DISC 280
PROJECT A-85-121

CYPRUS MINERALS AUSTRALIA COMPANY

PROGRESS REPORT

DECEMBER 1984 TO NOVEMBER 1985

MACKINTOSH EAST

EXPLORATION LICENCE 2/70

TASMANIA

P A JONES

NOVEMBER 1985

REPORT 470

CYPRUS

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by Mitre Geophysics

Note: Appendix 5 bound separately

ENCLOSURE

			Scale
1	Mackintosh East EL 2/70	• GEOLOGY	1:10000

Project Location

SUMMARY AND CONCLUSIONS

The primary exploration target on the Mackintosh East tenement is a volcanic hosted massive sulfide deposit of the Rosebery or Hellyer style. A belt of prospective Cambrian Mount Read Volcanics, which had previously been subject to Dighem airborne EM surveying, regional mapping, stream and soil sampling surveys by Aberfoyle-Paringa and Geopeko, was further detailed using large loop TEM surveys by Cyprus to locate mineralization at depths greater than 50 meters.

Three areas were cut and gridded prior to the commencement of an EM-37 survey which produced numerous weak anomalies from which Mitre Geophysics extracted four responses worthy of follow-up survey. Of these four responses, three have associated moderate

to strong soil geochemical anomalies, the fourth is blanketed by Tertiary basalt and has therefore not been geochemically assessed.

Four drillholes totalling 550 meters are planned to test these responses and downhole EM surveys will be conducted to test for offhole responses.

TARGET CONCEPT AND OBJECTIVES

The Cambrian Mount Read Volcanics within the tenement have excellent potential for hosting a +20 million tonne exhalitive volcanogenic massive sulfide deposit grading +20% lead/zinc with highly significant gold and silver credits.

Detailed EM-37 surveys were conducted over previously defined (Paringa-Geopeko) prospective volcanic sequences with numerous very weak responses being delineated. Three such responses were associated with strongly anomalous base metal geochemistry and a fourth was blanketed by Tertiary basalts. All four anomalous zones are targeted for diamond drilling.

RECOMMENDATIONS

Cyprus and Geopeko should carry out the proposed program of diamond drilling on the three prospects; Heap of Rocks, Carters and Speeler Creek grids. Concurrently downhole EM surveys should be conducted to screen for possible 'offhole' responses.

Dependent upon favorable results of the drilling program further drilling may be required and further ground work may be necessary in areas where more 'spotty' geochemistry was not tested by the EM-37 surveys.

The budget proposed will enable 550 meters of diamond drilling to be conducted (four holes) as well as downhole EM surveys.

DESCRIPTION OF THE PROPERTY AND OWNERSHIP

Cyprus Minerals Australia Company (formerly Amoco Minerals Australia Company) was approached by Geopeko in June 1984 with a farm-in proposal for part EL 2/70 Mackintosh East, which embraces potential host rocks for volcanogenic massive sulfide type deposits. A joint venture was negotiated whereby Cyprus could earn up to a 51% interest in the property.

Geopeko had previously entered into a joint venture (1979) with Cleveland Tin (a subsidiary of Aberfoyle) and Paringa to acquire a 60% interest. Exploration Licence 2/70 is held in two parts designated Mackintosh West (encompassing both the Que River and Hellyer deposits) and Mackintosh East by Aberfoyle Limited. The licence was reduced from 232 square kilometers to 125 square kilometers on December 30, 1984 due to new rules governing exploration licences introduced on July 1, 1982. The Mackintosh

East portion of the tenement (Enclosure 1) dropped in area from 58 square kilometers to approximately 29 square kilometers with a further three years' exploration available prior to the cessation of tenure. The prospective volcanic sequence is untouched by the reduction.

One pre-existing mining lease 38M/78 is present within the tenement. It occupies a square block of 49 hectares and encompasses lead/silver bearing quartz veinlets in a major fracture zone within Precambrian gneisses and schists (Tyennan Block).

LOCATION AND ACCESS

The Mackintosh East area is located in the central northwest of Tasmania approximately 55 kilometers south of the sea port of Burnie and 35 kilometers southeast of Waratah.

A formed gravel road to Waldheim in the Cradle Mountain - Lake St Clair National Park passes through the eastern portion of the tenement. This allows near to all-weather access to Pencil Pine Lodge which has been used in the past for accommodation for field crews. A new all-weather road, the Cradle Mountain Link Road, which will connect the West Coast Highway with the Cradle Mountain Road has been commissioned. The eastern section commences at Leary's Corner and traverses the northern portion of

the licence in the vicinity of the Speeler Creek grid. A four-wheel drive track heading southwest from a junction approximately one kilometer east of the Speeler Creek grid leads into the cleared baseline of the extensive survey grid established during the early 1970's.

No difficulties would be anticipated with respect to power, water and transport should a mine be developed. The area has an annual rainfall of 250 centimeters, a large proportion of which falls as snow during the winter months due to the average elevation of 800 to 1100 meters above sea level. This necessitates fieldwork being completed where possible during the summer season.

HISTORY AND EXPLORATION TO DATE

Pre 1979

Paringa Mining and Exploration Co Ltd (on behalf of the Aberfoyle group) commenced exploration during 1969-1970 on a small galena-sphalerite occurence referred to as Carter's Prospect. Surveys including B horizon geochemical and geological mapping programs established the existence of several lead anomalies over a strike length of 600 meters associated with shales and fine-grained cherty tuffs of Cambrian age adjacent to the northwestern margin of the Precambrian Tyennan Massif.

Further soil sampling extended the anomalous zone northeast and southest of Carters' prospect giving a total strike length of 5.5 kilometers. Minor galena-sphalerite mineralization was observed in quartz filled fault fissures and breccia zones possibly representing remobilized primary sulfides.

A regional wide spaced stream sediment program was undertaken in 1971, with samples being analyzed for copper, lead and zinc. Results from this survey supported the inference derived from the soil surveys that the volcanic suite was a highly favorable host.

In February 1972 a helicopter borne electromagnetic (HEM-400) and magnetometer survey was conducted by McPhar Geophysics Pty Ltd.

Exploration over the next two seasons (1973-74) consisted mainly of ground EM follow-up of four AEM anomalies within the tenement. Anomalies were found to be due to Tertiary basalts, ground water accumulations and graphitic and pyritic slates within the Precambrian metasediment sequence.

During February 1975, Geoquest Pty Ltd on behalf of Cominco Exploration Pty Ltd carried out induced polarization (IP) surveys on lines 8100N, 7300N, 2900N and 2100N over the lead soil geochemical anomalies established by Paringa in 1970/71. Weak frequency effect anomalies (within the Cambrian suite marginal to the Precambrian metasediments) were found to occur beneath the soil anomalies on lines 7300N and 2100N.

Testing of the anomalies by drilling was recommended. Further investigation of the coincident IP geochemical anomalies was delayed until 1978 when four bulldozer trenches were excavated on grid lines which had been covered by the IP survey.

Mapping of the trenches revealed the underlying rocks are weakly sheared barren rhyolites with minor late stage intersecting quartz-chlorite veinlets with disseminated sulfides. It was concluded the soil anomalies were derived from the later veinlet mineralization and were not due to stratiform sulfide mineralization.

Post 1979

Geopeko commenced exploration during 1979 and work completed to date has included regional geological mapping (1:10000 scale) and stream sediment (-80 mesh) sampling, detailed grid sampling and mapping, diamond drilling and Dighem helicopter borne EM surveys.

A large scale stream sediment program was completed during 1979-80 (only every fourth sample was assayed for gold, hence some drainages remained untested) confirming Paringa's soil results in the overall anomalous layered volcanic sequence. Two main prospects were delineated, Provers 1 and 3 (Carters' Prospect being designated Prover 2) and later detail soil sampled and geologically mapped.

At the Prover 1 area an open ended 900 by 100 meter geochemical anomaly as defined assaying from 500-2000 ppm lead (background approximately 100 ppm) coincident with fine grained tuffaceous (cherty) sediments interbedded with lithic (crystal) tuffs and porphyritic lavas. Samples KR5560, 5561 (Table 1) were taken from this horizon indicating minor mineralization. In comparison to soil values returned over the Que River deposit they appear highly significant. However the conclusions from the Que River Study (Webster and Skey, 1979) were that geochemical anomalies did not show close correlation to the projected ore lenses but did provide a useful method of outlining areas for systematic geophysical surveys which could be used for definition of drilling targets.

TABLE 1 PROVER 1 SOIL SAMPLES (GEOPEKO)

Sample	Rock Type	Cu	Pb	Zn	Ag(ppm)
KR-5596	Bedded pyritic Tuff-siltstone	110	300	65	3
KR-5660	Finely layered Tuff-siltstone	20	740	190	3
KR-5661	Finely layered pyritic tuff-siltstone	320	5800	5000	11
KR-5668	Layered pyritic tuff-siltstone	20	840	280	2
KR-5670	Layered pyritic tuff-siltstone	110	210	320	3

Note -
Background values average - Cu 20 ppm, Pb 40 ppm, Zn 70 ppm, Ag 1 ppm

In April 1982 a 156 meter diamond drillhole was completed to test the best geochemical zone. Minor lead/zinc mineralized quartz veins were cut within cherty tuffaceous units from 74-88 meters. The geochemistry observed downhole failed to be represented at surface, possibly indicating faulting and displacement of the lithologies.

A comprehensive geophysical orientation-calibration test program had been planned if the hole had given some encouragement, however as only minor vein style mineralization was intersected no test was made.

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In the Prover 3 area the stream sediment geochemistry values peak at 2200 ppm lead and 430 ppm zinc. These are highly significant in comparison to the initial anomalous drainage sample containing 300 ppm lead and 340 ppm zinc which lead to the discovery of the Que River deposit. Grid mapping has indicated an interbedded sequence of rhyolitic quartz crystal tuffs, lithic tuffs and vitric tuffs. Pyritic vitric tuffs and hematitic tuffaceous siltstones are also present. Bedrock sampling on 100 meter spaced lines has outlined anomalous lead geochemistry to 0.3% however the eastern portion of the grid is blanketed by Tertiary basalt, precluding reliable sampling. Further work on this grid was dependent on favorable results from DDH-1 on Prover 1.

Part of the Mackintosh East area was surveyed by helicopter borne Dighem in April 1980. No obvious strong conductors were located within the favorable host layered volcanic sequence to a depth of approximately 50 meters. Ground follow-up of possible weak conductors and/or magnetic anomalies (Provers 5, 6, 7 and 8 - Figure 2) involved establishment of small skeletal grids which were surveyed with moving source Turam (MST), magnetics, and limited geological/geochemical programs. Results from the follow-up program included anomalies within the noise level of the MST unit, indicating the initial responses may not have been adequately detailed.

REGIONAL SETTING

The joint venture area lies at the northern end of the highly prospective Mount Read Volcanic Belt of Lower to Middle Cambrian age. The northeast trending sequence of rhyolitic to intermediate volcanics and epiclastics lies between Precambrian metasediments to the south and Ordovician sediments to the north. The Hellyer deposit (15 kilometers to the east) lies within a similar belt of northeast trending rocks to the west of the Ordovician sediments. To the southwest the Belt is host to further world class volcanogenic massive sulfide deposits (Table 2).

TABLE 2 MASSIVE SULFIDE DEPOSITS
WITHIN THE MOUNT READ VOLCANIC BELT

Deposit	Mined and Gross Reserves (million tonnes)	Grades
Hellyer	20	7% Pb, 14% Zn, 0.3% Cu, 180g/t Ag, 2.5g/t Au
Que River	3.8	7% Pb, 12.5% Zn, 170g/t Ag 3.5g/t Au
Rosebery	18.4	5.6% Pb, 18.2% Zn, 0.6% Cu, 187g/t Ag, 3.8g/t Au
Mount Lyell	120	1.5% Cu, 8g/t Ag, 0.4g/t Au

GEOLOGY OF THE PROPERTY

The tenement covers a portion of the northwestern margin of the Precambrian 'Tyennan' Craton, the flanking Cambrian island arc volcanic assemblage known as the Mount Read Volcanics and the overlying conglomeratic sandstone (Mount Owen Conglomerate correlate) and limestone (Gordon River Limestone) of Ordovician age. Remnants of Tertiary basaltic flows cover part of the northeastern area. A 1:10000 geologic map (ex Geopeko) is included as Enclosure 1.

The Precambrian rocks outcropping in the southeast consist principally of laminated and massive quartzites, psammopelitic and minor carbonaceous mica schists and show multiple deformation textures and metamorphism to that of greenschist fascies.

The metasedimentary basement is unconformably overlain by a Cambrian rhyolitic volcanic sequence of massive fine grained quartz crystal tuffs with interbedded massive or finely laminated vitric tuffs, tuffaceous siltstones, cherts and fine grained porphyritic lavas. Occasionally observed soft sediment loading structures in the laminated vitric tuffs suggest subaqueous deposition in comparison to the more massive crystal tuffs which appear to be more subaerial. The highly anomalous host sequence is confined to a narrow (100-1500 meters) northeasterly to easterly striking belt, paralleling the margin of the metasedimentary block and dipping moderately to steeply to the northwest and north.

The volcanics are structurally overlain by a broadly conformable massive body of coarse grained quartz-feldspar-biotite porphyry. This 'unit' which is regarded as a large synvolcanic intrusive, is at least two kilometers wide in the central region and appears to extend the length of the tenement with great textural and compositional uniformity.

In the valley of Fleece Creek and the unnamed creek north of Speeler Creek, Ordovician siliceous sandstone and conglomeratic sandstone (Owen Conglomerate equivalent) is well exposed in sharp unconformable contact with the massive Cambrian porphyry. Disseminated blobs of pyrite are a minor constituent in some of the sandstone and pebbly bands with dark hematic matrix being locally prominent. The rocks dip gently to the northwest at 20-30° forming the eastern limb of an open synclinal fold which has a gently northeasterly plunging axis running approximately along the Vale River.

The sandstones pass upwards into a poorly exposed sequence of fine grained silty sediments and karstified mixture limestones (Gordon River correlate) which occupy the Vale of Belvoir.

Portions of the north and eastern sections of the licence are covered by remnants of flat lying Tertiary basaltic flows. Coarse grained hornblende gabbro outcropping south of the Iris River near the eastern boundary suggest the presence of basic volcanic vents in that area.

Recent fluviatite and Pleistocane glacial erosion have produced the present topography.

MINERALIZATION

Minor galena-sphalerite-chalcopyrite-pyrite mineralization is observed associated with small discontinuous quartz veins, stockworks and breccia zones within faulted Precambrian metasediments (Carters) within a quartz chlorite veined altered Cambrian rhyolitic quartz crystal tuff and as fine disseminations in sheared and chloritized rocks close to the structurally emplaced quartz-feldspar-biotite porphyry.

This style of mineralization would appear to have little economic potential, however it is possible it has been derived by remobilization of metals from the Cambrian volcanic sequence. Highly significant assays from finely layered pyritic vitric tuffs (Table 1) suggest a volcanic exhalitive environment containing base metal values was active during the deposition of the anomalous host volcanic sequence.

WORK CONDUCTED BY CYPRUS

A work program entailing assessment of previous work, preparation of a basemap, the implementation and interpretation of an EM-37 geophysical survey, line cutting, rockchip and sediment sampling and petrographic surveys was carried out during the period.

Basemaps acquired from Geopeko have been modified and made into one sheet. This base was used for the planning of the EM-37 geophysical survey.

The proposed geophysical 'attack' of the volcanics was substantially completed during May/June 1985 with the three major geochemically anomalous zones (Paringa/Geopeko) gleaned from the assessment of previous work being gridded and surveyed with EM-37. P & V Geophysical Services conducted the program using 600 x 300 meter loops placed up dip of the target geochemical zones for

maximum coupling. One loop was placed on the down-dip side (Speeler Creek) of an anomalous response delineated by the previous loop to further define the anomaly for drilling. Fifty meter station intervals were read with some detailing to 25 meters over anomalous zones. Loop locations are shown in Appendix 5 and plots of the data obtained included as Appendix 3.

Dr J Bishop of Mitre Geophysics was contracted to interpret the EM data and suggest possible drill targets. The coverage and interpreted anomalies are shown on Figures 2, 3 and 4, of Appendix 5, with the idealized transmitting loop positions. Only the down and across strike (north) components were used to pick responses due to the disappointing (noisy) data quality.

Geochemical samples were despatched either to Amdel (Adelaide) or Analabs (Burnie) for assay for a suite of elements including copper, lead, zinc, silver and gold. Results are included as Appendix 1.

Both the gridding and geophysical survey were slower than anticipated due to weather conditions (snow falls and heavy rain) and to sections of very rugged and steep terrain. The track into the Carters and Heap of Rocks grids became impassable to other than the two bombadiers used for transporting gear and personnel (J5 and Muskeg Carrier).

The following is a summary of each prospect surveyed during the period.

SPEELER CREEK GRID .....

Purpose

To conduct an EM-37 survey over a portion of volcanics from which highly significant stream sediment values of up to 2200 ppm lead and 430 ppm zinc drain as well as surveying volcanics covered by a thin blanket of Tertiary basalt.

Work Completed

Eleven line kilometers of gridding and line cutting, including re-establishment of part of Geopeko's grid (Prover 3) was completed prior to the commencement of the transient EM survey (Enclosure 1). Lines were spaces at 100 meter intervals and were staked at 50 meter stations along lines.

These lines were surveyed with EM-37 totalling 13 line kilometers, utilizing three loop set-ups - Tx 1, 2 and 3. All three components were measured using a 25Hz repetition rate.

No well defined anomalies were recorded (Mitre Geophysics, Appendix 5), however a number of weak responses were obtained throughout the gridded area (Figure 2 of Appendix 5). Loops one and two delineated two anomalous trends roughly parallel to the overall strike and to the northeast of Geopeko's Prover 3 grid. The grid was extended and a third loop was read to better define the anomalies. A highly responsive anomaly was delineated showing migration of the peak on later channels indicating a surficial or horizontal conductor within the basalt. An adjacent response - 11700E/9875N - was confirmed and extended by the third loop and has been targeted by Mitre Geophysics for diamond drilling (see proposed program, Appendix 4). A second weak response is also targeted for drilling as the anomaly center lies coincident (10800E/9775N) with a zone of highly anomalous geochemistry (up to 0.3% lead) and altered chloritic fine grained tuffs.

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HEAP OF ROCKS .....

Purpose

A 900 by 100 meter geochemical anomaly (Paringa/Geopeko - Prover 1) assaying from 500 to 2000 ppm lead coincident with fine grained (cherty) sediments was the target for the EM-37 survey.

Work Completed

Three line kilometers of gridding and line cutting was conducted prior to the TEM survey. Lines were gridded at 100 meter spacings with pegs at intervals of 50 meters.

Three line kilometers of EM-37 surveying was completed utilizing two loop set ups, Tx 4 and 5. A 100 meter offset between the loops was necessary to maintain the required coverage over the volcanics. All three components were measured using a 25Hz repetition rate.

A number of weakly conducting zones have been interpreted (Figure 4, Appendix 5). However, a pronounced response coincident with a strong (1950 ppm zinc, 495 ppm lead) lead-zinc soil anomaly was recorded at 9800E/10250N. A quantative interpretation was difficult due to noise, however the response was recorded by both loops and has been targeted for diamond drilling (PDH-1, Appendix 4).

Two petrographic samples collected in proximity to PDH-1 are described as being siliceous sercitic ashstones with thin tuffaceous lenses and as an original dacite, extensively altered to quartz sericite chlorite with very fine grained galena spalerite and pyrite present (Appendix 2).

Two rockchip samples were also taken from the grid, sample 113810 from a costean near 10000E/10200N, the second corresponding to the petrographic sample - altered dacite, outcrops near 10200E/10150N. Sample 113810 showed weak zinc-lead anomalies with values of 360 and 110 ppm respectively, however sample 113811 was highly anomalous with values of 0.41% lead, 570 ppm zinc and 7 ppm silver (Appendix 1).

CARTERS .....

Purpose

To implement an EM-37 survey over a zone of anomalous geochemistry outlined by Paringa and also a zone outlined by Geopeko (Prover 6) assaying up to 0.3% lead and 0.1% zinc.

Work Completed

Prior to the commencement of EM surveying, 11 kilometers of gridding and line cutting was completed. The grid was doglegged by 25° to allow for a change in strike of the geology consistent with a major fault traversing the area at Carters prospect. Again lines were spaced at 100 meter intervals and were pegged at 50 meter stations.

Nine line kilometers of EM-37 surveying was conducted utilizing two loop 'set-ups', Tx 6 and 7. All three components were measured using a 25Hz repetition rate.

The responses were similar to those on Heap of Rocks, with a number of weak conductors being outlined. An anomaly on line 10350E at 10275N is interpreted by Mitre Geophysics (Appendix 5) to possibly be a deep resonse with a conductor topping at 100 meters. The response lies coincident with strongly anomalous lead and zinc geochemistry outlined by Paringa's initial surveys and requires diamond drilling (PDH-2, Appendix 4). A second

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prospective anomaly, which after quantative interpretation was downgraded, lies in close proximity to a fault zone mapped by Geopeko. Other possible anomalous trends almost certainly appear to be due to noise.

One rockchip sample was taken from this grid (113858) located at the Carters Prospect. The sample was a retrogressed mineralized (quartz-galena-sphalerite-chalcopyrite-pyrite) schist which assayed 4.04% lead, 2.3% zinc, 16 ppm silver and 0.08 ppm gold (Appendix 1).

REGIONAL .....

Four further rockchip samples were randomly taken at various points within the licence to check for anomalous geochemistry and for geological descriptions. Locations are shown on Enclosure 1, results listed in Appendix 1 and petrographic descriptions given in Appendix 2.

Geochemical values for samples 113806, 807 and 808 are of background character containing trace amounts of gold (0.04-0.06).

Petrographic descriptions for samples 113806 and 113859 are as follows: thin layered siltstone-silty claystone (possible epiclastic) and a massive, glassy, rhyolite showing a brittle brecciation fabric.

EXPLORATION POTENTIAL

Highly geochemically anomalous volcanic and epiclastic sequences outcrop poorly throughout the tenement which is considered to have excellent potential for hosting a volcanogenic exhalitive base metal deposit with reserves of 20 million tonnes grading +20% combined lead and zinc with gold and silver credits. There is possible subordinate potential for stratabound and epithermal gold deposits within the volcanics as the sampling to date has been nondefinitive with individual drainages failing to be sampled.

PROPOSED PROGRAM

A field examination of the stronger EM/geochemical targets will be conducted and the most favorable targets will then be drill tested. A drilling program is scheduled for the summer field season.

Signed _____

P A JONES

CYPRUS MINERALS AUSTRALIA COMPANY

EXPENDITURE FOR THE PERIOD ENDING OCTOBER 30, 1985

EXPLORATION LICENCE (PART) 2/70

Salaries and Wages	22,859.08
Drafting	2,269.08
Cookery	8,190.15
Field Supplies	2,191.19
Freight	1,277.41
Travel	1,790.60
Communications	365.48
Geophysics	25,854.02
Consultants/Contractors	1,914.75
Drilling	-
Assays	3,929.97
Equipment Rental	703.40
Equipment Operation & Maintenance	747.41
Property Payments	-
	72,092.54
Overhead	7,209.25
	$ 79,301.79

T J Conquest for
ACCOUNTANT
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APPENDIX 1

ANALYTICAL RESULT SHEETS

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ANALABS

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A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999
52 Murray Road, Welshpool, W.A. 6106
Telex AA92560

ANALYTICAL REPORT No. 4.5 08 3103

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Amoco Minerals Australia Company
P.O. Box 493
North Sydney
N.S.W. 2060

ORDER No.	PROJECT
E 14740	MacIntosh-E
DATE RECEIVED	**RESULTS REQUIRED**
28.5.85	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	10

STATE OF SAMPLES		PRE-TREATMENT							ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
RC	152187-196	1	2	4	3 5				Cu Pb Zn Ag Au		101 313

RESULTS TO

As Above

RESULTS TO

61 Counsel St.
Zeehan 7469

REMARKS

Despatch No. 2307

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

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063036

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	4.5 08 3103	4.6.85	E 14740	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Ag	Au	Mac East. Spencer Ck Grid.		
1	152187		10	40	120	X	0.010	≈ 11700E / 9950N.		
2	152188		X	20	60	X	X	"	"	
3	152189		100	20	5	X	0.040	"	"	
4	152190		15	315	15	X	0.015	Quarry NE of Grid		
5	152191		5	50	10	X	0.005	"	"	
6	152192		X	45	20	X	X	"	"	
7	152193		X	215	20	X	X	"	"	
8	152194		X	115	15	X	0.005	"	"	
9	152195		X	55	15	X	X	"	"	
10	152196		X	130	35	X	X	"	"	
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Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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063037

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	4.5 08 3103	4.6.85	E 14740	2 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Ag	Au			
1	STD 3036		165	600	250	2.50	–			
2	RPT 152187		10	50	130	X	–			
3										
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22										
23	DETECTION		5	5	5	0.5	0.005			
24	DIGESTION									
25	METHOD		101	101	101	101	313			

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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037

063038

The Australian
Mineral Development
Laboratories

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide (08) 79 1662
Telex AA82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

3/786/0 - AC 3683/85
SPT 6/85

29 March 1985

Mr. P. Jones,
Amoco Minerals Australia Limited,
61 Counsel Street,
ZEEHAN TASMANIA 7469

SAMPLES 113806-813
ONLY ARE
MACKINTOSH EAST

REPORT AC 3683/85

YOUR REFERENCE:	Order Number 14704 Despatch No. 4945
REPORT COMPRISING:	Cover Sheet Page 1 Pages G1 - G2 Pages X1 - X2
DATE RECEIVED:	11 March 1985

D. Patterson
Chief Chemist
Analytical Chemistry Division

cc Mr. B. Roxburgh,
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ij

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063059

Report AC 3683/85
Page 1

THE MANAGER
AMDEL
FLEMINGTON STREET
FREWVILLE SA

Your Ref. No. A 94407 spt6/85

Our Ref. No. 8759/85

Date 25/3/85

Sample Received 11/3/85

REPORT ON FIRE ASSAY

METHOD: EFAS 50g

INVOICE No. 3758

	Sample Ref.	GOLD, GRAMS PER TONNE MEAN	ASSAY 1	ASSAY 2		Sample Ref.	GOLD, GRAMS PER TONNE MEAN	ASSAY 1	ASSAY 2
1	113806	0.06			26	113831	tr		
2	07	0.04			27	32	0.20		
3	MAC 08	0.04			28	33	0.08		
4	EAST 09	0.08			29	34	tr		
5	10	*			30	35	*		
6	11	*			31	36	tr		
7	12	*			32	37	*		
8	13	*			33	38	*		
9	14	tr			34	39	*		
10	15	tr			35	40	*		
11	16	*			36	41	tr		
12	17	tr			37	42	tr		
13	18	tr			38	43	tr		
14	19	*			39	44	tr		
15	20	*			40	45	tr		
16	21	*			41	46	tr		
17	22	tr			42	47	tr		
18	23	tr			43	48	*		
19	24	tr			44	49	*		
20	25	0.03	(0.04	tr)	45	50	tr		
21	26	*			46	51	tr		
22	27	*			47	52	tr		
23	28	tr			48	53	0.04		
24	29	tr			49	54	*		
25	30	*			50	113857	0.04		

039 (( )) amdel

063040

Analysis code A1/1.2 Report AC 3683/85 Page G1

NATA Certificate Order No. 14704 Results in ppm

Sample	Cu	Zn	Ni	Fe	Mn	Ag
ROCK 113806	72	48	12	3.23%	86	<1
ROCK 113807	76	30	12	4.20%	76	<1
ROCK 113808	170	41	10	18.6%	215	<1
ROCK 113809	275	2.30%	14	3.38%	165	16
ROCK 113810	37	360	20	3.91%	2460	<1
ROCK 113811	29	570	32	8.06%	3080	7
ROCK 113812	26	105	34	6.74%	1340	<1
ROCK 113816	29	84	26	3.85%	890	<1
ROCK 113818	29	56	335	5.12%	950	<1
ROCK 113819	38	58	330	4.61%	680	<1
ROCK 113820	70	56	490	7.04%	930	<1
ROCK 113823	19	28	20	3.46%	330	<1
ROCK 113824	155	82	120	11.6%	1260	<1
ROCK 113825	2.12%	125	60	44.7%	520	8
ROCK 113826	820	135	72	24.6%	3180	<1
ROCK 113827	170	64	30	5.60%	1.48%	<1
ROCK 113828	390	360	160	3.80%	37.7%	<1
ROCK 113829	29	12	10	1.18%	850	<1
ROCK 113830	105	52	80	8.24%	1320	<1
ROCK 113831	70	56	155	6.54%	780	<1
ROCK 113832	125	49	105	7.38%	1120	<1
ROCK 113833	205	68	100	8.56%	920	<1
ROCK 113834	328	74	62	10.1%	1280	<1
ROCK 113835	270	78	46	8.08%	550	<1
ROCK 113836	70	45	32	7.60%	265	<1
ROCK 113837	195	74	76	9.46%	990	<1
ROCK 113840	125	335	130	22.4%	455	<1
ROCK 113845	13	46	1020	13.1%	5650	<1
ROCK 113846	105	125	44	8.22%	790	<1
ROCK 113847	730	100	52	16.4%	3220	<1
ROCK 113848	43	37	195	4.80%	3660	<1
ROCK 113849	24	27	78	5.06%	550	<1
ROCK 113852	28	62	44	17.7%	2.16%	<1
ROCK 113857	280	120	78	38.5%	910	2
P CONC 113813	8	32	6	1.92%	1060	<1
P CONC 113814	38	125	72	8.42%	530	<1
P CONC 113822	110	135	440	6.16%	2260	<1
P CONC 113839	80	210	66	14.2%	2380	<1
P CONC 113842	78	145	92	11.0%	1180	<1
P CONC 113844	43	90	82	6.04%	650	<1
Detn limit	(2)	(2)	(5)	(5)	(5)	(1)

040

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063041

Analysis code X3 | Report AC 3683/85 | Page X1

NATA Certificate | Order No. 14704 | Results in ppm

Sample	As	Pb	Sn	W	Sb	Ba
ROCK 113806	78	43	<4	<10	<4	730
ROCK 113807	64	42	6	20	<4	410
ROCK 113808	680	40	8	<10	4	20
ROCK 113809	2515	4.04%	4	<10	22	500
ROCK 113810	2	110	10	10	<4	1360
ROCK 113811	<2	4100	10	<10	<4	1420
ROCK 113812	8	200	<4	<10	<4	1040
~~ROCK 113816~~	~~4~~	~~6~~	~~4~~	~~<10~~	~~<4~~	~~180~~
ROCK 113818	<2	5	<4	<10	<4	320
ROCK 113819	<2	2	<4	<10	<4	20
ROCK 113820	<2	8	10	<10	<4	45
ROCK 113823	4	7	4	10	<4	320
ROCK 113824	250	8	6	<10	14	<10
ROCK 113825	480	90	14	<10	36	<10
ROCK 113826	260	25	6	<10	22	35
ROCK 113827	19	4	6	<10	6	55
ROCK 113828	41	13	<4	20	18	1.76%
ROCK 113829	13	19	8	<10	4	820
ROCK 113830	6	6	4	10	<4	280
ROCK 113831	<2	<2	<4	<10	<4	130
ROCK 113832	8	8	<4	<10	4	390
ROCK 113833	<2	<2	4	<10	<4	110
ROCK 113834	7	6	4	<10	4	120
ROCK 113835	20	12	6	<10	<4	330
ROCK 113836	11	12	4	<10	<4	120
ROCK 113837	6	2	6	<10	<4	200
ROCK 113840	36	48	8	20	<4	200
ROCK 113845	26	4	4	<10	32	15
ROCK 113846	<2	4	<4	<10	6	530
ROCK 113847	10	<2	6	<10	12	140
ROCK 113848	3	<2	<4	<10	<4	25
ROCK 113849	<2	9	<4	<10	<4	60
ROCK 113852	66	310	<4	<10	<4	65
~~ROCK 113857~~	~~135~~	~~98~~	~~<4~~	~~10~~	~~10~~	~~<10~~
P CONC 113813	7	86	<4	<10	<4	230
~~P CONC 113814~~	~~22~~	~~16~~	~~4~~	~~<10~~	~~<4~~	~~280~~
P CONC 113822	7	18	6	<10	<4	180
P CONC 113839	19	12	<4	<10	<4	190
P CONC 113842	15	13	<4	10	4	230
~~P CONC 113844~~	~~9~~	~~7~~	~~<4~~	~~<10~~	~~<4~~	~~320~~
Detn limit	(2)	(2)	(4)	(10)	(4)	(10)

APPENDIX 2

MINERALOGICAL REPORTS

by Pontifex and Associates

Pontifex & Associates Pty. Ltd.

042 063043

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 4548

16th May, 1985

TO:	Mr. Jonathon Suppree, Amoco Minerals Aust. Co. 61 Counsel St., ZEEHAN Tasmania 7469
YOUR REFERENCE:	Order No. E14723 Mackintosh East, Cradle Mountain Area, Acid Volcanics
MATERIAL:	Rock samples
IDENTIFICATION:	E113806, 810, 811, 812 E113858, 859
WORK REQUESTED:	Thin section preparation and description.
SAMPLES & SECTIONS:	Returned to you with this report.

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

The six petrographic descriptions in this report provide a rock name, and include comments on genesis, also comparisons within the suite, and comment on the relationship between the petrography and your field notes, as appropriate.

The generally individual nature of each sample did not really justify a summary of the batch as a whole.

044

063045

E113806 : thin layered siltstone-silty-claystone, claystone sequence, with weak graded bedding; minor quartz stringers and limonite-lined micro-fractures and microfaults.

Field note: Cambrian acid volcanics, fine grained ?epiclastic tuffaceous silt.

This is a layered siltstone-claystone, with local graded bedding. There are no diagnostic characteristics which allow a distinction between a "normal clastic" sediment from an epiclastic facies, i.e. neither genesis can be confirmed or denied.

The beds range up to 30 mm thick, and range in grainsize from siltstone through silty claystone to claystone. Micro-faulting along limonite-lined fractures is common.

The siltstone consists of quartz grains up to 0.05 mm in size with minor sericite, leucoxene and limonite. With increasing sericite and decreasing quartz, this siltstone passes into a silty claystone, and eventually into a claystone with about 5% fine grained quartz and ultrafine opaque dust (?graphite). The bedding is somewhat irregular with lenses of more silty material in the silty claystone beds and rare very fine sandsized grains.

A lenticular quartz stringer is present in one of the silty layers. Limonite staining of the clays is common and there are numerous limonite-lined microfractures.

E113810 : siliceous sericitic ashstone (or possible altered rhyolitic glass) with minor thin tuffaceous lenses.

Field note: Cambrian Acid Volcanics, vitric and lithic crystal tuff, siliceous and laminated.

At least 90% of this rock is a laminated, extremely fine, siliceous sericitic claystone, with layers 0.1 to 3 mm thick, largely defined by variations in the abundance of illite and kaolinite, which have a good layer parallel orientation, and appear to be intimately mixed with minor ultrafine silica. Leucoxene spots about 0.1 mm in diameter are scattered, as the only other constituent in these laminae.

These compact, extremely fine components may represent volcanic ash, however this really cannot be distinguished from an altered rhyolitic-felsic glass (similar to E113859?).

Some layers do have more obviously tuffaceous character, as follows:

(1) a layer 3 mm thick with extremely angular quartz grains up to 0.2 mm, and ?kaolinised lithic or vitric fragments to 0.4 mm in size,

(2) a lens 2 mm thick with bipyramidal quartz crystals 0.2 - 2 mm in size and argillised vitric or lithic fragments.

(3) a lens of chlorite-sericite altered lithic fragments up to 4 x 2 mm.

Several random stringers of quartz, leucoxene-lined stylolite threads and narrow shear planes with disrupted clay foliation occur locally.

046

E113811 : original dacite, extensive alteration to quartz, sericite, leucoxene, chlorite, and ? chlorite-vermiculite; rare very fine galena, sphalerite, pyrite.

Field note: Cambrian Acid Volcanic, Vitric tuff.

The texture of this rock is quite massive, with a fairly homogeneous groundmass and scattered altered phenocrysts, with a complex vein network. This indicates that the sample is a lava rather than a pyroclastic rock.

It is classified as a dacite although it has <1% primary quartz phenocrysts.

The numerous altered phenocrysts were originally plagioclase (10%), now selectively replaced by quartz and/or sericite; with minor pyroxene phenocrysts replaced by quartz and leucoxene, and titanomagnetite microphenocrysts altered to leucoxene. Some chlorite and chlorite-?vermiculite occurs in some of the probable altered pyroxene phenocrysts. A sericitised xenolith 5 mm in length has quartz-filled vesicles.

The groundmass is altered to extremely fine grained sericite and clouded quartz, with finely dispersed opaque oxides. A complex but fairly sparse network of veins and tension gashes contains quartz and chlorite or quartz alone, with or without rare very fine galena, iron-rich sphalerite and pyrite. Rare fine sulphides also occur in altered phenocrysts.

E113812 : altered (lithic)-crystal acid tuff with trace sulphides.

Field note: Cambrian acid volcanics;
acid fragmental tuff.

This is a crystal-dominated tuff, with fragments of quartz crystals and some complete volcanic quartz crystals, (together 20 - 25%), also sericite pseudomorphs after felspar crystals (20%) 0.3 - 1 mm in size as the most prominant components.

Several lithic fragments up to lapilli size (14 mm), are scattered and show patchy alteration to sericite, chlorite and epidote. The textures suggest the former presence of felspar phenocrysts about 0.5 mm long and their overall mineralogy suggests a relatively basic/intermediate origin.

Minor leucoxenised magnetite is present, and there are rare clay-leucoxene pseudomorphs after biotite flakes.

The matrix is mostly ultrafine quartz and sericite, with patches of epidote and ?prehnite. Traces of pyrite and possible galena are scattered.

A limonite-rich weathering rind is present on this sample.

E113858 : probable retrogressed laminated schist; accessory, fine sphalerite and galena, in several small shear veins (?preCambrian schist)

Field note: close to contact zone of pre-Cambrian schists/ quartzites, and Cambrian volcanics; quartzite or tuff?

This is a laminated rock with sericite-rich layers, and alternating quartz-rich layers 0.5 - 1 mm thick. The layers are weakly crenulated but have mostly a layer parallel schistosity with, locally, an axial plane schistosity in some of the crenulations. The quartz is thoroughly recrystallised with a grainsize of 0.1 mm. Some of the sericitic layers contain chlorite and limonite-stained sericite, possibly after biotite. Randomly oriented leucoxene pseudomorphs of ilmenite plates (3%) to 0.8 mm long are scattered.

Quartz-chlorite shear veins cutting the rock contain rare fine iron-rich sphalerite and galena. Minor sphalerite also occurs as small grains in the schist another are late stage crosscutting quartz veins.

This rock appears to be retrogressed schist and is possibly part of the pre-Cambrian psammo-pelite schist and quartzite sequence mentioned in the field notes.

0-2

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E113859 : massive glassy rhyolite with minor small quartz-phenocrysts, argillised, with a brittle brecciation fabric of uncertain genesis.

Field note: Acid volcanics, chert/rhyolite?

At least 90% of this rock consists of a mass of micro to virtually cryptocrystalline quartz, crowded with subordinate, dispersed, clay-sericite.

A relict breccia texture is evident in some vague layers and is partly defined by an extensive, highly irregular network of sericite-filled threads and stringers. This network also occurs however in relatively homogeneous areas of the rock.

Small quartz phenocrysts (3 - 5%) are randomly scattered.

The rock is identified as an altered glassy rhyolite, the brecciation is of very brittle style, it may have occurred during flow, or it may be a later tectonic event.

Pontifex & Associates Pty. Ltd.

050

063051

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 4562

13th June, 1985

TO:	Mr. P.A. Jones, Amoco Minerals Aust. Co. 61 Counsel St., ZEEHAN Tas. 7469
YOUR REFERENCE:	Order No. E14741
MATERIAL :	Rock sample Mt. Read Volcanics, MacIntosh East.
IDENTIFICATION:	E152197
WORK REQUESTED:	Thin section preparation and description.
SAMPLES & SECTIONS:	Returned to you with this report.

PONTIFEX & ASSOCIATES PTY. LTD.

E152197 : schistose, sericitic, quartz-rich ignimbrite with minor chlorite;
including large fiamme replaced by sericite;
accessory fine pyrite disseminated.

Field note: altered pyroclastic with chloritic fiamme

This is a schistose quartz-sericite with ignimbrite, (welded vitric tuff with scattered crystals), with fiamme up to 30 mm long. Despite the dark colour in hand specimen, the fiamme are now represented largely by extremely fine shredded sericite (rather than chlorite), enclosing minor plagioclase phenocrysts mostly replaced by chlorite, and minor phenocrysts of quartz, 1 - 2 mm in size.

These fiamme occur in a matrix of fine quartz-sericite schist, with ultrafine leucoxene outlining vitric to pumice-like fragments up to 5 mm long. Small phenocrysts of quartz, and plagioclase are scattered, some of these are fragmented, and these are rare altered biotite flakes.

Stylolite like veins are decorated by leucoxene and very minor pyrite, and there are rare disseminated small pyrite cubes. Several small clusters of pyrite (pyritised fragments?) occur in the rock, but are not represented in the thin section.

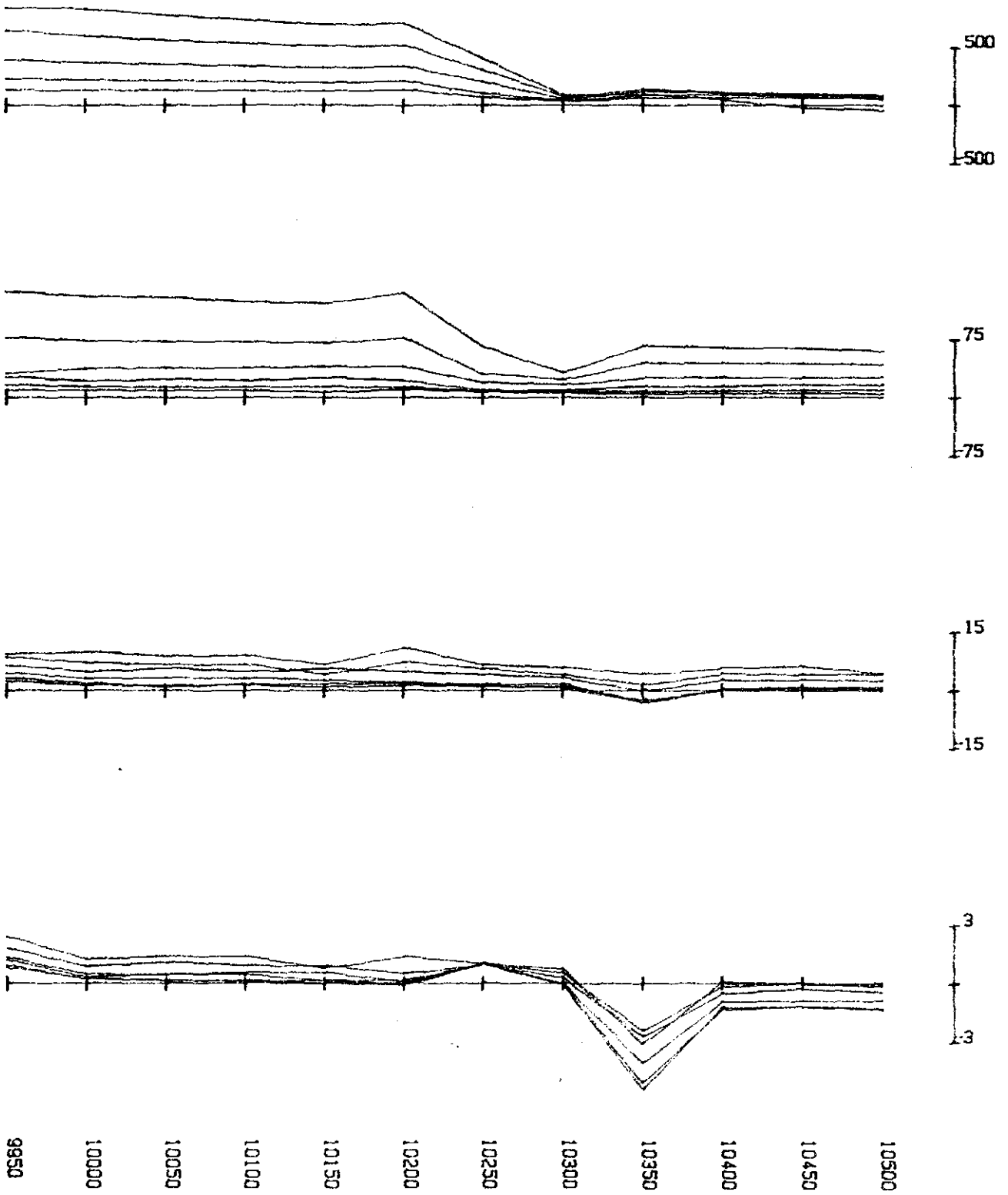
APPENDIX 3

EM-37 PLOTS

by P & V Geophysical Services

053

063054



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 ⇐ TX5 2 ? Line 9800 Component D

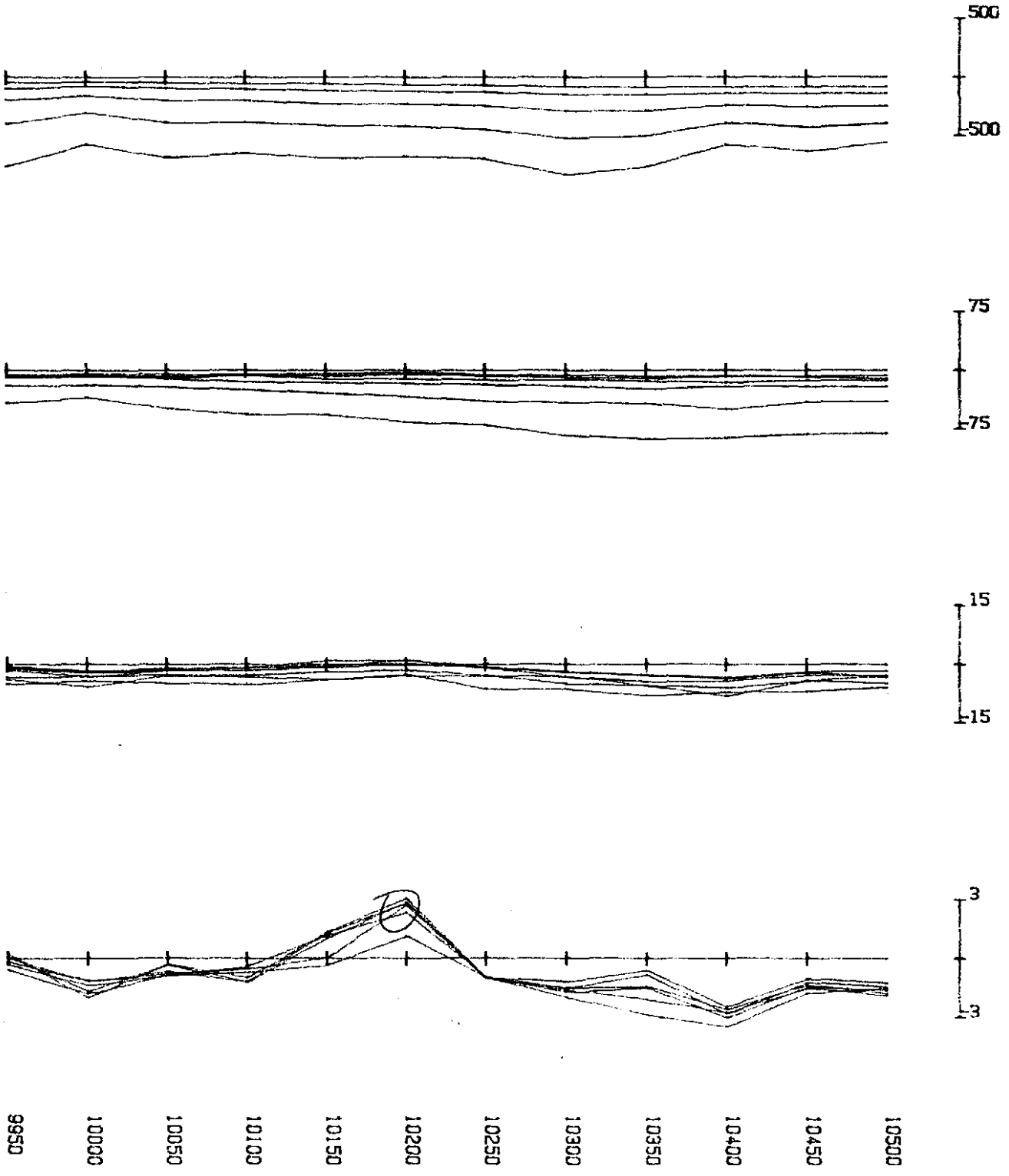
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

054

063055



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9800 Component N

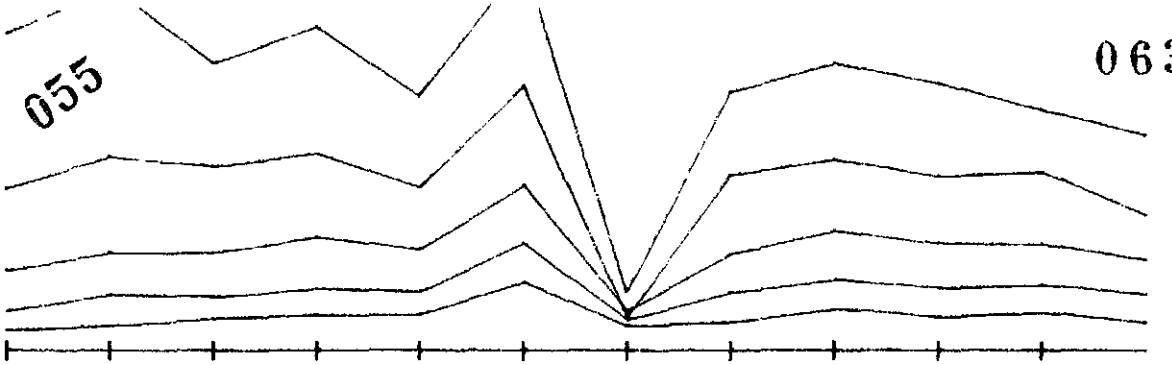
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

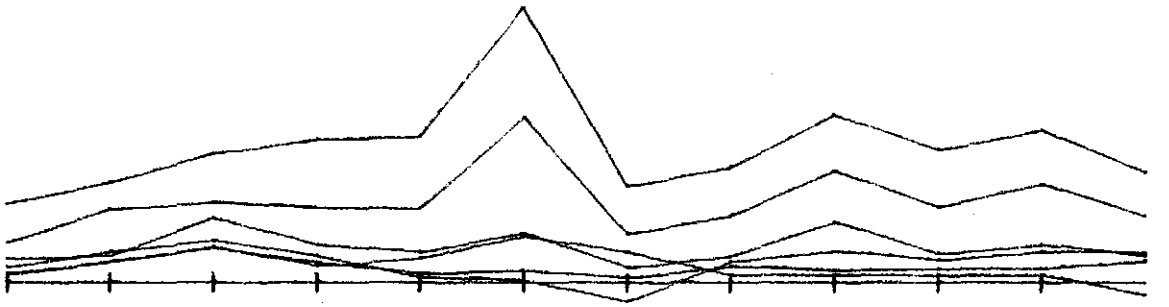
055

063056



100

-100

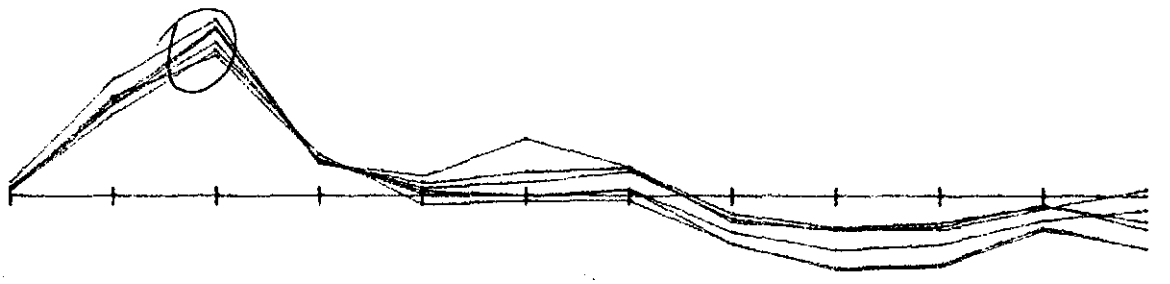


25

-25

10

-10



3

-3

9950 10000 10050 10100 10150 10200 10250 10300 10350 10400 10450 10500

EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9800 Component E

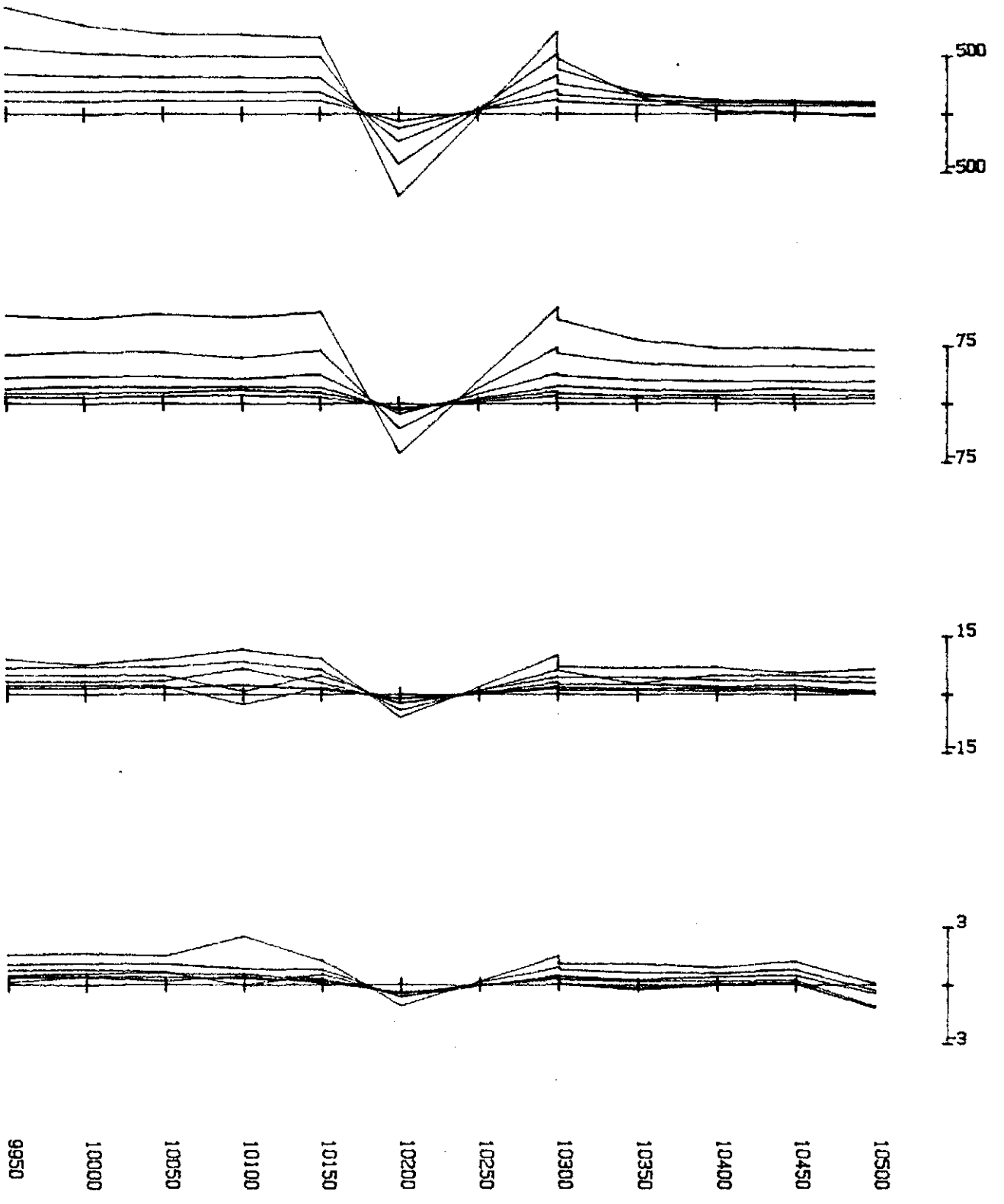
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063057

056



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx5

Loop HOR1 ⇐ 2 ? Line 9900 Component D

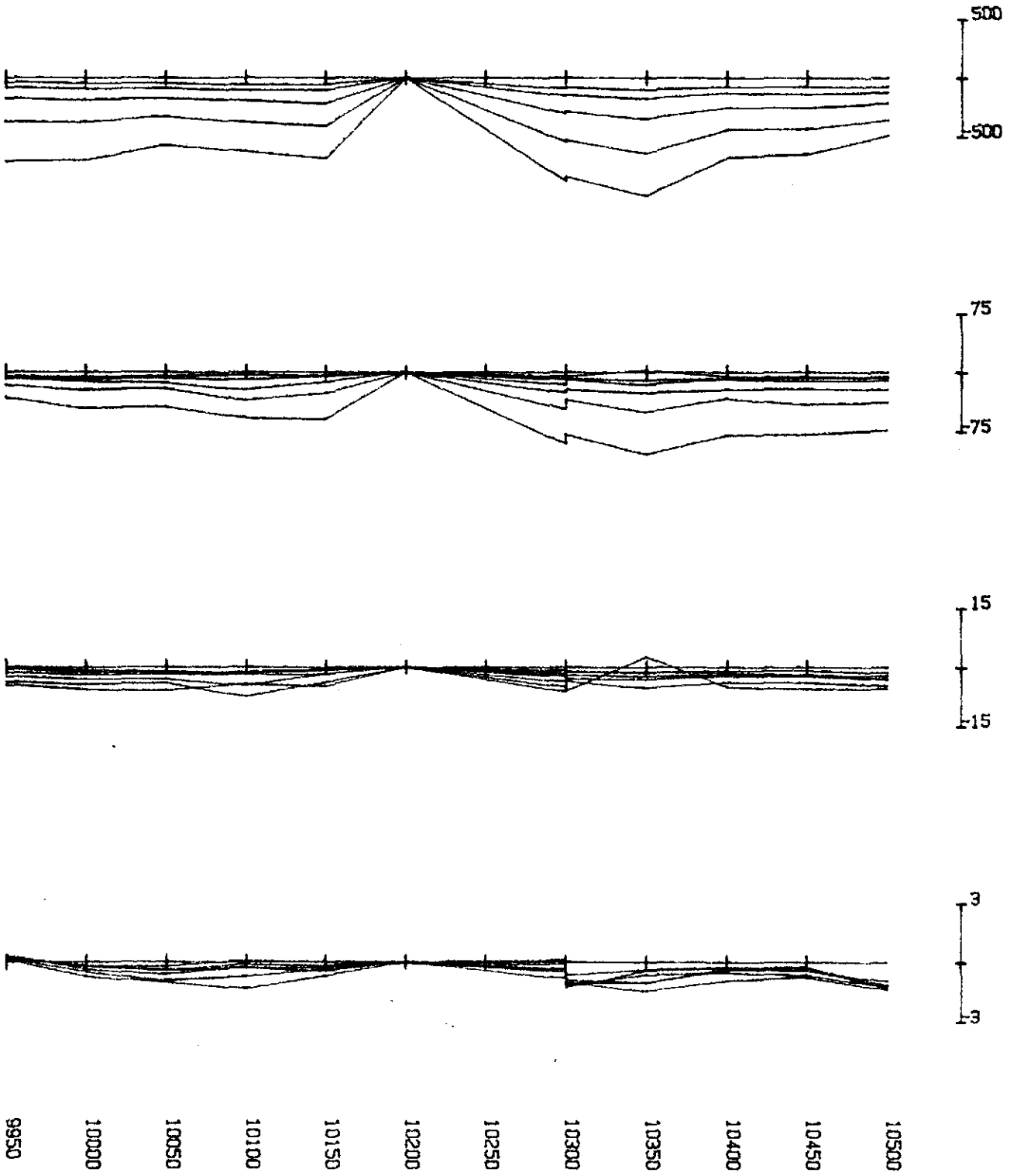
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

057

063058



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9900 Component N

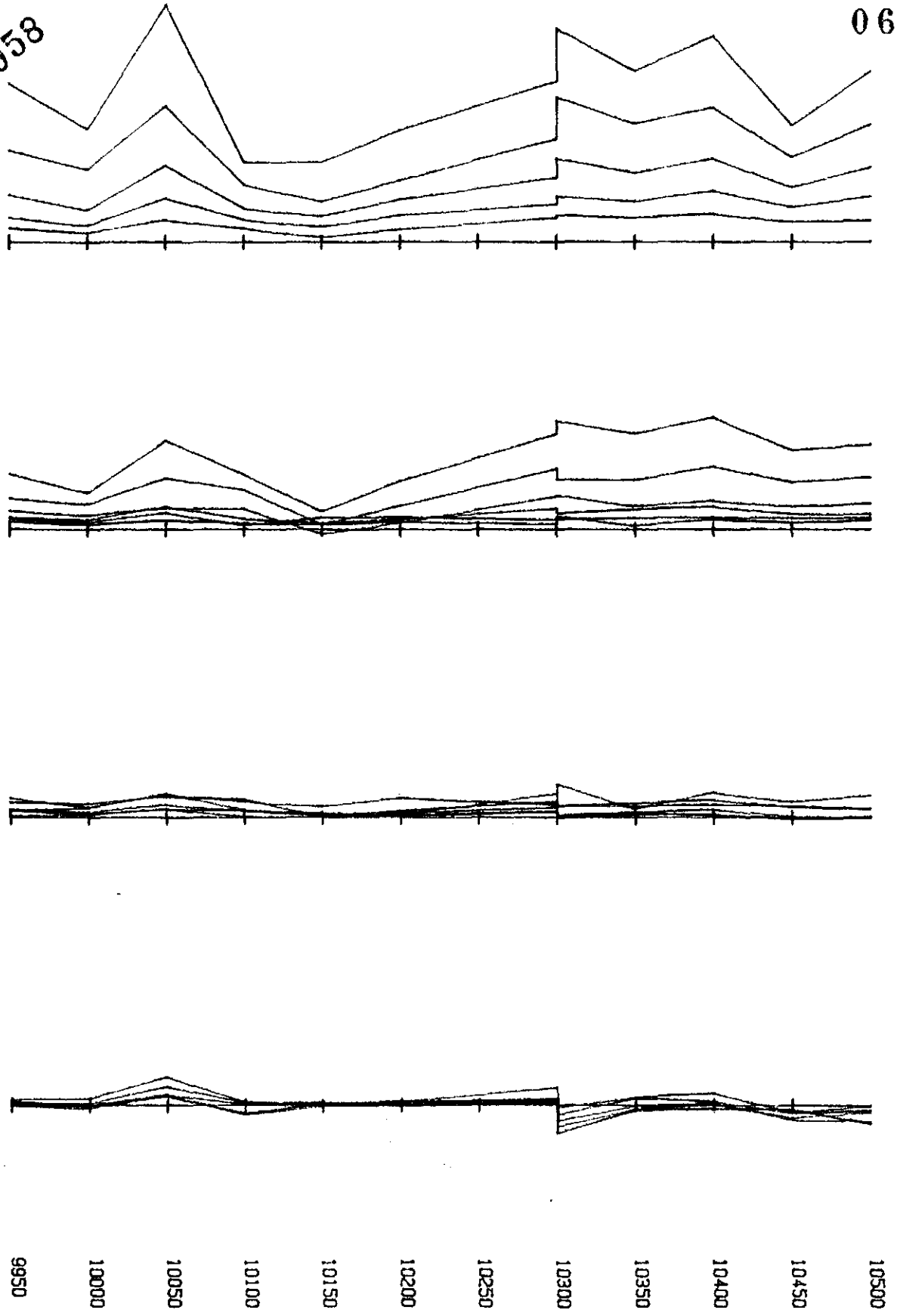
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

058

063059



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9900 Component E

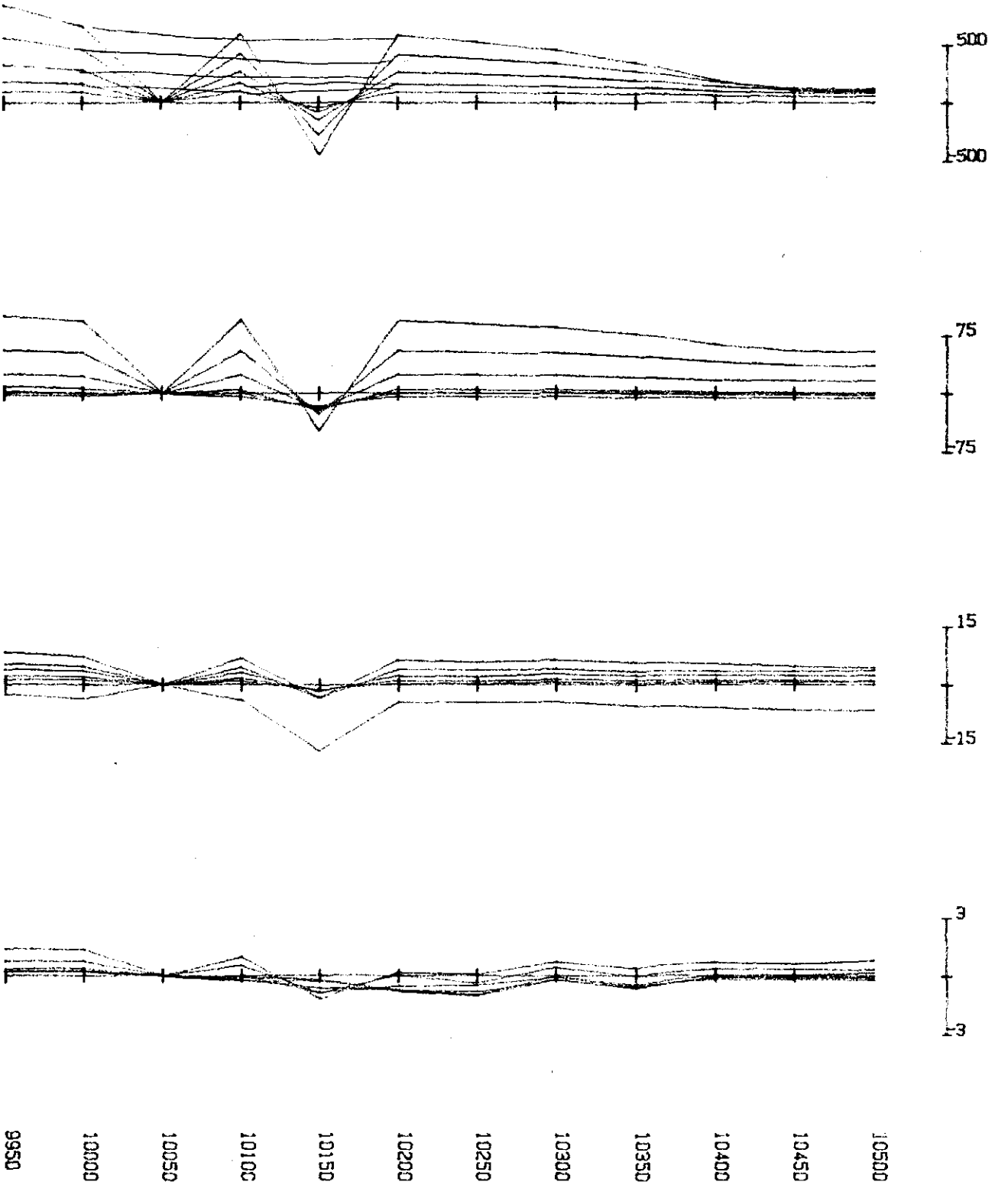
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

059

063060



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx 5
Loop HOR2 Line 10000 Component D

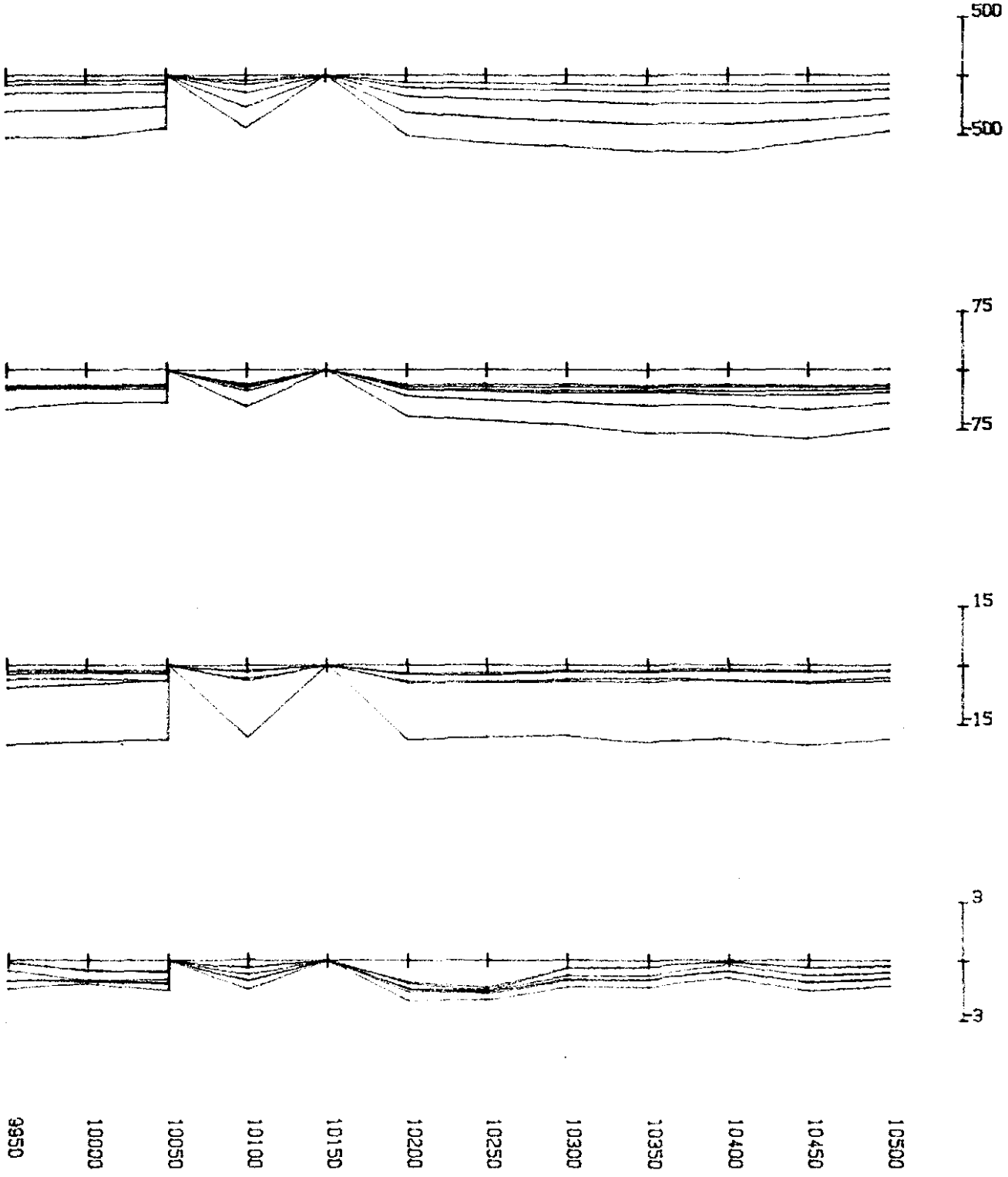
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

060

063061



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10000 Component N

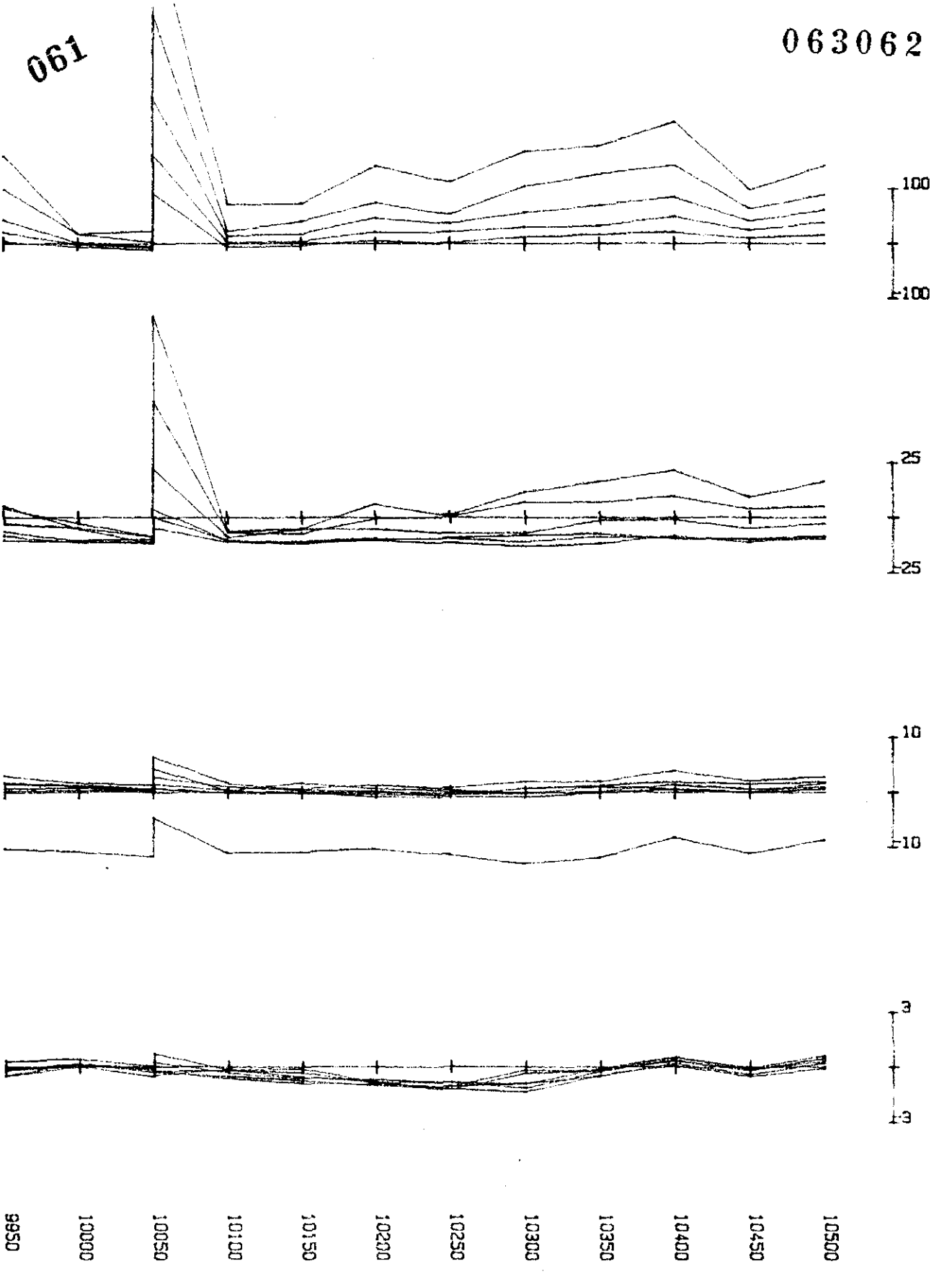
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

061

063062



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10000 Component E

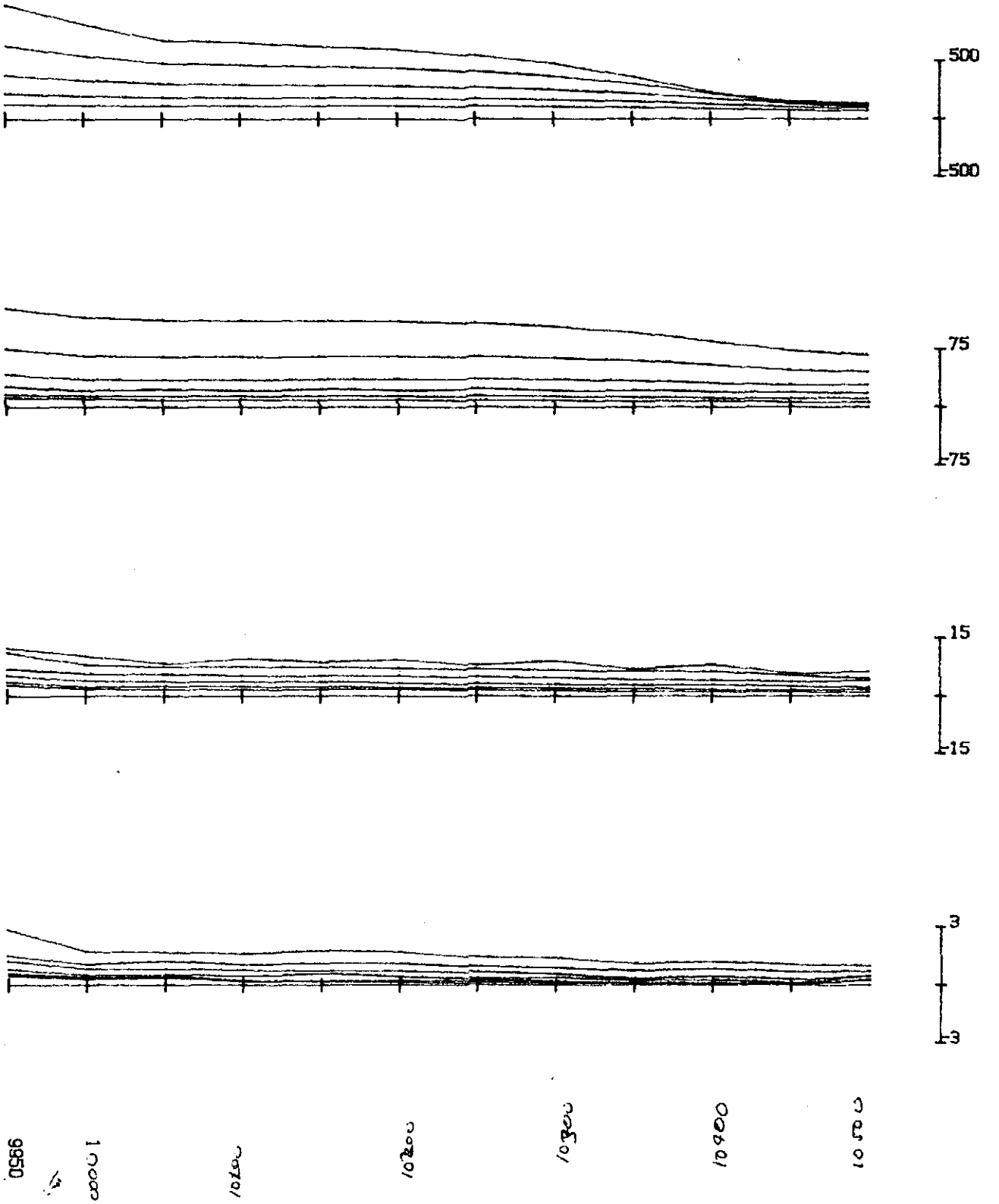
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

062

063063



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx 5

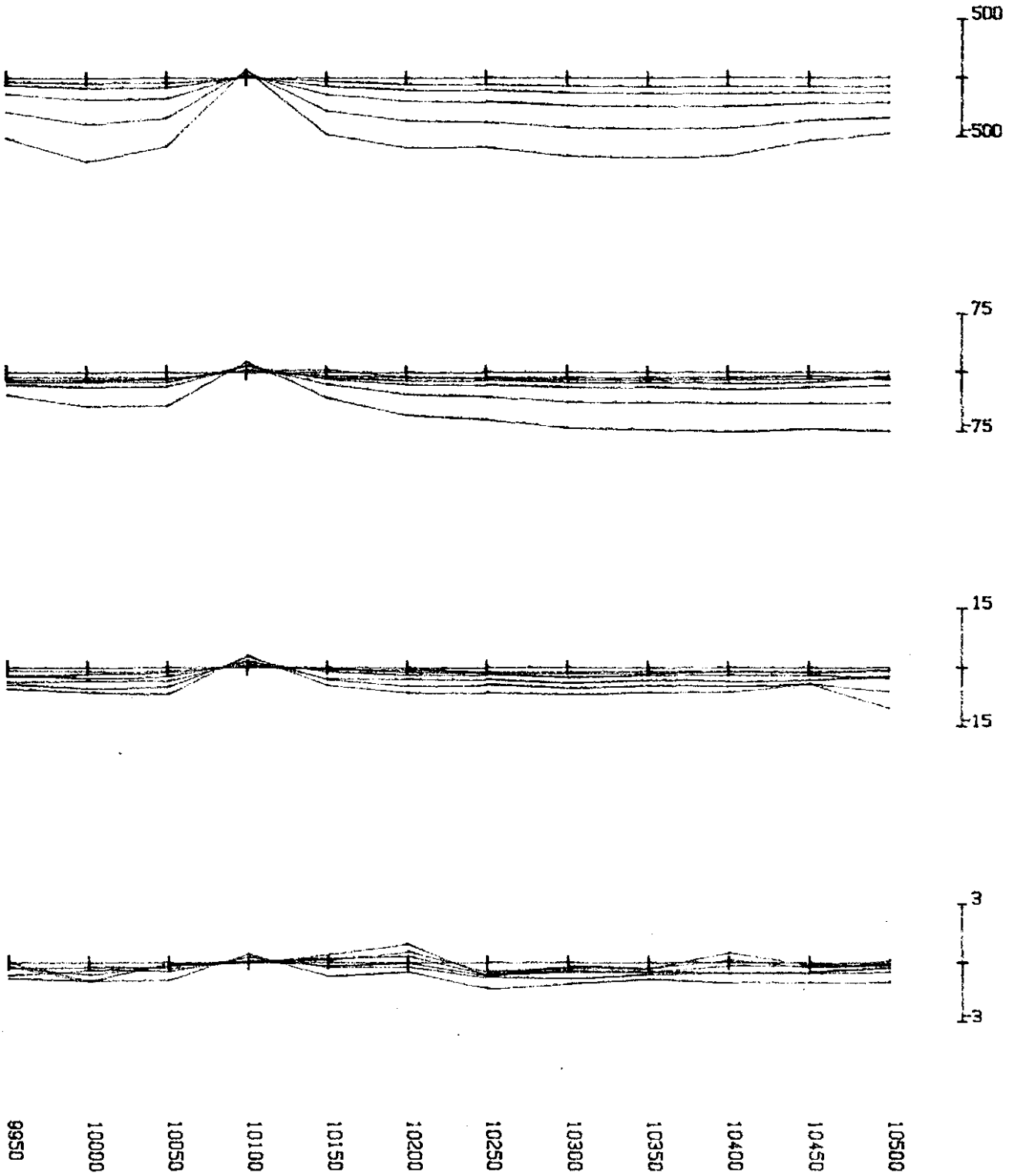
Loop HOR2 Line 10100 Component D

5 cm

P & V GEOPHYSICAL SERVICES

063

063064



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10100. Component N

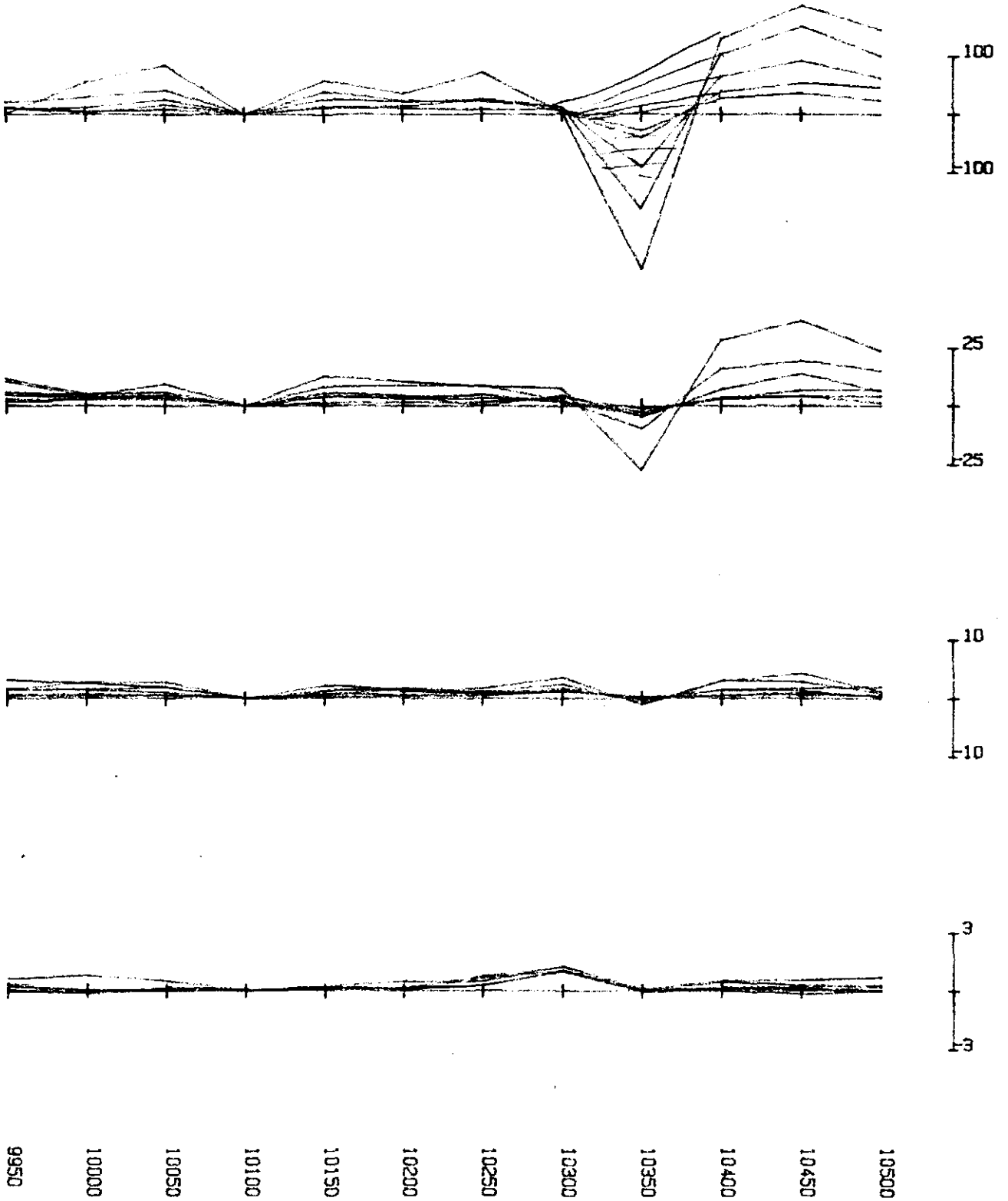
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

064

063065



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10100 Component E

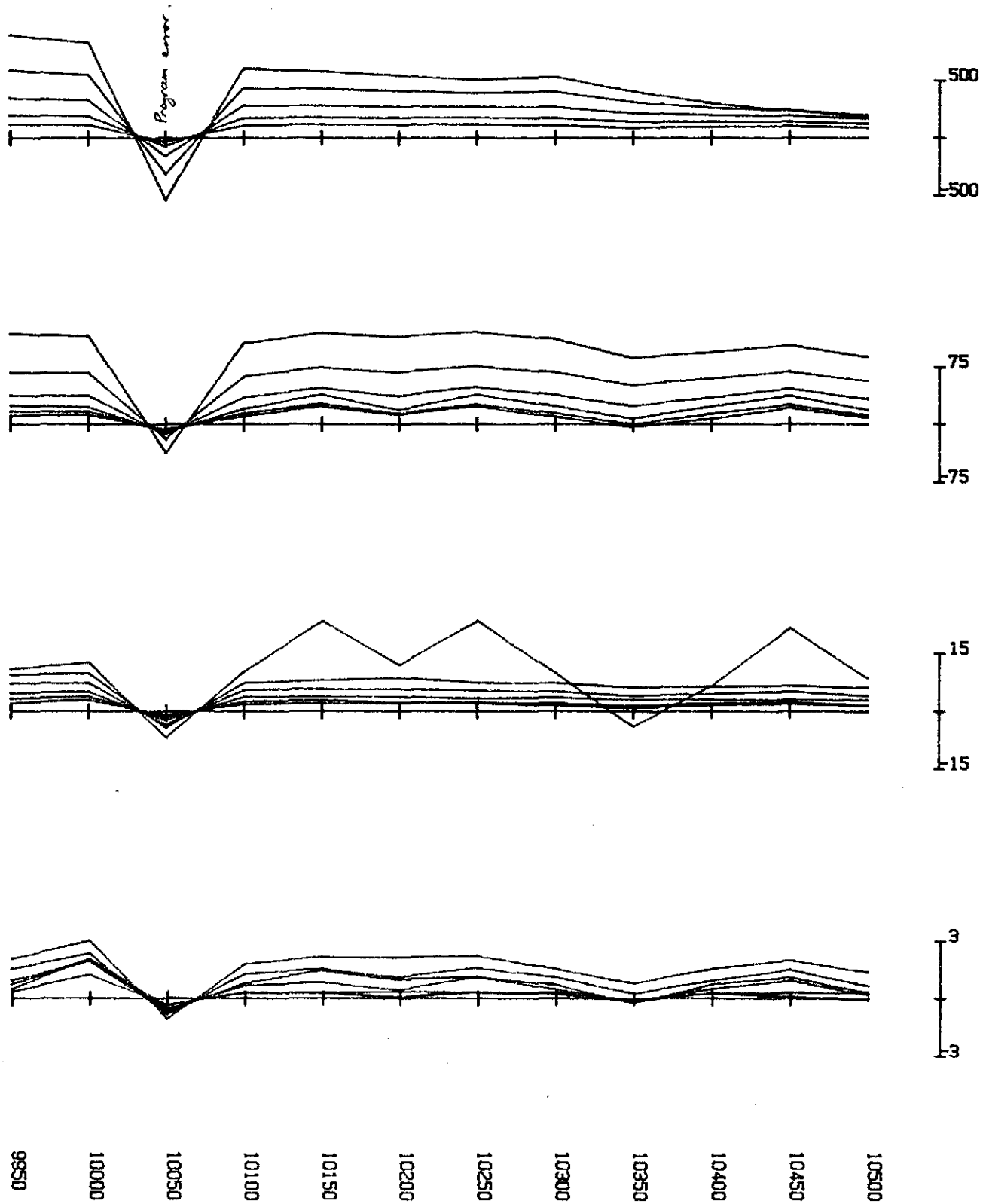
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

065

063066



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx 5
Loop HOR2 Line 10200 Component D

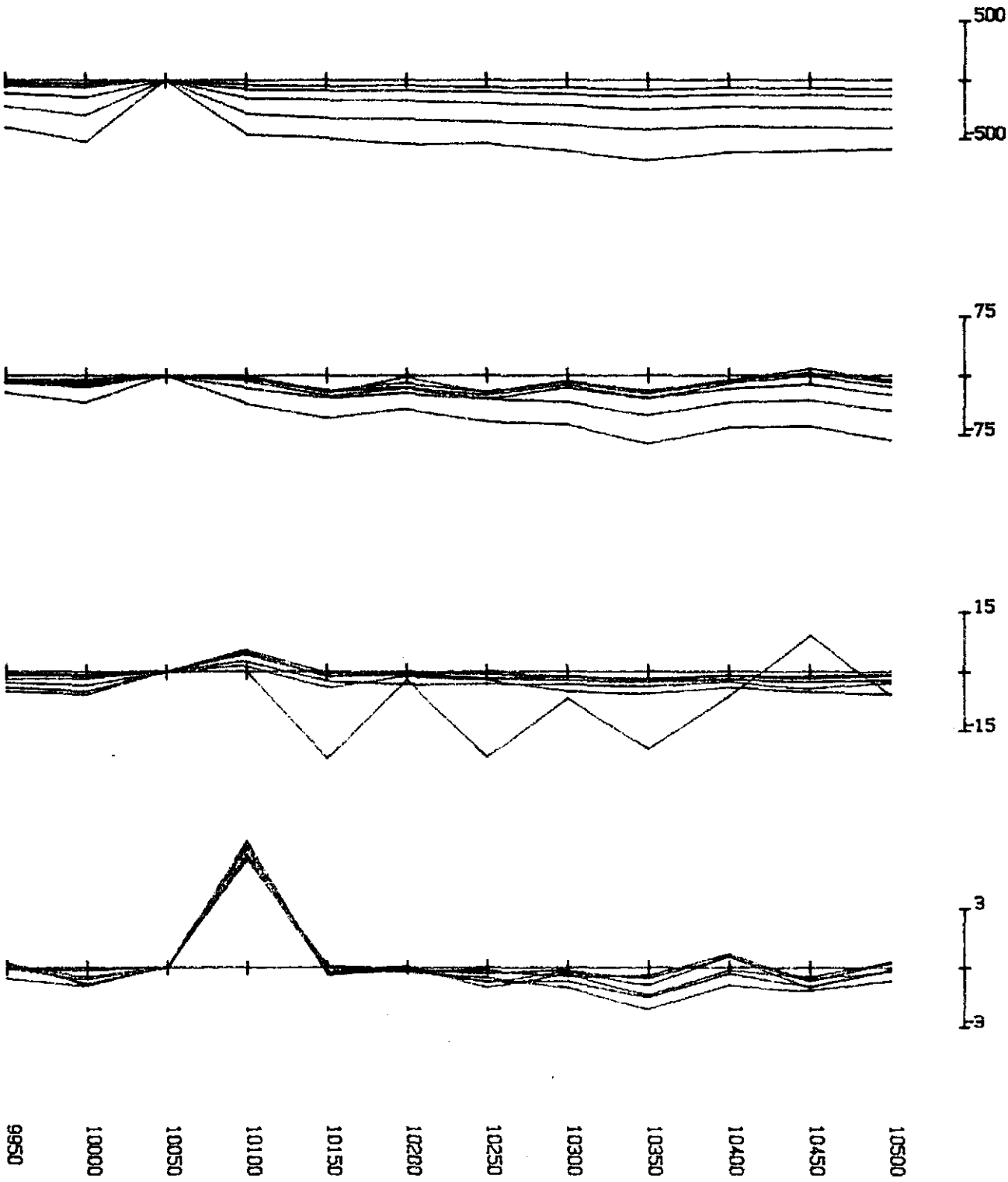
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

