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A REPORT ON
EIP AND TOTAL MAGNETIC FIELD SURVEYS
OVER THE WEST HENTY GRID
NEAR QUEENSTOWN, TASMANIA
ON BEHALF OF
THE MT LYELL MINING & R'WAY COMPANY LTD.

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A REPORT ON
GRADIENT ARRAY RECONNAISSANCE EIP
AND TOTAL MAGNETIC FIELD SURVEYS
OVER THE WEST HENTY GRID
NEAR QUEENSTOWN, TASMANIA
ON BEHALF OF
THE MOUNT LYELL MINING & RAILWAY COMPANY LTD.

BY

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SYDNEY, N.S.W.

JUNE, 1979
TAS-062B

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SCINTREX PTY. LTD.

GEOPHYSICAL CONSULTANTS AND CONTRACTORS

SUMMARY

The induced polarization survey over the Henty River grid has revealed a number of significant electrical induced polarization anomalies associated with the contact zone between the Mixed Volcanics and Tuffaceous Shales. As mineralisation has been recorded associated with this contact, these anomalies must be considered of potential economic interest.

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A REPORT ON

GRADIENT ARRAY RECONNAISSANCE EIP AND TOTAL MAGNETIC FIELD SURVEYS OVER THE WEST HENTY GRID NEAR QUEENSTOWN, TASMANIA

ON BEHALF OF

THE MOUNT LYELL MINING & RAILWAY COMPANY LTD.

INTRODUCTION

At the request of Mr. K. Reid, Chief Geologist for Mount Lyell Mining & Railway Company Ltd., Scintrex Pty. Ltd. executed gradient array reconnaissance electrical induced polarization and total field magnetometer surveys over the West Henty River grid. The work was supervised on site by Mr. R. Meares, Senior Exploration Geologist for Mt. Lyell.

The work was undertaken in two periods - the first under Mr. G. Street,B.Sc., and Mr. R. Sims over 6.75 production days between 26th June and 8th July, 1978, the work being curtailed by snow, and second with Mr. R. Bennett as party leader on 5 double operator days between 10th and 18th January, 1979.

METHOD AND EQUIPMENT

The EIP surveys were executed using a Scintrex 2.5 kilowatt induced polarization transmitter to energise the gradient array, while the resultant primary (resistivity) and secondary (chargeability) potential fields were recorded using Scintrex IPR-8/10 receivers.

The total magnetic field was recorded using several on-line Scintrex/ Geometrics total field proton precession magnetometers and a local base station read every 3 minutes(±) to correct the data for variation in the magnetic field.

DATA PRESENTATION

Lines to the north of 5N were surveyed on a metric grid, while lines to the south from 4N were surveyed on an imperial grid.

The *contoured data* is presented at the geological mapping scale of 1:2500.

The *magnetic field data profiles* are shown on a 1:1200 scale for the imperial grid and a 1:2500 scale for the metric grid. In the former, 25 feet stations were read, and in the latter 12.5 metres. The metric grid vertical scale is 1 centimetre = 20 gamma while the imperial grid employs a 1 inch = 100 gamma scale.

The *induced polarization data profiles* are presented on the same horizontal scales as for the magnetic field data with vertical scales as follows: 25m potential electrode spacing

	Imperial Grid	Metric Grid
Resistivity in ohm-metres	5 inch log cycle	10 centimetre log cycle
Chargeability in millivolts/volt	1 inch = 5mV/V	1 centimetre = 2 mV/V
ΔM in millivolts/volt	1 inch = 2mV/V	-

CURRENT ELECTRODES:	LINE	LOCATION
BLOCK ①	2N	5000E
BLOCK ②	8N(W) 9N(E)	

DISCUSSION OF THE DATA

THE CONTOUR INTERPRETATIONS - CORRELATION WITH MAPPED GEOLOGY

The geological data supplied has been used to bias the contour interpretations of the chargeability, resistivity and total magnetic field data presented in Plates 1, 2 and 3 respectively. On the whole there is an excellent correlation between the geological data and geophysical data although there are a number of discrepancies.

The unit mapped as *Mixed Volcanics* which outcrops over all lines to the west, is characterised by moderate to low chargeability background with no significant induced polarization responses superimposed thereon to the south of 5N, while to the north although the backgrounds appear the same at 12 millivolts/volt(±), a distinct series of twice background anomalies were recorded. The resistivity does not uniquely define the unit against the shales to the east. With the exception of two responses, the majority of significant local increases in magnetic field occur within the mixed volcanics, although the strike direction of these features is not always in accord with that suggested by the geological mapping.

To the east of the *Mixed Volcanics* a group mapped as *Tuffaceous Shales and Greywackes* have a slightly higher background of the order of 17 millivolts/volt and have a number of moderate increases in chargeability which may be significant. The strike of these is approximately parallel to the geological strike to the south of 9N, but in the north, a distinct strike difference was recorded. The

associated resistivities are a high 7000 to 15,000 ohm-metres, and a slight difference in strike of the highs/lows is inferred to that indicated from geological mapping, particularly north of 9N. The total magnetic field data with a number of exception, shows this unit to be of low amplitude south of 8N. North of this line substantial increases in magnetic field along specific horizons, progressing in frequency and amplitude to the north, infer a facies change to the north.

Also a marked fall-off in magnetic field on the eastern flanks of lines 10N to 13N infer a rock type change there also.

East of the Henty River, the *Felsic Volcanics* were mapped only on lines 1S to 4N. On these lines the resistivities show a fall from 7000 to 10,000 ohm-metres in the west to 3000 to 5000 ohm-metres in the east. The inferred strike is parallel to the Henty River. The magnetic field remains quiet over this section as does the chargeability (save for western sections of lines 3N and 4N).

The mineralisation outcrops on line 4N at 2500E and on line 1N at 3000E within the *Tuffaceous Shales and Greywacke* unit immediately east of the conformable contact with the *Mixed Volcanics* unit. The resistivity data does not uniquely show the northern mineralisation, although a resistivity high occurs in the vicinity of it, while the southern outcrop is characterised by lower resistivities. The chargeability data shows a distinct, sharp, 2.5 times local background response to 25 millivolts/volt, while the northern response

has no distinct chargeability, although a major chargeability high was seen to the north along the same stratigraphic horizon.

It is therefore concluded that the most favourable location for the location of induced polarization responses would be on, or in close proximity to the *Mixed Volcanics/ Tuffaceous Shales* contact.

LINE BY LINE DESCRIPTION

Each of the lines surveyed is separately discussed below and inter-line correlations are suggested.

LINE 1S (2025E - 4025E Imperial)

The Mixed Volcanics are seen as having a background resistivity of about 6000 ohm-metres with individual maxima to 14,000 ohm-metres. The chargeability background is about 10 millivolts/volt. The only response of note within this unit is of 4 millivolts/volt above background at 2485E. The source is considered to be disseminated, and perhaps silicified also as the resistivity is a high 14,000 ohm-metres.

Within the Tuffaceous Shales and Mixed Volcanics and close to the boundary, two small, but distinct chargeability maxima of 5 millivolts/volt superimposed on a 12 millivolts/volt background were recorded at 2875E and 2975E. While the associated resistivity is high at 4000 ohm-metres and 7000 ohm-metres respectively, it is *lower* than the adjacent high values of 10,000 to 14,000 ohm-metres. The source

therefore is disseminated chargeable material within a host less resistive than the enclosing rocks. The maximum depth to source is about 75 feet.

East, across the Henty River, the chargeability has a background of about 15 millivolts/volt on which 5 millivolts/volt responses were superimposed at 3625E and 3900E. Again, disseminated sources at estimated depths of 50 feet and 75 feet are interpreted.

The magnetic field remains quiet.

LINE 00 (2000E-4000E imperial)

The chargeability levels are similar to those recorded on line 1S, as are the observed resistivities.

While the geological map infers an absence of shales on this line, the resistivity data infers a correlation between resistivity maxima at 2937E and 3025E on line 00 and 2937E and 3037E on line 1S. An anomaly of 3.5 millivolts/volt at 2925E, and a similar response at or east of 3025E *may* be related to similar responses which were recorded in the vicinity of the line 1S shales. The maximum depth to source is between 50 and 75 feet. In this case a relatively strong magnetic anomaly centred at about 2900E infers a magnetic source centred west of 2900E and dipping west.

East of the Henty River within the Felsic Volcanics, the sole

significant response was a 4 millivolts/volt above the high 15 millivolts/volt background at 3375E. The local increase in resistivity infers a resistive source. The fast decay form infers a fine grained source.

LINE 1N (2025E - 3975E imperial)

The backgrounds observed over the Mixed Volcanics are similar to those seen to the south, namely, 10 millivolts/volt and 6000 to 10,000 ohm-metres.

Two small anomalies of about 6 and 5 millivolts/volt above background were observed centred at 2625E and 2735E which *may* be related to relative resistivity lows of 3000 ohm-metres and 4000 ohm-metres at 2575E and 2675E. Two magnetic field increases of 180 gamma and 300 gamma centred at 2600E and 2775E may also be related. (The magnetic field anomalies appear to correlate with lesser anomalies at 2675E and 2850E on line 00). The maximum depth to the source of the chargeability is estimated at 75 to 100 feet in both cases.

As one would expect, a significant 15 millivolts/volt above background response was located centred at 2975E. While the resistivity shows a decrease to 4000 ohm-metres, the source remains essentially disseminated. While the sulphides actually outcrop, the maximum depth to source looks to be about 200 feet. This perhaps indicates the influence of a gradual build-up in sulphides rather than a sharp contact with the host rocks on the depth estimate. It may be

significant that the low resistivity section has a much narrower source, and a maximum depth of less than 50 feet.

To the east of the Henty River, higher backgrounds of 15 millivolts/volt were again noted on the Felsic Volcanics. The sole significant induced polarization maximum was 5 millivolts/volt above this background and accompanied by high resistivities between 700 and 10,000 ohm-metres centred at about 3525E. The magnetic field remained quiet over the Felsic Volcanic unit.

LINE 2N (2025E - 3975E imperial)

The background over the Mixed Volcanics is about 10 millivolts/volt west of 2475E, but rises to 12 to 14 millivolts/volt to the east of that point. A 5 to 7 millivolts/volt response above background was recorded at 2525E accompanied by relatively higher resistivities. This feature was also accompanied by a 700 gamma increase in magnetic field, which, together with a faster than average decay form, infers a disseminated magnetite rich source at a depth no greater than 150 feet.

Higher chargeabilites were recorded either side of the Mixed Volcanics/Tuffaceous Shales boundary in two maxima of about 5 and 7 millivolts/volt above background centred at 2875E and 2975E, both within extremely high resistivity of 12,000 ohm-metres.

The general correlation between lines 2N and 1N east of the Henty River is excellent, the form of both the resistivity and chargeability data profiles being similar. The chargeability maximum seen at 3525E on line 1N is seen as a lesser response at 3475E on line 2N. A sharp rock type change seen as a 4 to 5 fold increase in resistivity to the west takes place at 3610E on line 1N and 3565E on line 2N. As to the south, the magnetic field remains quiet.

LINE 3N (2025E - 4075E imperial)

Overall, the chargeability background over the volcanics increases from 10 millivolts/volt seen to the south, to 13 millivolts/volt, while the resistivity is a lower background of 5000 to 6000 ohm-metres. The sole significant EIP response within the volcanics was recorded at 2675E where a 5 millivolts/volt response was recorded from rocks having 6000 ohm-metres resistivities. The maximum depth to source is about 120 feet. Two significant increases in magnetic field were noted at 2290E and 2525E of 500 gamma and 160 gamma respectively. The source is no doubt disseminated pyrrhotite within resistive rocks (perhaps a rock type).

A moderate induced polarization response was recorded at 2875E of 9 millivolts/volt above background, which has a slower than average decay form.* This, together with the 6000 ohm-metres resistivity infers a coarse grained sulphide source at a maximum depth of 180 feet. As this anomaly lies within the favourable horizon, it may be worthy of follow-up.

* Note: In this case average decay is about -1 millivolts/volt

The Felsic Volcanics section east of the Henty River shows higher backgrounds between the river and 3450E, 18 millivolts/volt chargeabilities being recorded from rocks more resistive than those to the east. The resistive/less resistive rock contact referred to above could lie at 3450E on this line. As to the south, the magnetic field remains quiet over the Felsic Volcanics.

LINE 4N (2025E - 4025E imperial)

A 250 feet sinistral displacement was noted between lines 4N and 3N, close to the former. At about 2500E mineralisation has been recorded, however, no significant induced polarization responses were recorded on this line associated with this showing. The backgrounds over the shales were about 15 millivolts/volt, with a 4 to 5 millivolts/volt response at 2775E being the only significant response over that background. The associated resistivity increases to 14,000 ohm-metres from 6500 ohm-metres indicating a disseminated source no deeper than 75 feet.

The magnetic field shows two maxima of 220 gamma and 140 gamma at about 2300E and 2125E respectively. These correlate with responses at 2525E and 2300E on line 3N, and therefore infer a displacement of the field of about 220 feet (along the traverse).

The background over the Felsic Volcanics remains at about 15 millivolts/volt, however, a 12 millivolts/volt anomaly centred at or west of 3225E within falling, *but still high*, 6000 ohm-metres

resistivities may be significant. Unfortunately the river precluded readings west of 3225E. In broad outline lines 3N and 4N are similar and infer a grid north south strike between them.

LINE 5N (2600E - 3000E metric)

The geological mapping indicates the boundary between the Mixed Volcanics to the west and the Tuffaceous Shales to the east, to lie at about 2810E. Over the former, the backgrounds were 10,000 ohm-metres (±) and 12 millivolts/volt. Close to the boundary a significant 26 millivolts/volt response was recorded at 2812E. This is about twice the background over the volcanics and 50% greater than the background of the Shales to the ~~west~~ EAST. The maximum depth to source is not greater than 50 metres, while the form suggests an east dip to the source. However, resistivities of 7000 ohm-metres at 2837E *may?* infer greater interconnection within the chargeable source at depth. A sharp coincident increase in magnetic field indicates the source in part consists of magnetite.

A second response of about 5 to 6 millivolts/volt associated with a doubling of resistivity to 18,000 ohm-metres comes from a disseminated chargeable source no deeper than about 40 metres and is located at about 2962E.

On this line, and lines to the north, no EIP data was acquired east of the Henty River.

LINE 6N (2600E - 3000E metric)

While the general form of the profile is the same as 4N, with significant features being sinistrally displaced about 25 metres on a co-ordinate basis, no significant responses were recorded. The equivalent stratigraphic point on this line to the 26 millivolts/volt response on line 5N is 2790E, but the chargeability at this point is minor.

LINE 7N (2600E - 3000E metric)

The mapping shows the critical Volcanics/Shales boundary to be at about 2800E. In this case all three parameters indicate no significant changes across this boundary. Two significant induced polarization anomalies were recorded.

The largest was within the Mixed Volcanics unit, centred at 2690E. Here, a 10 millivolts/volt above background response was associated with high ~~6000~~ 9000 ohm-metres resistivities and a sympathetic increase in magnetic field by 100 gamma. The source therefore contains magnetite but this alone is not the sole source of the anomaly. Sulphides (or graphite) would have to be present also. Pyrrhotite alone *could* cause the response. The maximum depth to source is assessed to be 50 metres, and the shape of the anomaly suggests a west dip.

The second, less significant response, lies within the Shales at 2925E. A 6 to 7 millivolts/volt anomaly on an 18 millivolts/volt background was recorded from 10,000 ohm-metres material. In this

case no material increase in magnetic field was recorded. Thus the source is sulphides and/or graphite in disseminated form at a maximum depth of 40 metres.

