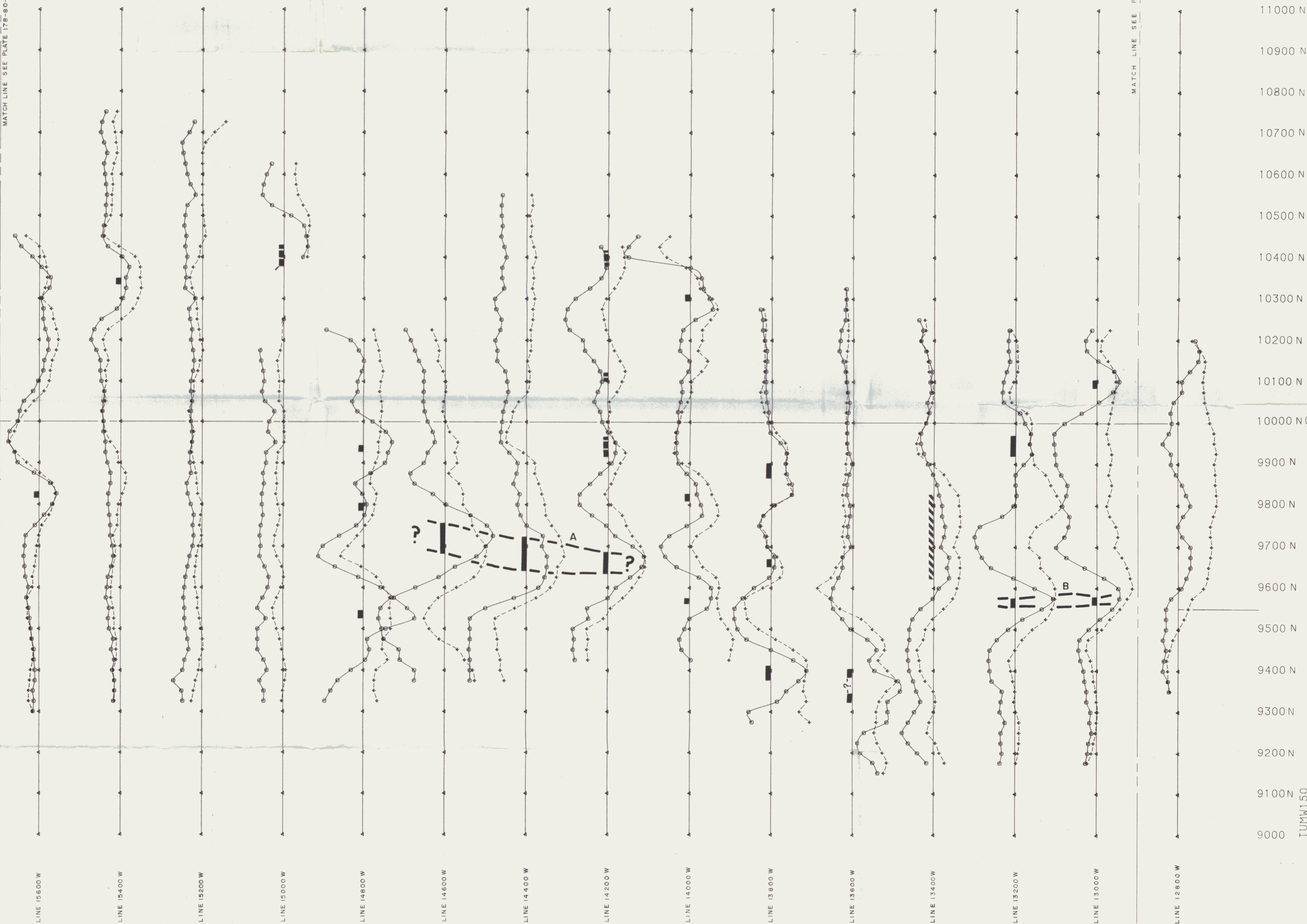


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Revised by:	Date:			Date:
Scale: 1 : 50 00		Date: SEPT 1980	Plate: 178-80-7	