066

063067



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10200 Component N

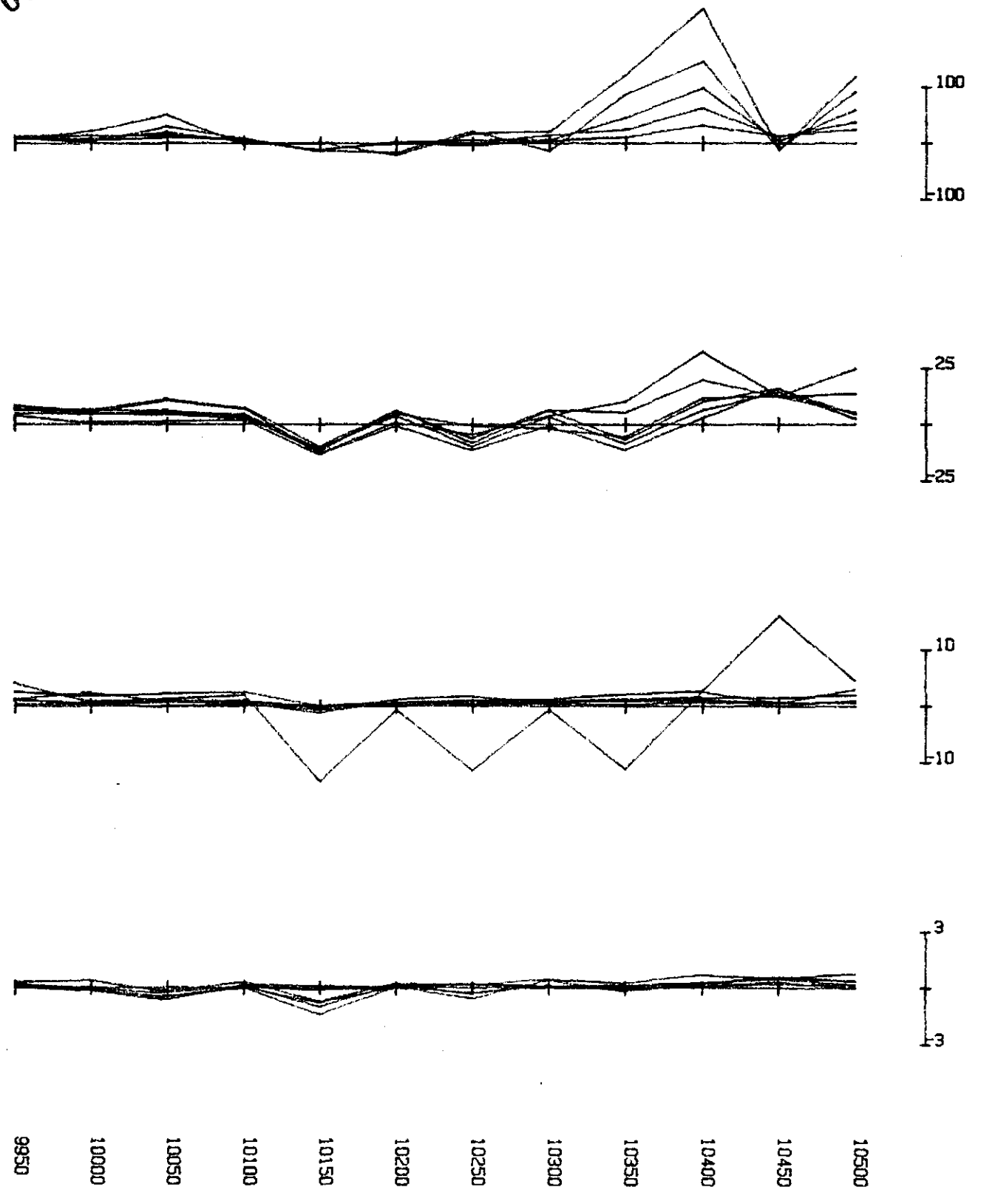
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063068

067



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10200 Component E

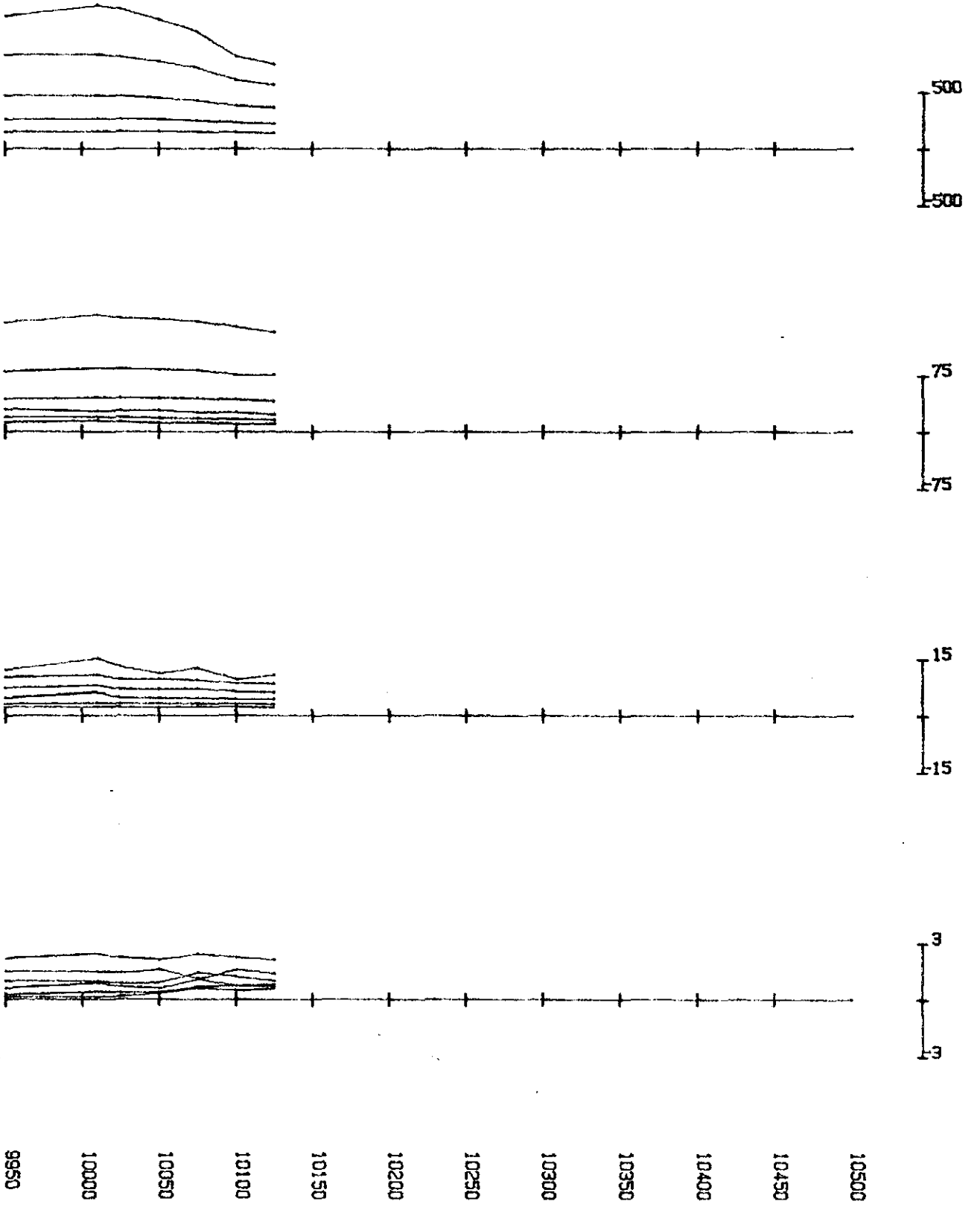
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063069

068



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 (Tx 5) Line 10300 Component D

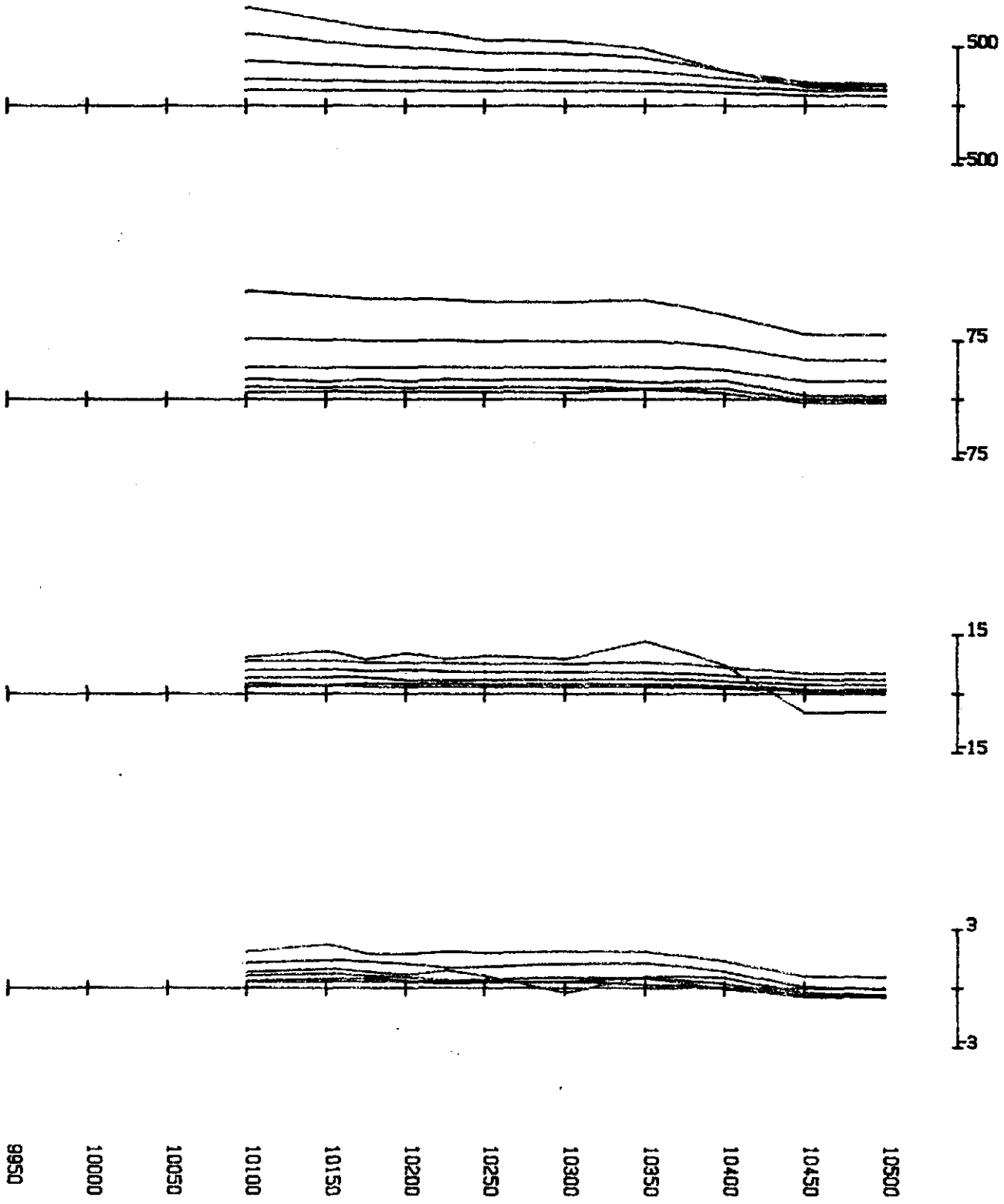
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

069

063070



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10300 Component D

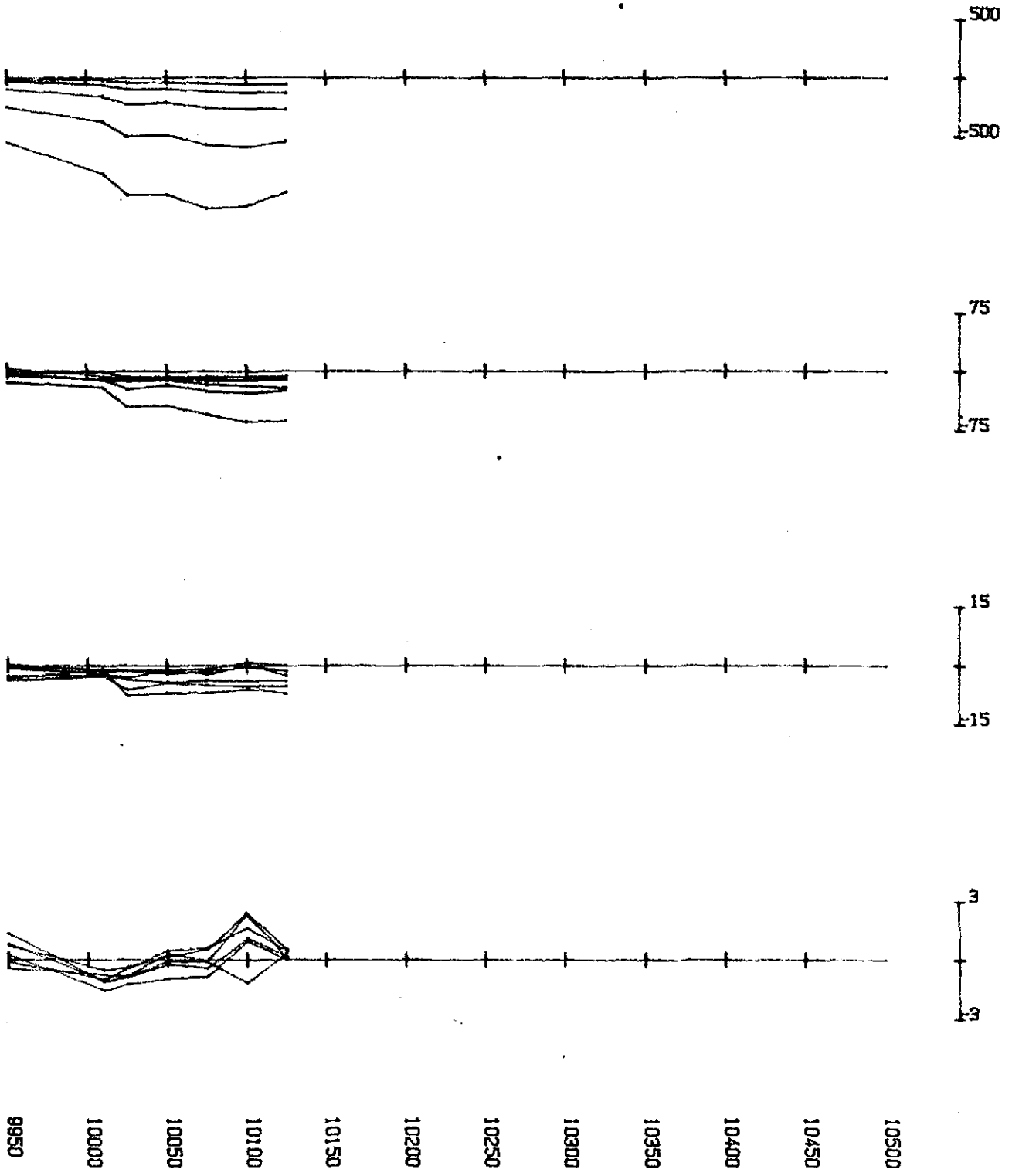
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

070

063071



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 Line 10300 Component N

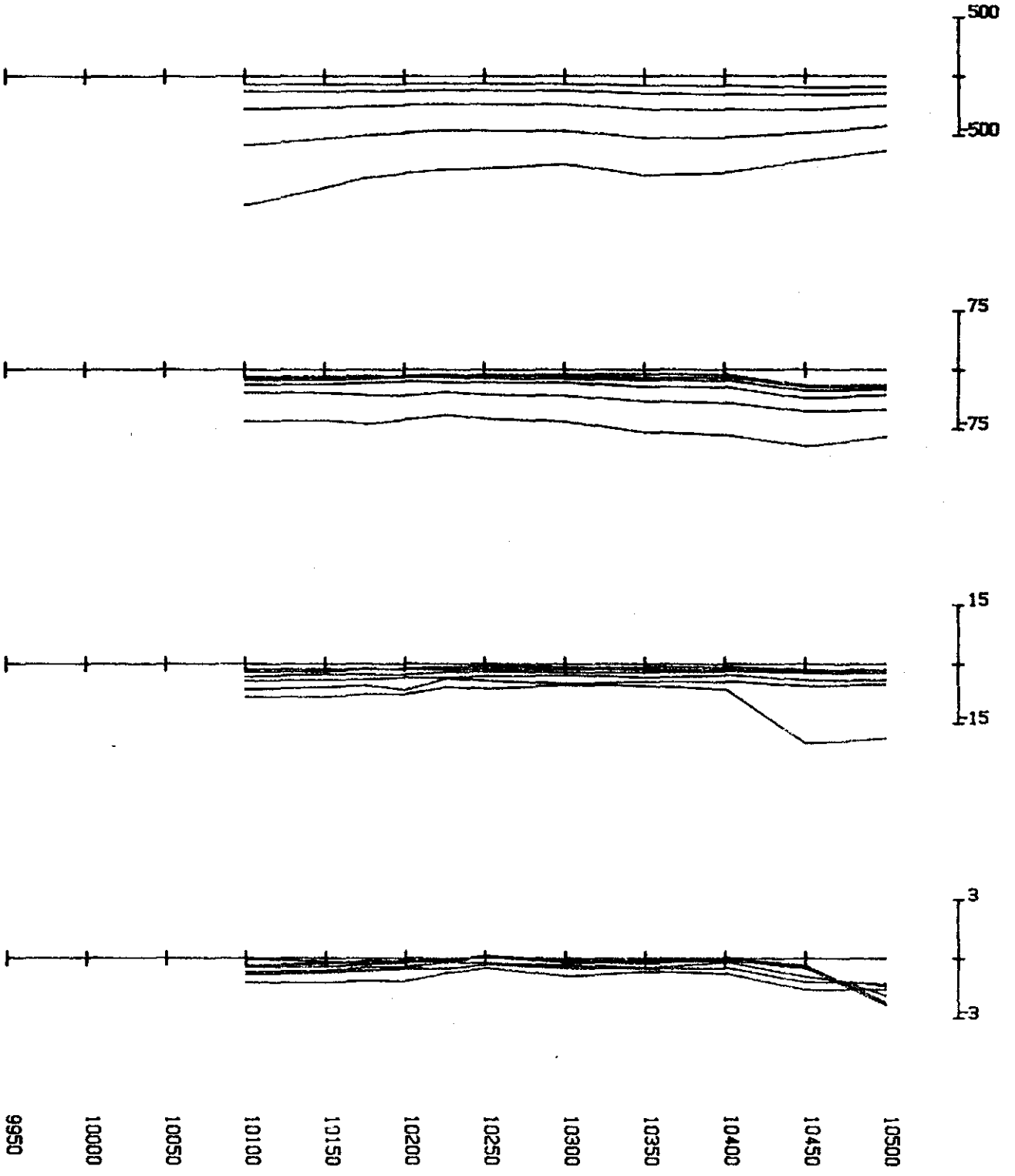
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

071

063072



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10300 Component N

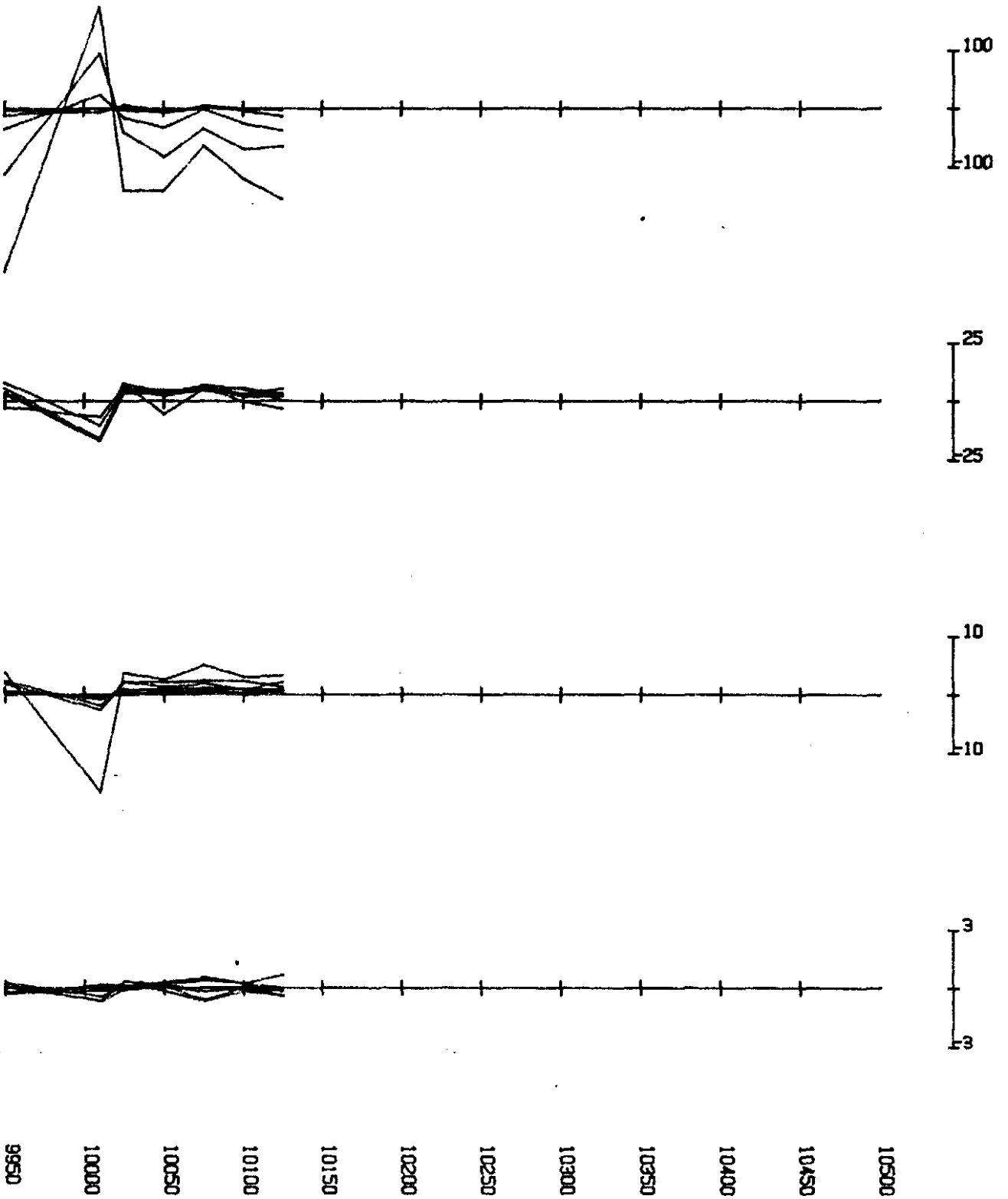
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

072

063073



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 Line 10300 Component E

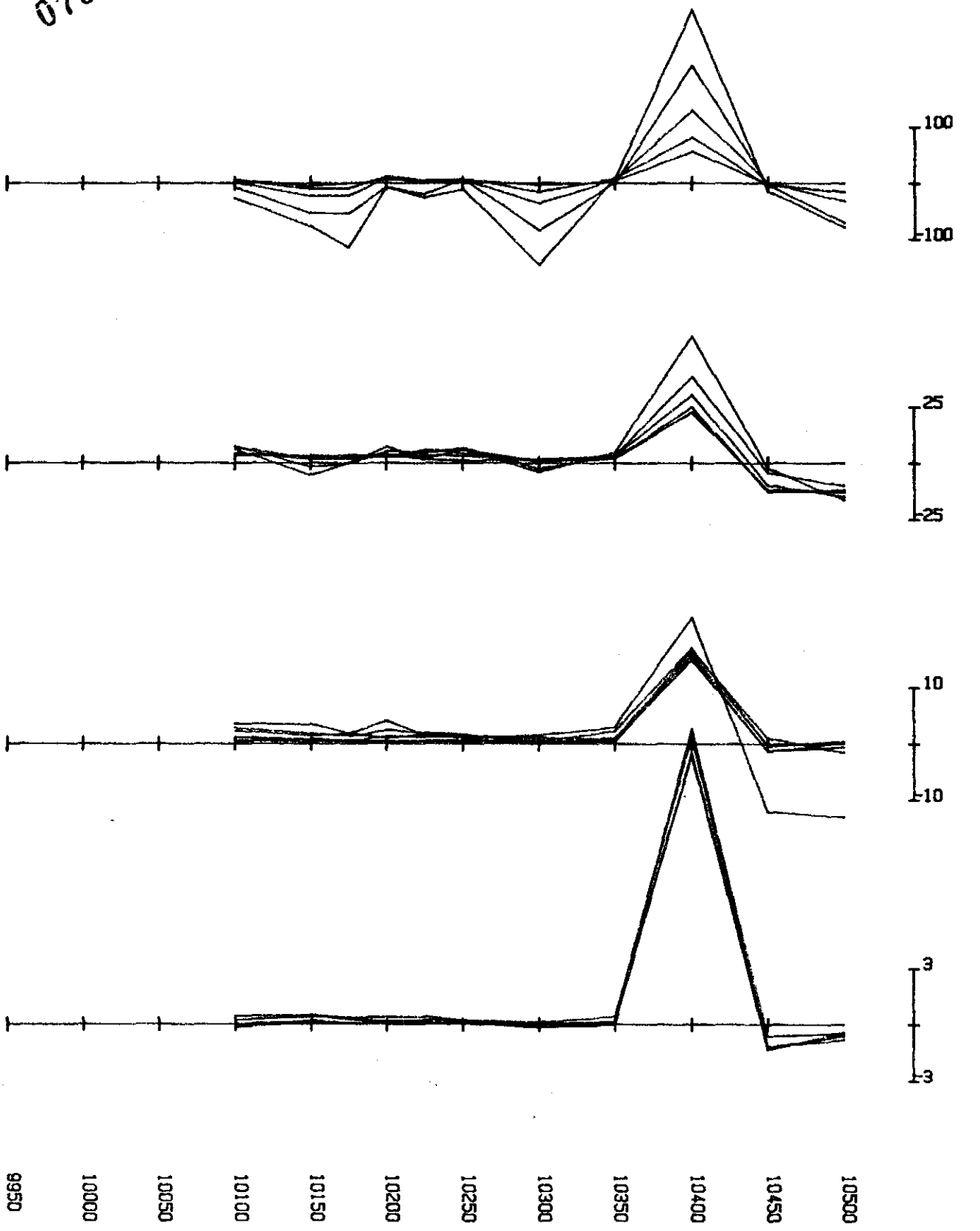
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

073

063074



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR2 Line 10300 Component E

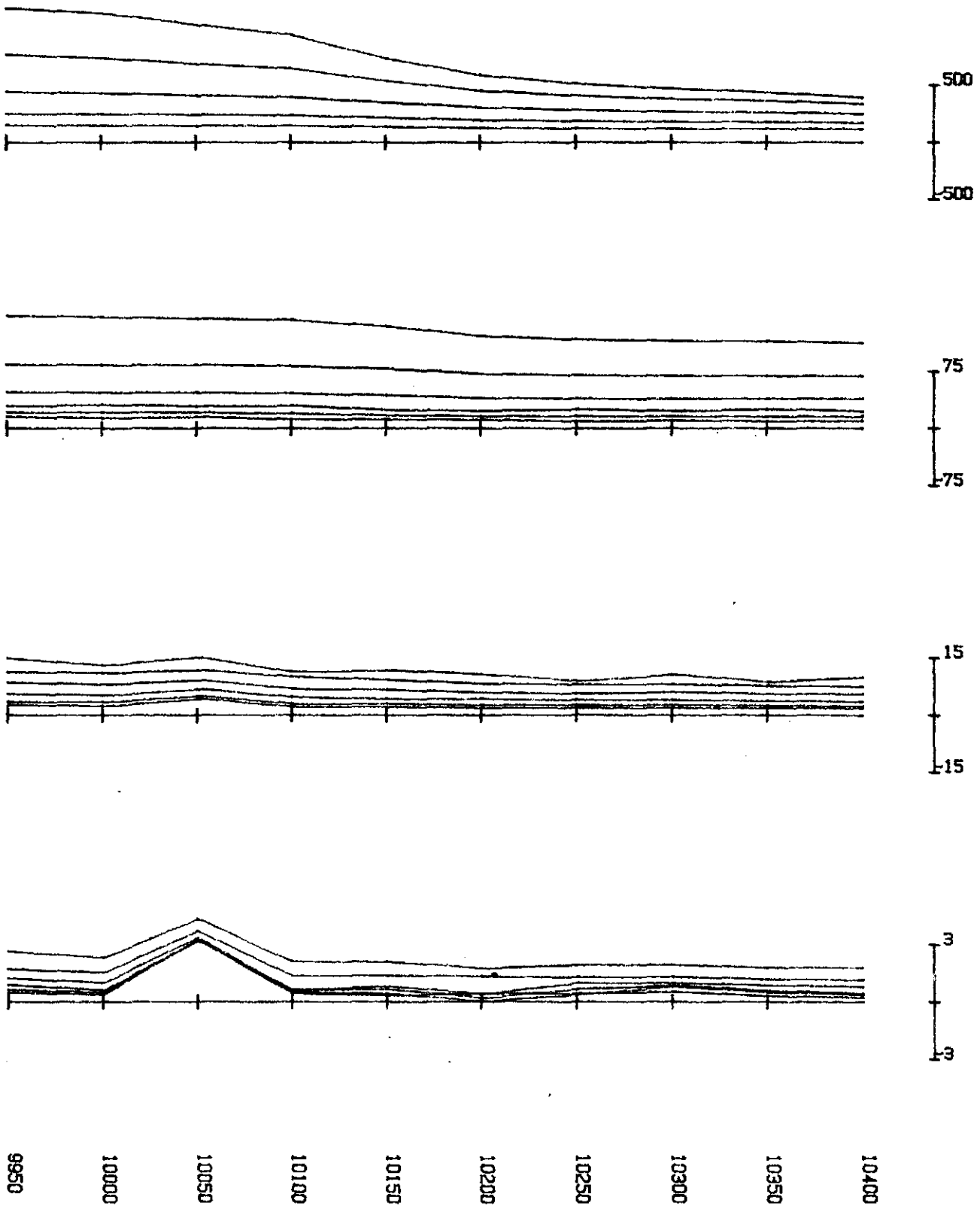
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

074

063075



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Tx 5

Loop HOR2 Line 10400 Component D

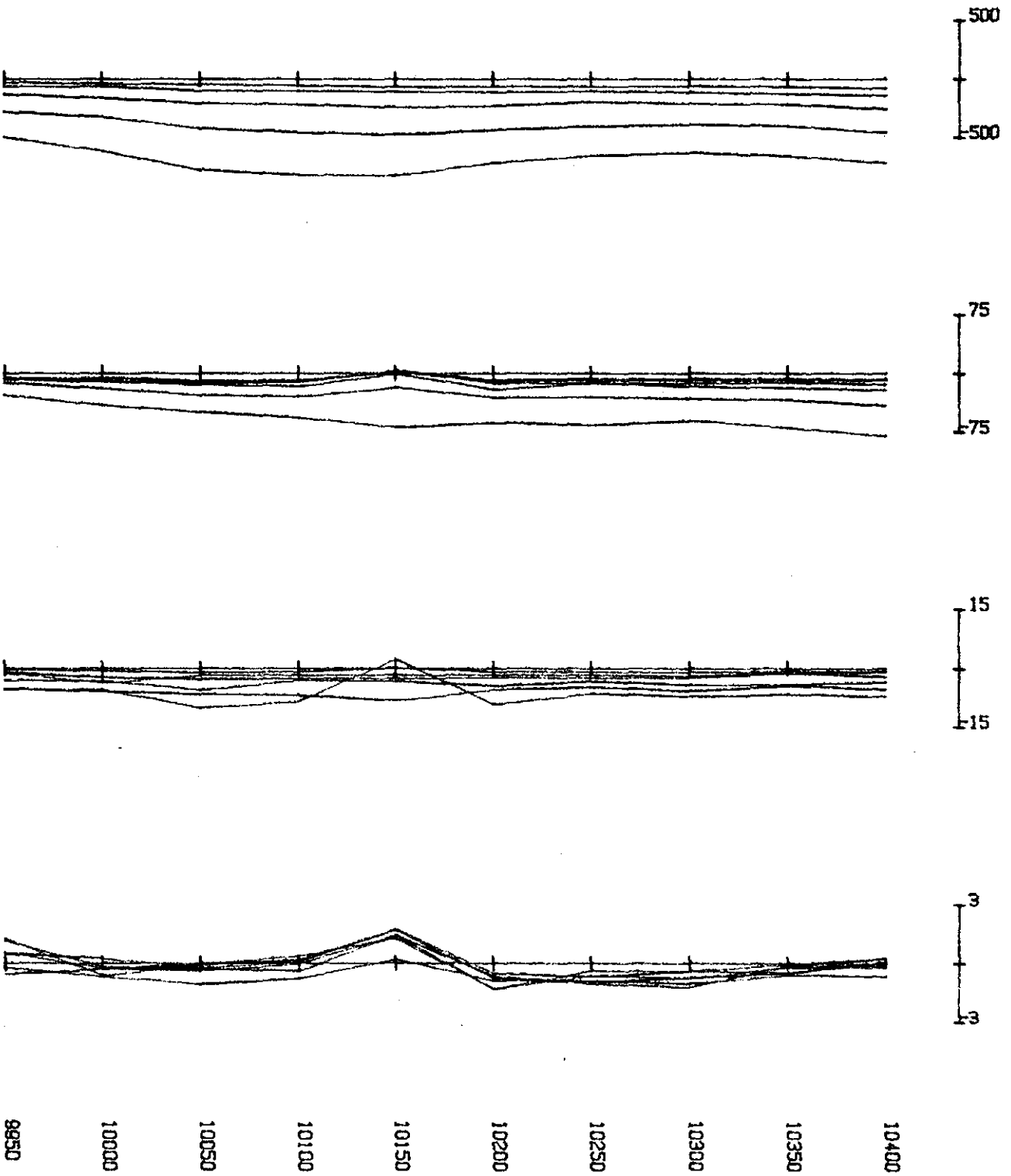
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

075

063076



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 Line 10400 Component N

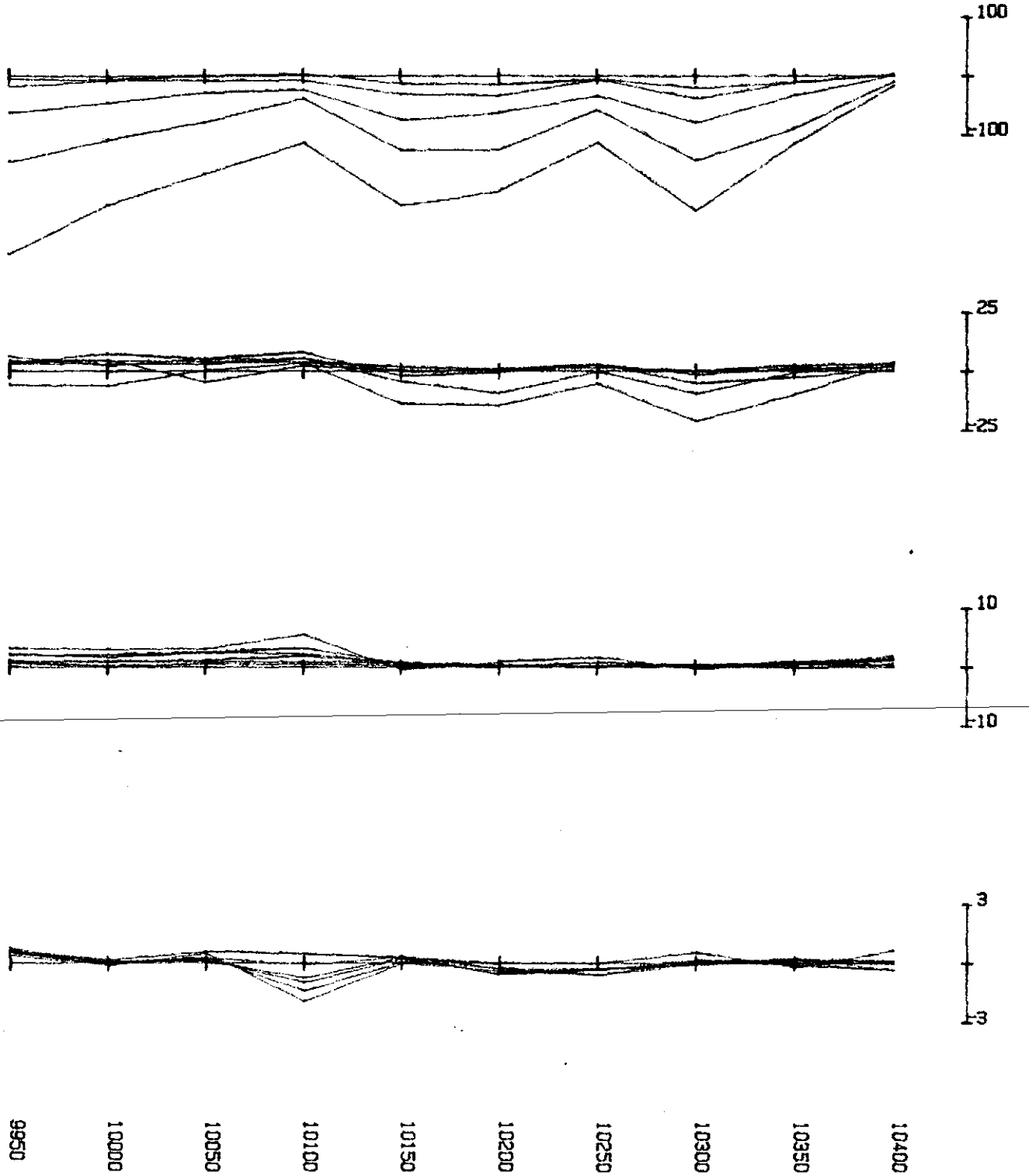
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

076

063077



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 Line 10400 Component E

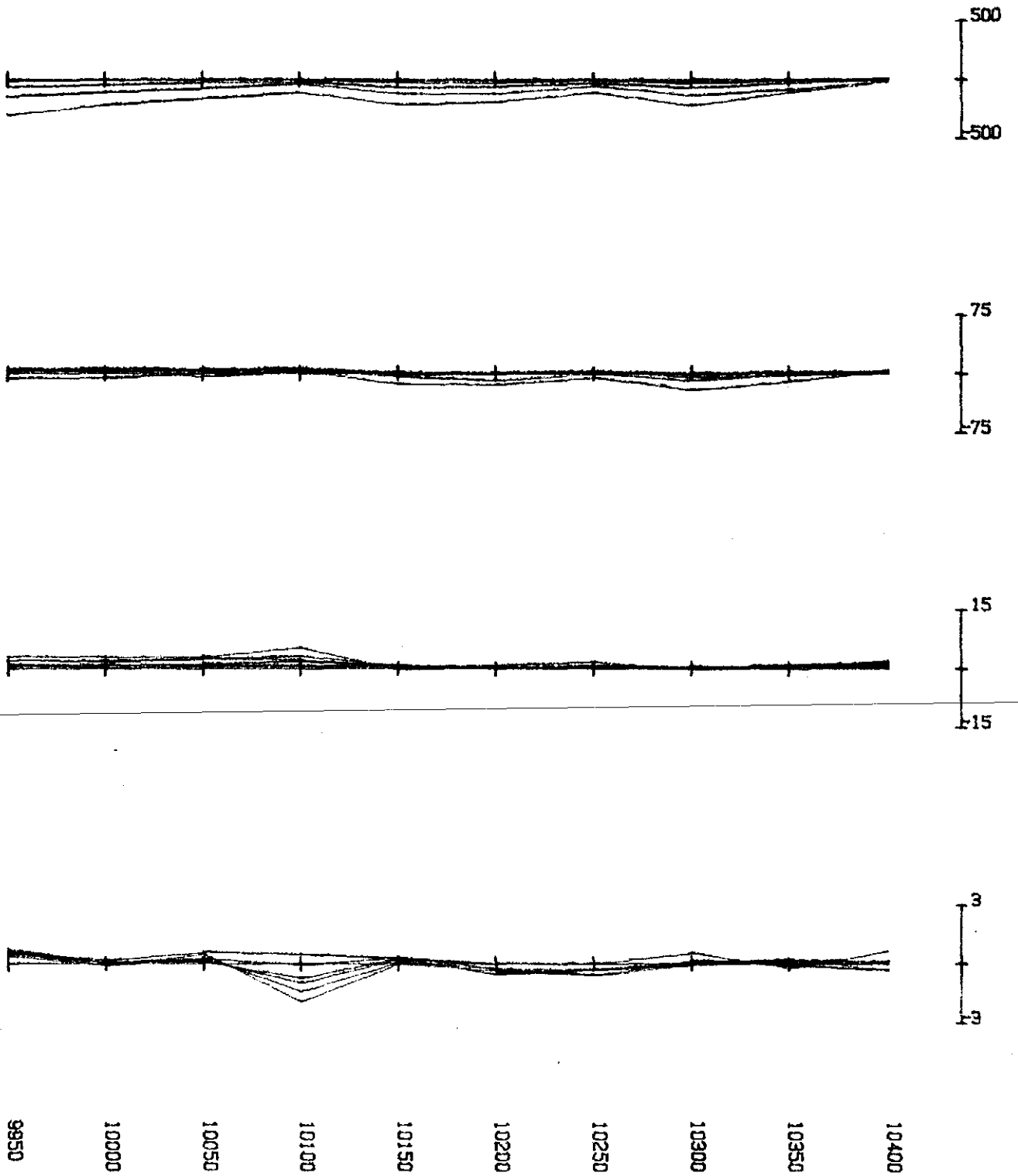
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

063078

077



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR2 Line 10400 Component E

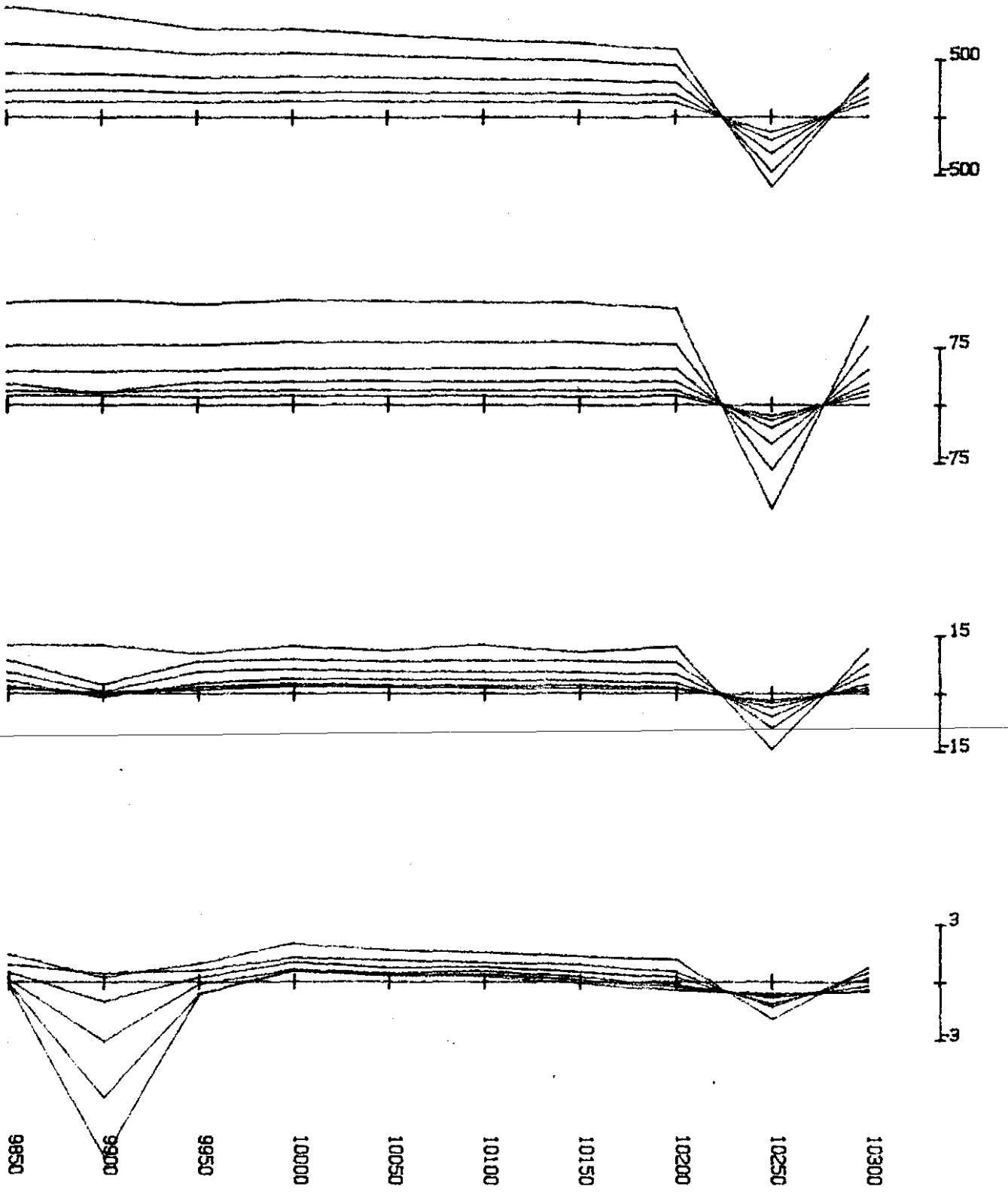
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

078

063079



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx 4

Loop HOR1 Line 10800 Component D

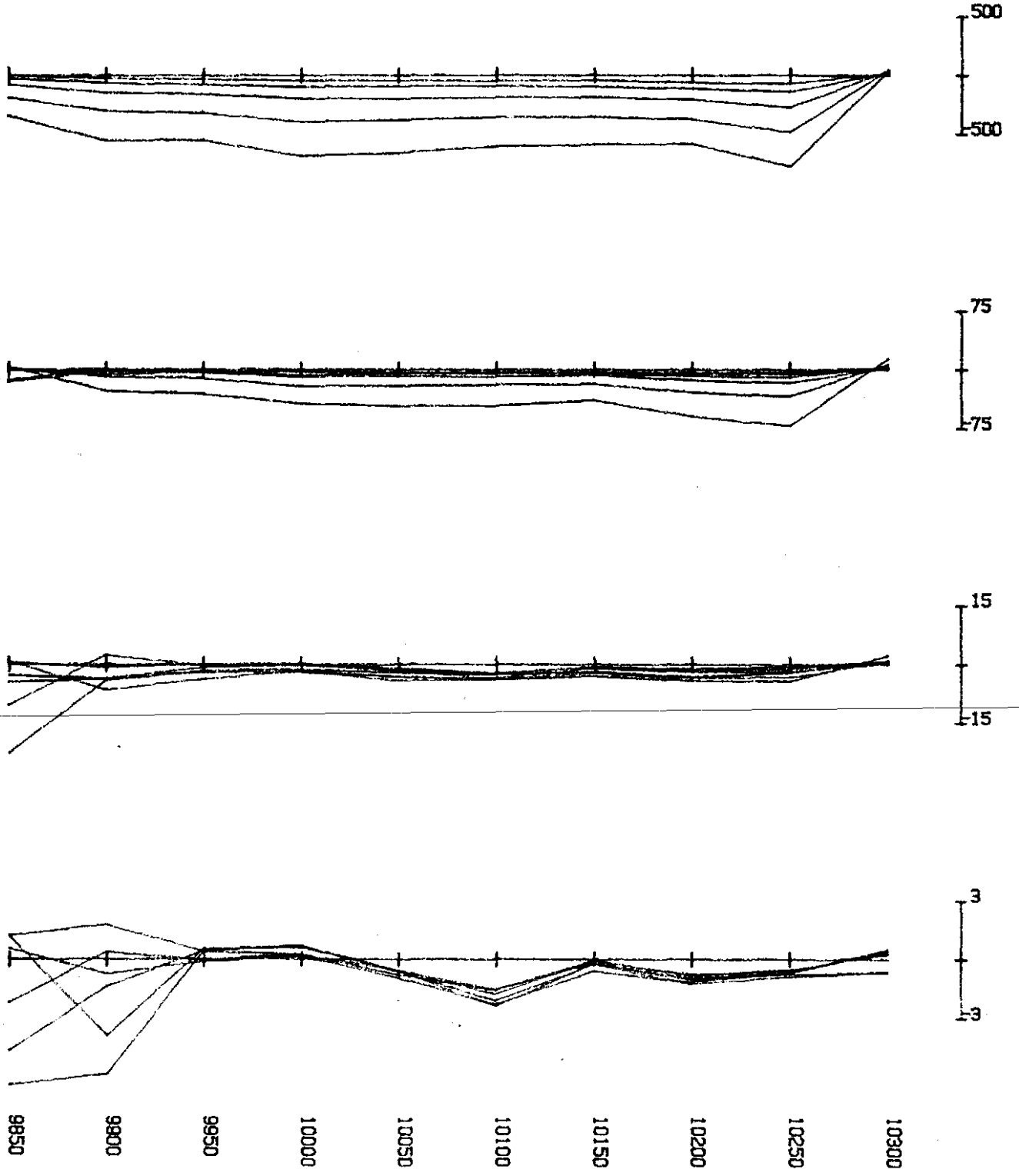
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

079

063080



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9800 Component N

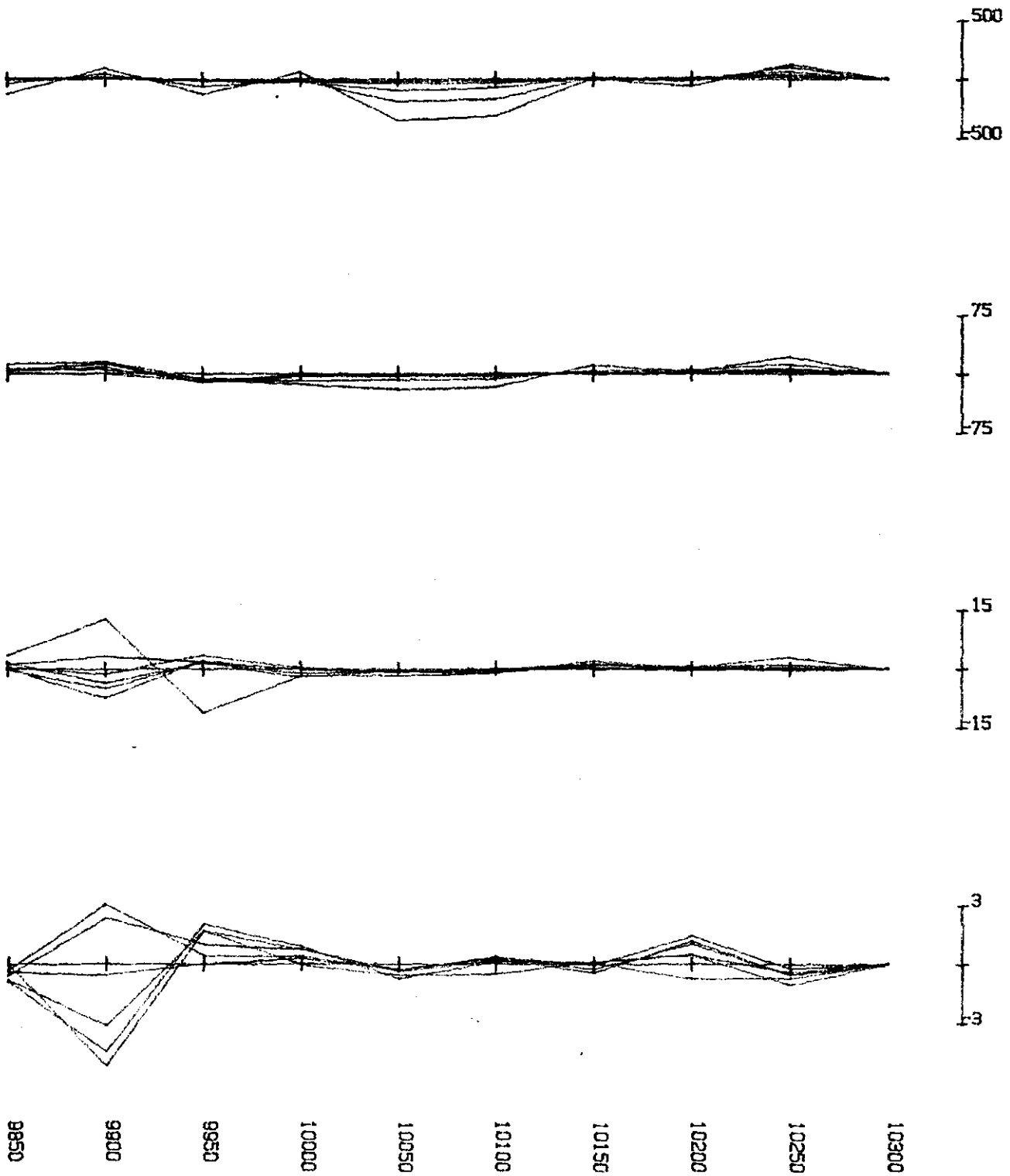
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

080

063081



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9800 Component E

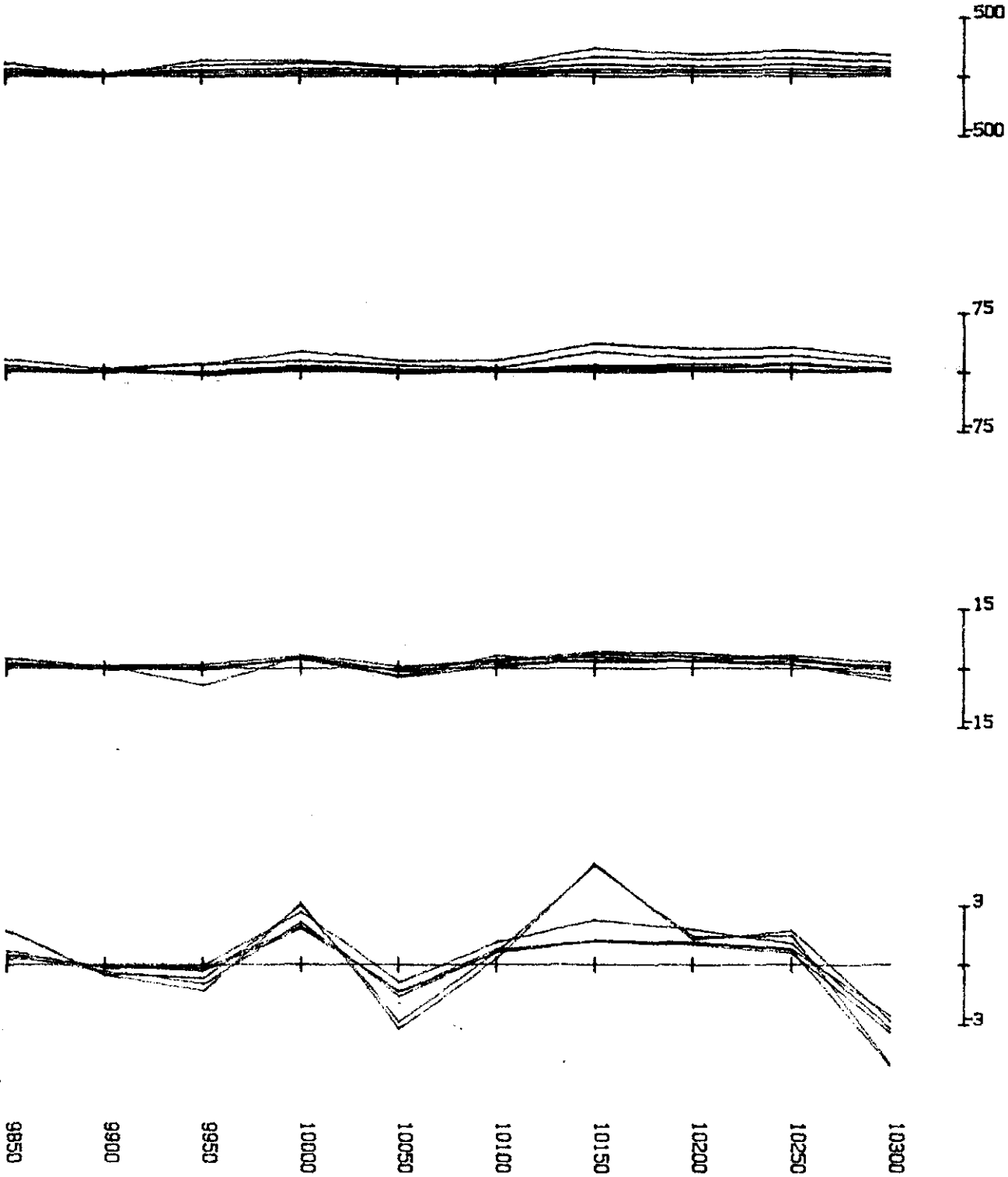
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

081

063082



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9700 Component E

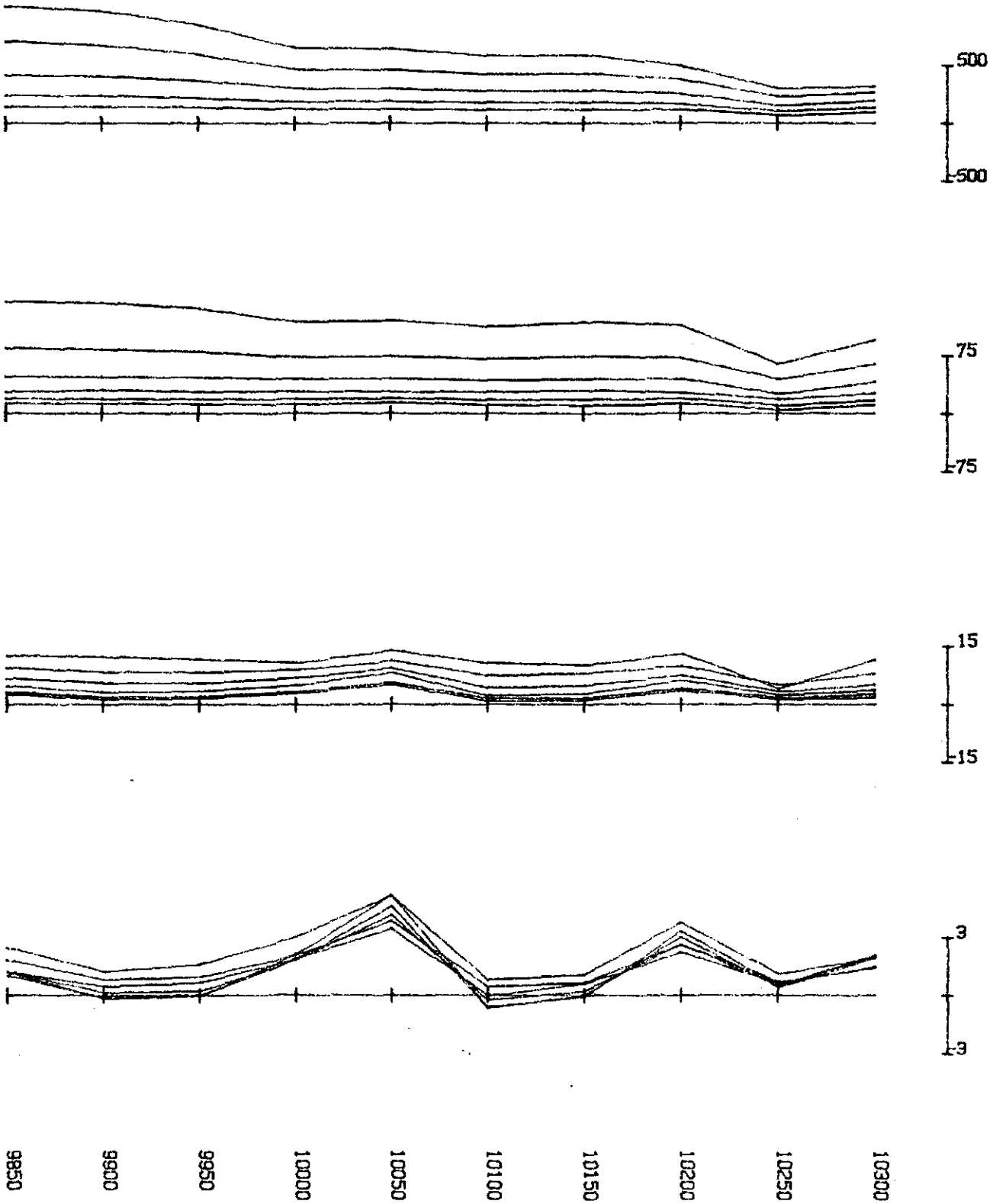
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

082

063083



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx4

Loop HOR1 Line 9700 Component D

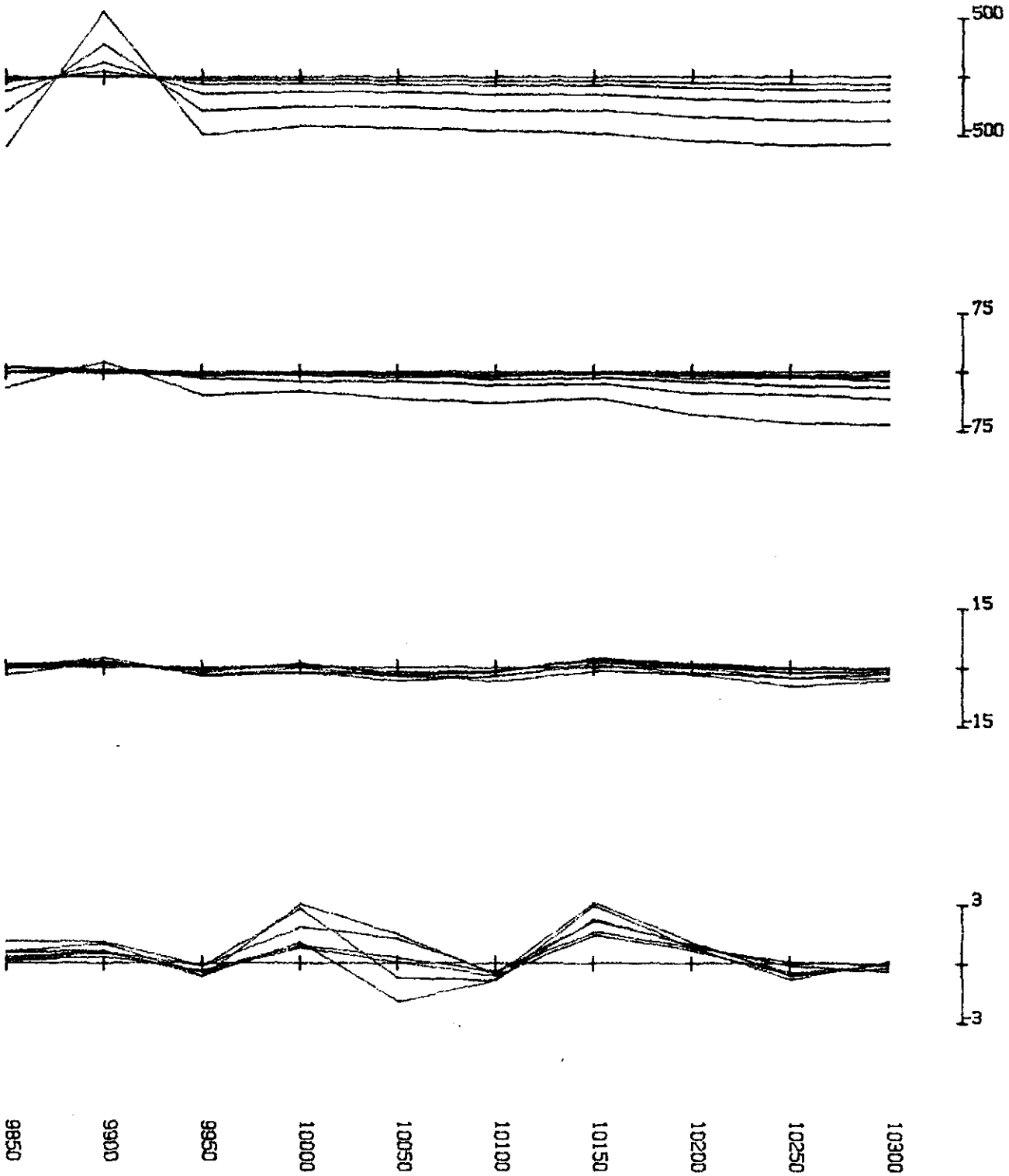
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

083

063084



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9700 Component N

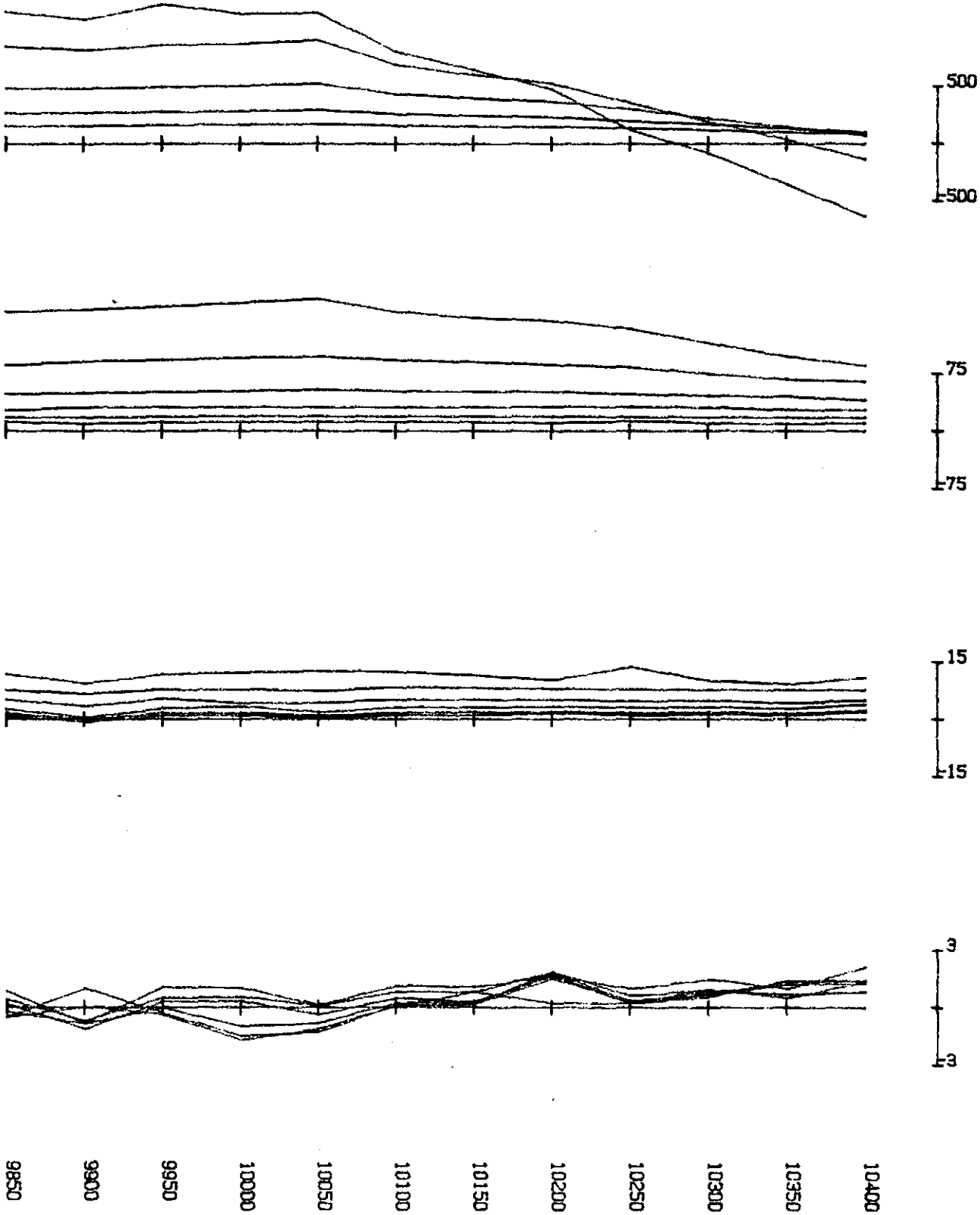
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

034

063085



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx 4
Loop HOR1 Line 9600 Component D

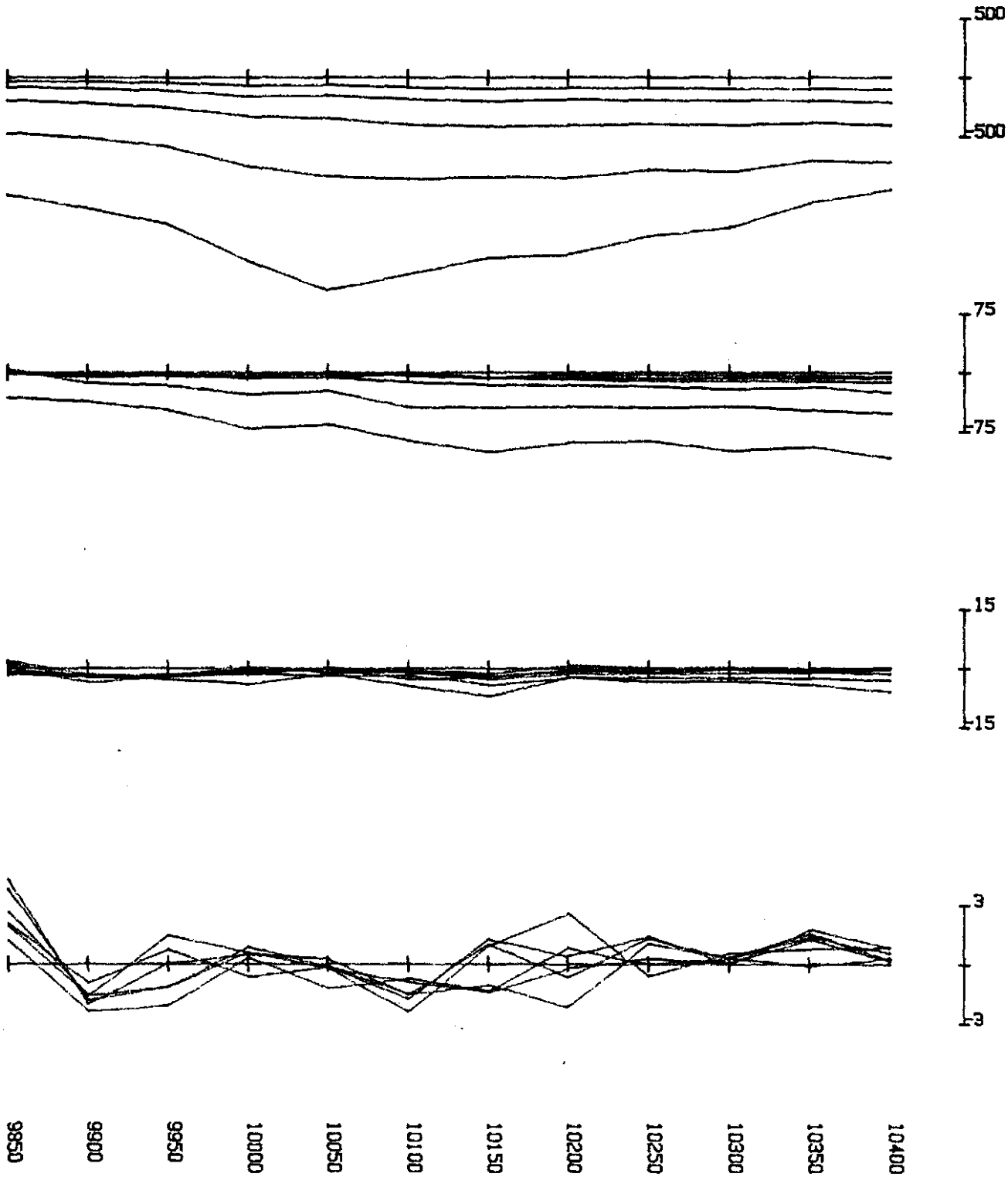
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

085

063086



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9600 Component N

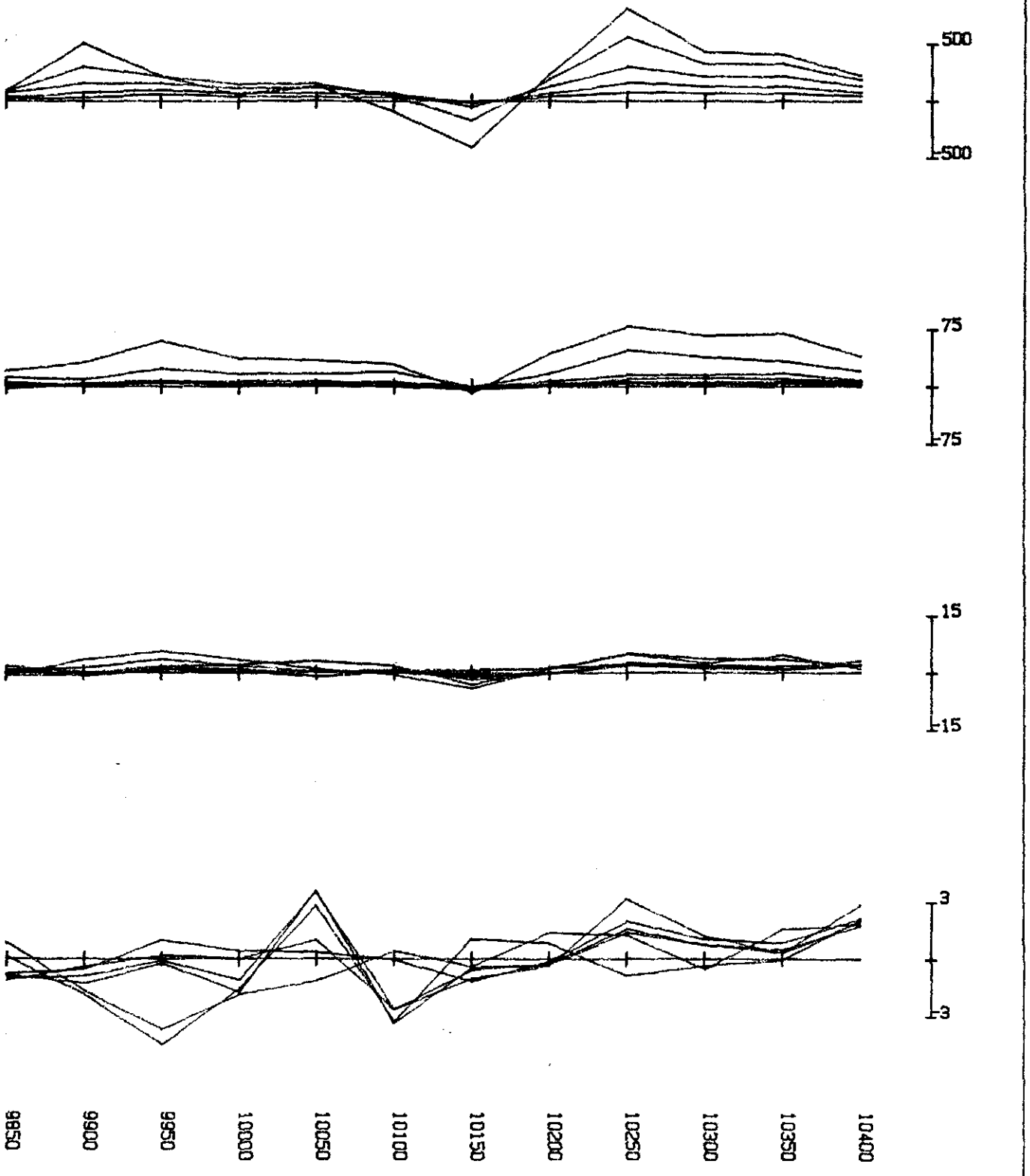
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

086

063087



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9600 Component E

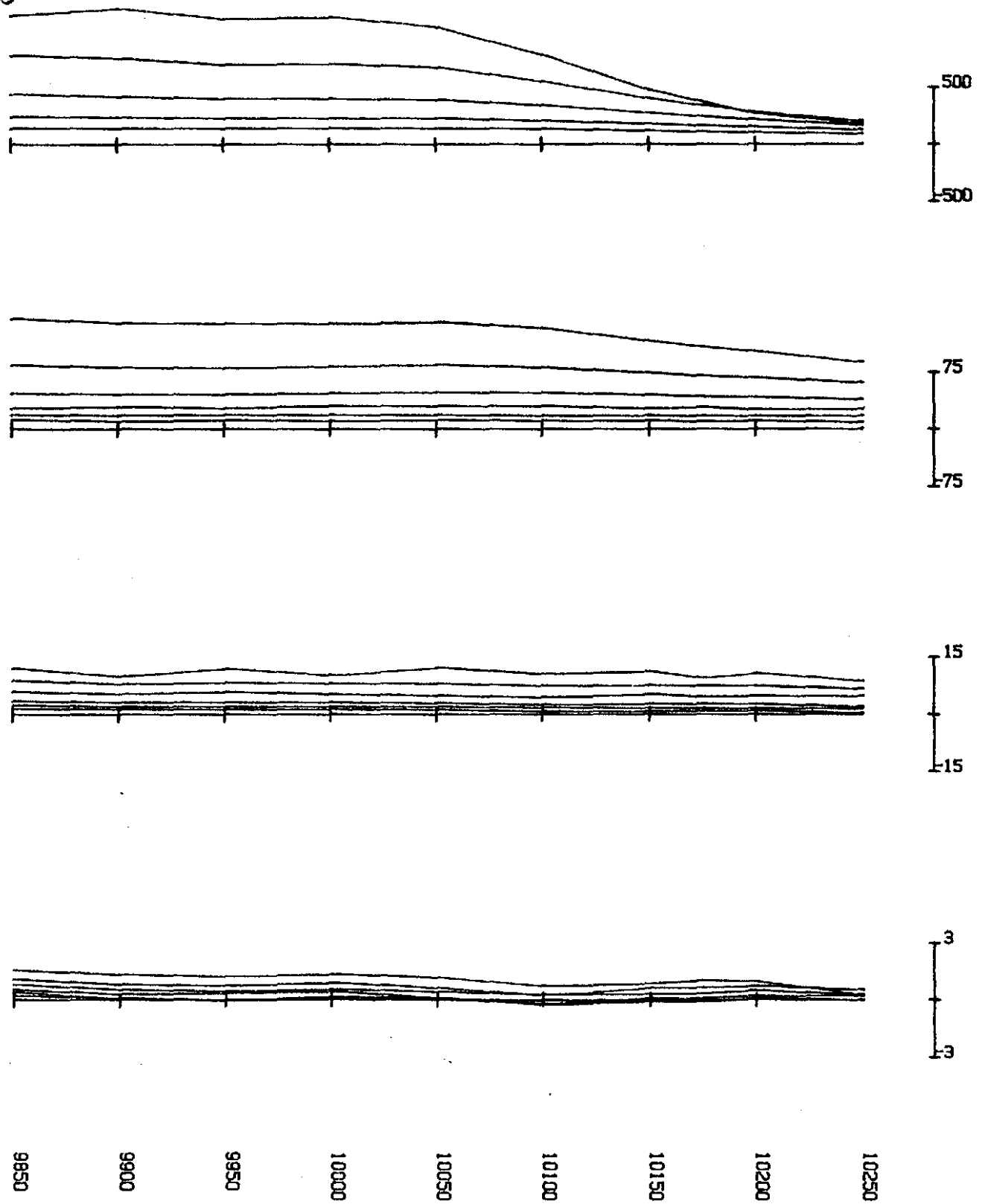
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063088

087



EM37 PLOT | Client AMOCO | Area HEAP OF ROCKS

Tx 4

Loop HOR1 | Line 9500 | Component D

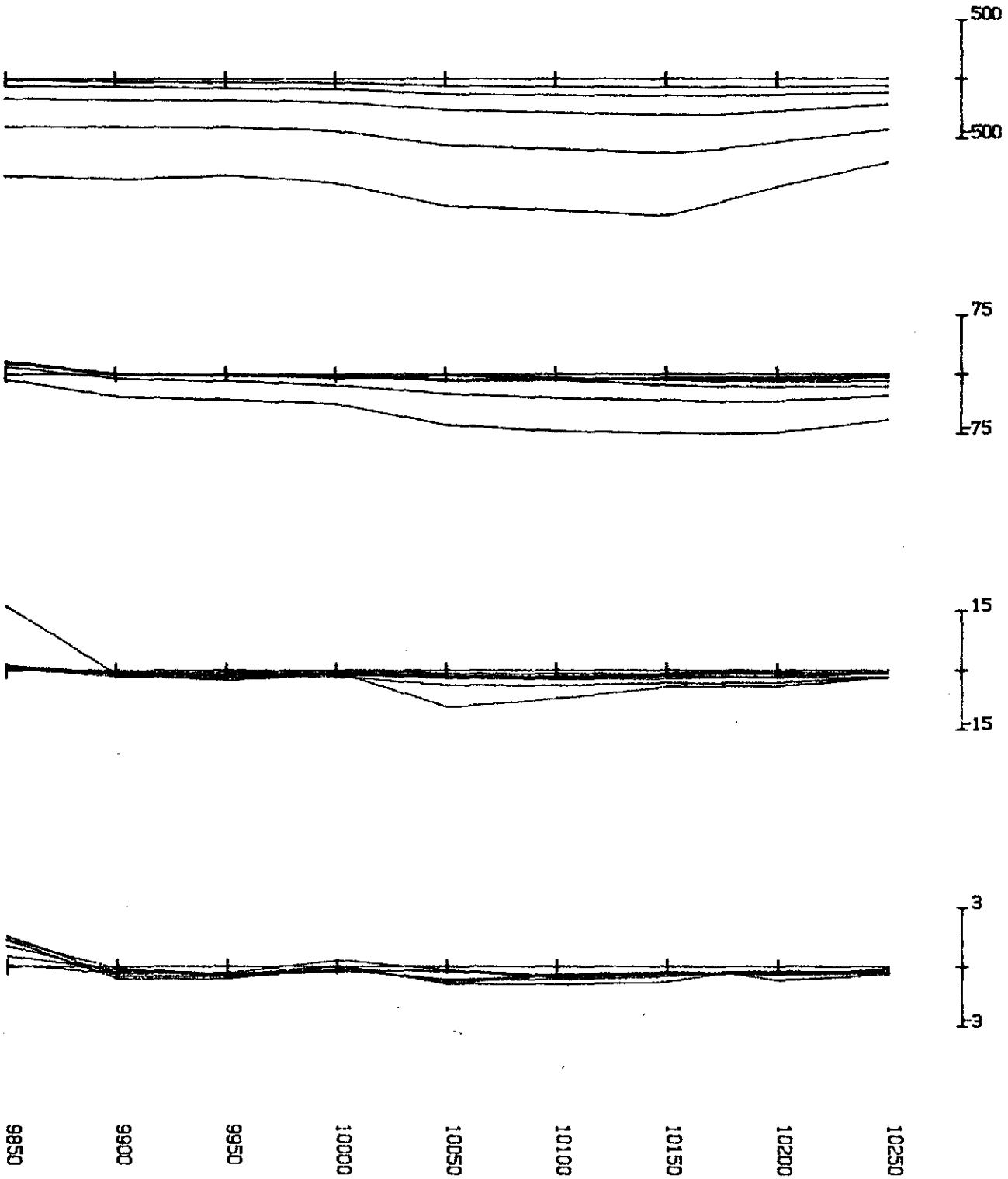
Scale 1 : 2667.

5 cm

P & V GEOPHYSICAL SERVICES

088

063089



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

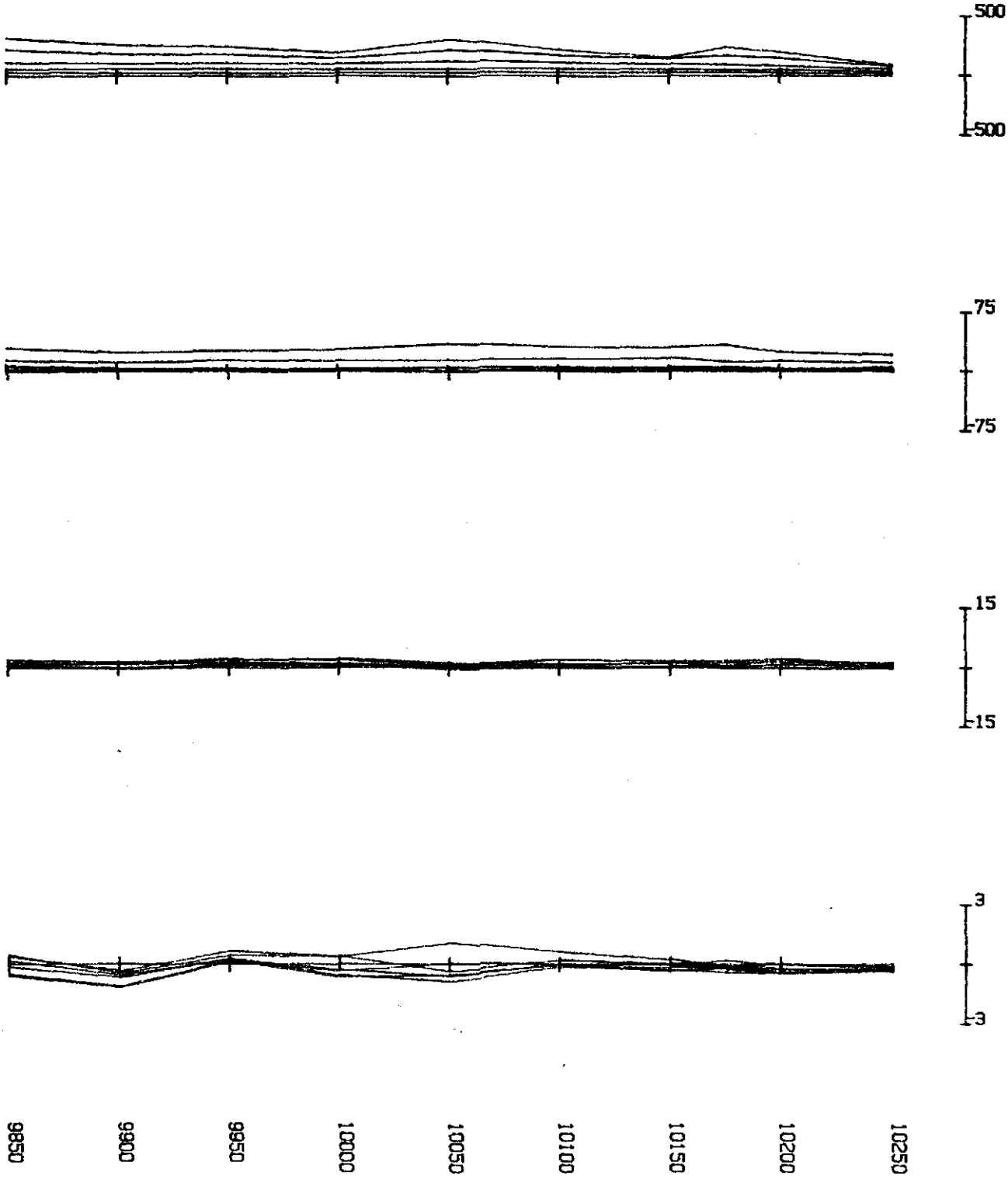
Loop HOR1 Line 9500 Component N

Scale 1 : 2667.

5 cm

P & V GEOPHYSICAL SERVICES

063090



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9500 Component E

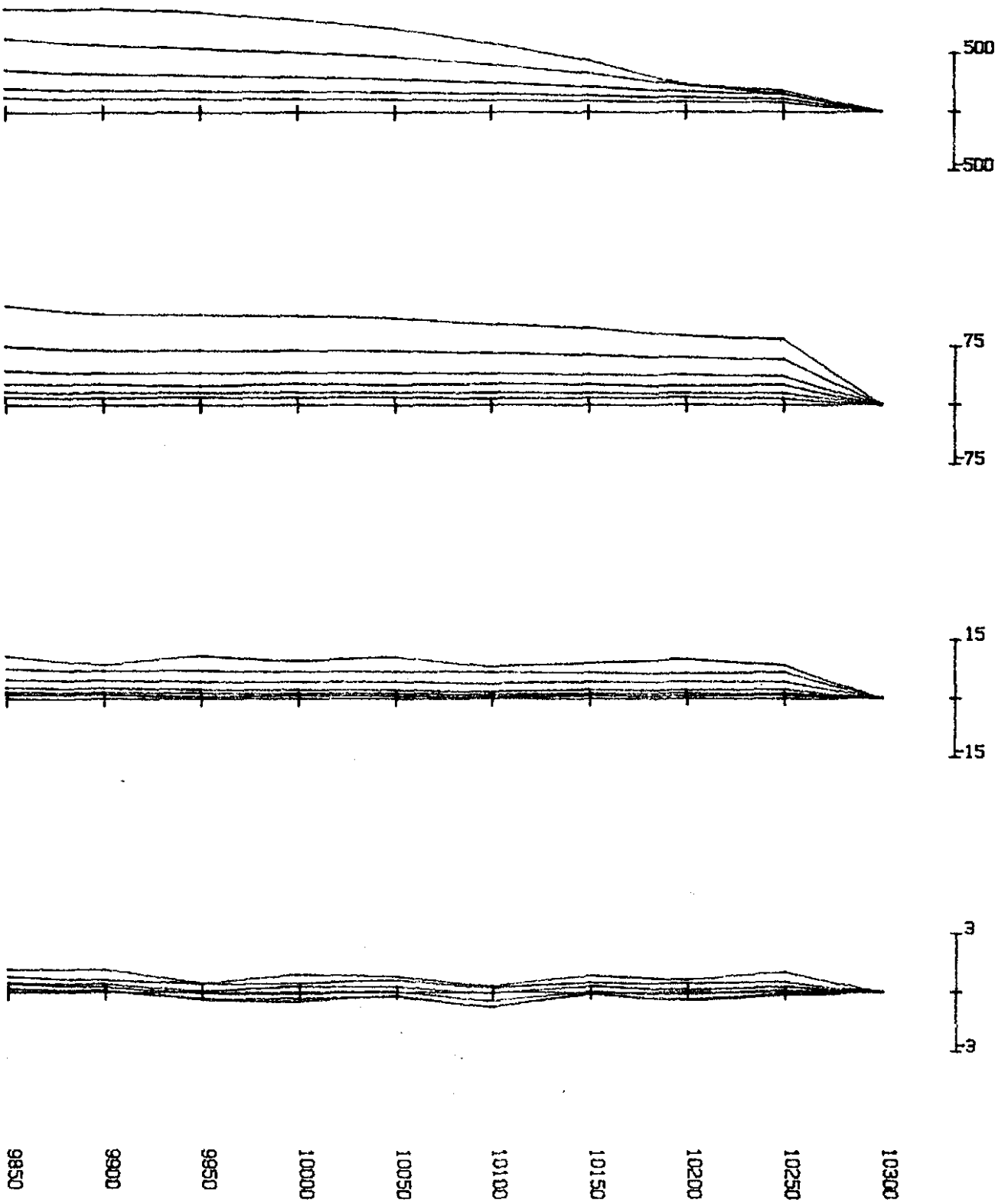
Scale 1 : 2667.