LINE 8N (2500E - 3000E metric)

The Volcanics/Shales boundary is at 2700E. No feature on any of the three parameters marks the transition, although a distinct break in magnetic field pattern was noted at 2650E within the volcanics. Two maxima were recorded at 2590E and 2690E of 7-6 millivolts/volt and 4 millivolts/volt above the high 16 millivolts/volt background. The maximum depths to the source in each case looks to be about 40 metres. The high 5000 and 10000 ohm-metres resistivities show the source to be disseminated.

The shale section has anomalies of 6 millivolts/volt at 2760E and 2860E. The former from a narrow source, and the latter from a broad (50 metres) source. The high resistivity also infers a disseminated source.

LINE 9N (EIP: 2500E - 3000E; Magnetics: 2500E - 4000E metric)

The mapped Volcanics/Shales contact is at 2645E on this line. In this case the Volcanics show a distinct increase in activity to 100 gamma plus, over the quiet conditions of the Shales. Similarly east of the contact (see below) the background over the Shales is 16 to 18 millivolts/volt and shows no major variations from these levels. Unlike line 7N, there is a sharp change in resistivity

at the boundary whose inflexion infers a major contact from more resistive material to the east (5000 ohm-metres) to 1600 ohm-metres to the west.

Associated with this relative resistivity low at 2637E are two responses almost certainly related - they are 3 and 8 millivolts/volt above background responses centred at 2612E and 2660E. These anomalies are associated with 120 and 40 gamma magnetic responses respectively, therefore magnetite (or pyrrhotite) make a contribution to the chargeable source. The maximum depths are estimated to be 25 to 35 metres in each case.

The magnetic field over the Felsic Volcanics is as usual, quiet.

LINE 10N (2400E - 3000E metric)

The Volcanics/Shale contact on this line was mapped at 2650E.

While the magnetic field is very quiet east of 2625E, and extremely active west of 2600E, the resistivity data shows a broad similarity with lower (3000 ohm-metres) resistivities over the Volcanics and higher (10,000 ohm-metres+) resistivities over the Shales. The contact between these units is, however, gradual and not sharp as seen on line 9N.

The most significant induced polarization anomaly was recorded centred at 2575E where an ~~18~~ 14 millivolts/volt above background (17 millivolts/

volt) response was recorded from a source at, or in close proximity to the contact. The asymmetry of the response suggests a west dip and a maximum depth to source of 50 metres. The anomaly is associated with a 1200 gamma magnetic response which indicates that a sulphide/ graphite source contains magnetite or pyrrhotite.

A second relatively minor maximum of 5 to 7 millivolts/volt above background was recorded at 2662E again on a resistivity change whose inflexion (contact) has a resistivity of 10,000 ohm-metres. A 50 gamma coincident increase in magnetic field was recorded also.

There were no other significant anomalies on this line, although increase in chargeability to 17 millivolts/volt at 2838E and at 3000E correspond to more significant responses along strike to north and south. (See contour map)

The magnetic field remains quiet over the Tuffaceous Shales group, however, a fall to the east of 2925E, coinciding with an increase in chargeability, may indicate a rock type change at this point.

LINE 11N (2300E - 3000E metric)

The major feature on the resistivity data is a sharp change from 3000 ohm-metres plus, to 10,000 ohm-metres(±) which takes place at 2512E. This marks a major rock type change at this point. This is close to the mapped contact between the Tuffaceous Shales to the east and the Mixed Volcanics to the west. The magnetic field,

however, remains quieter only east of 2600E.

A moderate induced polarization response of 5 millivolts/volt was recorded coincident with the rock type change at 2512E and is obviously related to the major anomaly at 2575E on line 10N. In this case, however, the material increase in magnetic field is not confined to the EIP anomaly, but was defined between 2450E to 2512E ±50 metres. Therefore the source is considered to be sulphides (or graphite). The maximum depth to source is of the order of 50 metres. The importance of this response may be underestimated in that the chargeability background over the Volcanics is 14 millivolts/volt, so that the EIP response of 8 millivolts/volt contrasts with 4 millivolts/volt on the Tuffaceous sediment background of 18 millivolts/volt.

The magnetic field is much less quiet than seen to the south, inferring a change in facies to the north where increasingly greater magnetite content is clearly inferred by magnetic field increases.

The eastern sector of the field shows a material fall-off east of 2900E. This correlates with similar changes to the north and south, and indicates a further rock type change.

LINE 12N (2300E - 3000E metric)

The Volcanics/Shales contact is mapped just west of 2400E. The resistivity data does not reflect such a dramatic change at this

point as seen on 11N along strike. However, a significant 8 millivolts/volt increase in the 16 millivolts/volt background was observed between 2390E and 2437E from a source at a maximum depth of 30 metres. (The source itself is wide, say 25 to 40 metres). Unlike the stratigraphically equivalent responses to the south, there is no rise in magnetic field over the anomaly.

A most significant increase in chargeability to 32 millivolts/volt was recorded at 2960E. This lies within the fall-off in magnetic field which takes place to the east of 2912E. A decrease of 40% in the apparent resistivity to 6000 ohm-metres infers a disseminated source, graphite or sulphides, with some interconnection between grains. The maximum depth is about 50 to 60 metres.

The fall-off in magnetic field which takes place east of 2912E may infer a change in rock type.

Substantial increases in magnetic field to 62,800 gamma (±) from the 62,600 gamma background were noted between 2750E and 2900E with two distinct maxima at 2850E and 2890E. These maxima show minor decreases in resistivity, but lie in a major decrease in chargeability. This feature was first seen in minor form on line 11N at 2880E ±20 metres, and continues north as an increased magnetic field anomaly. This also obviously represents a marked facies change along strike.

LINE 13N (2300E - 2950E metric)

The resistivity change between Volcanics to the west and Tuffaceous Shales to the east takes place at 2375E while the mapped contact is at 2325E. This difference could well be due to some conduction within the significant increase in chargeability to 27 millivolts/volt from 17 millivolts/volt background. Like the equivalent anomaly to the south, there is no change in the magnetic field, therefore the source is disseminated or weakly interconnected shales or sulphides within a less resistive host. The maximum depth is 50 metres while the asymmetry of form suggests an east dip.

Increases in magnetite content in the shales within interfingering horizons are inferred by significant increases in magnetic field centred at 2527E, 2625E and between 2750E±25 metres and 2875E. Little or no change in resistivity was noted, however, in the case of the latter a depression in chargeability within the most magnetic section was accompanied by small but significant increase in chargeability at 2762E and 2890E of 4 millivolts/volt and 7 millivolts/volt. The two chargeability responses have maximum depths to the graphite or sulphide sources of 40 metres.

To the east of 2880E the magnetic field falls away, indicating a rock type change in that direction.

CONCLUSIONS

1 - The contour interpretation in general agrees well with the mapped units as displayed on Henty River grid map #1/012 (1:2500 scale. In detail however, the magnetic field contours show a contrary trend, particularly south of line 5N. This could be due to cross cutting intrusions, but is considered more likely to be due to 'en-echelon' magnetic horizons of short strike length, or folding,or faulting (unmapped) within the Mixed Volcanics.

Magnetite-bearing lenses occur thoughout the Mixed Volcanics unit and often (but not always) occur with higher chargeability. In the south, magnetic highs occur with chargeability lows, both in this unit and in the Tuffaceous Shale unit. The latter has no significant magnetic field distortions in the south, but north of line 9N substantial increases along specific horizons infer a facies change in the north.

2 - A series of induced polarization maxima were recorded from the Mixed Volcanics/Tuffaceous Shale boundary, which from their stratigraphic position, must be considered of possible economic interest. In particular the anomalies on lines 10N and 5N are considered to be of prime interest.

3 - The significant induced polarization responses recorded in the area are as follows:

3N at 2875E ..... disseminated source within a resistive host; maximum depth 180 feet ±20 feet; slow decay form infers a coarse grained source. The anomaly lies within Tuffaceous Shales.

5N at 2812E ..... a 12 millivolts/volt above background response from a source interpreted to be 50 metres deep at most and dipping to the east, is located in the vicinity of the Volcanics/Shale conformable contact. This is a most significant response, particularly as it lies north of the mineralisation noted on line 4N.

7N at 2690E ..... A significant 10 millivolts/volt above background response was recorded from a resistive 6000 ohm-metres source. A sympathetic increase in magnetic field by 100 gamma shows magnetite or pyrrhotite to contribute to the source. The former alone, however, could not cause the anomaly. The maximum depth is about 50 metres, and the form suggests a west dip. The anomaly lies well within the volcanics.

7N at 2925E ..... A 6 to 7 millivolts/volt response from a resistive host at a maximum depth of 40 metres is considered of secondary interest.

10N at 2575E ..... The most significant induced polarization response recorded in the area has an 18 millivolts/volt response associated with a marked change in rock type as indicated by a three fold increase in resistivity. The source contains magnetite

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and/or pyrrhotite as indicated by a coincident 1200 gamma increase in magnetic field, but should also contain other sulphides or graphite. The maximum depth to source is about 50 metres. The asymmetry infers a west dip.

11N at 2512E ..... The anomaly at this point is a relatively small 5 to 8 millivolts/volt but is the northerly extension of the substantial anomaly described above. The maximum depth to source is 50 metres. The response is of secondary interest, but its stratigraphic location, together with the responses to the south, enhances its interest.

12N at 2390E-2437E ..... 8 millivolts/volt response on or in close proximity to the Volcanics/Tuffaceous Shale contact. The maximum depth is 30 metres(±) to the broad (25 to 40 metres) source. The source is sulphides (or graphite), there being no magnetic field increase.

12N at 2960E ..... A 32 millivolts/volt response about 14 millivolts/volt above the overall background, is associated with a 40% drop in resistivity to 6000 ohm-metres. The source, disseminated sulphides and/or graphite showing weak interconnection within the source, lies at a maximum depth of 50 to 60 metres. The fall in associated magnetic field infers the anomaly to be unrelated in form to any other response recorded to the south and west, and may lie in a rock type other than Tuffaceous Shales or the geophysical characteristics are different.

13N at 2337E ..... A significant response of 8 to 9 millivolts/volt above background lies on lower than background resistivity of 6000 ohm-metres on the contact between the Tuffaceous Shales to the east and the Mixed Volcanics to the west. While the anomaly itself is 'moderate' in amplitude, the favourable location enhances its interest. The maximum depth to the source which contains sulphide and graphite and has an inferred east dip, is 50 metres.

13N at 2762E & 2890E ..... increases in chargeability of 4 and 7 millivolts/volt against background are associated with little or no change in the high resistivity of 10,000 ohm-metres. This infers a disseminated source - sulphides or graphite - which is present either side of a magnetite rich disseminated zone between 2775E to 2875E. The maximum depths to source are about 40 metres.

Respectfully submitted on behalf of:

SCINTREX PTY. LTD.

A.W. HOWLAND-ROSE, MSc, DIC, AMAusIMM, FGS.

GEOPHYSICIST

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LINE 13N

West Henty Area

Magnetics

MAS-062

62884

62800 S

62700 S

62600 S

62500 S

2300E

2400E

2500E

2600E

2700E

2800E

2900E

3000E

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026

LINE B.N

West Henty Area

GRADIENT ARRAY E/P

TAS-067

Resistivity in ohm-metres

20,000

10,000

5,000

Chargeability in milliseconds per volt

28

24

20

16

12

8

4

0

2300E

2400E

2500E

2600E

2700E

2800E

2900E

3000E

M1

M2

M3

K&E KEUFFEL & ESSER CO. MADE IN U.S.A. 10 X 15 CM.

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West Hemlj Area

Magnetics

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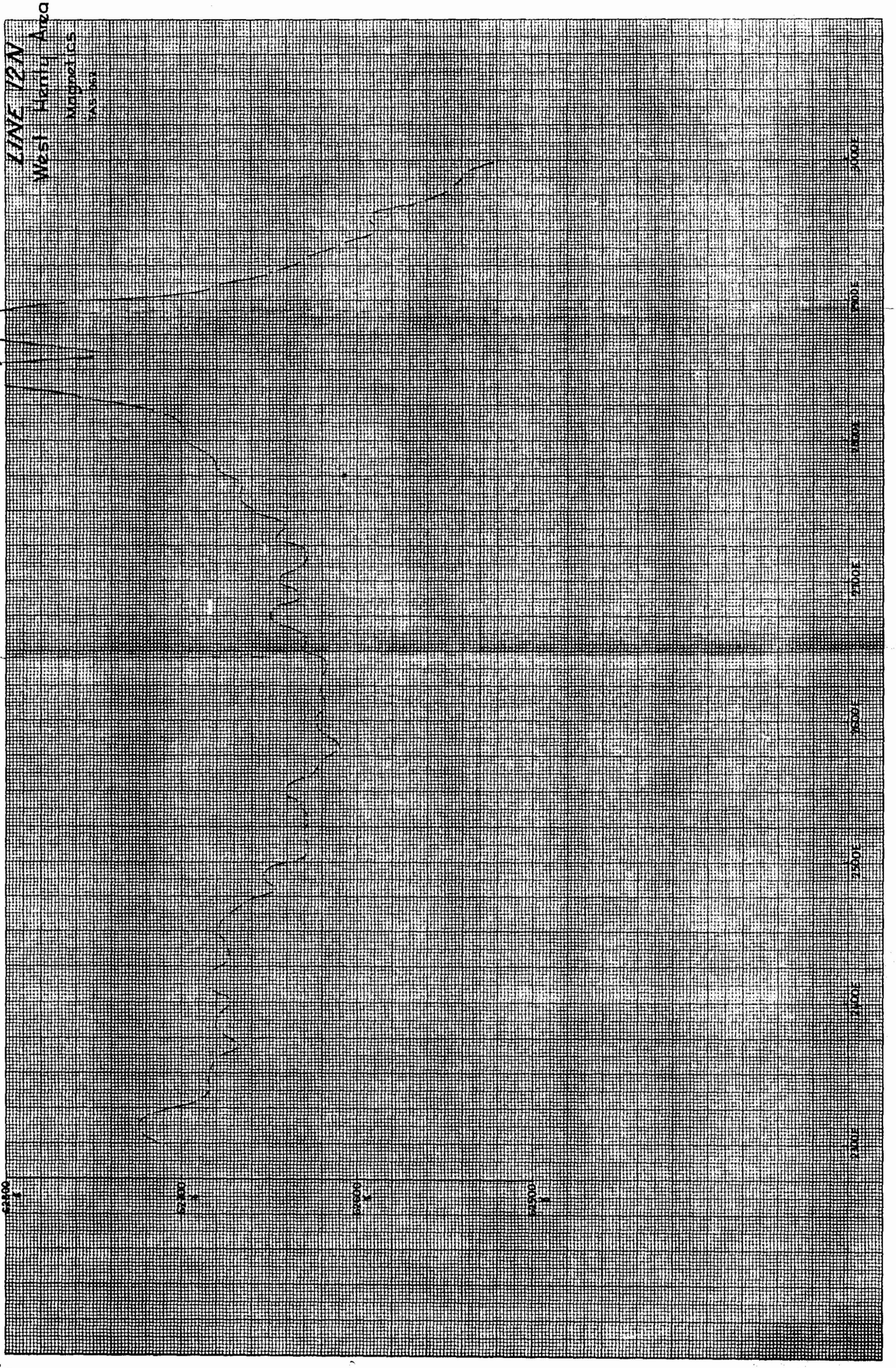


027

K•E KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE CENTIMETER • 25 X 25 CM.