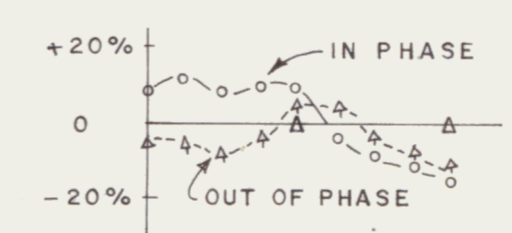
MATCH LINE SEE PLATE 178-80-7

MATCH LINE SEE PLATE 178-80-9



11000 N
10900 N
10800 N
10700 N
10600 N
10500 N
10400 N
10300 N
10200 N
10100 N
10000 N (BASELINE)
9900 N
9800 N
9700 N
9600 N
9500 N
9400 N
9300 N
9200 N
9100 N
9000 N
TUMW150

△—△ 1980 GEOPHYSICS GROUND GRID
INSTRUMENT: MAX MIN II
○—○—○ IN PHASE
△—△—△—△ OUT OF PHASE
CONDUCTOR LOCATION
■ DEFINITE
▨ PROBABLE
▩ POSSIBLE
E INDICATED CONDUCTOR

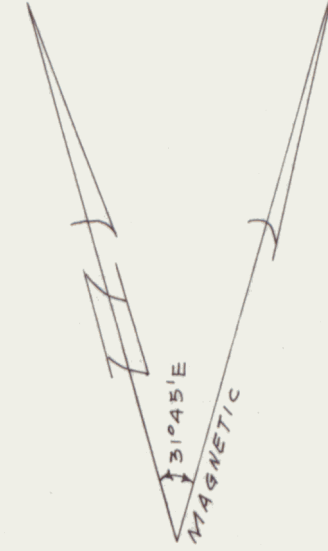


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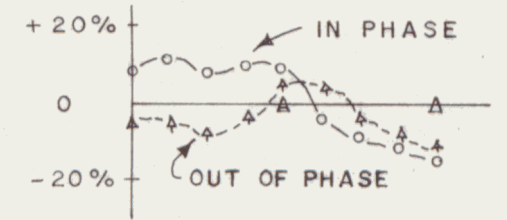
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Revised by / Date	Revised by / Date