5 cm

P & V GEOPHYSICAL SERVICES

063091

090



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Tx4

Loop HOR1 Line 9400 Component D

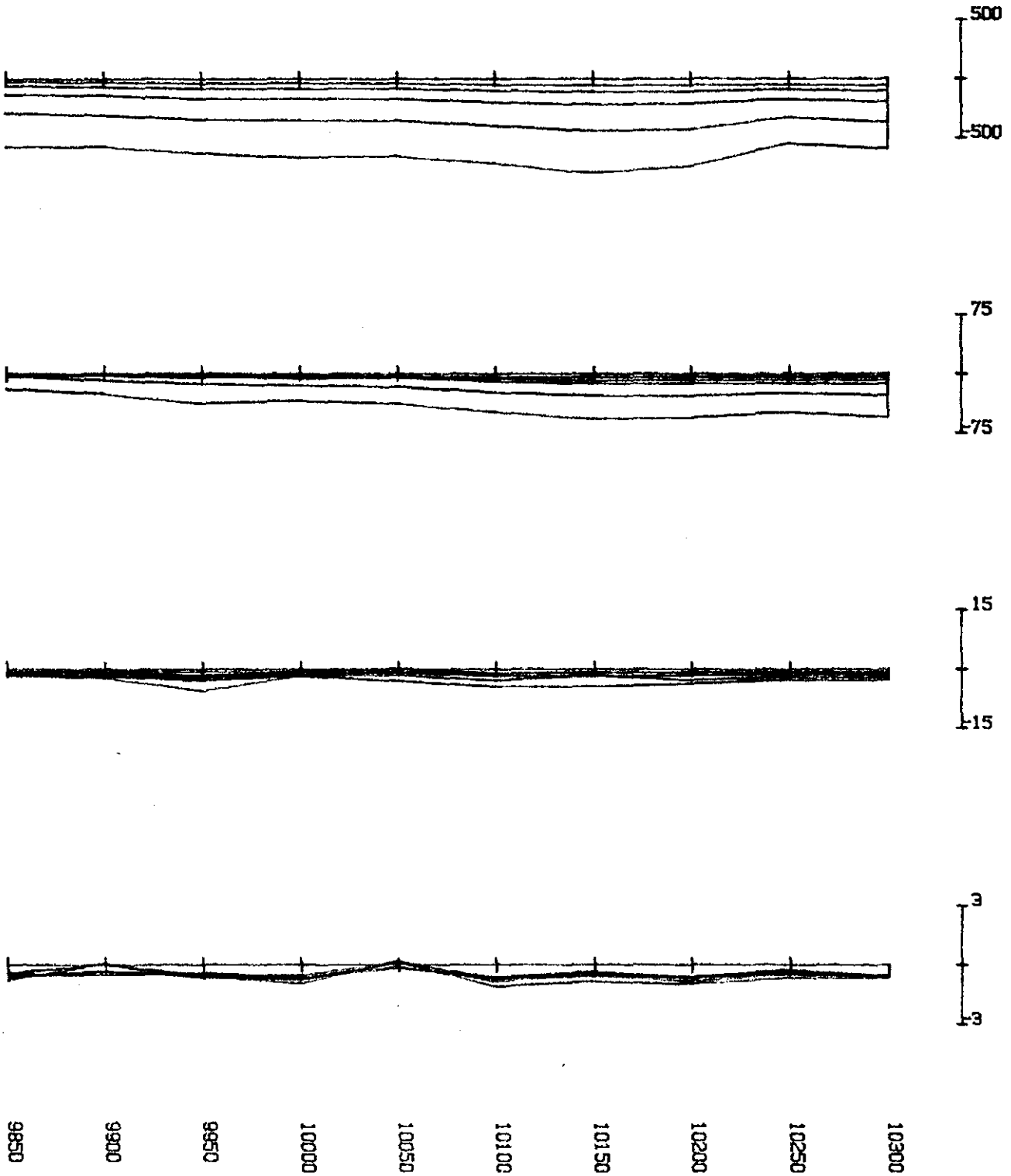
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

091

063092



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9400 Component N

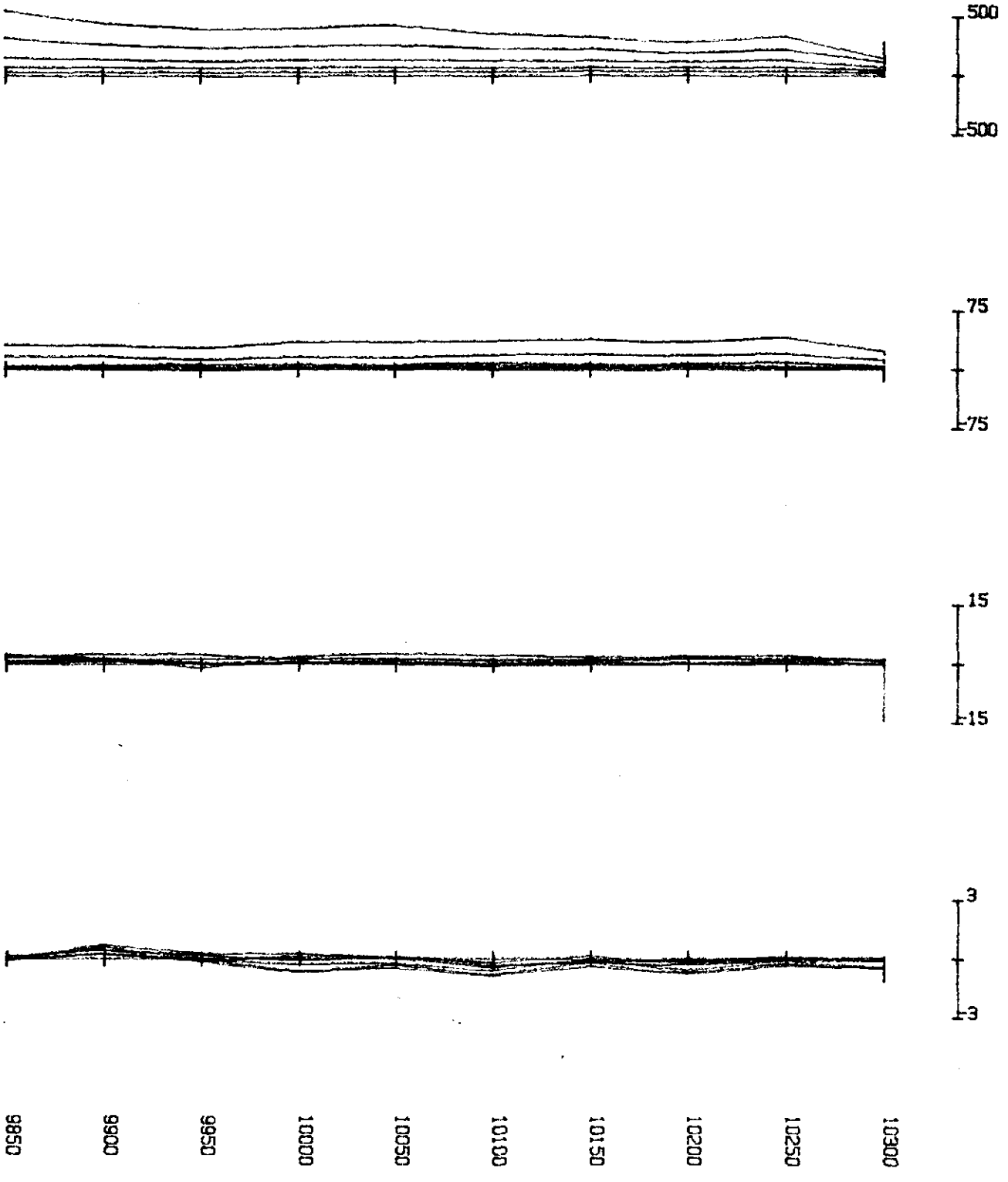
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

092

063093



EM37 PLOT Client AMOCO Area HEAP OF ROCKS

Loop HOR1 Line 9400 Component E

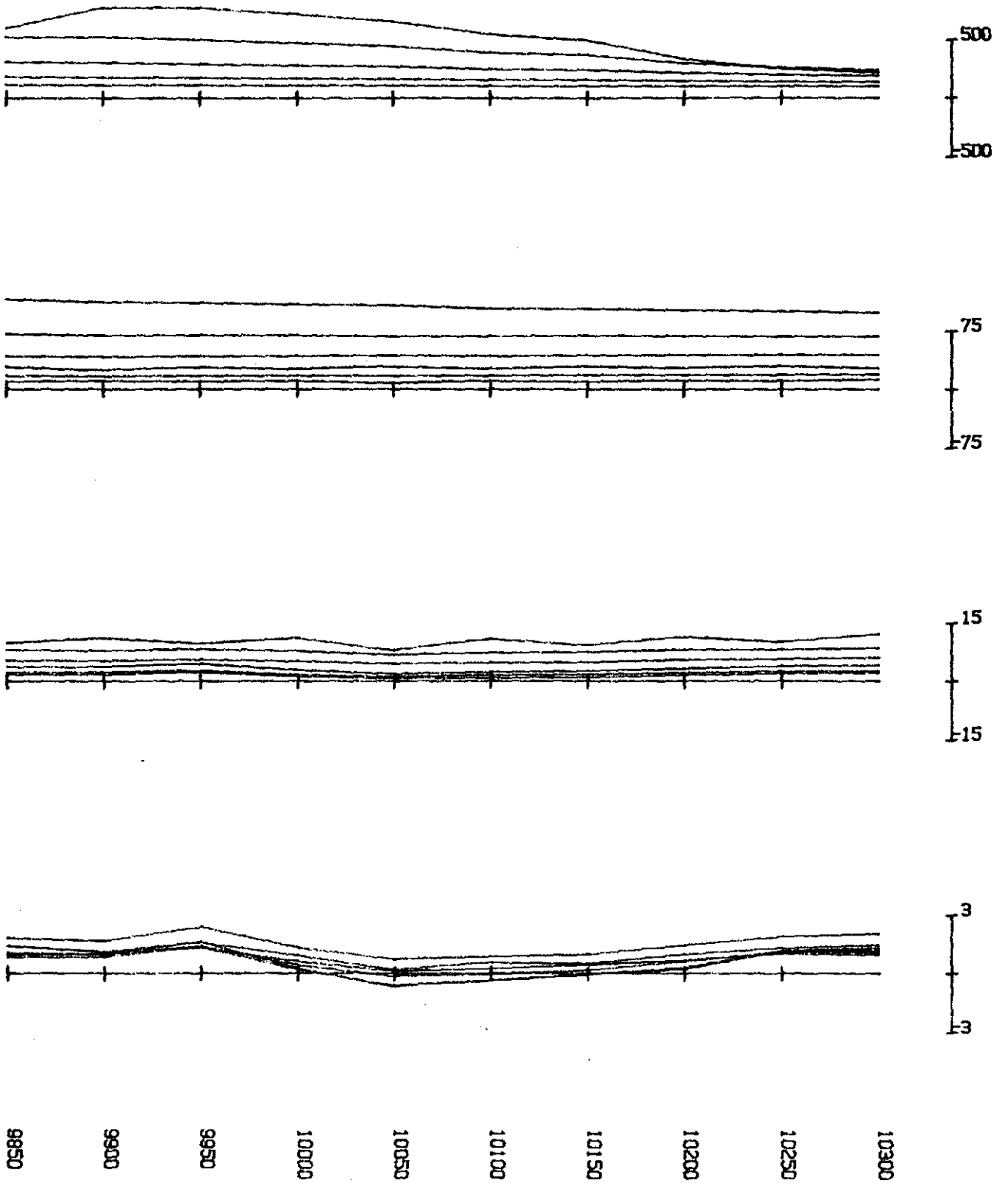
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

093

063094



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

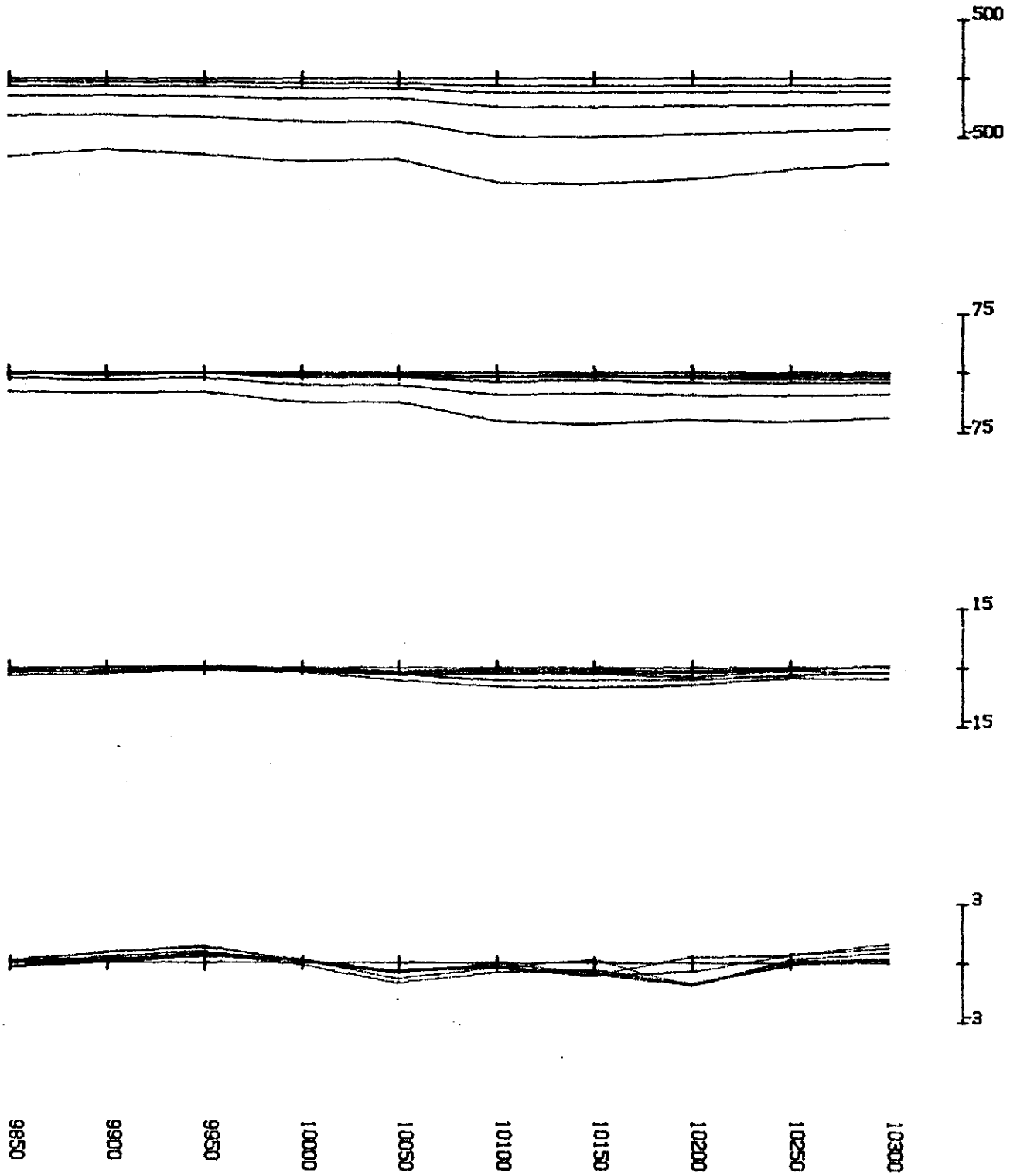
Tx4

Loop HOR1 Line 9300 Component D

Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR1 Line 9300 Component N

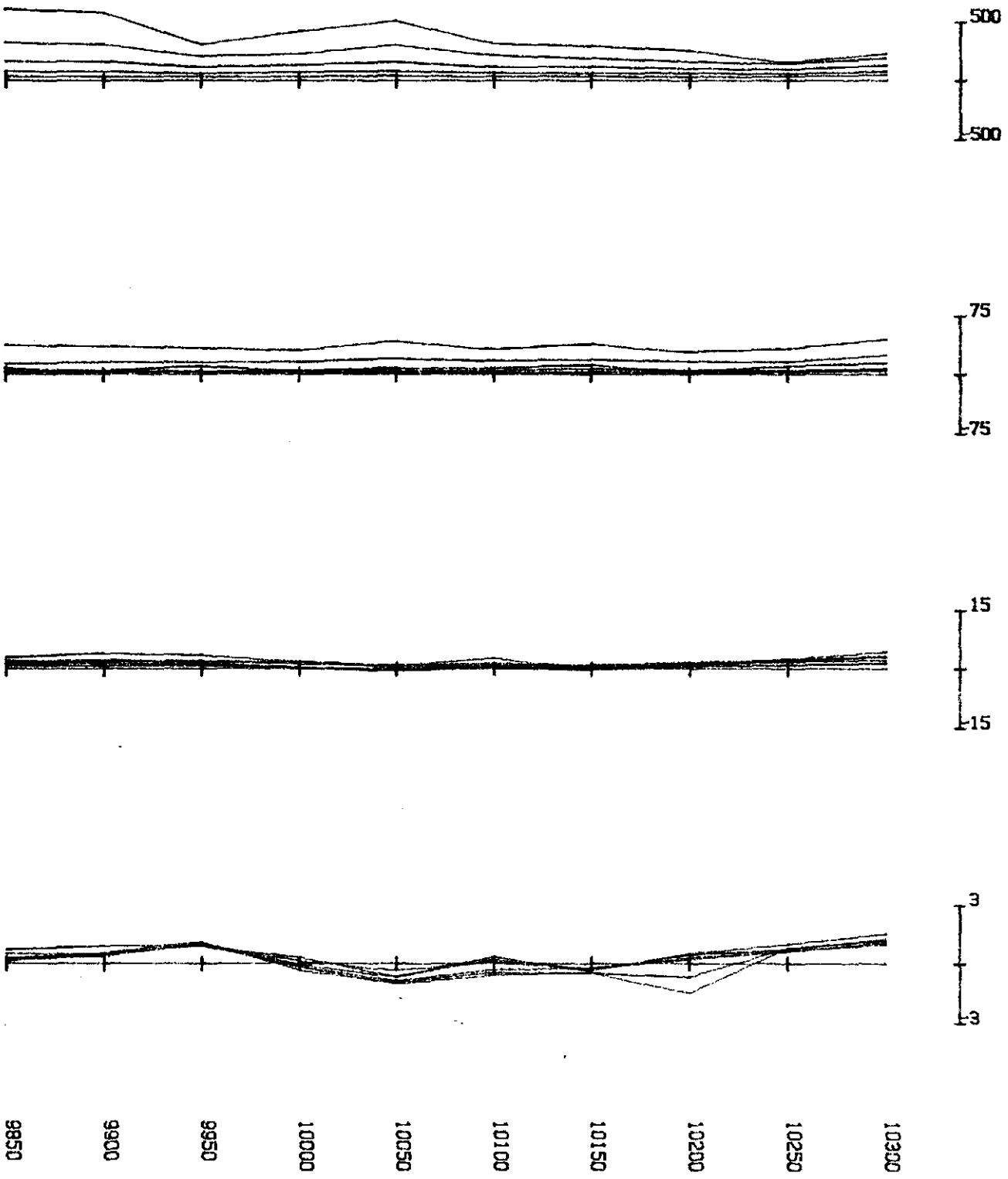
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

095

063096



EM37 PLOT Client AMOCO MINERALS Area HEAP OF ROCKS

Loop HOR1 Line 9300 Component E

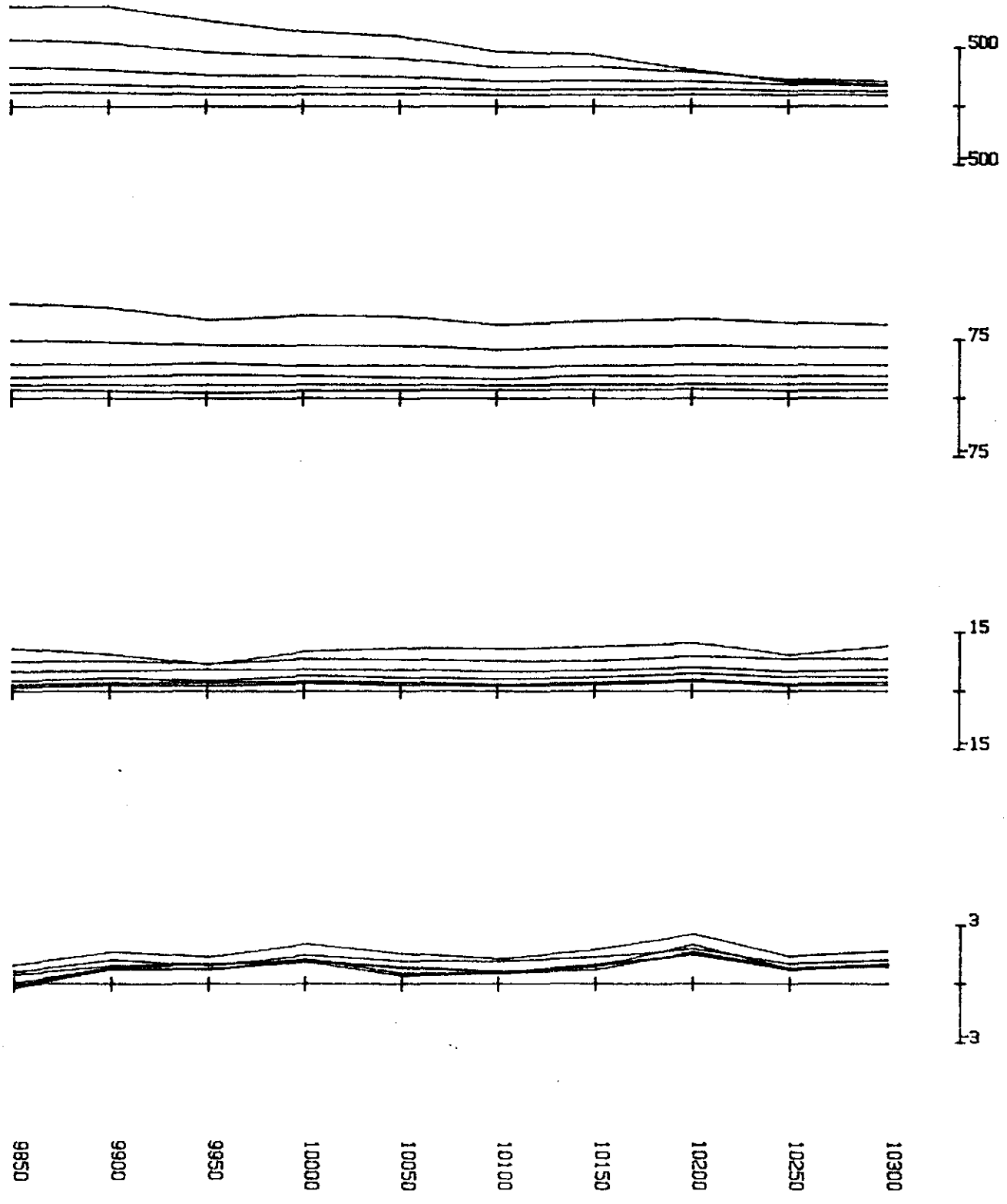
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

096

063097



EM37 PLOT
Loop HOR1
Freq 25 Hz

Client AMOCO
Line 9200
Current 14.8 Amps

Area HEAP OF ROCKS
Component D
T/O Time 235 microsecs

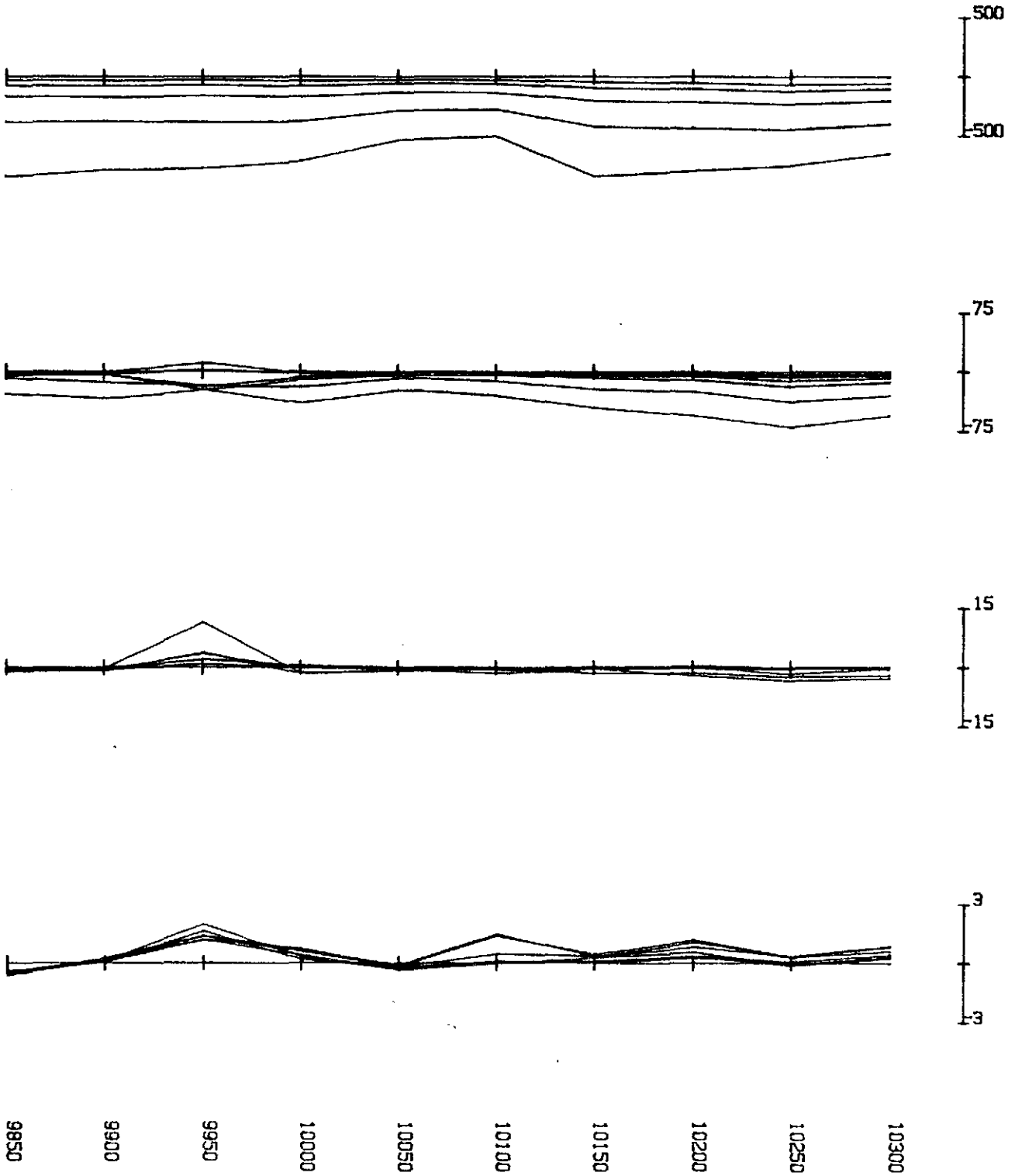
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

097

063098



EM37 PLOT
Loop HOR1
Freq 25 Hz

Client AMOCO
Line 9200
Current 14.8 Amps

Area HEAP OF ROCKS
Component N
T/O Time 235 microsecs

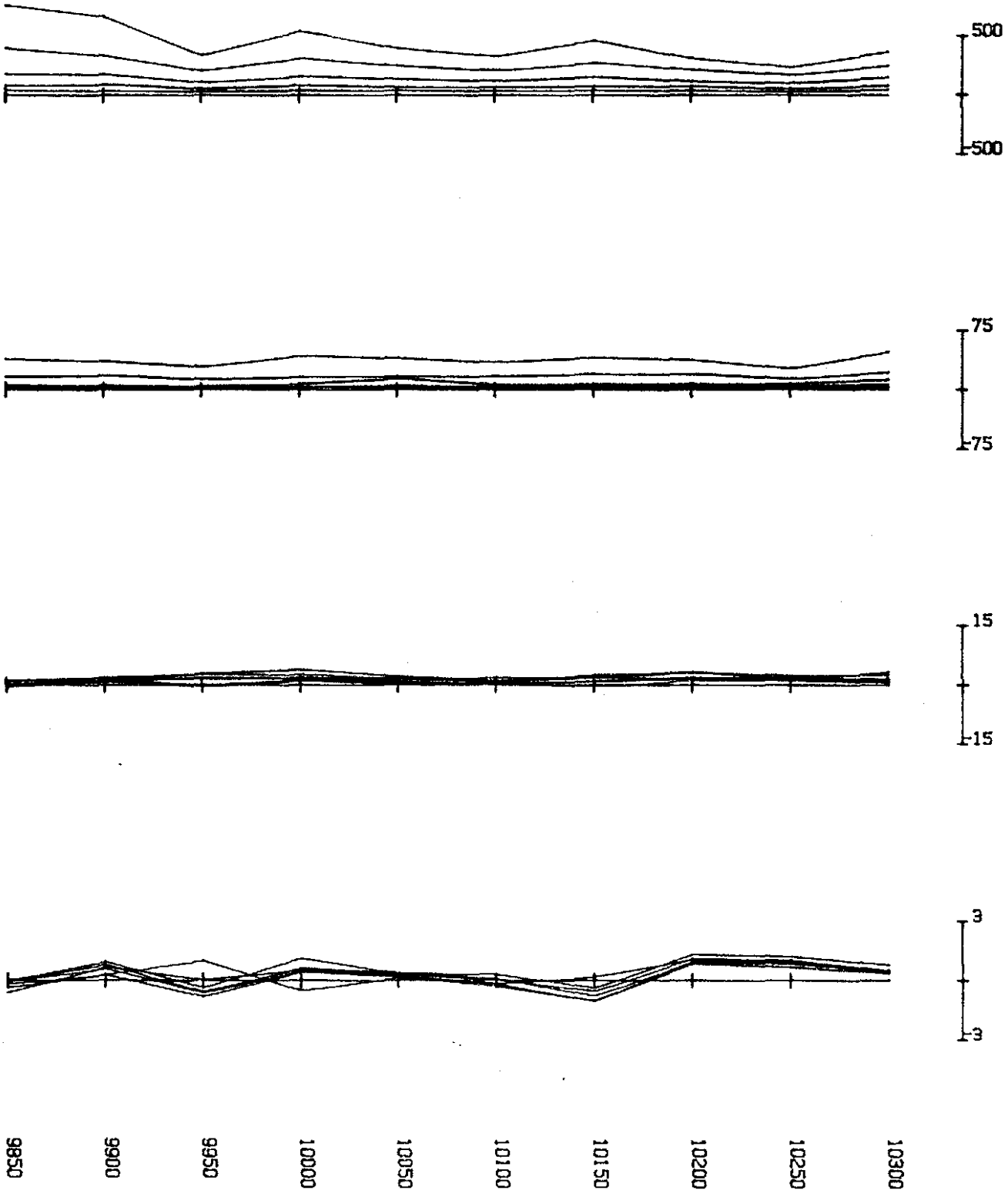
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

098

063099



EM37 PLOT
Loop HOR1
Freq 25 Hz

Client AMOCO
Line 9200
Current 14.8 Amps

Area HEAP OF ROCKS
Component E
T/O Time 235 microsecs

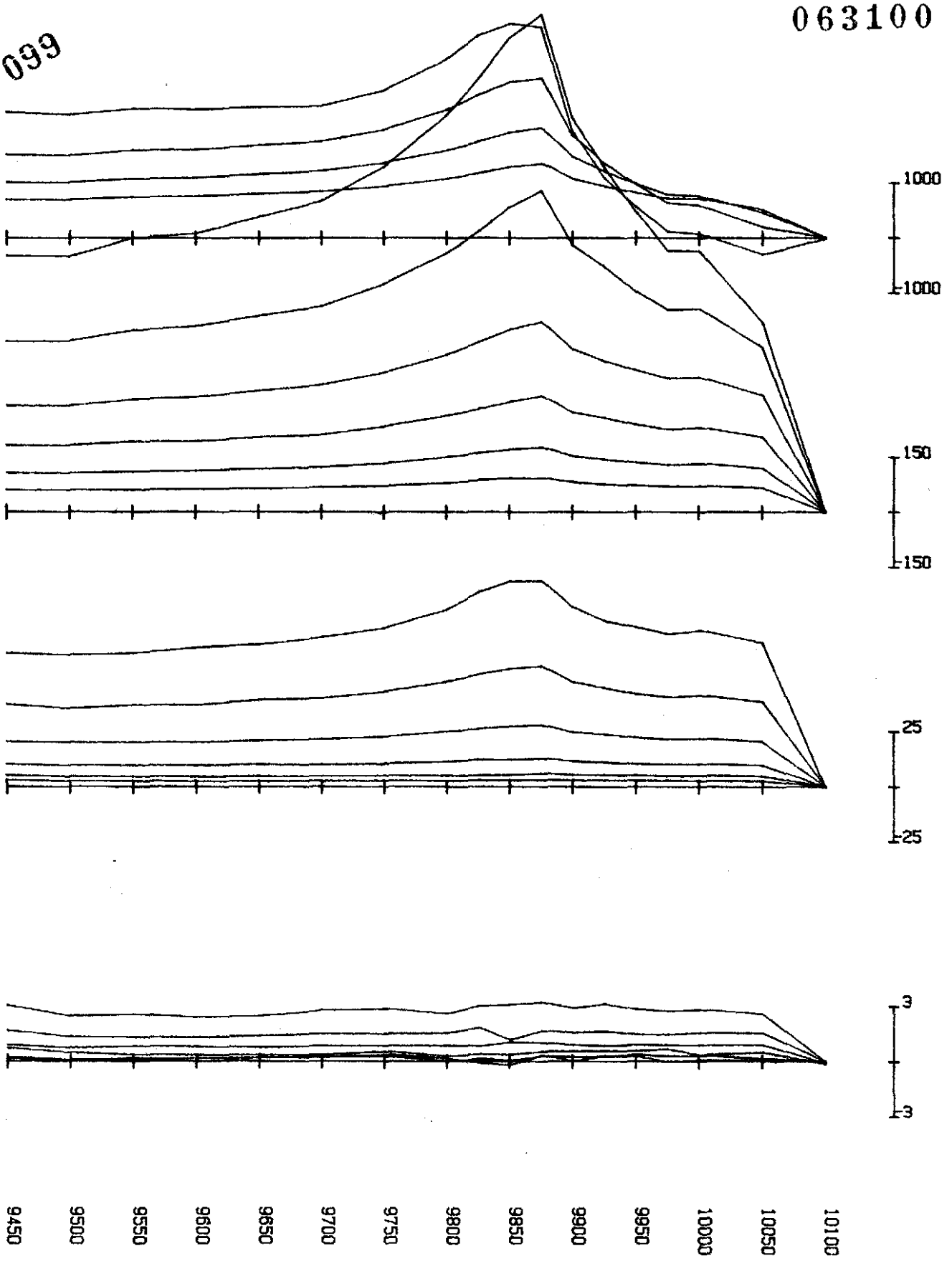
Scale 1 : 3000.

5 cm

P & V GEOPHYSICAL SERVICES

063100

099



EM37 PLOT Client Area SPEELER

Loop Tx2 Line 11600 Component D

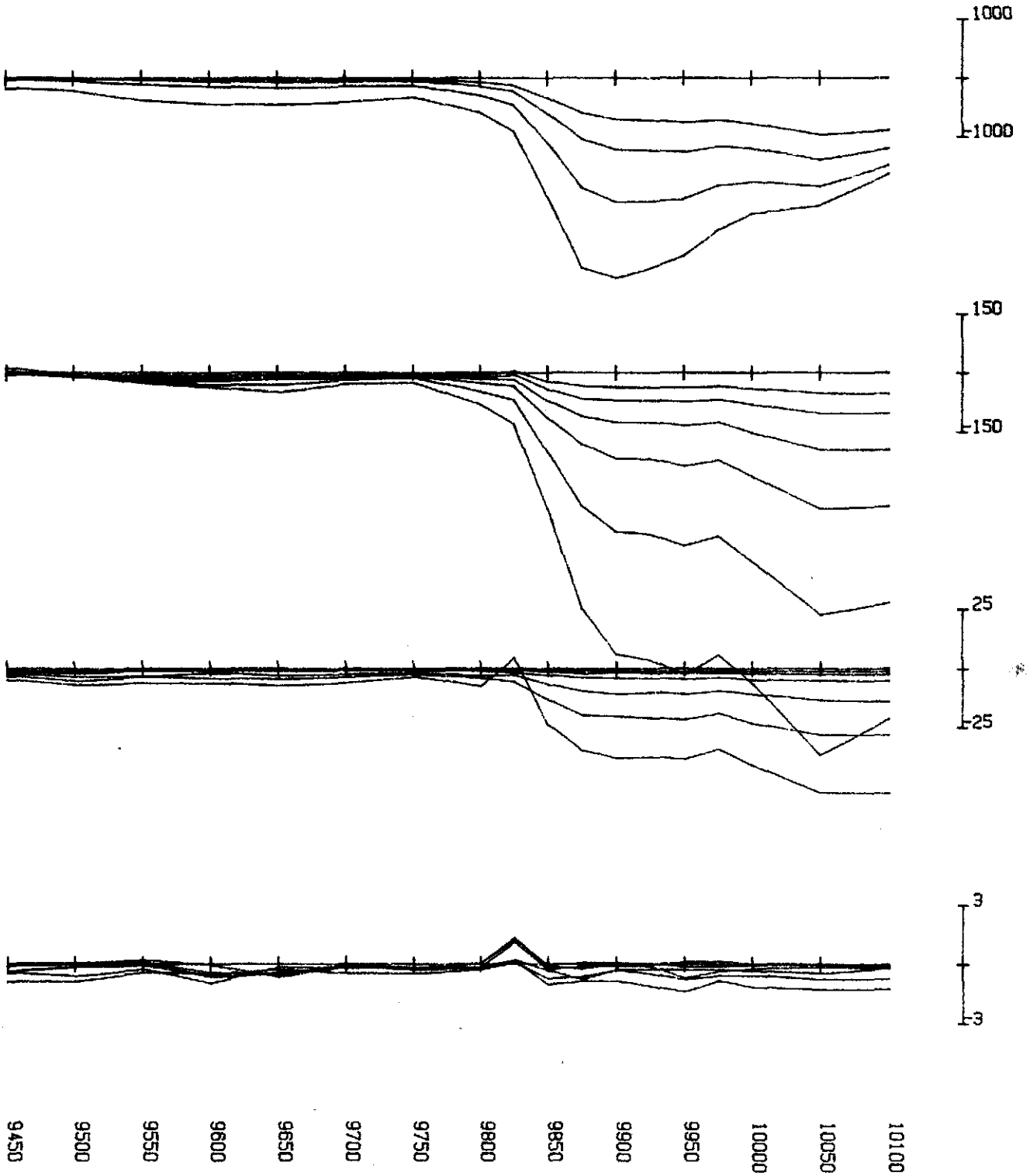
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

100

063101



EM37 PLOT Client Area SPEELER

Loop 1 Line 11600 Component N

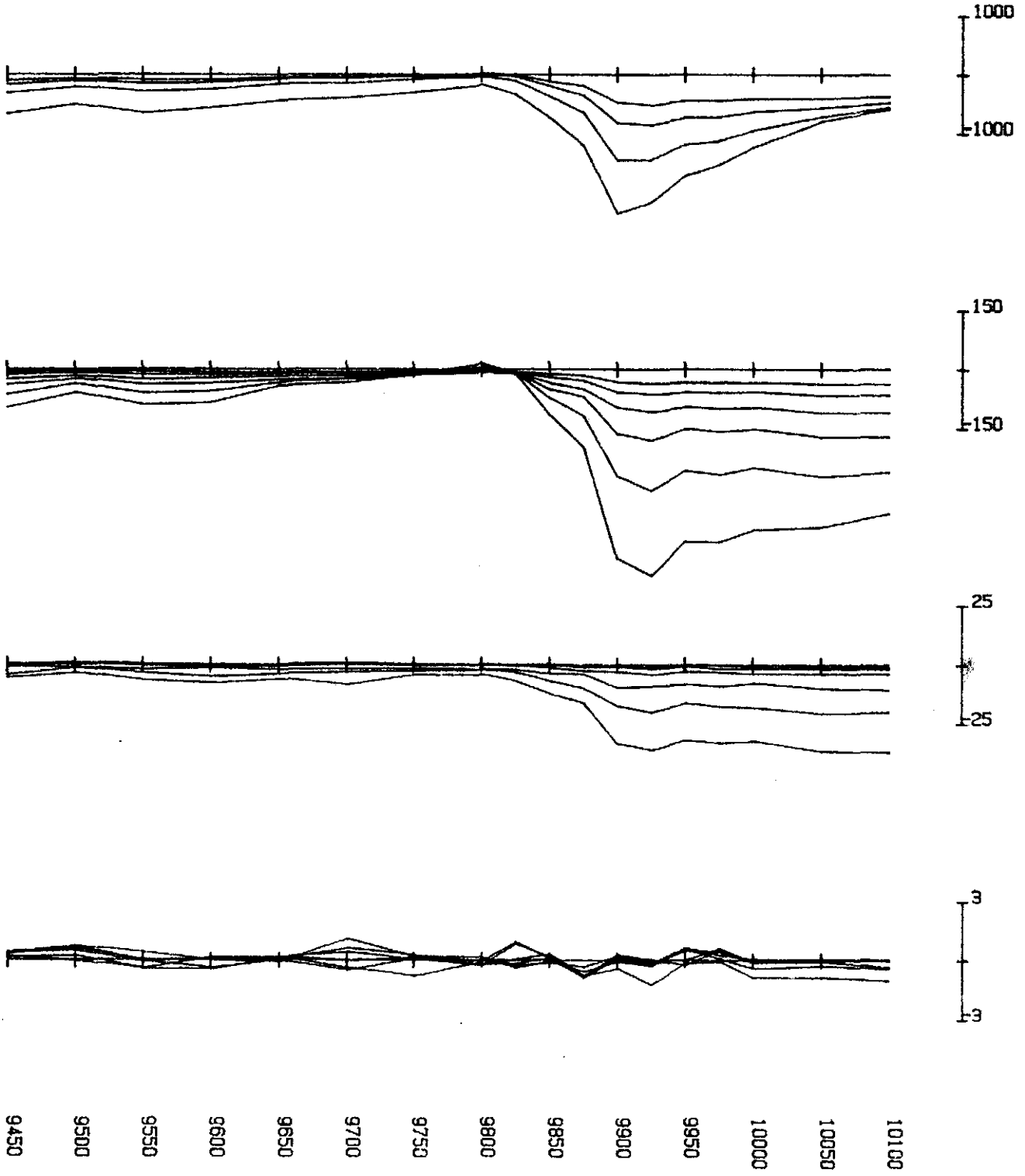
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

101

063102



EM37 PLOT Client Area SPEELER

Loop 1 Line 11600 Component E

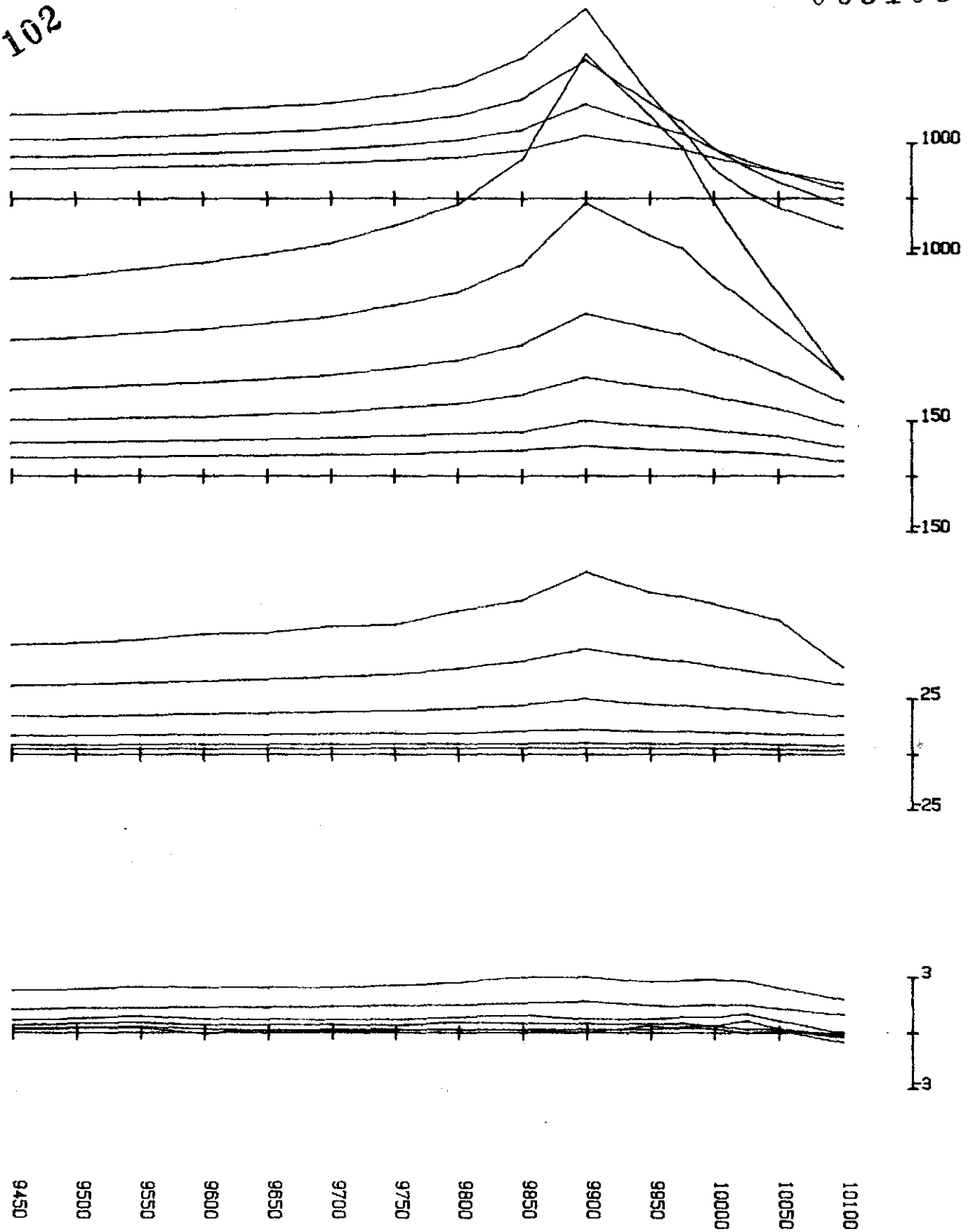
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063103

102



EM37 PLOT | Client | Area SPEELER

Loop Tx 2 | Line 11500 | Component D

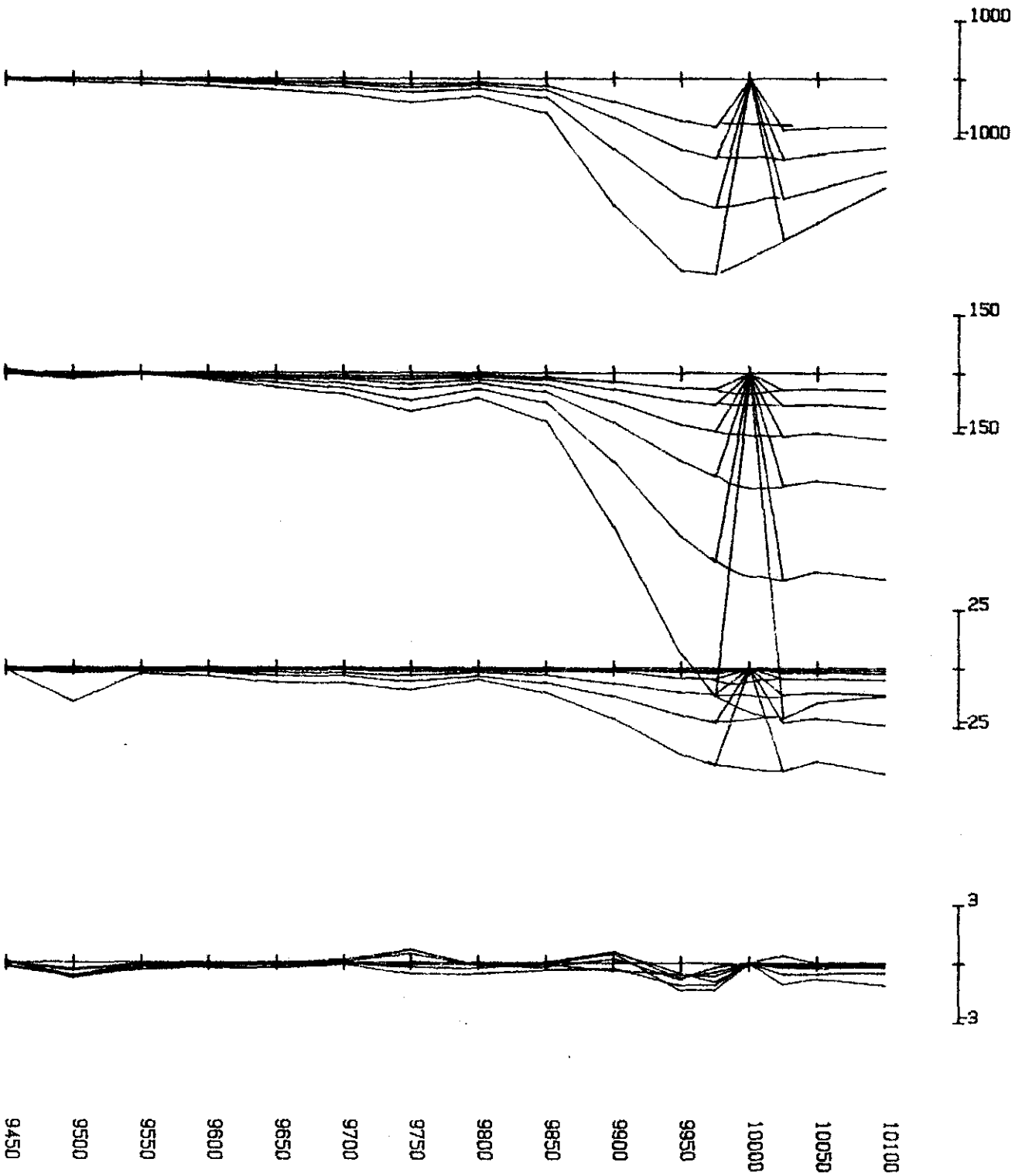
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

103

063104



EM37 PLOT Client Area SPEELER

Loop 1 Line 11500 Component N

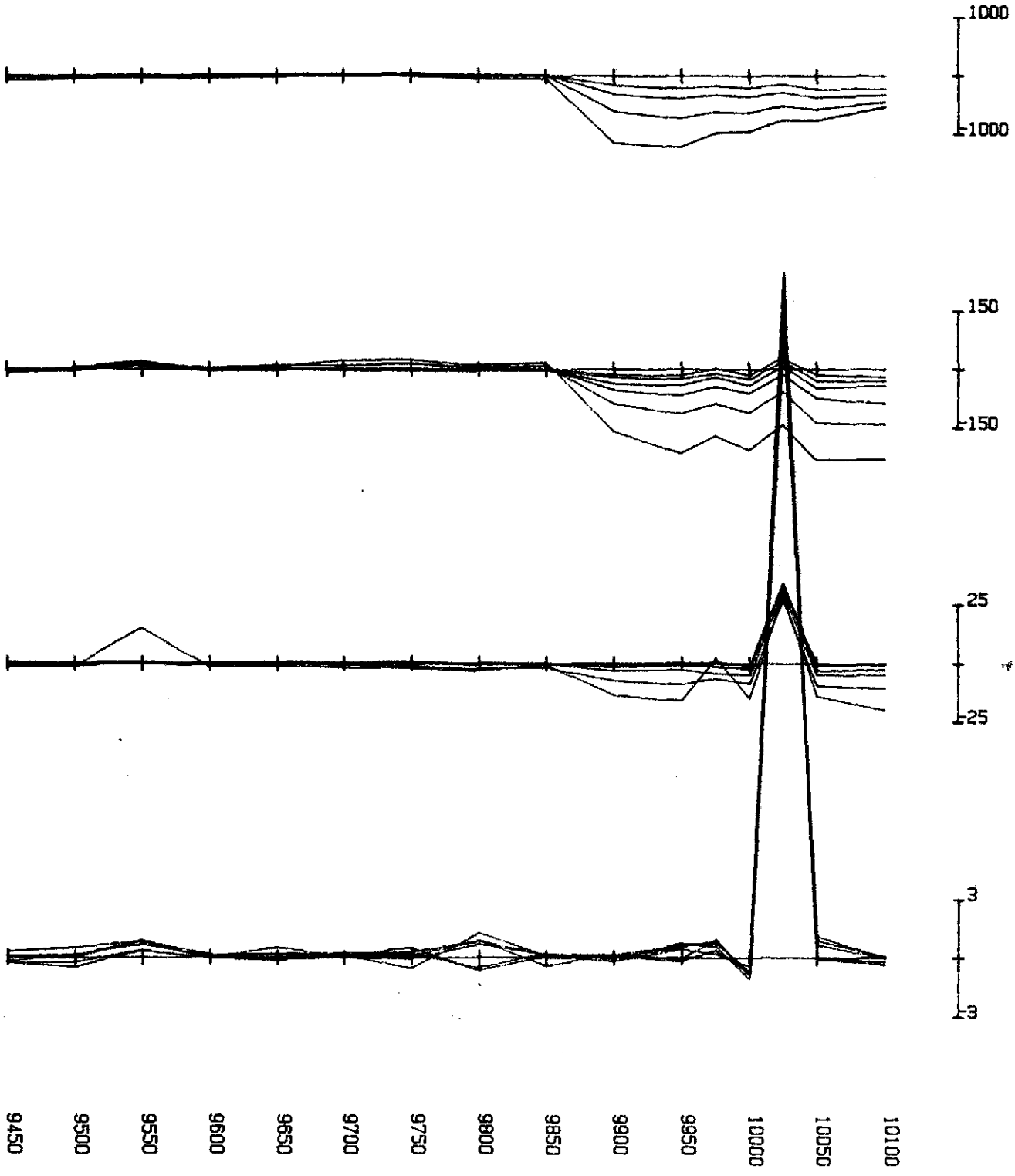
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

104

063105



EM37 PLOT Client Area SPEELER

Loop 1 Line 11500 Component E

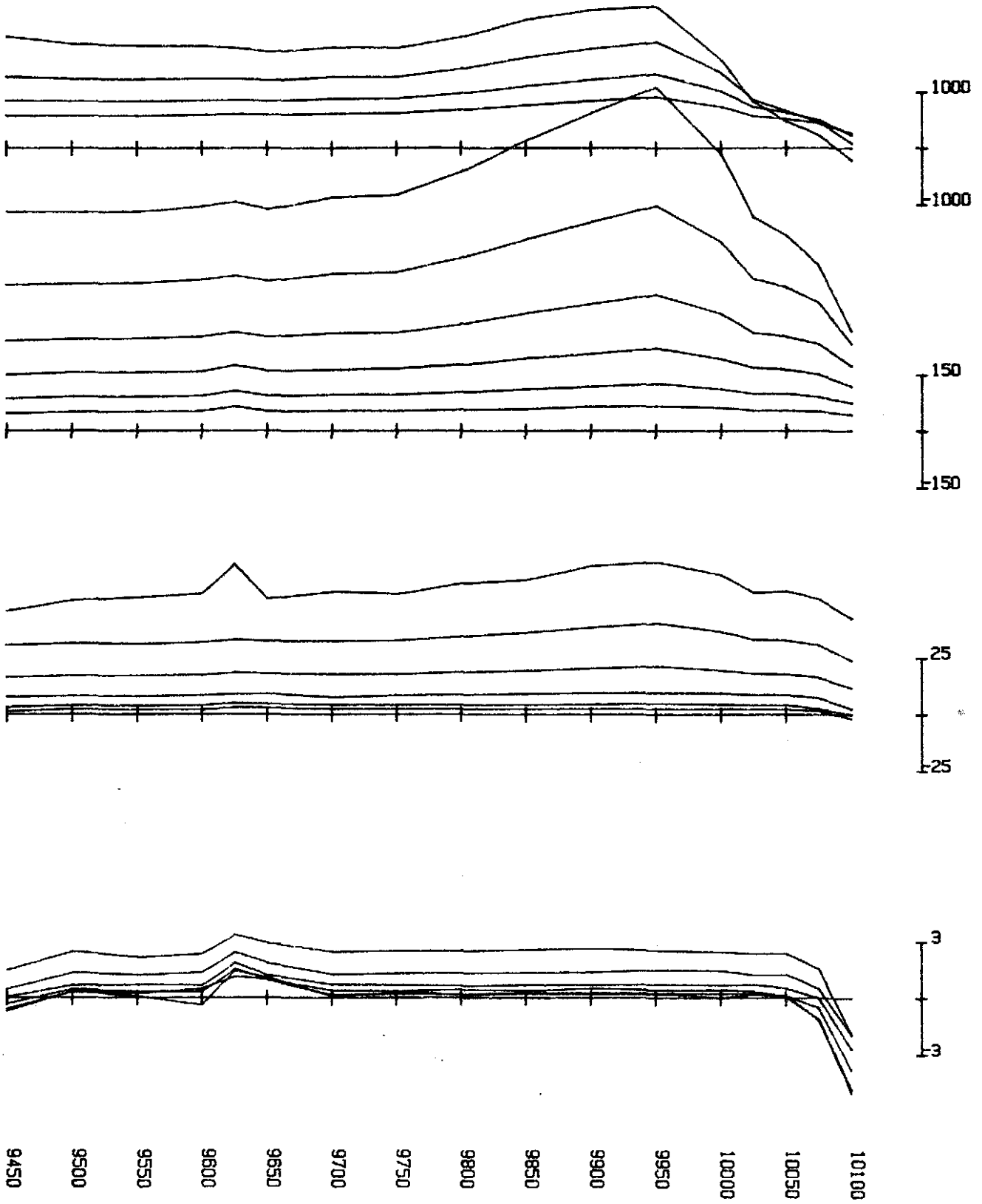
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

105

063106



EM37 PLOT Client AMOCO Area SPEELER

Loop ~~SPC1~~ Tx 2 Line 11400 Component D

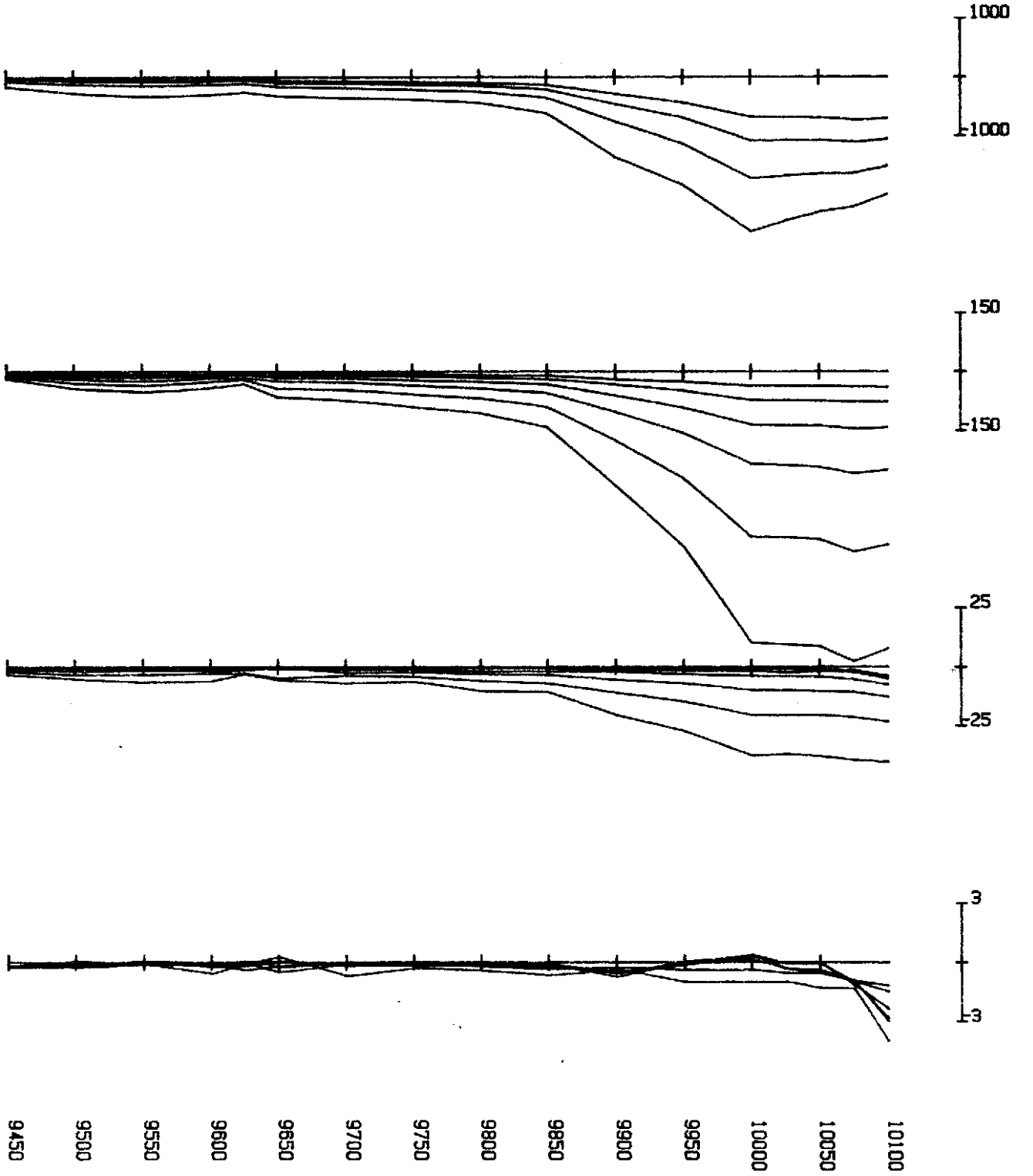
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

106

063107



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11400 Component N

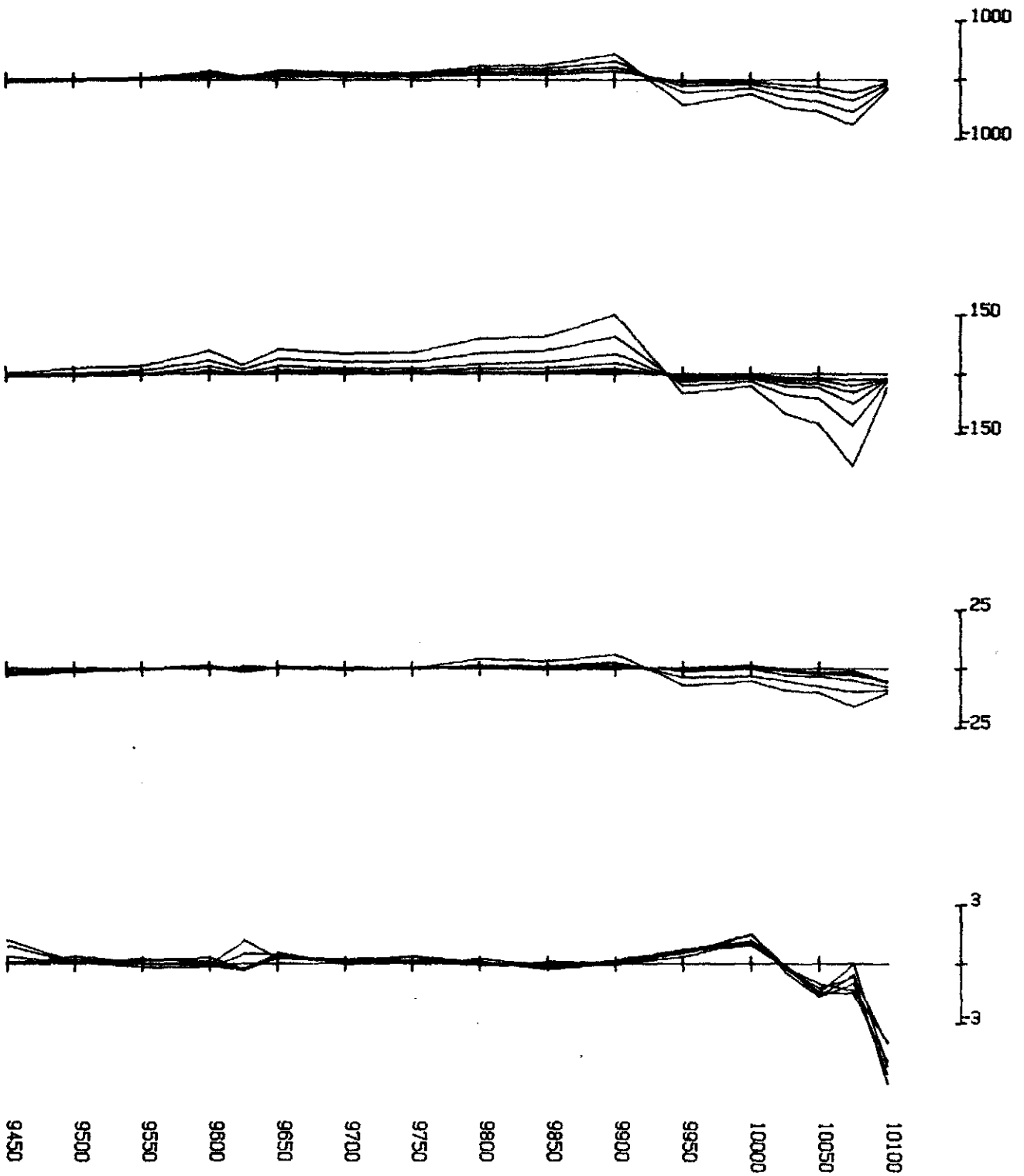
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

107

063108



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11400 Component E

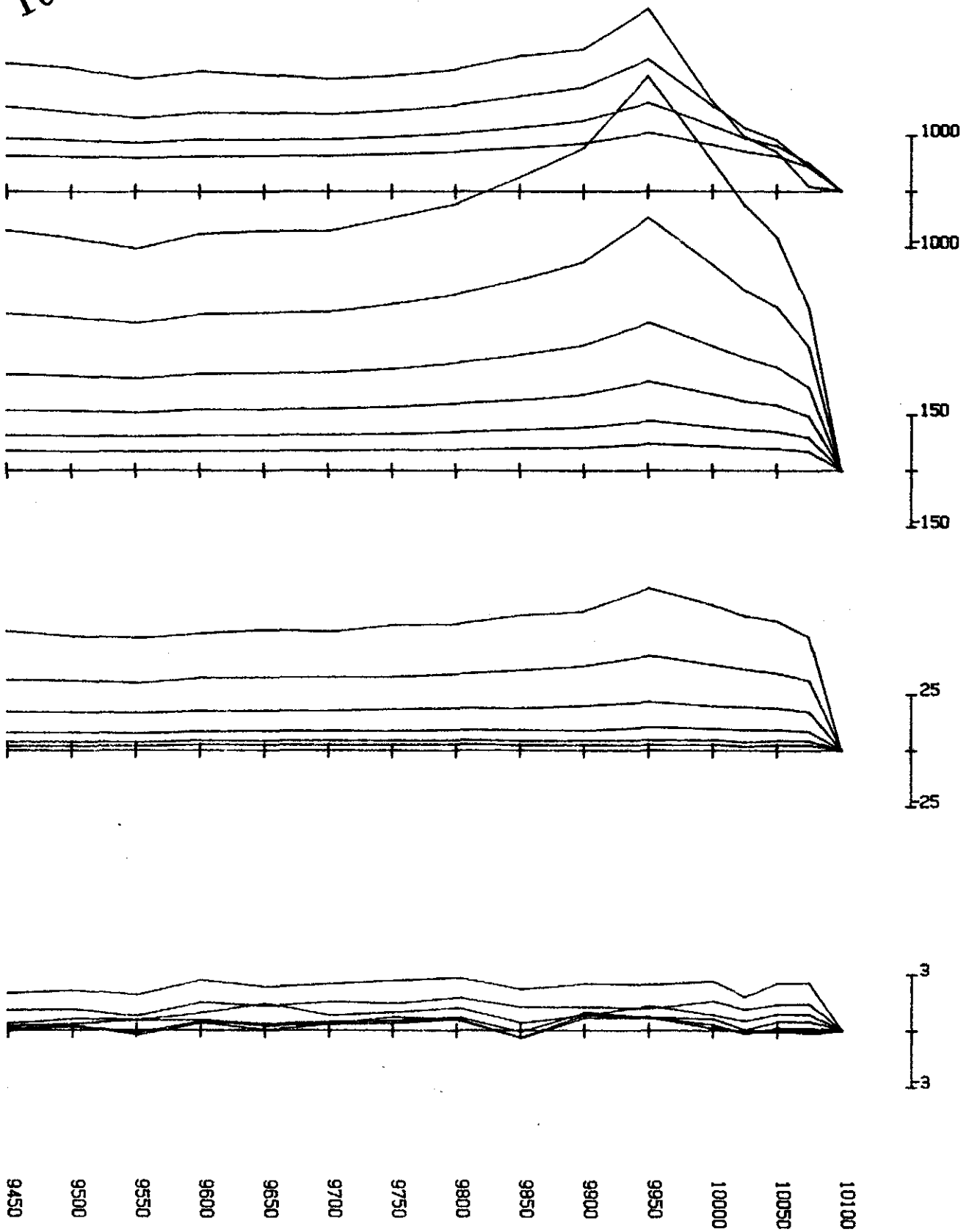
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

108

063109



EM37 PLOT

Client AMOCO

Area SPEELER

Loop ~~SPC1~~ Tx2

Line 11300

Component D

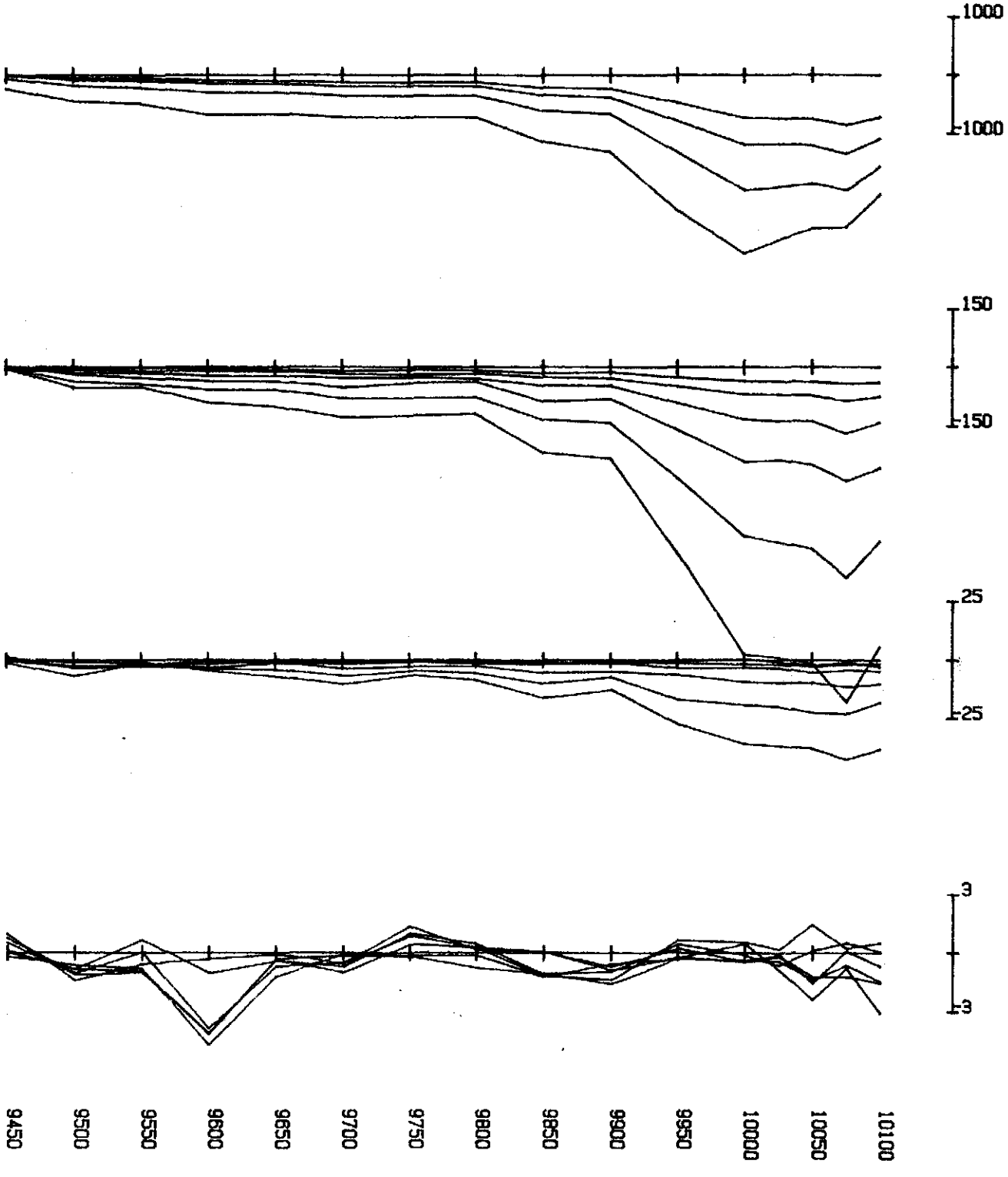
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

109

063110



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11300 Component N

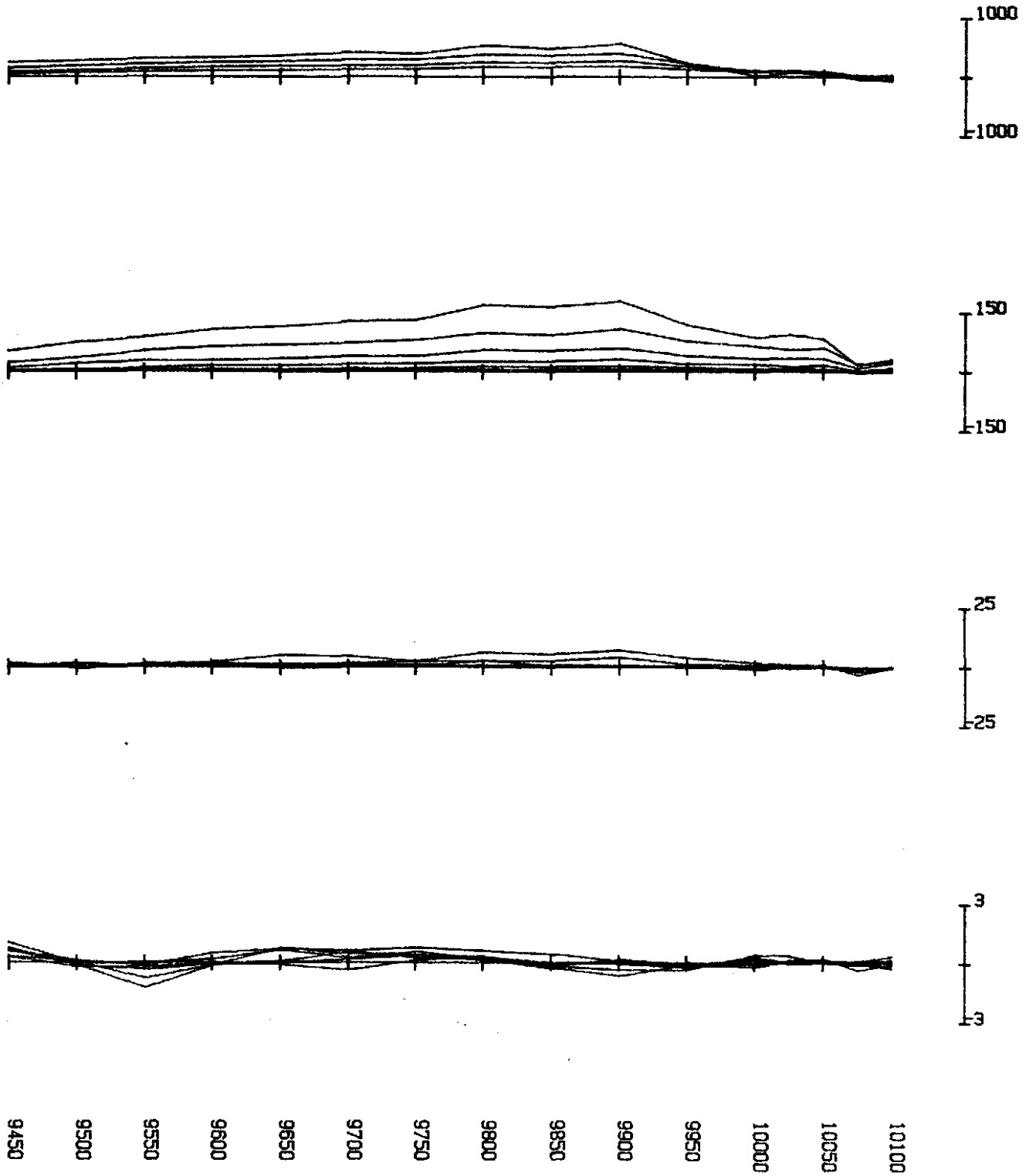
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

110

063111



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11300 Component E

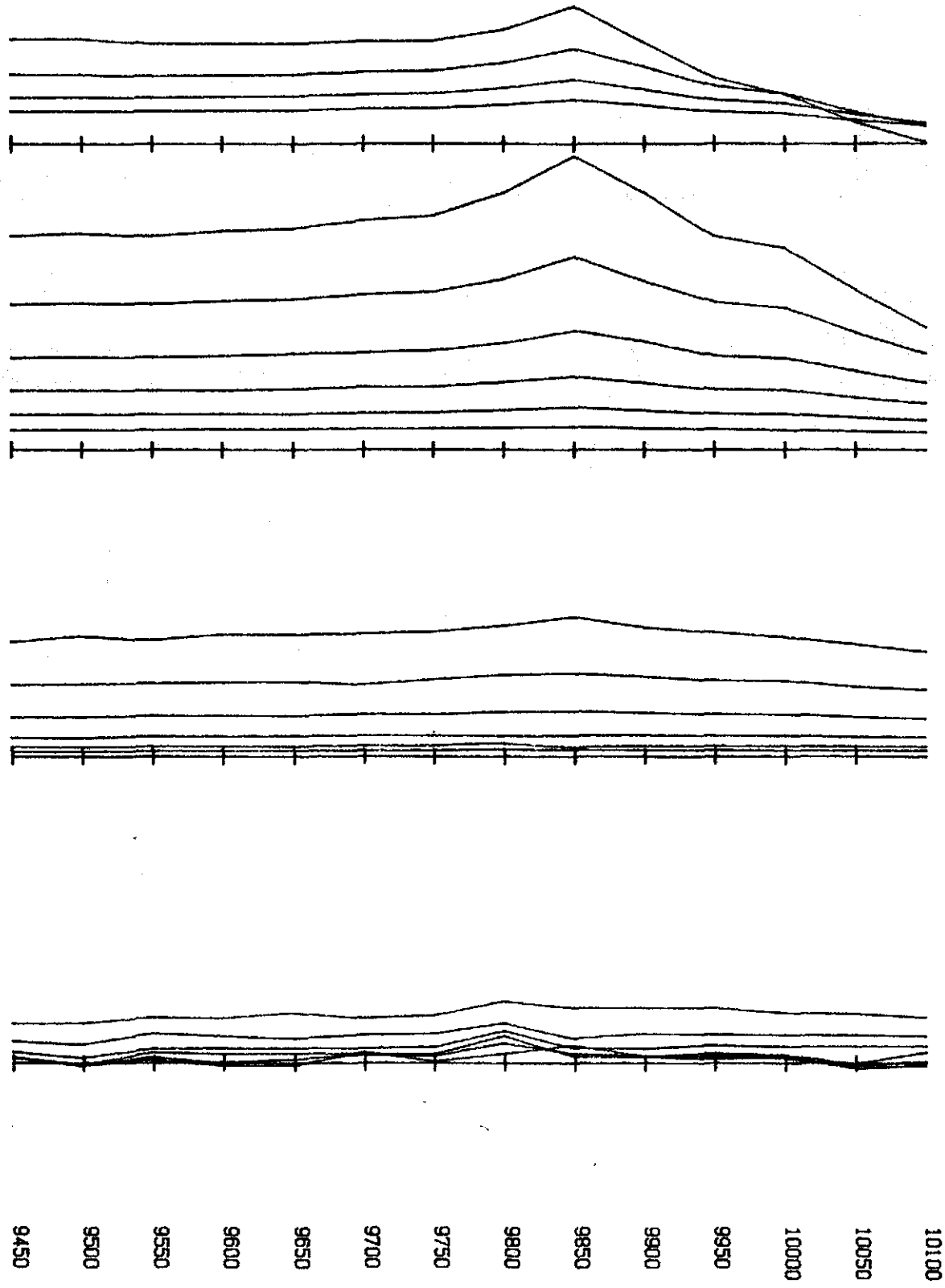
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

111

063112



EM37 PLOT Client AMOCO Area SPEELER

Loop ~~SPC1~~ Tx2 Line 11200 Component D

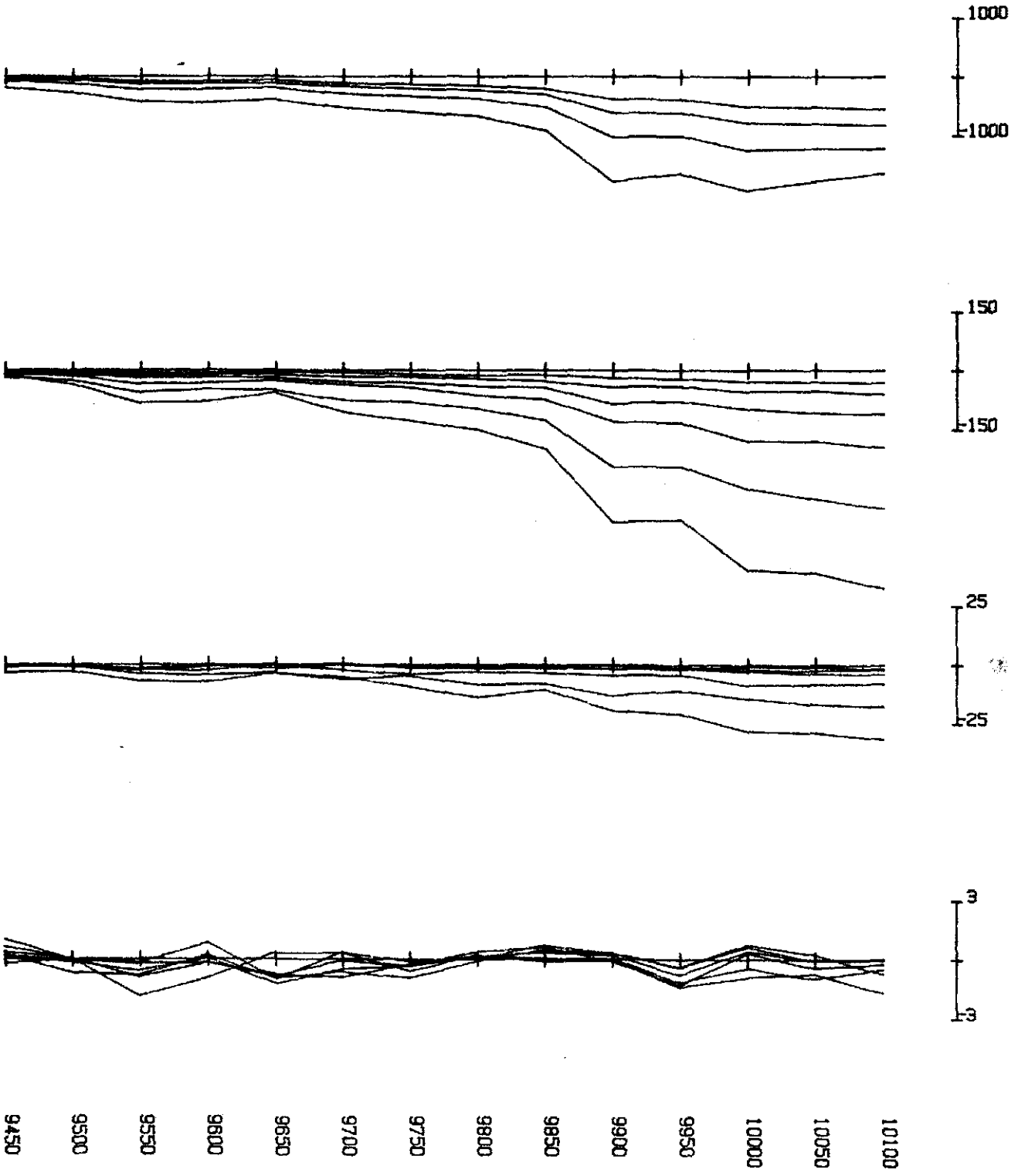
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063113

112



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11200 Component N

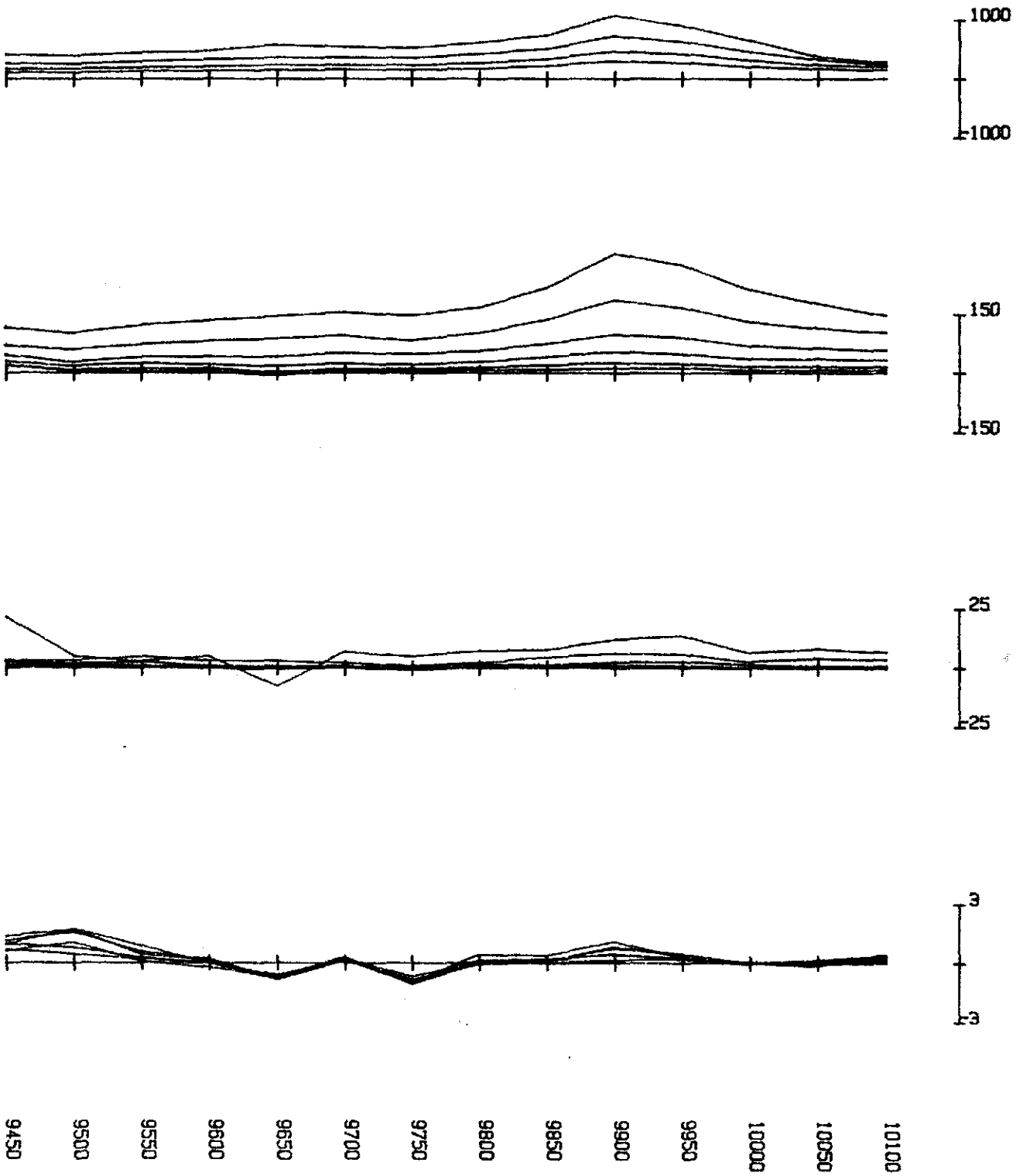
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

113

063114



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11200 Component E

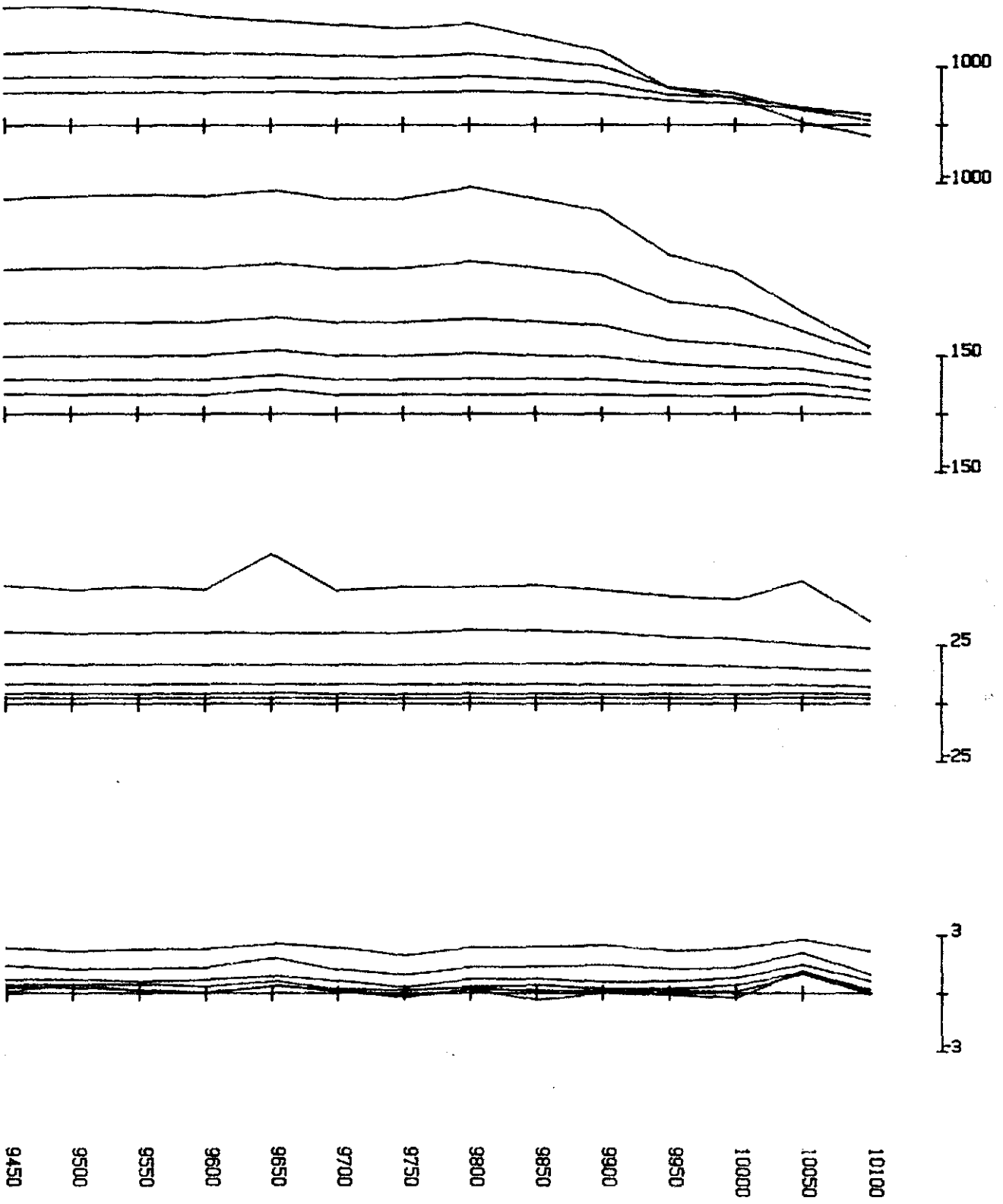
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

114

063115



EM37 PLOT Client AMOCO Area SPEELER

Loop ~~SPC1~~ Tx 2 Line 11100 Component D

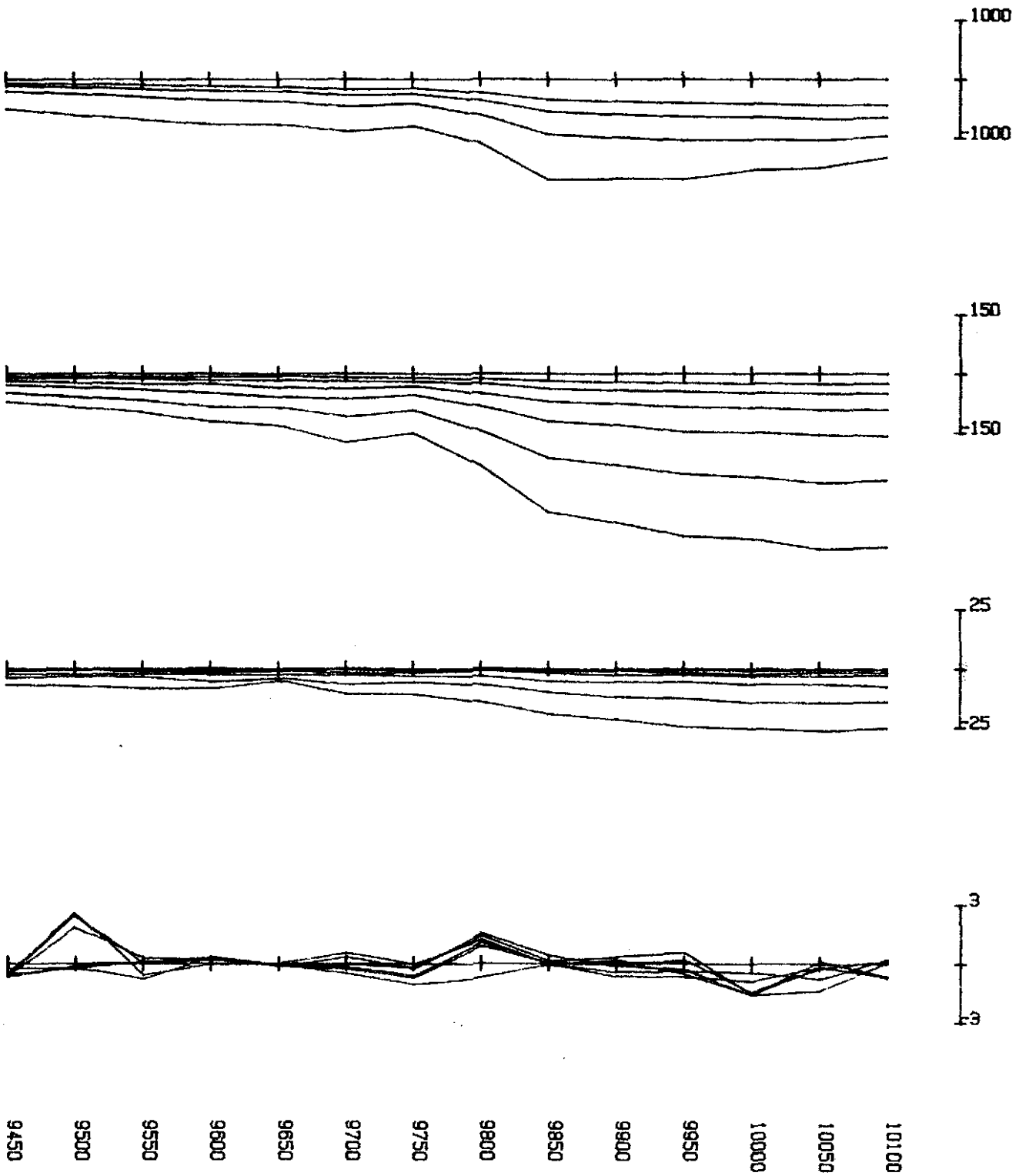
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