T151 TA

028

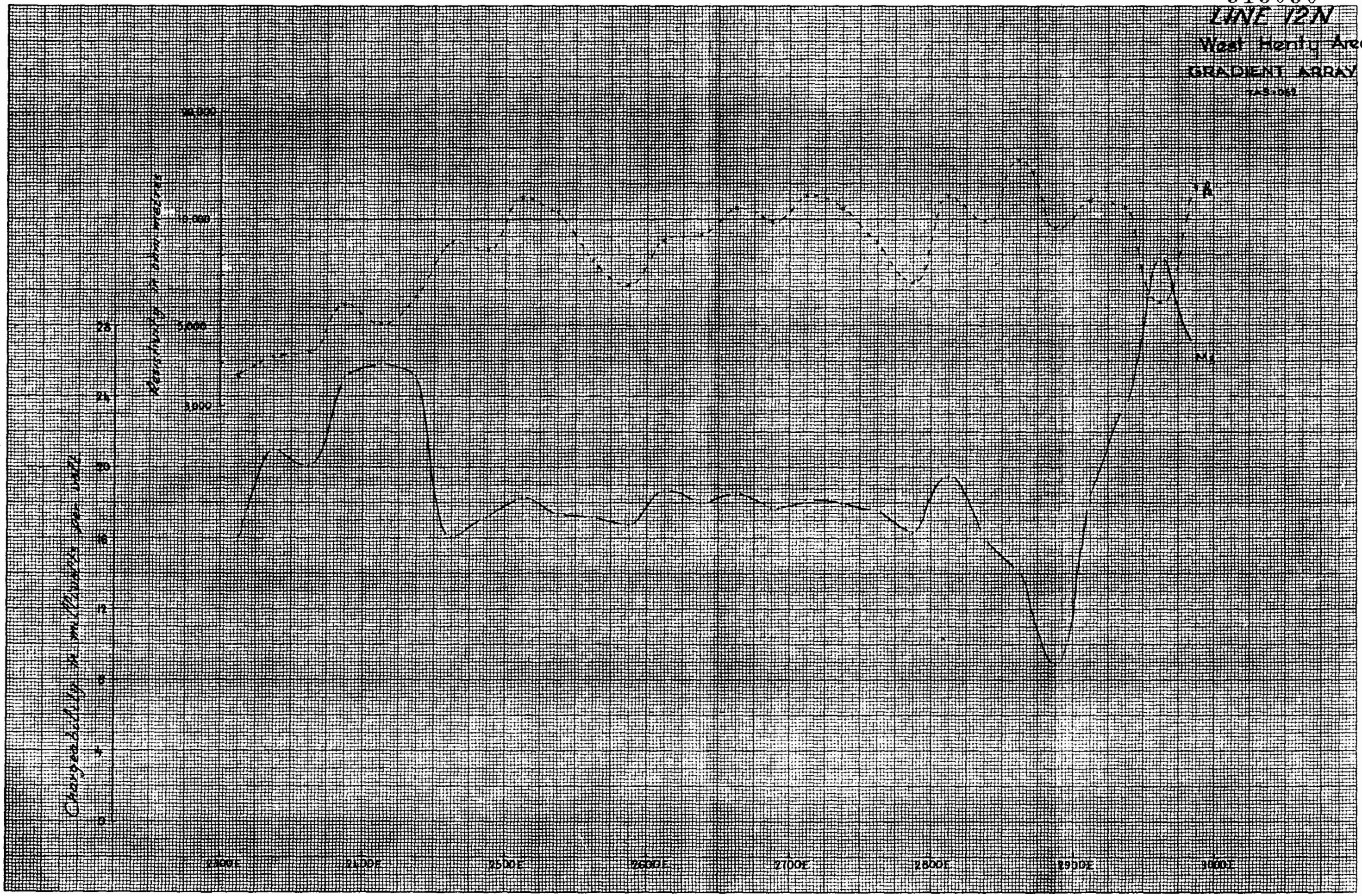
313030

LINE 12N

West Henty Area

GRADIENT ARRAY EIP

PAS-062



K&E 10 X 10 TO THE CENTIMETRE 359-10 X 25 CM
KEUFFEL & ESSER CO. MADE IN U.S.A.

12N 12

Copyright Geophysical Services Pty. Ltd.

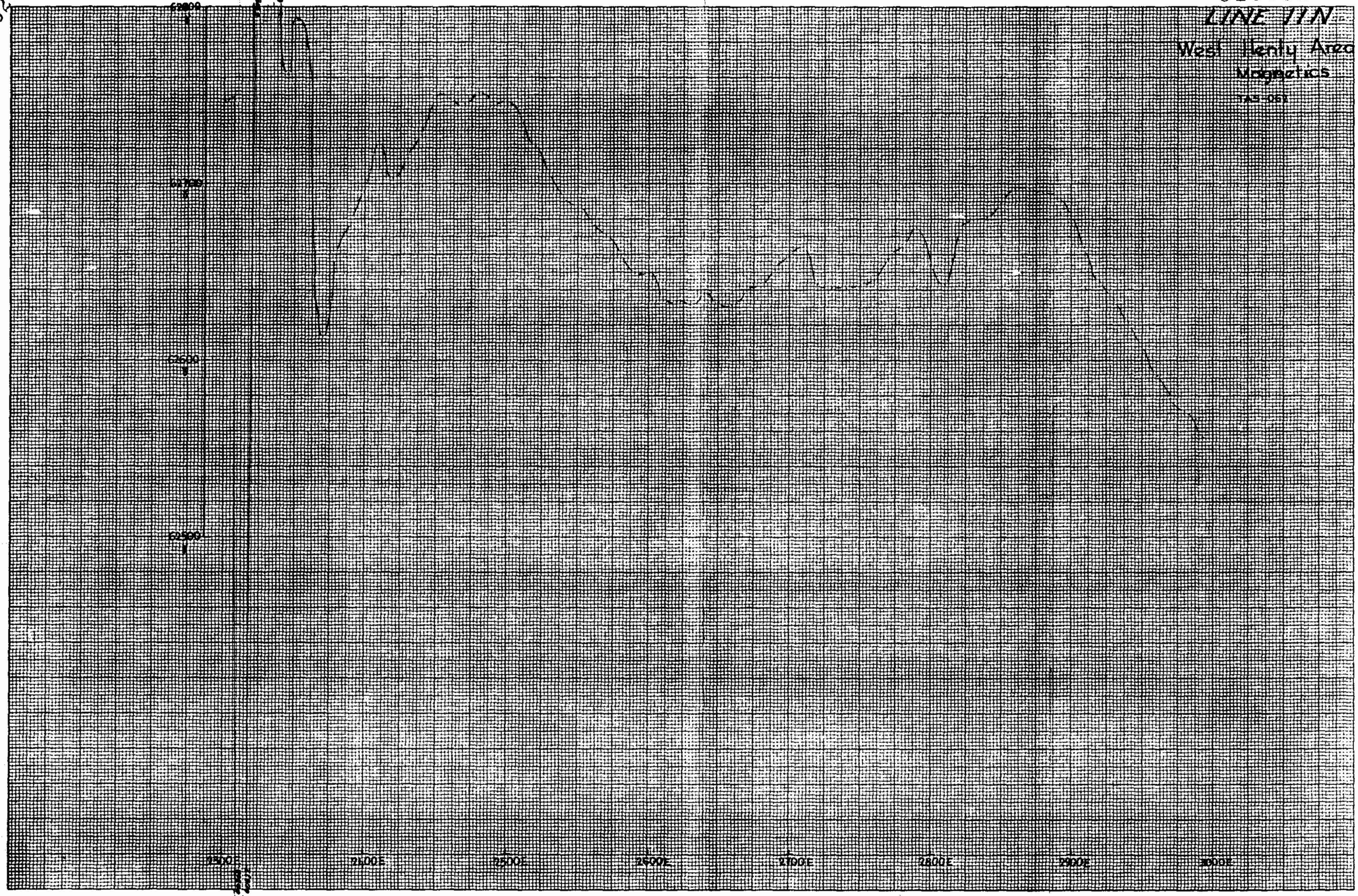
313031

LINE 11N

West Henty Area

Magnetics

TAS-061



030

313032

LINE 11N

West Henty Area

GRADIENT ARRAY EIP

TAS-061

Resistivity (ohm-m)

10,000

5,000

3,000

Chargeability (milliseconds)

20

16

12

8

4

0

2300E

2400E

2500E

2600E

2700E

2800E

2900E

3000E

031

313033

LINE 10N

West Henty Area

Magnetics

K&E

KEUFFEL & ESSER CO. MADE IN U.S.A.

CM. 25 X 25 CENTIMETERS

47 1512

2818

2842

62800

62700

62600

62500

2400E

2500E

2600E

2700E

2800E

2900E

3000E

032

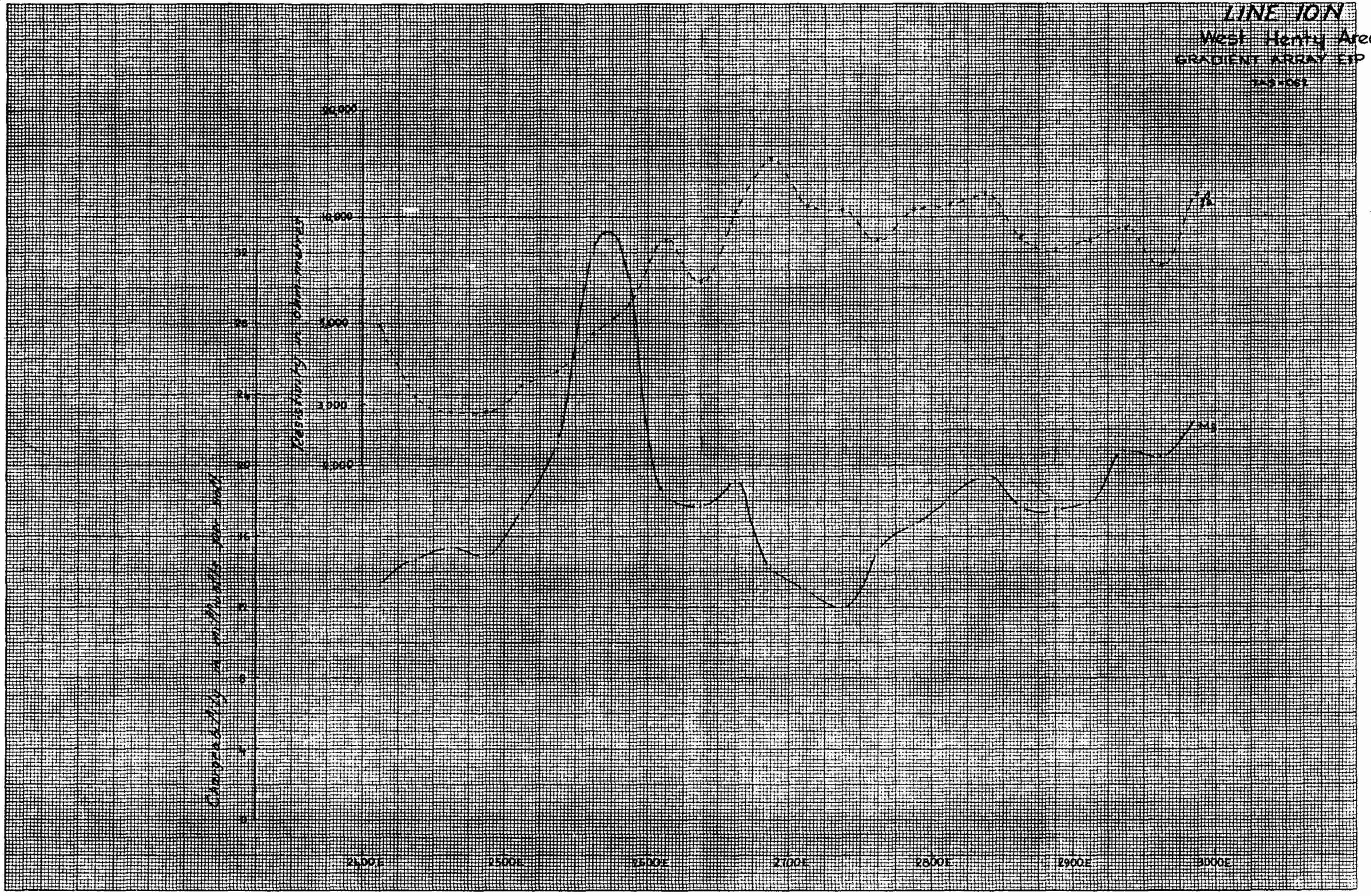
313034

LINE 10N

West Henty Area

GRADIENT ARRAY EIP

SAS-061



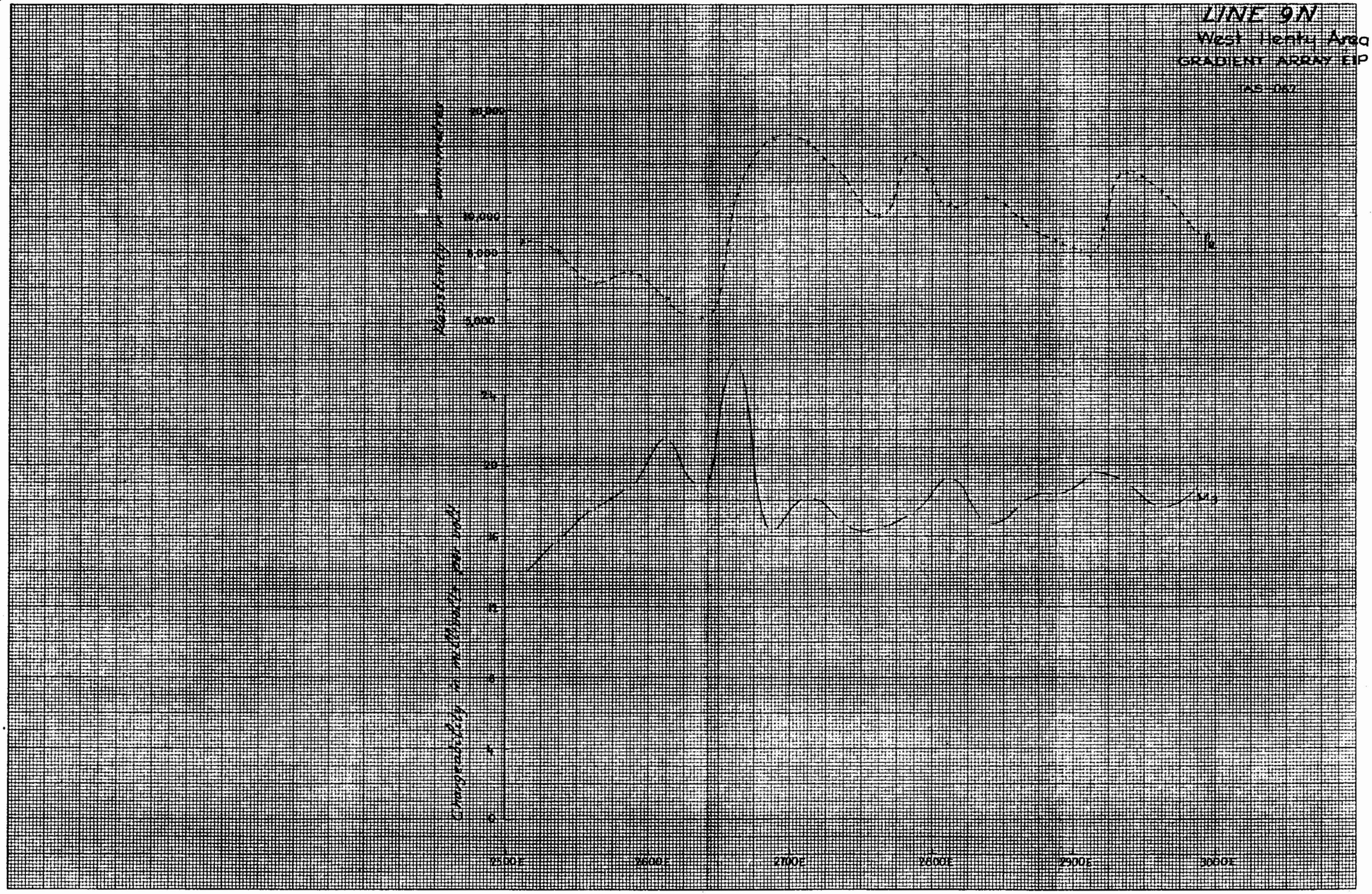
KEUFFEL & ESSER CO. MADE IN U.S.A.
K+E 10 X 10 TO THE CENTIMETER 25 x 25 CM.