**NORTH GRID
HORIZONTAL LOOP ELECTROMAGNETIC SURVEY
150 m COIL SEPARATION, 1777 Hz
WHITEHORSE M.D., YUKON**

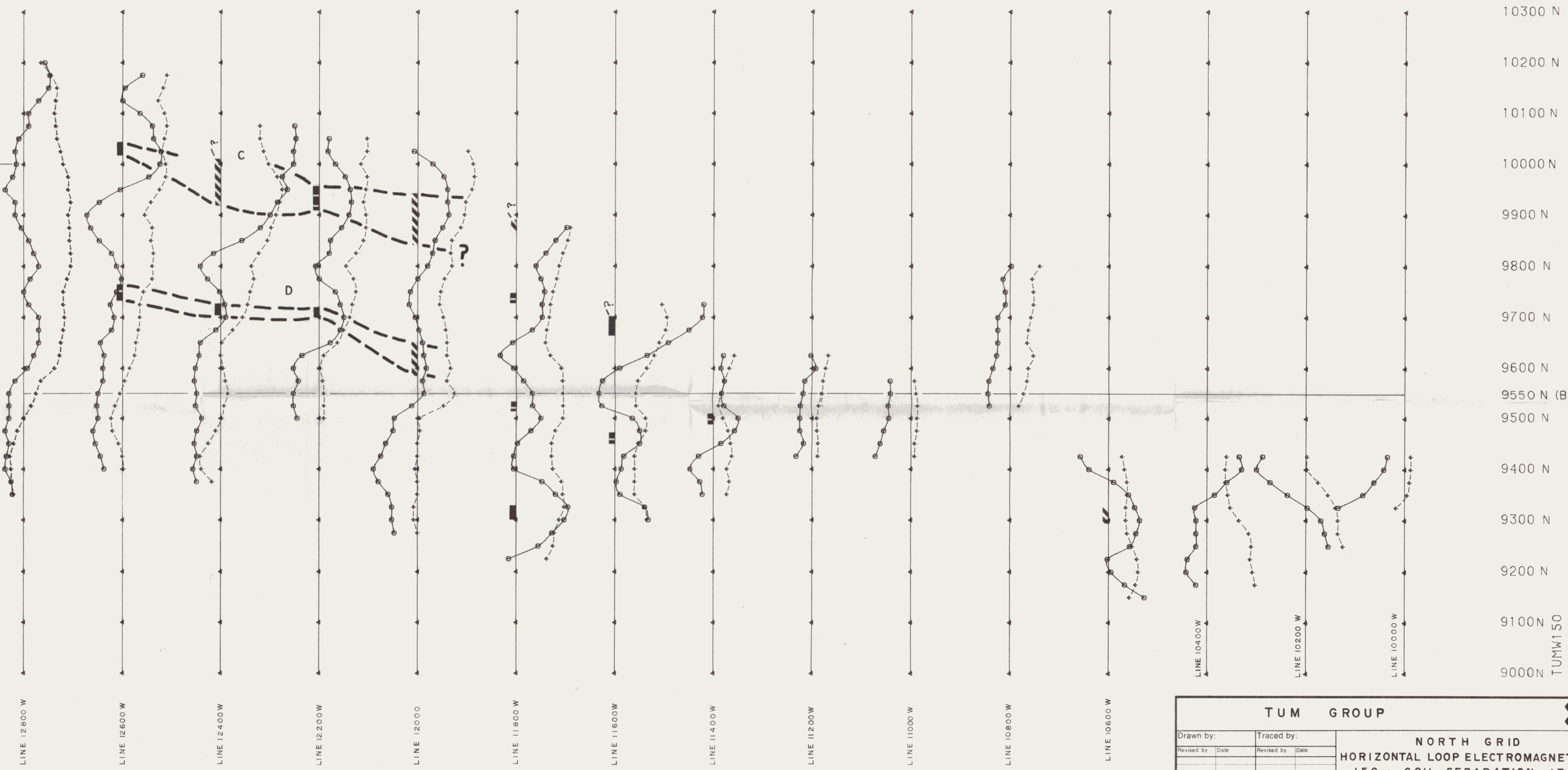
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MATCH LINE SEE PLATE 178-80-9



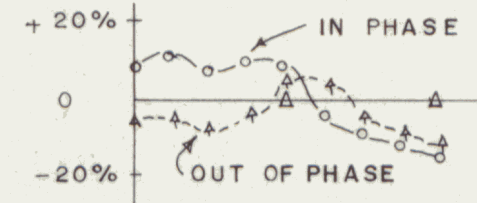
- ▲ — ▲ 1980 GEOPHYSICS GROUND GRID
- INSTRUMENT : MAX MIN II
- — ○ IN PHASE
- ▲ — ▲ — ▲ — ▲ OUT OF PHASE
- CONDUCTOR LOCATION
- █ DEFINITE
- ▒ PROBABLE
- ▨ POSSIBLE
- E** INDICATED CONDUCTOR



TUM GROUP				NTS 105-L-11
Drawn by:	Traced by:		NORTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 150 m COIL SEPARATION, 1777 Hz WHITEHORSE M.D., YUKON	
Revised by	Date	Revised by		Date
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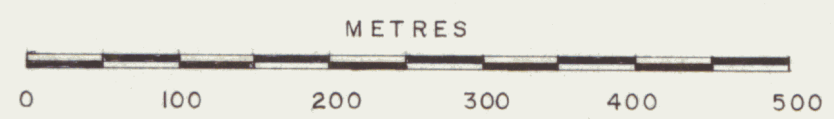
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- △ — △ 1980 GEOPHYSICS GROUND GRID
- INSTRUMENT : MAX MIN II
- — ○ — ○ IN PHASE
- △ — △ — △ — △ OUT OF PHASE
- CONDUCTOR LOCATION
- █ DEFINITE
- ▤ PROBABLE
- ▨ POSSIBLE
- E** — INDICATED CONDUCTOR