115

063116



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11100 Component N

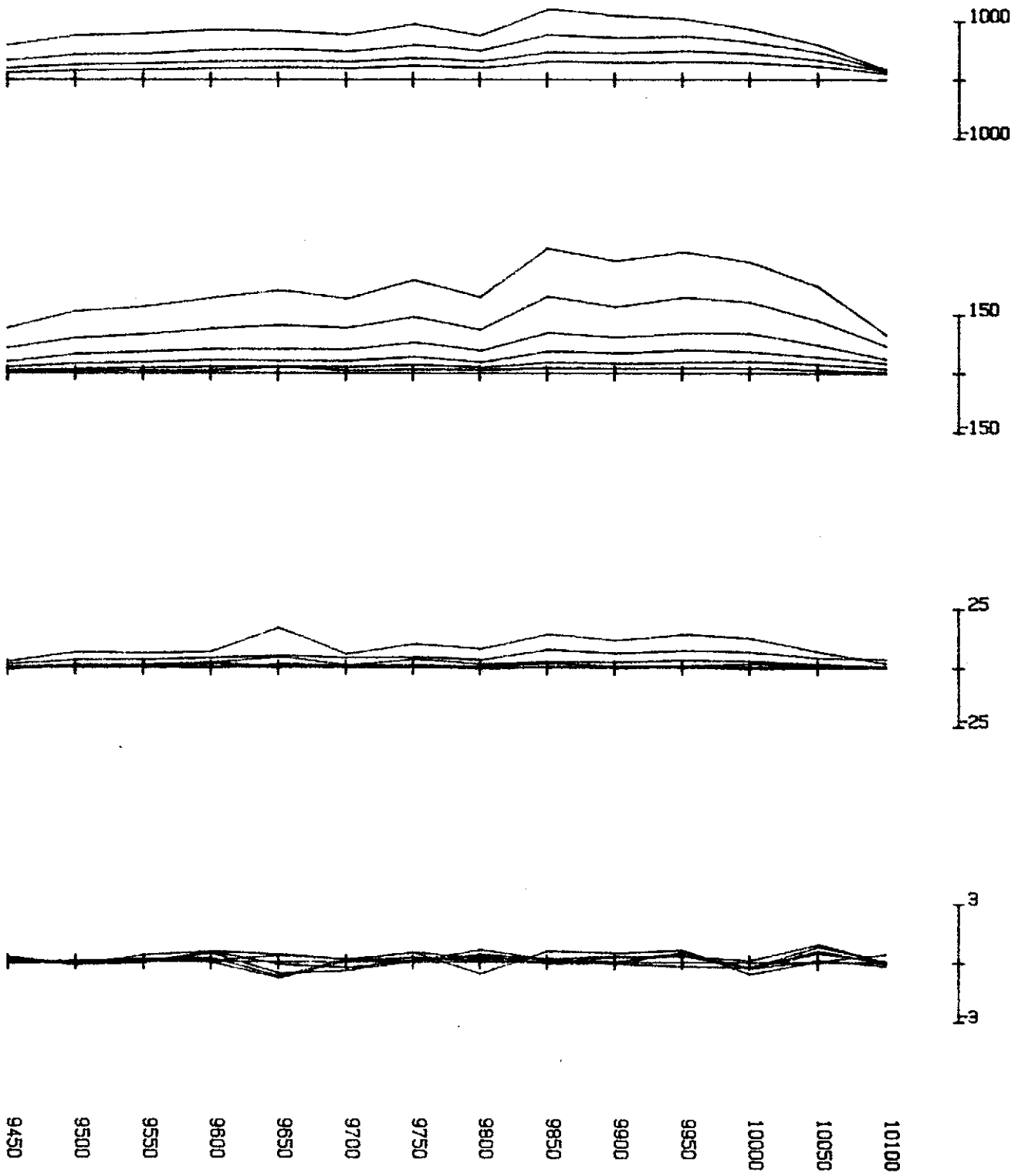
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

116

063117



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11100 Component E

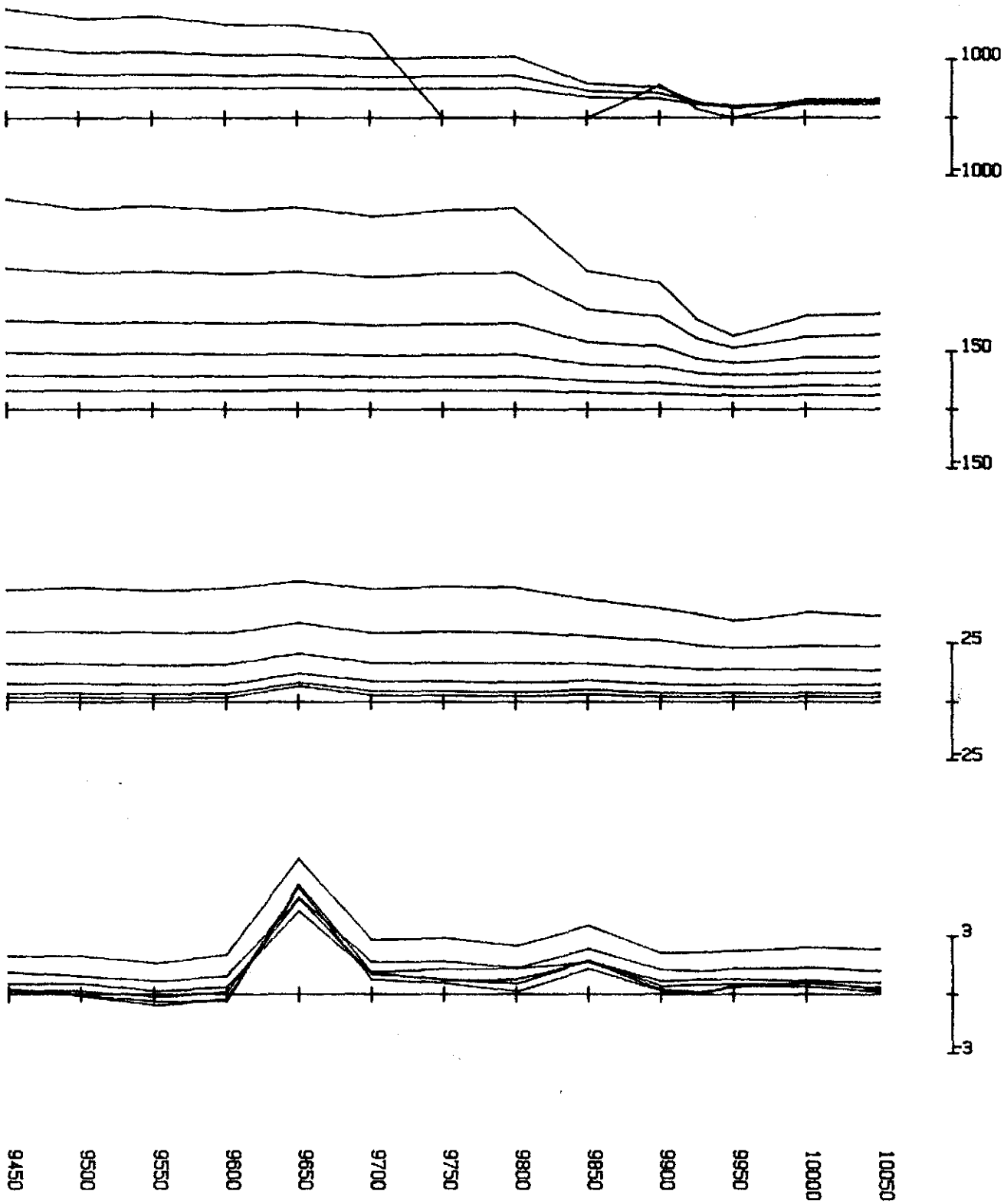
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

117

063118



EM37 PLOT Client AMOCO Area SPEELER

Loop ~~SPE~~ Tx2 1 Line 11000 Component D

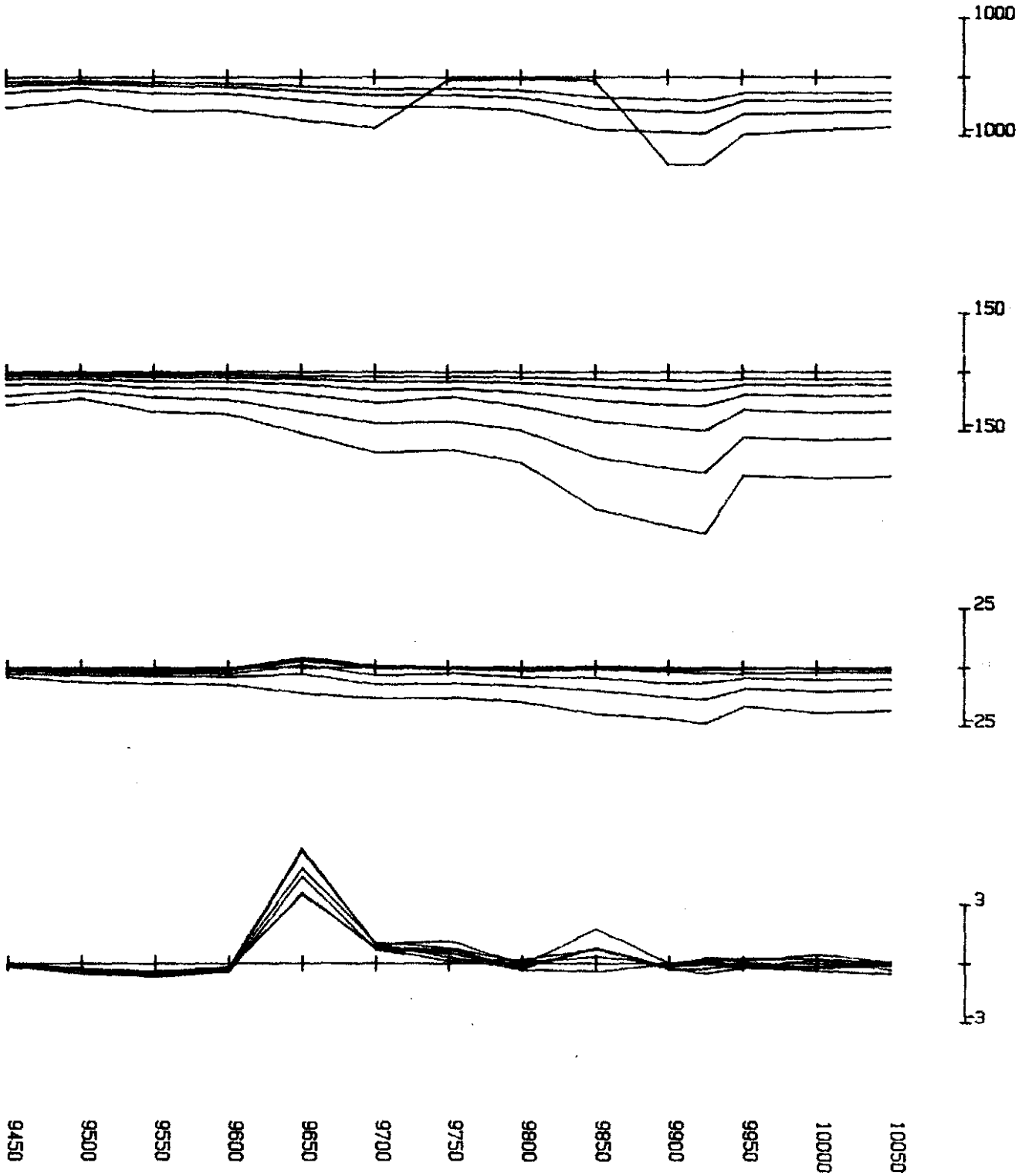
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

118

063119



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11000 Component N

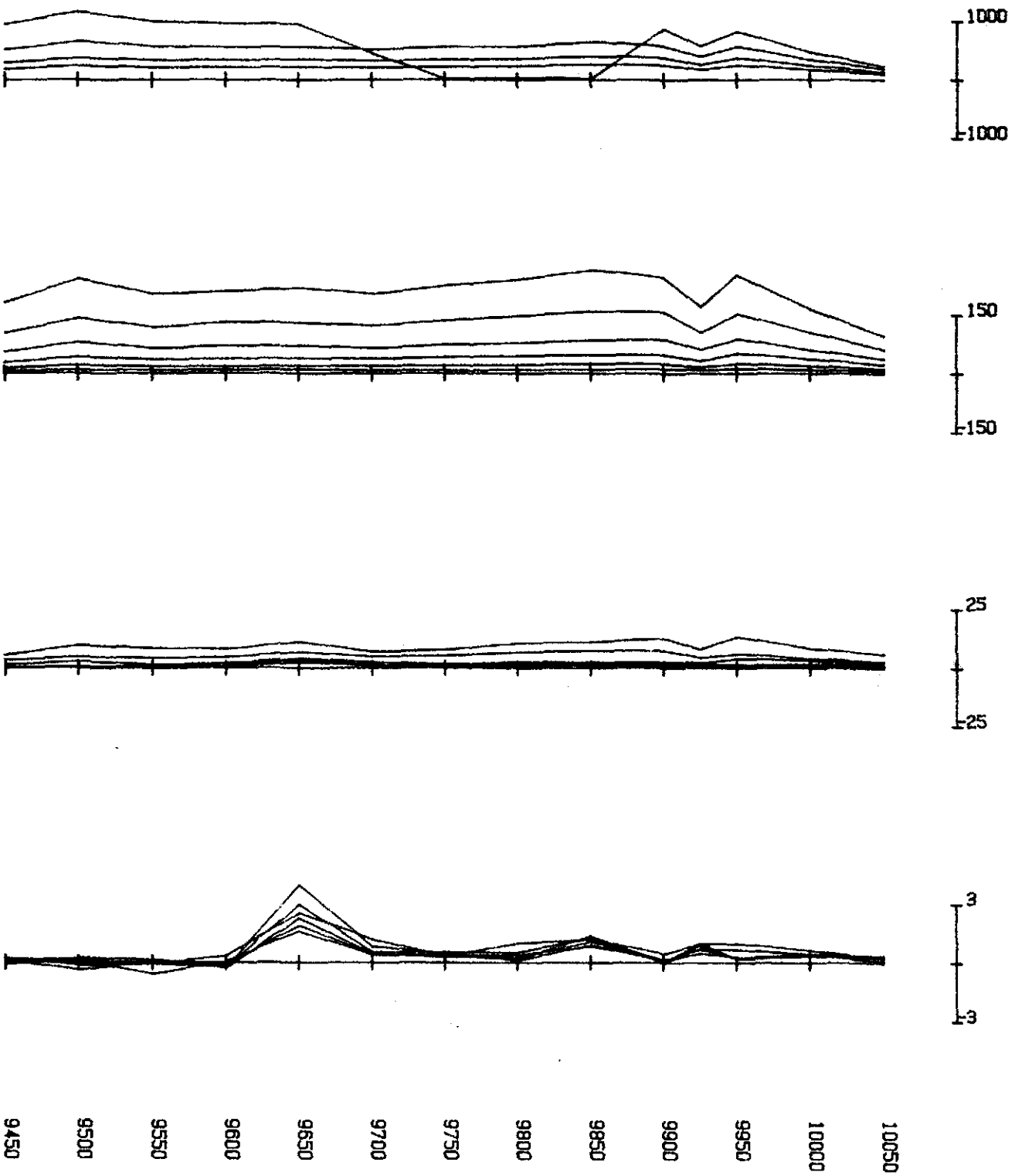
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

119

063120



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC1 Line 11000 Component E

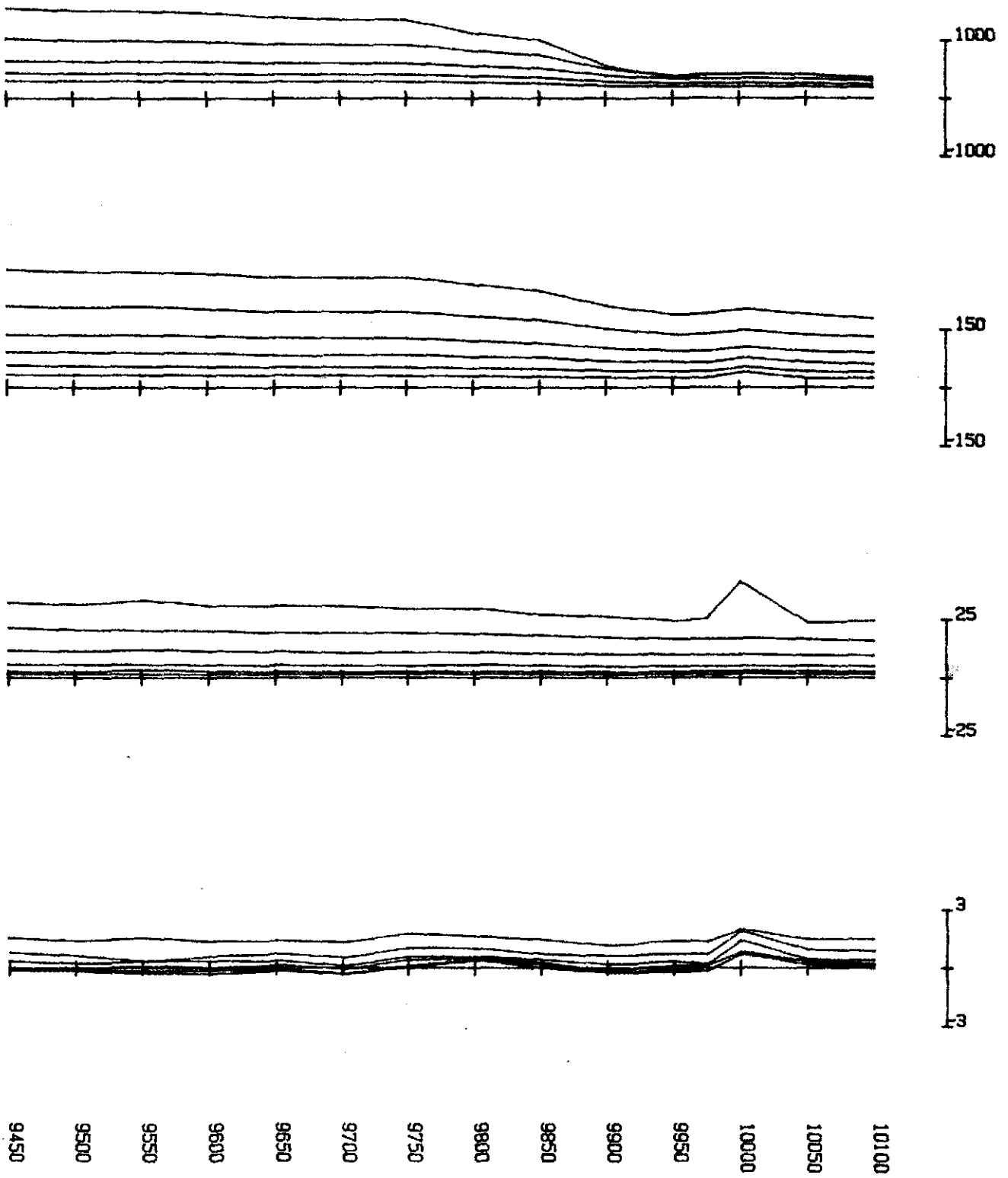
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

063121

120



EM37 PLOT | Client AMOCO | Area SPEELER

Loop ~~SPC2~~ Tx 1 | Line 10900 | Component D

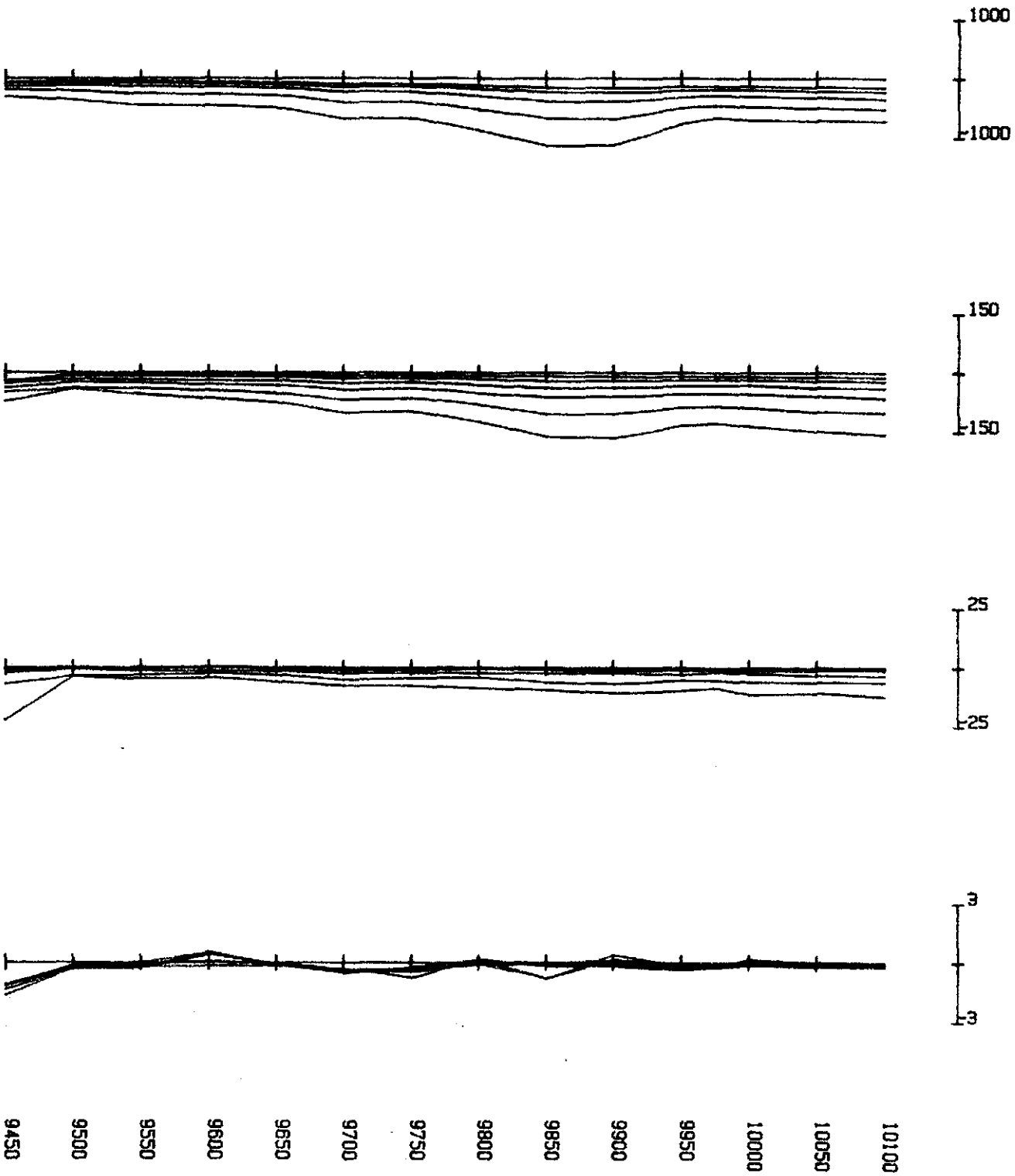
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

121

063122



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10900 Component N

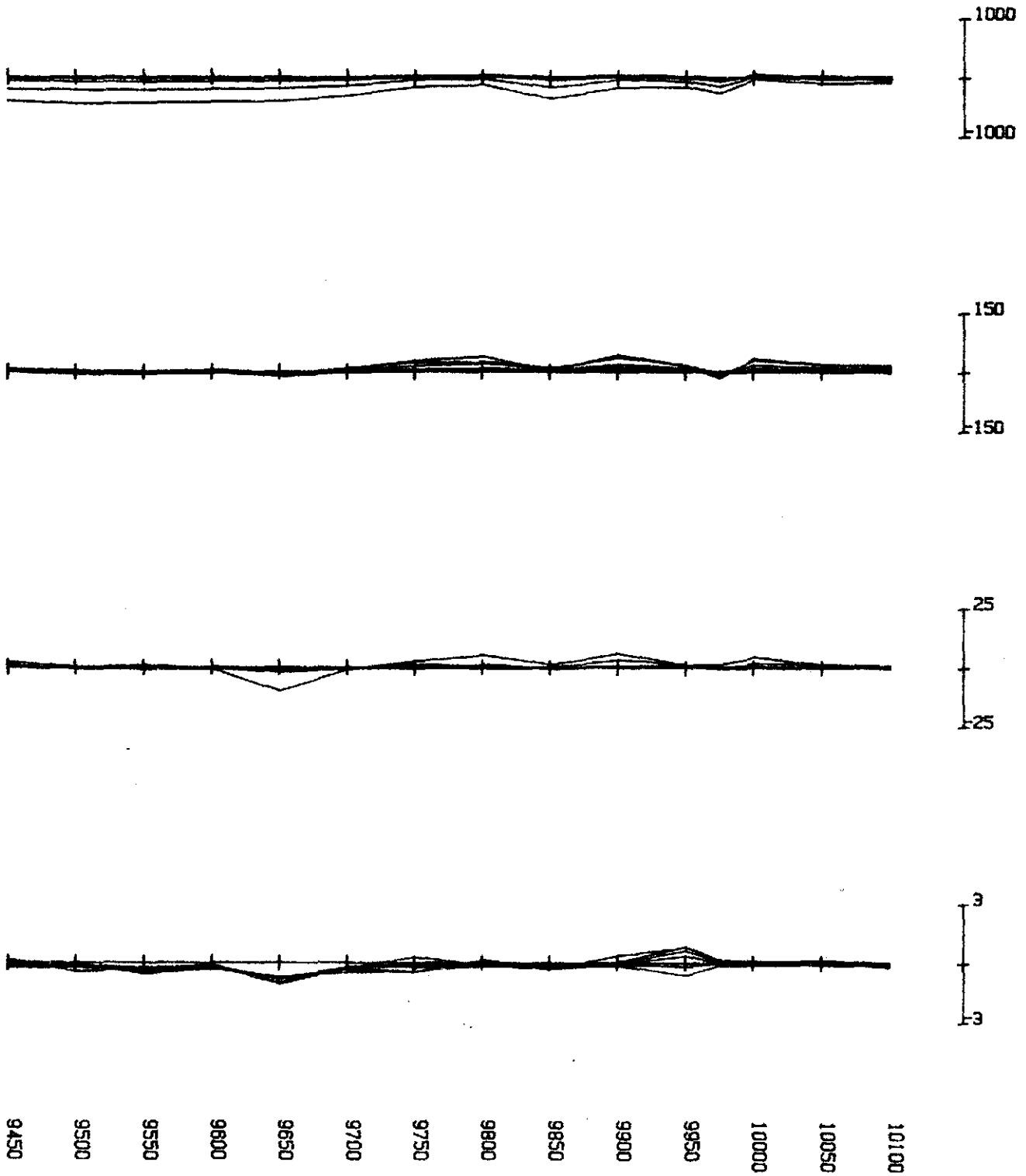
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

122

063123



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10900 Component E

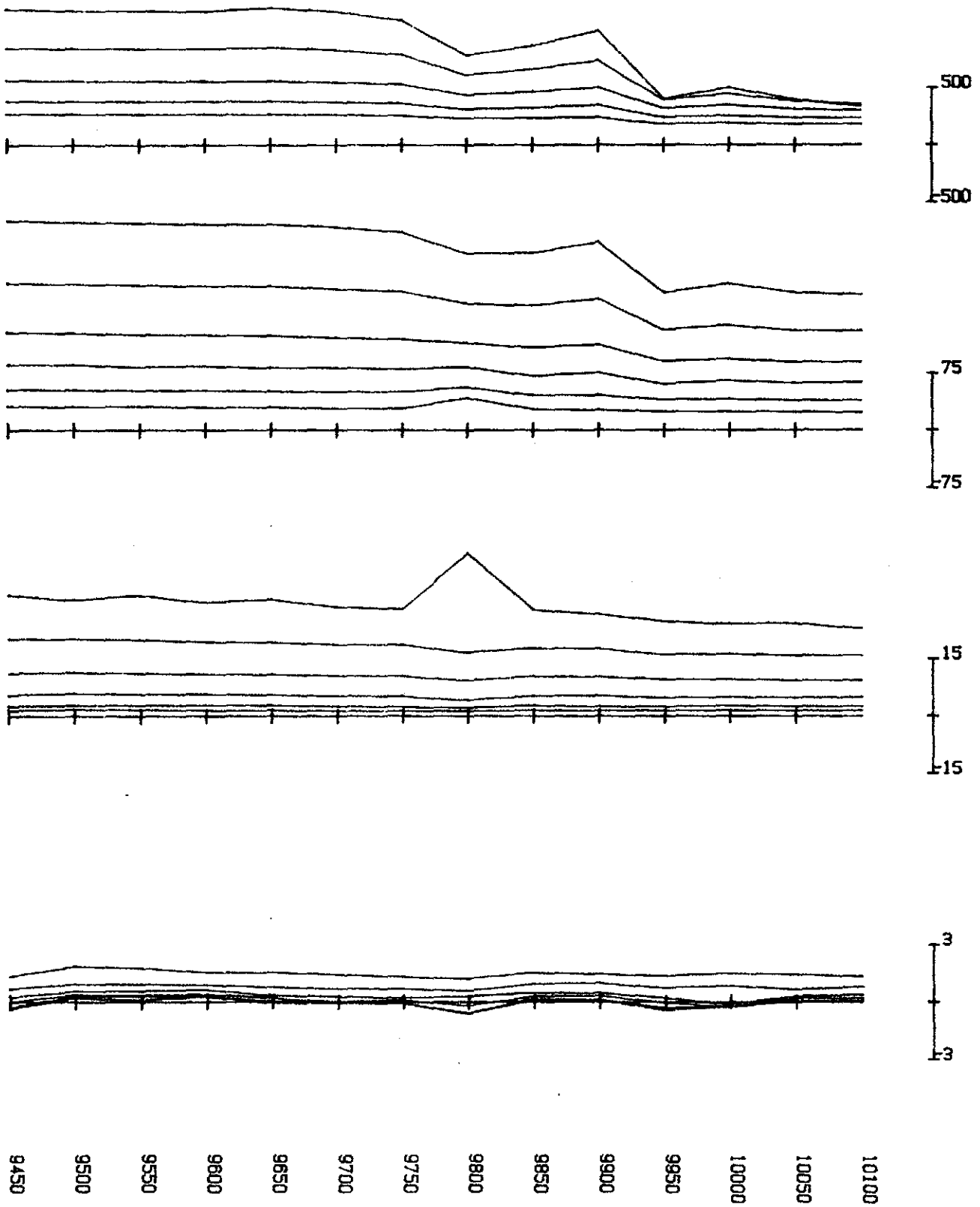
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

123

063124



EM37 PLOT Client AMOCO Area SPEELER

Loop ~~SPC2~~ Tx1 Line 10800 Component D

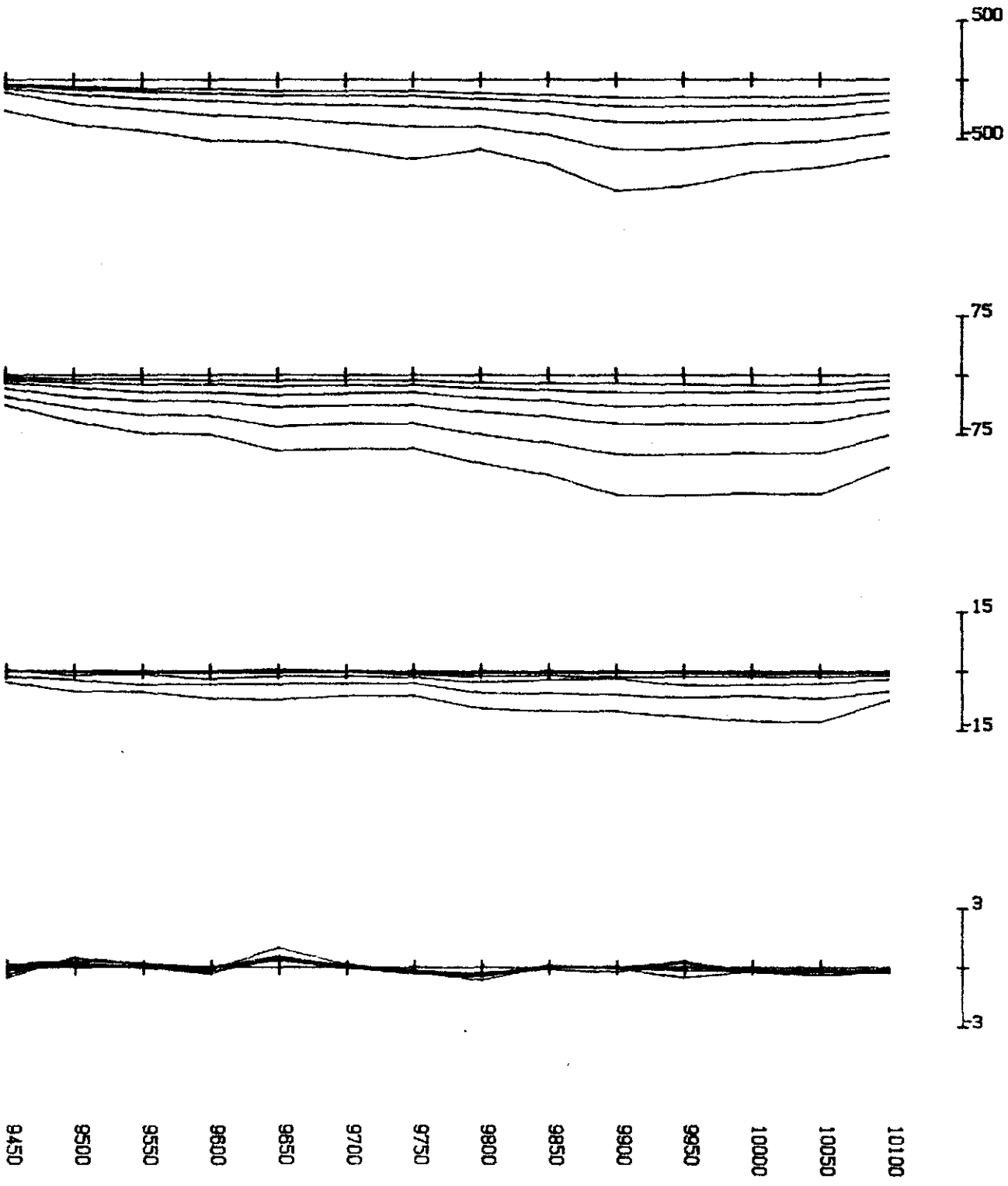
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

124

063125



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10800 Component N

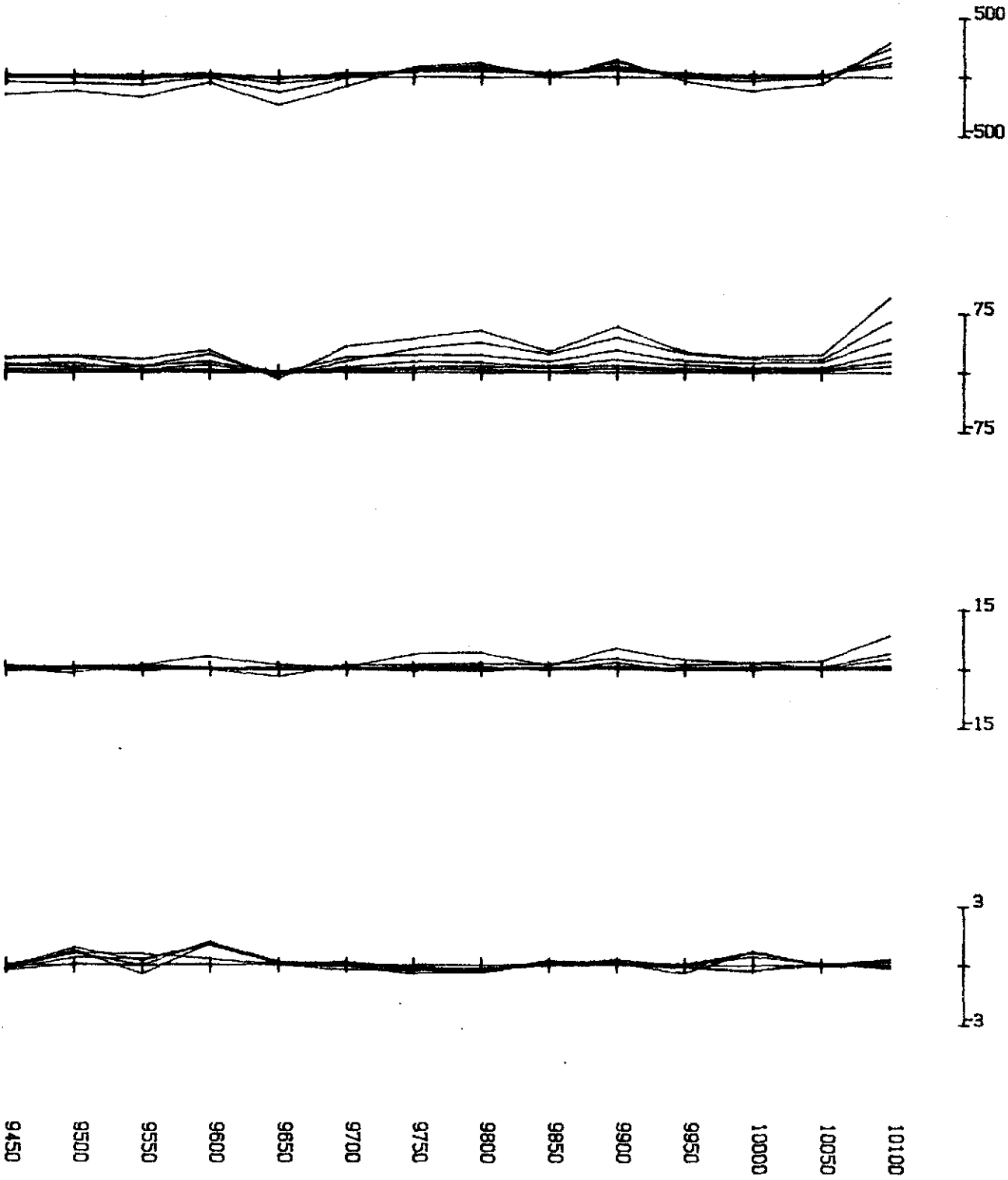
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

125

063126



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10800 Component E

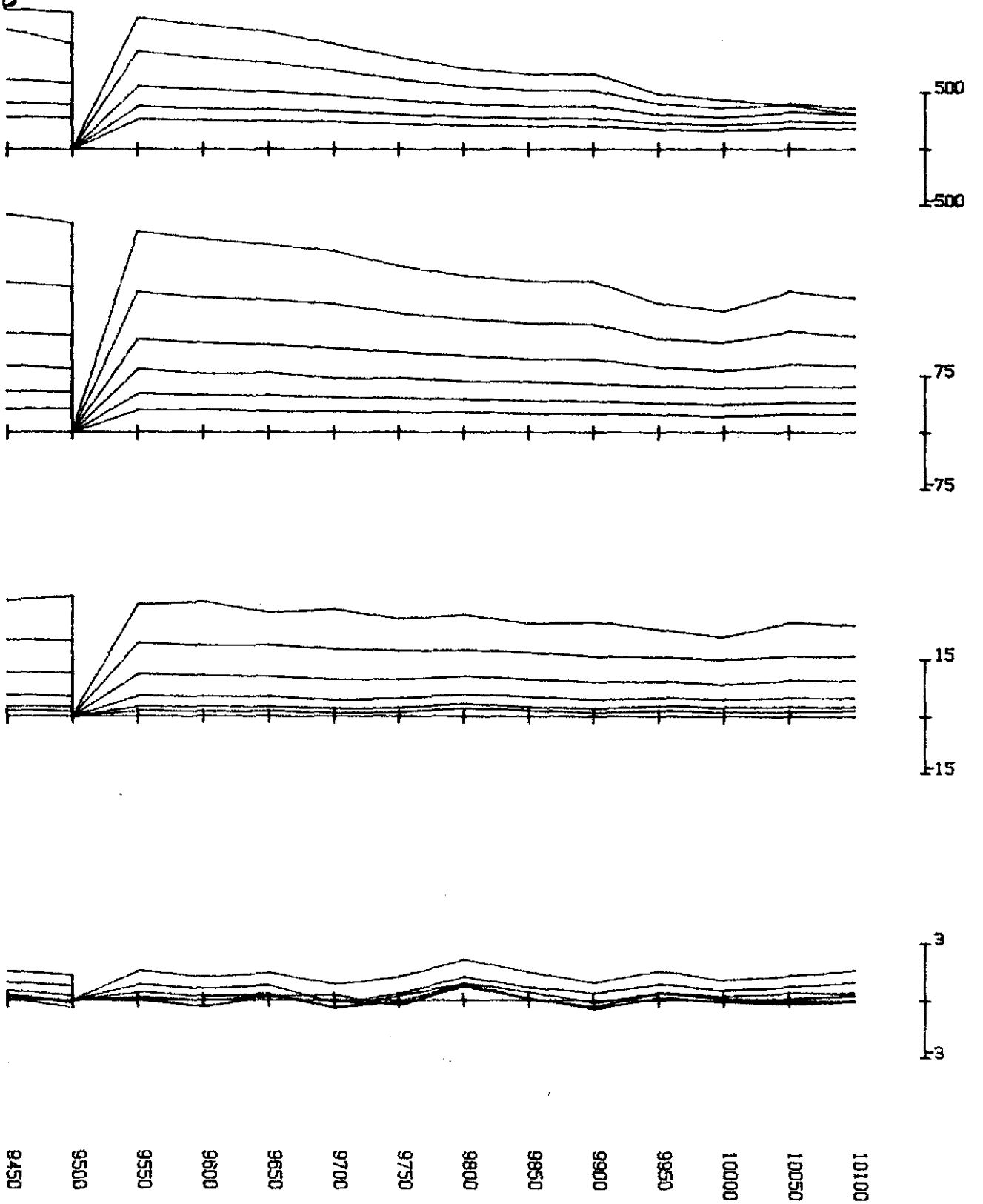
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063127

126



EM37 PLOT Client AMOCO Area SPEELER

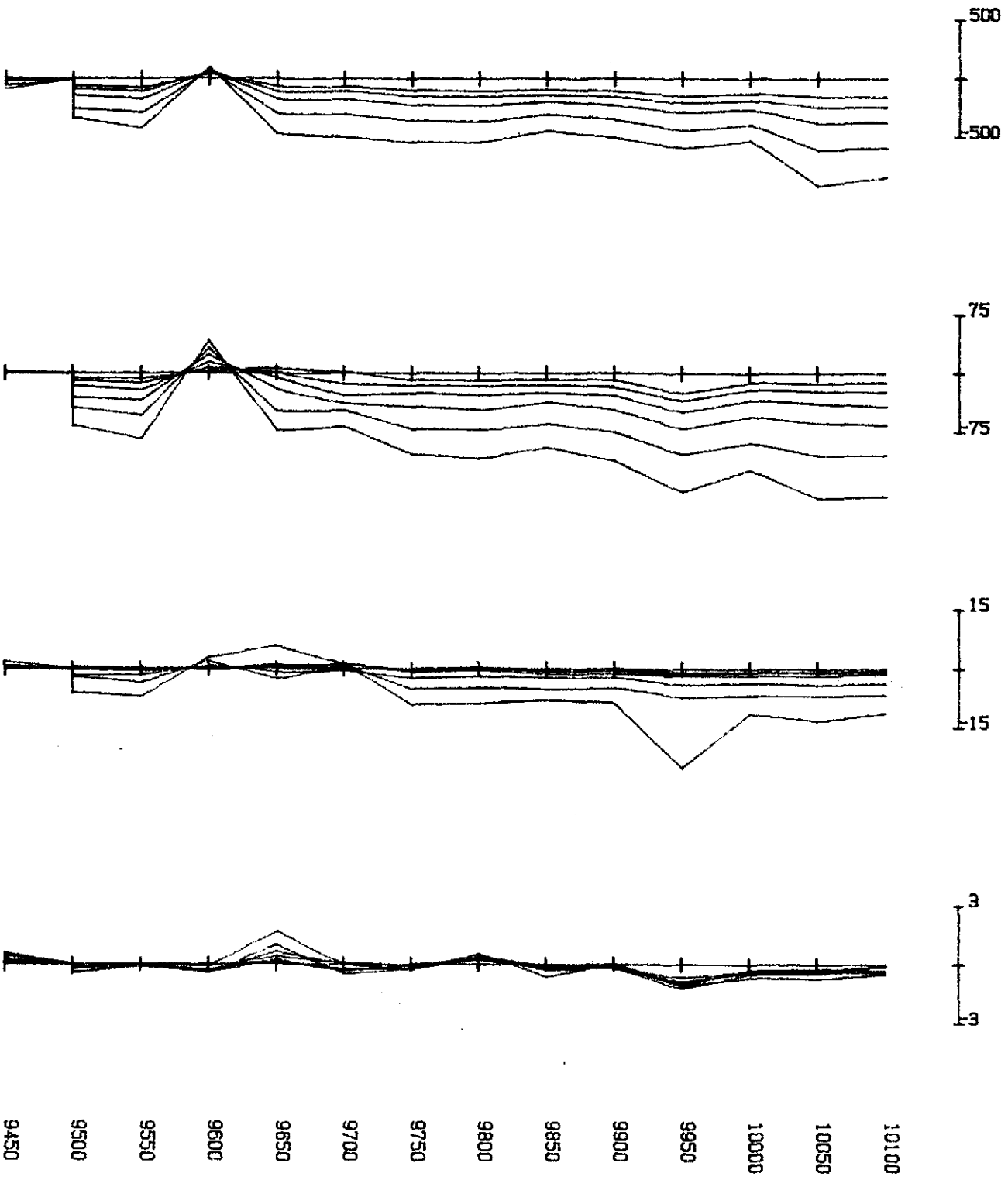
Loop ~~SP62~~ Tx 1 Line 10700 Component D

Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063128



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10700 Component N

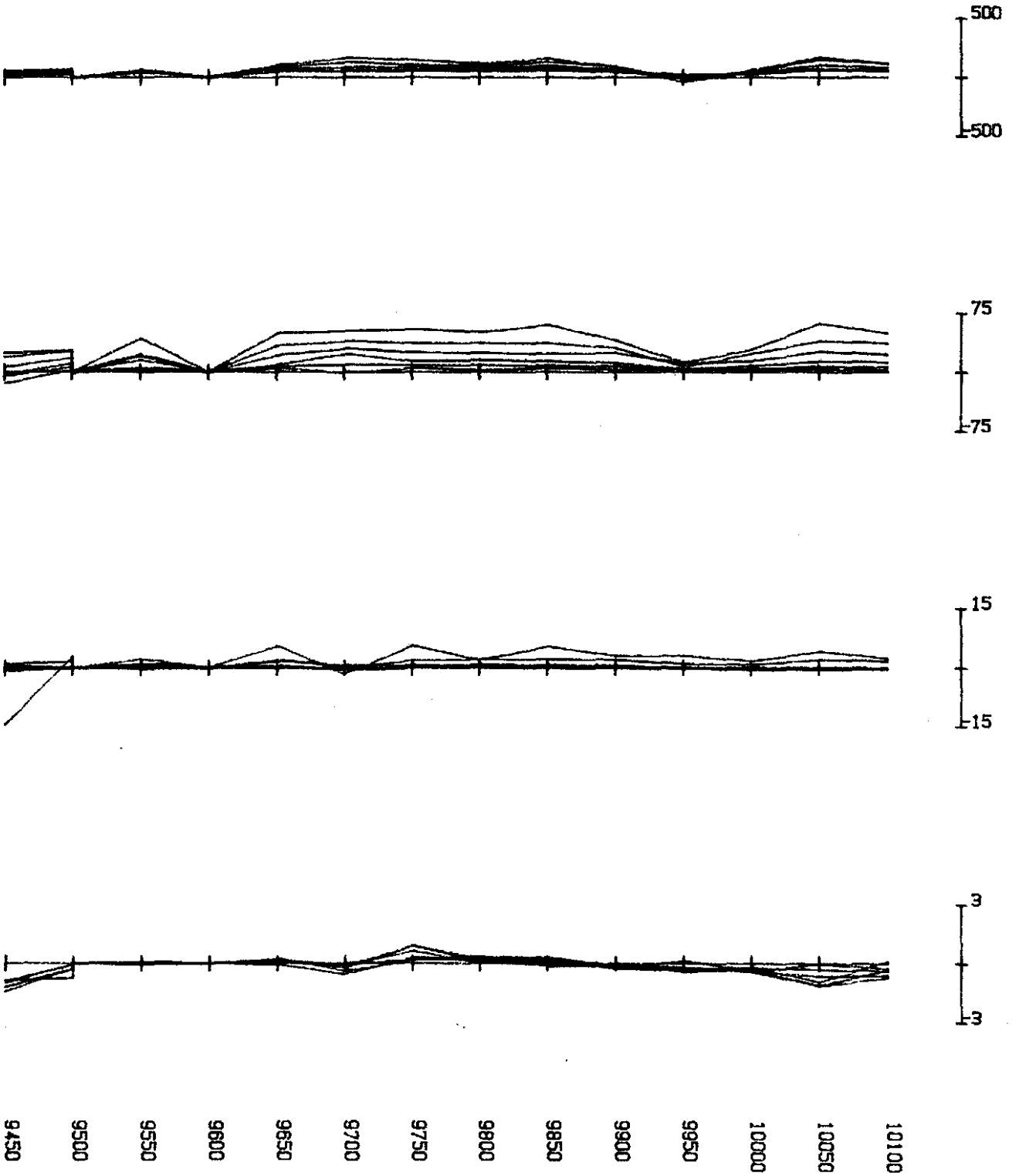
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

128

063129



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10700 Component E

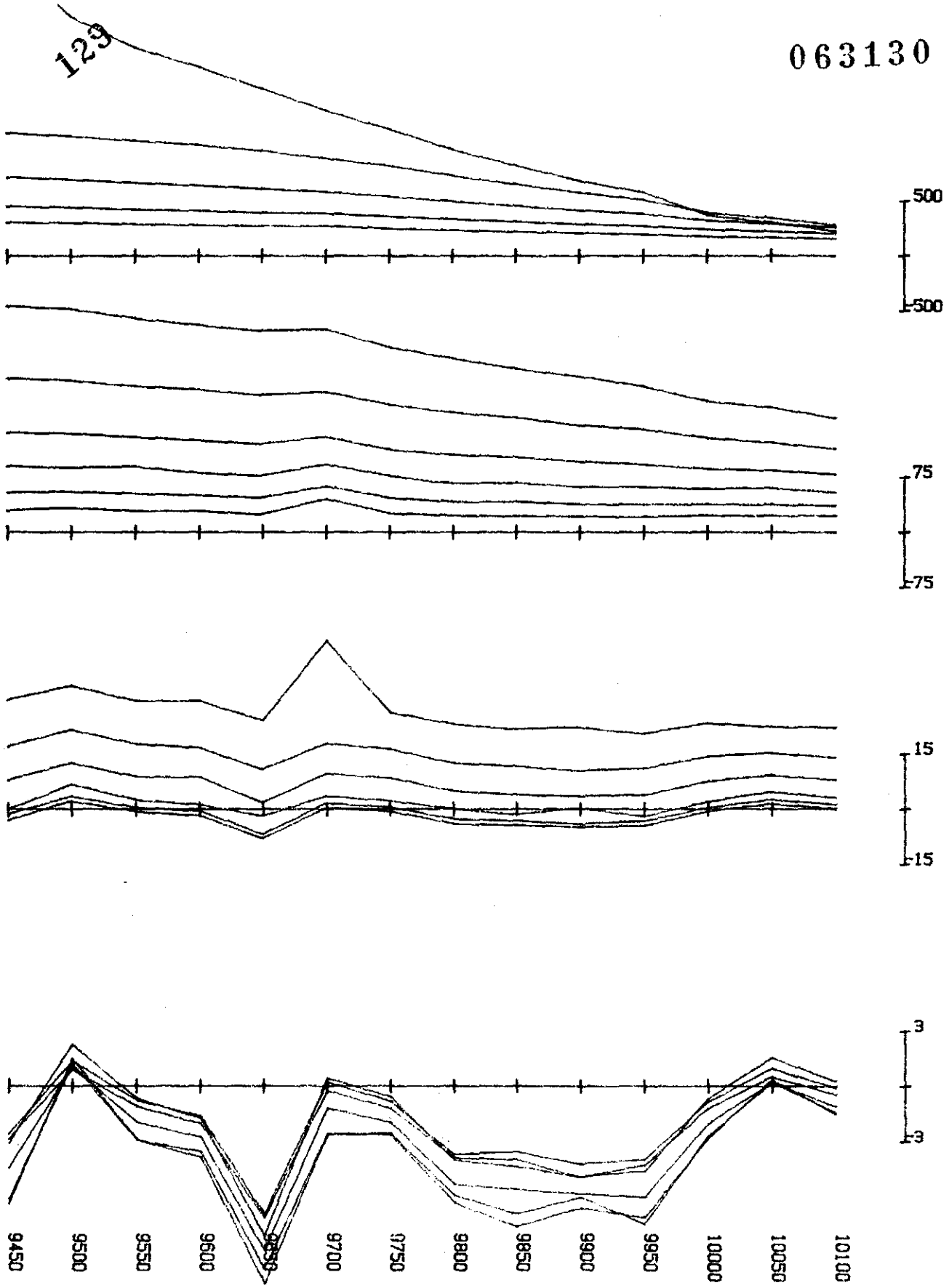
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

129

063130



EM37 PLOT | Client AMOCO | Area SPEELER

Loop SP62 | Line 10600 | Component D

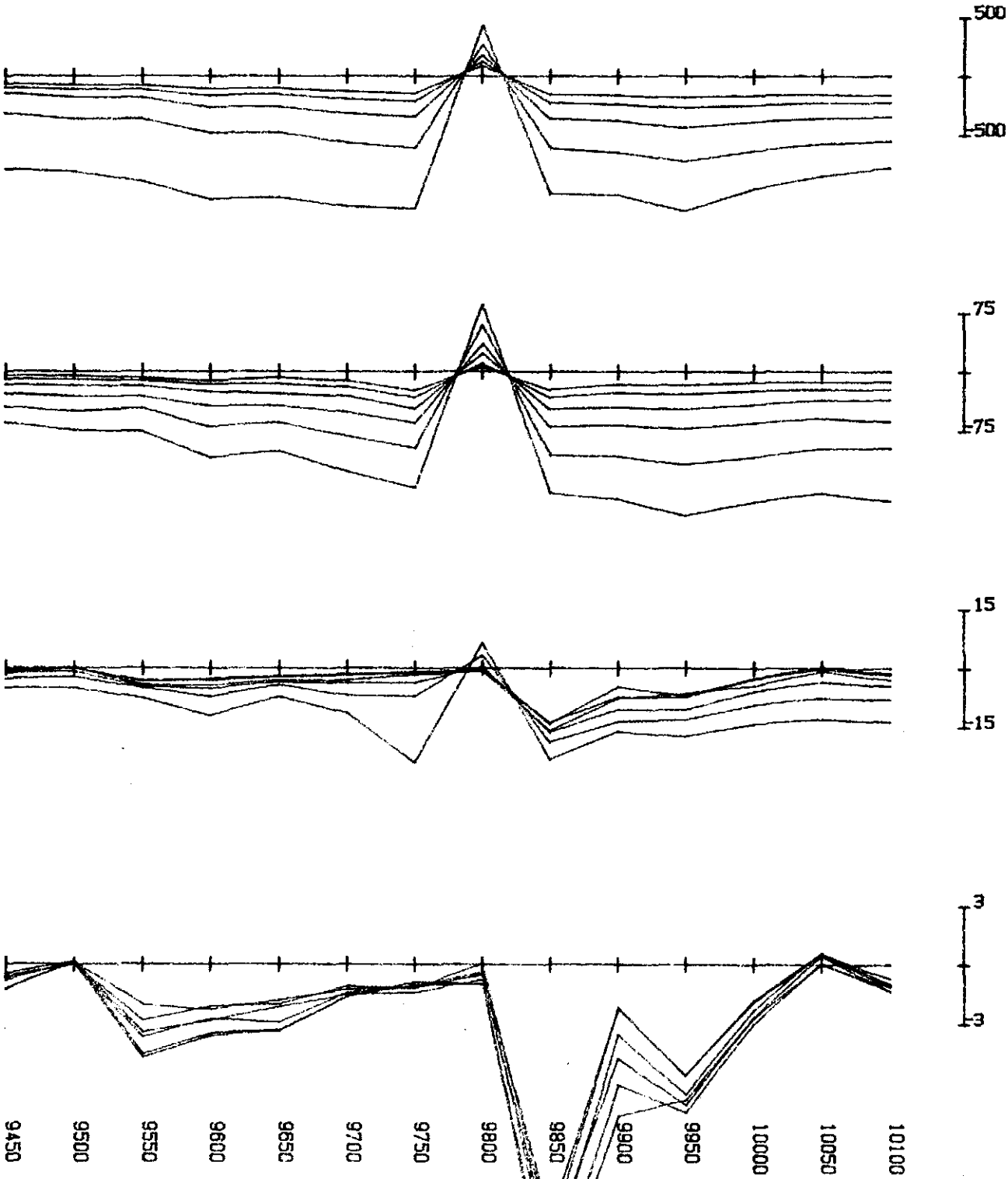
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

130

063131



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10600 Component N

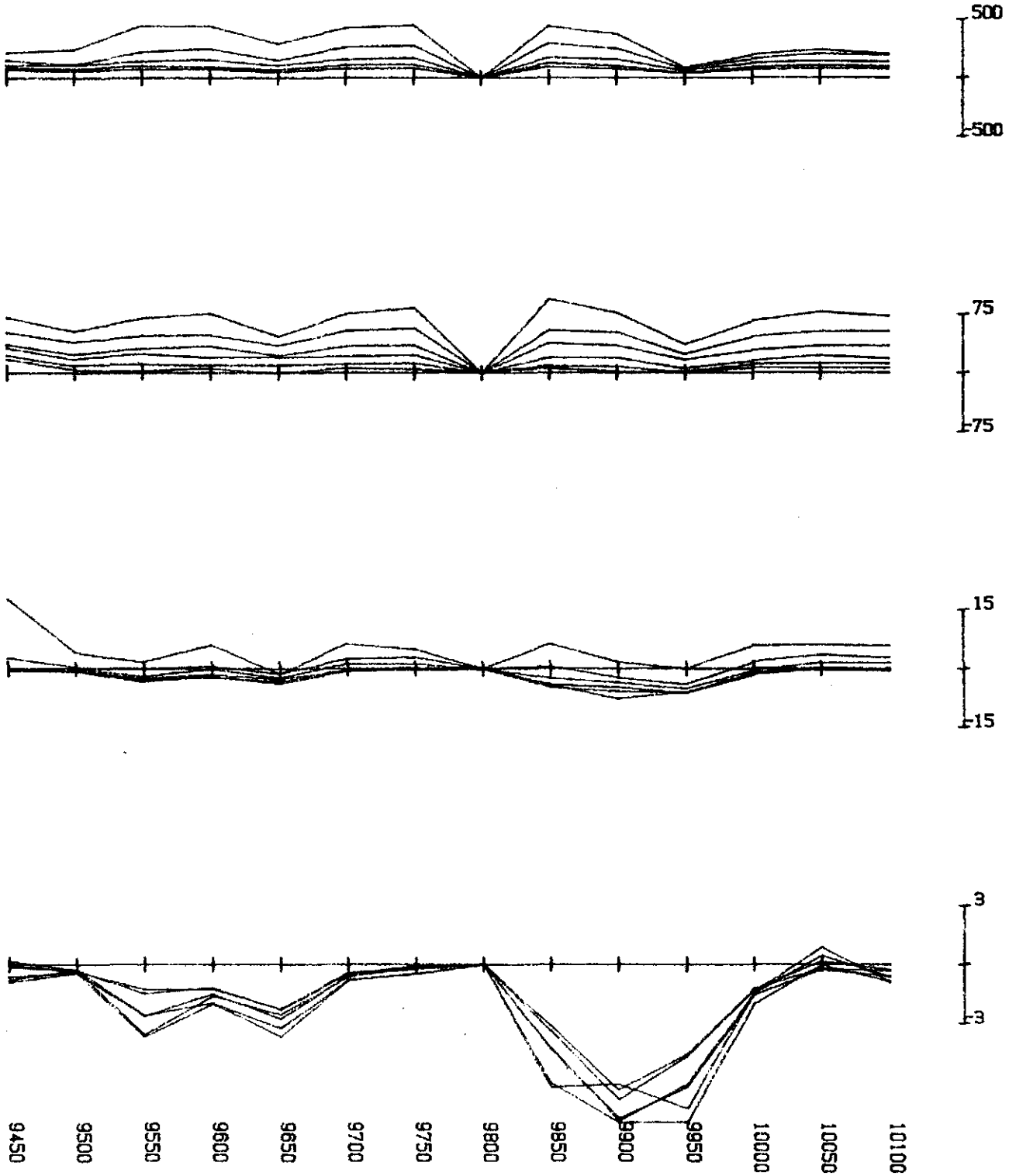
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

131

063132



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10600 Component E

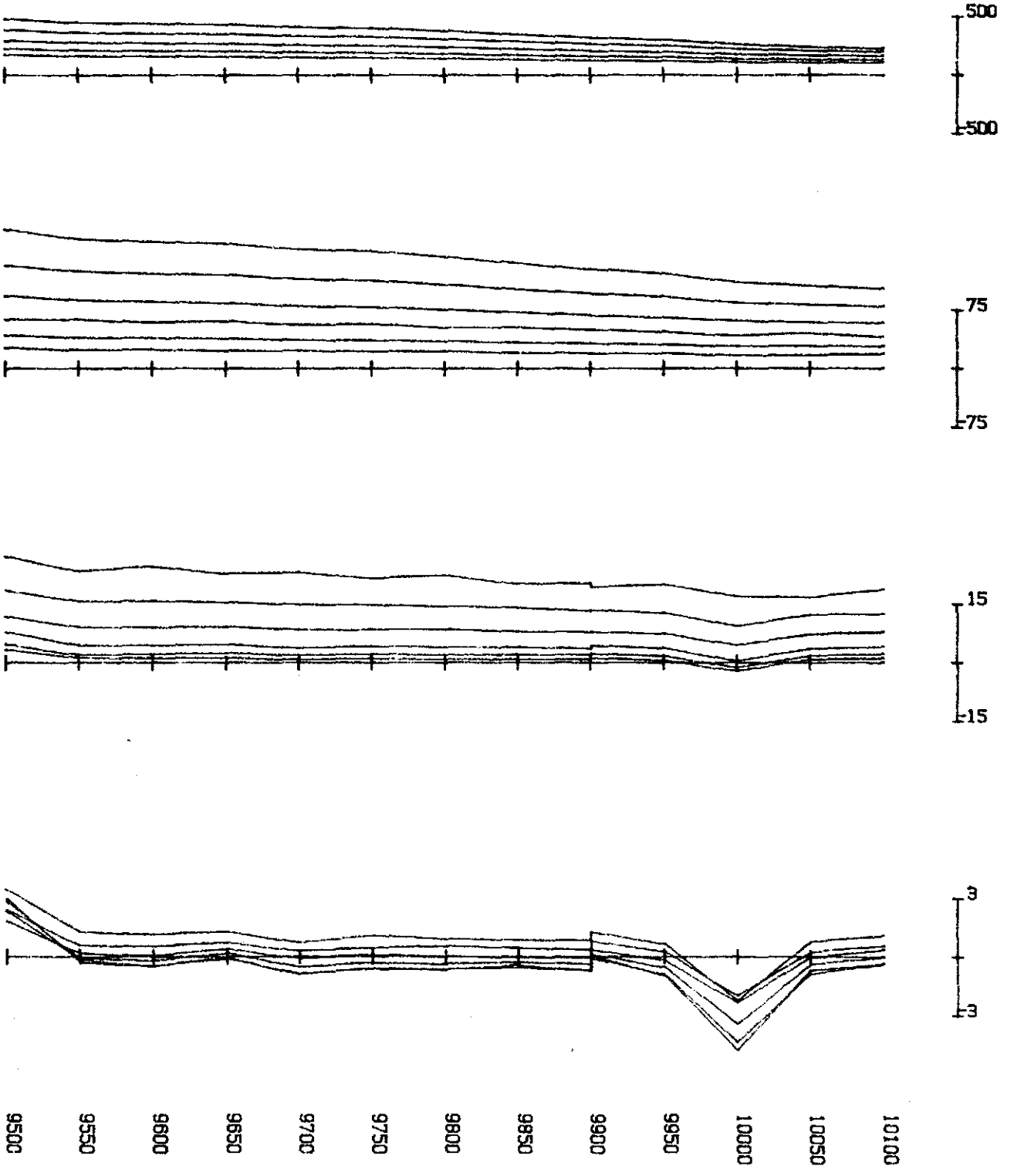
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

132

063133



EM37 PLOT Client AMOCO Area SPEELER

Tx 1

Loop SPC2 Line 10400 Component D

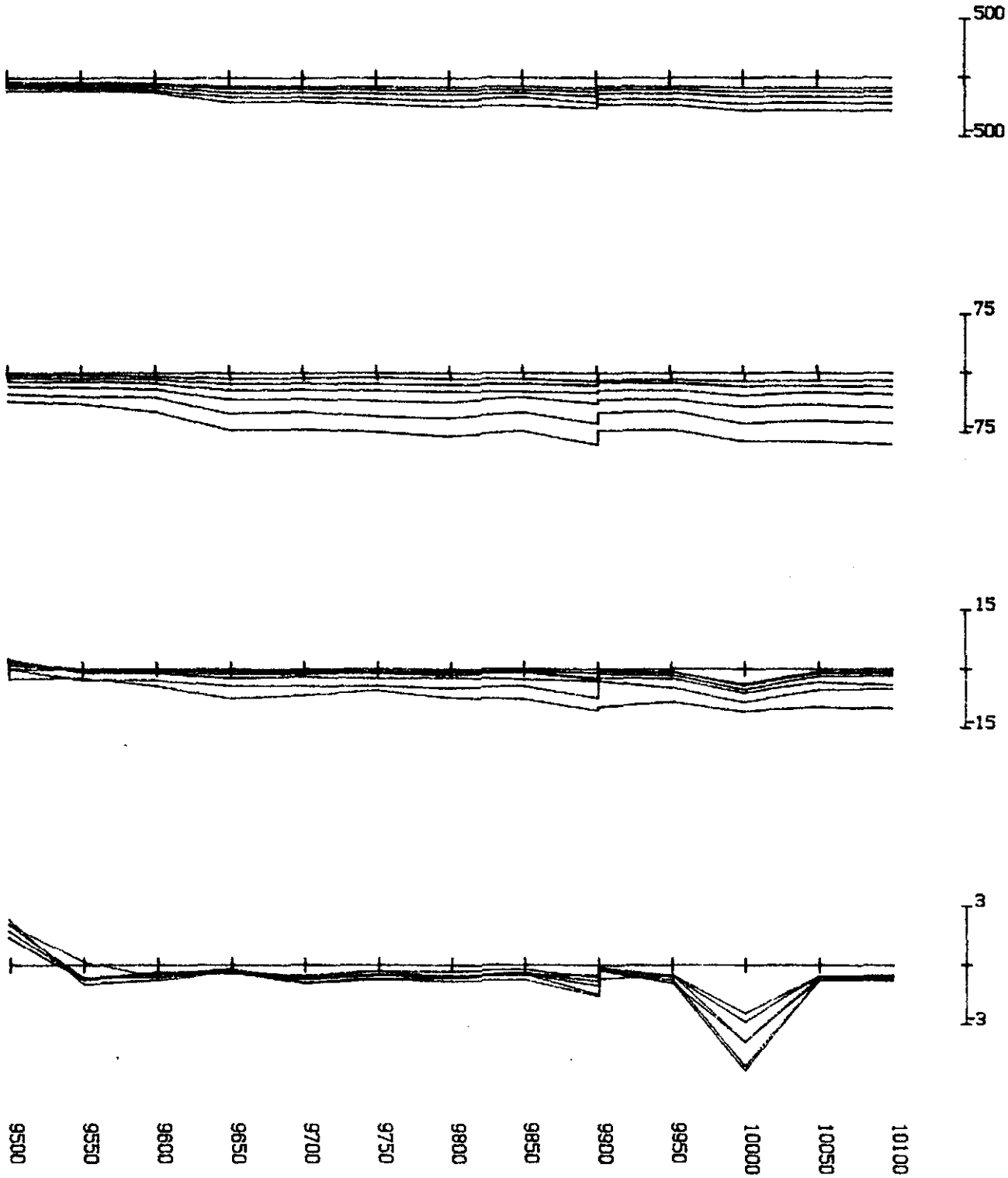
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

133

063134



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10600 Component N

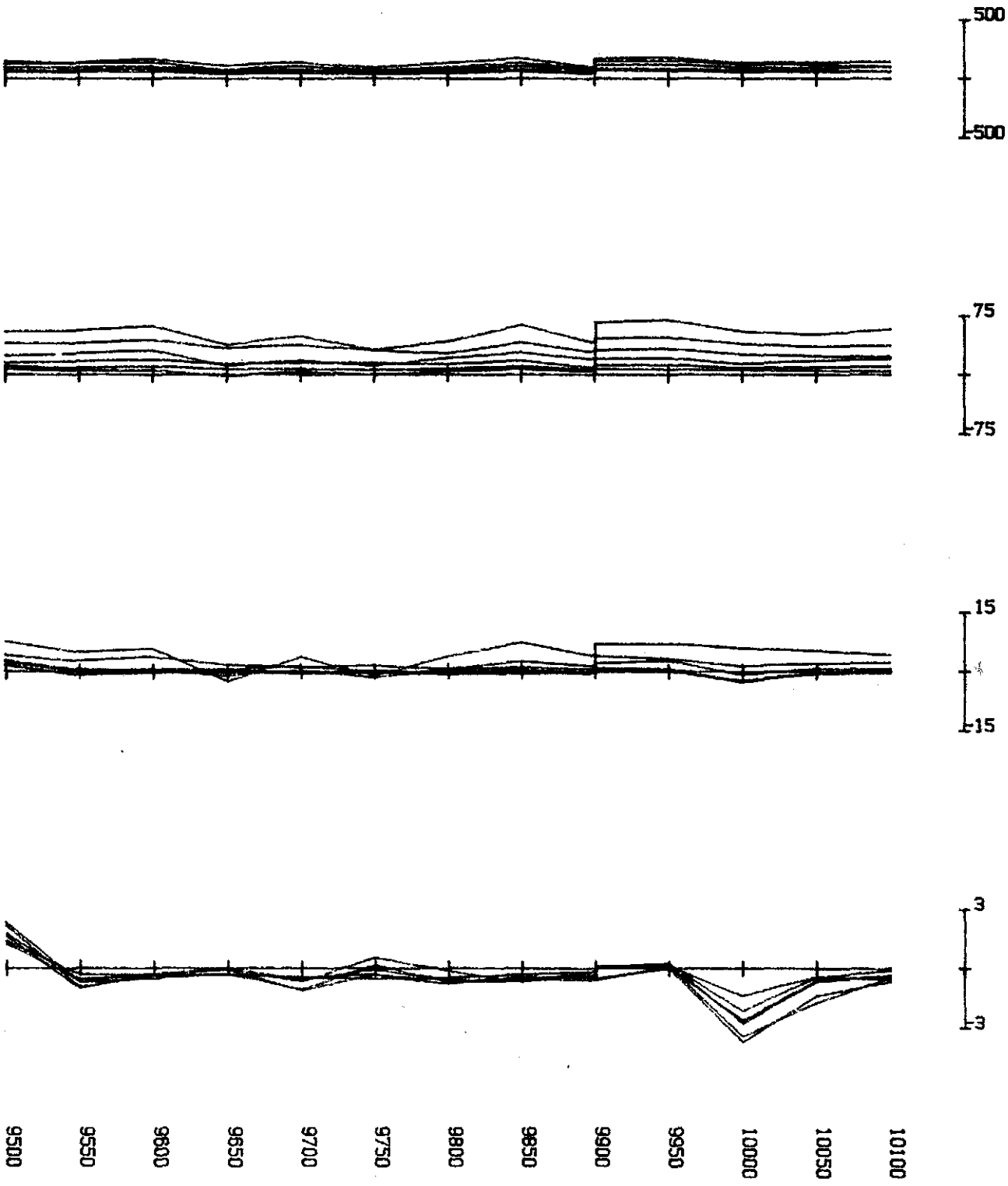
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

134

063135



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10400 Component E

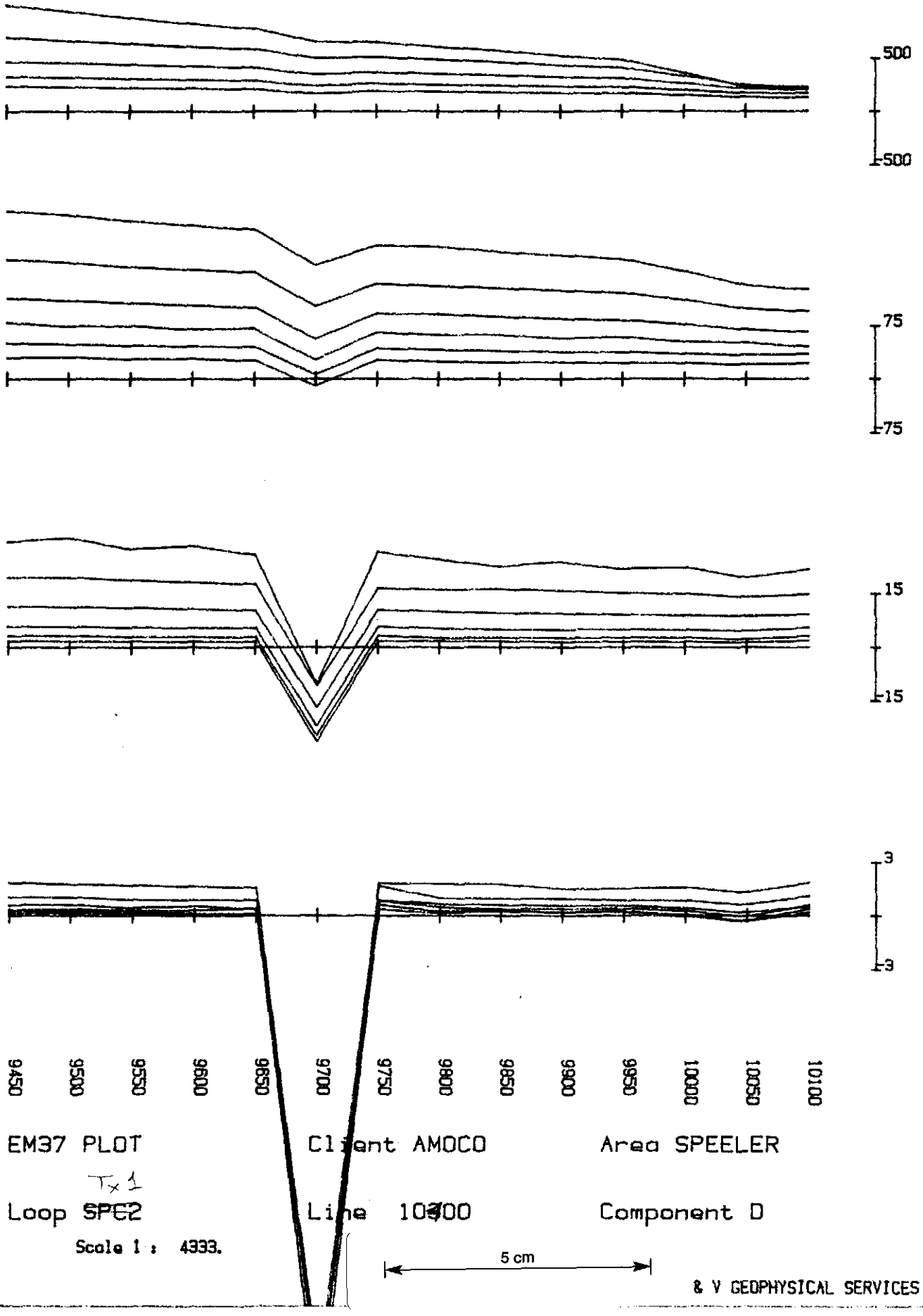
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

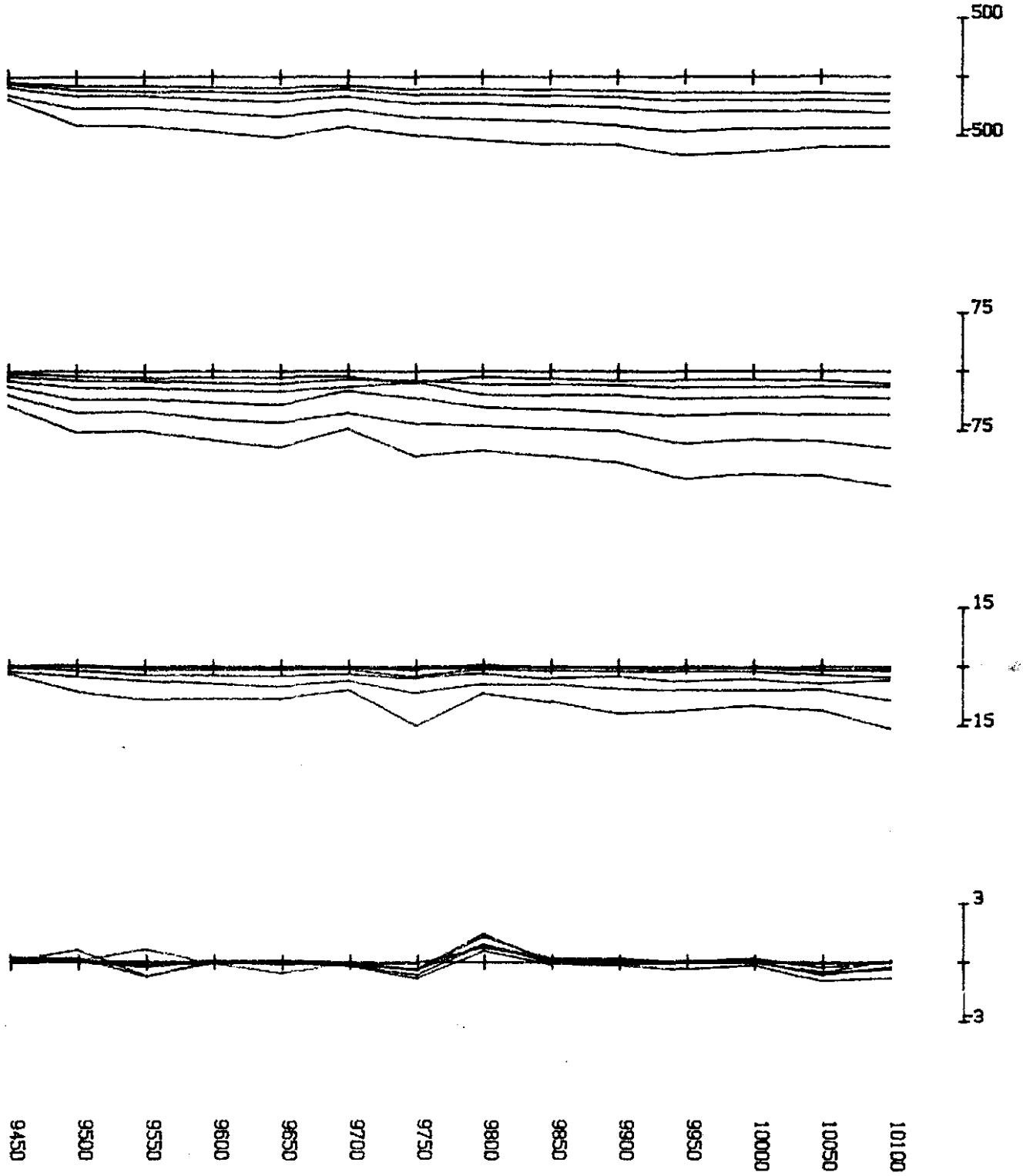
135

063136


500
-500
75
-75
15
-15
3
-3
9450
9500
9550
9600
9650
9700
9750
9800
9850
9900
9950
10000
10050
10100
EM37 PLOT
Client AMOCO
Area SPEELER
Tx 1
Loop SPE2
Line 10400
Component D
Scale 1 : 4333.
5 cm
& V GEOPHYSICAL SERVICES

136

063137



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10400 Component N

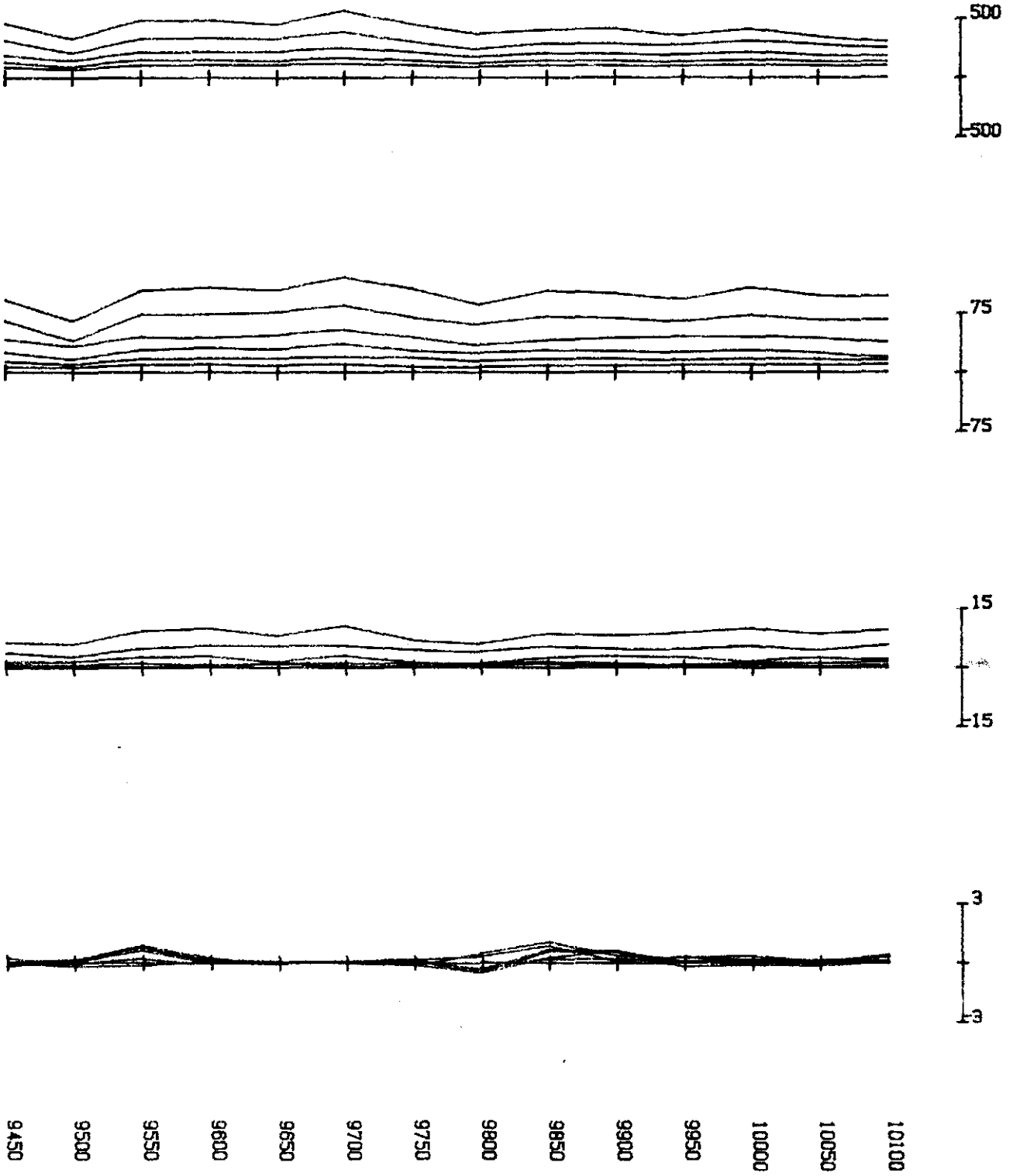
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

137

063138



EM37 PLOT Client AMOCO Area SPEELER

Loop SPC2 Line 10400 Component E

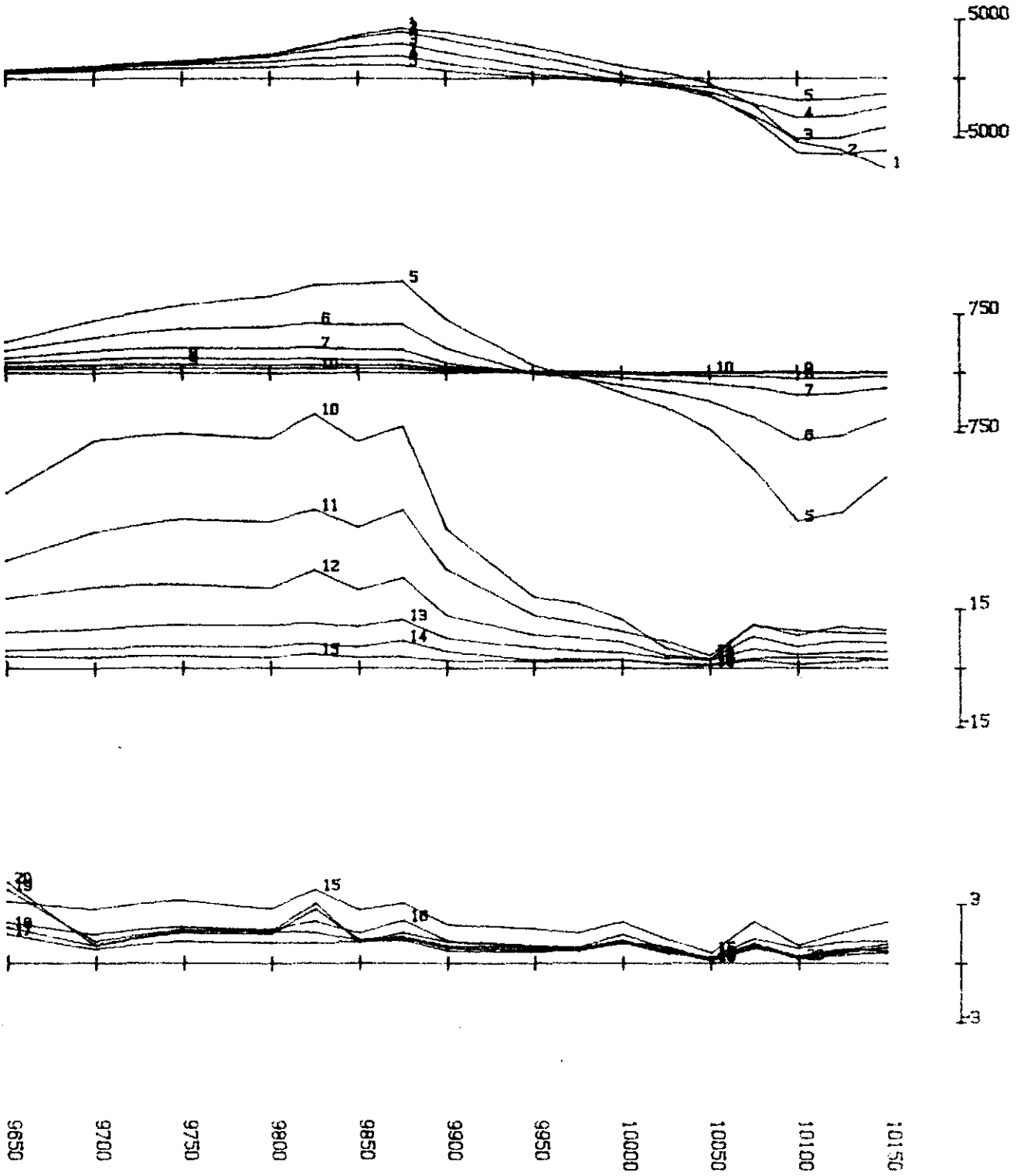
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

138

063139



EM37 PLOT
Loop SPC3
Freq 25 Hz

Client AMOCO
Line 11900
Current 14.8 Amps

Area SPEELER CREEK
Component E
T/O Time 240 microsecs

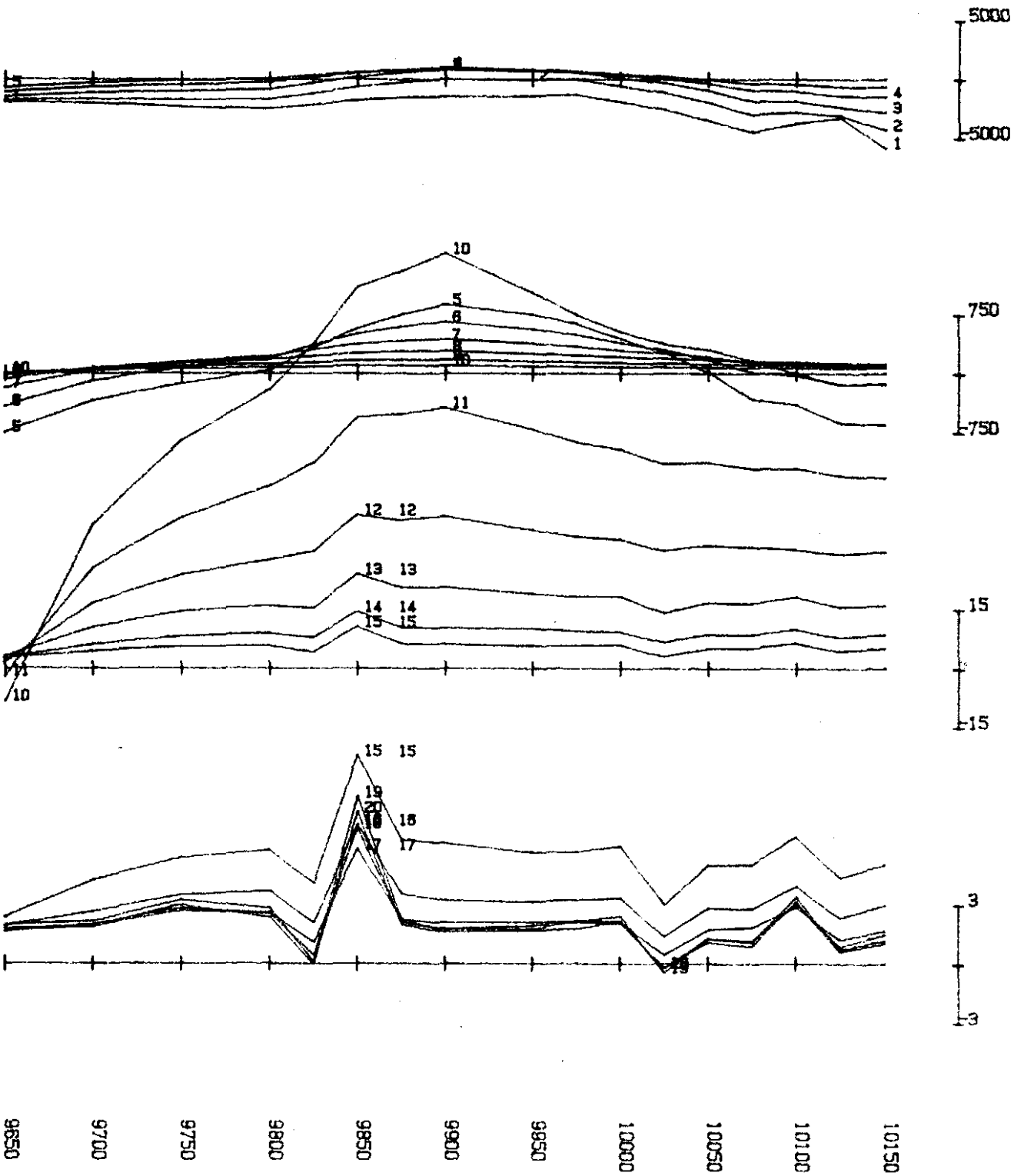
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