V121 V4

033

313035

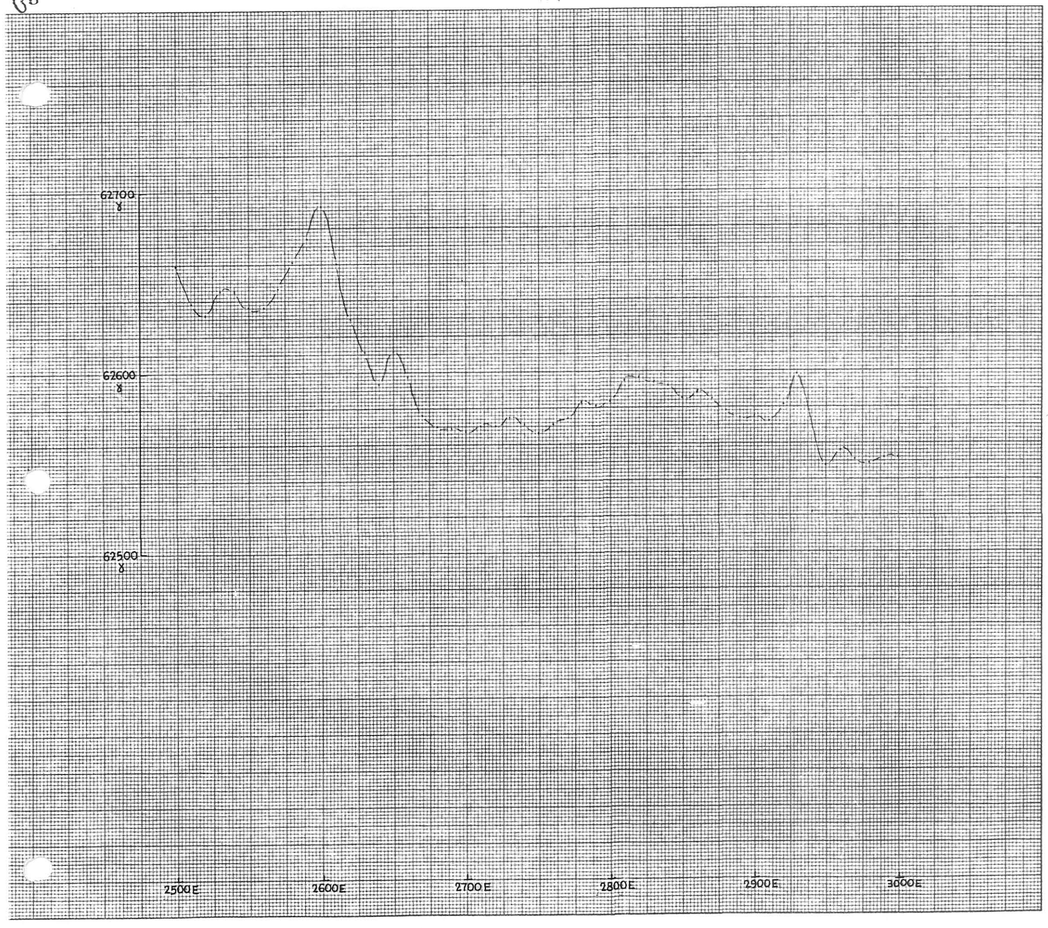
LINE 9N
West Henty Area
GRADIENT ARRAY IP
AS-067



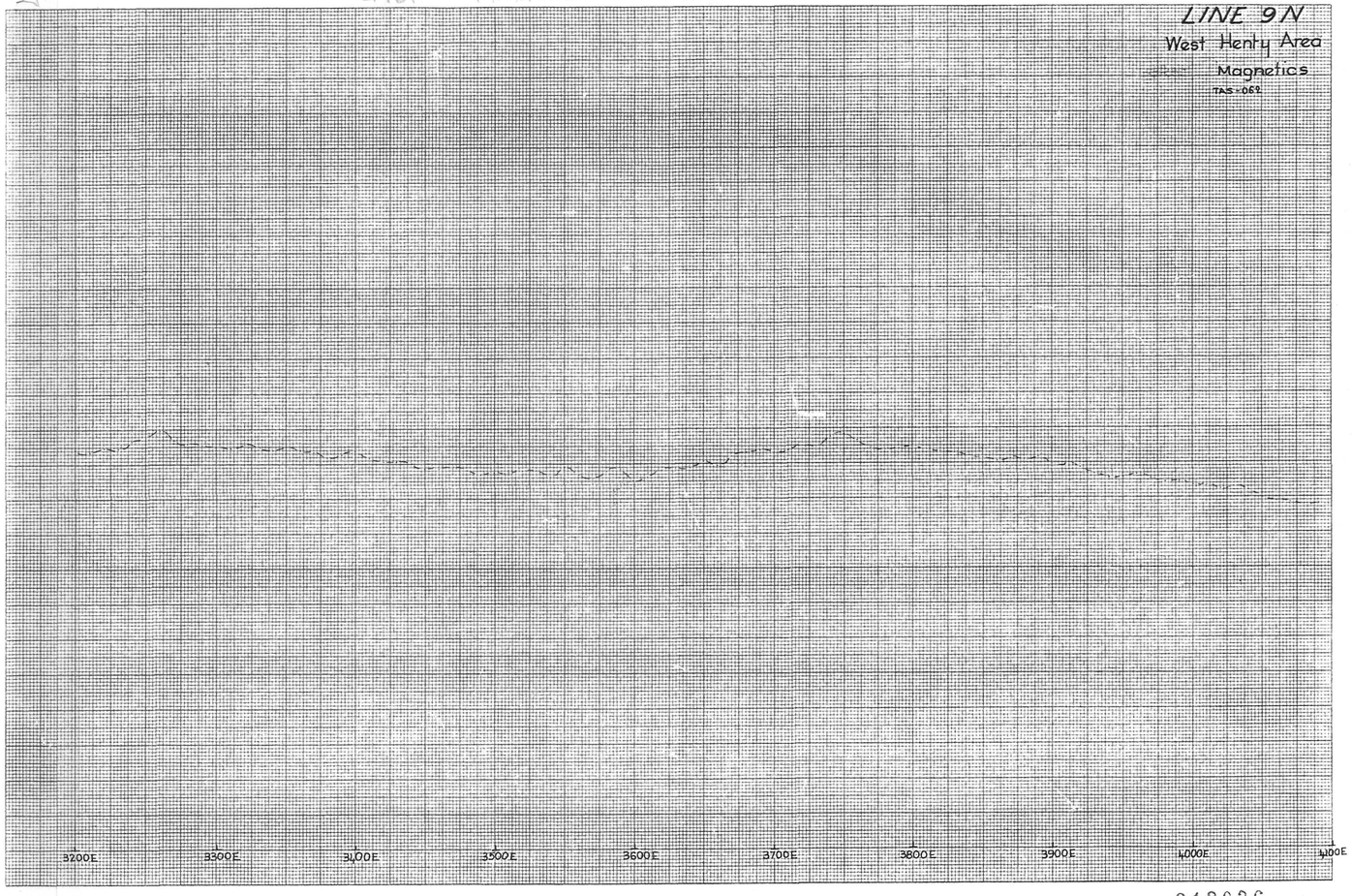
K+E 10 X 10 TO THE CM 46 1510 KEUFFEL & ESSER CO. MADE IN U.S.A.

034

9N



EAST TYNDALL LINE 6N



313036

035

LINE 8N -

West Henty Area

Magnetics

TMI - nT

52700 N

52600 N

52500 N

2500E

2600E

2700E

2800E

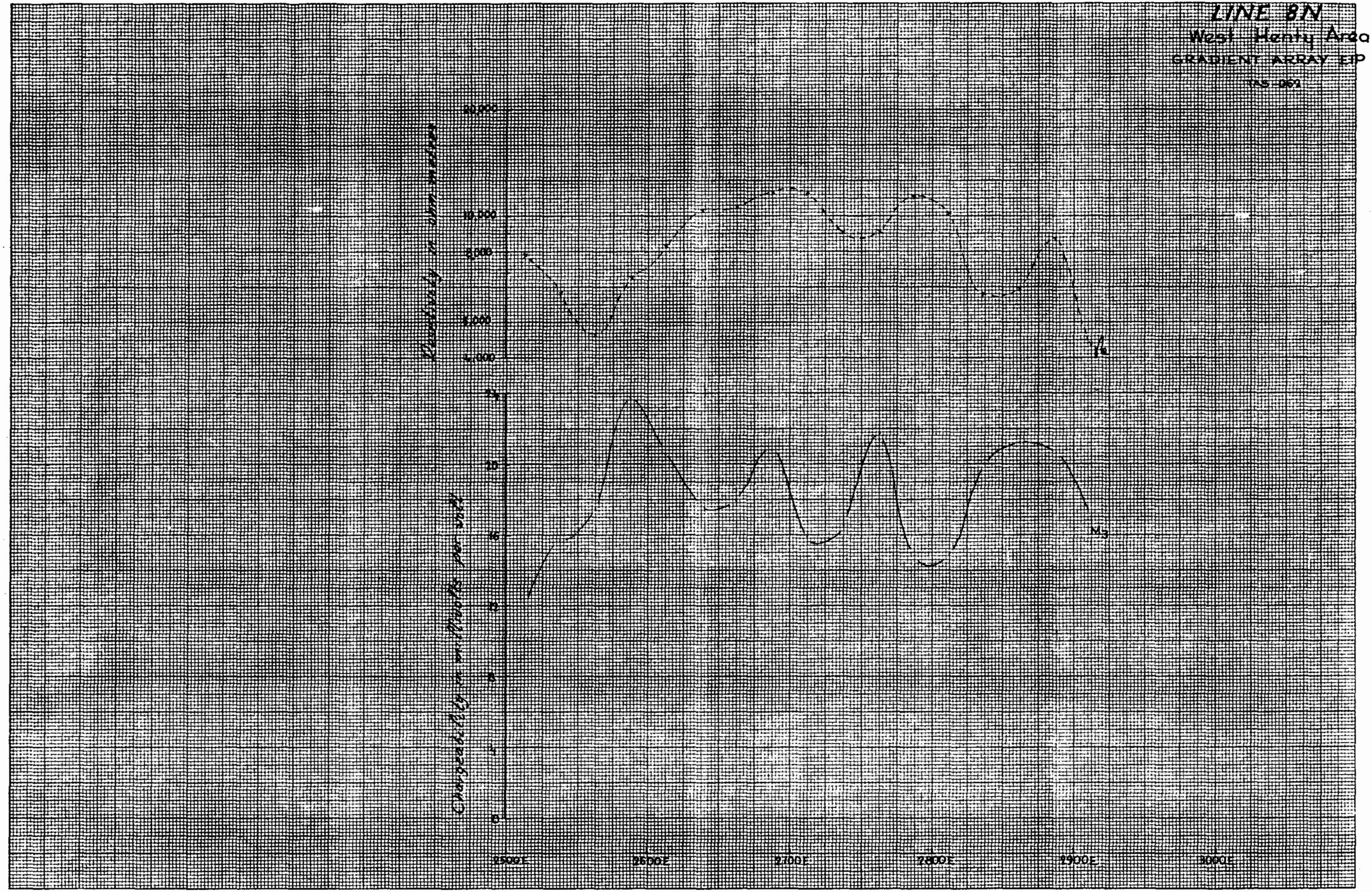
2900E

313037

KE 10 X 10 TO THE CENTIMETER 18 X 25 CM

036

LINE 8N
West Henty Area
GRADIENT ARRAY IP
TNS-001



313038

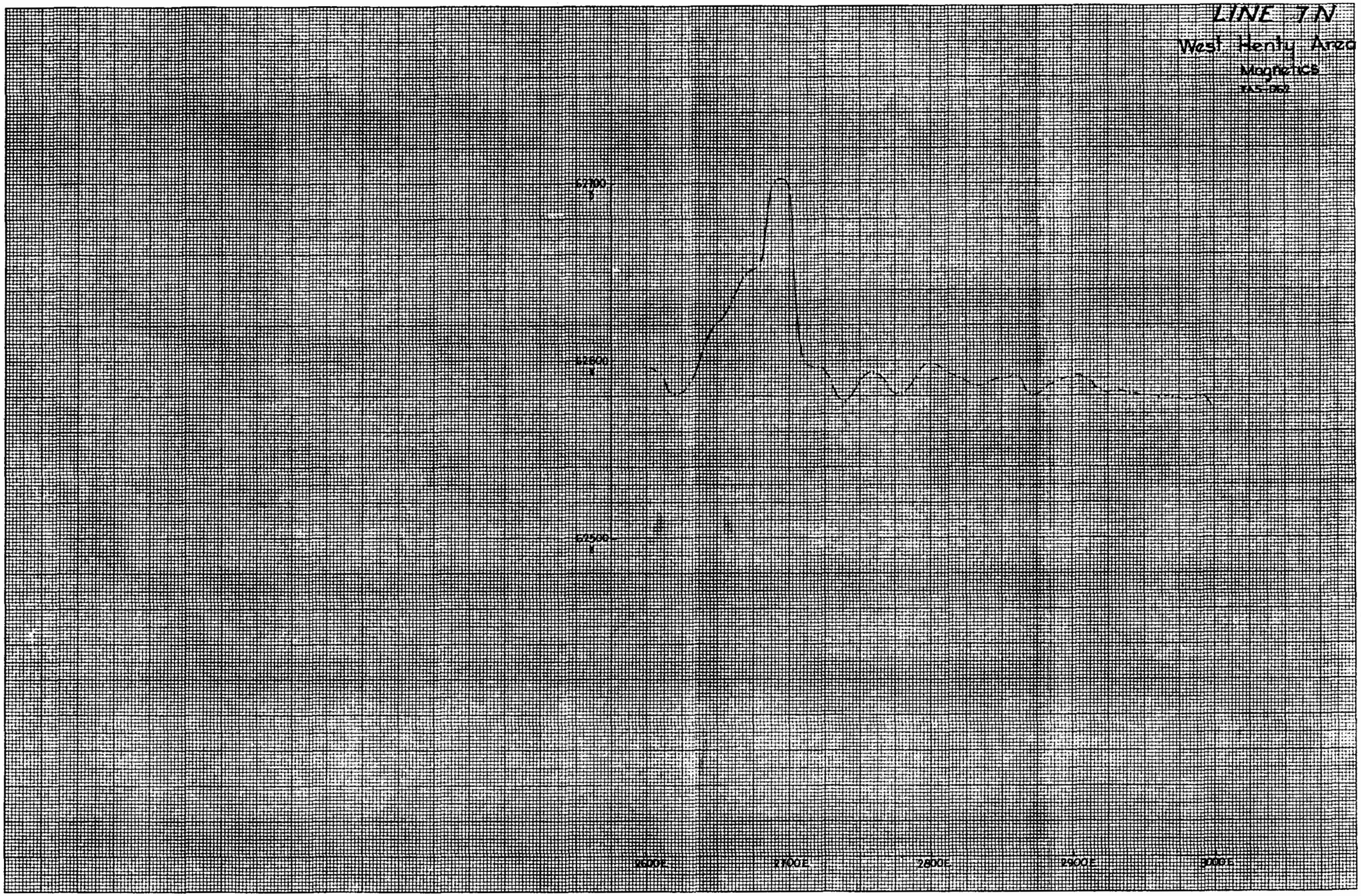
037

LINE 7N

West Henty Area

Magnetics

KAS-062



KEUFFEL & ESSER CO. MADE IN U.S.A.