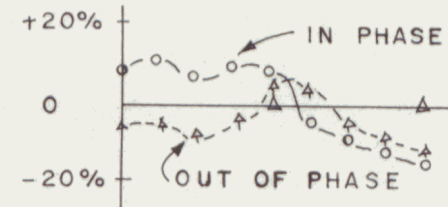


MATCH LINE SEE PLATE 178-80-11



TUM GROUP				NTS 105-L-11
Drawn by:		Traced by:		SOUTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 150 m COIL SEPARATION, 1777 Hz WHITEHORSE M.D., YUKON
Revised by:	Date:	Revised by:	Date:	
Scale: 1:5000		Date: SEPT 1980		Plate: 178-80-10

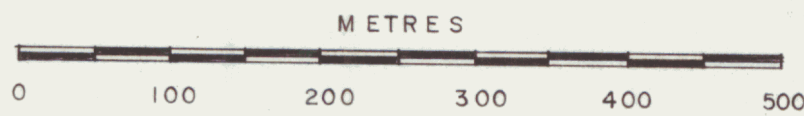
10400 N
 10300 N
 10200 N
 10100 N
 10000 N (BASELINE)
 9900 N
 9800 N
 9700 N
 9600 N
 9500 N
 TUME150



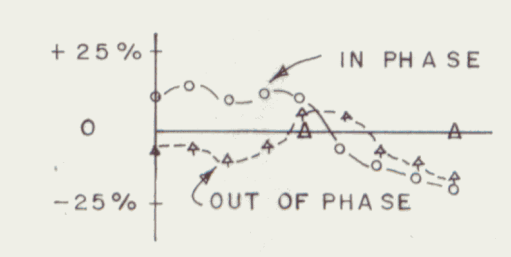
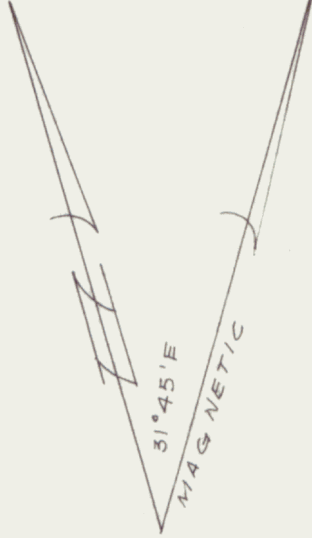
MATCH LINE SEE PLATE 178-80-10



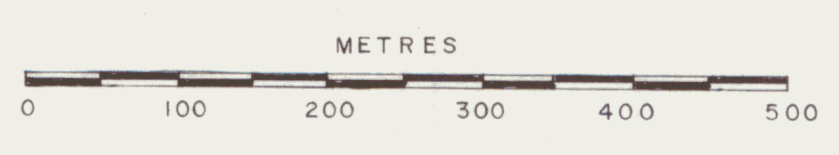
- ▲ 1980 GEOPHYSICS GROUND GRID
- INSTRUMENT: MAX MIN II
- IN PHASE
- ▲ OUT OF PHASE
- CONDUCTOR LOCATION
- █ DEFINITE
- ▒ PROBABLE
- ▨ POSSIBLE
- E INDICATED CONDUCTOR



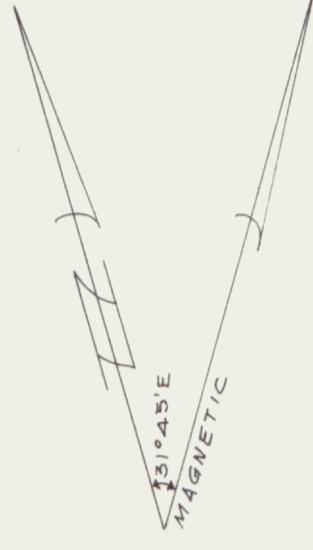
TUM GROUP				NTS 105-L-11	
Drawn by:		Traced by:		SOUTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 150m COIL SEPARATION, 1777 Hz WHITEHORSE M. D., YUKON	
Revised by	Date	Revised by	Date		
Scale: 1:5000				Date: SEPT 1980	
				Plate: 178-80-11	