139

063140



EM37 PLOT
Loop SPC3
Freq 25 Hz

Client AMOCO
Line 11900
Current 14.8 Amps

Area SPEELER CREEK
Component D
T/D Time 240 microsecs

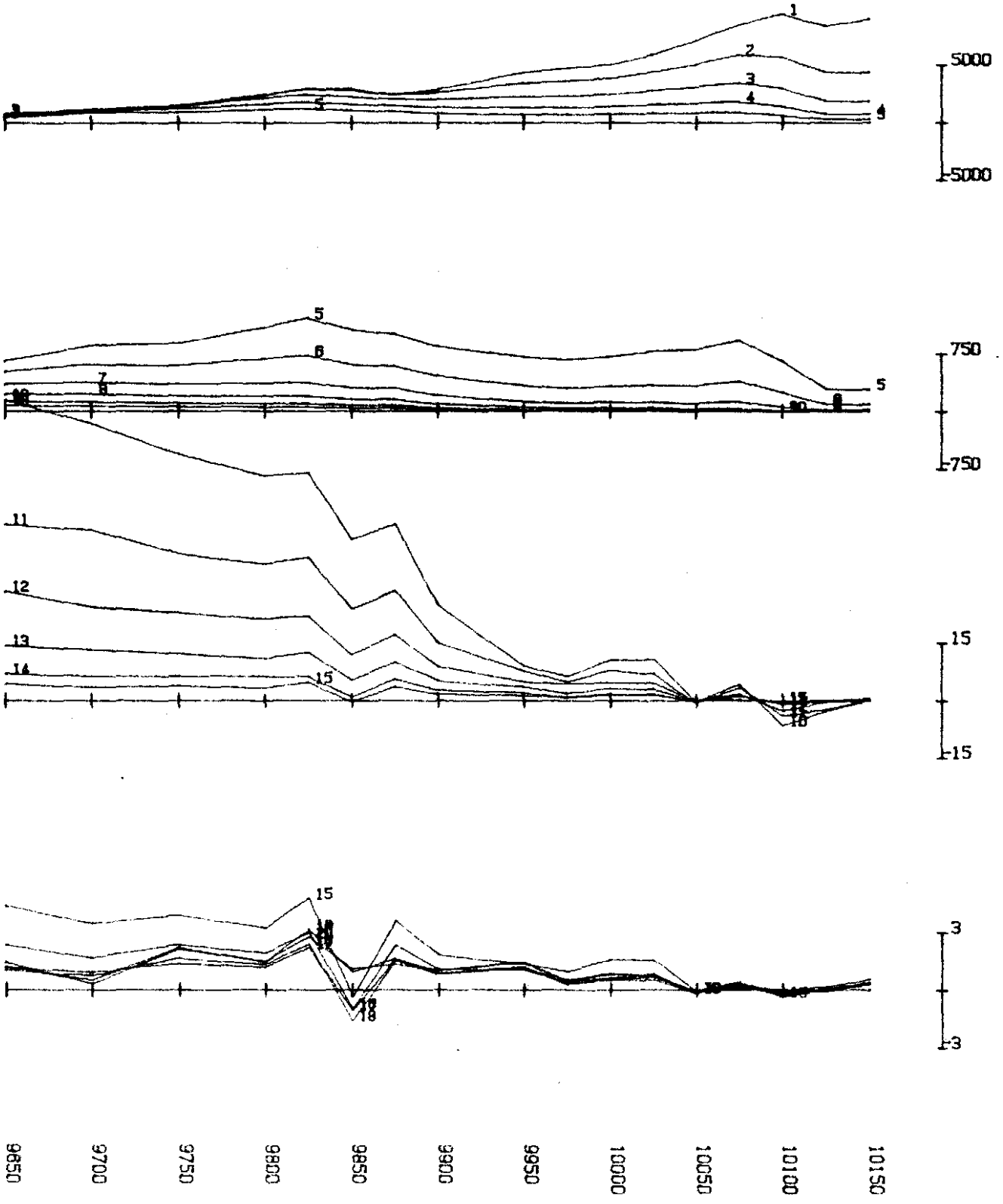
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

140

063141



EM37 PLOT
Loop SPC3
Freq 25 Hz

Client AMOCO
Line 11900
Current 14.8 Amps

Area SPEELER CREEK
Component N
T/O Time 240 microsecs

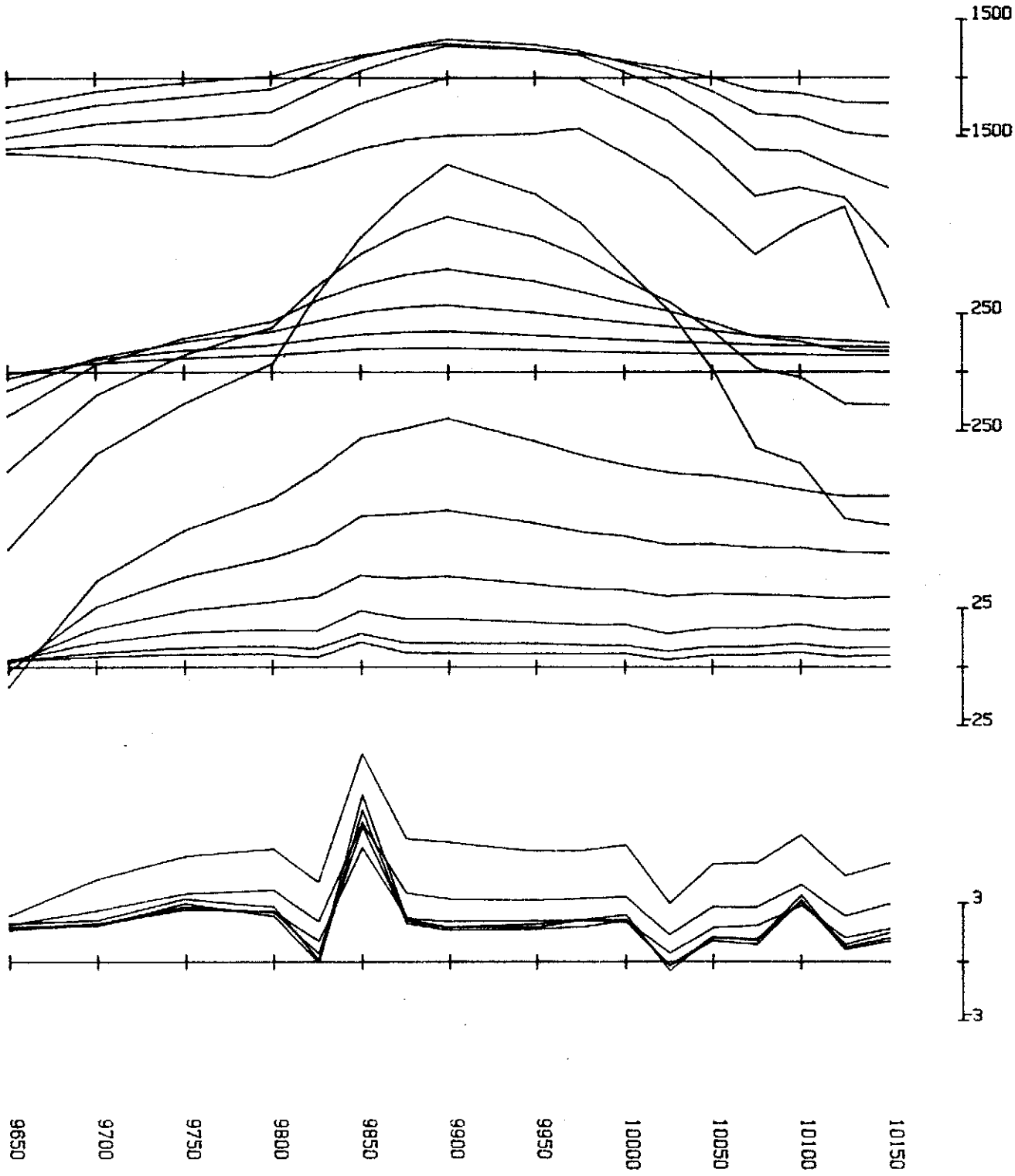
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

141

063142



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11900 Component D

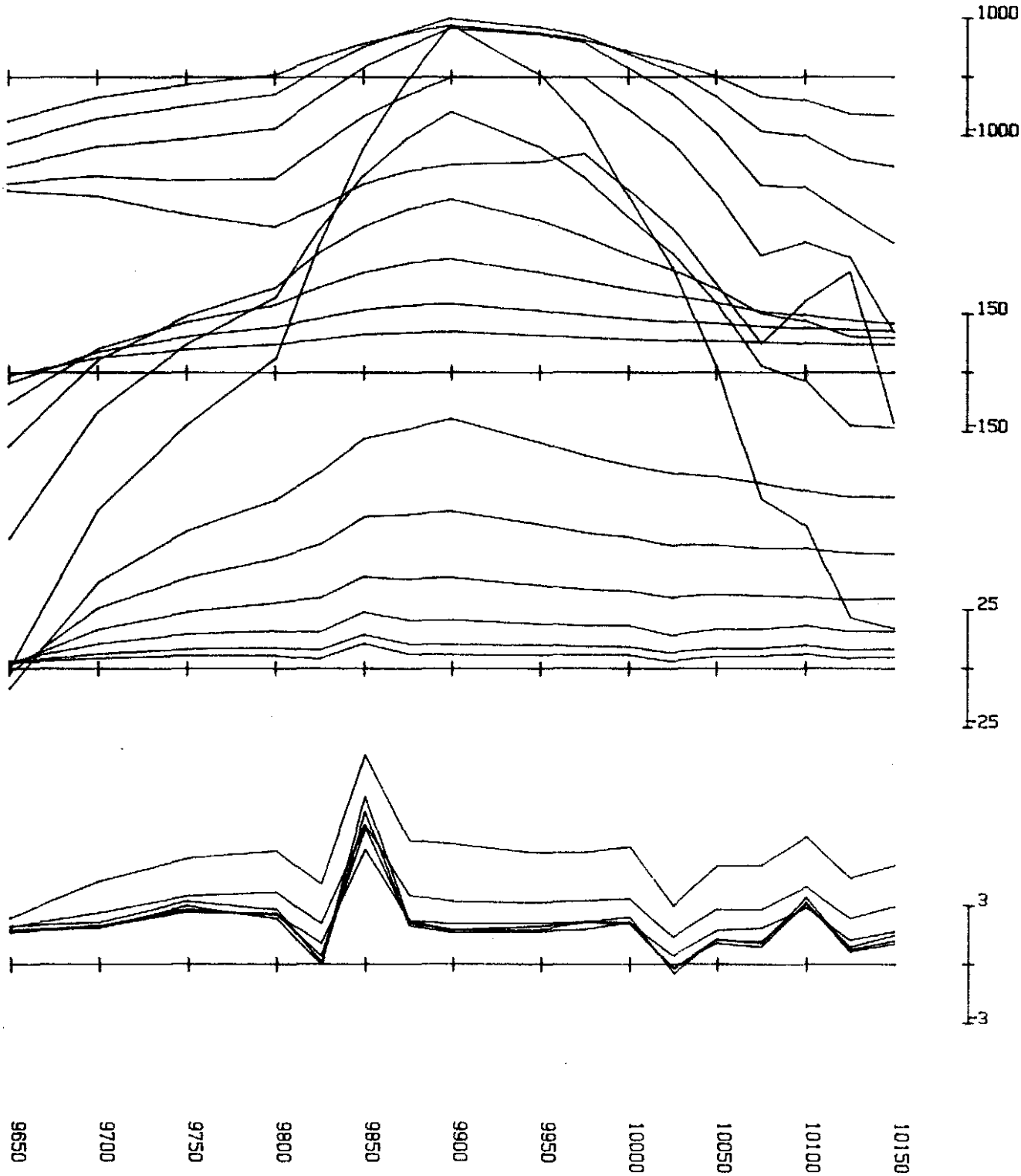
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

142

063143



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11900 Component D

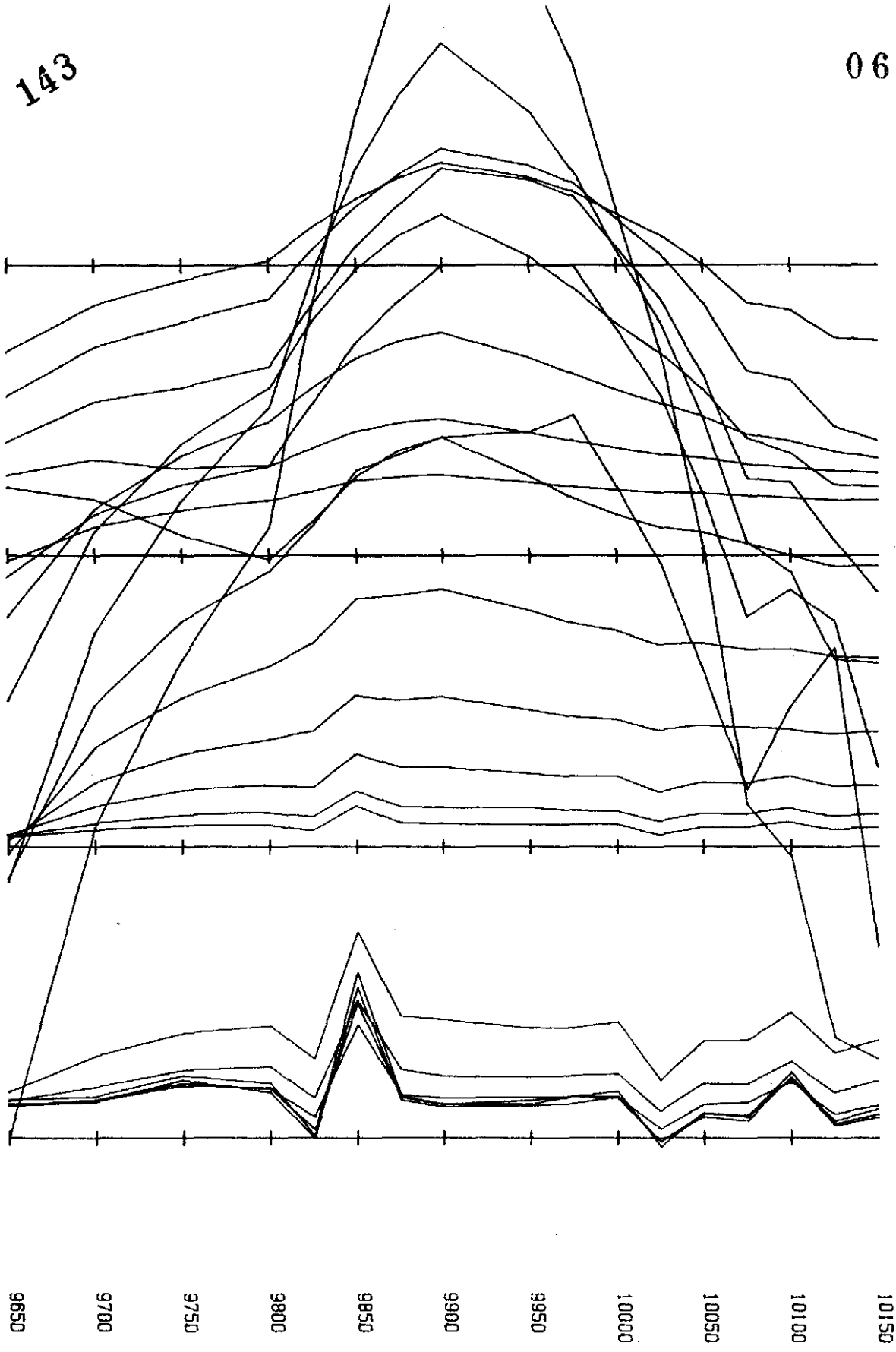
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

143

063144



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11900 Component D

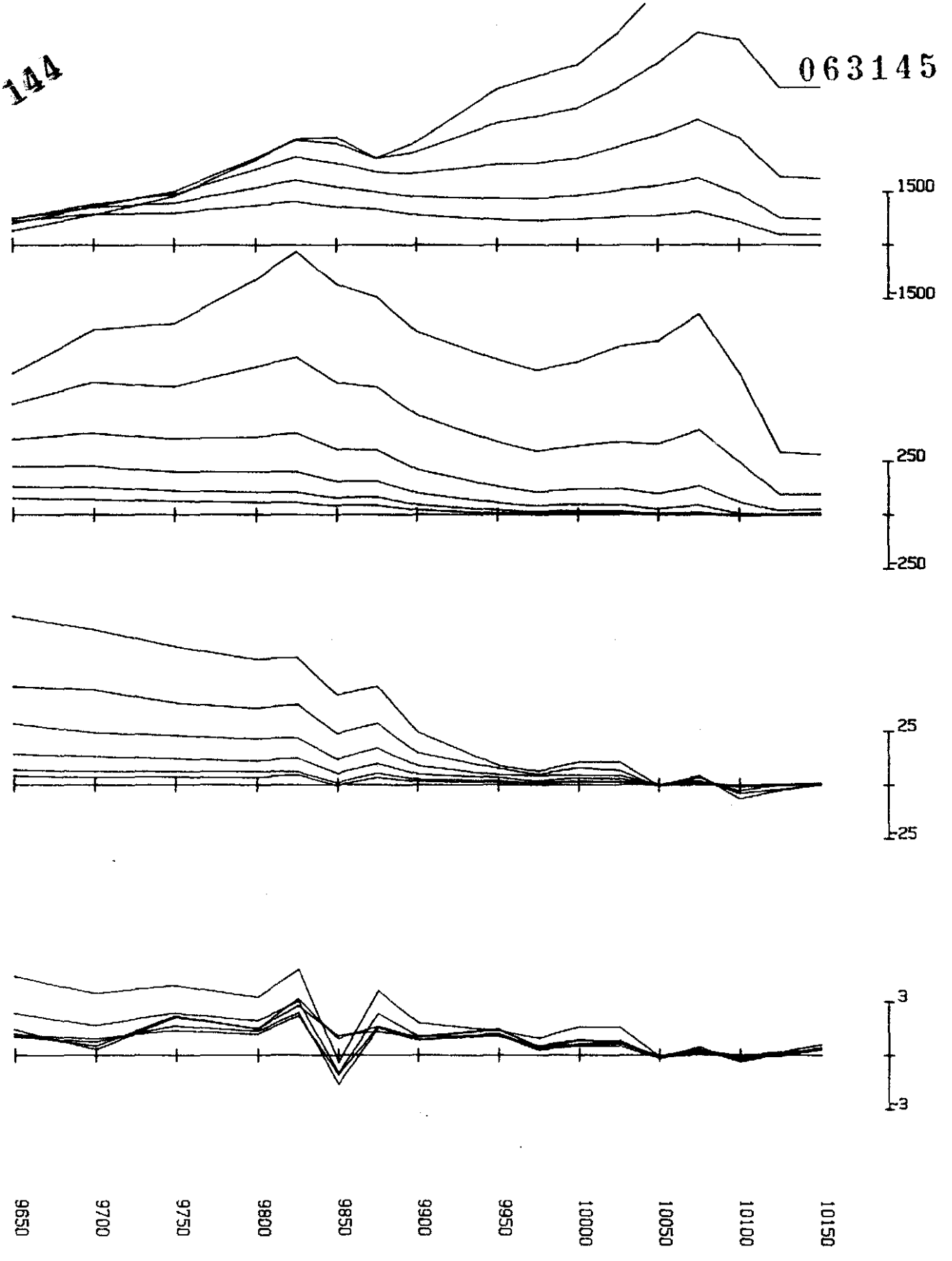
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

144

063145



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11900 Component N

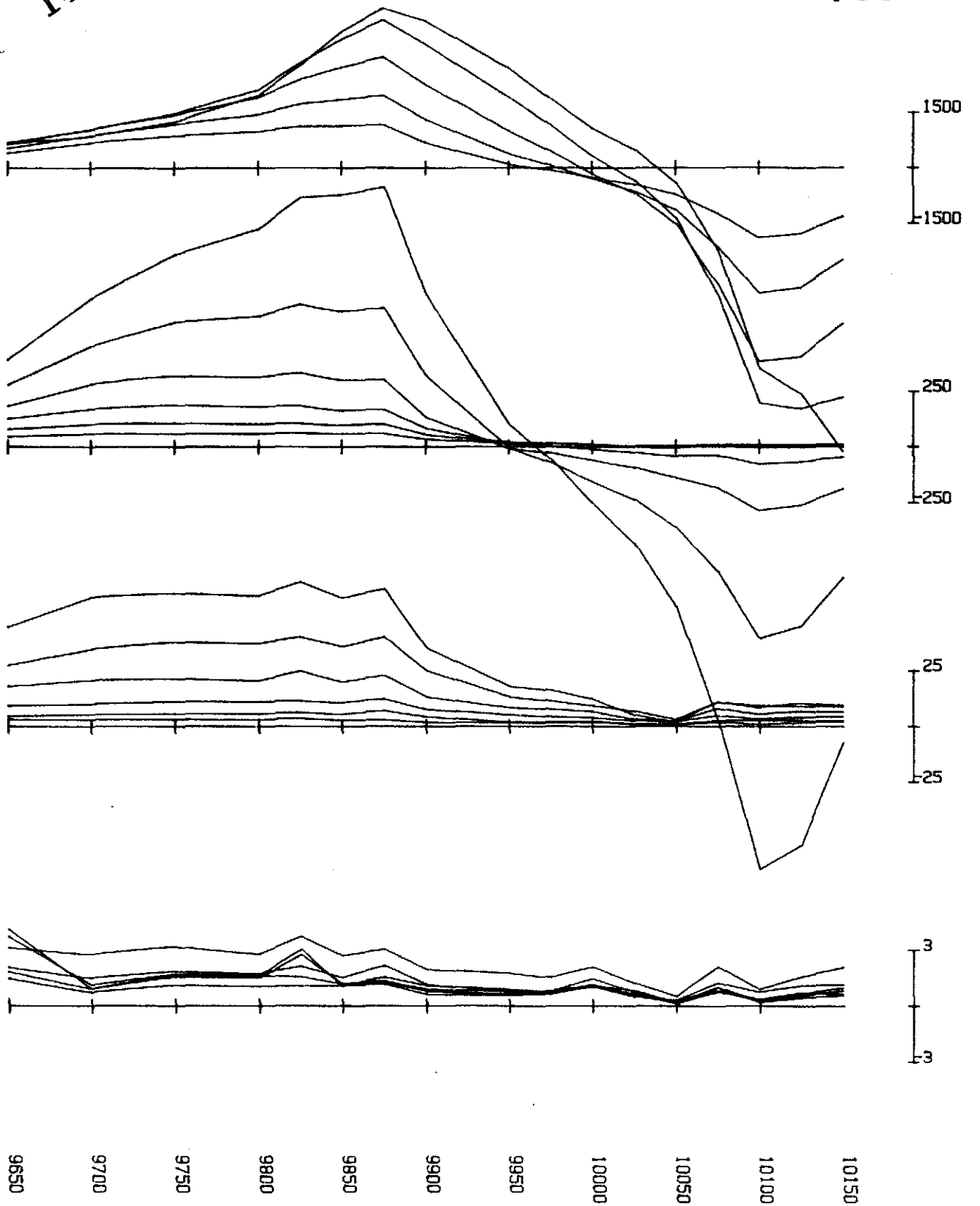
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

145

063146



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11900 Component E

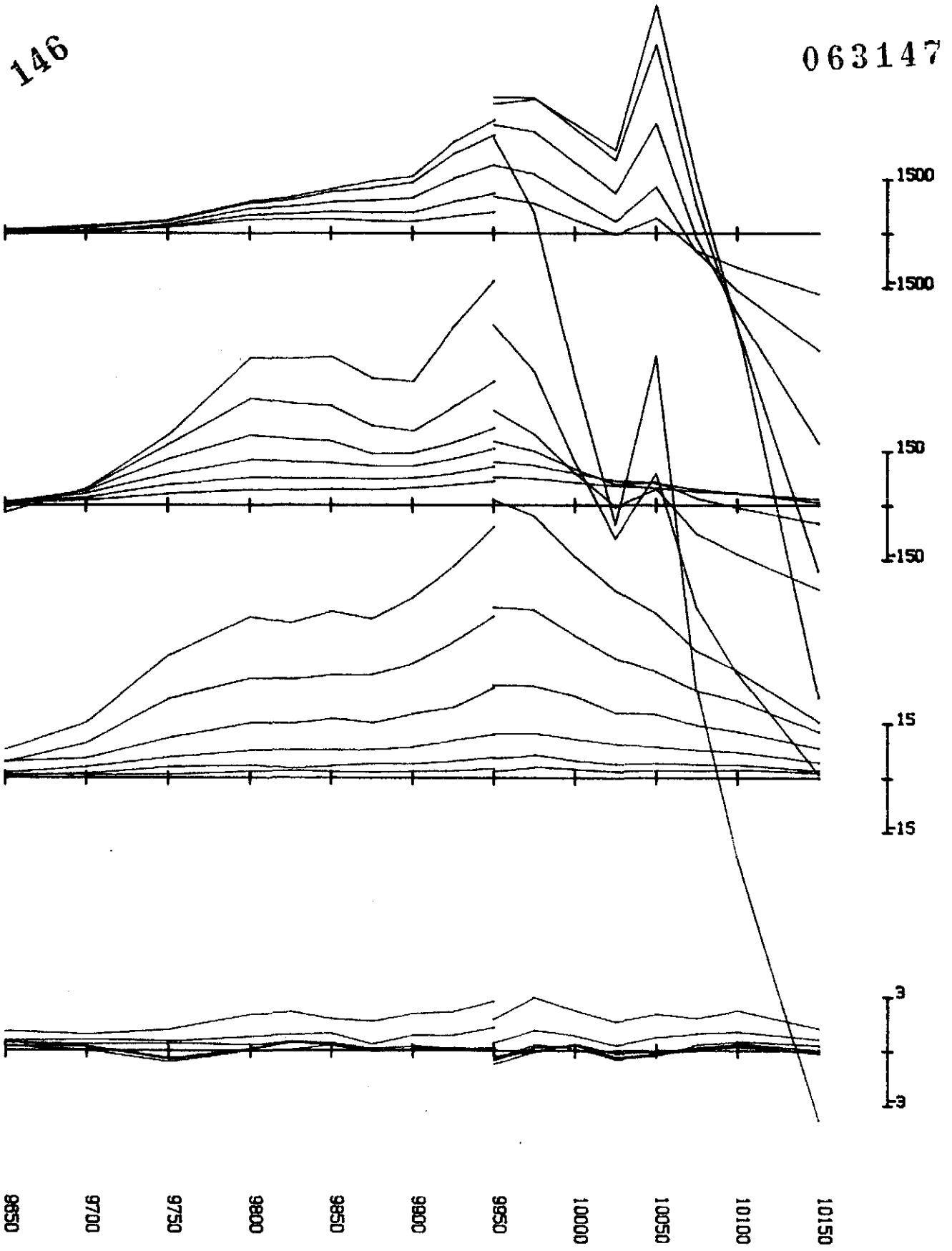
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

146

063147



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11800 Component E

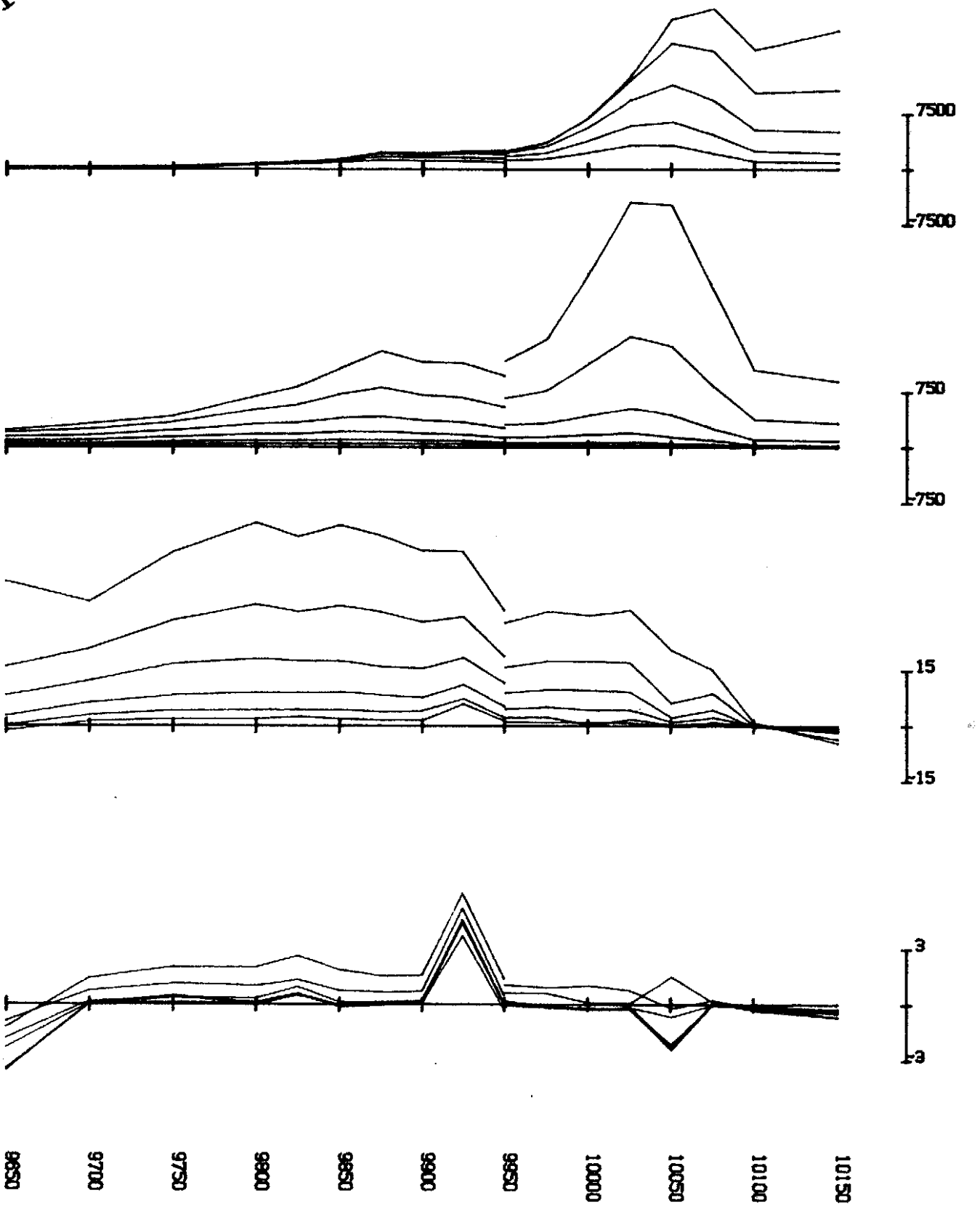
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

147

063148



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11800 Component N

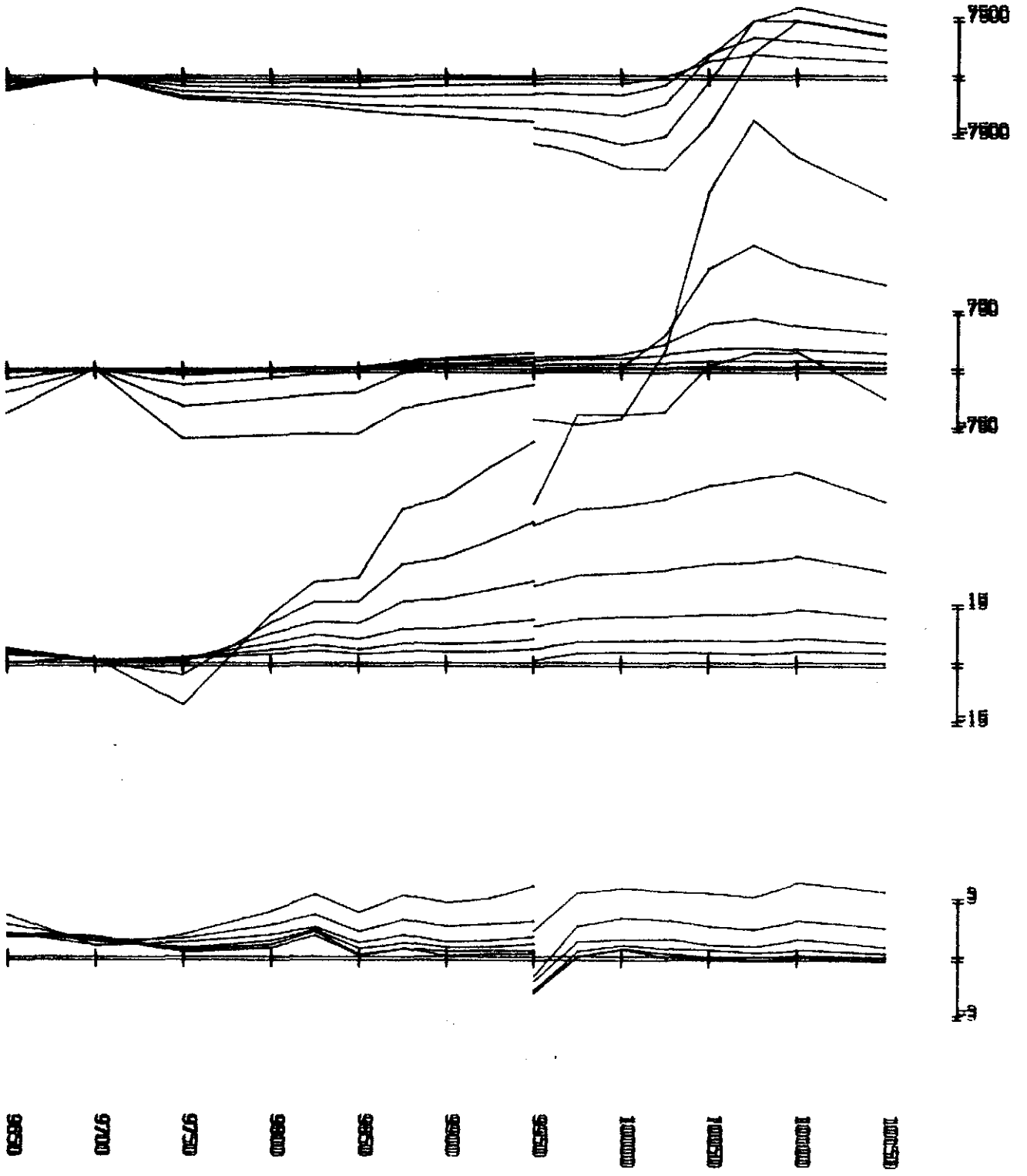
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

148

063149



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11800 Component D

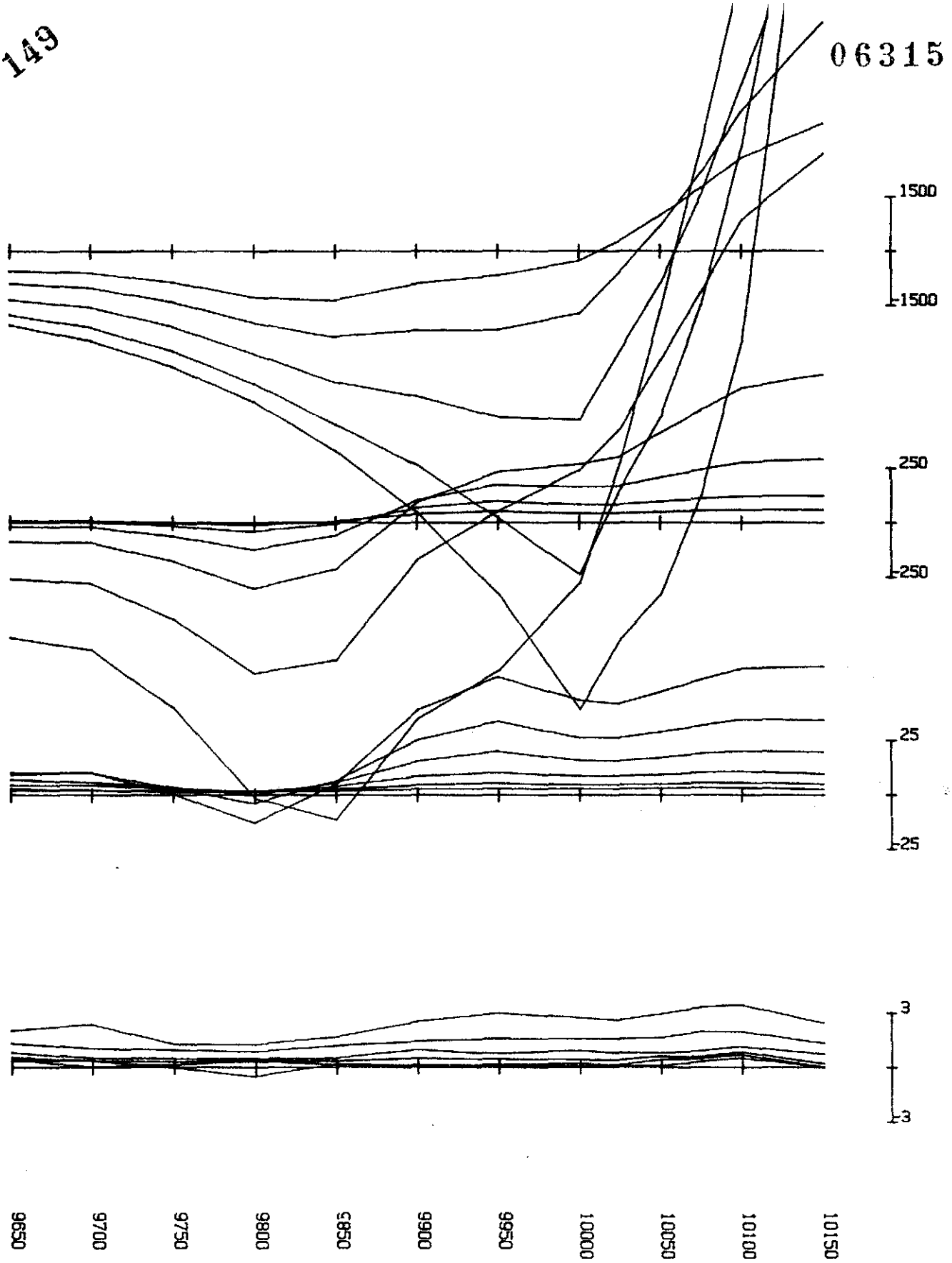
Scale 1 : 9938.

5 cm

P & V GEOPHYSICAL SERVICES

149

063150



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11700 Component D

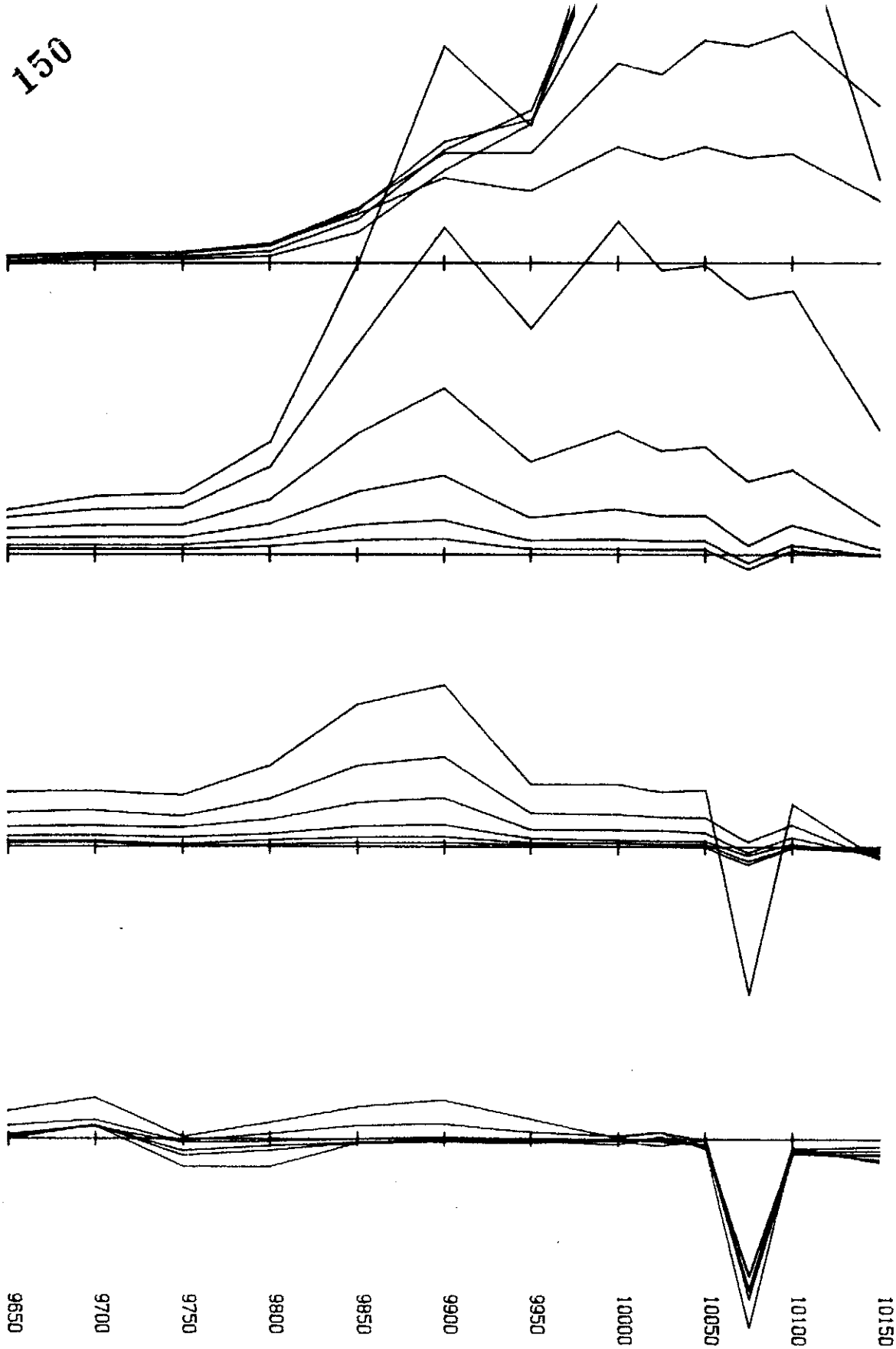
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

150

063151



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11700 Component N

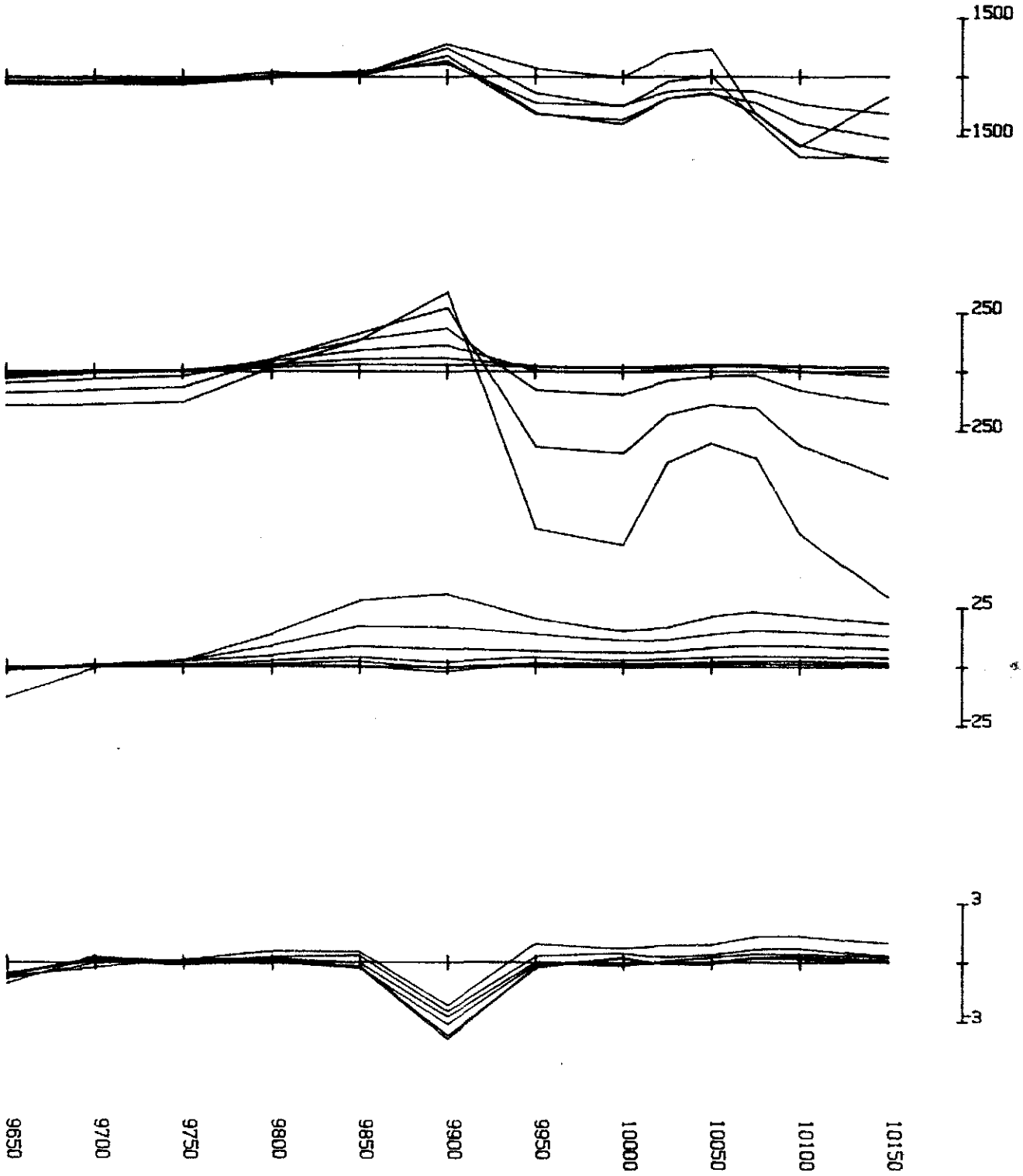
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

151

063152



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11700 Component E

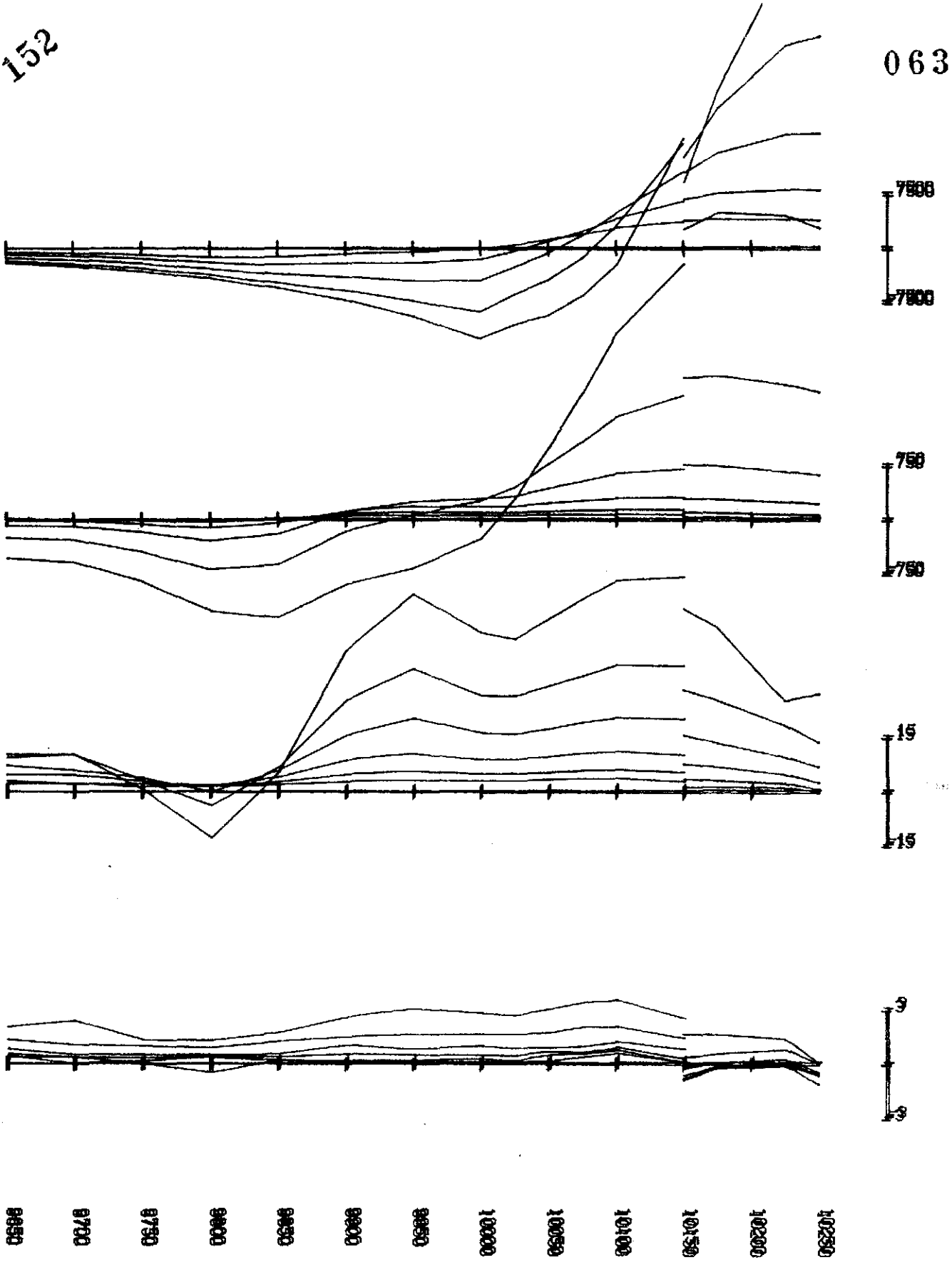
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

152

063153



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11600 Component D

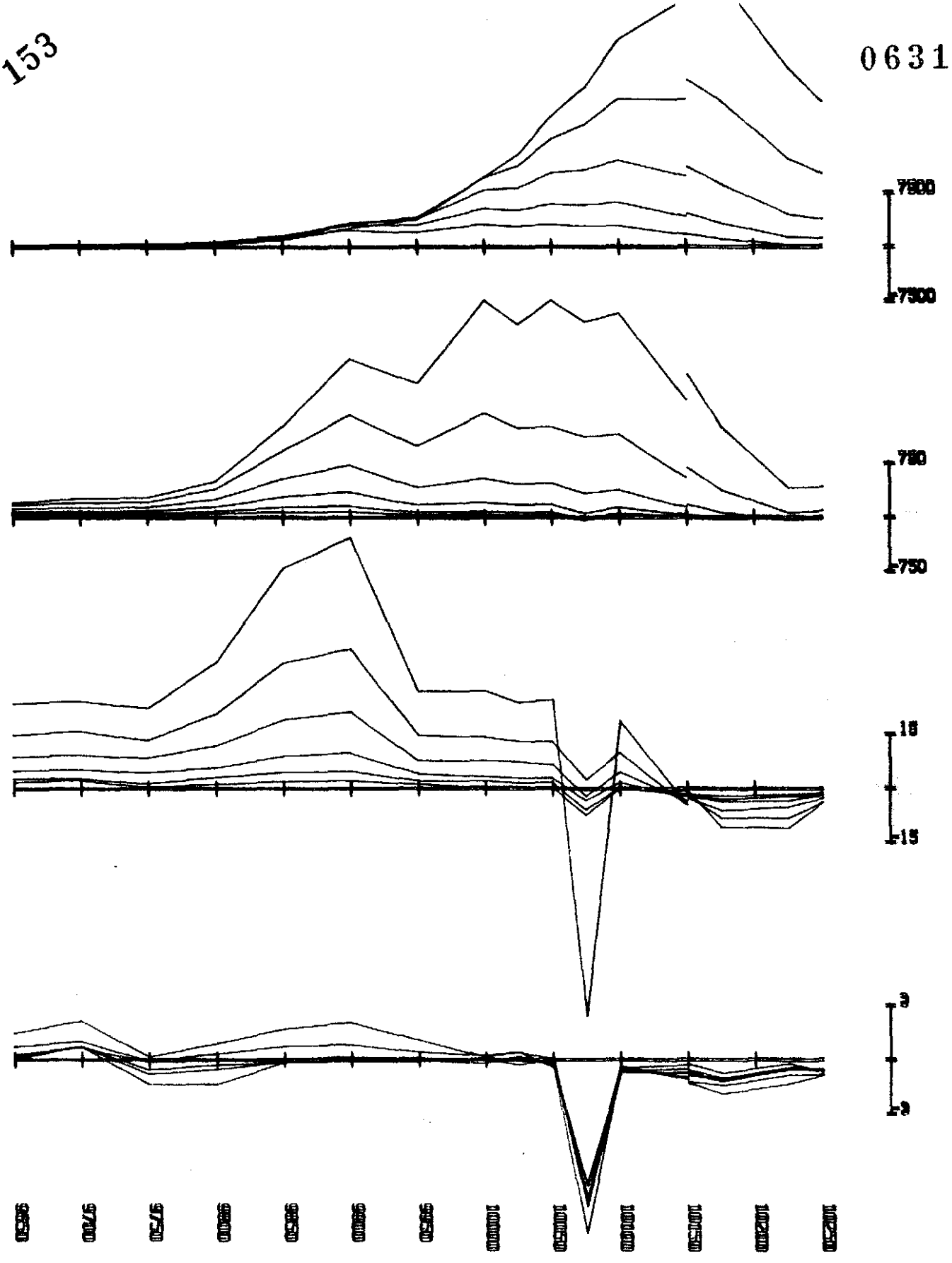
Scale 1 : 4000

5 cm

P & V GEOPHYSICAL SERVICES

153

063154



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11800 Component N

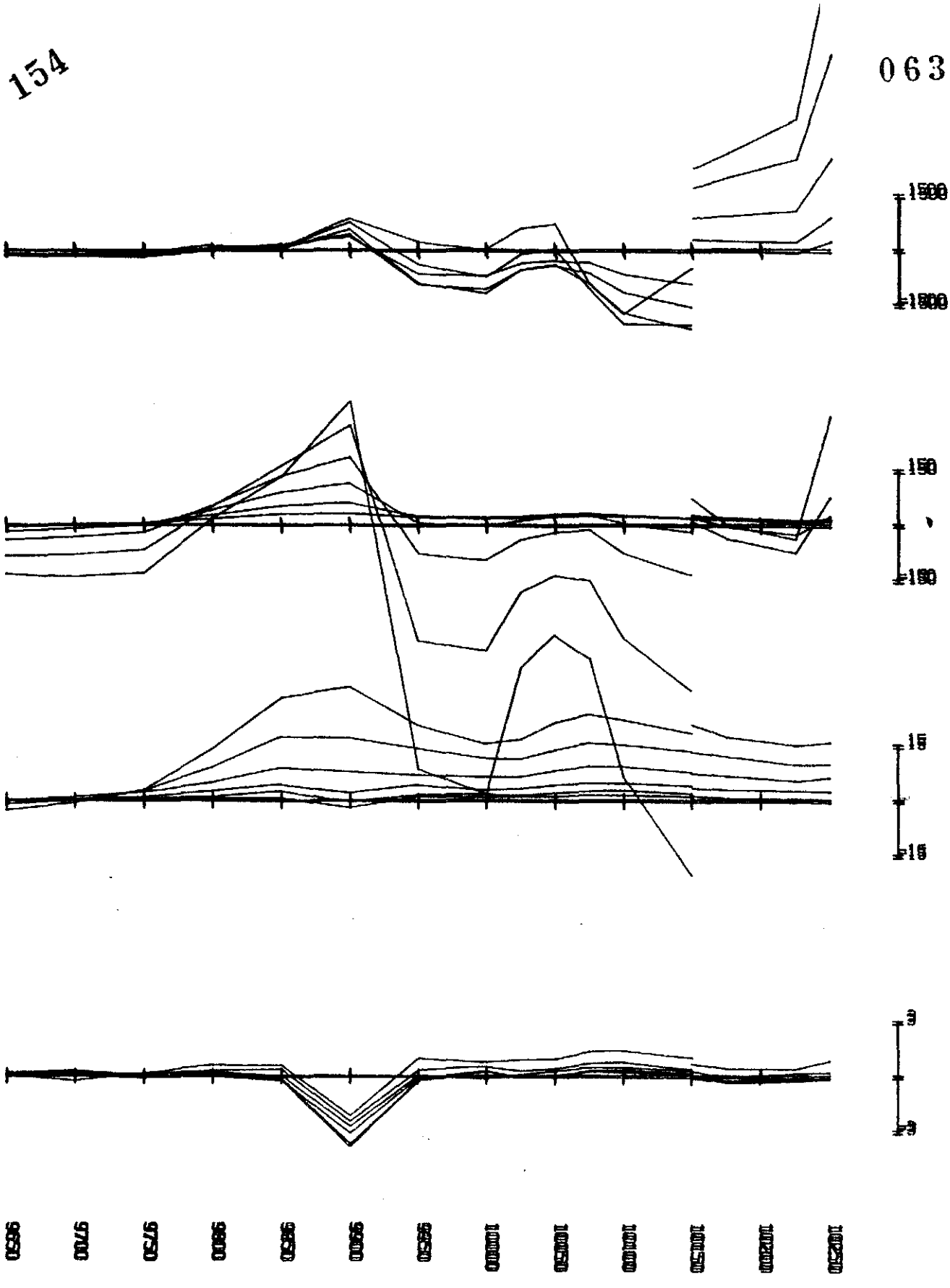
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

154

063155



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11600 Component E

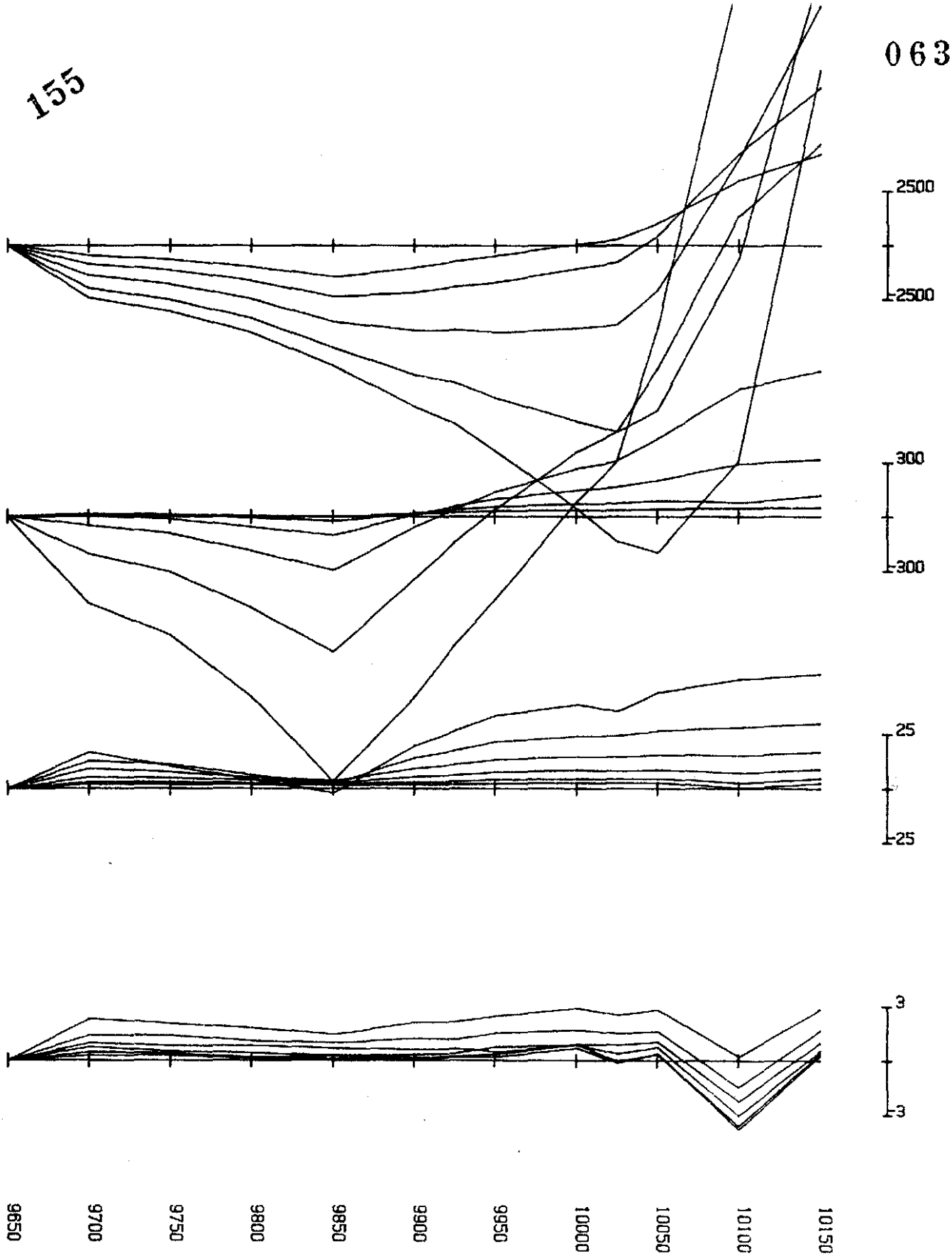
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

063156

155



EM37 PLOT | Client AMOCO | Area SPEELER CREEK

Loop SPC3 | Line 11600 | Component D

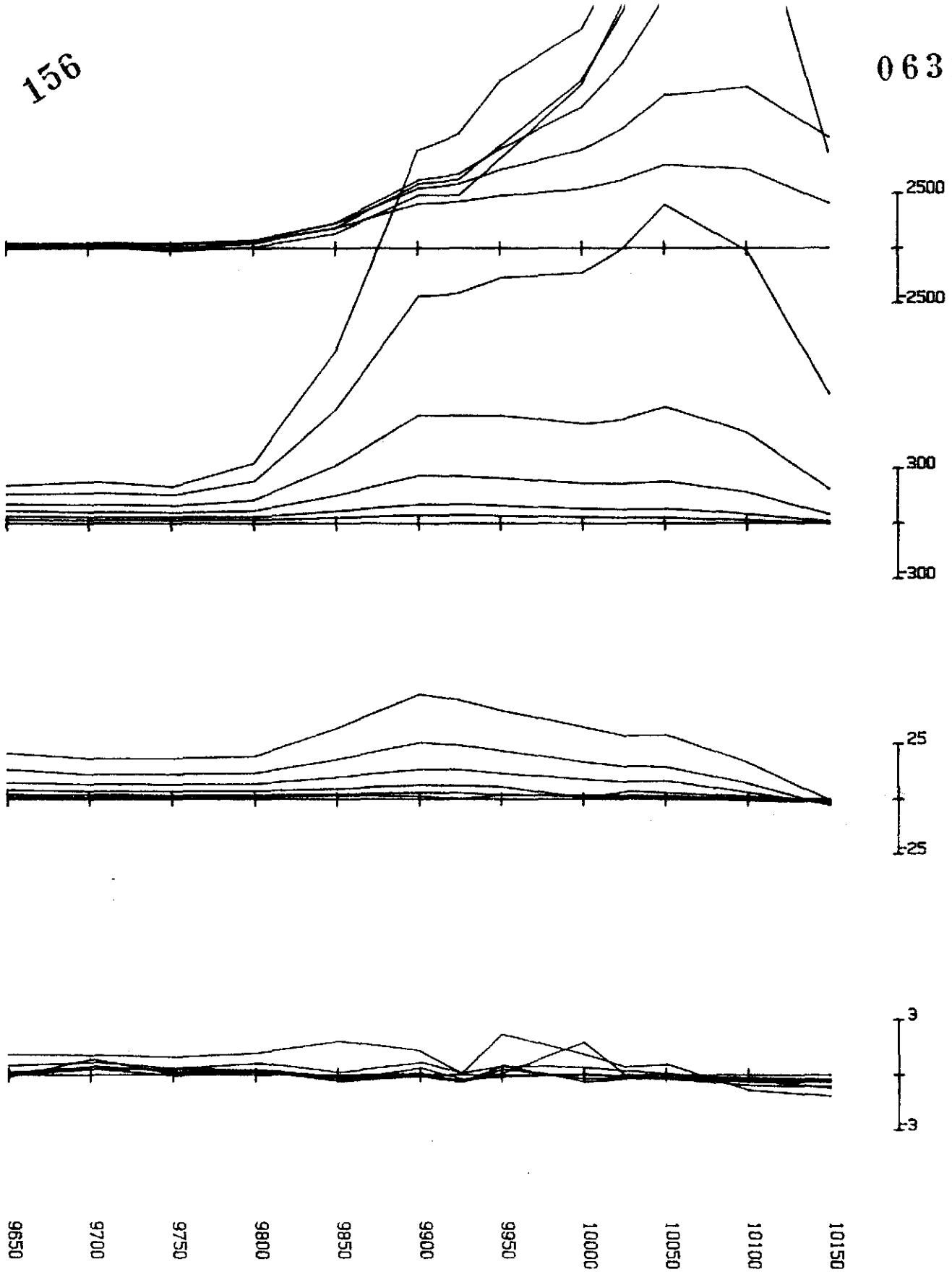
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

156

063157



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11600 Component N

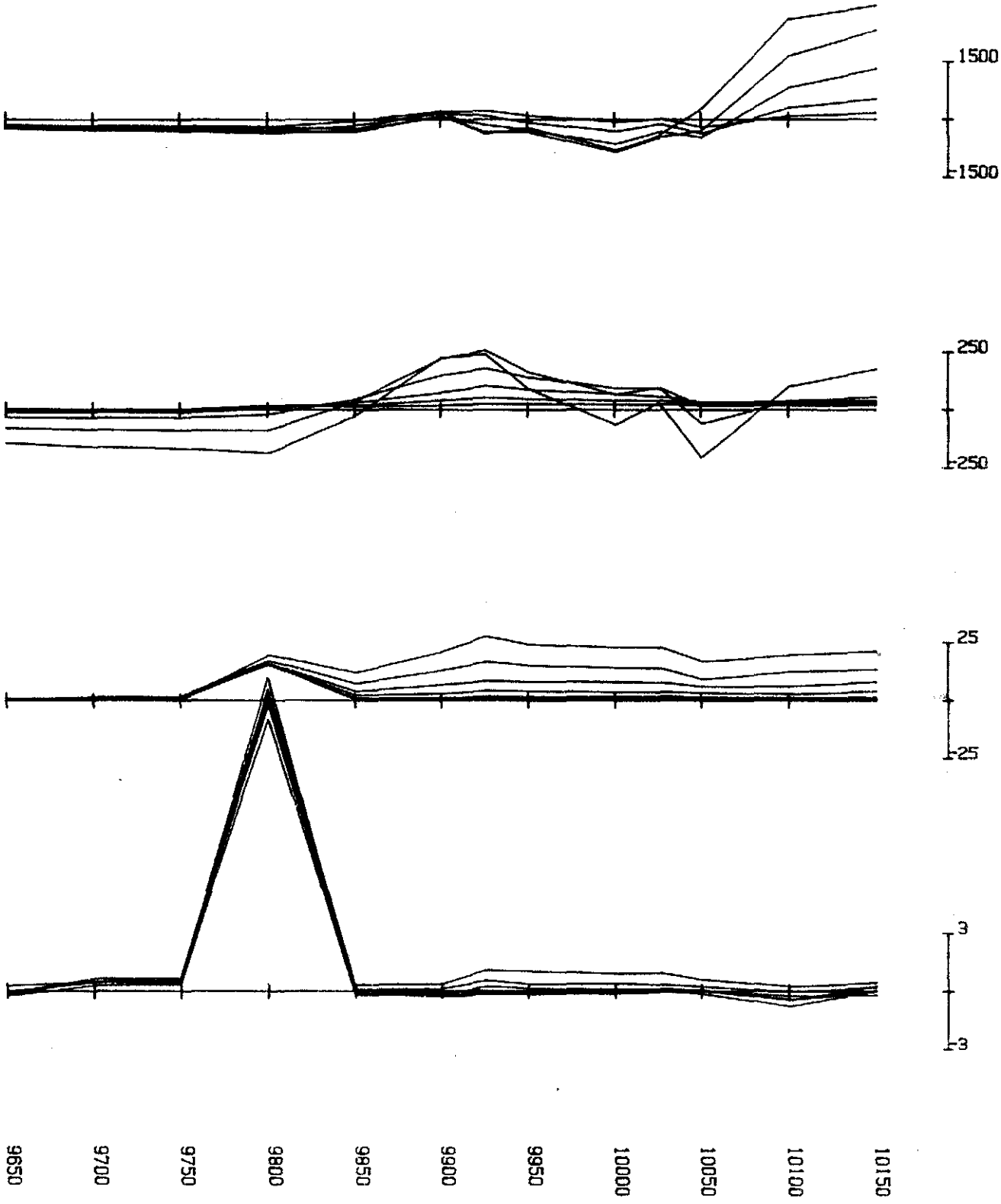
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

157

063158



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11600 Component E

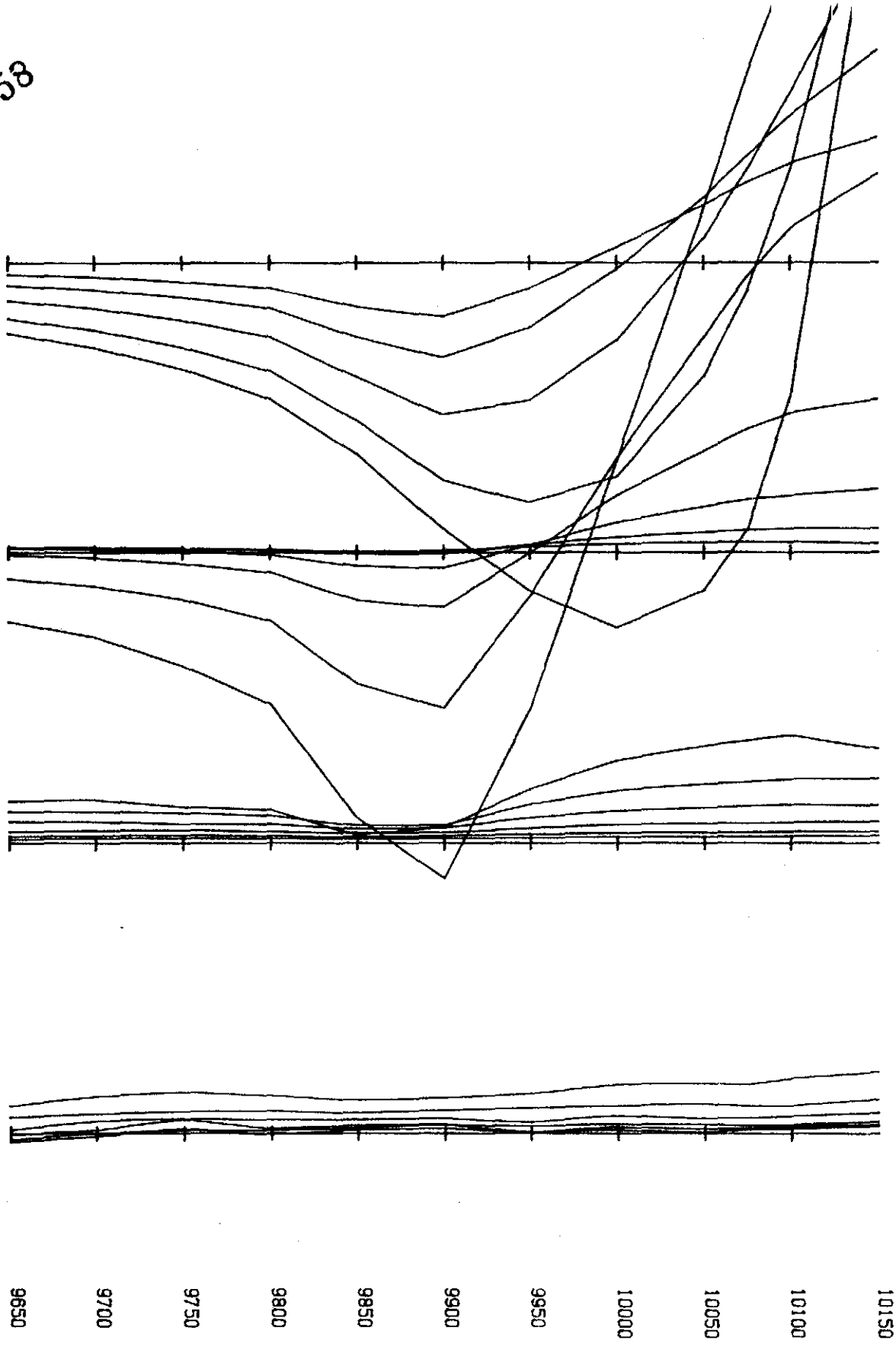
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

158

063159



EM37 PLOT | Client AMOCO | Area SPEELER CREEK

Loop SPC3 | Line 11500 | Component D

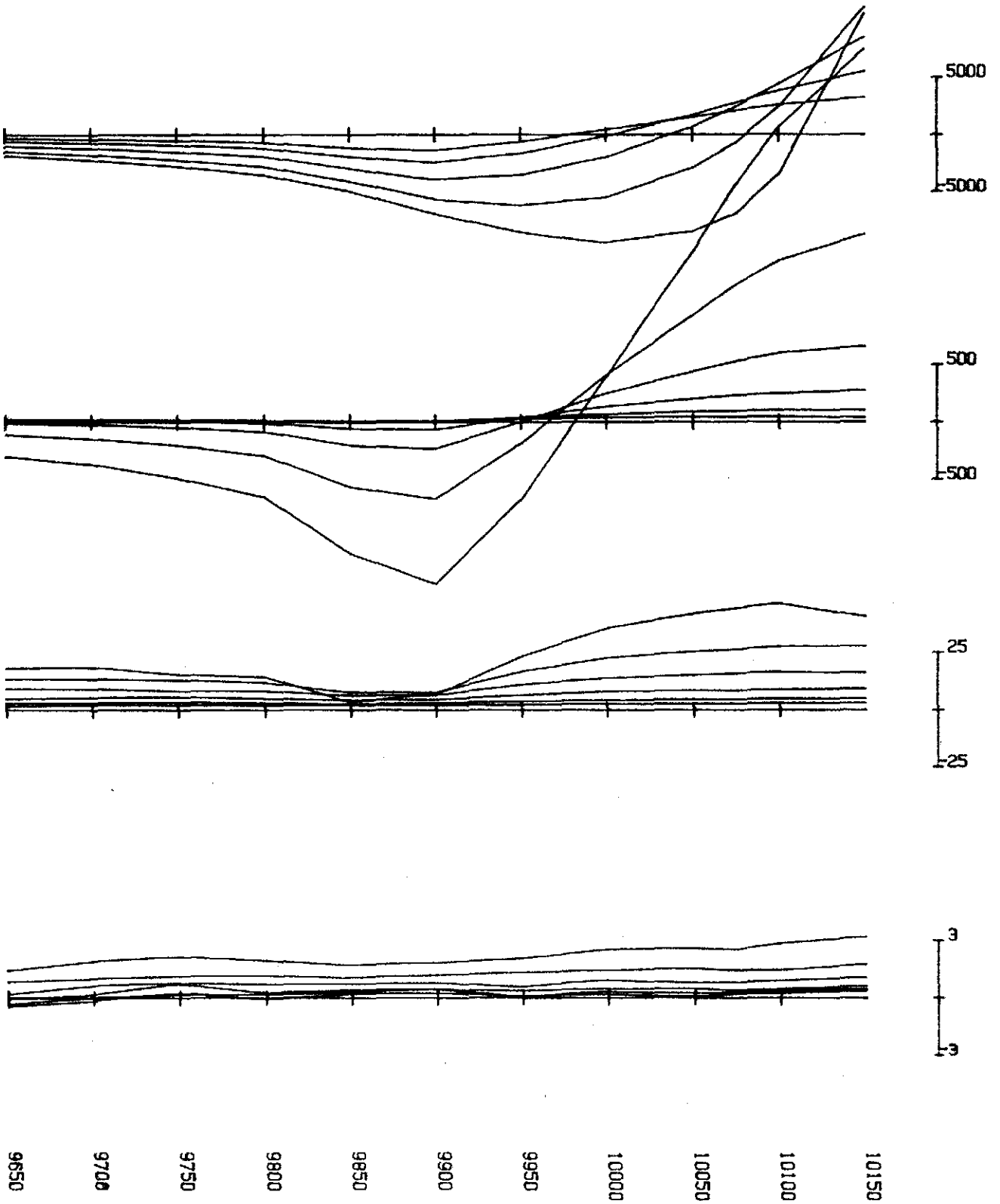
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

159

063160



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11500 Component D

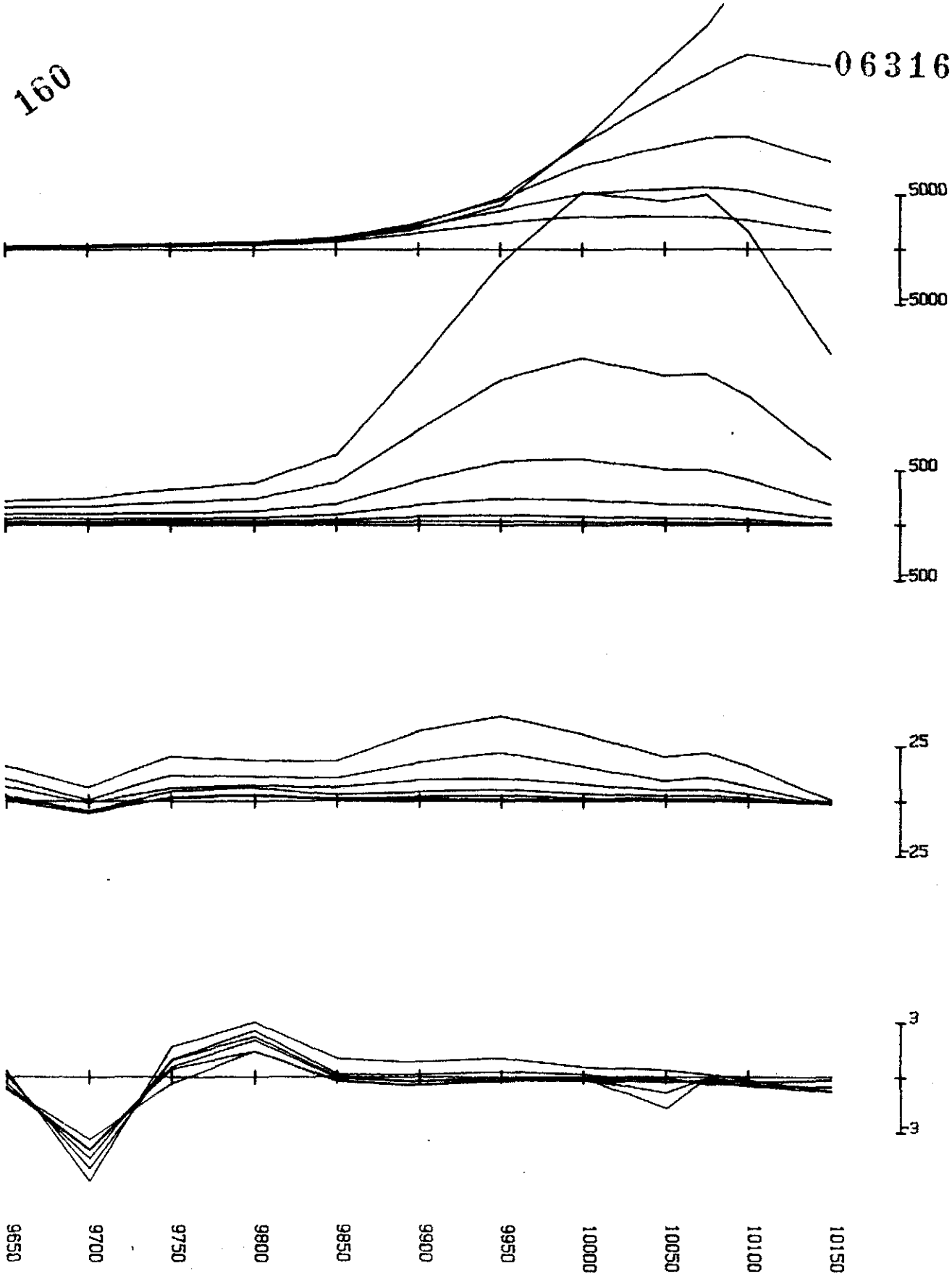
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

160

063161



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11500 Component N

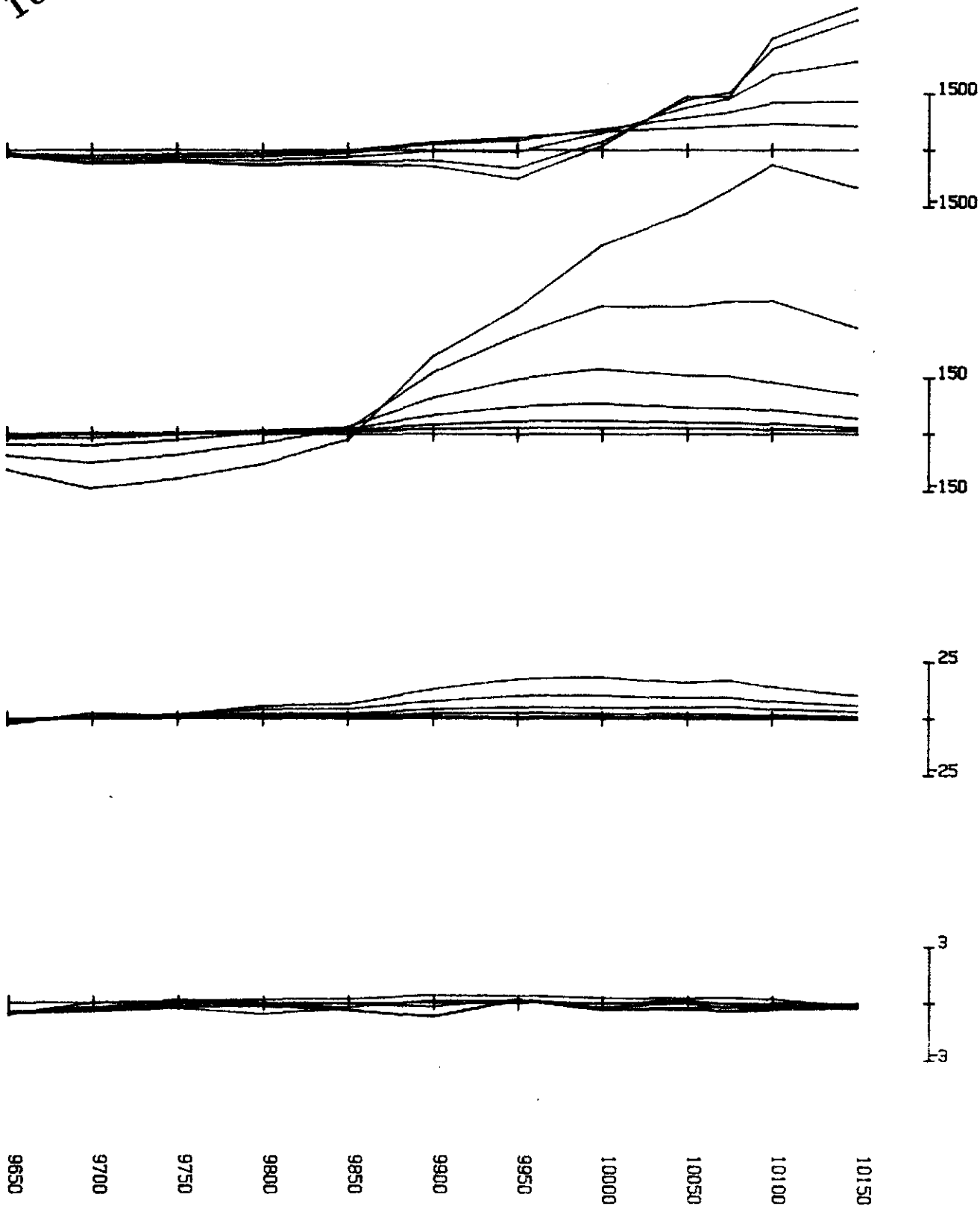
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

063162

161



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11500 Component E

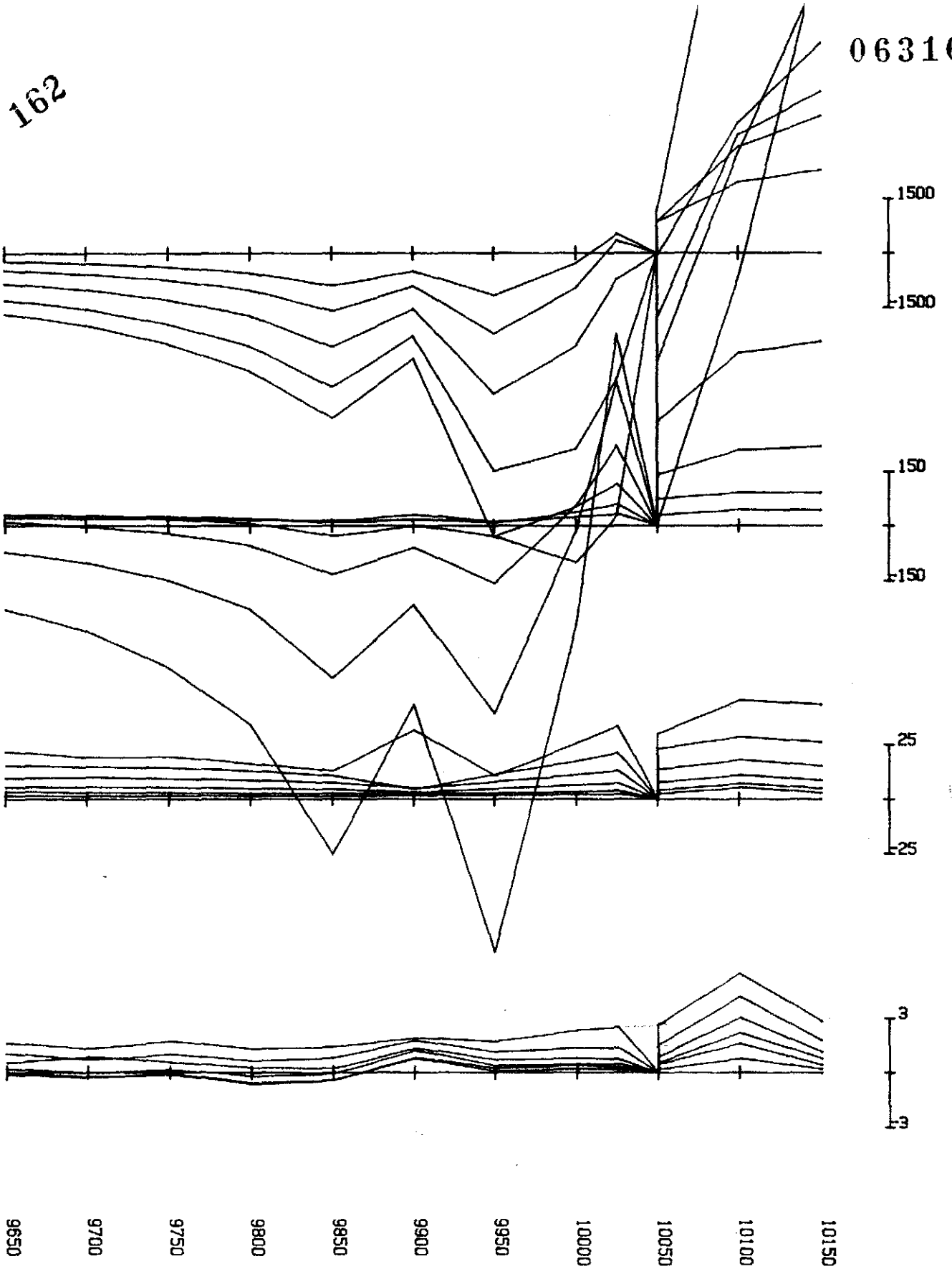
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

063163

162



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11400 Component D

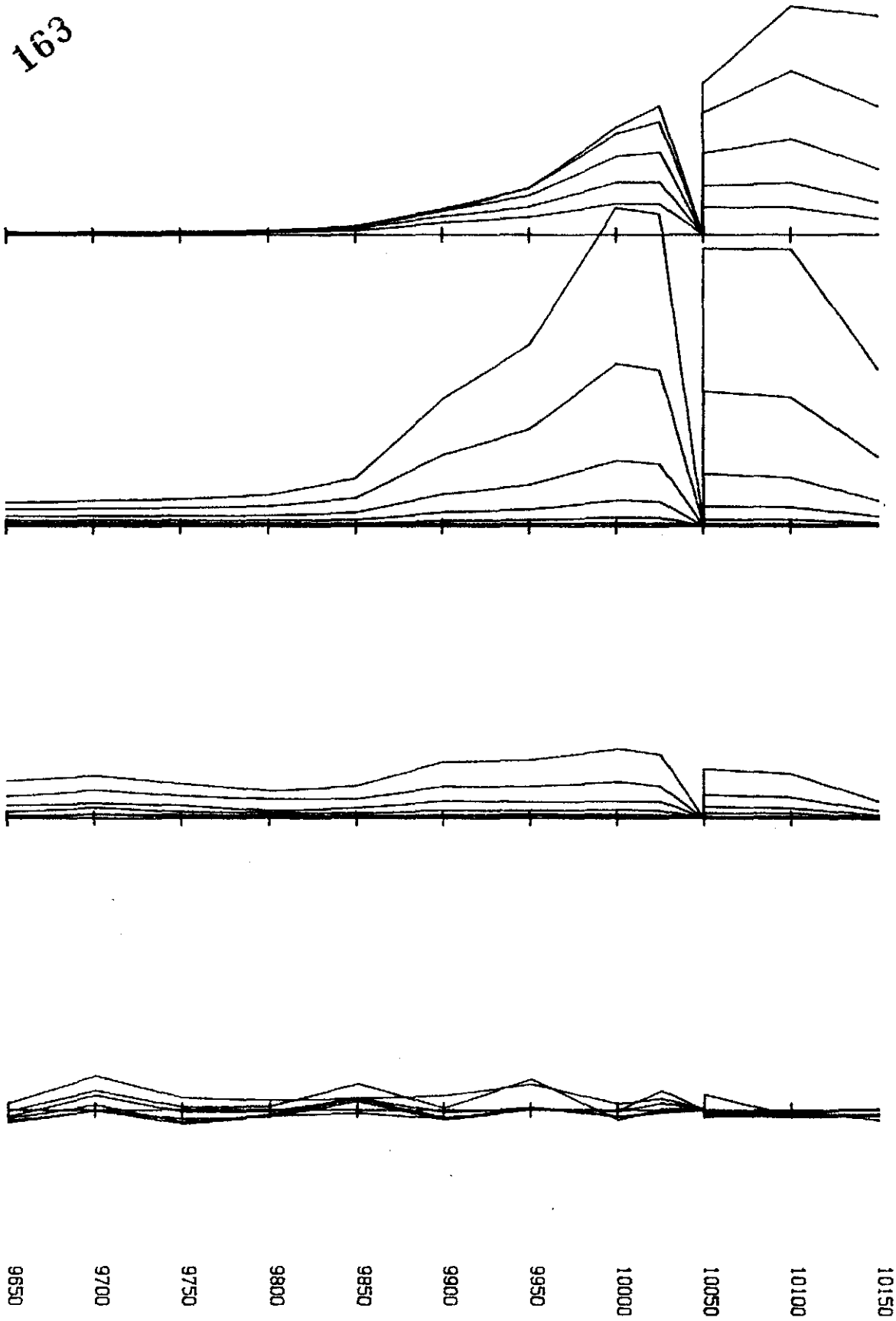
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