313619

038

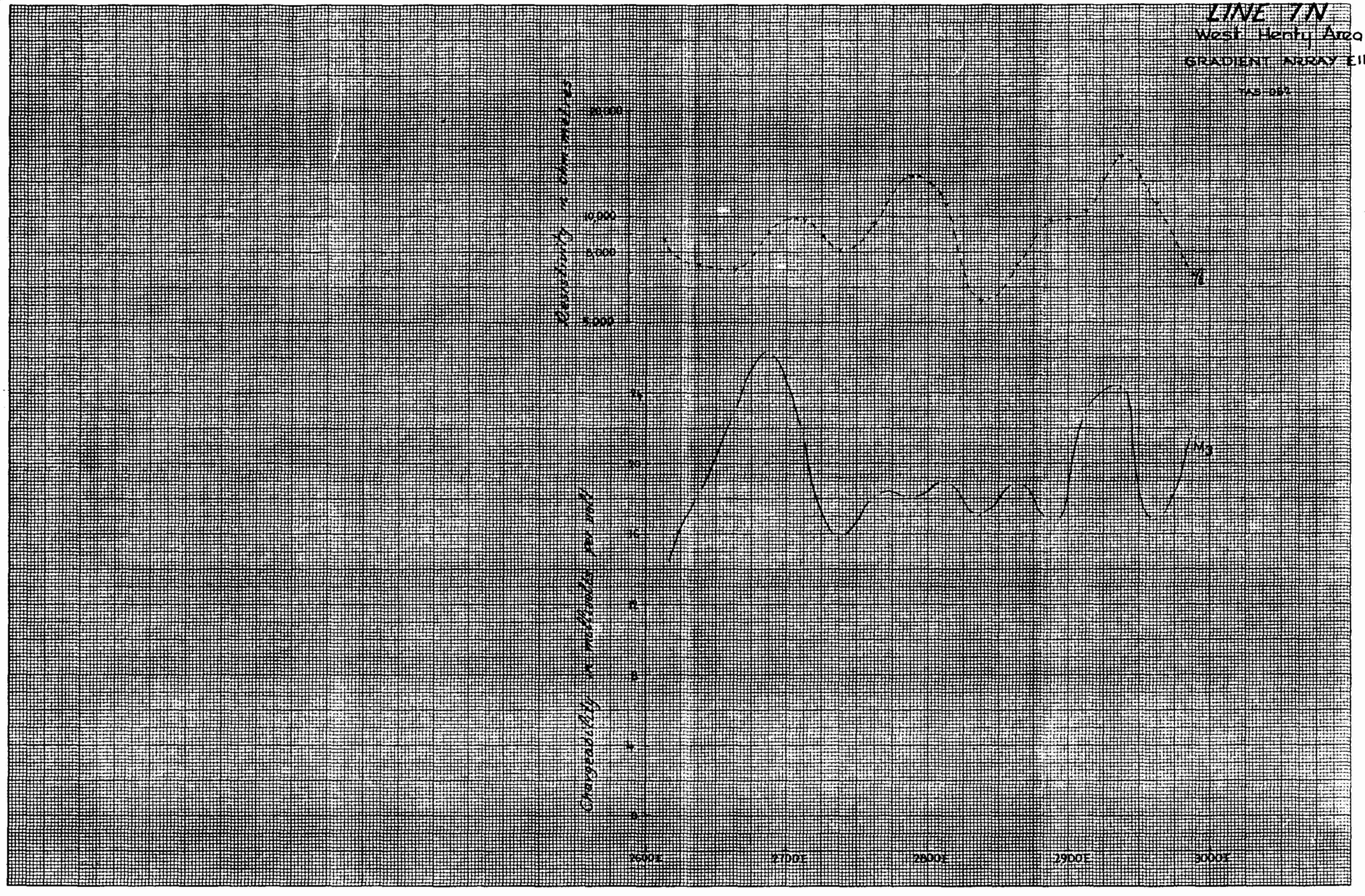
313040

LINE 7N

West Henty Area

GRADIENT ARRAY EIP

TAS-052



K+E 10 X 10 TO THE CENTIMETER 46 1320
MADE IN U.S.A.

7121 14

039

313041

LINE 6N

West Henty Area

Magnetics

TAS-051

62952

62700

62600

62500

62400

2600E

2700E

2800E

2900E

3000E

K&E 10 X 10 TO THE CENTIMETRE 359-23
MADE IN U.S.A.

313042

040

LINE 6N

West Hendy Area

GRADIENT ARRAY I.P

TAS 96%

Chargeability (milliseconds)

20,000

10,000

5,000

2½

20

15

10

5

0

Conductivity (milliSiemens/m)

M1

2600E

2700E

2800E

2900E

3000E

K&E KEUFFEL & ESSER CO. MADE IN U.S.A.

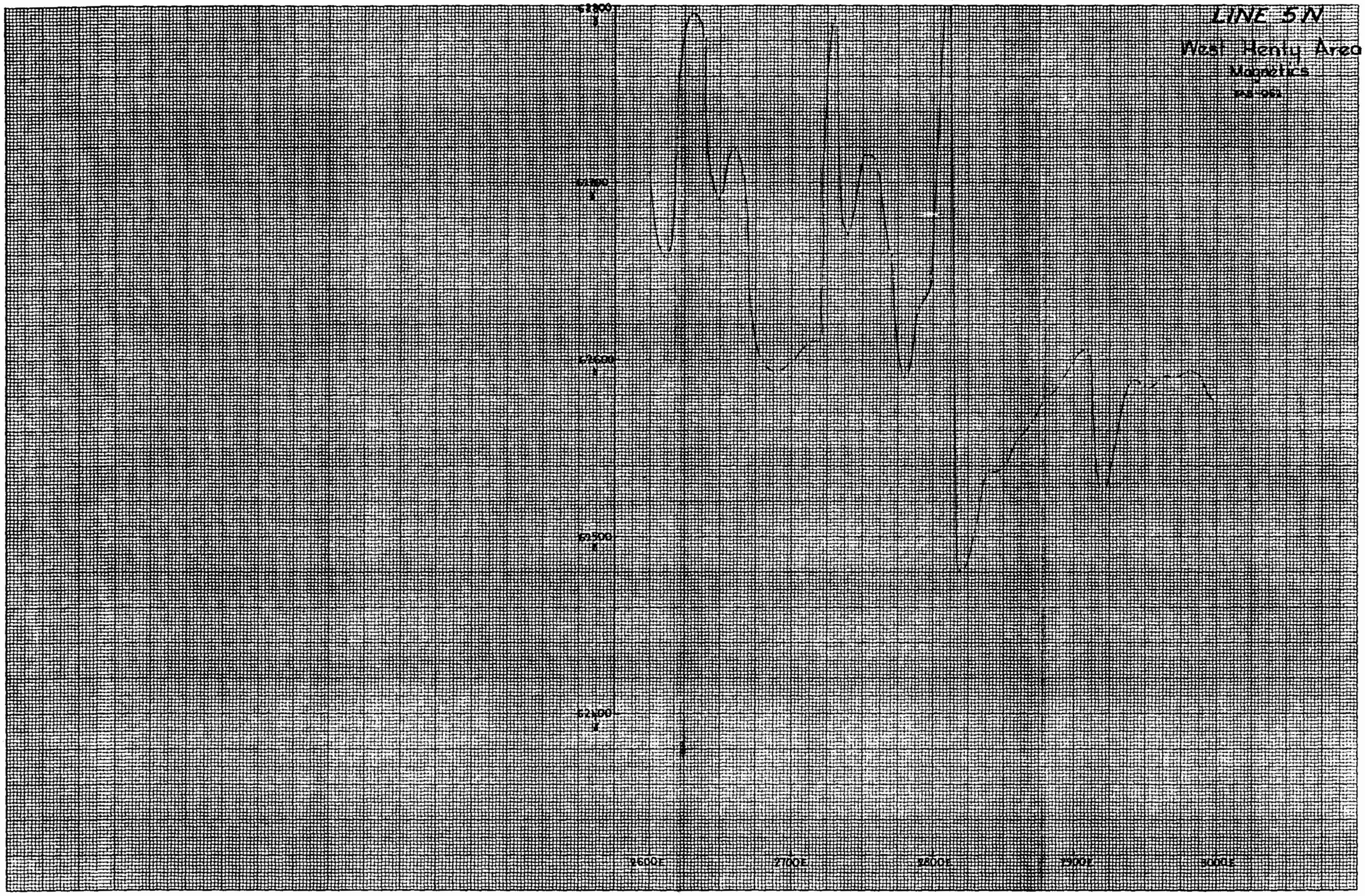
10 X 10 TO THE CENTIMETER 25 X 25 CM

313043

LINE 5N

West Henly Area

Magnetics



042

313044

LINE 5N

West Henty Area

GRADIENT ARRAY IP

TAS-061

20,000

10,000

5,000

2,500

1,250

24

20

16

12

8

4

0

Chargeability (milliseconds)

2600E

2700E

2800E

2900E

3000E

A

A'

K&E

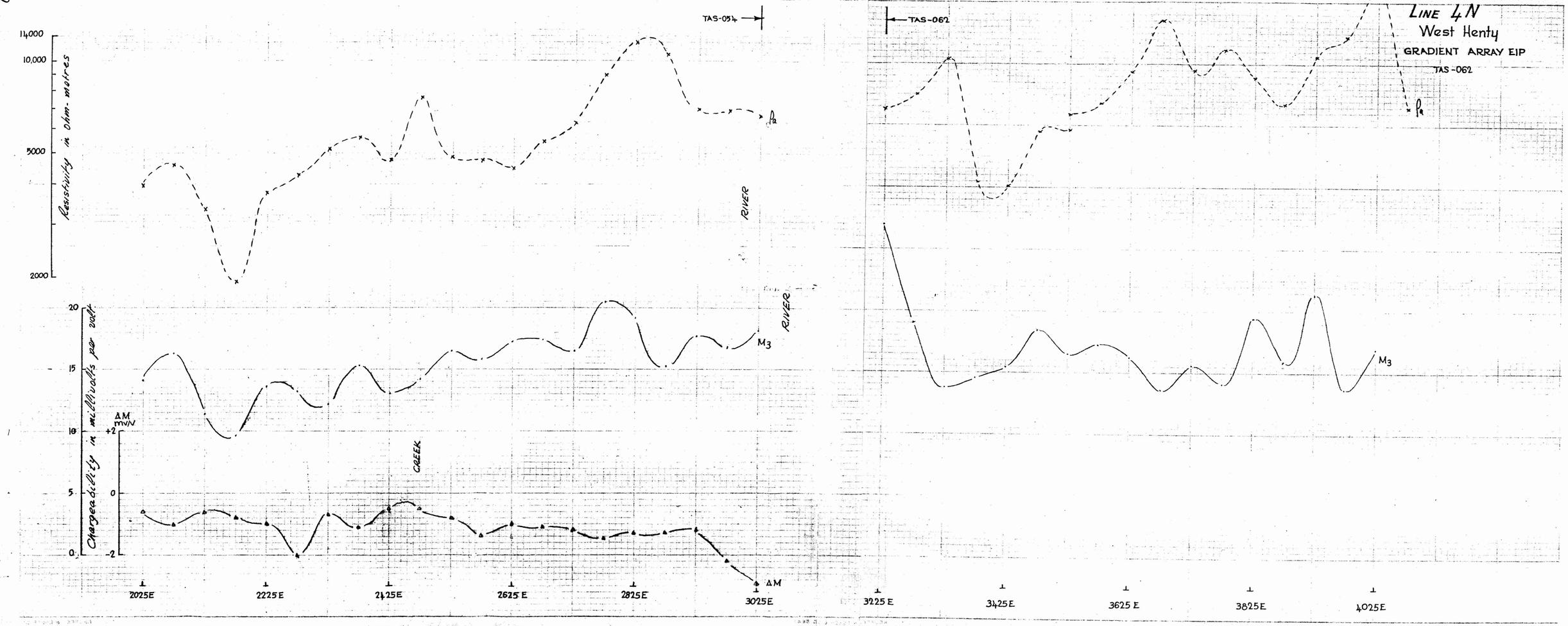
KEUFFEL & ESSER CO. MADE IN U.S.A.

4 IN. X 4 IN. X 20 CM.

47 1511

043

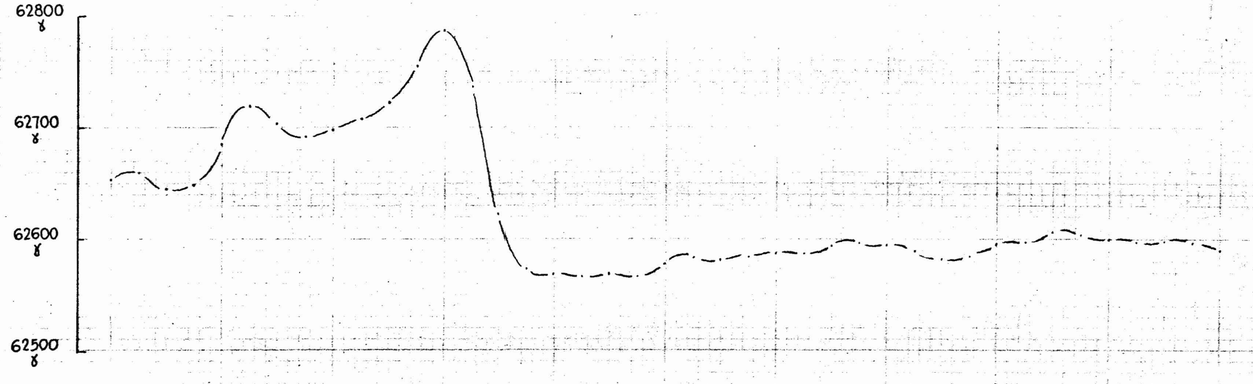
313045


LINE 4N
West Henty
GRADIENT ARRAY EIP
TAS-062
TAS-051
Resistivity in ohm-metres
14,000
10,000
5000
2000
RIVER
RIVER
CREEK
Chargeability in millivolts per volt
20
15
10
5
0
ΔM mV/V
+2
0
-2
f_a
M_3
ΔM
2025E
2225E
2425E
2625E
2825E
3025E
3225E
3425E
3625E
3825E
4025E