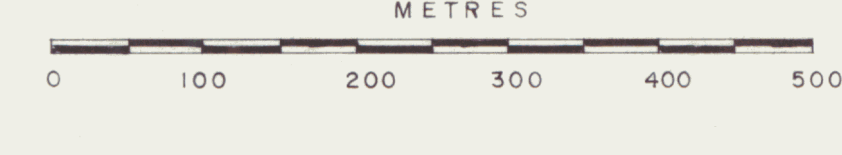
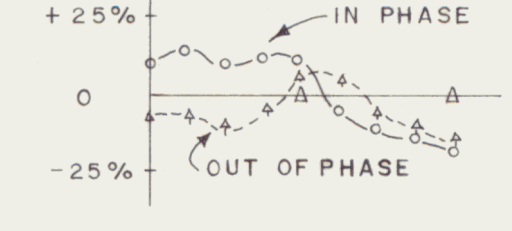
▲ ——— ▲ 1980 GEOPHYSICS GROUND GRID
 INSTRUMENT : MAX MIN II
 ○ ——— ○ IN PHASE
 △ ——— △ OUT OF PHASE
 CONDUCTOR LOCATION
 ■■■■■■ DEFINITE
 ▒▒▒▒▒ PROBABLE
 ▨▨▨▨ POSSIBLE
 E ——— INDICATED CONDUCTOR