163

063164



EM37 PLOT Client AMOCO Area SPEELER CREEK

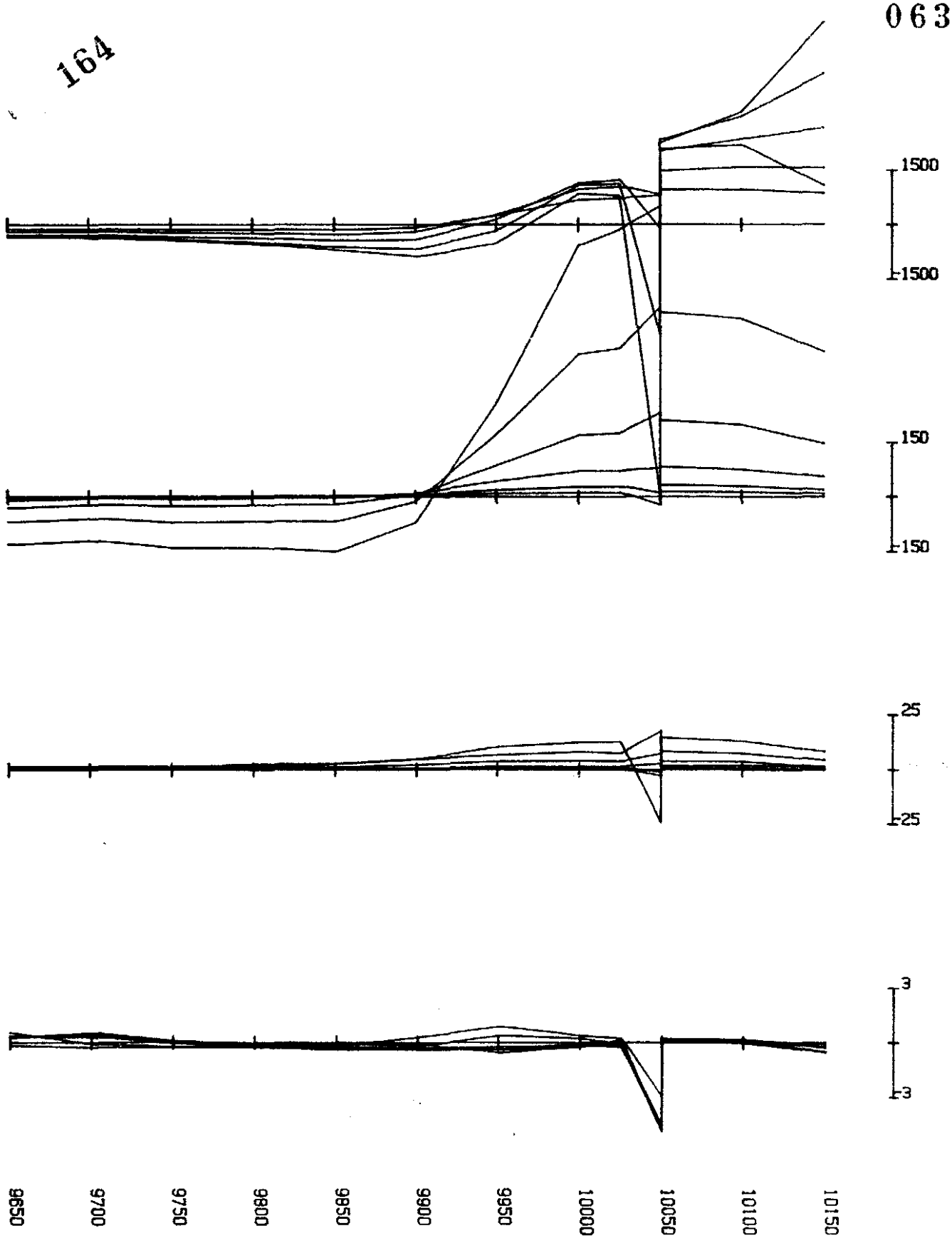
Loop SPC3 Line 11400 Component N

Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

164



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11400 Component E

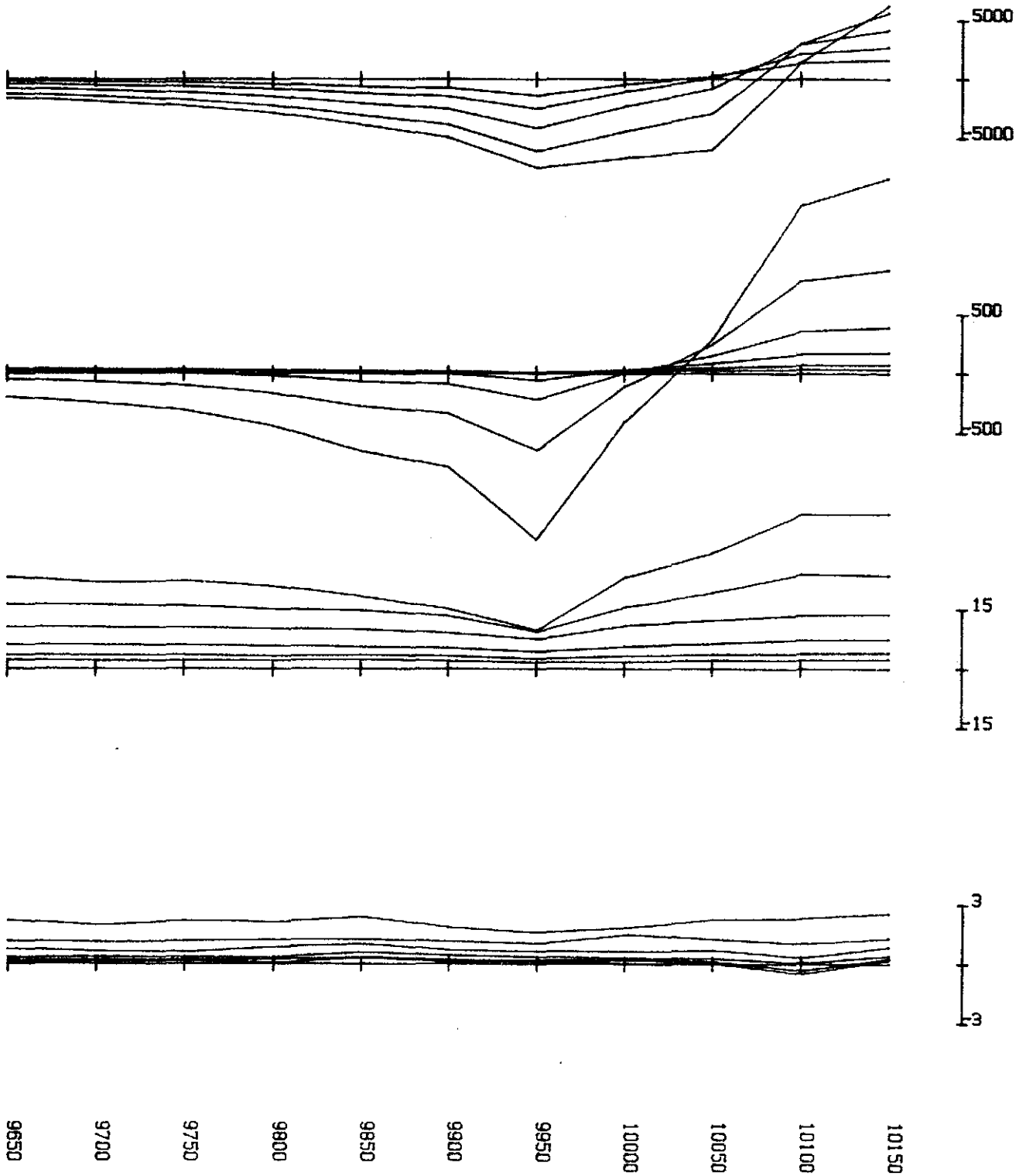
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

165

063166



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11300 Component D

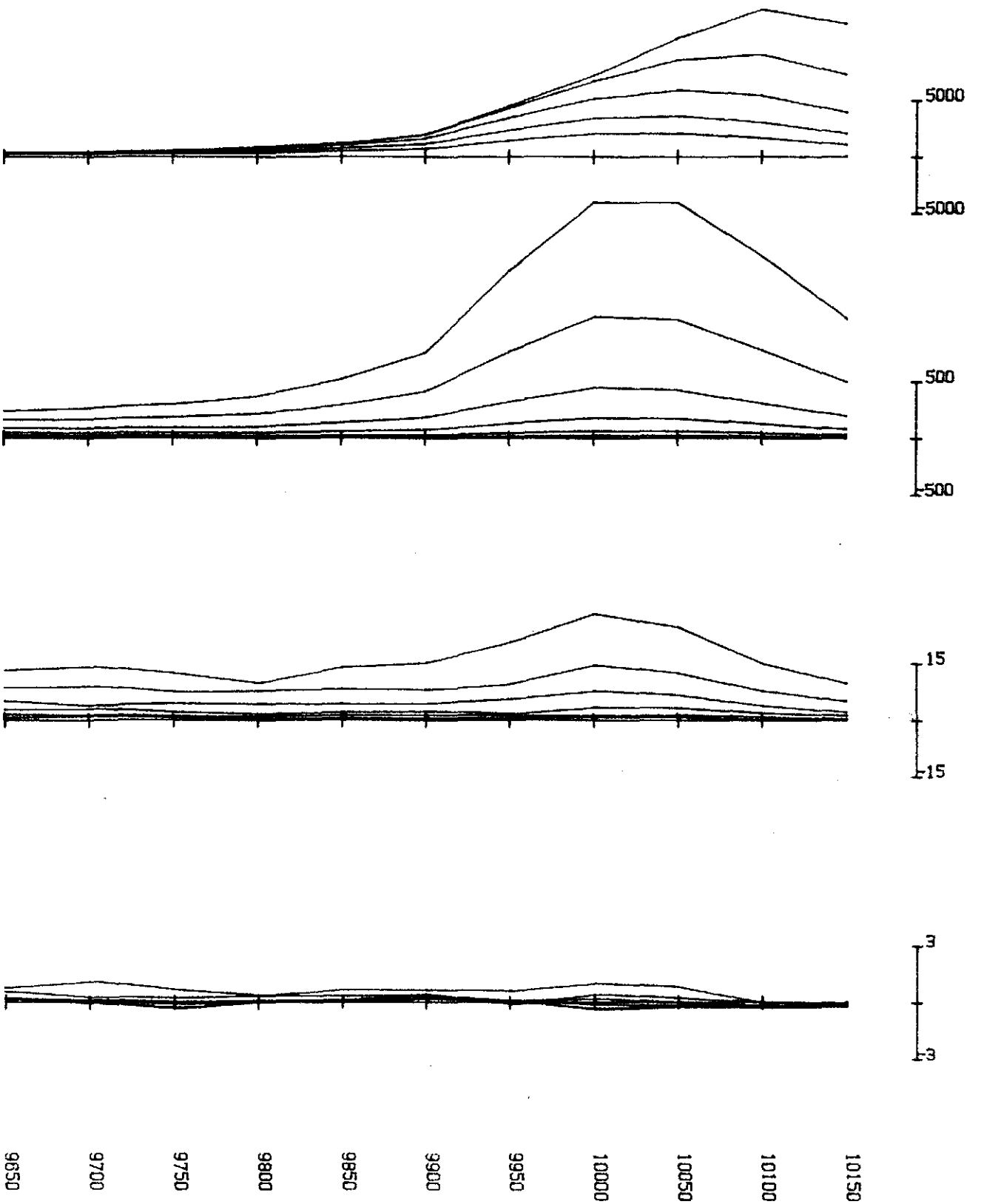
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

166

063167



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11300 Component N

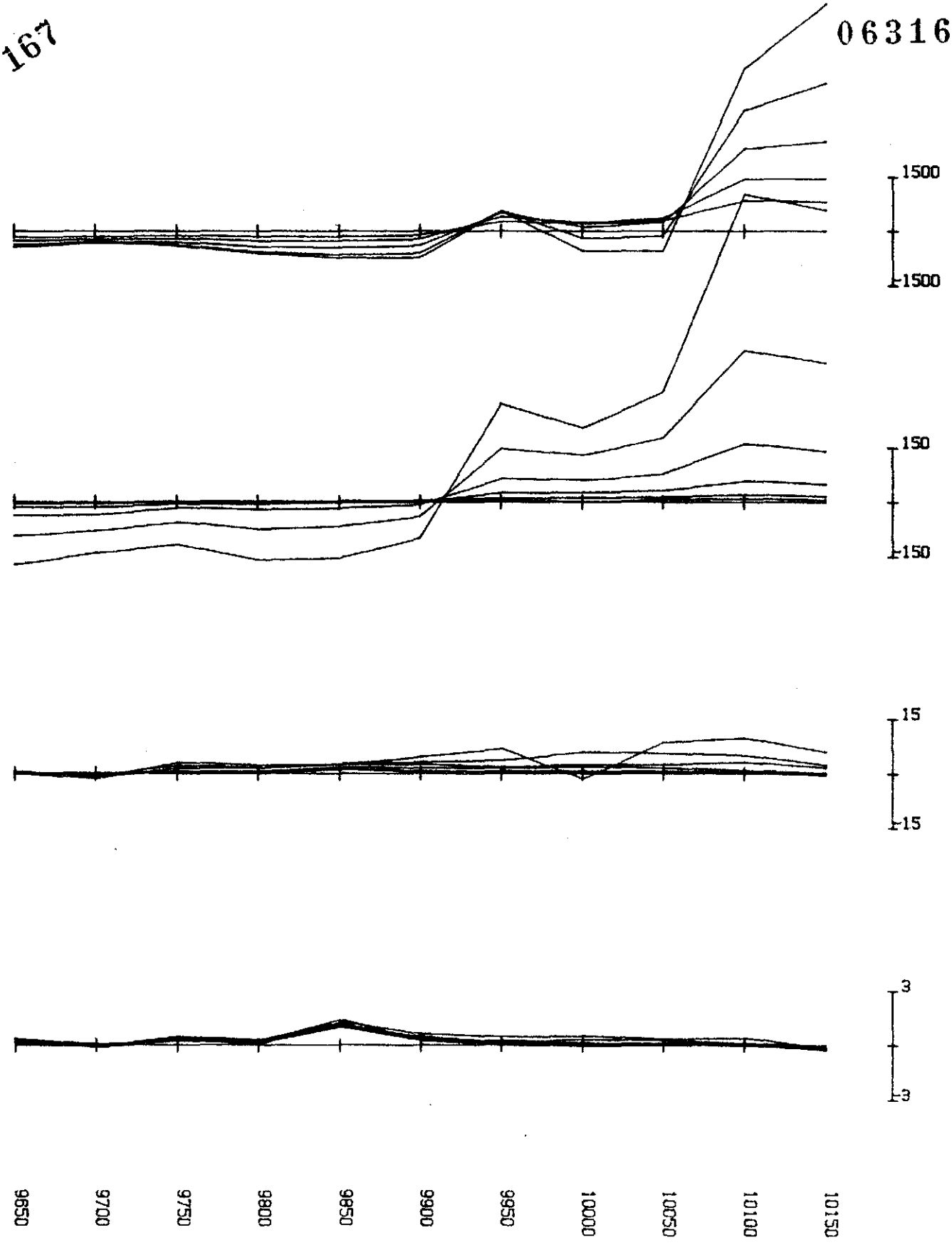
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

167

063168



EM37 PLOT Client AMOCO Area SPEELER CREEK

Loop SPC3 Line 11300 Component E

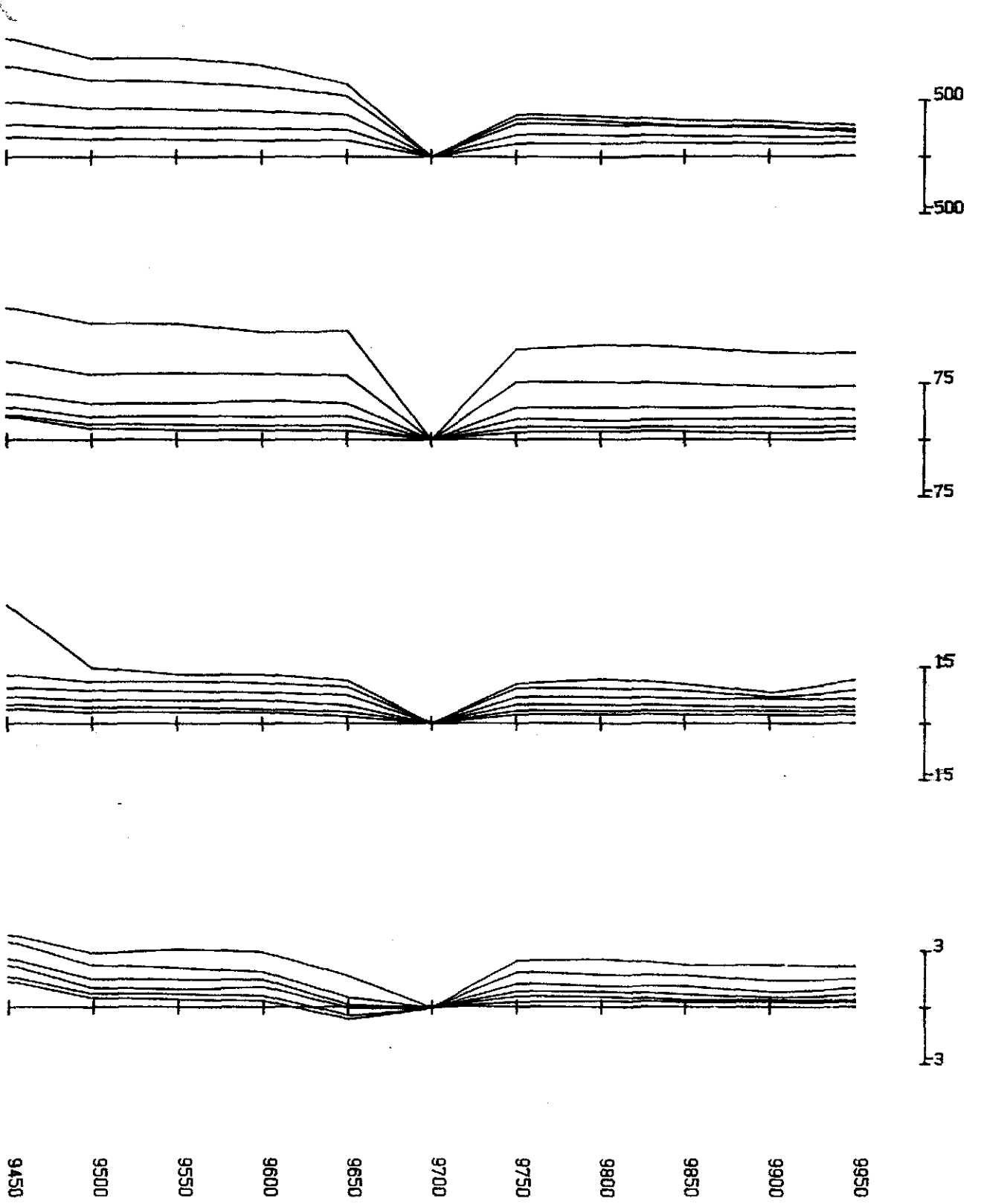
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

168

063169



EM37 PLOT Client AMOCO Area CARTERS

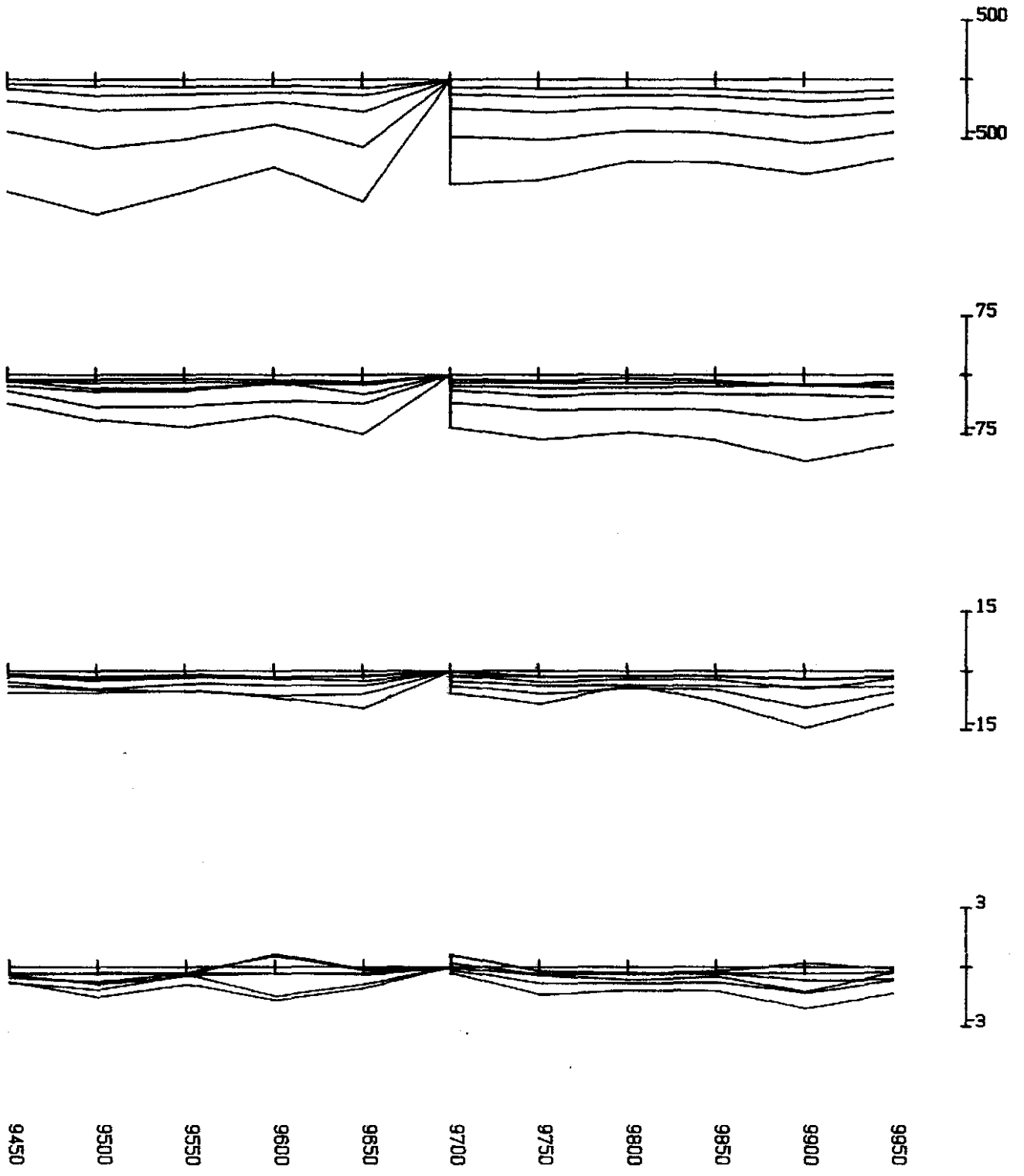
Loop CA1 9350 Component D

Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

169



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9350 Component N

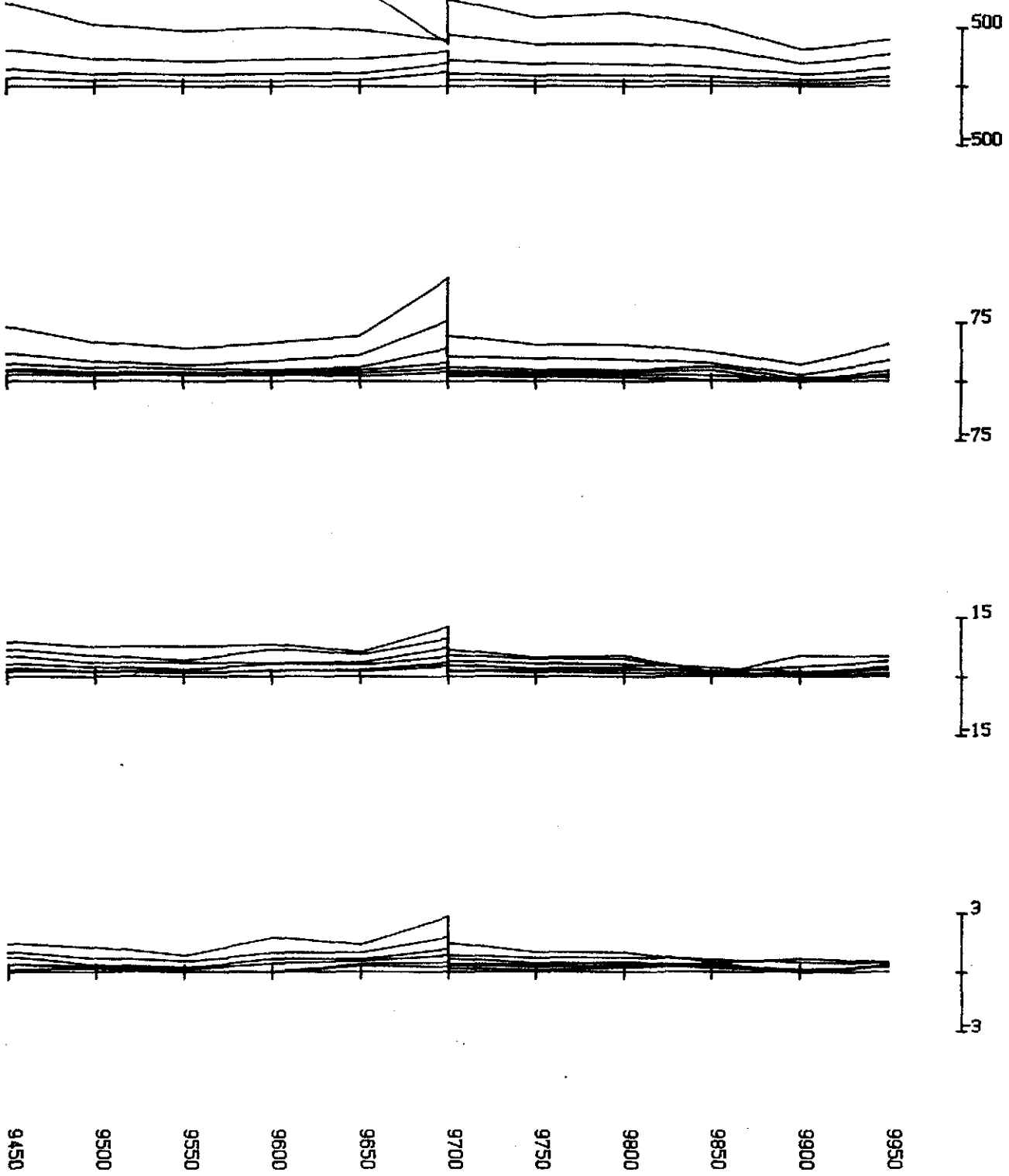
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

170

063171



EM37 PLOT | Client AMOCO | Area CARTERS

Loop CA1 | Line 9350 | Component E

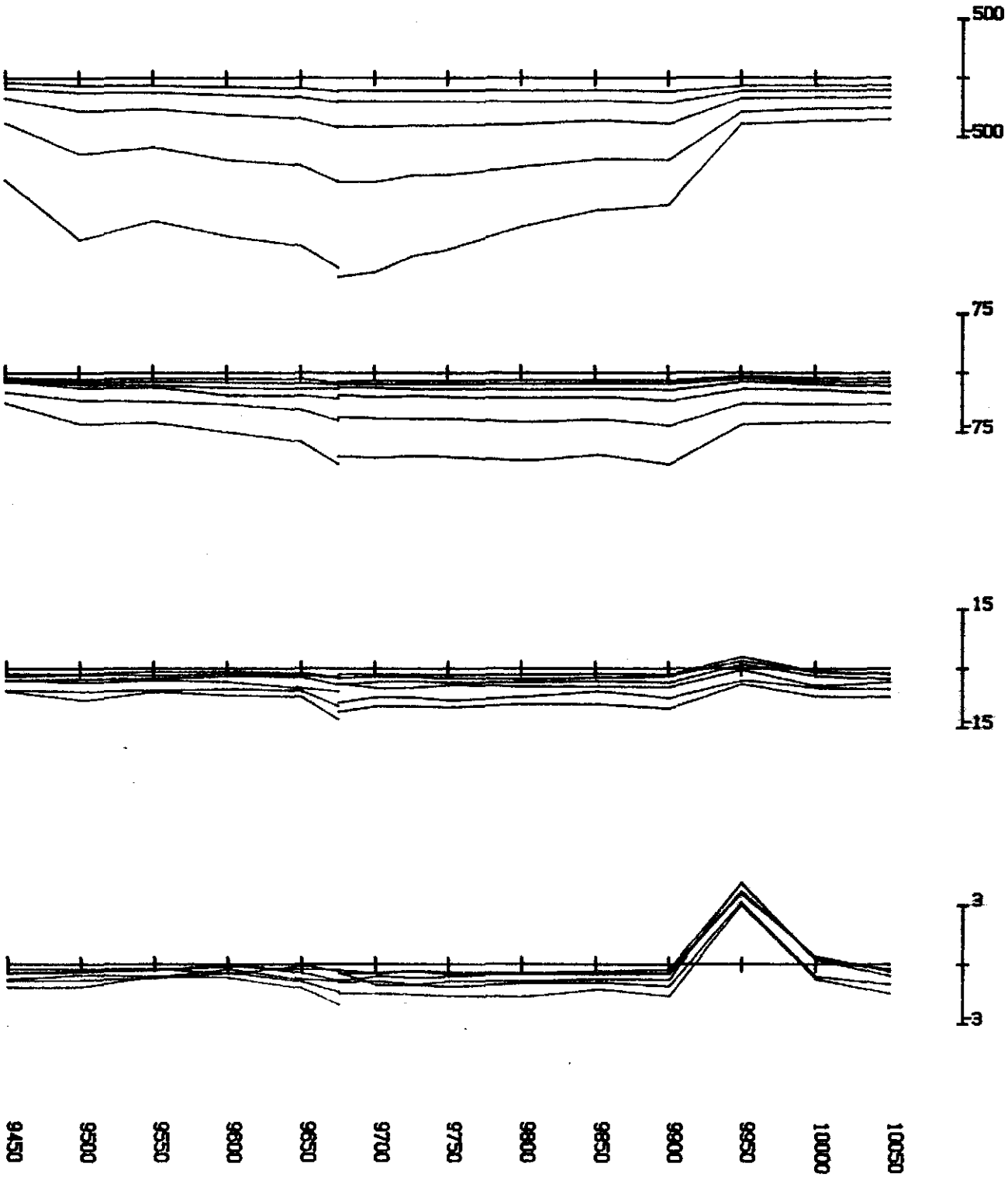
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

171

063172



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9450 Component N

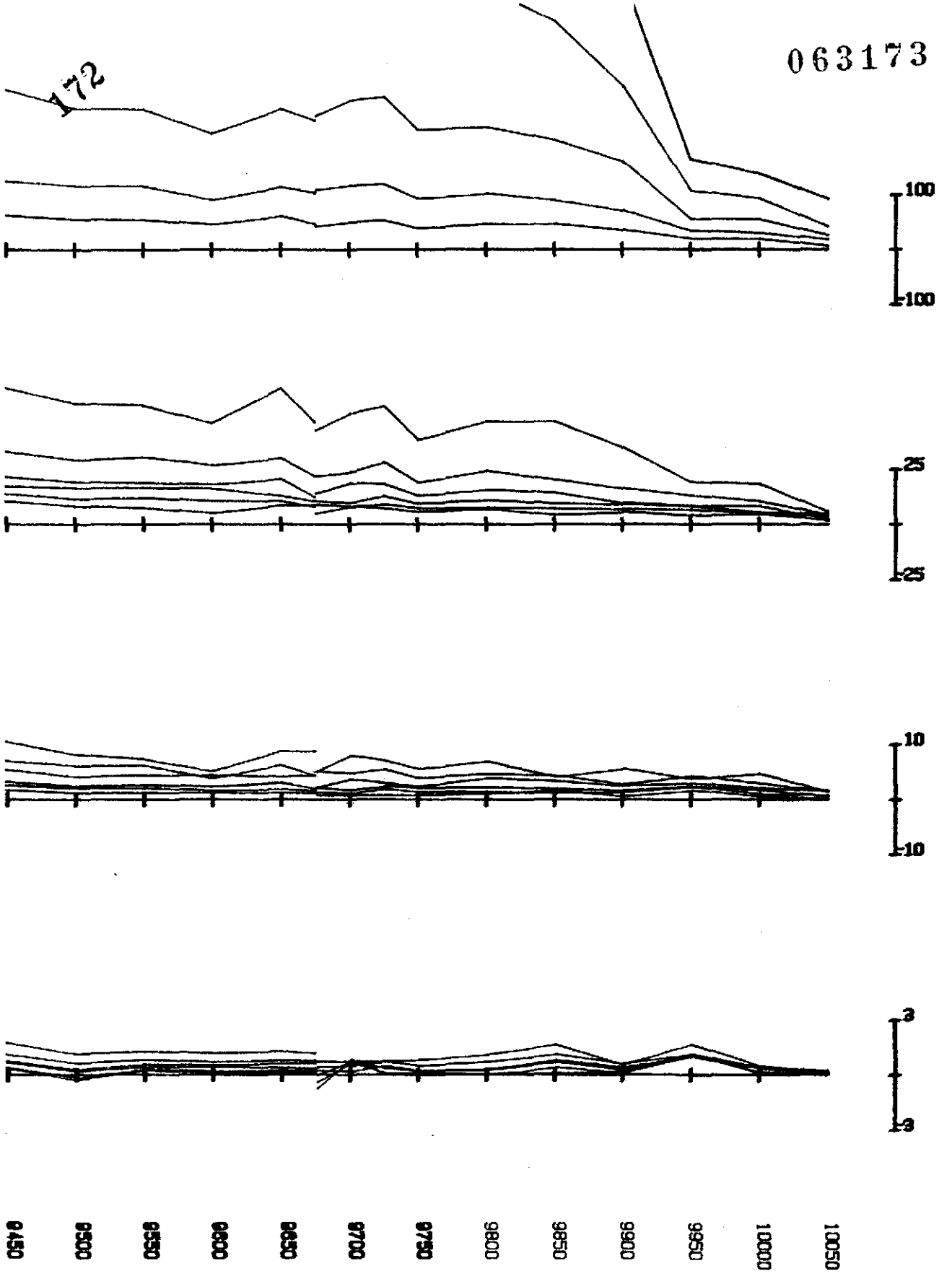
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

063173

172



EM37 PLOT | Client AMOCO | Area CARTERS

Loop CA1 | Line 9450 | Component E

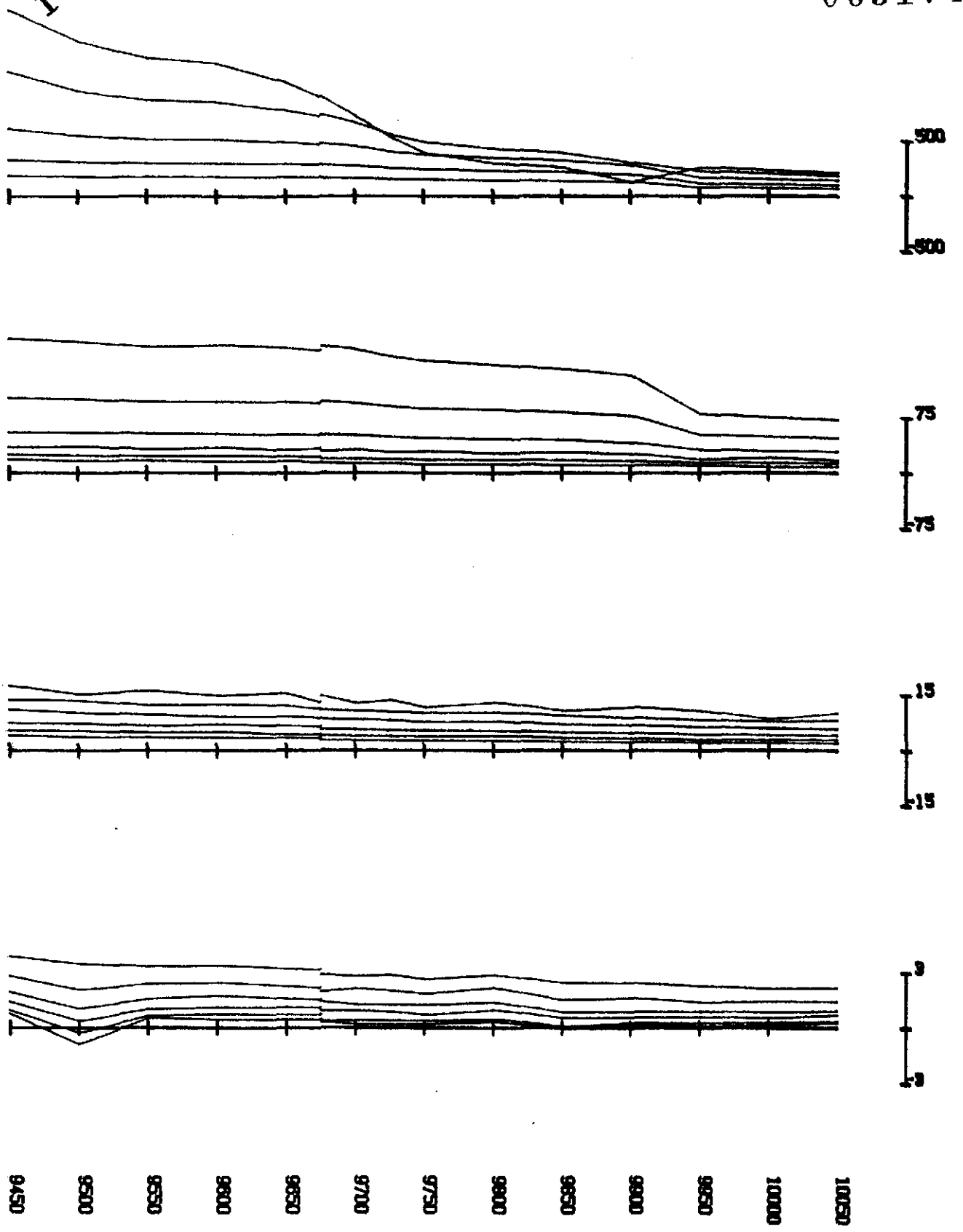
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

173

063174



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9450 Component D

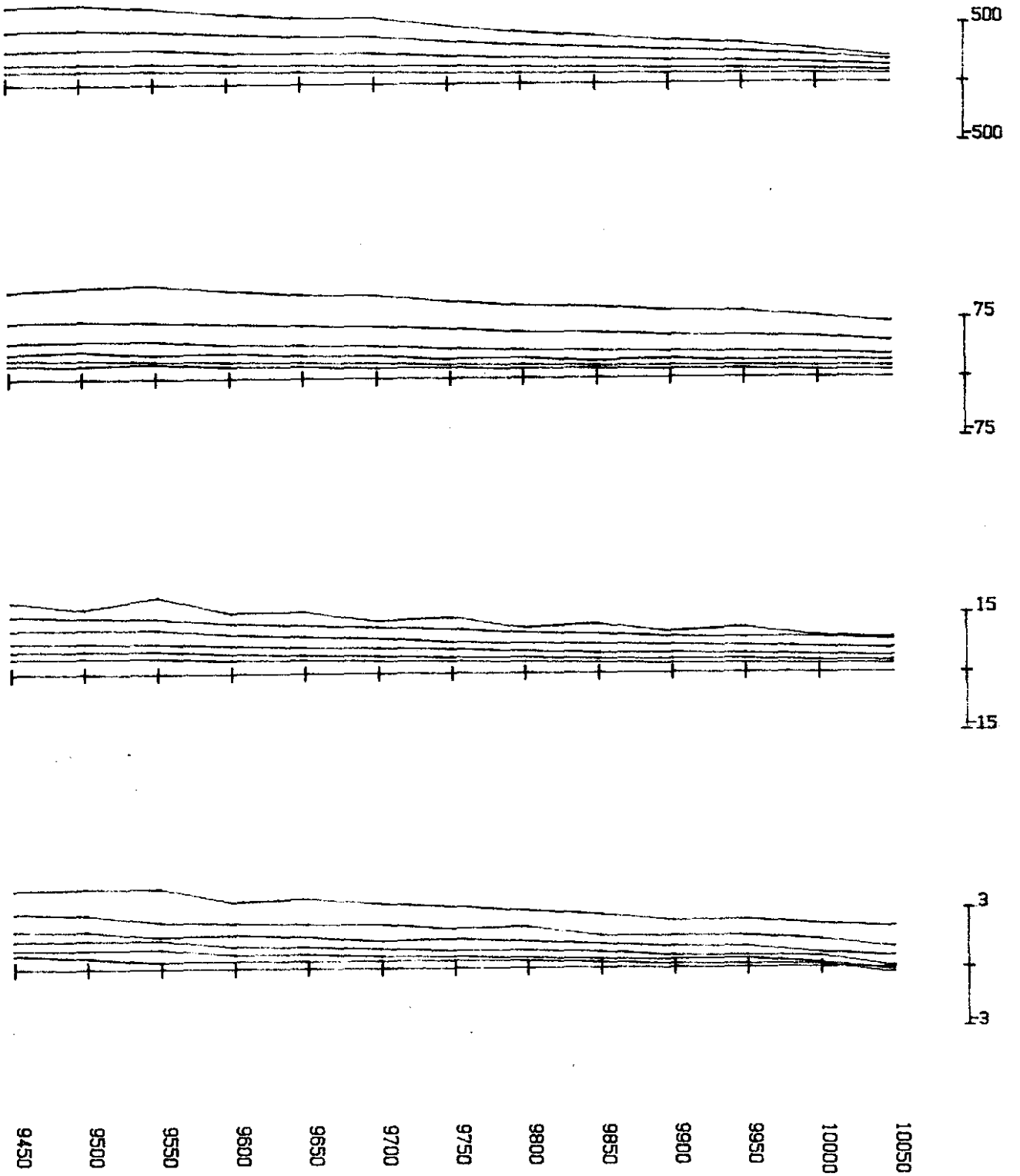
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

174

063175



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 10550 Component D

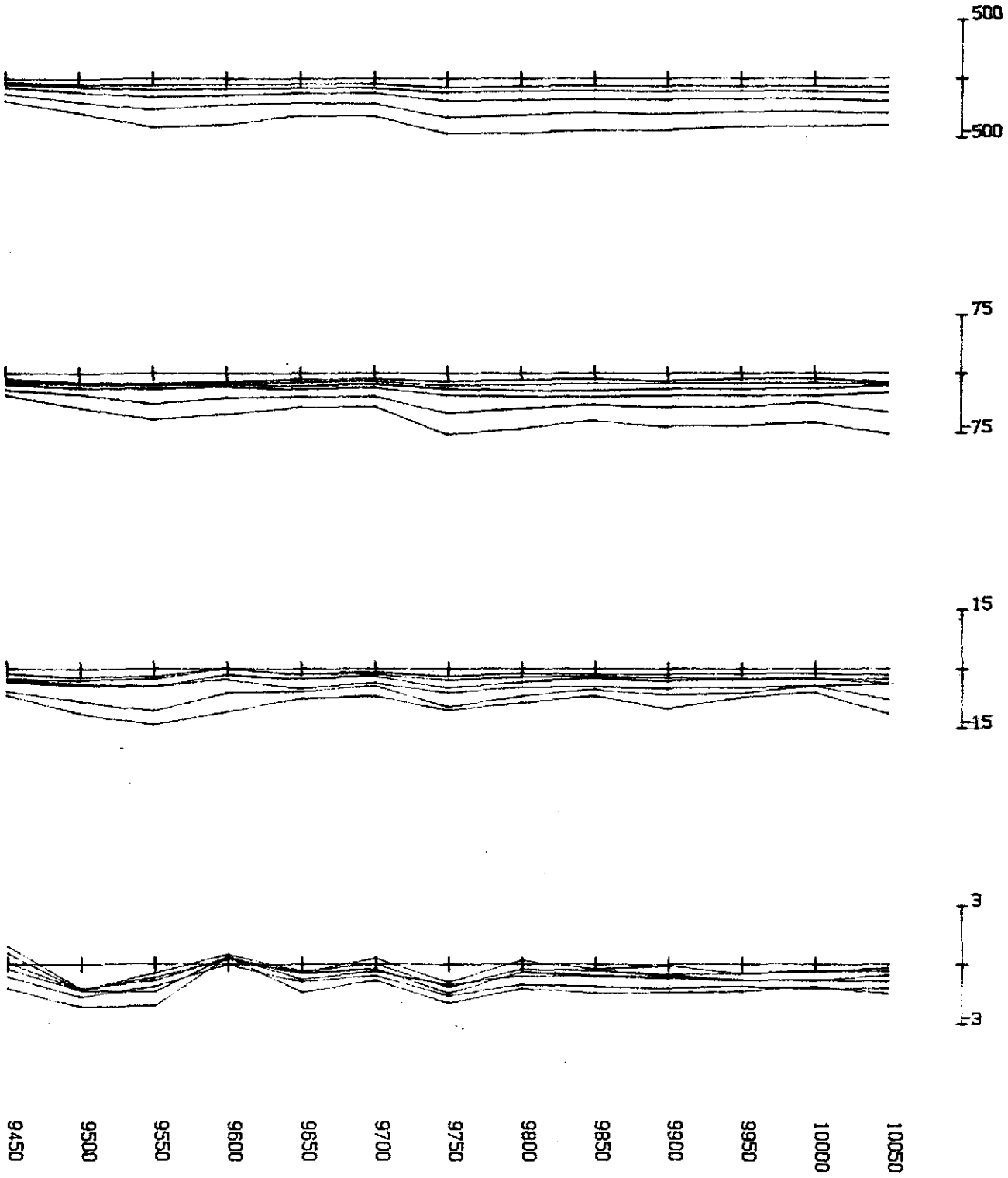
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

175

063176



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 10550 Component N

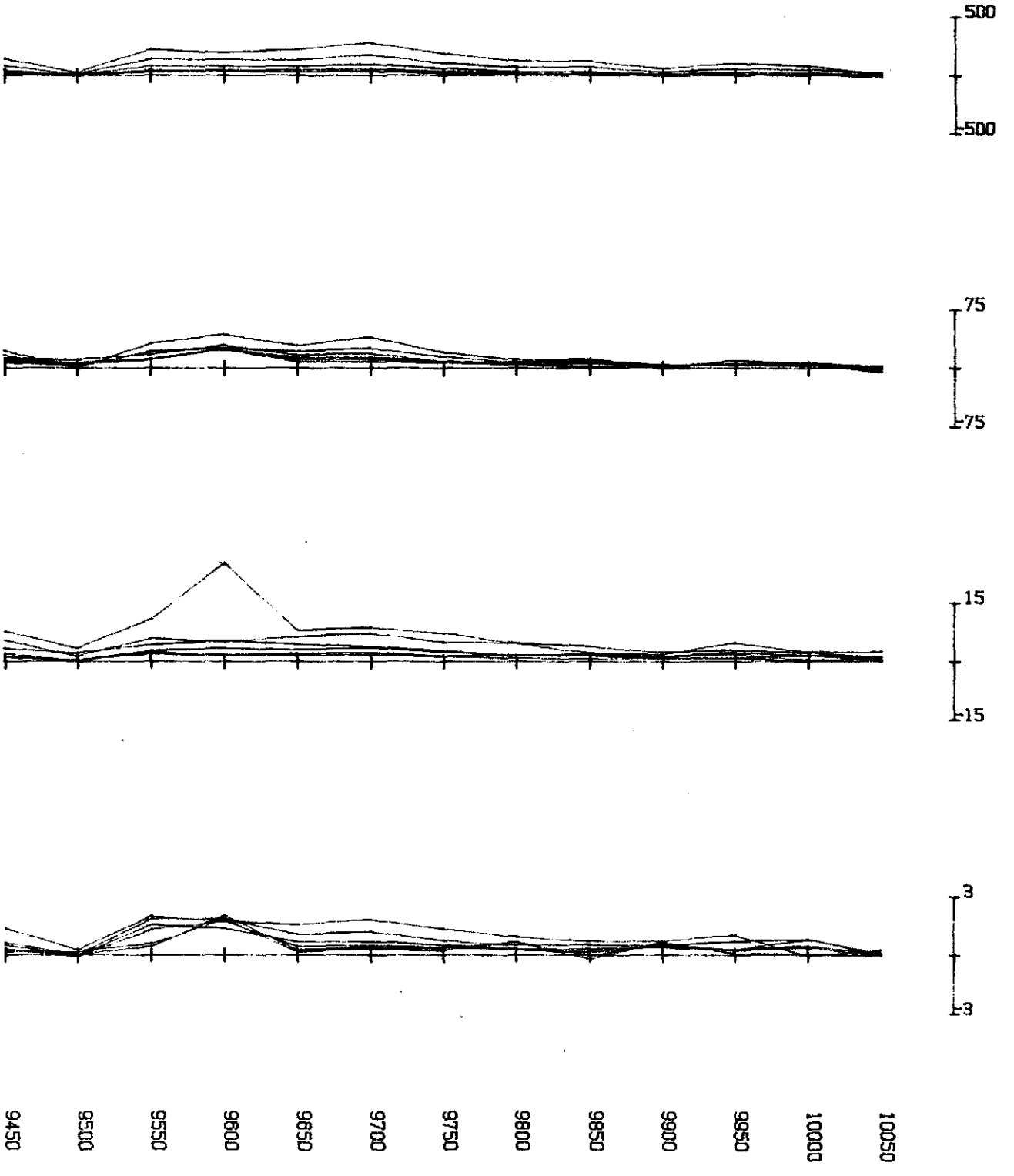
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

176

063177



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9550 Component E

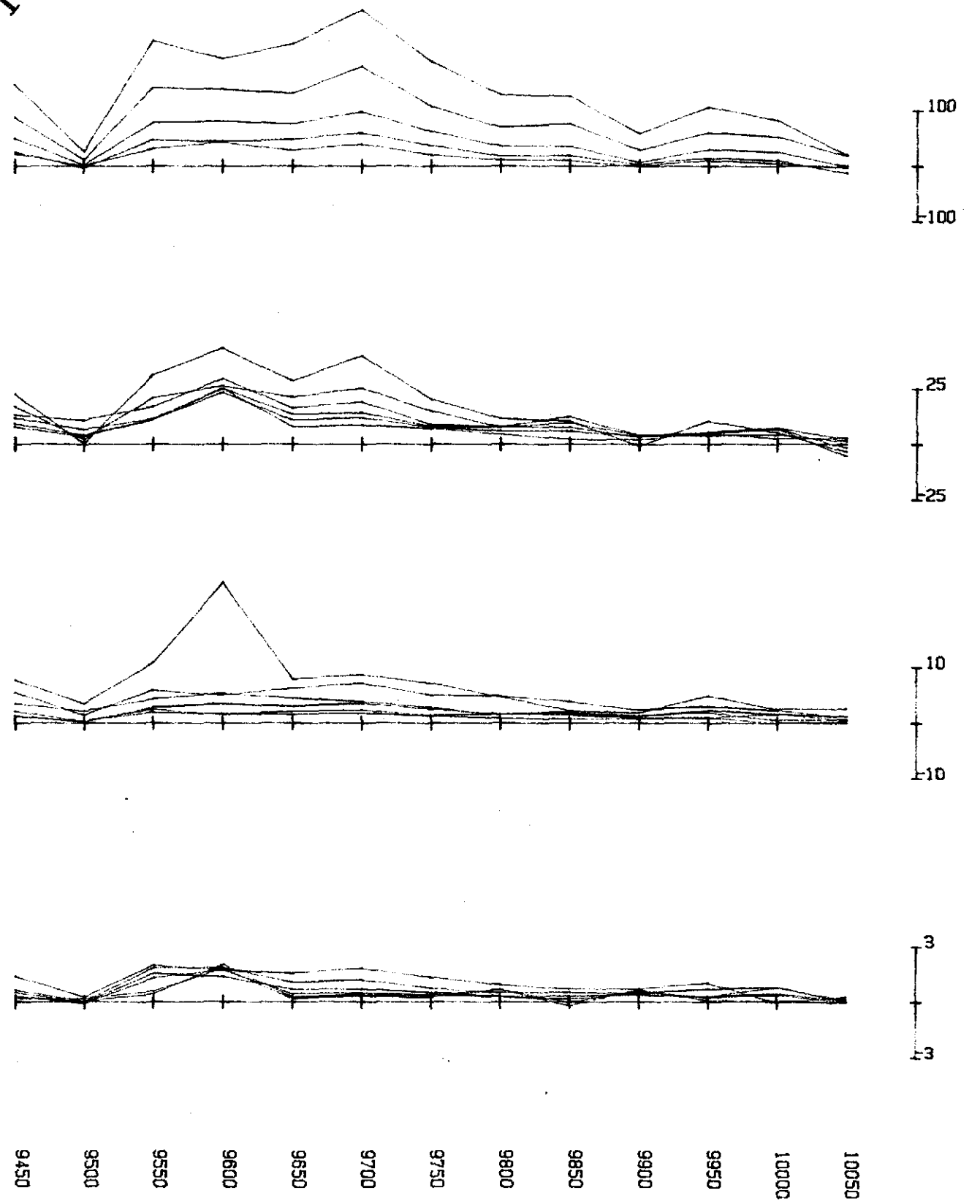
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

177

063178



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 10550 Component E

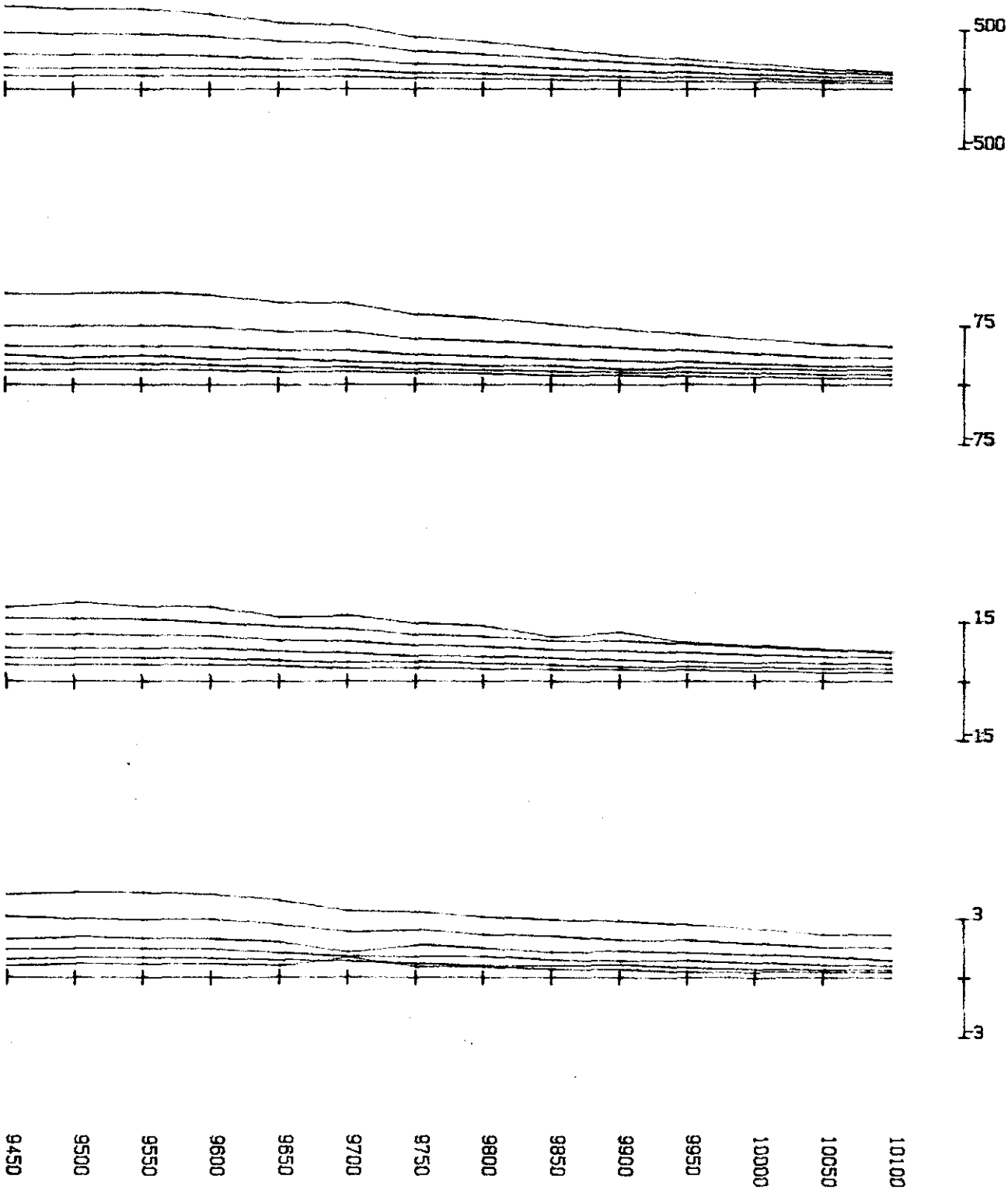
Scale 1 : 4000.

5 cm

P & V GEOPHYSICAL SERVICES

178

063179



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9650 Component D

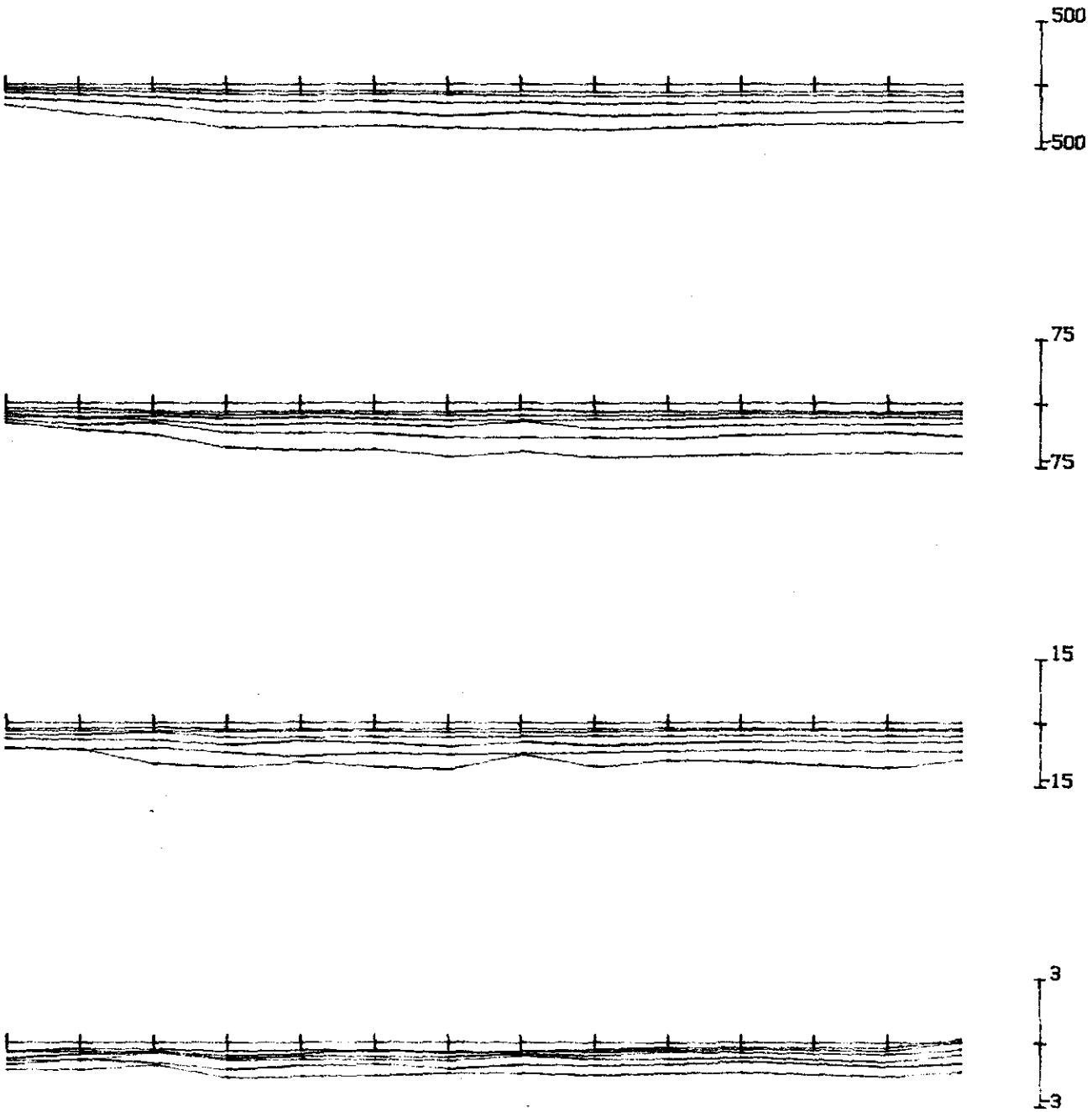
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063180

179



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9650 Component N

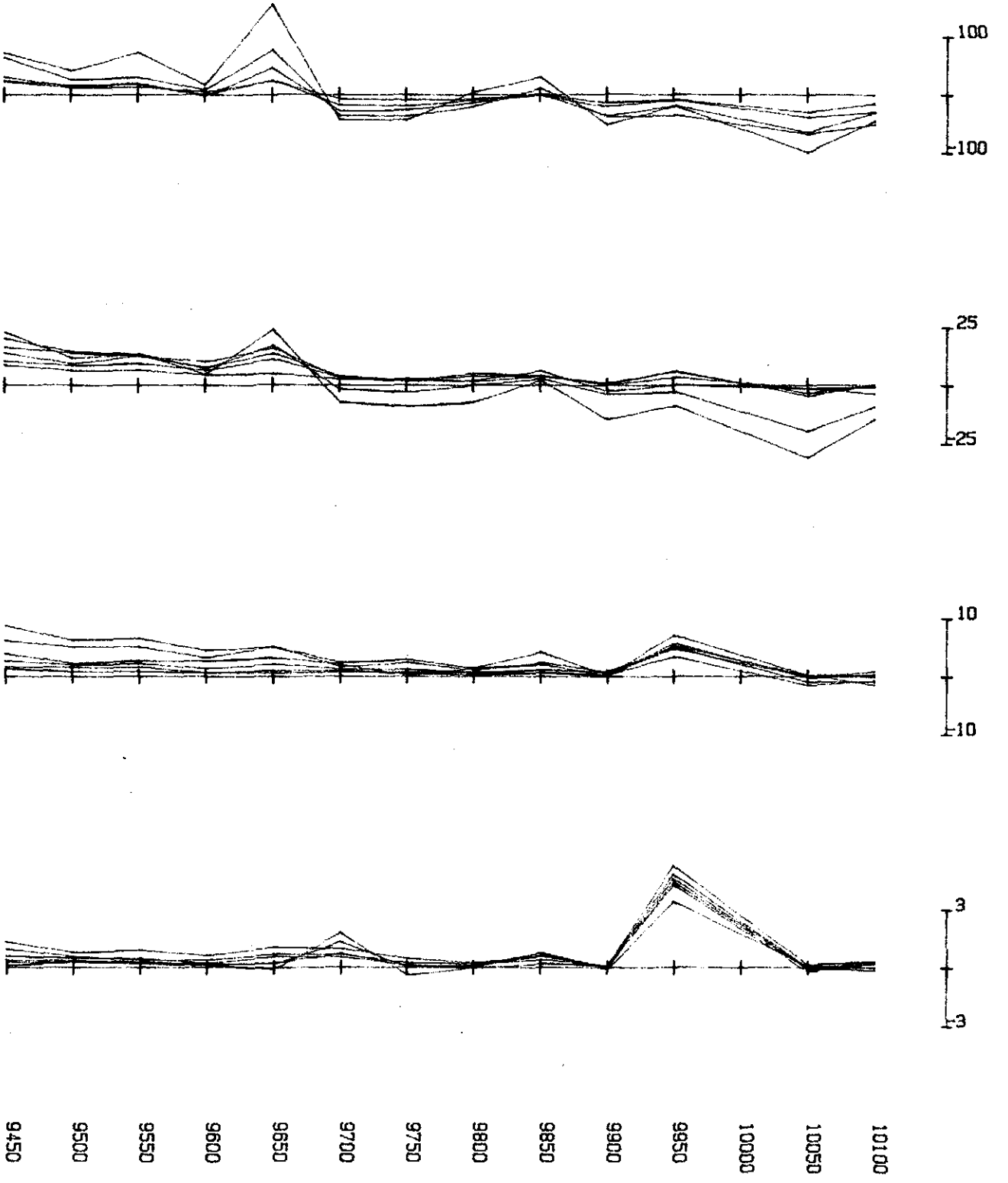
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063181

180



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9650 Component E

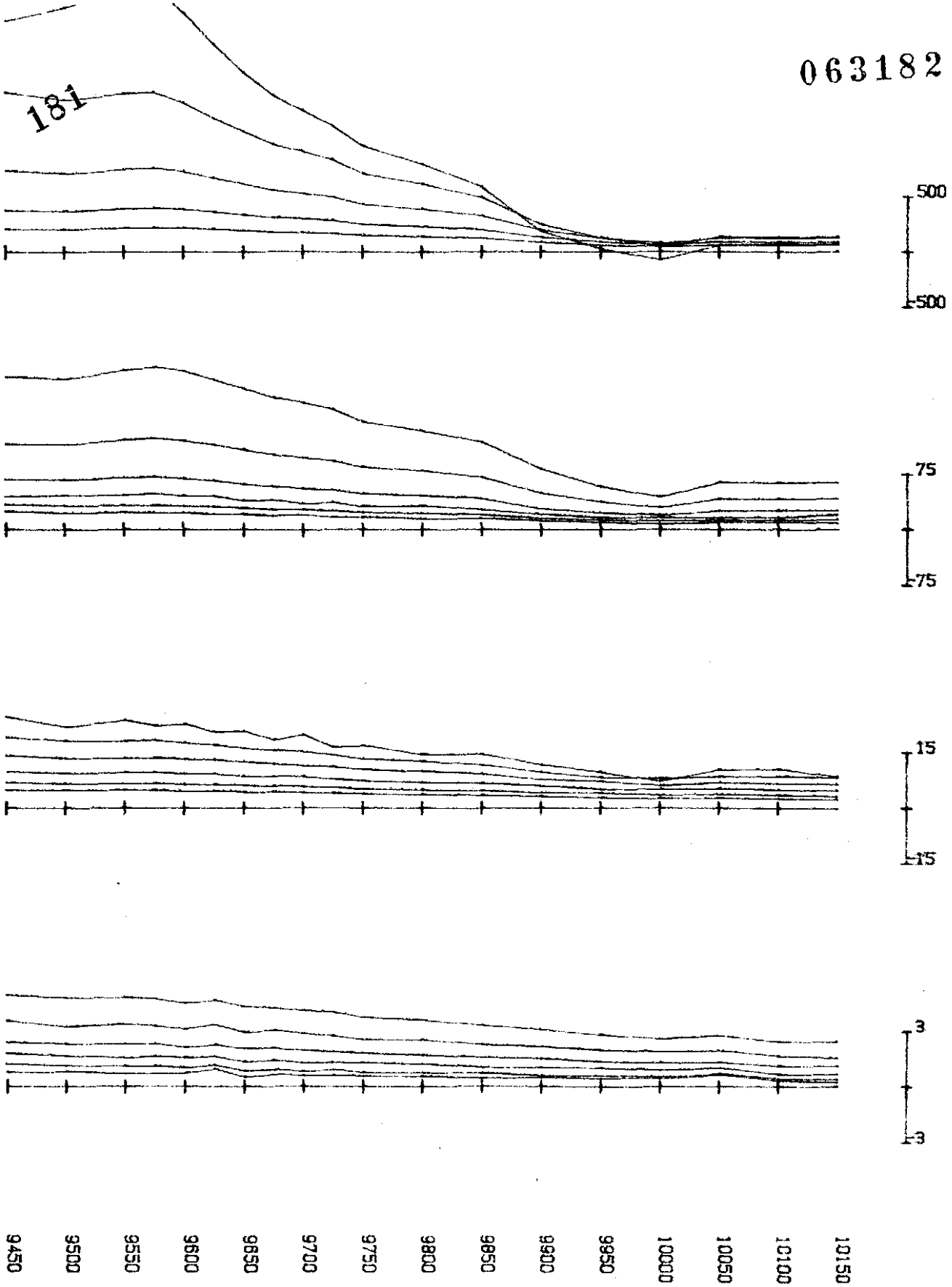
Scale 1 : 4333.

5 cm

P & V GEOPHYSICAL SERVICES

063182

181



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9750 Component D

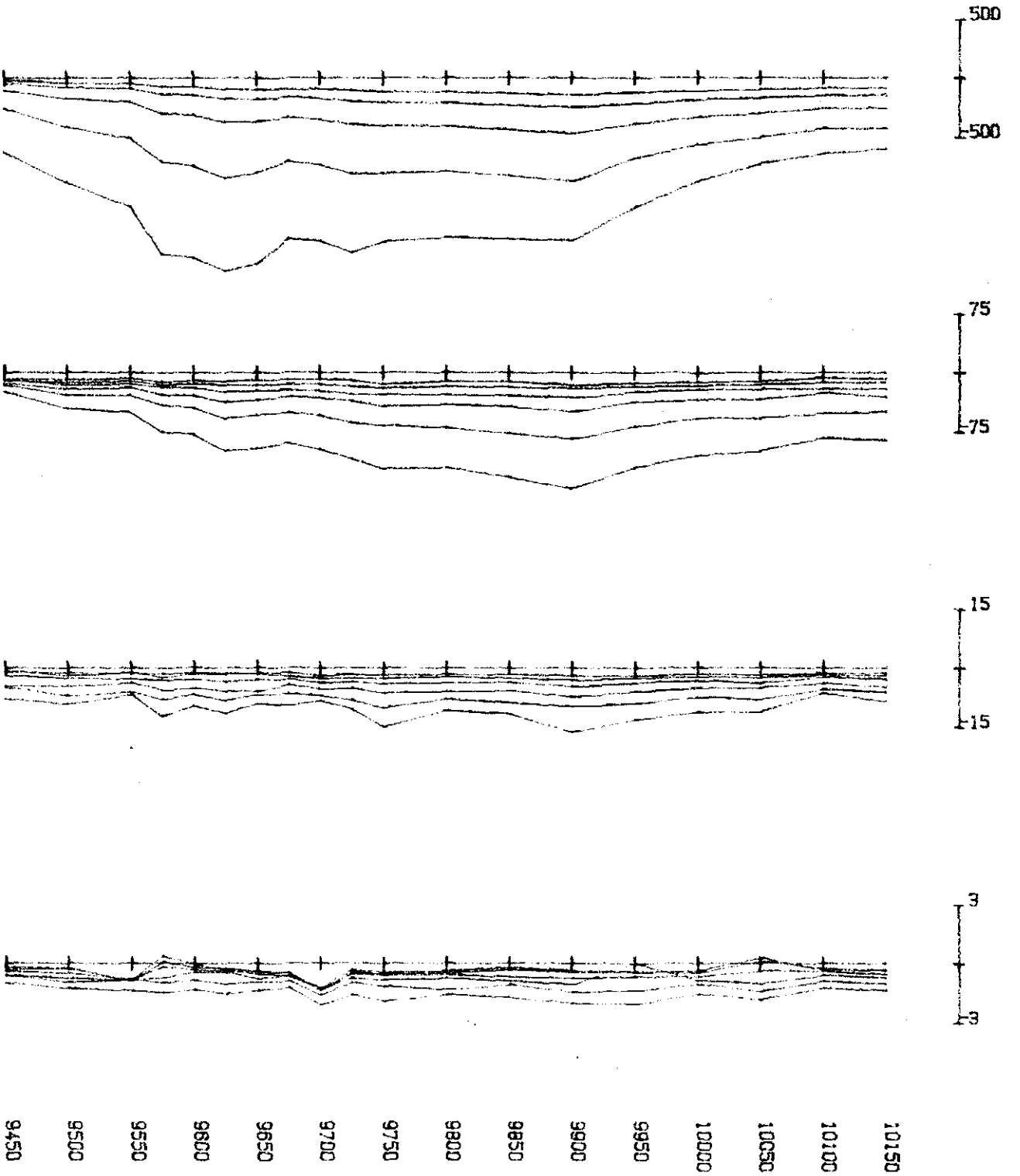
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

063183

182



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9750 Component N

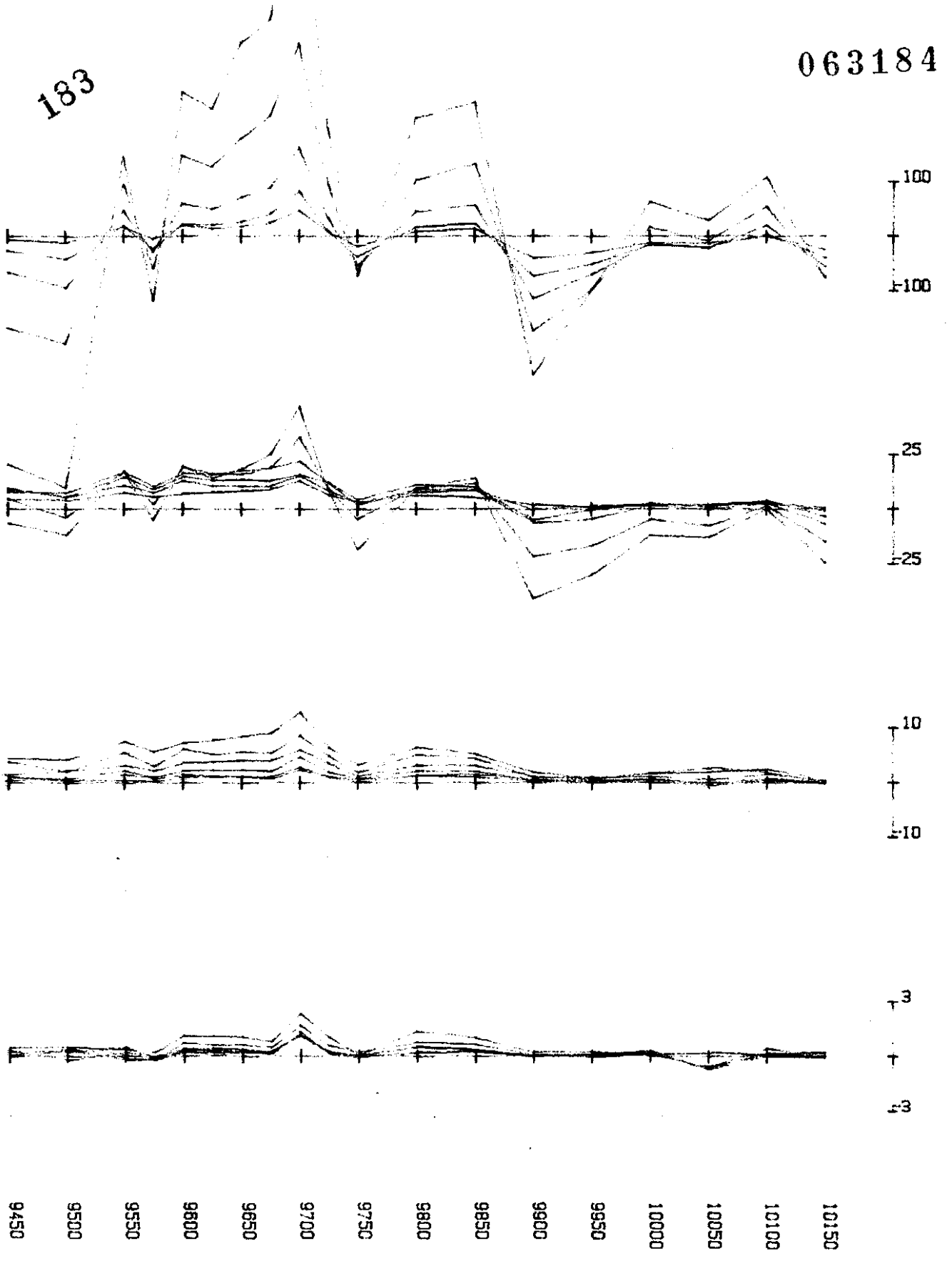
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

063184

183



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9750 Component E

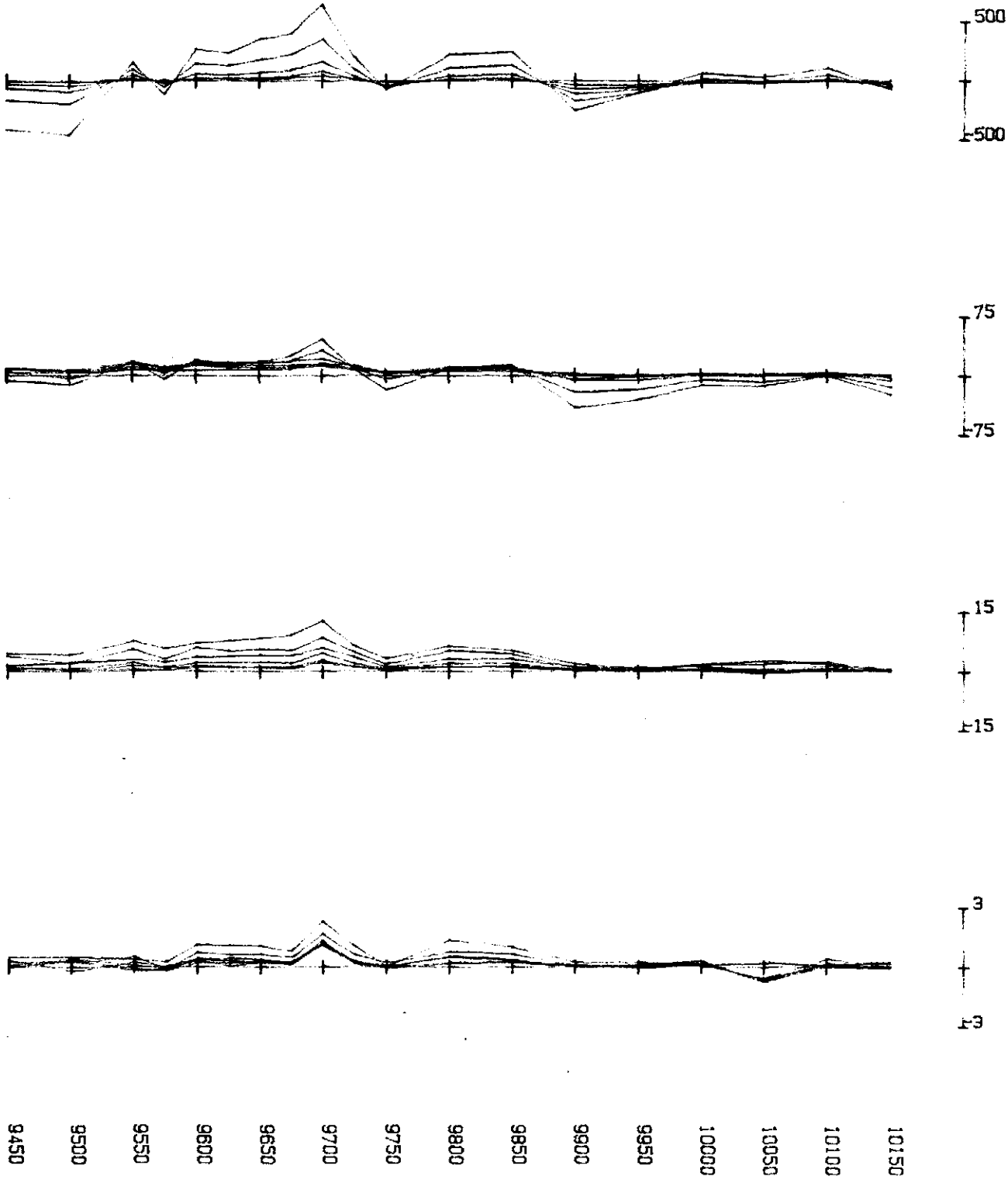
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

063185

184



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9750 Component E

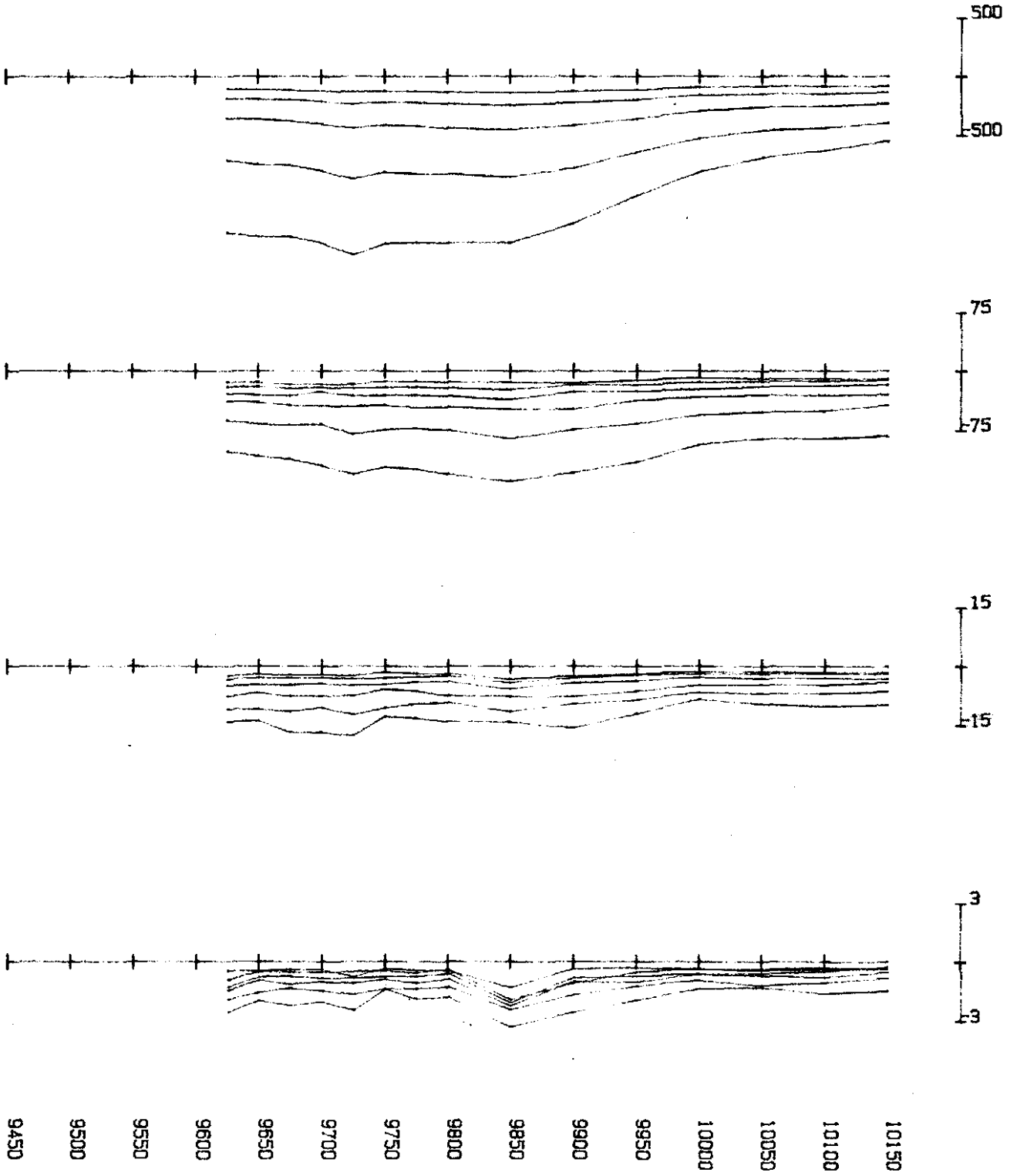
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

185

063186



EM37 PLOT Client Area CARTERS

Loop CA1 Line 9850 Component N

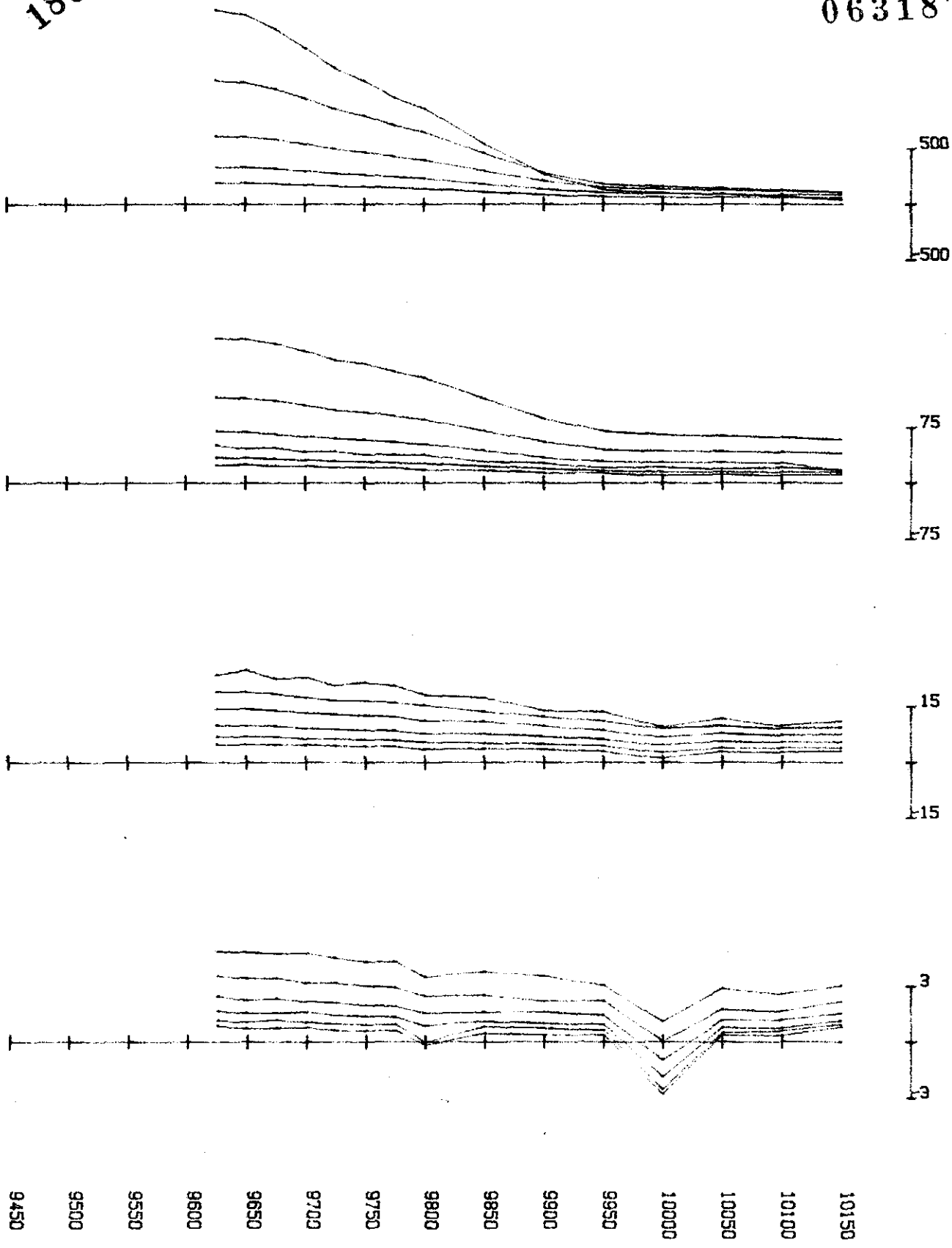
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

186

063187



EM37 PLOT Client Area CARTERS

Loop CA1 Line 9850 Component D

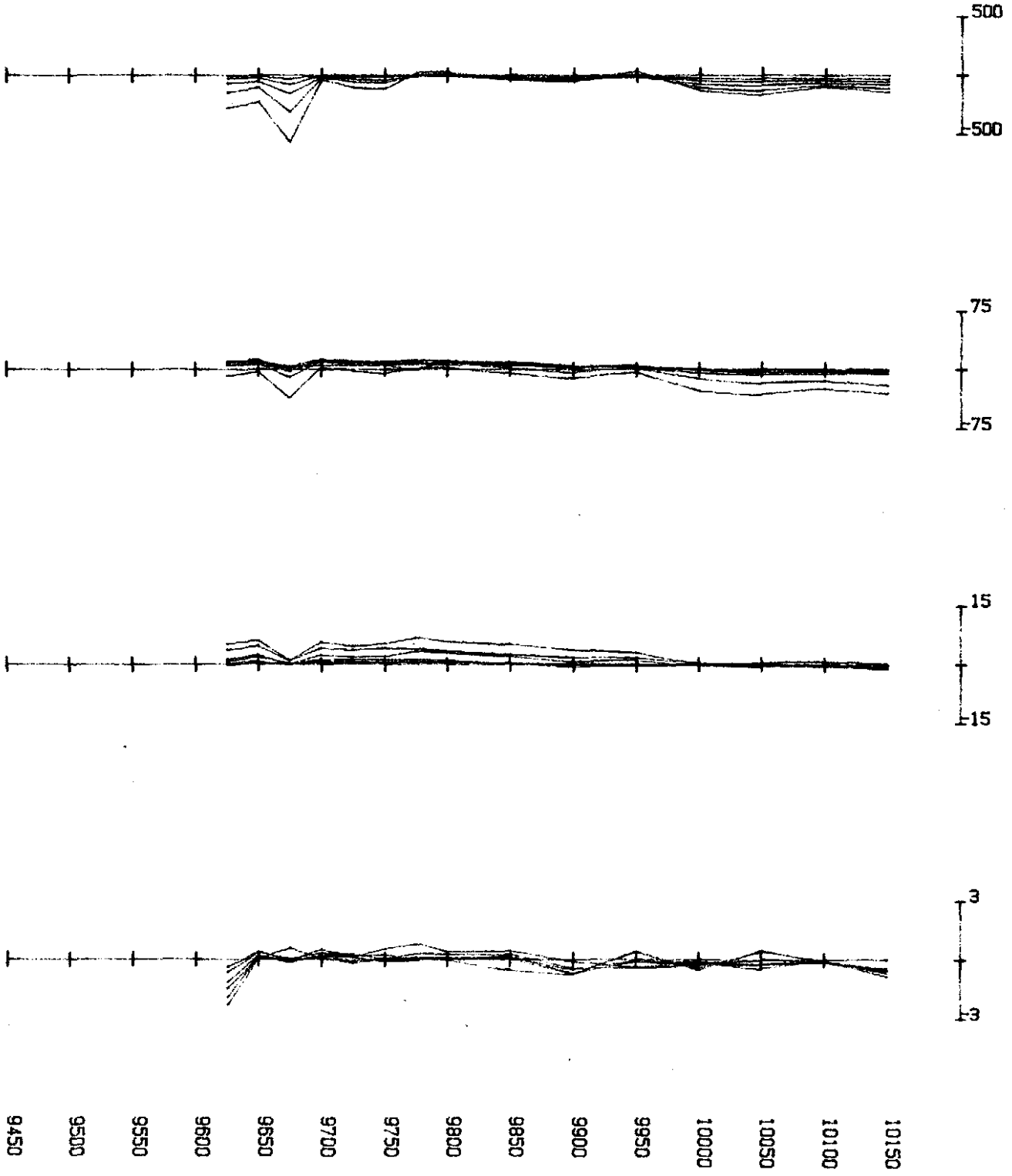
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

187

063188



EM37 PLOT Client Area CARTERS

Loop CA1 Line 9850 Component E

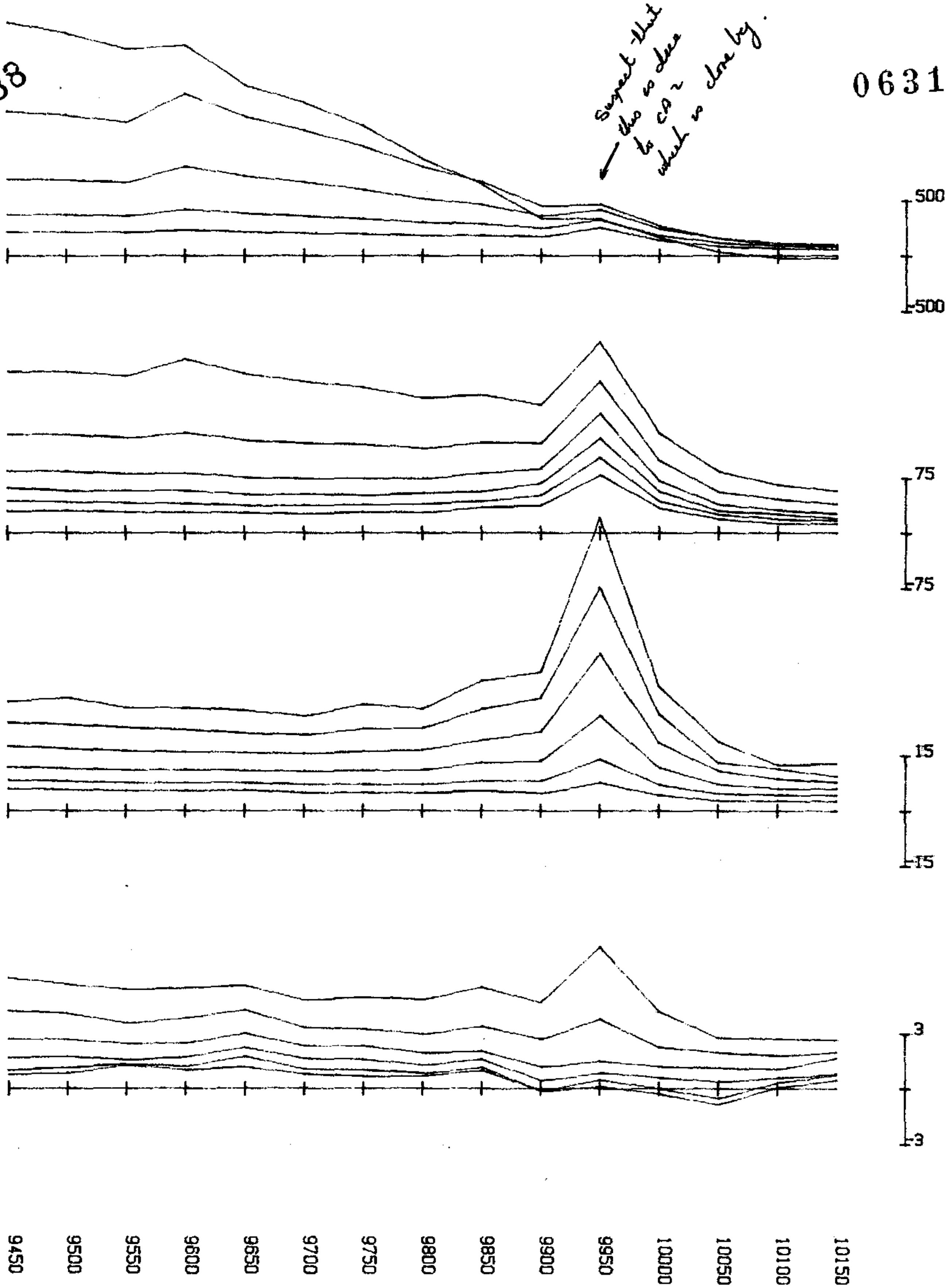
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

188

063189



EM37 PLOT | Client AMOCO | Area CARTERS

Loop ~~CA1~~ Tx 6 | Line 9950 | Component D

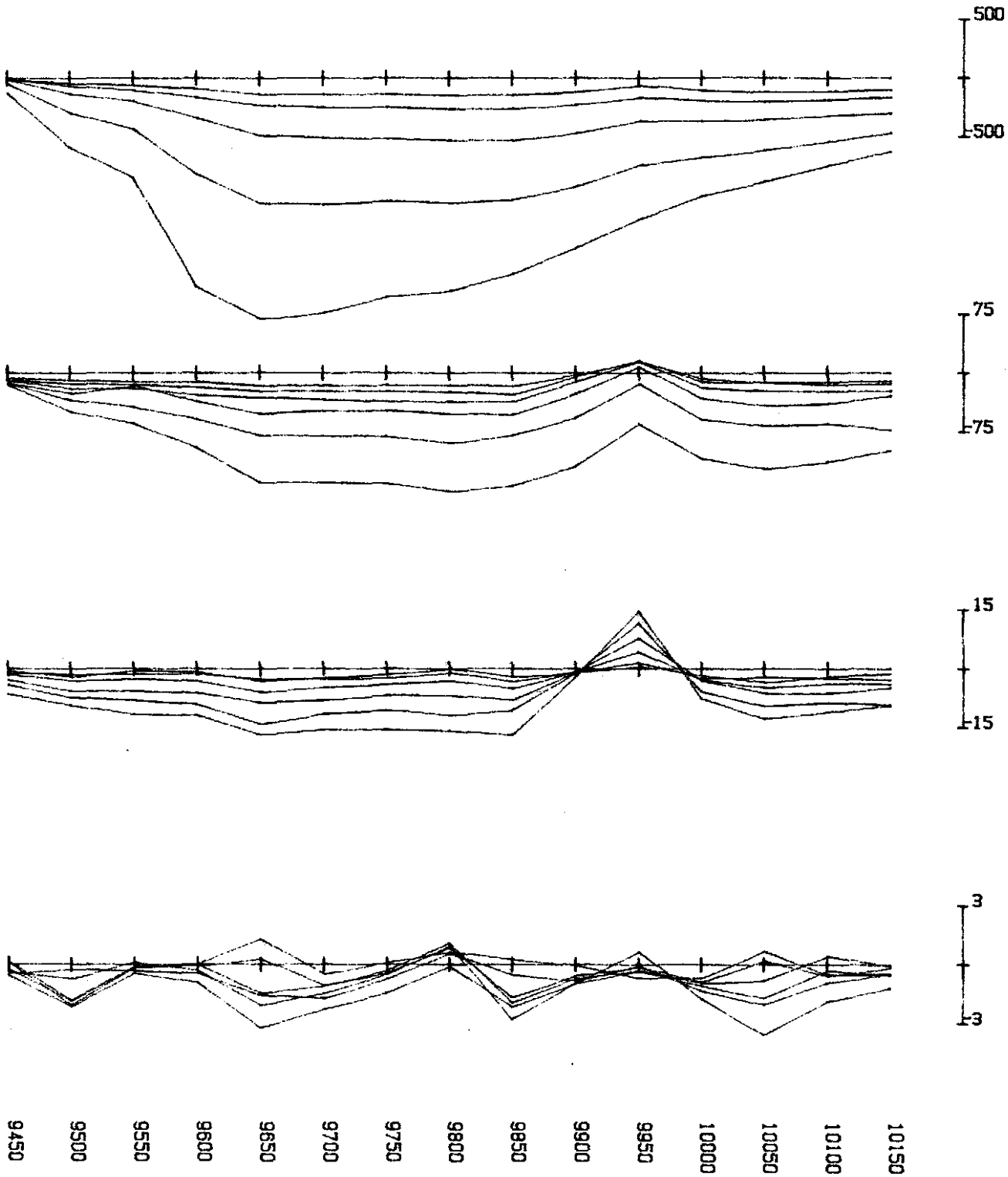
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

189

063190



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9950 Component N

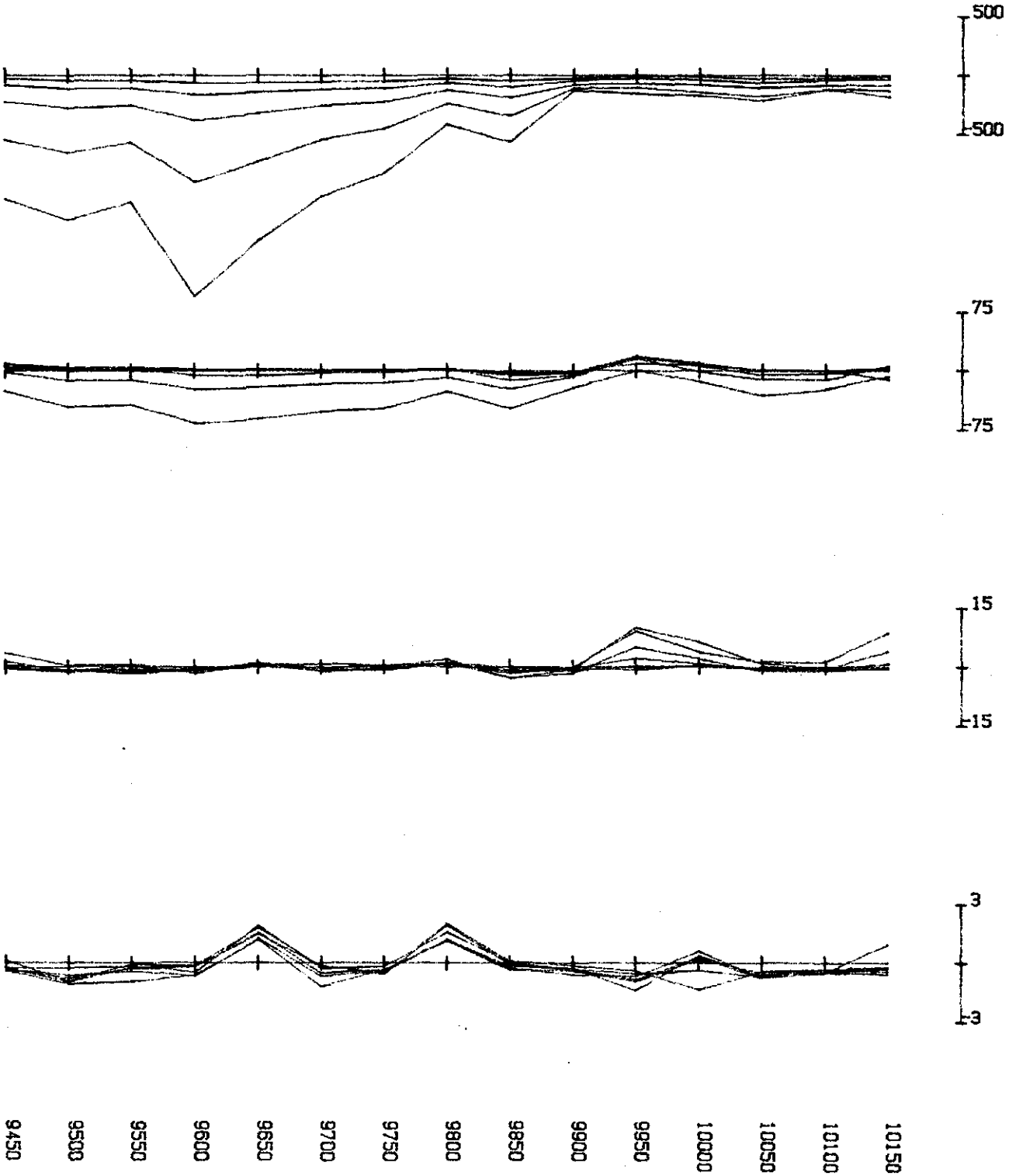
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

063191

190



EM37 PLOT Client AMOCO Area CARTERS

Loop CA1 Line 9950 Component E

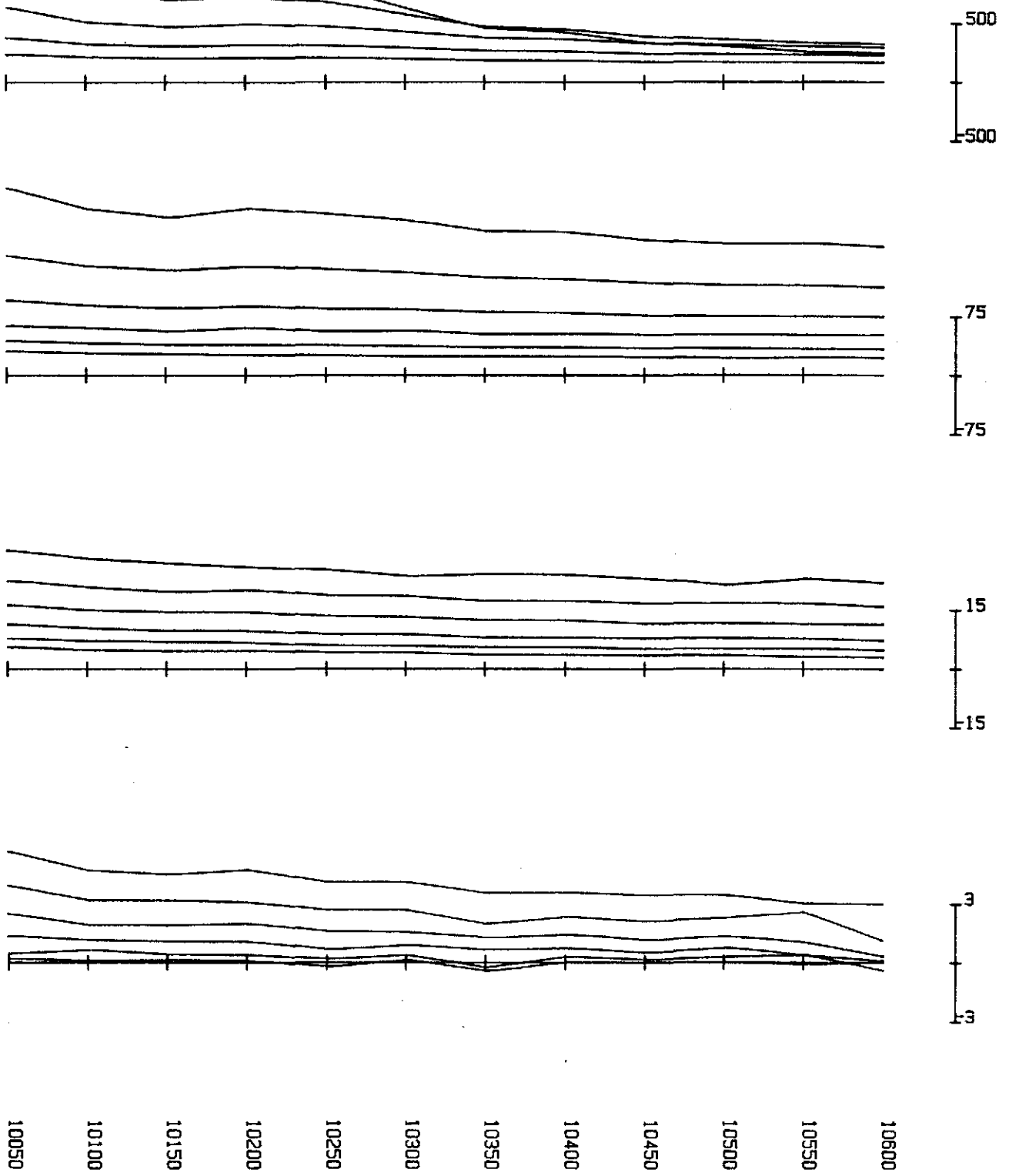
Scale 1 : 4667.