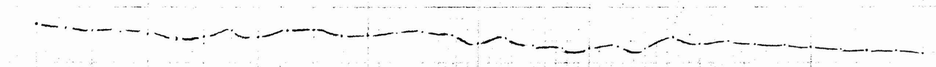
044

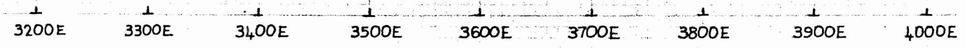
313046

Line 4N
West Henty Area
Magnetics
TAS-062



RIVER



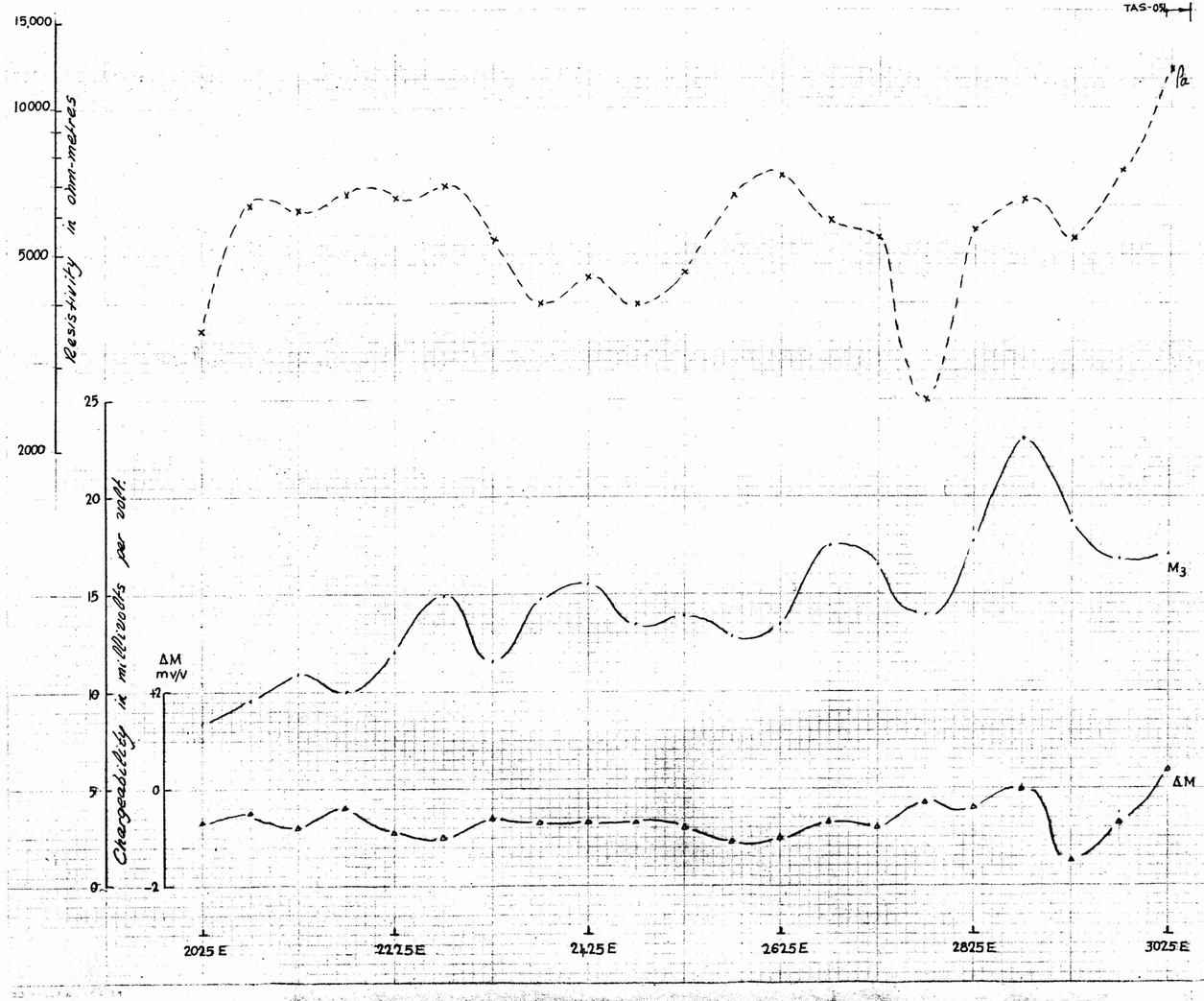


045

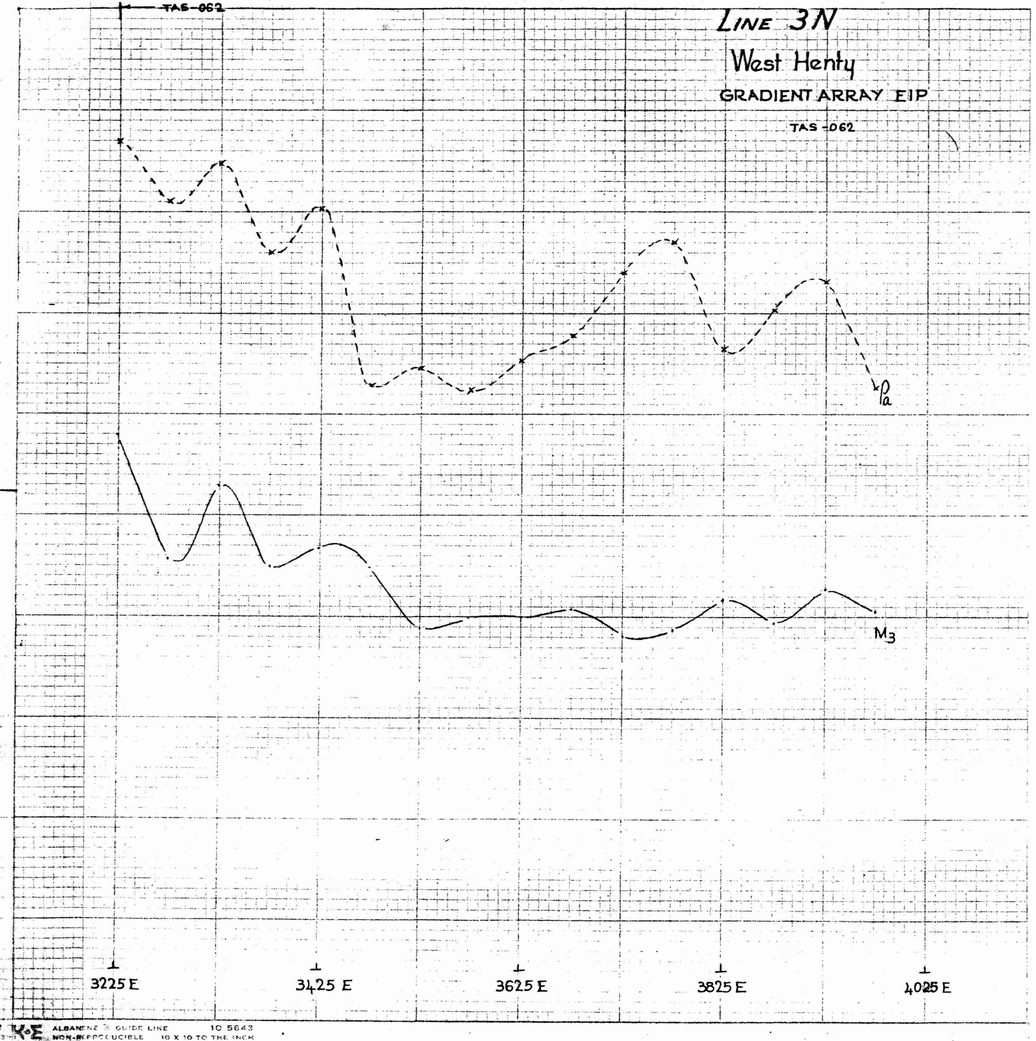
313047

LINE 3N
West Henty
GRADIENT ARRAY EIP

TAS-062



RIVER



ALBANENE 3 GUIDE LINE 10 5643
NON-REPRODUCIBLE 10 X 10 TO THE INCH

046

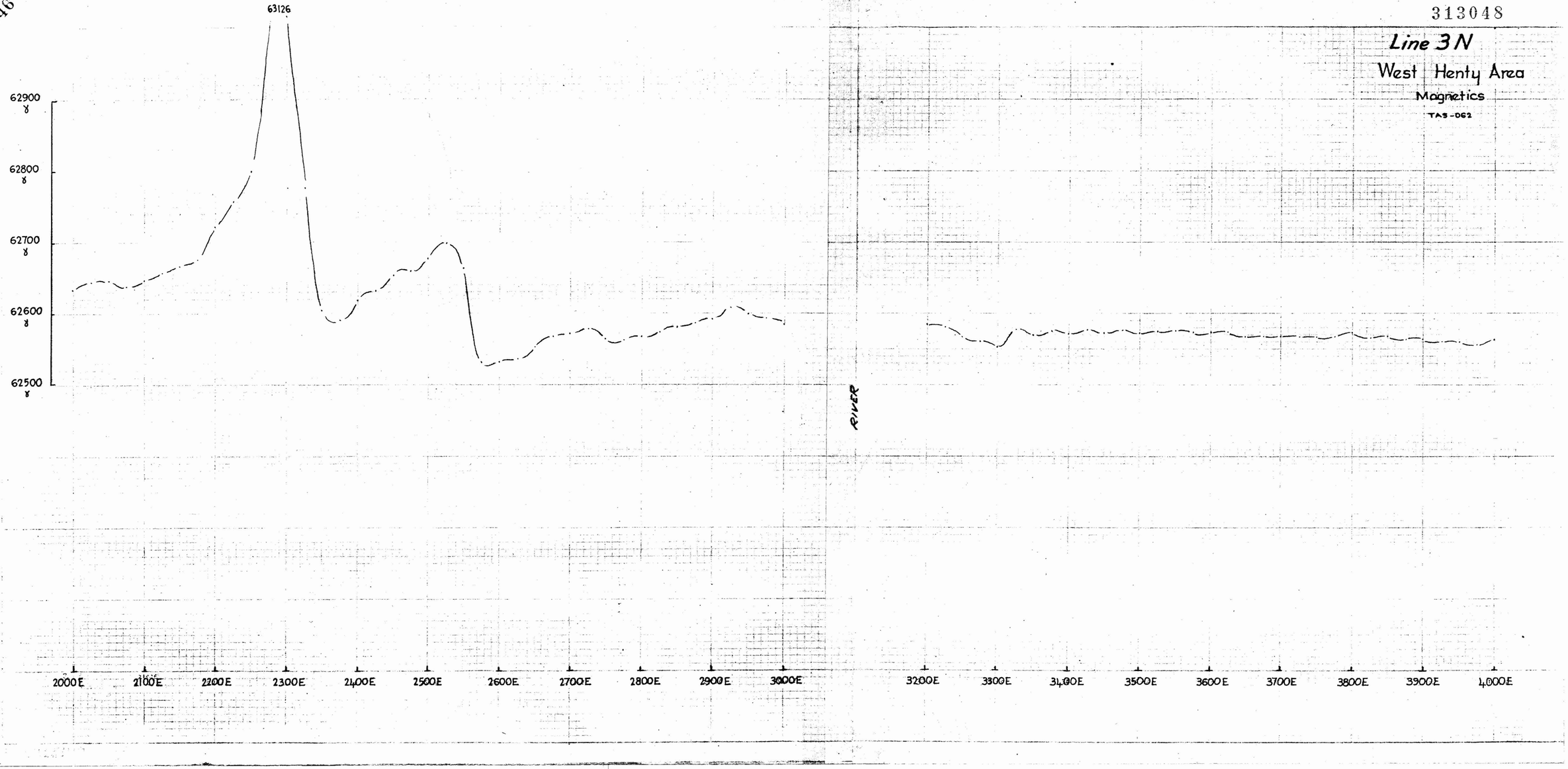
313048

Line 3N

West Henty Area

Magnetics

TAS-062



047

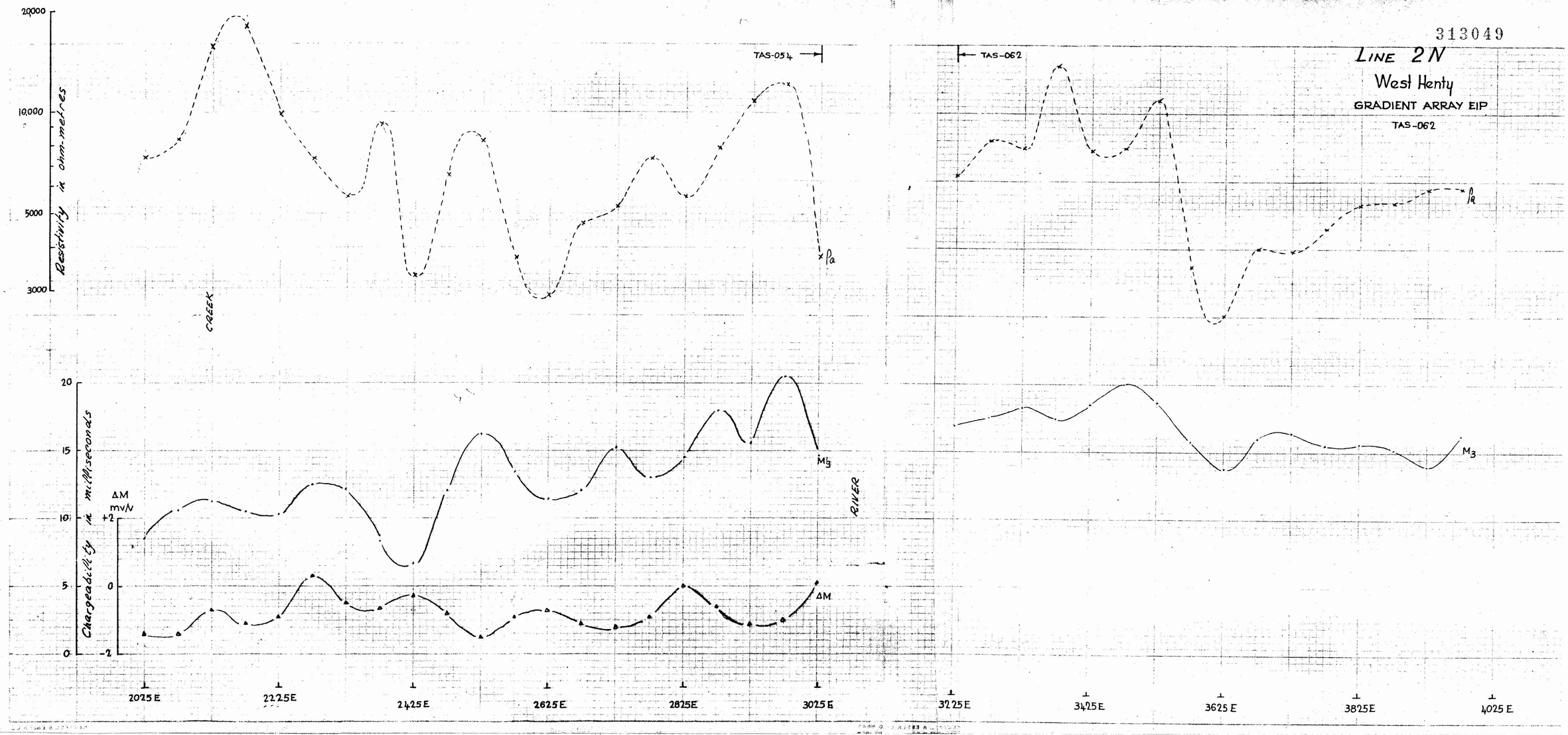
313049

LINE 2N

West Henty

GRADIENT ARRAY EIP

TAS-062



313050

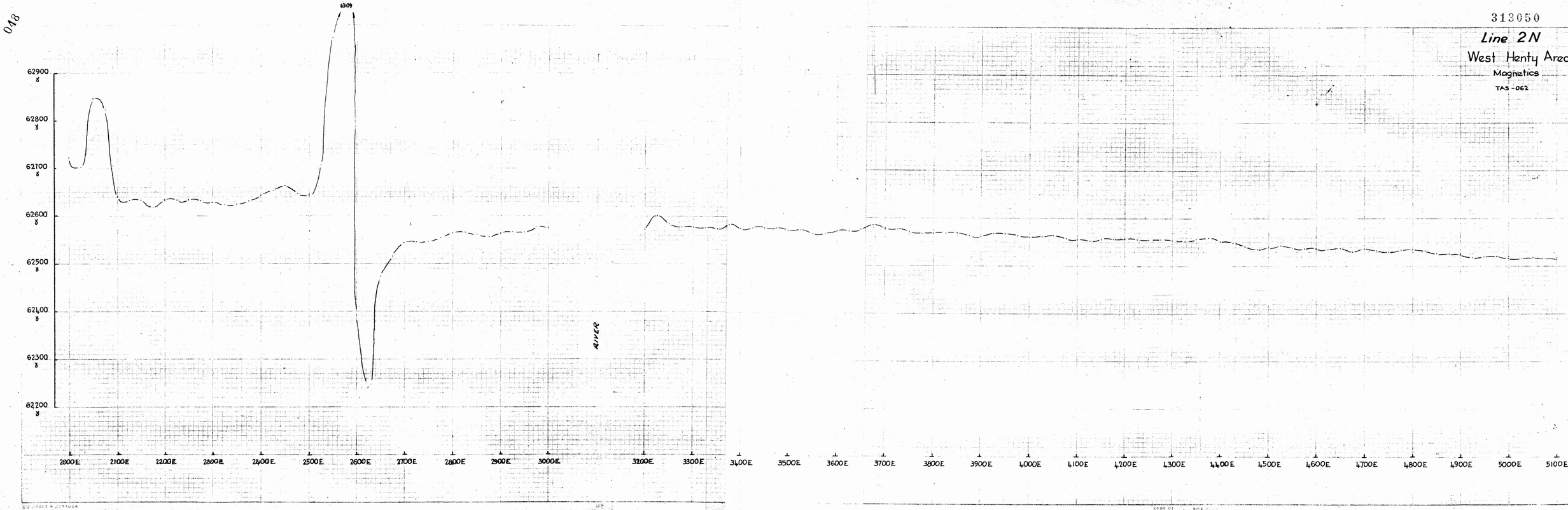
Line 2N

West Henty Area

Magnetics

TAS-062

018

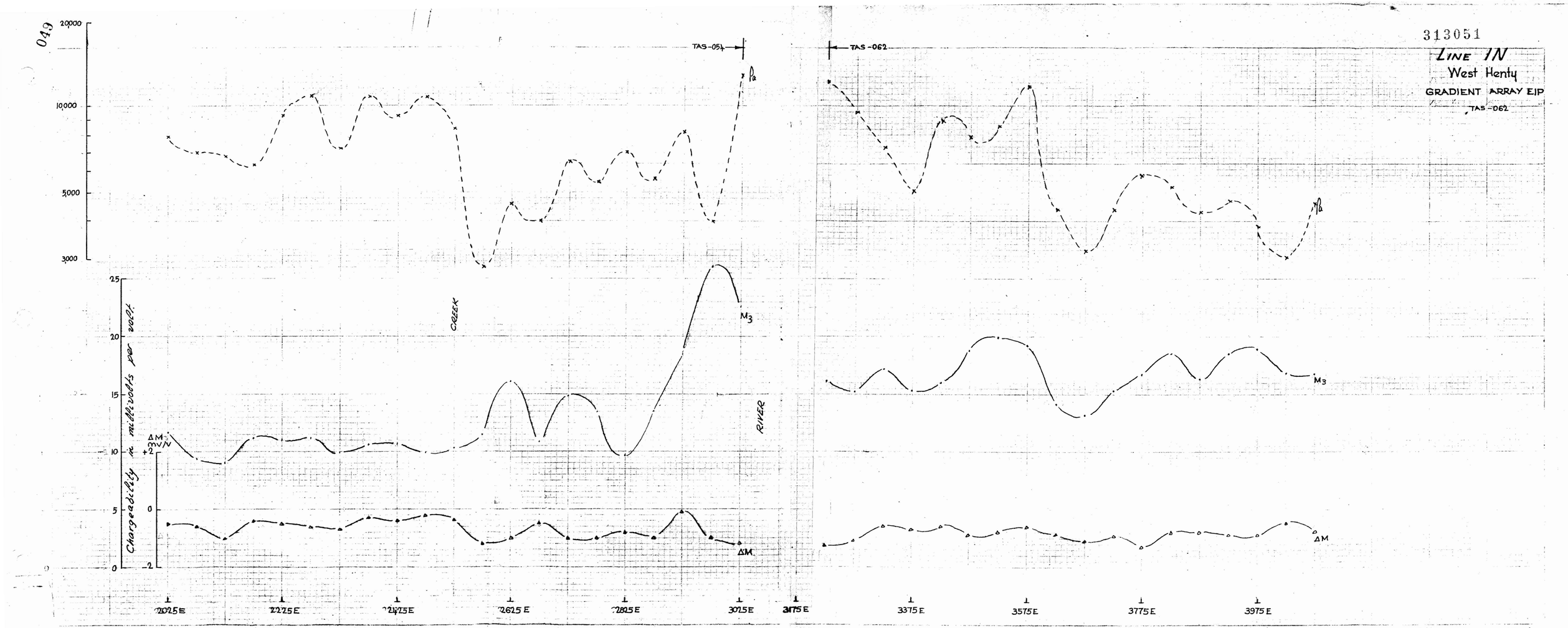


LINE 1N

West Henty

GRADIENT ARRAY EIP

TAS-062



050

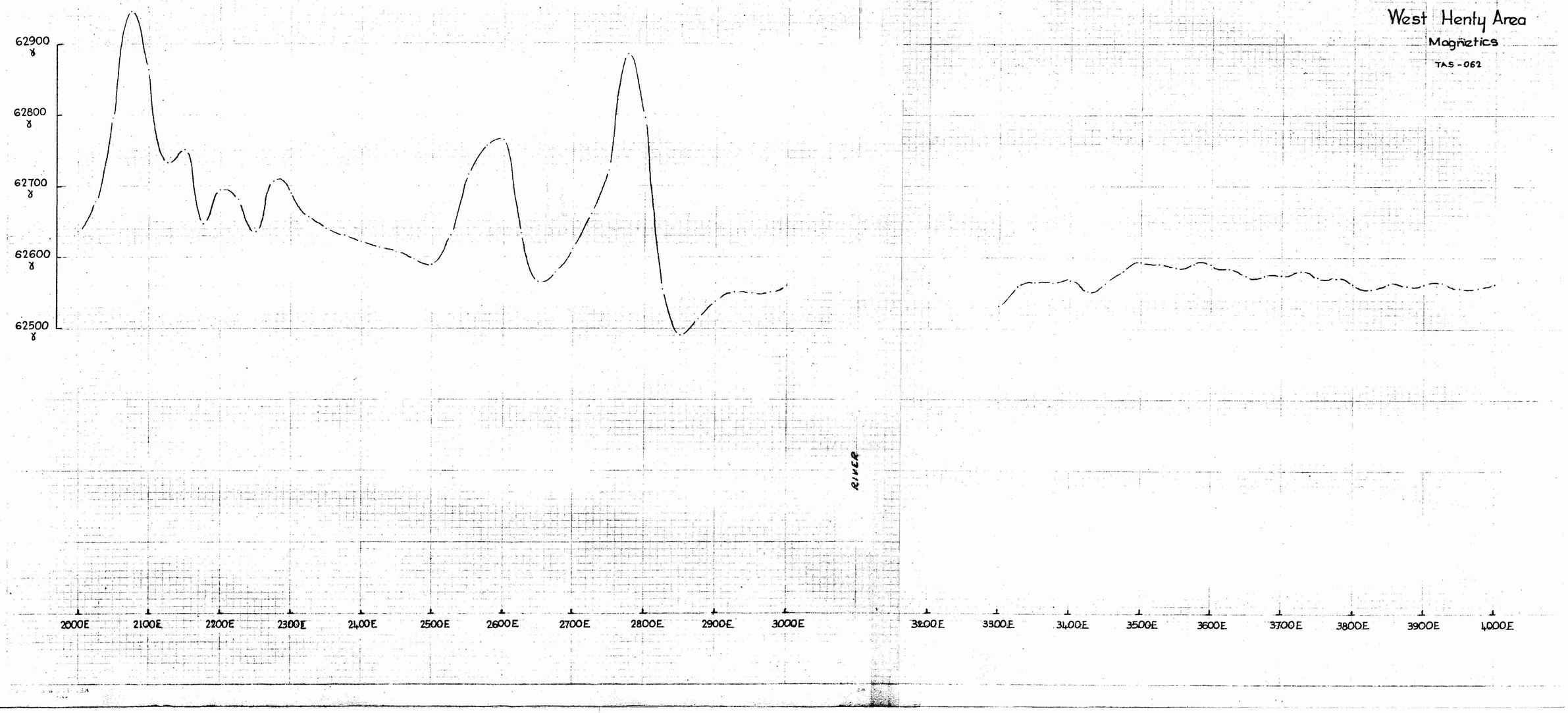
313052

Line 1N

West Henty Area

Magnetics

TAS-062



051

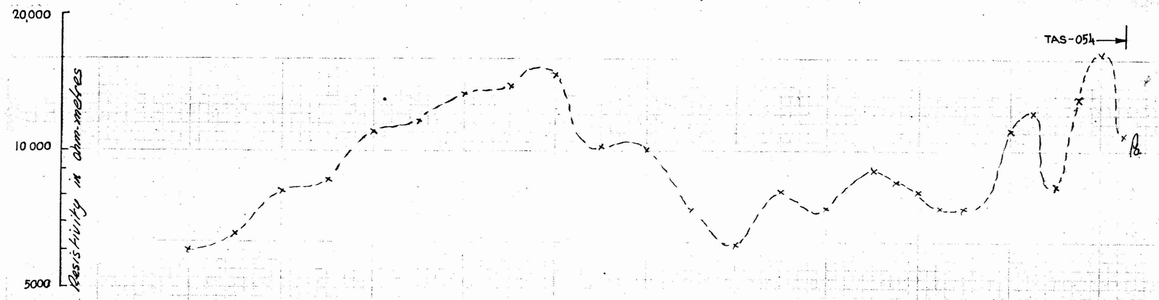