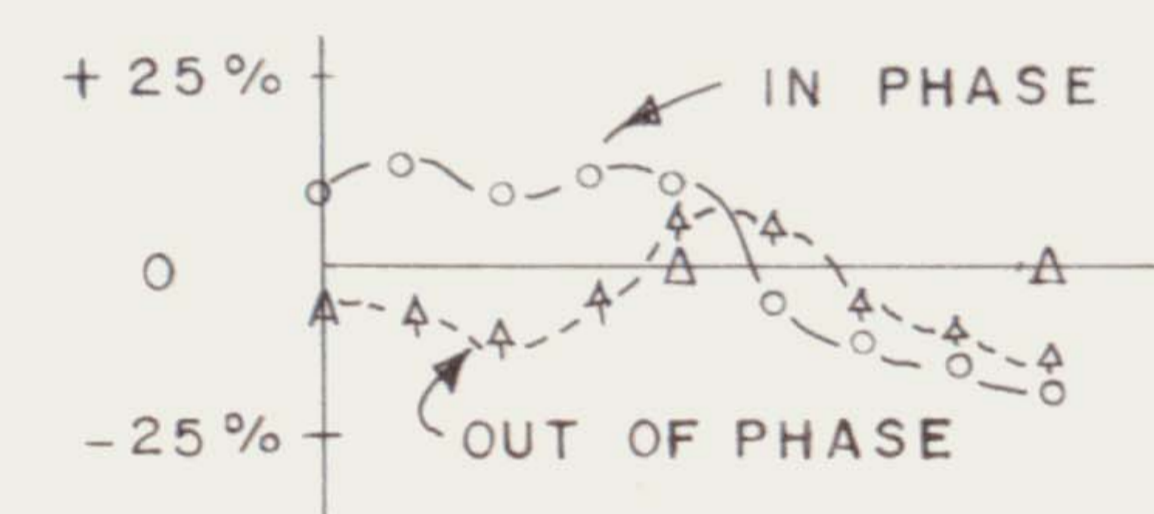
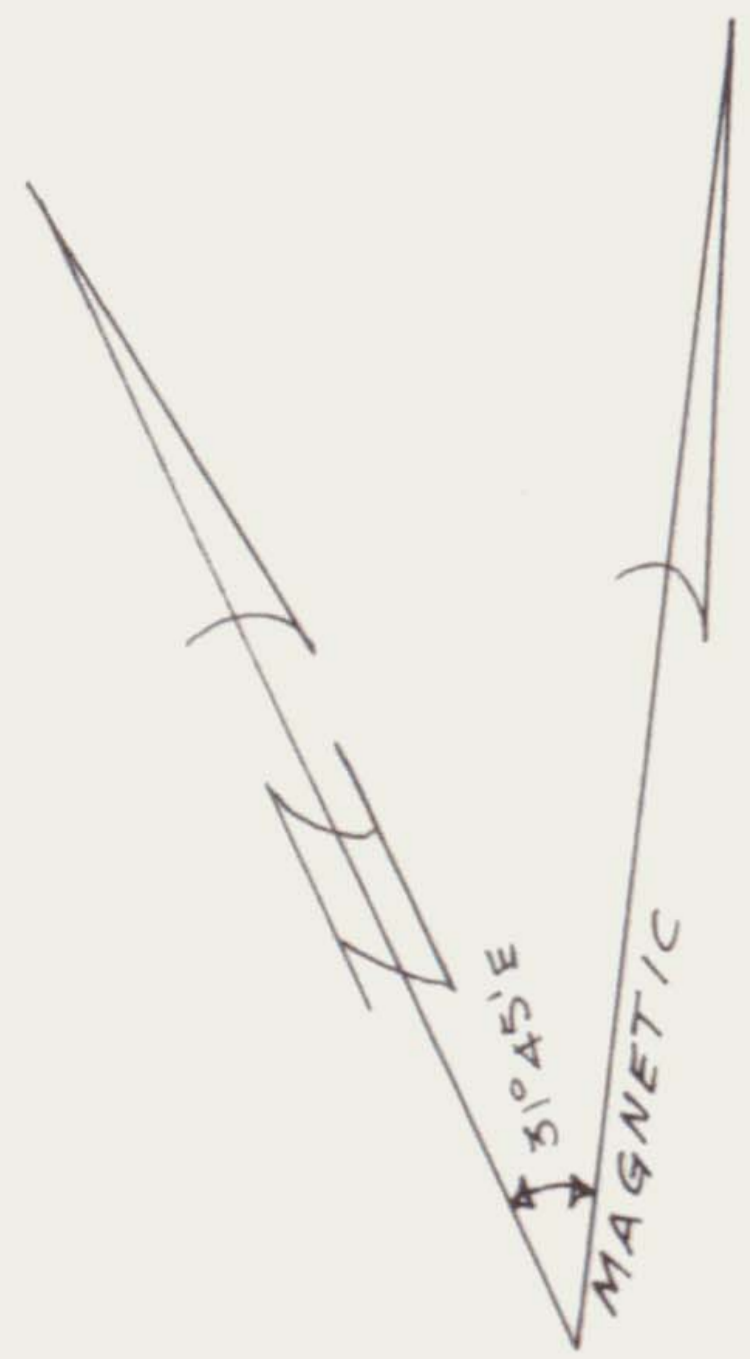
TUM GROUP				NTS 105-L-11
Drawn by:	Traced by:			
Revised by	Date	Revised by	Date	NORTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 100 m COIL SEPARATION, 1777 Hz WHITEHORSE M.D., YUKON
Scale: 1 : 5000		Date: SEPT 1980		Plate: 178-80-12