5 cm

P & V GEOPHYSICAL SERVICES

191

063192



EM37 PLOT Client AMOCO Area CARTERS

Loop ~~CA2~~ Tx 7 Line 9950 Component D

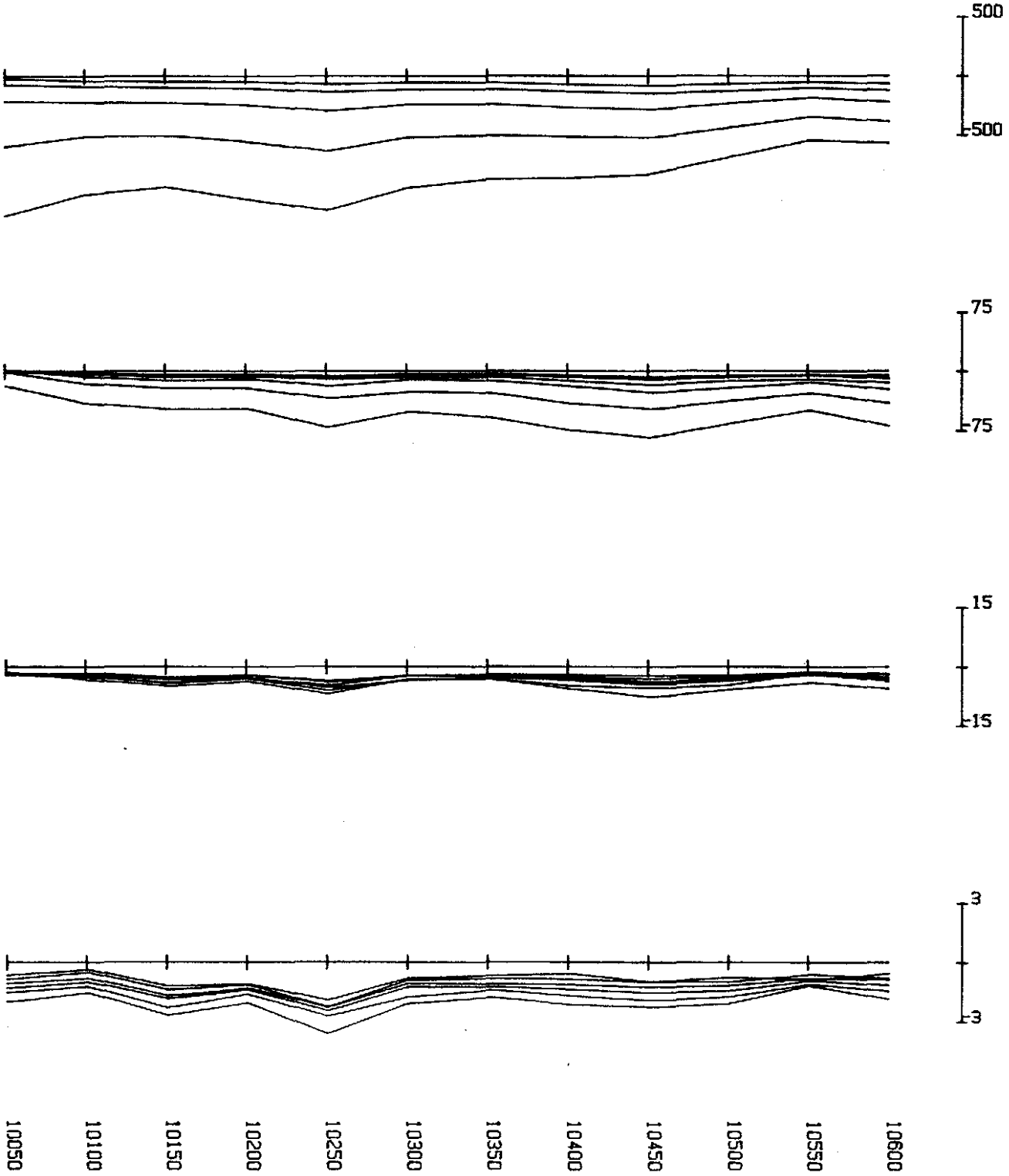
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

192

063193



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 9950 Component N

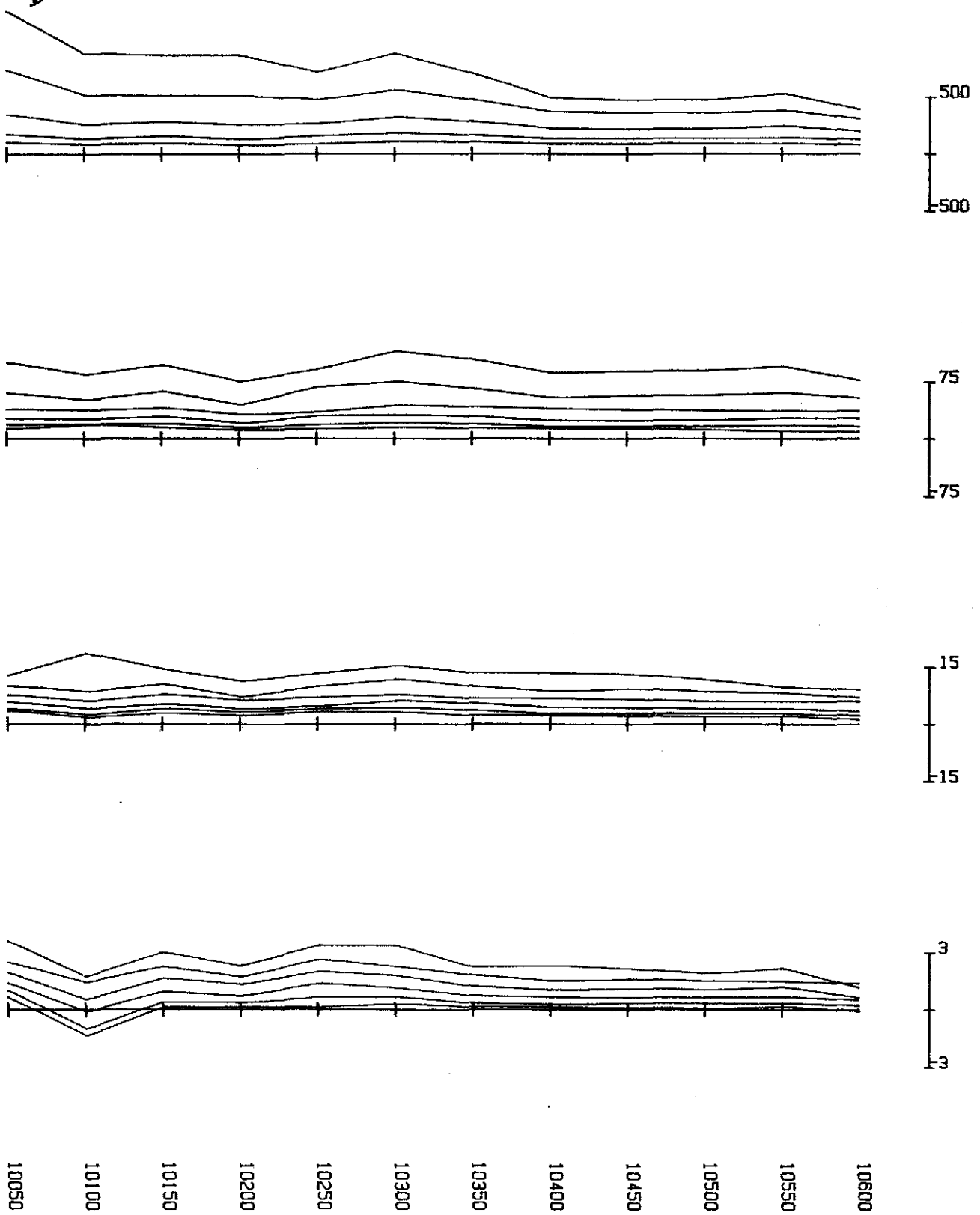
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

193

063194



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 9950 Component E

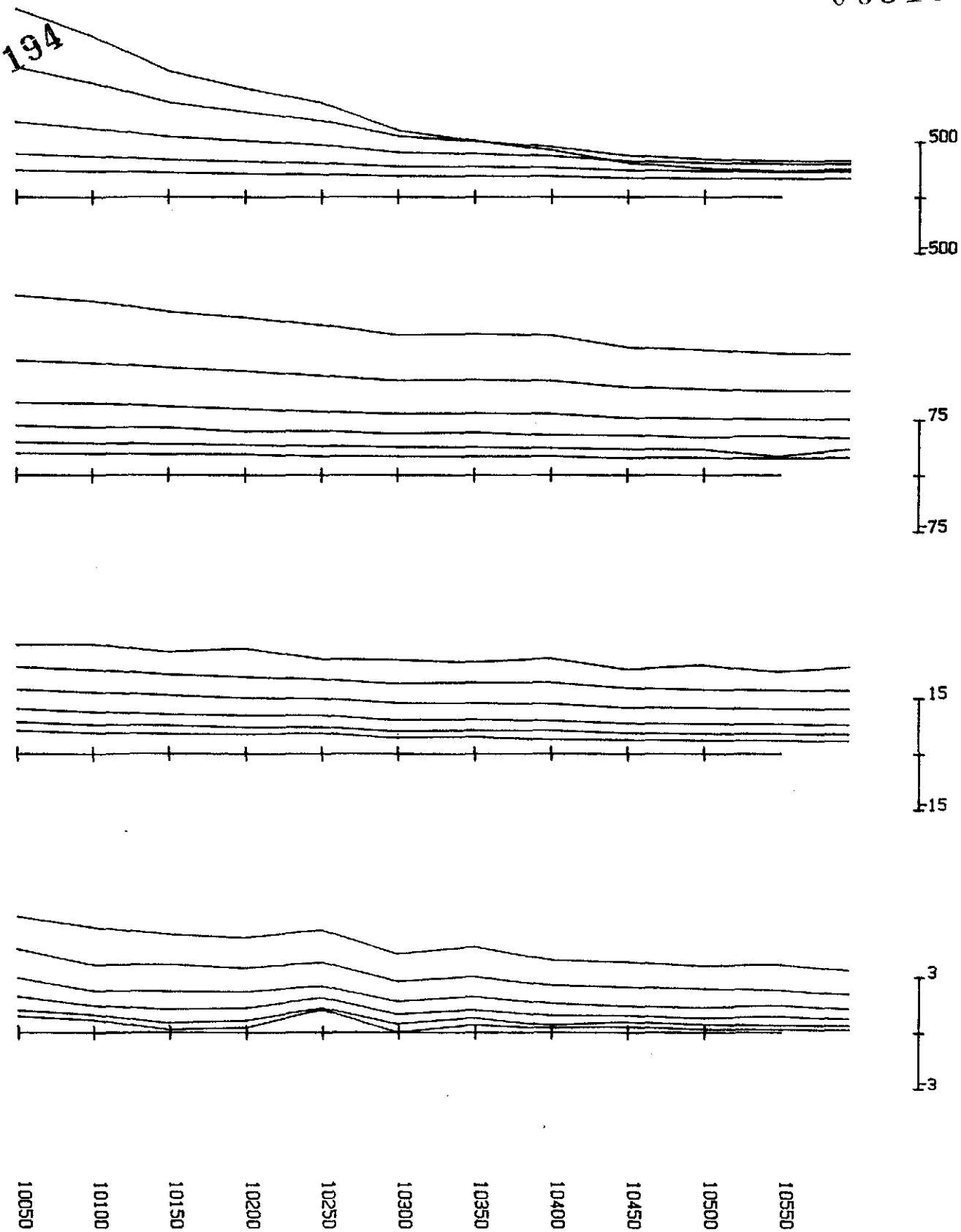
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063195

194



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10050 Component D

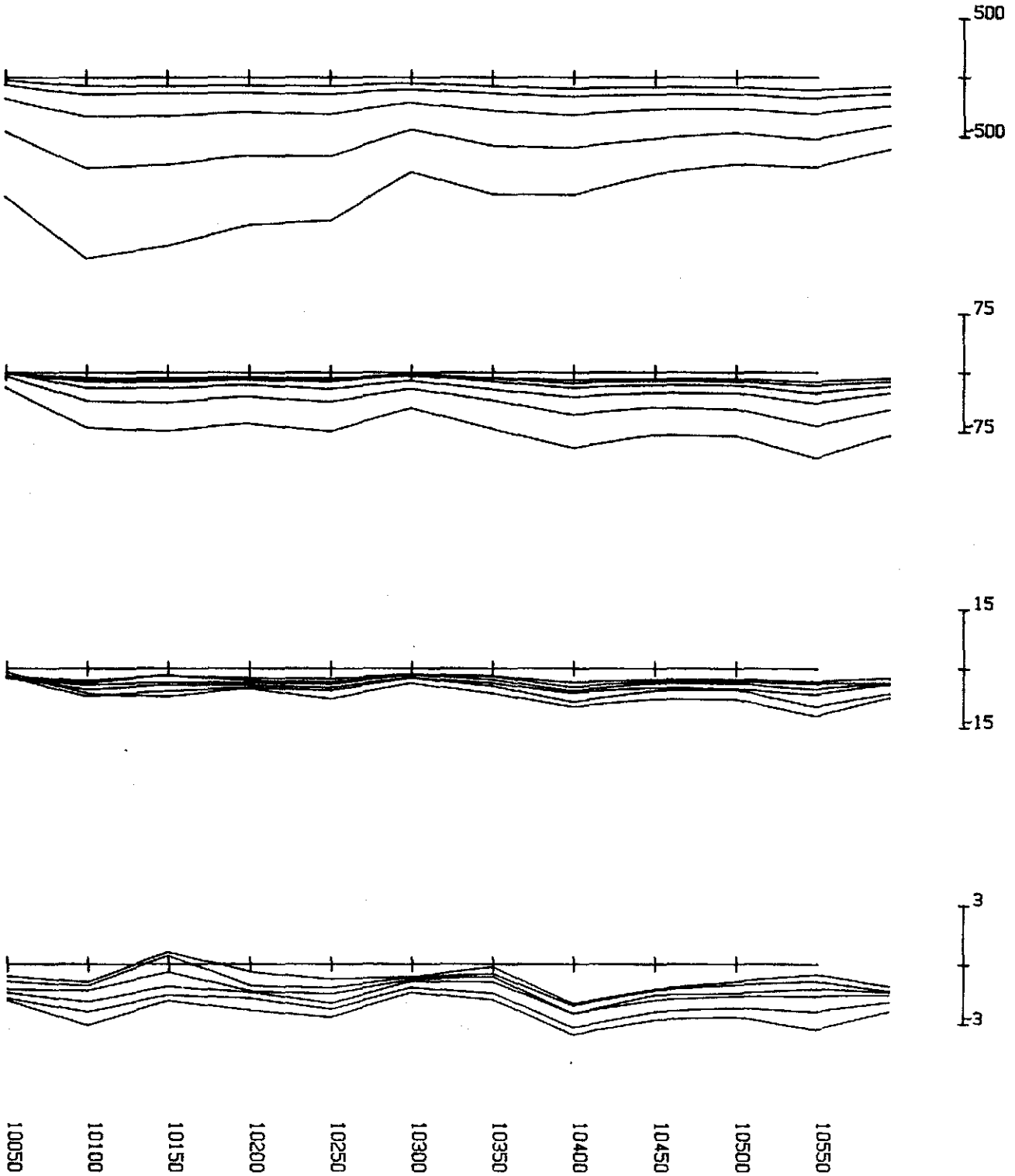
Scale 1 : 3633.

5 cm

P & V GEOPHYSICAL SERVICES

195

063196



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10050 Component N

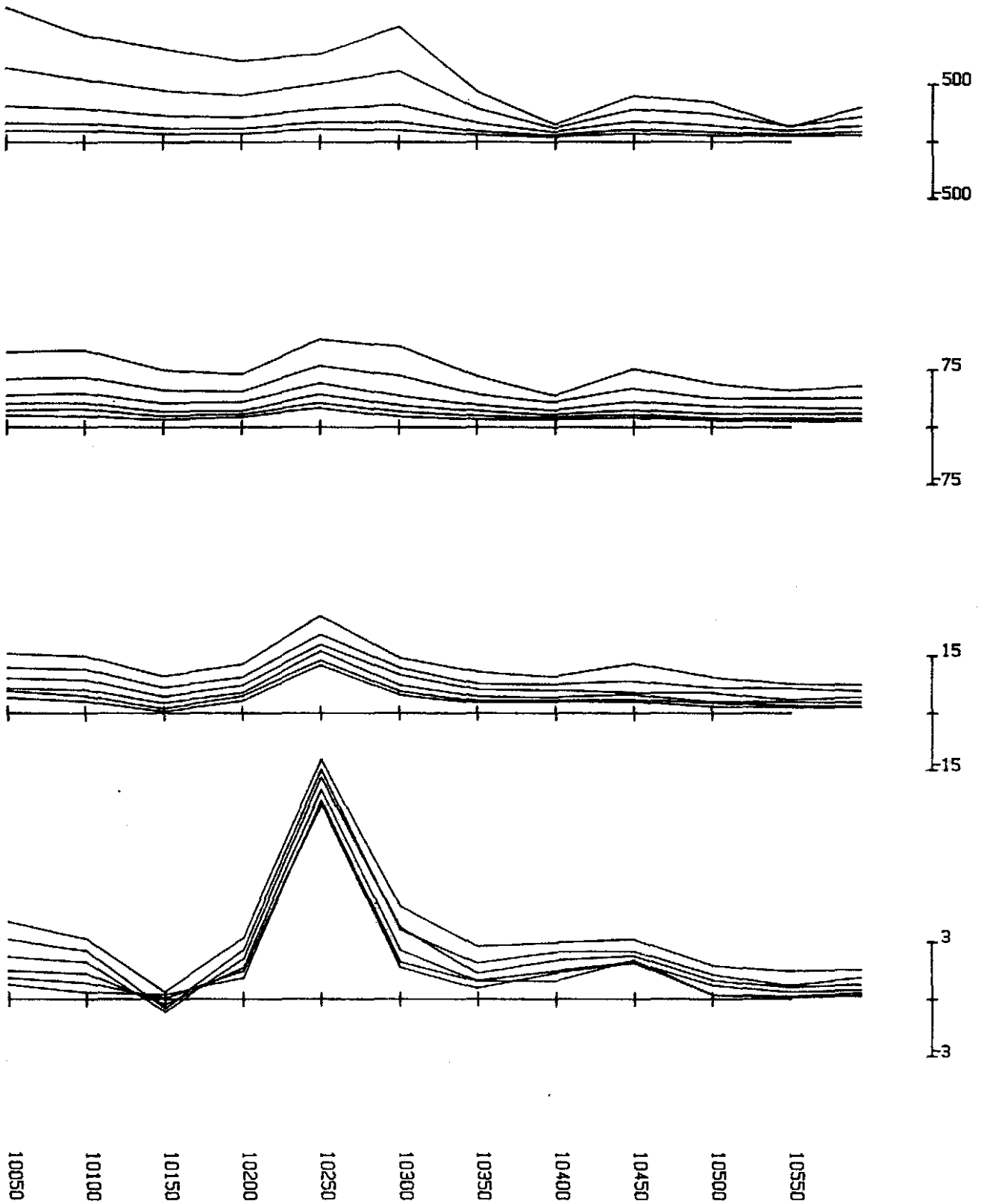
Scale 1 : 3633.

5 cm

P & V GEOPHYSICAL SERVICES

196

063197



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10050 Component E

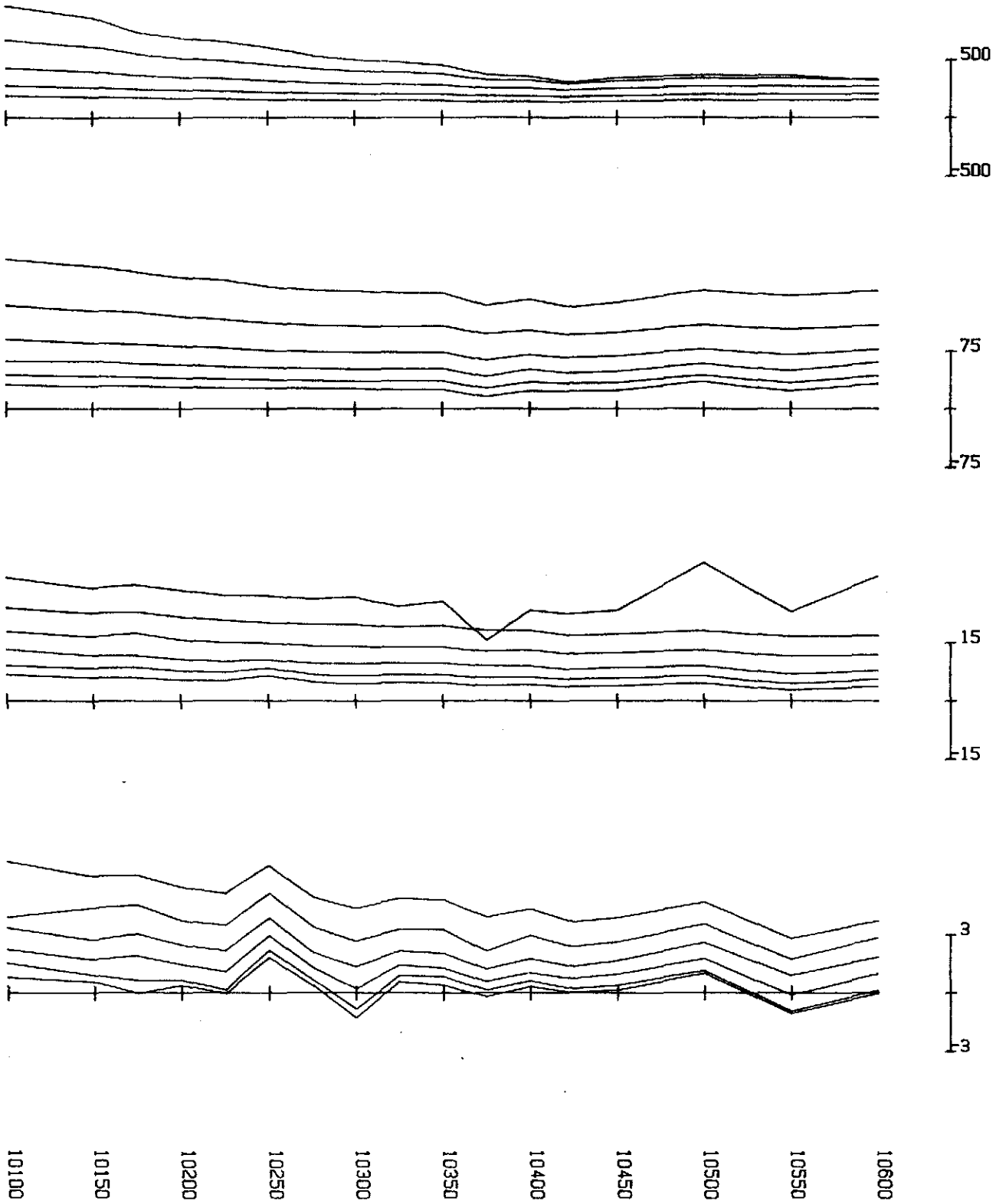
Scale 1 : 3633.

5 cm

P & V GEOPHYSICAL SERVICES

197

063198



EM37 PLOT Client AMOCO Area CARTERS

Loop Line 10150 Component D

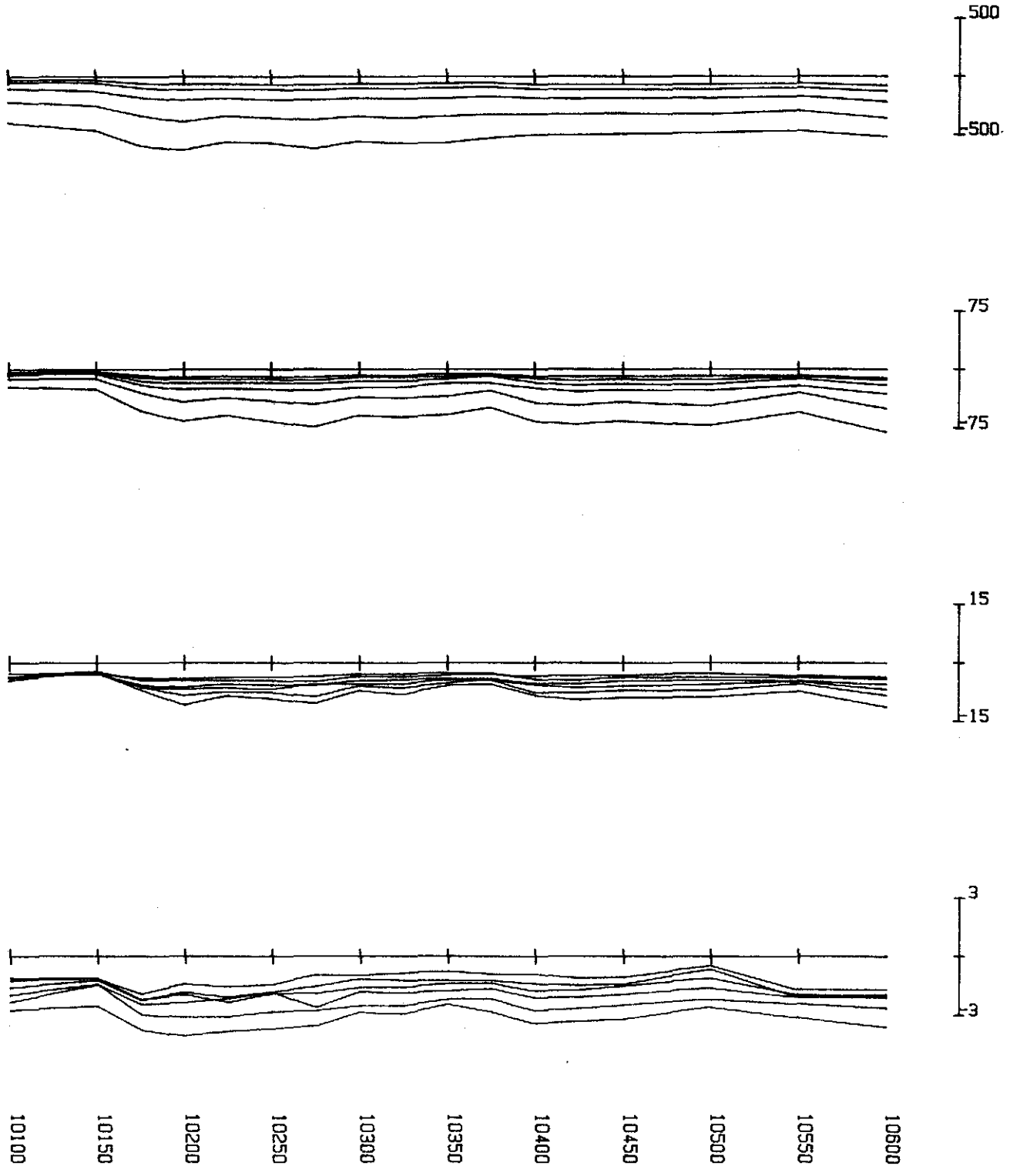
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

198

063199



EM37 PLOT Client AMOCO Area CARTERS

Loop Line 10150 Component N

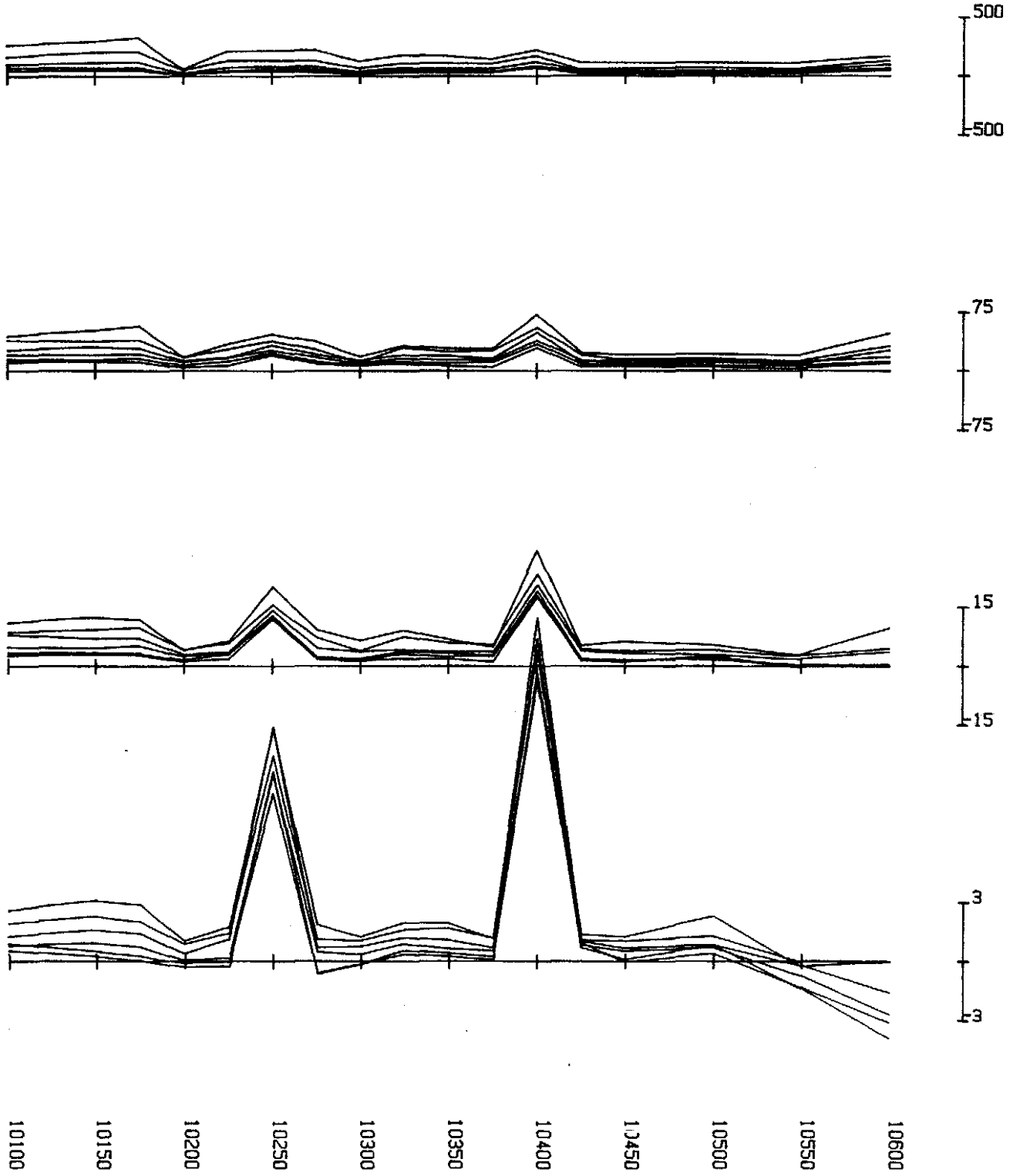
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

199

063200



EM37 PLOT Client AMOCO Area CARTERS

Loop Line 10150 Component E

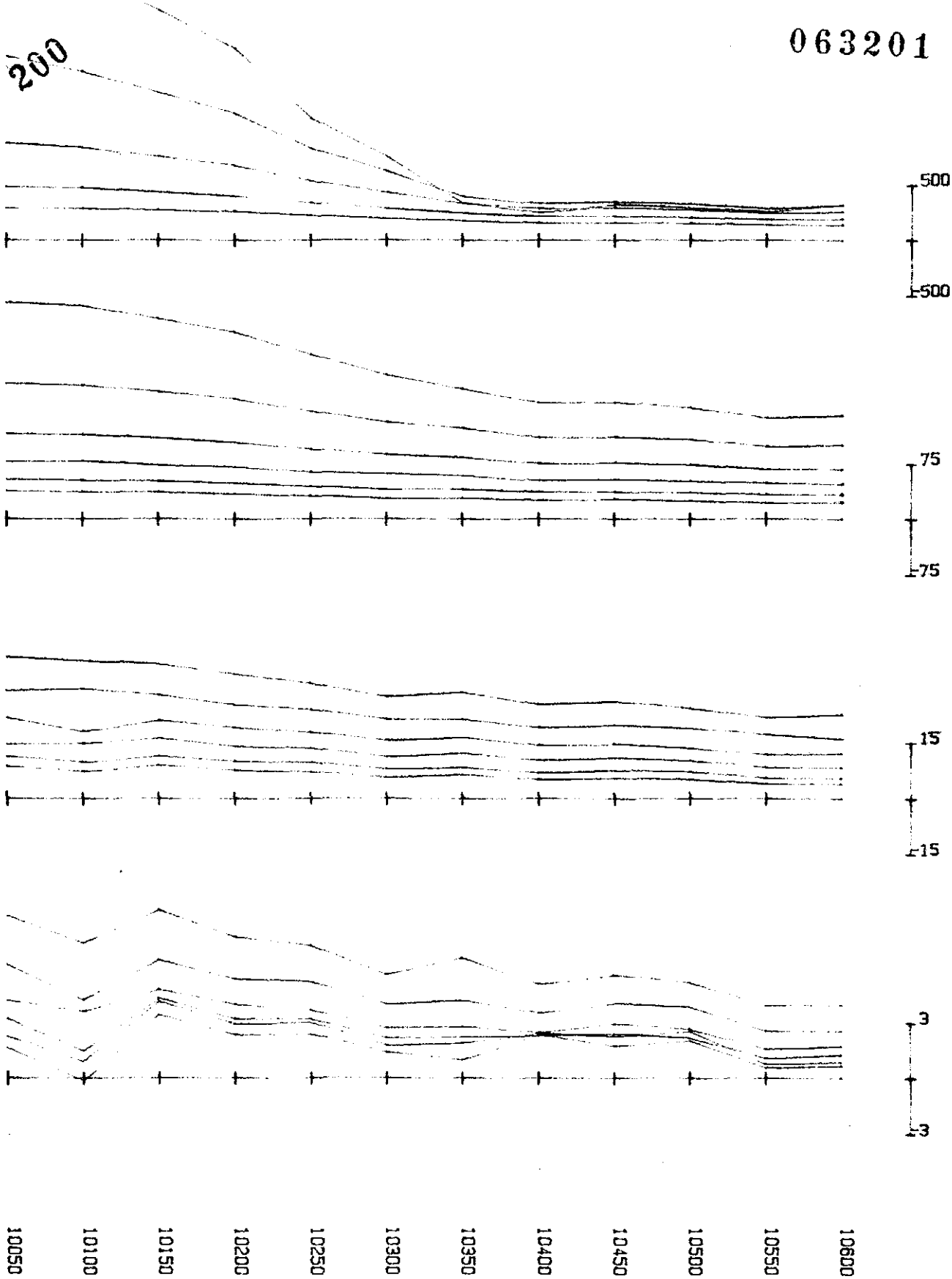
Scale 1 : 3333.

5 cm

P & V GEOPHYSICAL SERVICES

200

063201



EM37 PLOT Client AMOCO Area CARTERS

Loop Line 10250 Component D

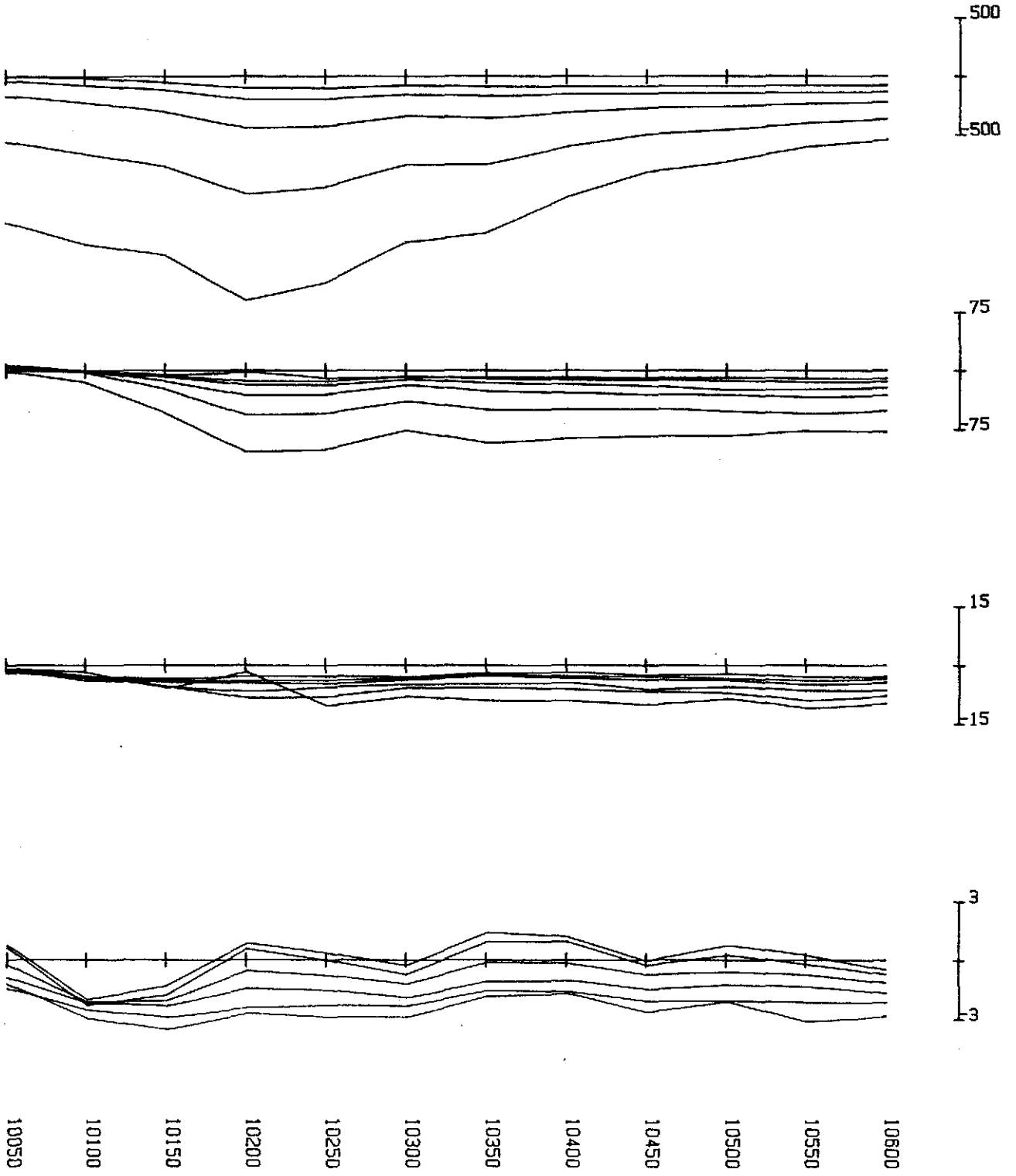
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

201

063202



EM37 PLOT Client AMOCO Area CARTERS

Loop Line ~~10150~~ 10250 Component N

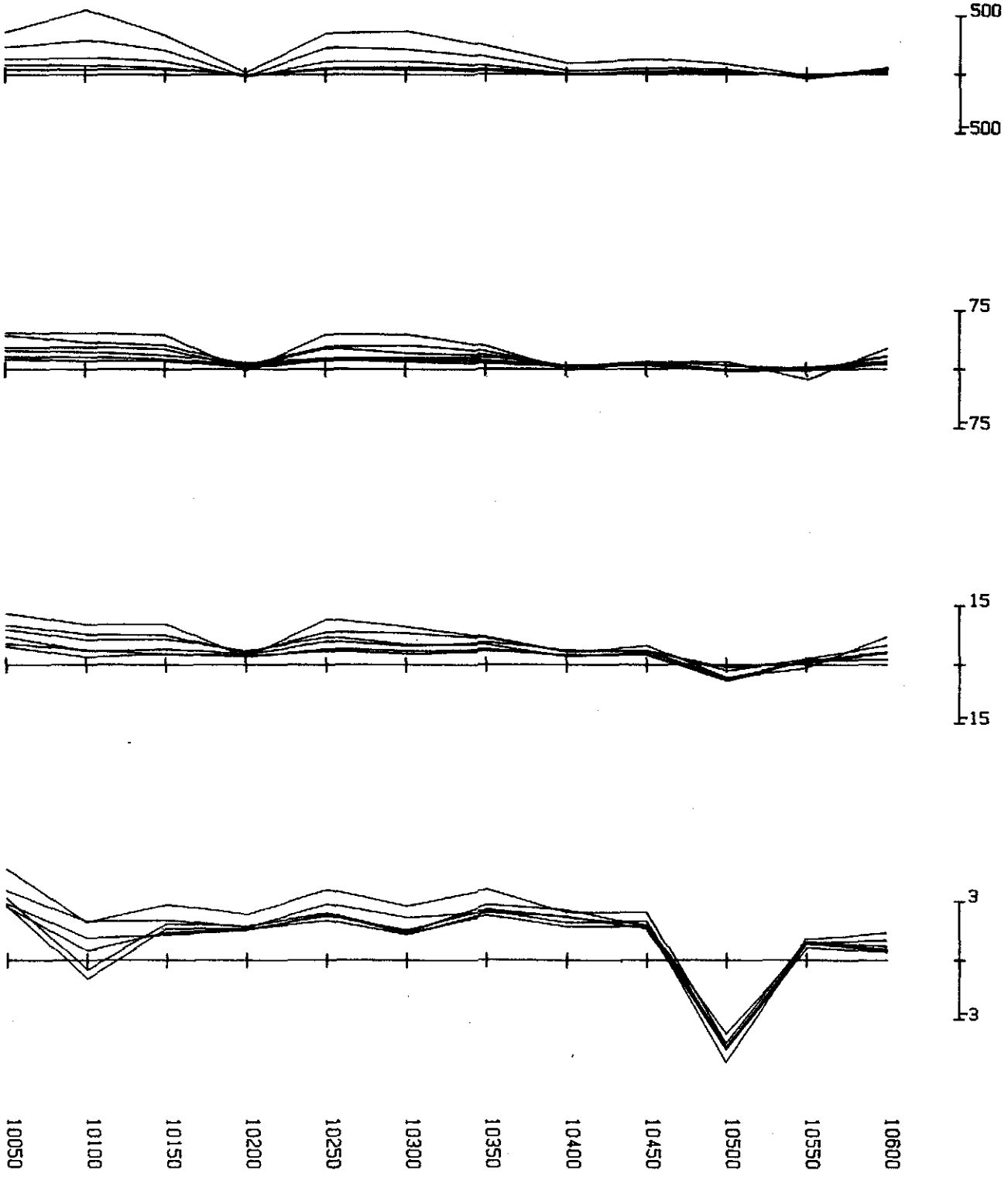
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

202

063203



EM37 PLOT Client AMOCO Area CARTERS

Loop Line ~~10150~~ 10250 Component E

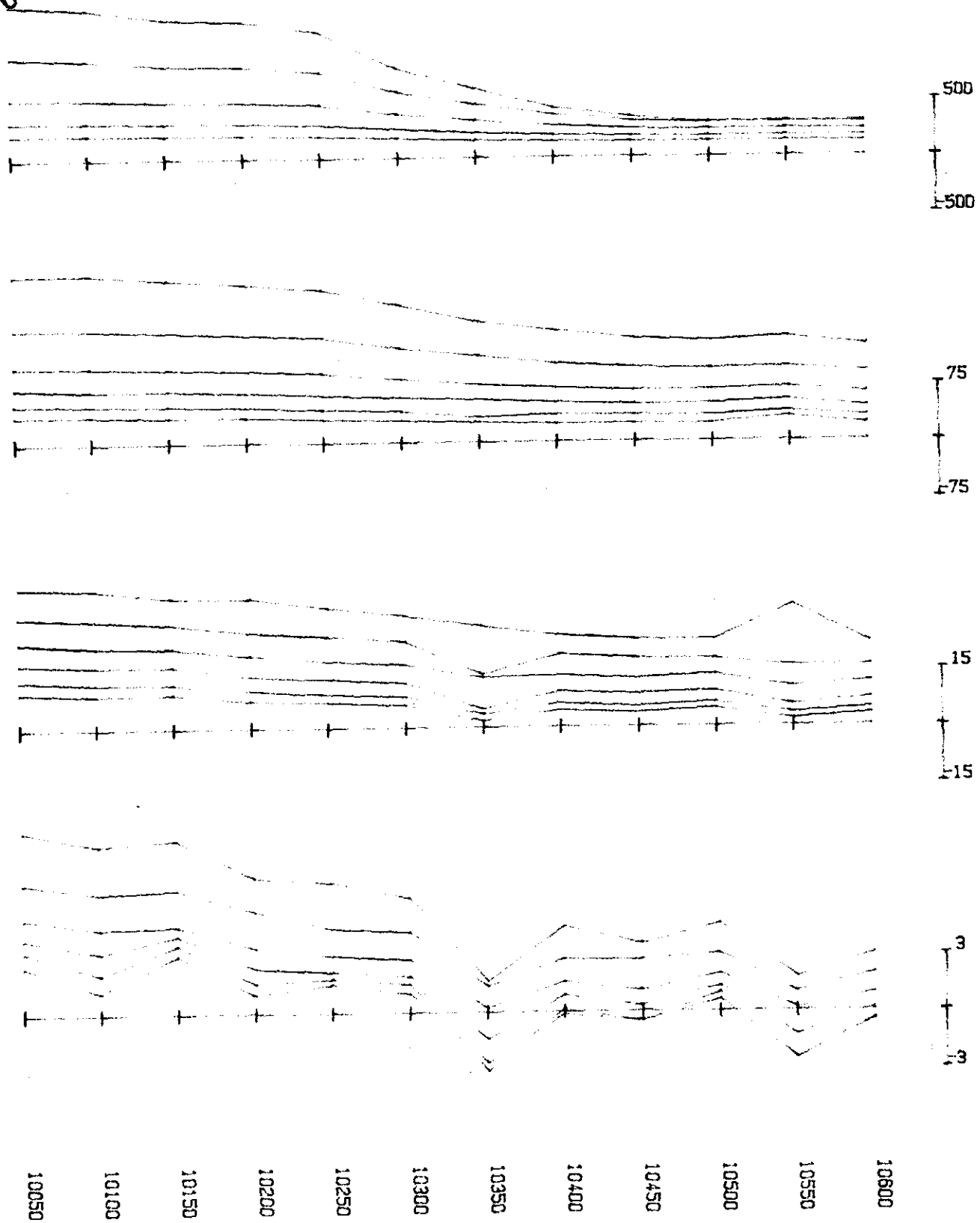
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063204

203



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10350 Component D

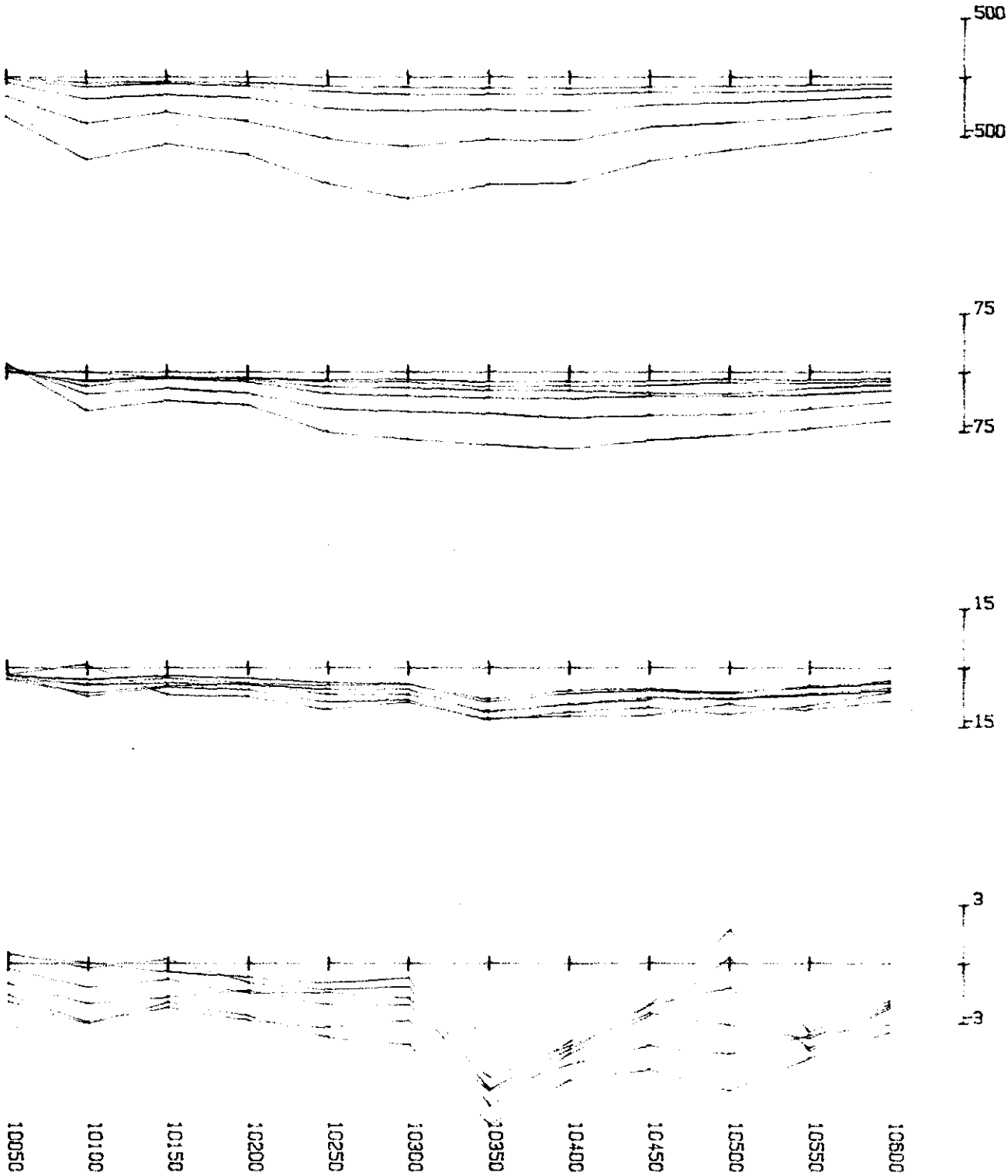
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

204

063205



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10350 Component N

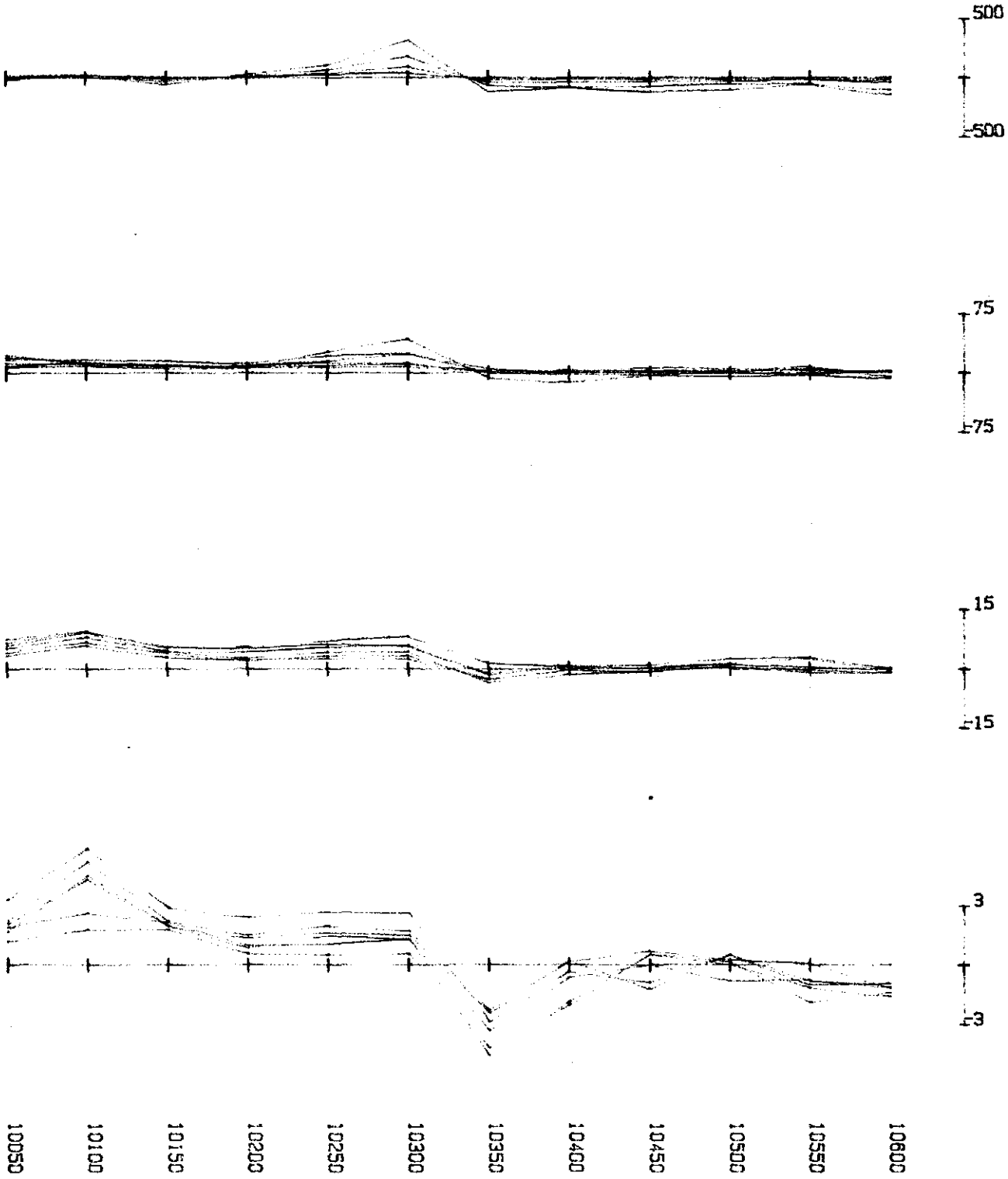
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

205

063206



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10350 Component E

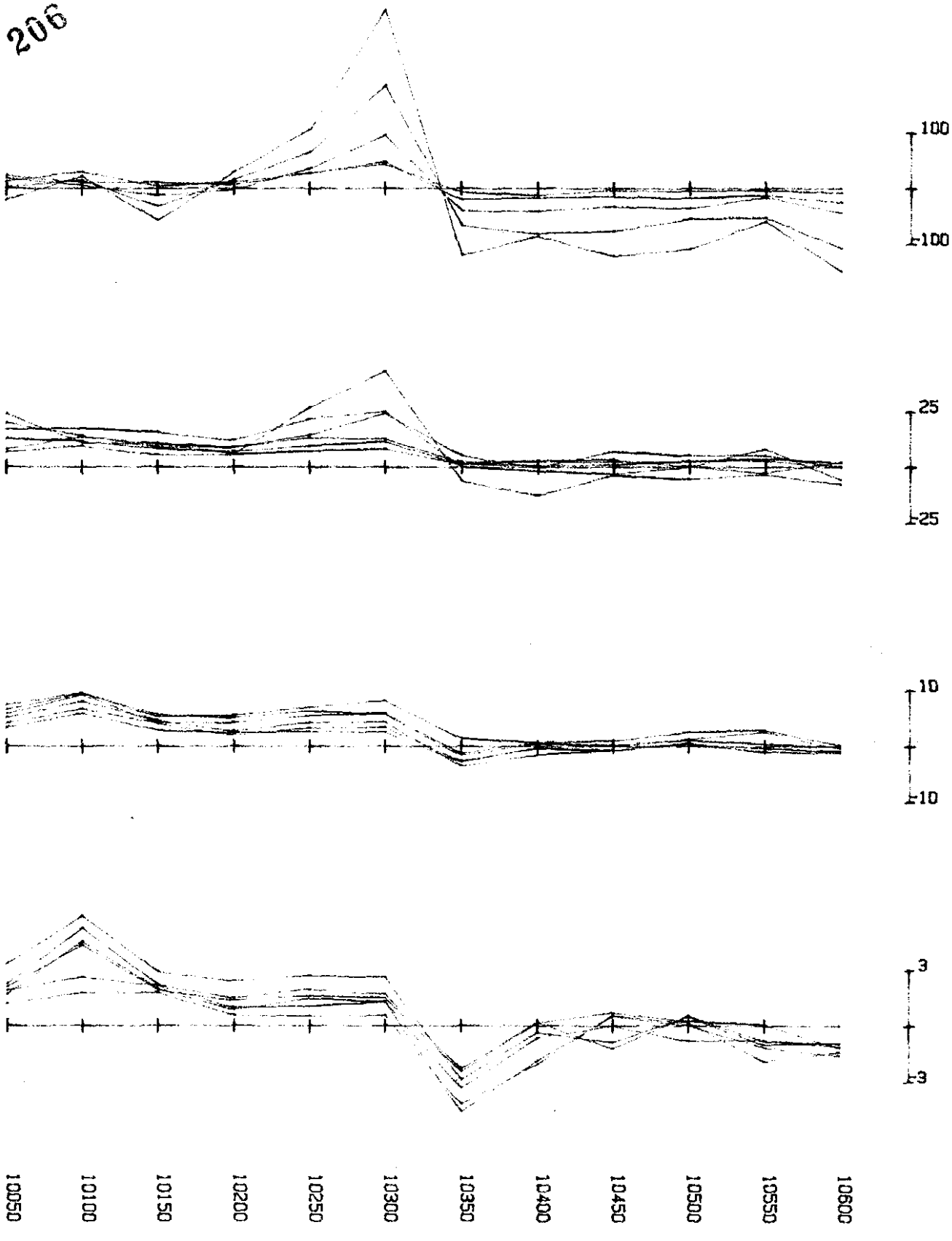
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063207

206



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10350 Component E

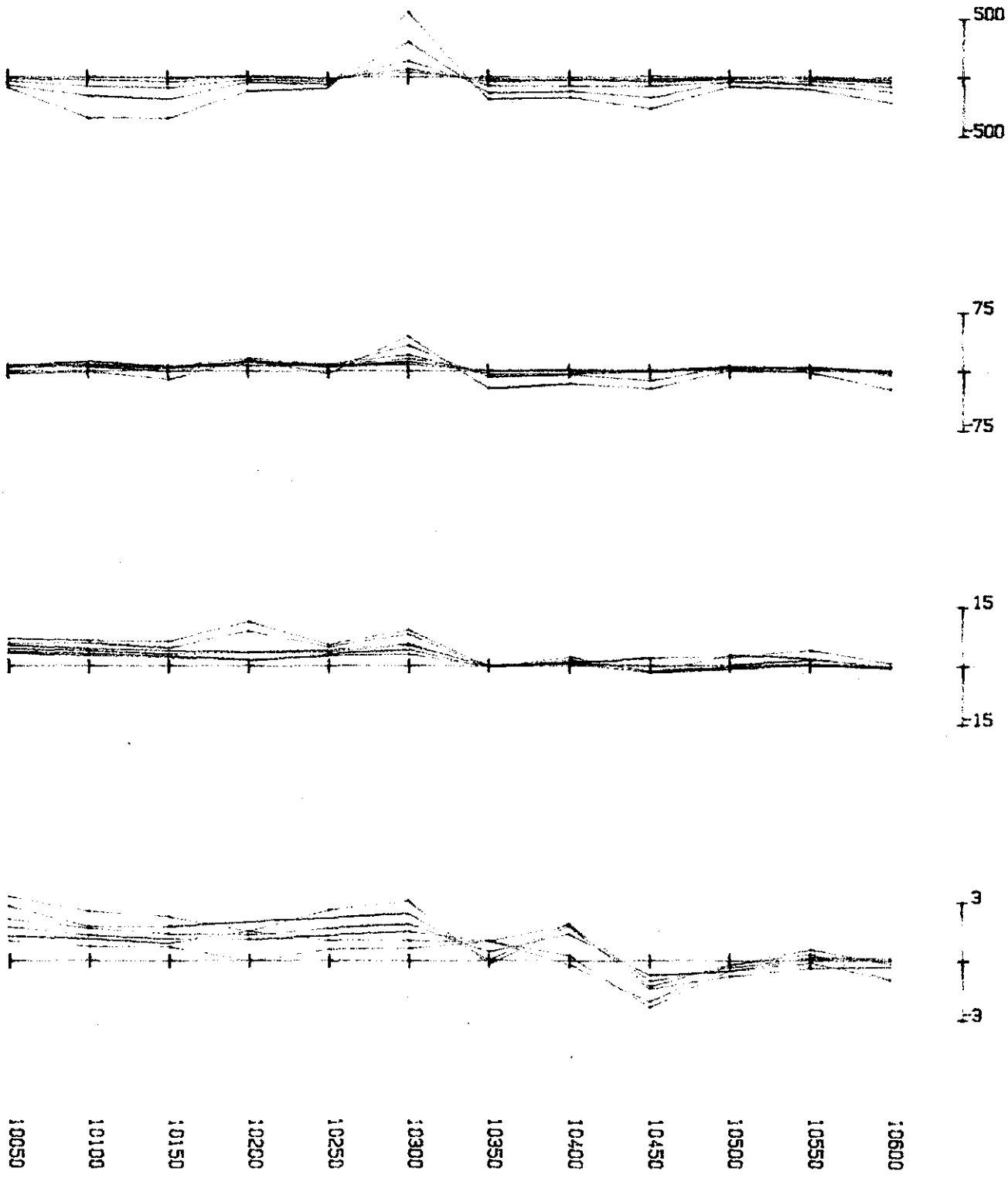
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

207

063208



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10450 Component E

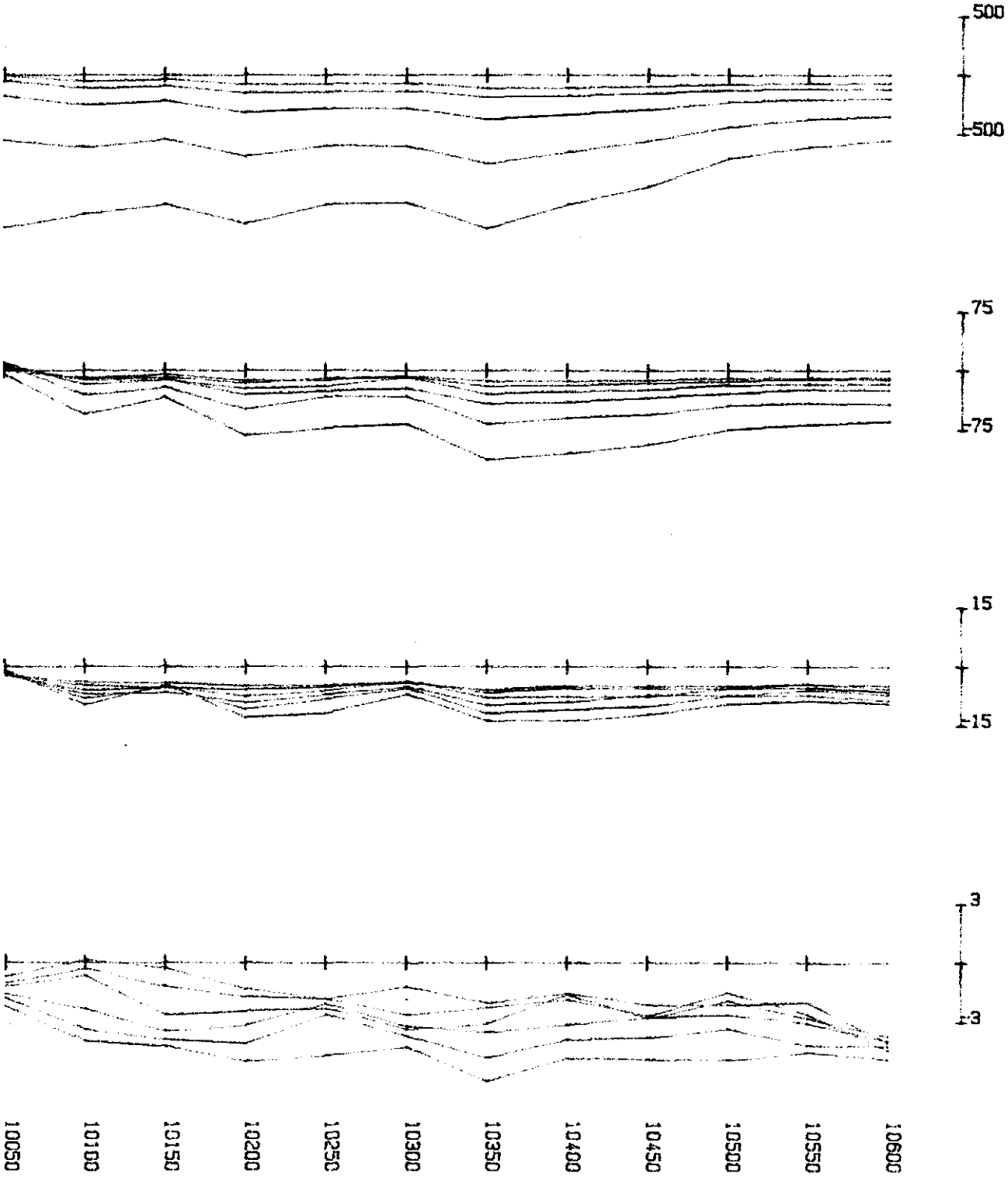
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

308

063209



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10450 Component N

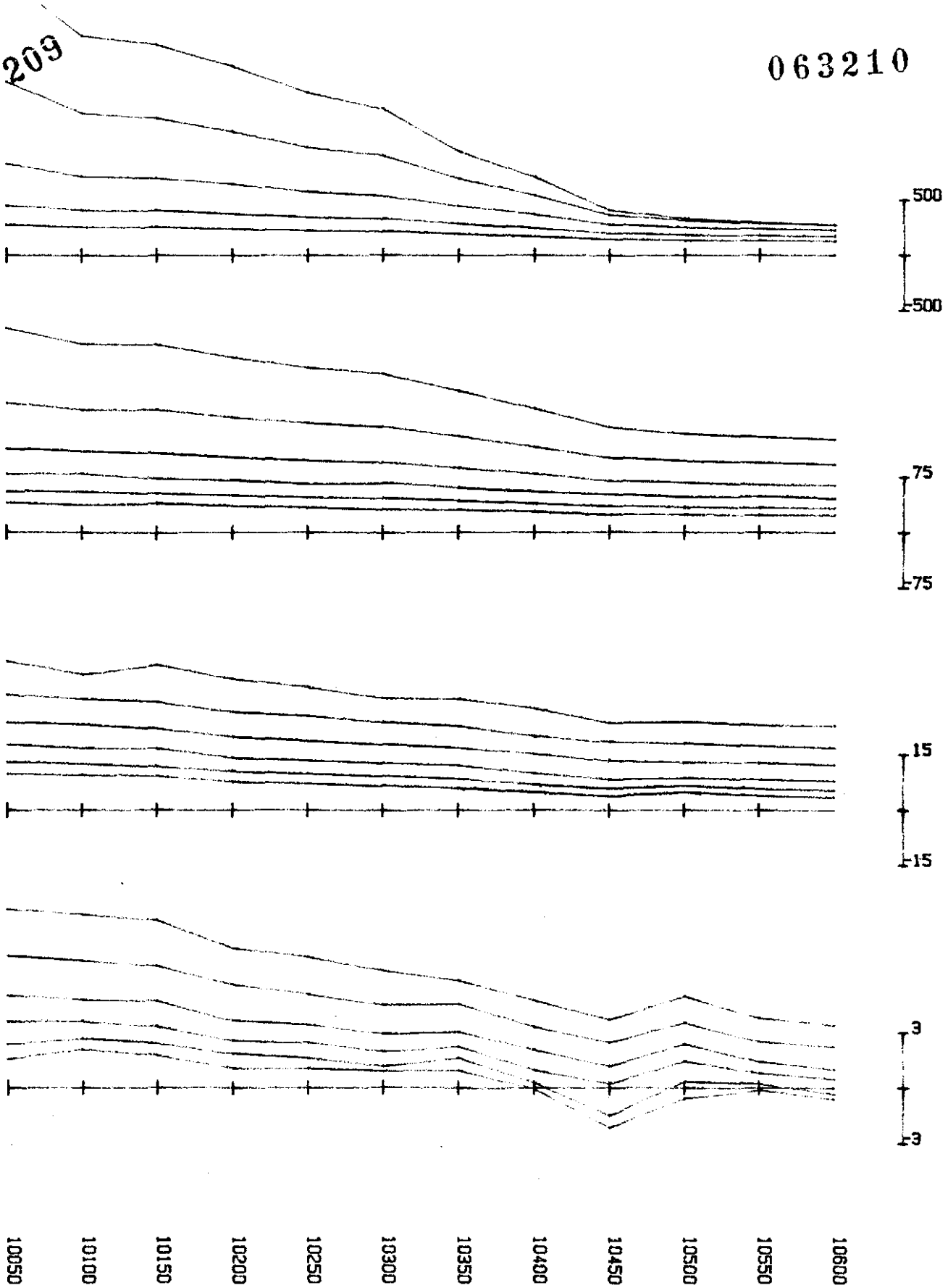
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

209

063210



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10450 Component D

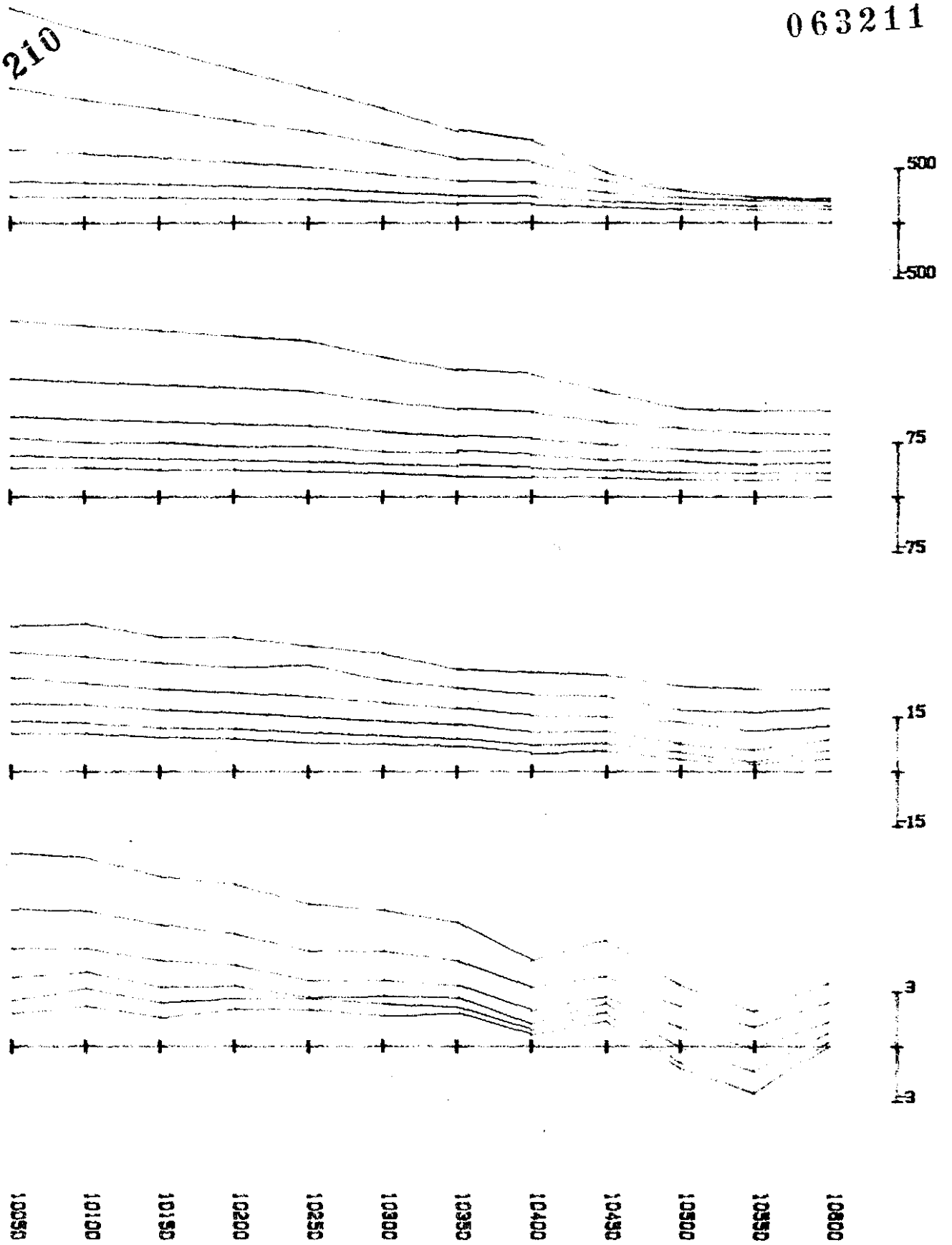
Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

063211

210



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10550 Component D

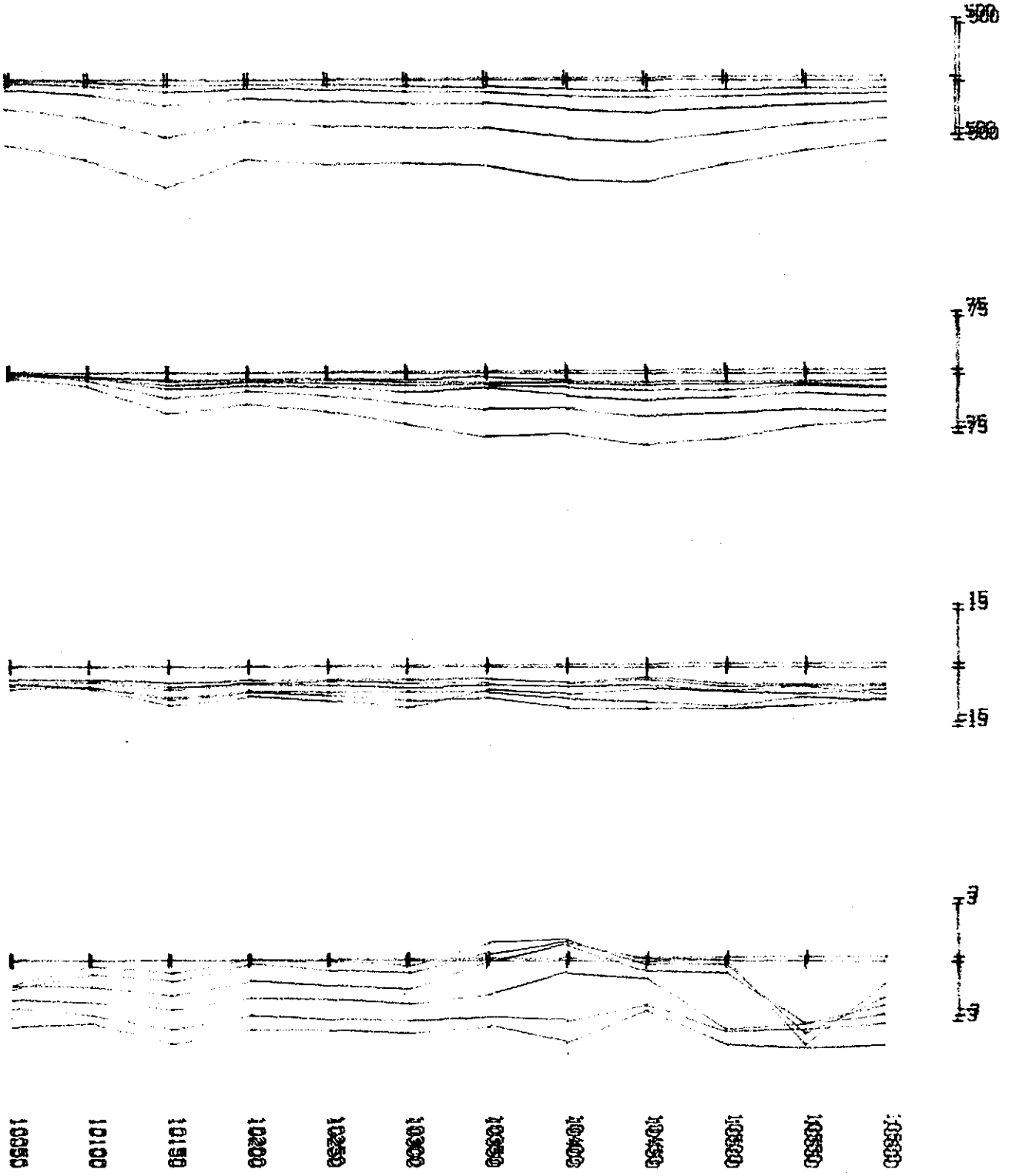
Scale 1 : 3667.

5 cm

P & Y GEOPHYSICAL SERVICES

063212

211



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10550 Component Y

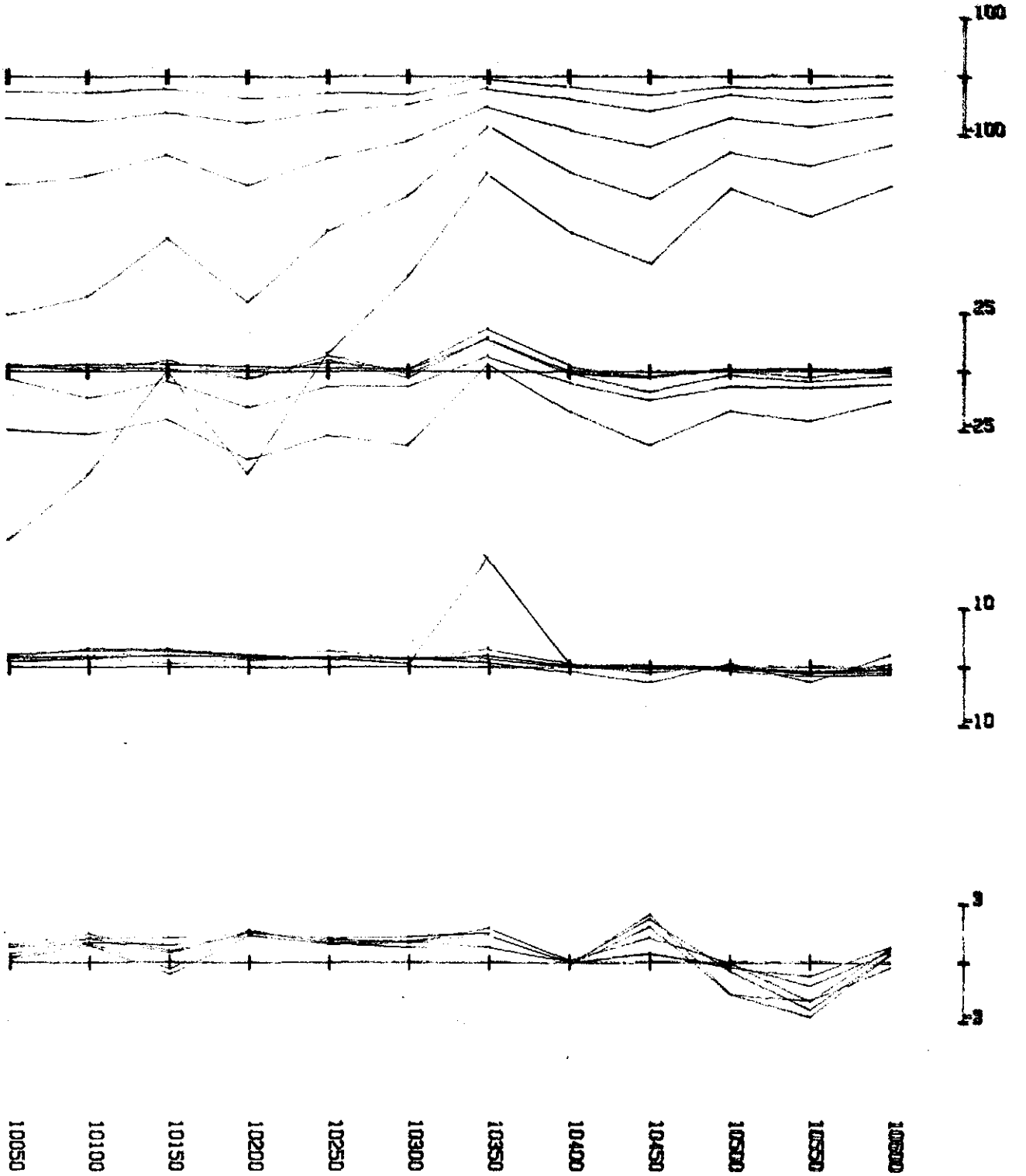
Scale 1 = 3667.

5 cm

P & W GEOPHYSICAL SERVICES

212

063213



EM37 PLOT Client AMOCO Area CARTERS

Loop CA2 Line 10550 Component E

Scale 1 : 3667.