313053

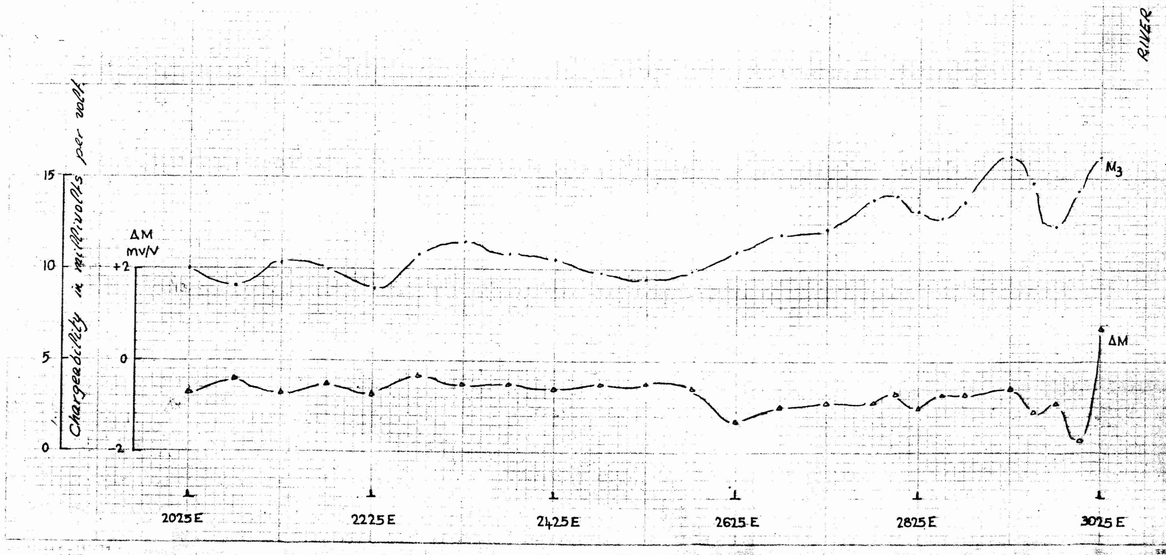
LINE 00

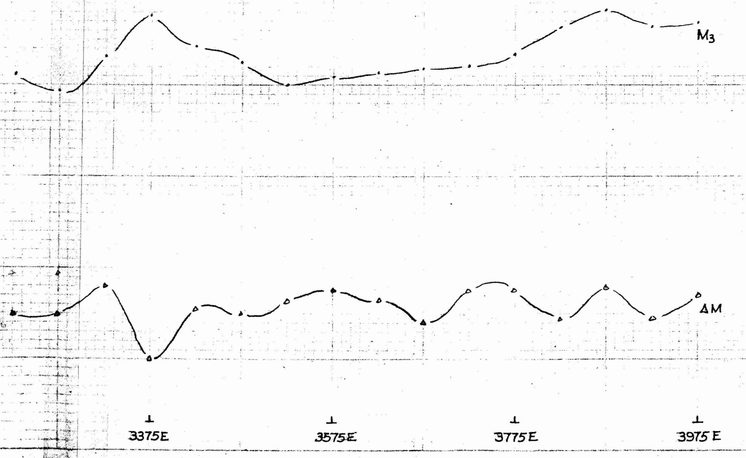
West Henty

GRADIENT ARRAY EIP

TAS-062







052

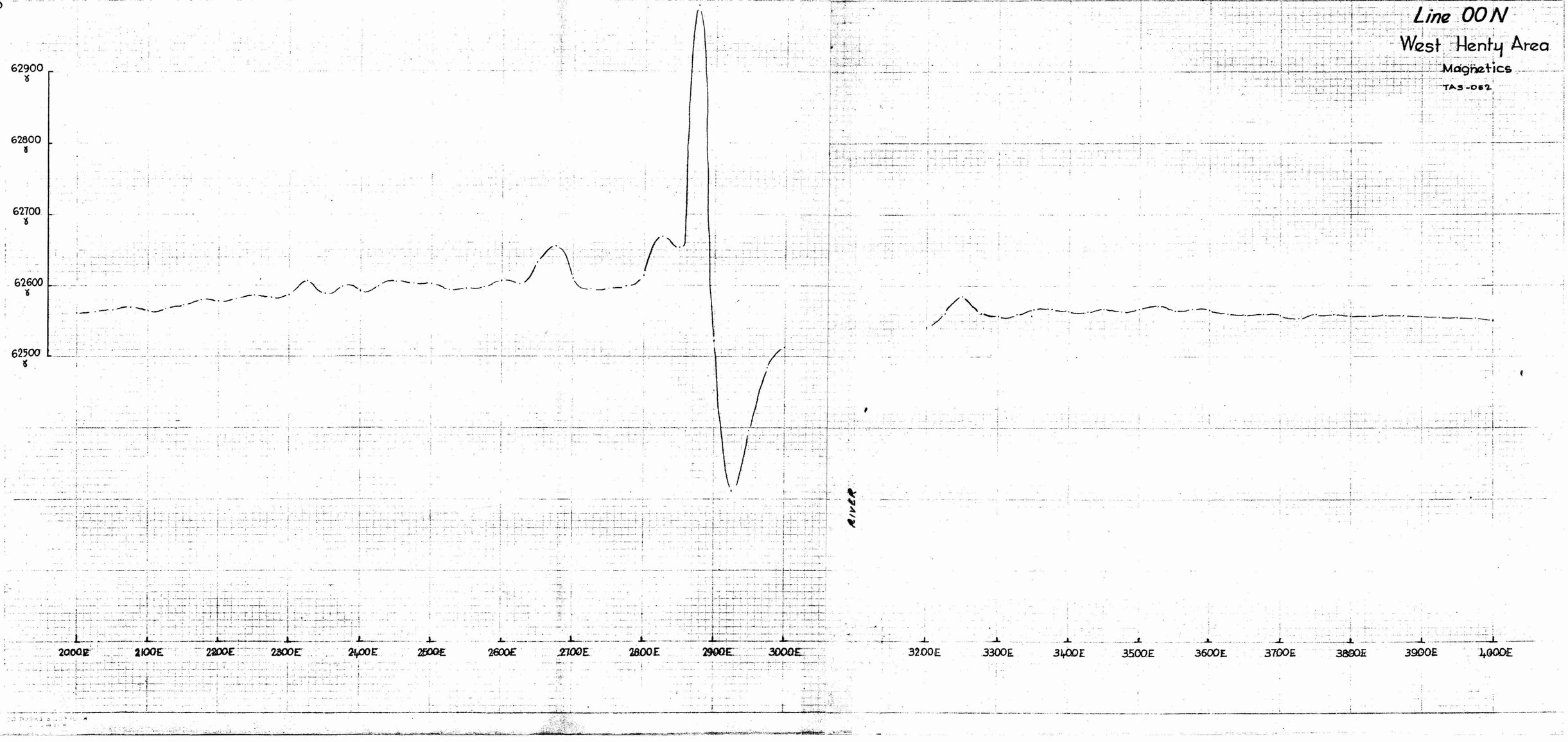
313054

Line 00N

West Henty Area

Magnetics

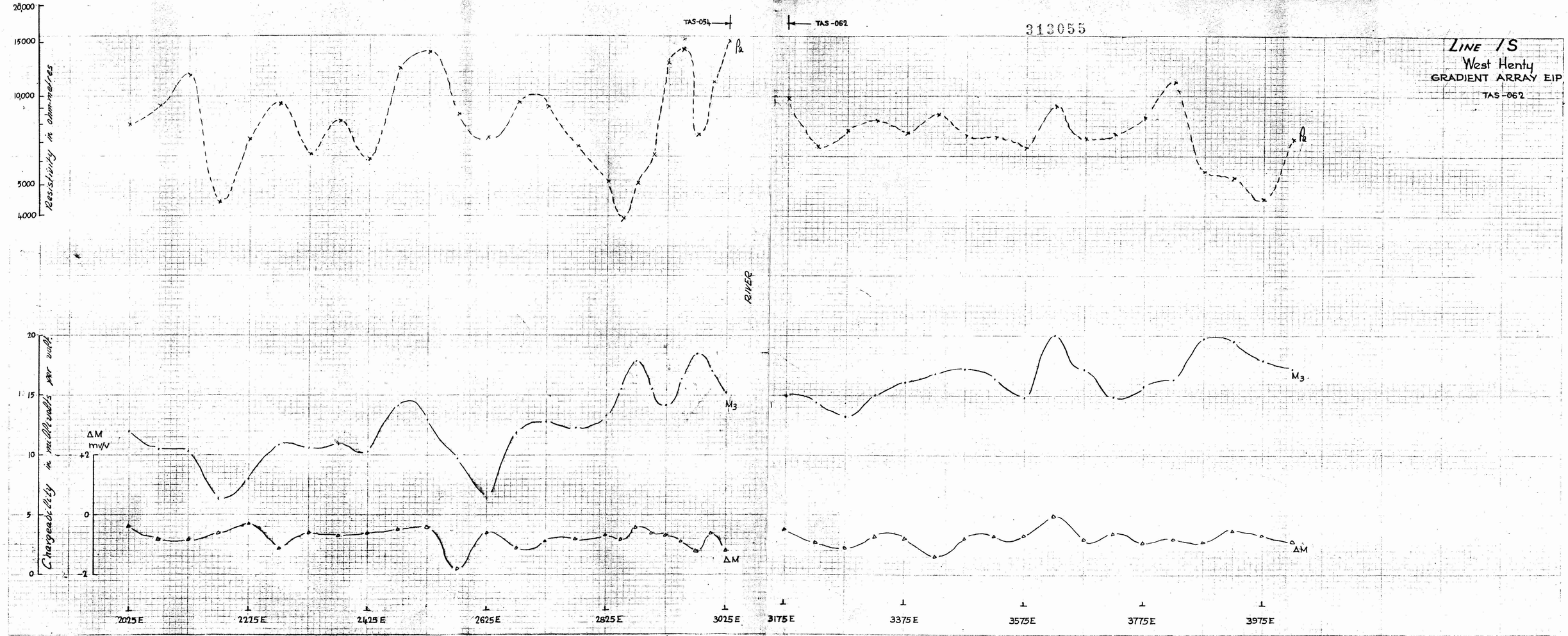
TAS-052



053

313055

LINE 1S
West Henty
GRADIENT ARRAY EIP
TAS-062



051

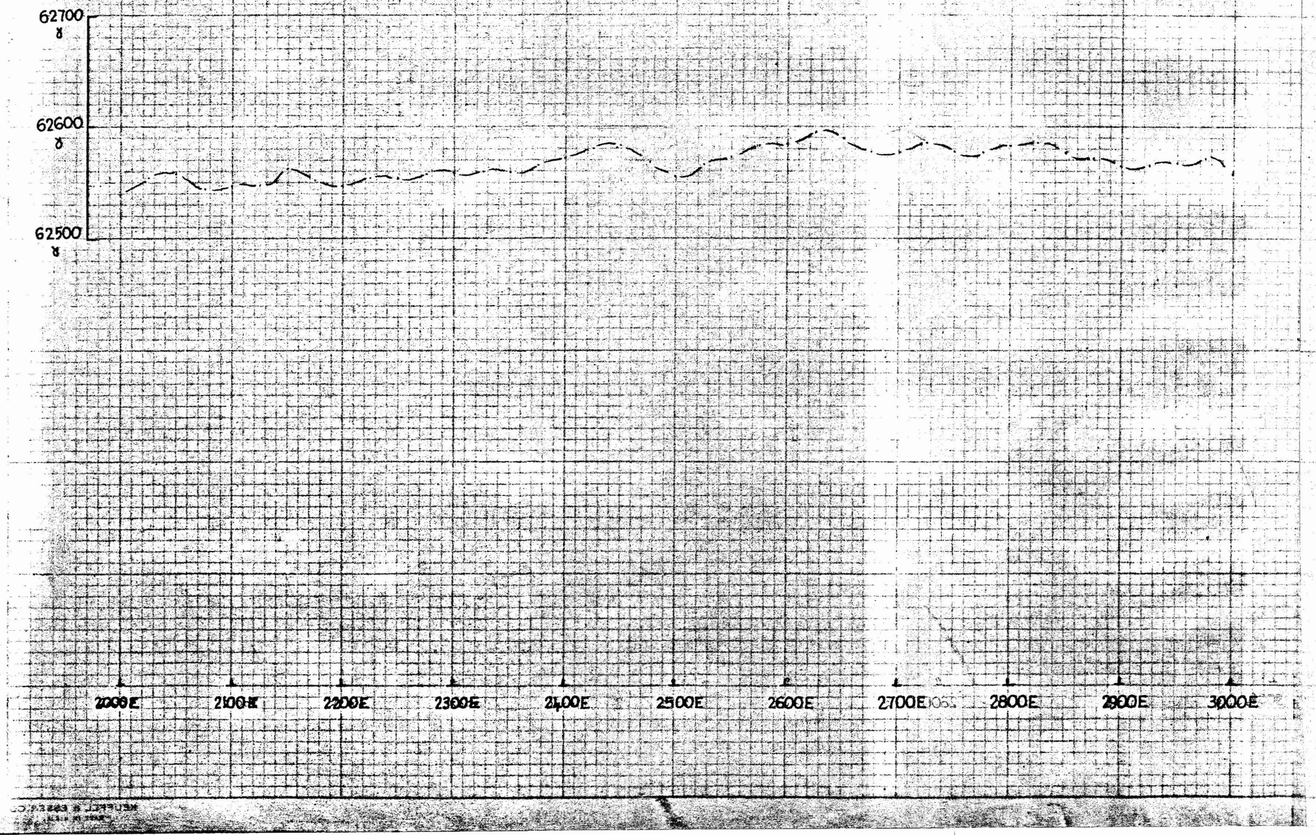
313056

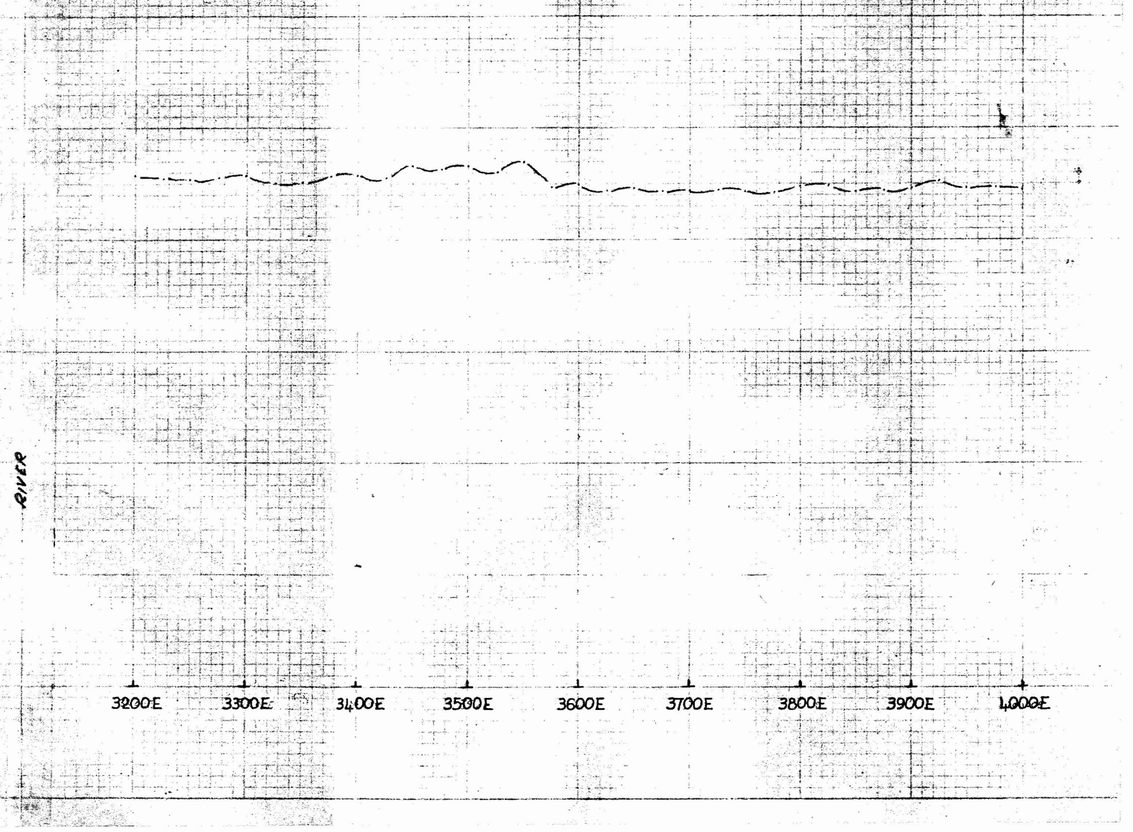
Line 1S

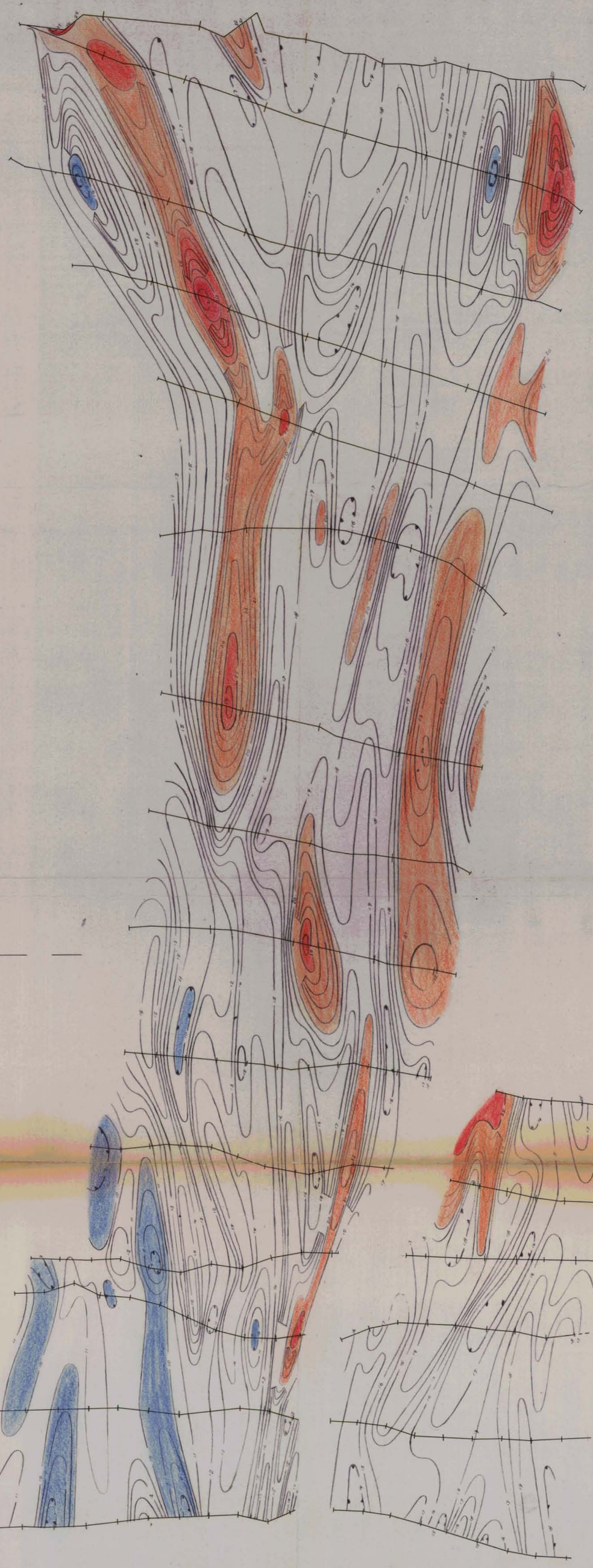
West Henty Area

Magnetics

TAS-062







D of M | A.O. | C.G. | E.O. | D.S.M.E. Registrar
D. DIR. | 2 OCT 1984 DEPT. OF MINES | E & I.L.
REF. No. 10,076/84

MOUNT LYELL MINING & RAILWAY COMPANY LTD.

WEST HENTY GRID

NR. QUEENSTOWN - TASMANIA

GRADIENT ARRAY EIP SURVEY
CHARGEABILITY CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

JUNE 1978 (TAS-054)
NOV '78 & JAN '79 (TAS-062)

313057 SCALE 1:2500 055