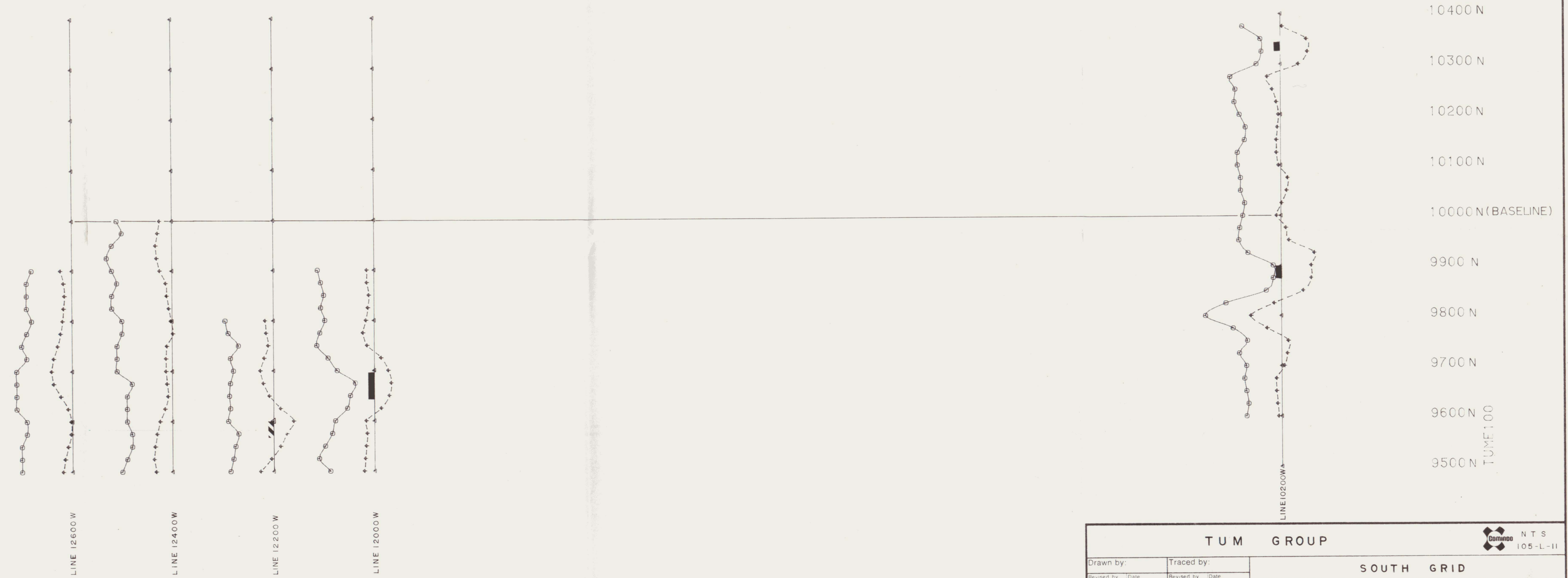
▲ ——— ▲ 1980 GEOPHYSICS GROUND GRID
 INSTRUMENT : MAX MIN II
 ○ ——— ○ IN PHASE
 ◊ ——— ◊ OUT OF PHASE
 CONDUCTOR LOCATION
 ■■■■■■ DEFINITE
 ▒▒▒▒▒▒ PROBABLE
 ▨▨▨▨▨ POSSIBLE
 E INDICATED CONDUCTOR



TUM GROUP				 NTS 105-L-11
Drawn by:	Traced by:	NORTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 50 m COIL SEPARATION, 1777 Hz WHITEHOUSE M. D., YUKON		
Revised by:	Date:	Revised by:	Date:	Scale: 1:5000
				Date: SEPT 1980
				Plate: 178-80-13



- △ — △ 1980 GEOPHYSICS GROUND GRID
- INSTRUMENT : MAX MIN II
- — ○ — ○ IN PHASE
- △ — △ — △ — △ — △ OUT OF PHASE
- CONDUCTOR LOCATION
- █ DEFINITE
- ▒ PROBABLE
- ▤ POSSIBLE
- E INDICATED CONDUCTOR



TUM GROUP				NTS 105-L-11	
Drawn by:		Traced by:		SOUTH GRID HORIZONTAL LOOP ELECTROMAGNETIC SURVEY 100m COIL SEPARATION, 1777Hz WHITEHORSE M.D., YUKON	
Revised by:	Date:	Revised by:	Date:		
Scale: 1 : 5000		Date: SEPT. 1980		Plate: 178-80-14	