Job N° TAS-062 (-054) Sht 1 of 1 PLATE 1

5 cm

84-2247 vol 2

13 N

12 N

11 N

10 N

9 N

8 N

7 N

6 N

5 N

4 N

3 N

2 N

1 N

0 0

1 S

Grid in metres

Grid in ft

MOUNT LYELL MINING & RAILWAY COMPANY LTD

WEST HENTY GRID

NR. QUEENSTOWN - TASMANIA

GRADIENT ARRAY EIP SURVEY

RESISTIVITY CONTOUR PLAN

SURVEYED & COMPILED BY

SCINTREX

JUNE 1968 (TAS-054)

NOV. '78 & JAN '79 (TAS-062)

SCALE 1:2500

056

Job. Nº TAS-062 (054) Sht 1 of 1 PLATE 2.

5 cm

313058

8L-2247 vol 2.

13 N

12 N

11 N

10 N

9N

8N

7N

6N

5N

4N

3N

2N

1N

00

1S

Grid in Ft.

Grid in metres

Note :
For total magnetic field
add 62000 gammas to all values

MOUNT LYELL MINING & RAILWAY COMPANY LTD

WEST HENTY GRID

NR. QUEENSTOWN - TASMANIA

TOTAL MAGNETIC FIELD SURVEY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

JANUARY 1979

SCALE 1:2500

057

Job Nº TAS-062

Sht 1 of 1

PLATE 3

313059

5 cm

84-2247 vol 2.