5 cm

P & V GEOPHYSICAL SERVICES

APPENDIX 4

PROPOSED DRILLHOLE DETAILS AND SECTIONS/PROFILES

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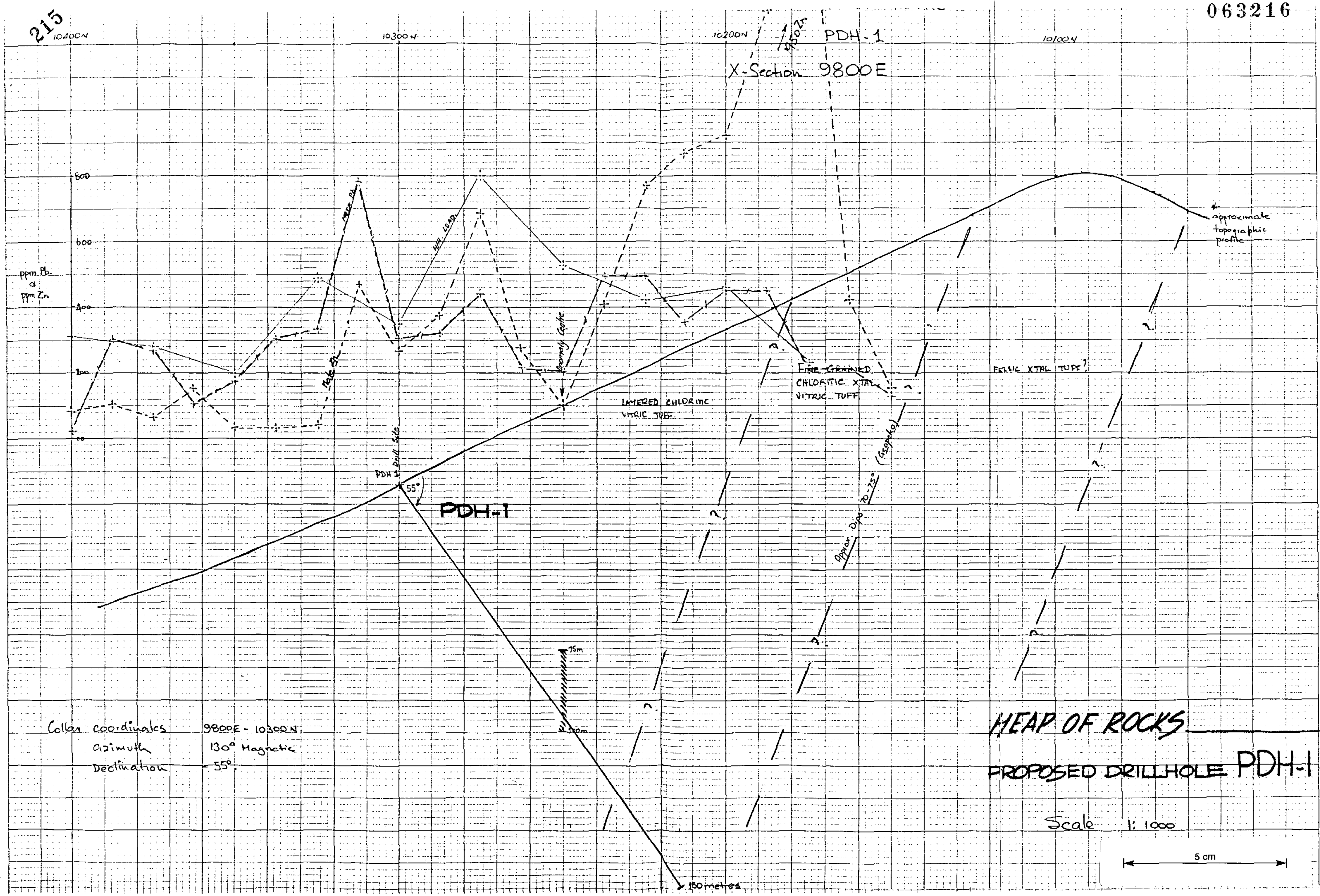
063215

MACKINTOSH EAST - PROPOSED DIAMOND DRILLHOLE DETAILS

Prospect:	HEAP OF ROCKS
Proposed Hole Number:	PDH-1
Anomaly Center:	9800E/10250N
Size:	Strike length approx 200m
Depth:	< 100m
Dip:	Conductor? Geology approx 70-75°
Depth Extent:	Large
Geochemistry:	An anomalous zone 700 x 150m averaging >300 ppm lead and zinc (up to 495 ppm lead and 1950 zinc)
Geology:	Petrography indicates siliceous sericitic claystones, chloritic altered dacites (with diseminated galena/sphalerite and ferriginous chloritic crystal vitric tuffs with disseminated pyrite.
Access:	Road to within 200m of PDH - minor access to pad only if used during summer
Length of Hole:	150 meters

063216


10400N
10300N
10200N
10100N
PDH-1
X-Section 9800E
800
600
400
200
ppm Pb & ppm Zn
approximate topographic profile
Fine Grained Chloritic Xtal Vitric Tuff
Felsic Xtal Tuff?
Layered Chloritic Vitric Tuff
PDH 1 Drill Site
55°
PDH-1
75m
100m
150 metres
Approx. Dips 70-75° (Geophys)
Collar coordinates 9800E - 10300N
azimuth 130° Magnetic
Declination -55°
HEAP OF ROCKS
PROPOSED DRILLHOLE PDH-1
Scale 1: 1000
5 cm

216

MACKINTOSH EAST - PROPOSED DIAMOND DRILLHOLE DETAILS

Prospect:	CARTERS
Proposed Hole Number:	PDH-2
Anomaly Center:	10350E/10275N
Size:	200m?
Depth:	< 100m
Dip:	??
Depth Extent:	??
Geochemistry:	A 500 x 100m zone of coincident lead/zinc averaging >300 ppm lead and 150 ppm zinc (Paringa)
Geology:	Sequence of rhyolitic crystal lithic tuffs with minor chlorite alteration and pyrite (Geopeko)
Access:	360 meters distant from track into Carters Prospect. Good for summer access only.
Length of Hole:	150 meters

063218

10400N

10300N

10200N

10100N

approximate topographic profile *

>300 ppm Pb Zn Paringa Geochemistry. Zone

>150 ppm.

PreCambrian Schistose Sediments.

Rhyolitic Quartz Crystal minor crystal lithic tuffs (Geopeko)

* Dips vary from 40° to 75° to North

Quartz Feldspar Biotite Porphyry

PDH-2

60°

90m

110m

150 metres

Collar coordinates 10350E - 10340N

azimuth 128°

Declination -50°

5 cm

CARTERS.

PDH-2 X-SECTION 10350E

1:1000

218

063219

MACKINTOSH EAST - PROPOSED DIAMOND DRILLHOLE DETAILS

Prospect:	SPEELER CREEK
Proposed Hole Number:	PDH-3
Anomaly Center:	11700E/9875N
Size:	>500M
Depth:	Approx 60m
Dip:	60°S?? Geology 70°N
Depth Extent:	<100m??
Geochemistry:	Acid volcanic sequence here overlain by Tertiary basalt, however 300m along strike to the east (quarry) are highly
Geology:	altered sericite/chlorite, pyroclastics with disseminated pyrite assaying up to 3.15 ppm lead (background 40-50 ppm)
Access:	Very good as new Cradle Mountain Line Road only 200m distant from drillsite is on open button grass.
Length of Hole:	1 150 meters - across dip 2 100 meters - down dip

063220

10000 N.

9900N.

9800N.

9700

No geochemistry due to Basalt Cover !!

PDH-3

Basalt cover

45

Basalt cover

60

* approximate topographic profile.

Cambrian.
Predominantly Quartz crystal tuff
minor crystal lithic tuff.

approximate bedding dips vary from 45° to 55°. (Geopeko)

Quart Feldspar Biotite Porphyry.

Dip 60°s Mitre Geophysics

100m

Conductor ??

150m

5 cm

	* Perpendicular to Geology.	* Down Dip to Geology
Collar Coordinates[1]	11700E - 9940N [2]	11700E - 9840 N
azimuth [1]	132.5° [2]	312.5°
Declination.[1]	-45° [2]	60°

SPEELER CREEK

PDH-3 X-SECTION 11700E

1:1000 Scale

S.12

220

063221

MACKINTOSH EAST - PROPOSED DIAMOND DRILLHOLE DETAILS

Prospect:	SPEELER CREEK
Proposed Hole Number:	PDH-4
Anomaly Center:	10800E/9775N
Size:	>400m
Depth:	<100M
Dip:	??
Depth Extent:	??
Geochemistry:	Good geochemistry over 200 x 100m assaying >500 ppm lead (up to 0.3% lead)
Geology:	Green, fine grained chloritic crystal tuffs (dacites/rhyolites)
Access:	Not good, approx 1.5 kilometers from track into Carters Prospect but traverses mainly button grass and light scrub
Length of Hole:	100 meters

063222

10000 N

9900N

9800N

9700N

9600N

Geopeko (Pb)

EOH 4

PDH-4

* approximate topographic profile

Fine grained Vitric Crystal tuff.

Green chloritic Crystal tuff Fine grained (Geopeko)

approx bedding dips (Geopeko)

Medium Grained Crystal Tuff.

Conductor (Mitre)

100 metres

5 cm

Collar coordinates : 10800E - 9820N
azimuth : 132.5°
diedination : -55°

SPEELER CREEK
PDH - 4 X-SECTION 10800E
1:1000 SCALE

222

063223

MITRE GEOPHYSICS PTY LTD

MINERAL EXPLORATION AND ENGINEERING CONSULTANTS

BUGGS LANE ELLIOTT TASMANIA 7325 PHONE 004-363143

INTERPRETATION OF THE EM37 SURVEYS OVER THE SPEELER CREEK, CARTER'S & HEAP OF ROCKS GRIDS MACKINTOSH EAST (E.L. 2/70).

for

Cyprus Minerals Australia Company

by

Dr J.R. Bishop

CM/MG85/15
Nov., 1985

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063224

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SUMMARY

An EM37 survey has been carried out over three grids which overlie geochemically anomalous tuffs and volcaniclastic sediments belonging to the Mt Read Volcanics suite in the Mackintosh East area, northern Tasmania (E.L. 2/70).

The survey did not define any strong, prospective anomalies, but four responses have been examined in some detail -one on each of Carter's and Heap of Rocks and two on Speeler Creek. One of the Speeler Creek anomalies is overlain by basalt, the remainder are associated with good soil geochemistry. Given the very little previous exploration in this area (one drill-hole) and the good geochemistry in prospective rocks, it is recommended that these poor responses be drilled. Target details are given in Table 1.

INTRODUCTION

The Speeler Creek, Carter's and Heap of Rocks grids cover three prospective areas in E.L. 2/70 (Mackintosh East), where the target is an orebody similar to the large Hellyer deposit which lies some 15kms to the west.

E.L. 2/70 is held by Cleveland Tin (a subsidiary of Aberfoyle), but the exploration program is now being managed by Cyprus Minerals under a joint venture agreement with Aberfoyle and Geopeko.

This report interprets the results from an EM37 survey carried out over the Speeler Creek, Carter's and Heap of Rocks grids in May/June, 1985.

EXPLORATION TARGET AND GEOLOGICAL SETTING

E.L. 2/70 covers a north-east trending belt of the Cambrian Mt Read Volcanics which lies between PreCambrian metasediments to the south east and Ordovician sediments to the north west. (The Hellyer deposit lies within a similar belt of north-east trending rocks to the west of the Ordovician sediments.)

The target is a polymetallic, volcanogenic massive sulphide deposit similar to the Hellyer, Que River and Rosebery deposits which also occur within the Mt Read Volcanics. These deposits are dense, chargeable and conductive. Except for a buried lens of pyrrhotite at Rosebery, they are not magnetic. EM surveys over the first two deposits and testing of core samples, has shown that while the deposits are not excellent conductors, they are sufficiently conductive to respond to large loop TEM techniques such as the EM37, even when buried at depth.

Apart from EM, IP has been successful in locating these deposits (EM with its better resolution was better able to separate the sulphide response from black shales at Hellyer and this would almost certainly also be the case at Rosebery where the two are intimately associated.) Despite the rugged topography (and depth of Hellyer -150m), gravity anomalies have also been confirmed over these deposits.

The prospective rocks at Mackintosh East are a narrow sequence of northeast to east striking tuffs and volcaniclastic sediments with moderate to steep northwest to north dips. They have been mapped on the E.L. over a strike length of about 9kms with a width varying between 100m and 1500m. The north eastern end of the zone is covered by Tertiary basalt. The sequence is overlain by quartz-feldspar-biotite porphyry intrusives which make up the bulk of the volcanics on the E.L. and is underlain by the Pre-Cambrian (see Figure 1).

The only recorded significant mineral occurrence is Carter's prospect (described under the 'Fury Mine' in Collins et al,

1981). This consists of quartz veins with galena, sphalerite, chalcopyrite and pyrite in a fault zone. However, much of the area has highly anomalous stream and soil base-metal values (see below) and minor disseminated sulphides have been observed within the volcanics.

EXPLORATION HISTORY

The first exploration was carried out by Paringa in 1969/70 when an (imperial) grid was cut over Carter's prospect and a soil geochemical program carried out (Paringa's 'Back Peak' project). A number of Pb and Zn anomalies were defined and the grid was extended in 1970/71 to define an anomalous zone about 5.5kms long. Some wide spaced stream sediment samples were also assayed and shown to be anomalous in base-metals.

Aberfoyle, then called Cominco, held shares in Paringa. At some time in the early 1970's management of the E.L. was taken over by Aberfoyle.

In 1972, a helicopter EM/aeromagnetic survey was carried out over the area (McPhar's HEM-400 system)*. Four anomalies were recorded within Mackintosh East. These were followed up with ground EM (VHEM) and magnetics. Three were located over basalt# (anomalies 9, 10 & 12), while the fourth (no. 11) was associated with a graphitic shale in the PreCambrian (see Figure 1). VHEM was also carried out over the Paringa grid lines, but no interesting responses were obtained.

In 1975, four lines of dipole-dipole IP were carried out over geochemical anomalies on the Paringa grid (lines 2100N, 2900N, 7300N & 8100N: the latter two just north of Carter's prospect). Mostly poor, resistive responses were obtained indicative of disseminated mineralisation. This was confirmed when trenches were bulldozed over the four lines@ in 1978. It was concluded that the geochemical anomalies came from this veinlet style of mineralisation and not from a stratiform massive sulphide deposit (Herrmann, 1980; who also gives references for the above history).

Most of Aberfoyle's effort was now concentrated on Mackintosh West around the newly discovered Que River deposit and in 1979, a joint venture agreement was signed with Geopeko who took over management of the exploration program. They also carried out a

---

* Follow up of anomaly no.8 from this survey led to the discovery of the Que River deposit.

The basalts here are porous and have a low resistivity. There may also be gravel and sand layers within or beneath the basalts.

@ Not to be confused with the four costeans put in by Paringa over Carter's prospect.

stream sediment sampling program and integrated with Paringa's earlier work, they decided on the most prominent anomalous regions and designated them Prover's 1, 2 & 3. From rock chip samples, they concluded that the volcaniclastic sediments were more anomalous in lead and zinc than the tuffs and lavas. The gridded areas of Prover 1 and Prover 3 are shown in Figure 1. Prover 2 was apparently never followed up.

In early 1980, a Dighem survey was flown over part of the Mackintosh East licence. No good, prospective anomalies were defined from this survey, but some follow up of possible responses was carried out. Specifically, four EM &/or aeromagnetic responses were chosen for follow up. These were designated Prover's 5 and 6 ('X' grade anomalies*); Prover 7 (a series of large amplitude, but low grade EM anomalies with associated magnetic responses); Prover 8 (a magnetic response only).

The follow up of the EM anomalies was carried out using 'Moving Source Turam' (MST)#. The 'X' grade anomalies were not located and Prover 7 was found to be due to basalt (as suspected). Prover 8 was more interesting. The peak of the anomaly was found to correspond with a window of pyroclastic rocks which overlay the porphyry intrusives. The rocks were anomalous in copper but not in Pb/Zn and no further work was recommended (Herrmann et al, 1984).

In 1982, DDH P1 was drilled. This 156m hole (collared at 10,000E/10260N with bearing grid south) was sited to investigate the rocks beneath the strong (>1%) Prover 1 soil geochemical anomaly. There was little correlation between the down-hole assays and the surface augur samples and it was concluded that this style of disseminated mineralisation (eg, veins) was not sufficiently encouraging "to proceed with the planned geophysical orientation-calibration exercise". (Herrmann et al, 1984).

No further work was carried out by Geopeko. Herrmann et al (1984) admit that the work on Mackintosh East was regarded as their 'winter project' and that as such the project "struggled along in adversity of climate and suffered from numerous staff changes and resultant discontinuity of exploration logic, interpretation and reporting".

Thus Mackintosh East is a relatively unexplored, but highly prospective, section of the Mount Read Volcanics. In 1985,

---

* Dighem anomalies are divided into 6 grades depending on the conductance of their interpreted sources (no. 6 being the best grade). Possible anomalies are designated 'X' grade.

(A Prover 4 is not mentioned in the Geopeko reports.)

MST is an EM system designed by Geopeko which uses the usual two receiving coils of the Turam method, but with a mobile transmitting coil.

Cyprus Minerals (then called Amoco Minerals) entered into a joint venture agreement with Aberfoyle and Geopeko, as managers of the exploration program over a reduced E.L.. It was decided to carry out a deep-seeking, large loop EM survey over the most anomalous areas of soil geochemistry.

Geopeko's Prover 1 prospect was partly re-established and renamed Heap of Rocks. Prover 6 was also partly re-established and extended (at an angle) to cover the Prover 2 area suggested by Herrmann (1980): this was renamed Carter's. Finally, Geopeko's Prover 3 was partly re-established and extended (to the east) and renamed Speeler Creek (after the creek which lies to the south of the grid).

It is pointed out that the Imperial Paringa grid runs grid north parallel to magnetic northeast, while the later metric grids run grid east parallel to this direction. Note also that the coordinates used for the three grids are independent of each other, but use the same values.

The Prover 1 and Prover 3 grids are confidently located onto Figure 1 from Geopeko's 1:2,500 scale maps. I understand that these have been accurately relocated by Cyprus. The Prover 6 part of Carter's should also be properly located, but the recutting necessary for the rest of the grid may not be exactly as shown on Figure 1.

SURVEY DETAILS

The survey was carried out by the Perth-based company P & V Geophysical Services in May/June, 1985. Seven loops were used to cover the three grids. The line spacing on each grid was 100m using a station interval of 50m with some detailing at 25m. All three components were measured using a 25Hz repetition rate.

The coverage and interpreted anomalies are shown on Figures 2, 3 & 4 with the idealised transmitting loop positions. (These figures have been produced at 1:2,500 scale to overlie Geopeko's geological plans for Speeler Creek and Heap of Rocks.)

INTERPRETATION

The results were disappointing: no good, well defined anomalies were recorded. However a number of responses were obtained and these are shown on Figures 2, 3 & 4, with the channels on which the anomalies can be recognised, indicated*. Four of these have been tentatively suggested as drill targets: one on each of Carters and Heap of Rocks and two on Speeler Creek.

---

* The EM37 system has 20 channels, numbered from 1 ('early-time' at 0.09ms) to 20 ('late-time' at 7.2ms). The better the conductor, the better the response at late times.

The responses were picked from the down and across-strike (north) components with an emphasis on the former, since this usually is less noisy. (The data quality was generally disappointing: channels 15 to 20 could rarely be interpreted with confidence - thus most of the late-time responses are suspect. Only rough unedited plots were produced in the field which did not permit an effective evaluation of the data.)

The host rocks were mostly resistive and the lack of prospective anomalies was not due to masking from conductive overburden (although a strong response from a superficial conductor was obtained at Speeler Creek).

SPEELER CREEK

The original survey, using loops 1 & 2, defined an interesting series of anomalies assumed to be under basalt in the northeast corner of the grid (Geopeko's mapping did not extend this far to the east). The grid was extended and a third loop placed on the northern side to better define these responses. Large anomalies were obtained which showed strong migration, indicative of a large, unconfined conductor (see Figure 2) and this has been interpreted as a conductor within the basalt (either the basalt itself or a gravel/sand layer in or beneath the basalt).

An adjacent zone was confirmed and extended by the third loop and a pronounced anomaly within this zone has been quantitatively interpreted. The anomaly is located at 11700E/9875N at a depth of around 60m. A D.C. offset on the data* made an accurate determination of dip difficult, but an attempted interpretation suggested 60° to the south (which is contrary to the regional northerly dip). Determination of depth extent was also hampered by the offset, but appears to be quite limited. The time constant is a very poor 0.8ms. Although the West Coast base-metal massive sulphides are generally not good conductors, economic deposits should have much higher values than this#.

The zone to which this anomaly belongs does not show any migration of cross-overs, indicative of unconfined conductors; nevertheless, the source may still be within the basalt (eg, a fracture zone) despite the fact that the interpreted depth is (?)greater than the thickness of basalt@. But a drill hole is

---

* Much of the data was similarly offset; presumably due to poor calibration.

Time constants reflect the sizes of conductors as well as their conductivity. (Using Svetov's formula for a plate, this gives a conductance of 40S assuming a depth extent of only 50m.)

@ This anomaly has only been defined by one (northerly) loop. A second survey with the loop on the southern side would be required to verify the confined nature of the conductor.

recommended since a specific, albeit poor, target has been defined and the ground beneath the basalt, given a continuation of the geology, must be considered prospective since it is totally unexplored. (Altered volcanics with upto 315ppm Pb, are exposed in a quarry 300m to the east.)

Two other responses are shown on the Speeler grid extending to late times: these are at 11000E/9825N and 11900E/9675N. At late times, both responses are in the noise level and thus the inferred slow decay is suspect. The former is a very subtle response and a decay constant cannot be determined, but a conductor at 70m plus, beneath 9850mN is suggested. (The data print out for this line was for loop 1 whereas the profile shows somewhat different data from loop 2.) The second response, at 11900E/9675N, is an end-of-line anomaly. It is insufficiently defined for any quantitative interpretation and though evident in both the 'Z' and 'X' components, it may be noise.

An anomaly at 10800E/9775N is coincident with highly anomalous Pb and Zn soil geochemistry (sampled by Geopeko; coverage not shown on Figure 1). The response is too poor to obtain any meaningful quantitative interpretation, but I suggest that it is caused by a poor, possibly shallow conductor.

CARTER'S

At Carter's, a number of weakly conducting zones have been interpreted. The most prospective anomaly appeared to be at 9750E/9875N, however a quantitative interpretation produced the very low time constant of 0.4ms (and a depth of around 100m). The pronounced anomaly at 9950E/10025N, recorded from loop 1, is almost certainly due to noise. It was not duplicated by the loop 2 survey along line 9950AE.

Two other responses were further examined, at 10350E/10375N and at 10450E/10200N. Both of these were tentatively recognised down to channel 20. In both cases the apparent late-time responses are probably noise, however the anomalies are close to the strong soil geochemistry anomaly defined by Paringa. The response at 10450E/10200N, if genuine, is very shallow and thus of little interest (costeaning in this area suggested that the geochemistry was caused by near-surface veining). However it is possible to interpret the adjacent anomalies on line 10350E (at 10350E/10375N and 10350E/10275N) as one deep response, in which case a conductor at ~100m is indicated beneath 10350E/10325N. If drilling in this area is warranted on geological/geochemical grounds, then the EM37 responses supply a tenuous target.

HEAP OF ROCKS

The responses on the Heap of Rocks grid were similar to those at Carter's: ie, outlining a number of weak conductors, but a pronounced response was recorded at 9800E/10250N which is coincident

with a strong (800ppm) Pb soil anomaly.

This response was recorded by both loops, however there is noise on both profiles and a quantitative interpretation is difficult. (A similar response was recorded on the adjacent line, 9900E. Although the profile is smooth, it has different values from the data print out supplied and so could not be confidently interpreted.) The depth to the top of the conductor beneath 9800E/10250N is probably between 50m and 100m. The dip was not determined, but it appears to have a large depth extent. The time constant is very weak (not quantified).

This response is only 200m from DDH P1 which only intersected minor base metal mineralisation, however this hole has not tested the conductor defined by the EM37 survey (see Figure 4).

CONCLUSIONS AND RECOMMENDATIONS

This survey has not defined any good, long time-constant responses. Noise, particularly in the late-time channels, has resulted in more than the usual uncertainty in interpretation. By optimism and 'over-interpretation' four drill-targets have been selected from the survey results.

At Speeler Creek, one response beneath basalt has been defined; although a confined source is suggested, a non-prospective cause of the anomaly within or beneath the basalt cannot be discounted. The three other targets, one on each grid, are associated with anomalous soil geochemistry, however I do not think that the EM responses are caused by economic amounts of sulphide. They may be due to faulting along which mineralisation has moved from a very deep-seated body (ie, beneath the range of the EM37 survey). In which case, any drilling should be designed to pass well below the interpreted depths of the EM anomalies.

J.R. Bishop
Nov., 1985.

REFERENCES

Collins, P.L.F. et al, 1981. Geological Survey report for the Mackintosh 1 mile sheet. Tas. Mines Dept publication.

Herrmann, W., 1980. Progress report on Mackintosh East (part of E.L. 2/70), Dec. 1978 to Dec. 1979. Geopeko report.

Herrmann, W., Pemberton, J. and Sumpton, J., 1984. Progress report on mineral exploration in Mackintosh East (part of E.L. 2/70), June 1980 to June 1982. Geopeko report.

Table 1.

MACKINTOSH EAST (E.L. 2/70) EM37 SURVEY

DRILL TARGETS

1) Speeler Creek Grid.

Location:	beneath 11700E/9875N.
Strike length:	greater than 500m.
Depth to top:	~60m.
Dip:	unreliably interpreted as 60° to grid south. Other criteria such as geology along strike should be given priority.
Depth extent:	limited: less than (?)100m.
Time constant:	0.8ms.
Comment:	Underlying rocks are interpreted to be tuffs and volcaniclastic sediments which along strike contain disseminated pyritic sulphides. Overlying rocks are Tertiary basalt and the source may lie within these rocks (despite the interpreted depth) or be a porous channel beneath the basalt.

2) Speeler Creek Grid.

Location:	beneath 10800E/9775N.
Strike length:	?800m.
Depth to top:	possibly shallow (?less than 50m).
Dip:	not determined.
Depth extent:	not determined.
Time constant:	not determined.
Comment:	A weak response associated with highly anomalous soil geochemistry.

3) Carter's Grid.

Location:	beneath 10350E/10325N (a combination of 10275N and 10375N)
Strike length:	?200m.
Depth to top:	~100m.
Dip:	not determined.
Depth extent:	not determined.
Time constant:	not determined.
Comment:	A weak and doubtful response in an area of favourable geochemistry.

4) Heap of Rocks.

Location:	beneath 9800E/10250N.
Strike length:	200m plus.
Depth to top:	less than 100m.
Dip:	not determined.
Depth extent:	large.
Time constant:	not determined.
Comment:	A weak and doubtful response in an area of favourable geochemistry. The nearby DDH P1 has not tested the EM conductor.

236

405 000 m.E.

410 000 m.E.

Prover 7

SPEELER CK.
(Prover 3)

Sediments

Basalt

Prover 8
mag only

MT. MAYDAY

Old E.L. 2/70 Boundry

Ordovician

Pre Cambrian

CARTER'S
(Prover 6 and Prover 2)

MRV-Porphyry

5 395 000 m.N.

HEAPS OF ROCKS
(Prover 1)

E.L. 2/70

MRV- Tuffs and Sediments

Prover 5

Pre Cambrian

MT. REMUS

PARINGA GRID

5 390 000 m.N.

405 000 m.E.

410 000 m.E.

Ref. CM/MG 85/15

LEGEND:

- Imperial grid cut by Paringa in 1969/1970. North and south extensions 1970/1971
- Pb > 300 p.p.m. in soils
- Zn > 150 p.p.m. in soils
- Approximate boundary of McPhar HEM-400 survey for Aberfoyle (1972)
- (9) HEM-400 anomaly with follow up grid for VHEM and/or magnetics. (Taken from 1978 Aberfoyle map; positional discrepancies with some earlier maps.)
- Dipole-dipole IP Surveys for Aberfoyle (1975)
- Approximate boundary of Dighem Survey for Geopeko (1980).
- (1), X — Prover 7: Dighem anomaly with grade. (Only those anomalies considered for follow up are shown. A large number of superficial responses were recorded.)
- Metric grids cut by Geopeko 1980-1982. Partly repegged and modified by Cyprus 1985.
- DDH P1 — Diamond drill hole by Geopeko (1982)

NB. Stream sediment surveys by Paringa and Geopeko not shown.

063237

5 cm

85-2515A

CYPRUS MINERALS

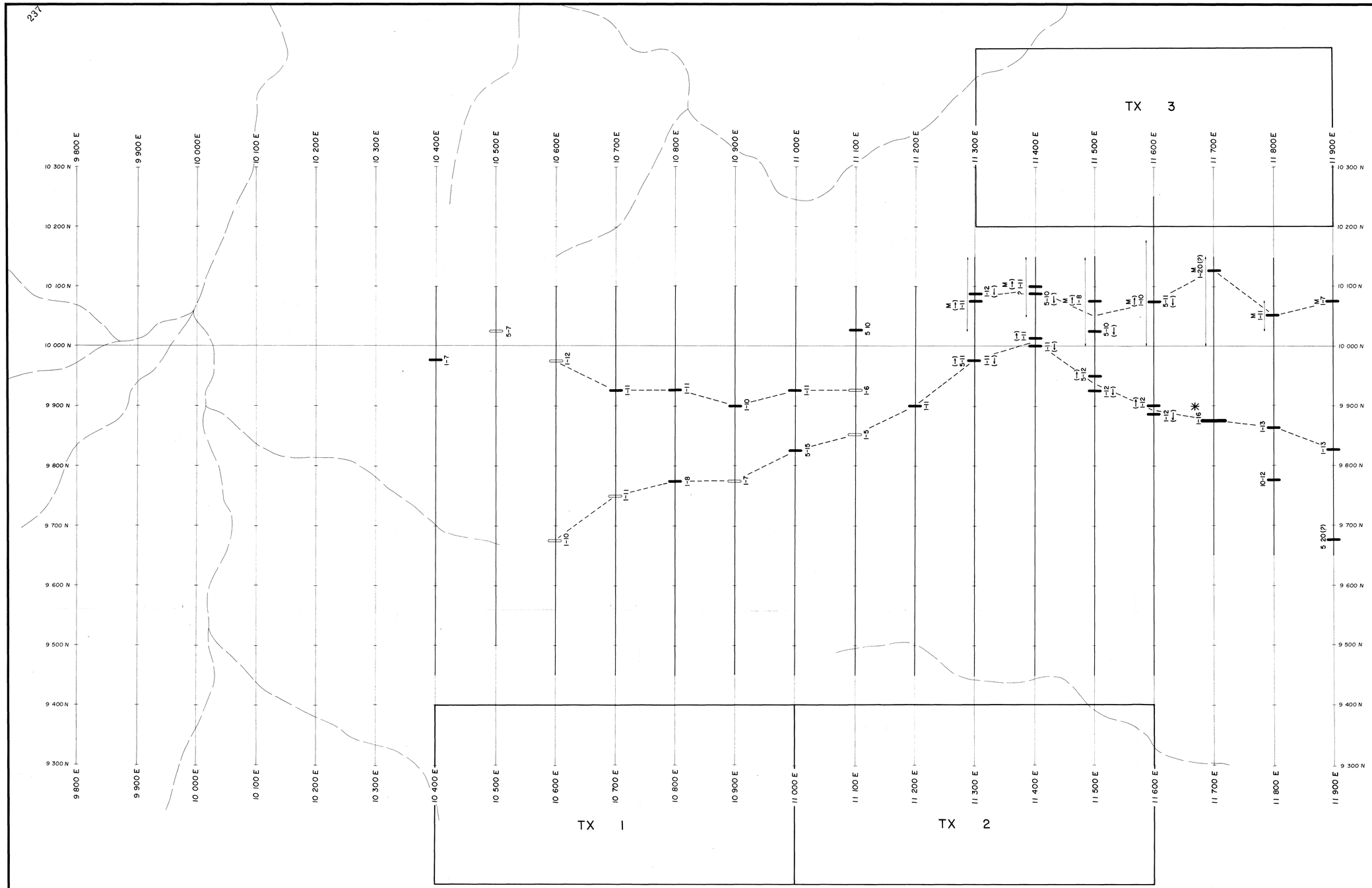
MACKINTOSH EAST (E.L. 2/70)

LOCATION, GEOLOGY AND PREVIOUS EXPLORATION PLAN

DRAWN BY : J.B.
DRAFTSMAN : T.G.D.S.
DATE : Nov. 1985
REVISIONS :
FILE NO.

SCALE 1:25,000 — 500 0 500 1000 METRES

FIG. 1



LEGEND

Low Amplitude — Anomaly — Pronounced Anomaly — Survey Coverage

5-11

Channel interval over which anomaly can be recognised.

- ✳ Quantitative interpretation
- ? Possible anomaly
- M Migration of cross-over.
- -- Extent of migration.
- (←) Direction of transmitting loop.

Survey by: P.B.V. Geophysical Services.
Date: May/June 1985.

NOTE:
The grid lines indicated are not necessarily as cut by Geopeko or Cyprus.

063238

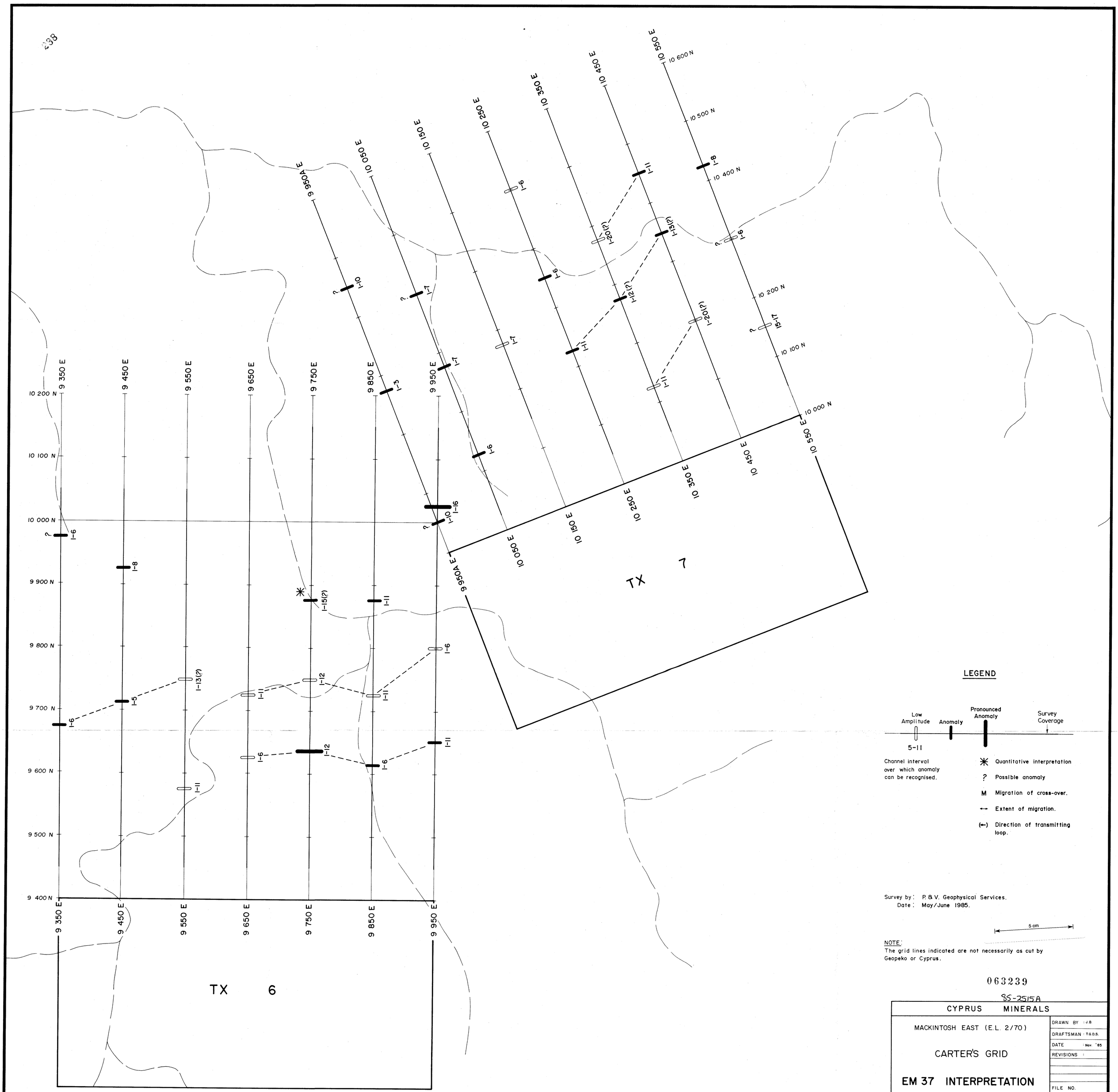
5 cm

95-2515A

CYPRUS MINERALS	
MACKINTOSH EAST (E.L. 2/70)	DRAWN BY : J.B.
	DRAFTSMAN : T.S.D.S.
	DATE : Nov '85
SPEELER CREEK GRID	REVISIONS :
EM 37 INTERPRETATION	FILE NO.
SCALE 1:2,500 (50 0 50 100 METRES)	FIG. 2

Ref. CM/MG 85/15

238



LEGEND

Low Amplitude — Anomaly — Pronounced Anomaly — Survey Coverage

5-11

Channel interval over which anomaly can be recognised.

- ✳ Quantitative interpretation
- ? Possible anomaly
- M Migration of cross-over.
- ⟷ Extent of migration.
- (⟵) Direction of transmitting loop.

Survey by: P. & V. Geophysical Services.
Date: May/June 1985.

5 cm

NOTE:
The grid lines indicated are not necessarily as cut by Geopeko or Cyprus.

063239

SS-2515A

CYPRUS MINERALS

MACKINTOSH EAST (E.L. 2/70)

CARTER'S GRID

EM 37 INTERPRETATION

DRAWN BY : J.B.
DRAFTSMAN : T.G.D.S.
DATE : Nov. '85
REVISIONS :
FILE NO.

SCALE 1:2,500 — 50 0 50 100 METRES

FIG. 3

Ref CM/MG 85/15

9 200 E | 9 300 E | 9 400 E | 9 500 E | 9 600 E | 9 700 E | 9 800 E | 9 900 E | 10 000 E | 10 100 E | 10 200 E | 10 300 E | 10 400 E

10 600 N | 10 500 N | 10 400 N | 10 300 N | 10 200 N | 10 100 N | 10 000 N | 9 900 N | 9 800 N

D.D.H. P1

TX 4

TX 5

LEGEND

Low Amplitude | Anomaly | Pronounced Anomaly | Survey Coverage

5-11

Channel interval over which anomaly can be recognised.

- Quantitative interpretation
- ? Possible anomaly
- M Migration of cross-over.
- ⟷ Extent of migration.
- (←) Direction of transmitting loop.

5 cm

Survey by: P. & V. Geophysical Services.
Date: May/June 1985.

063240

NOTE:
The grid lines indicated are not necessarily as cut by Geopeko or Cyprus.

85-2515A

CYPRUS MINERALS

MACKINTOSH EAST (E.L. 2/70)

HEAP OF ROCKS GRID

EM 37 INTERPRETATION

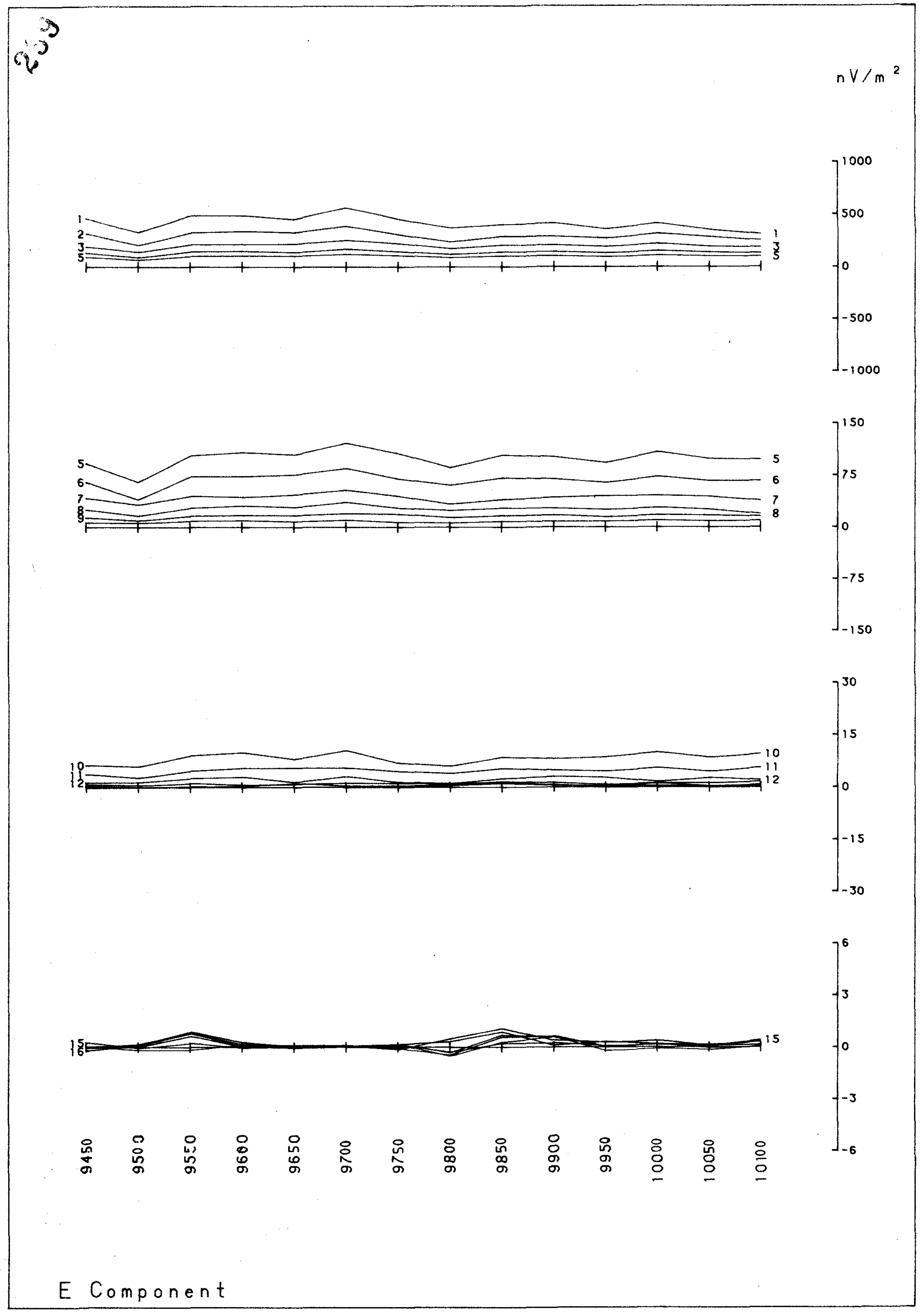
DRAWN BY : J.B.
DRAFTSMAN : T.G.D.S.
DATE : Nov. '85
REVISIONS :
FILE NO.

SCALE 1:2,500 — 50 0 50 100 METRES

FIG. 4

Ref. CM/MG 85/15

6384



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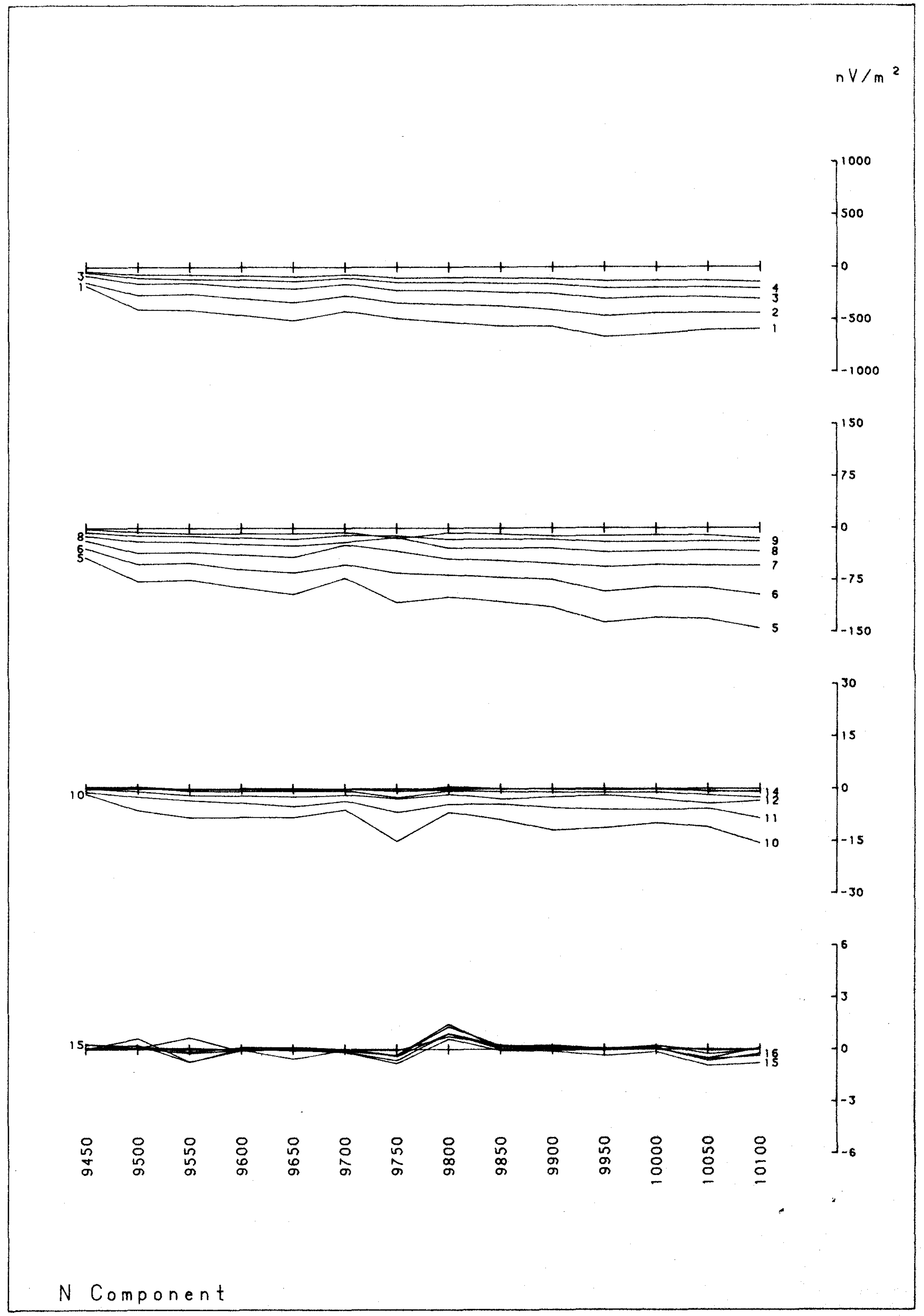

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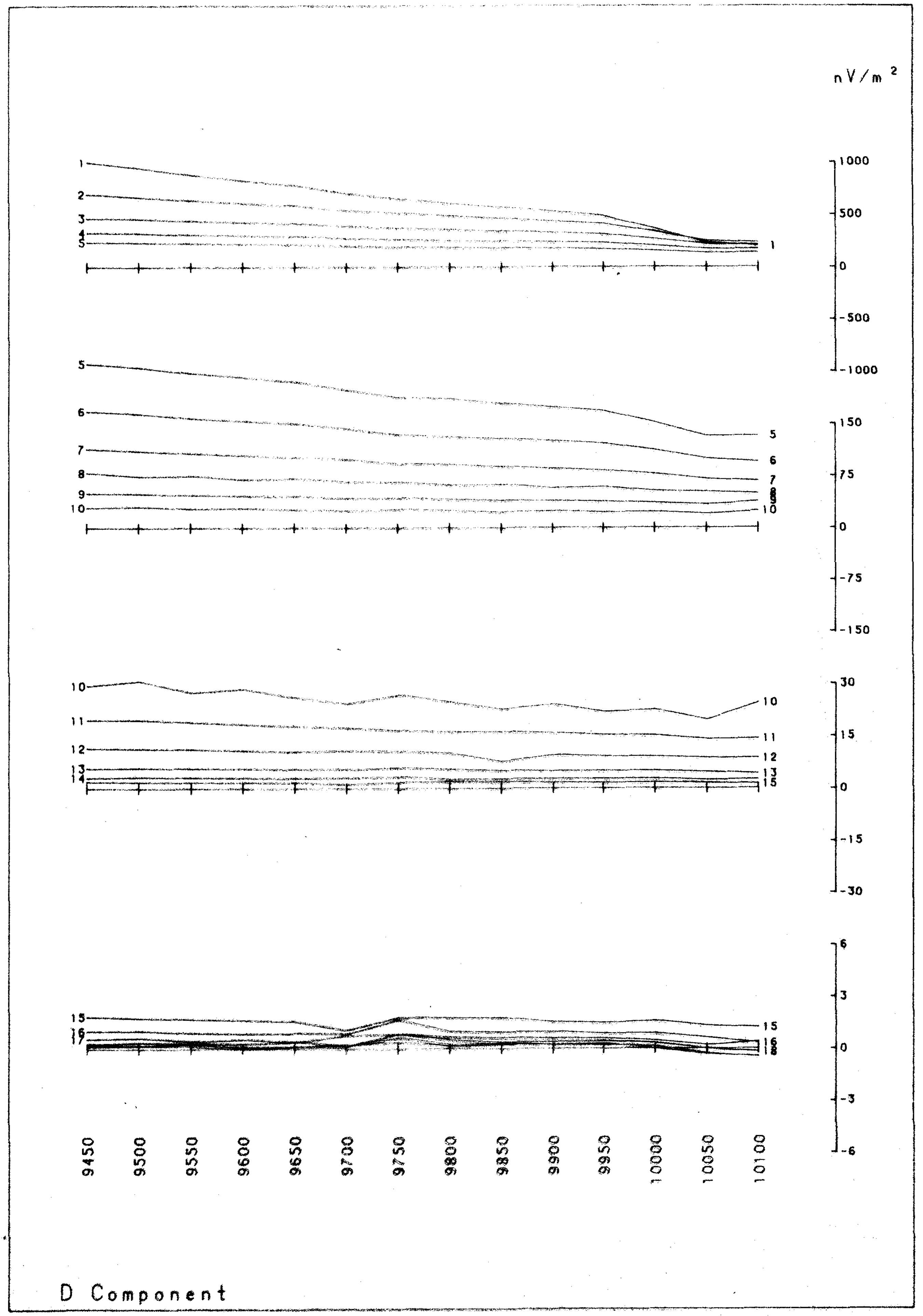
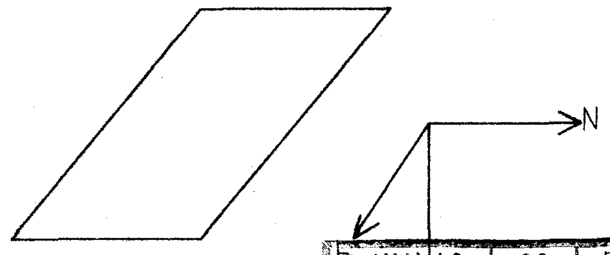


D Component

EM 37 TRANSIENT ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



0 100 200 300 400m

SCALE 1:5000

5 cm

SURVEY SPECIFICATIONS

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	: 11000E 9100N	10400E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

063241

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

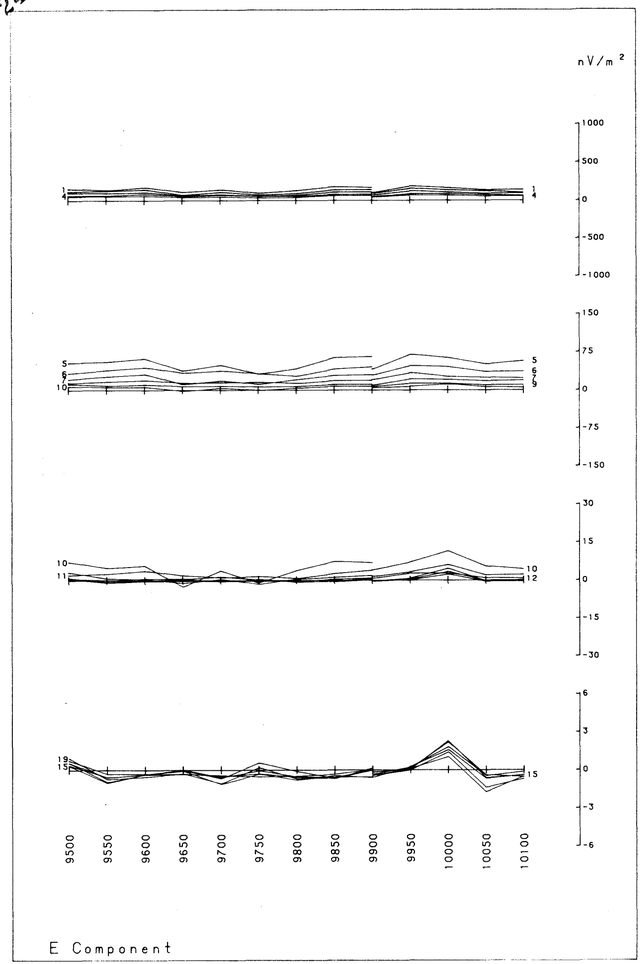
LINE : 10400E

COMP. : E, N & D

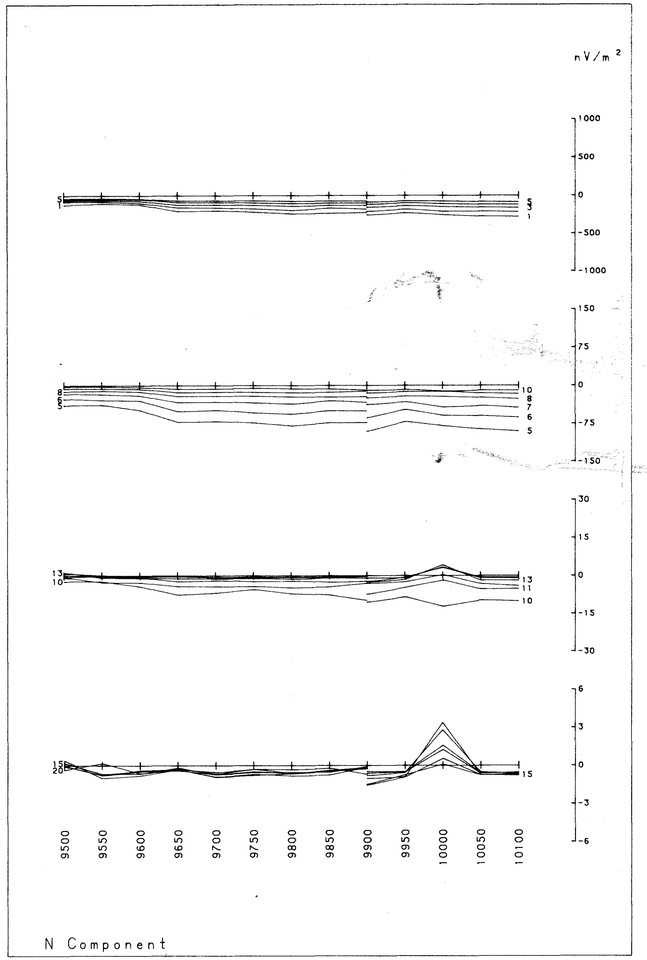
Tx LOOP : Tx 1

P & V GEOPHYSICAL SERVICES

240



E Component



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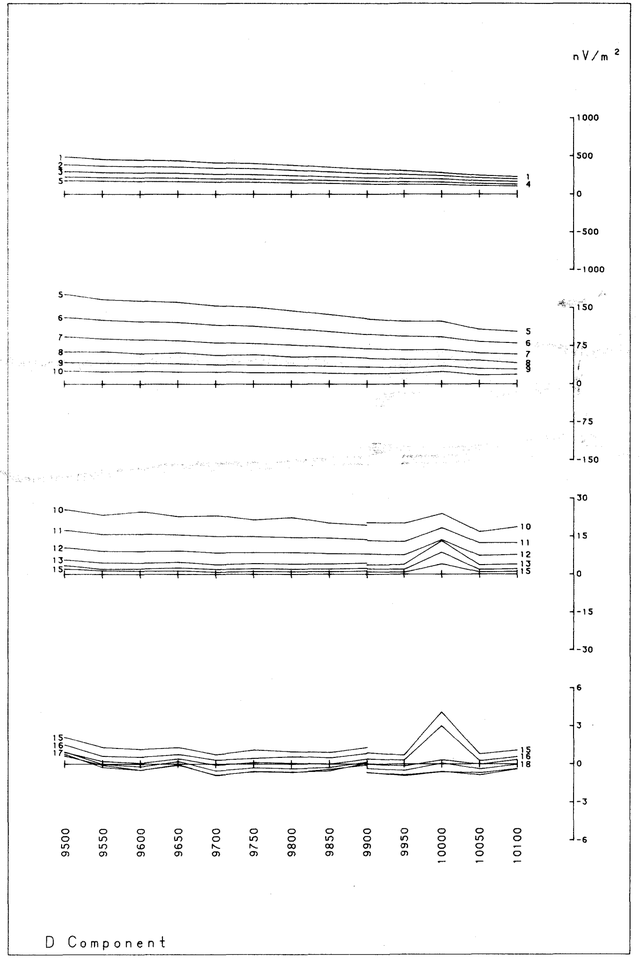
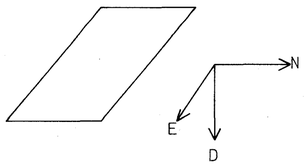


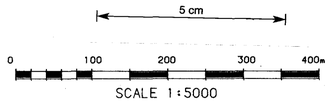
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11000E 9400N	10400E 9400N
	: 11000E 9100N	10400E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 10500E

COMP. : E , N & D

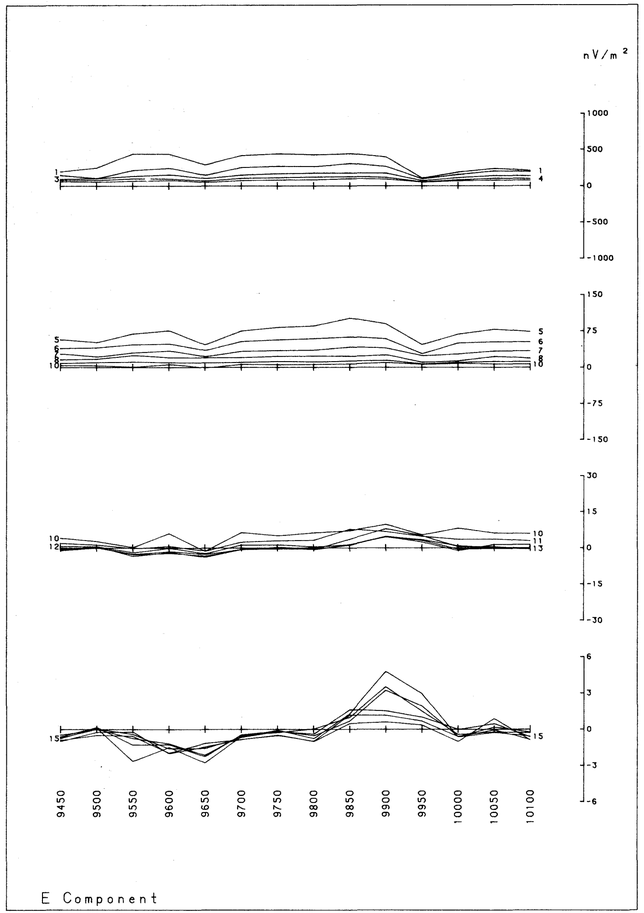
Tx LOOP : Tx 1

063242

241

241

241



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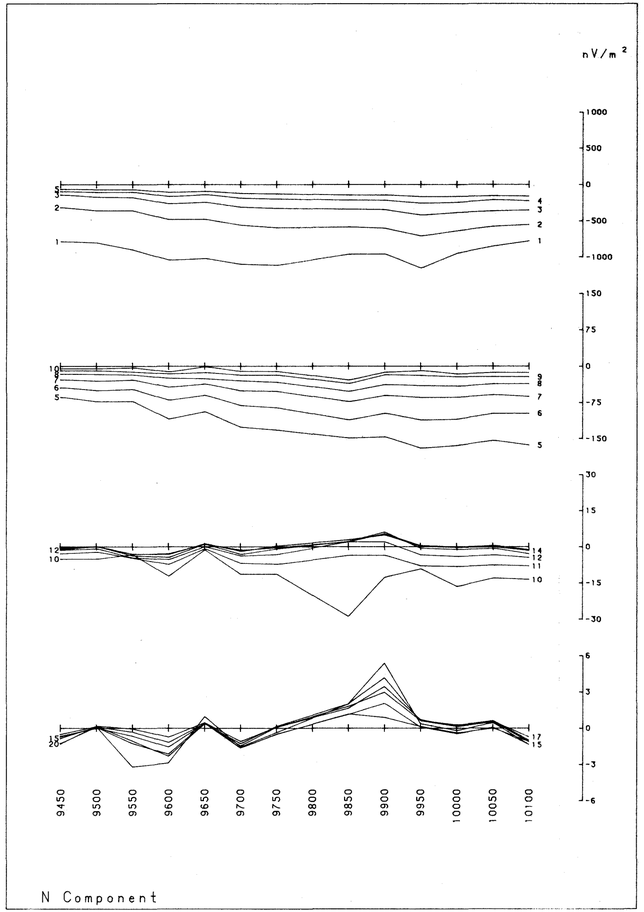

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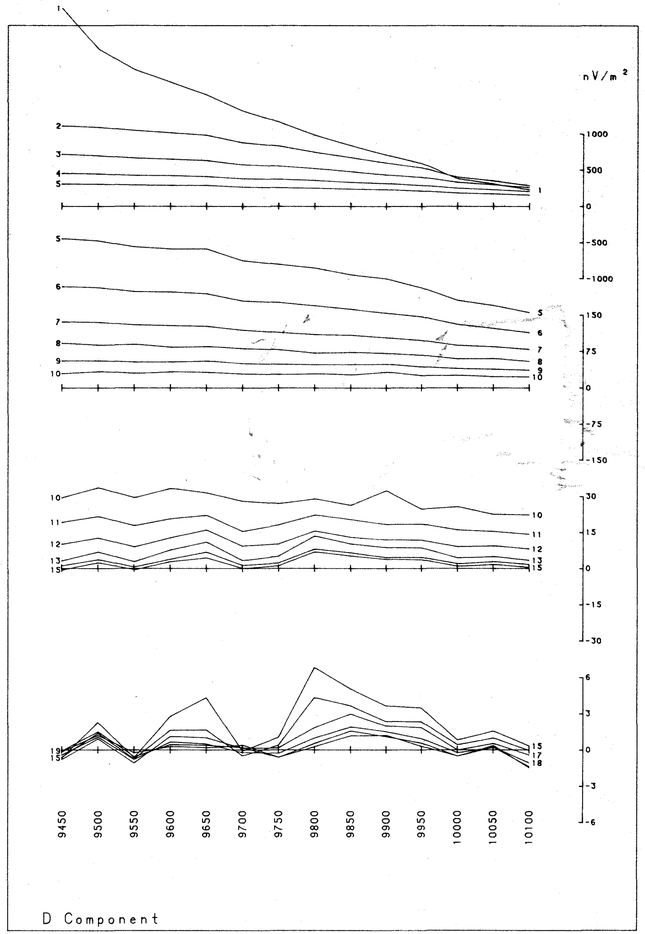
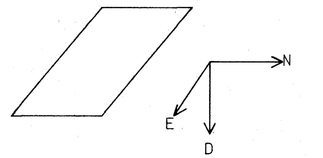


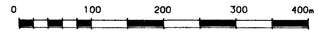
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11000E 9400N	10400E 9400N
	: 11000E 9100N	10400E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 10600E

COMP. : E , N & D

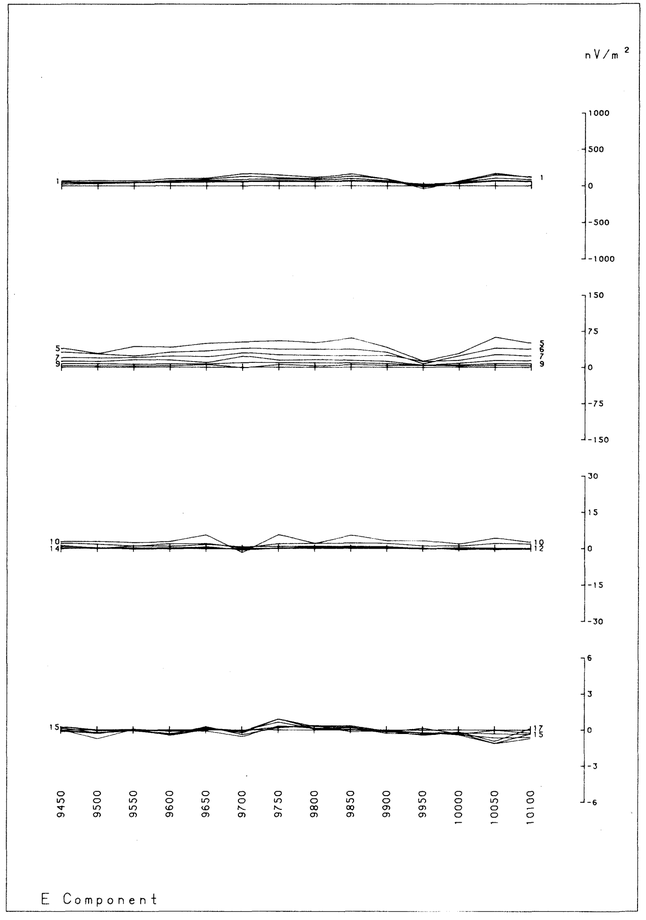
Tx LOOP : Tx 1

063243

242

242

242



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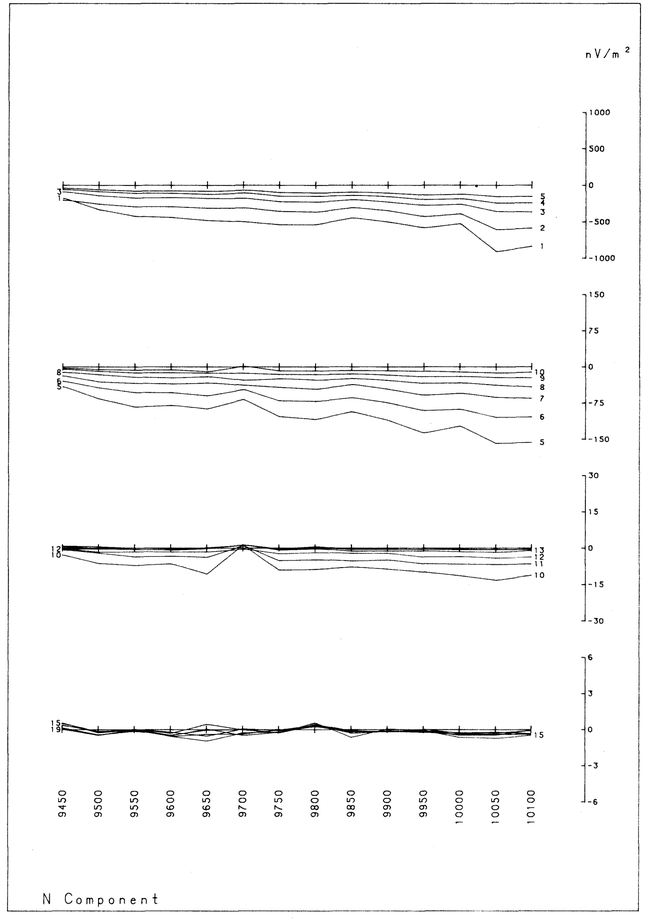

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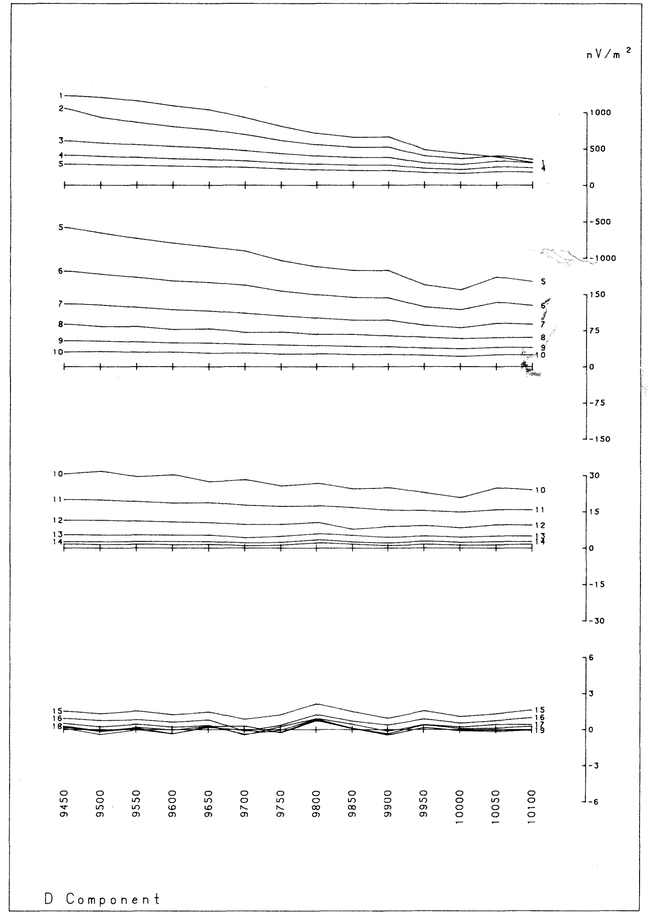
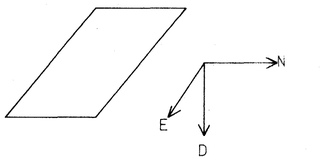


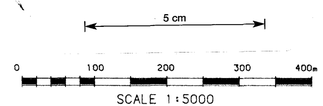
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

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	: 11000E **9100N**	10400E **9100N**
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 10700E

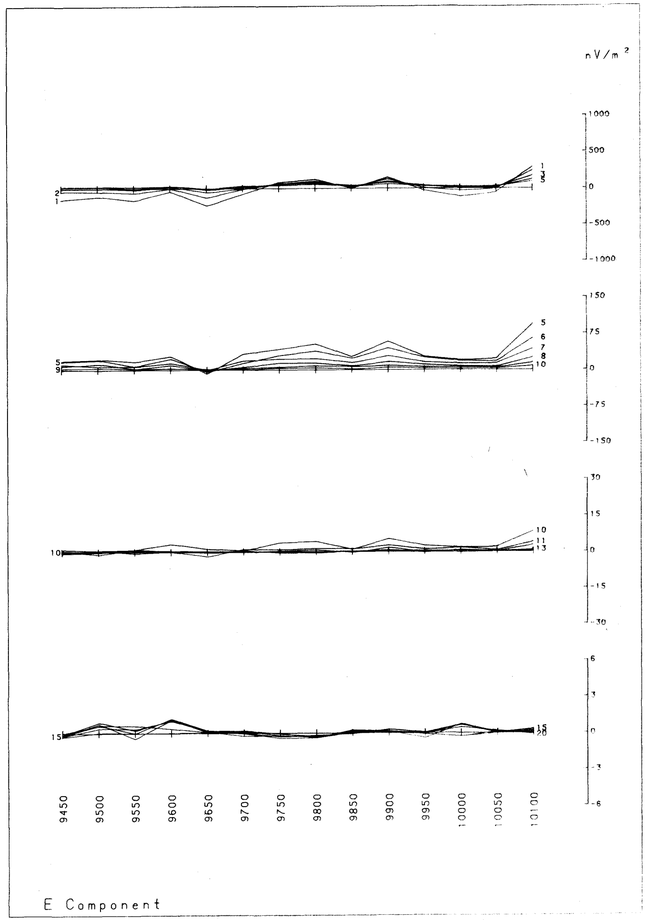
COMP. : E , N & D

Tx LOOP : Tx 1

063244

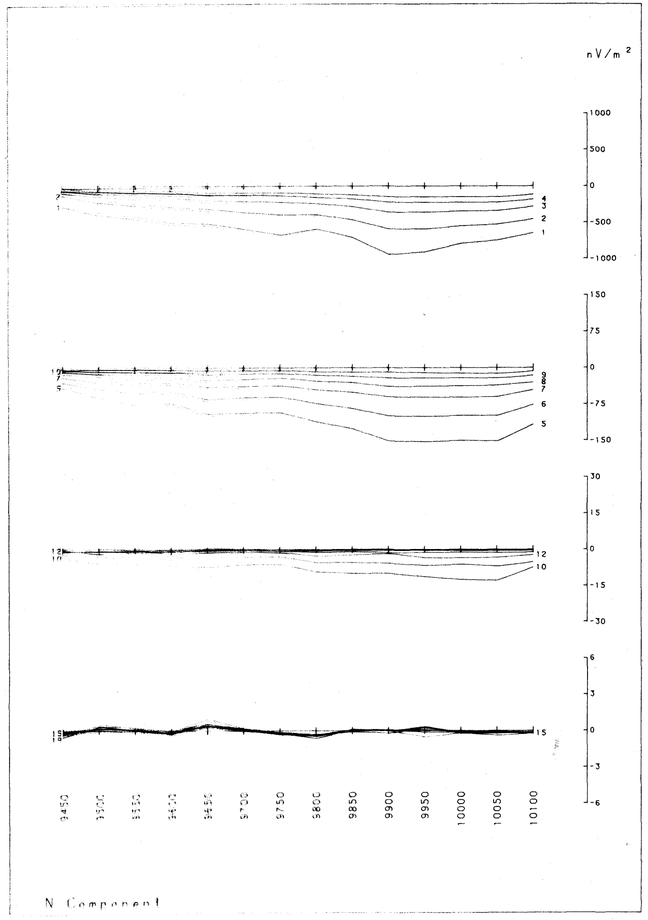
243

1



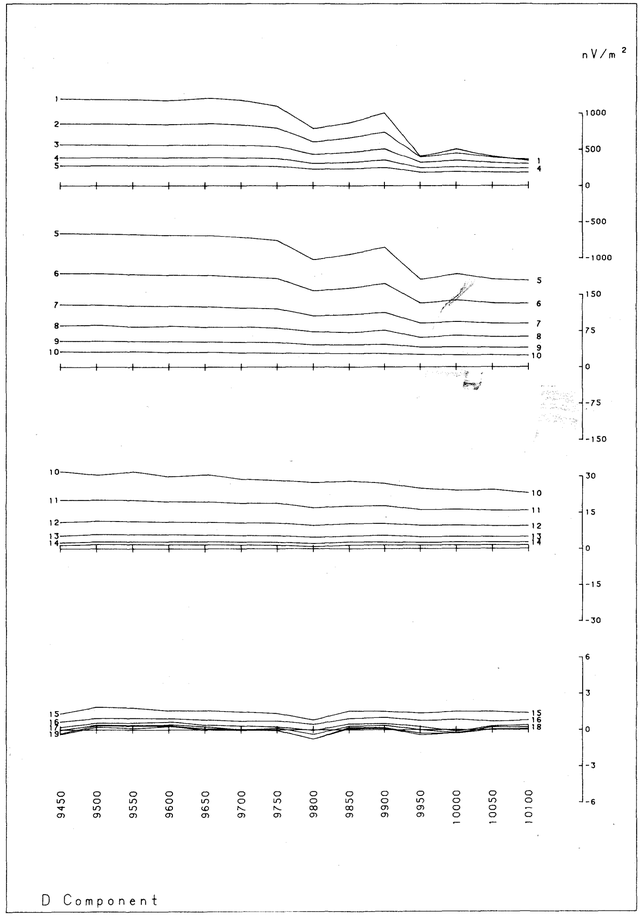
E Component

2



N Component

3

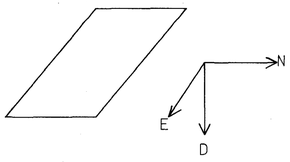


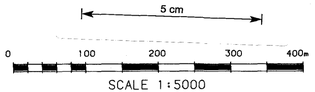
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11000E 9400N	10400E 9400N
	: 11000E 9100N	10400E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

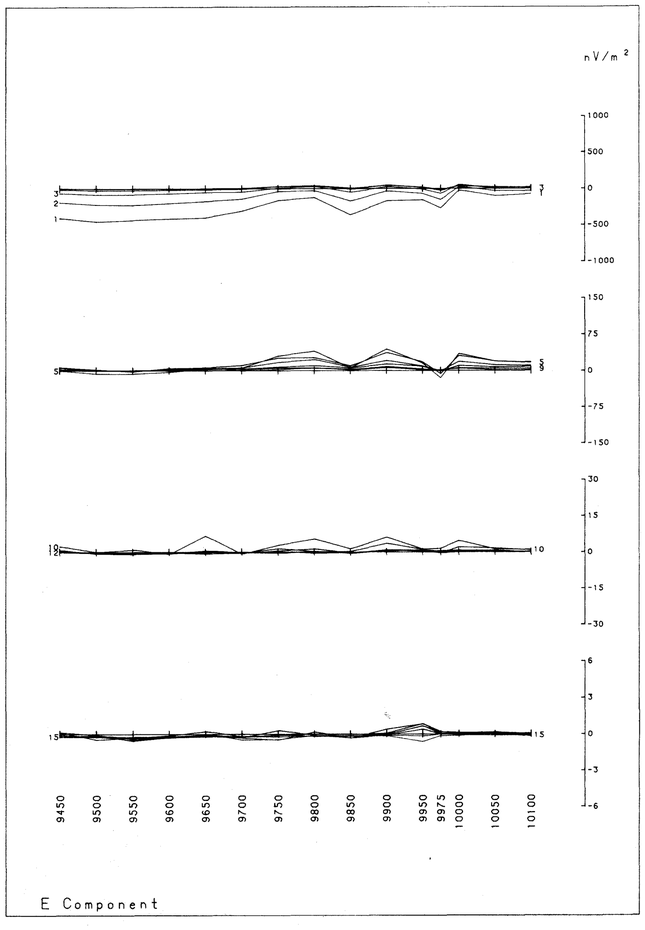
AREA : SPEELER CREEK

LINE : 10800E

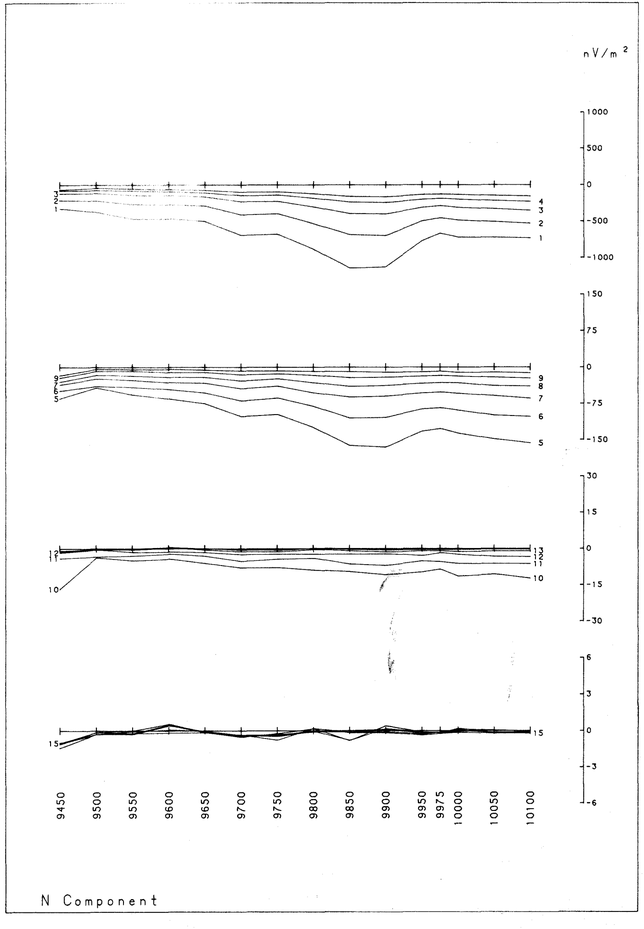
COMP. : E , N & D

Tx LOOP : Tx 1

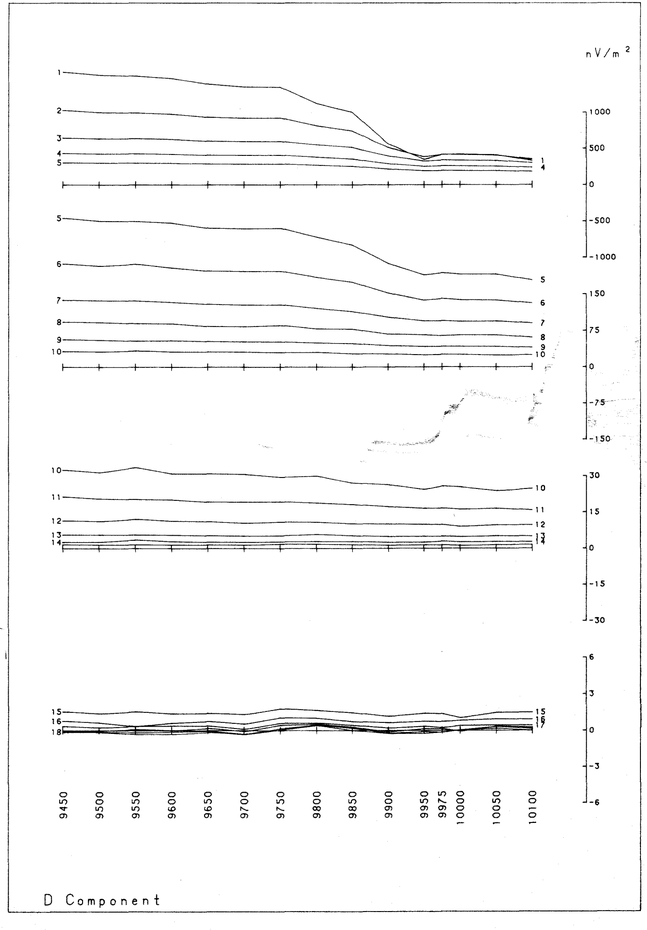
063245



E Component



N Component

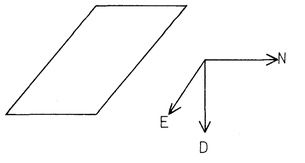


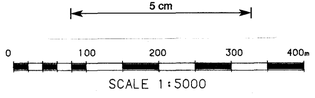
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11000E 9400N	10400E 9400N
	: 11000E 9100N	10400E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 10900E

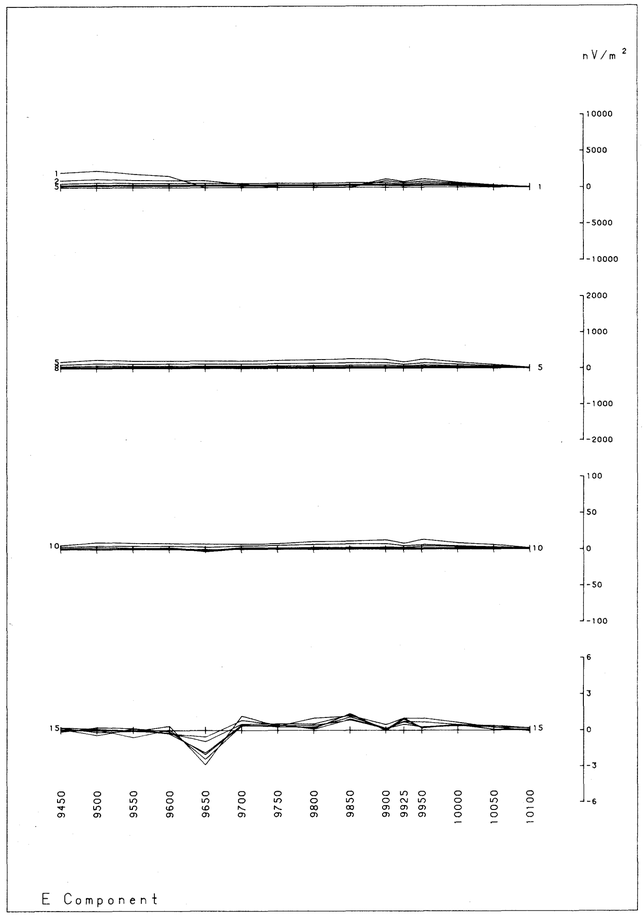
COMP. : E , N & D

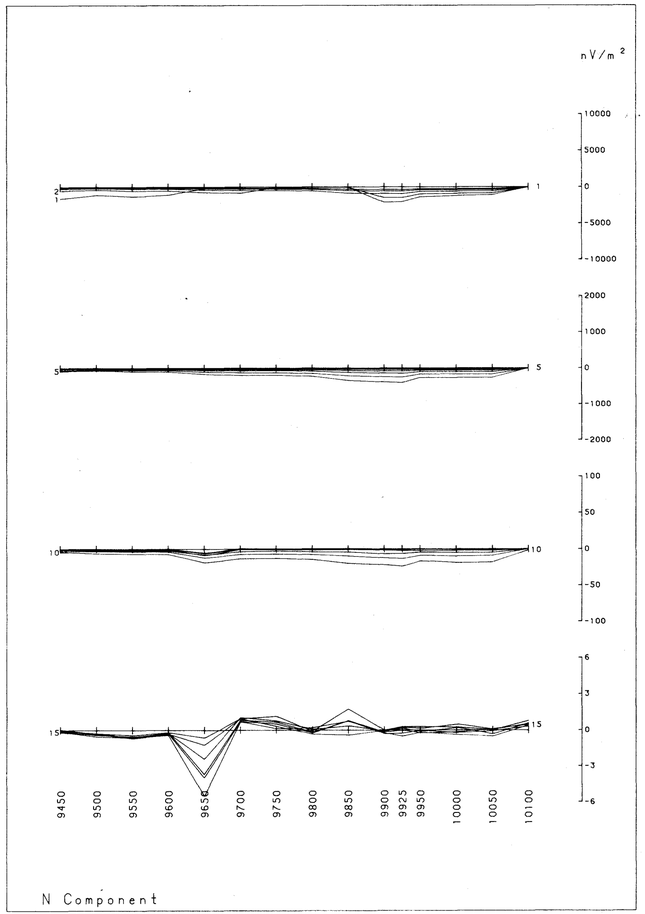
Tx LOOP : Tx 1

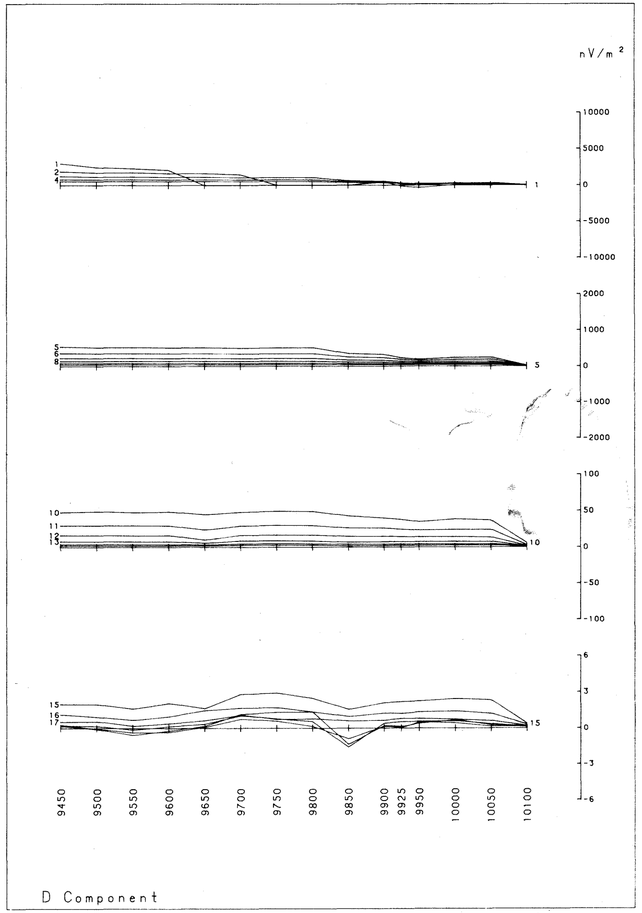
063246

245

1 2 3



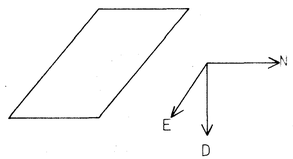




P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 11000E

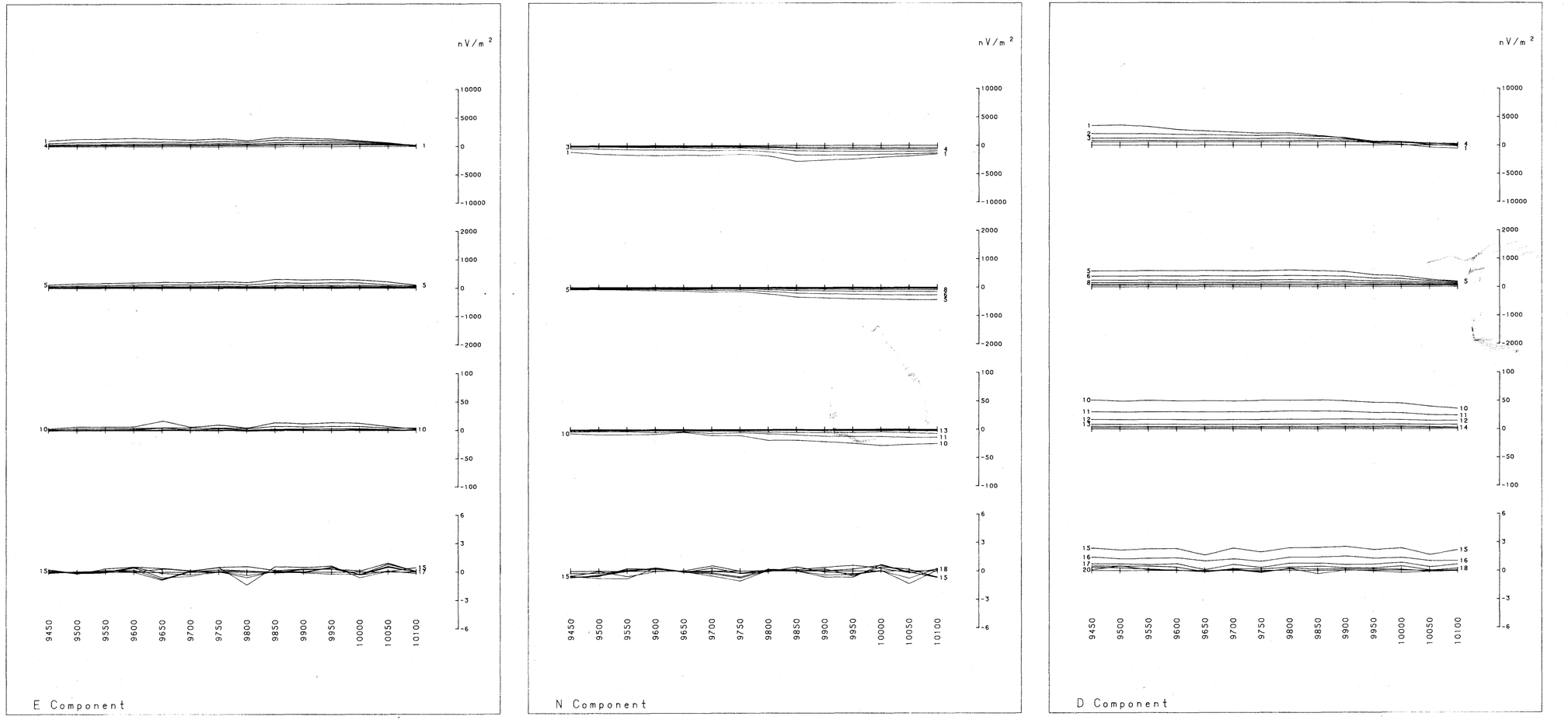
COMP. : E , N & D

Tx LOOP : Tx 2

063247

246

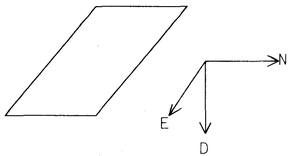
1 2 3



P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N 11000E 9400N
	: 11600E **9100N** 11000E **9100N**
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 242 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.0 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY - JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 11100E

COMP. : E , N & D

Tx LOOP : Tx 2

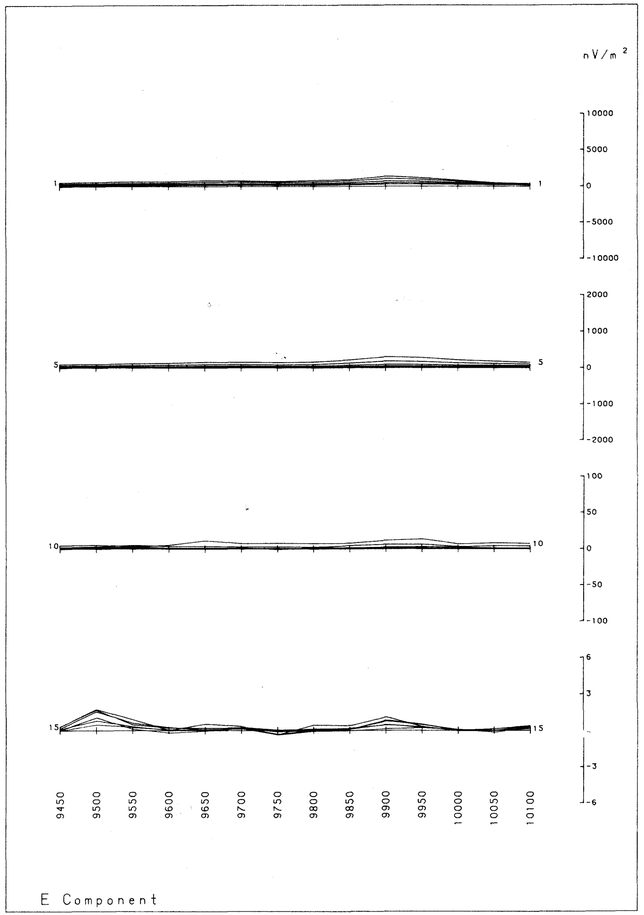
063248

247

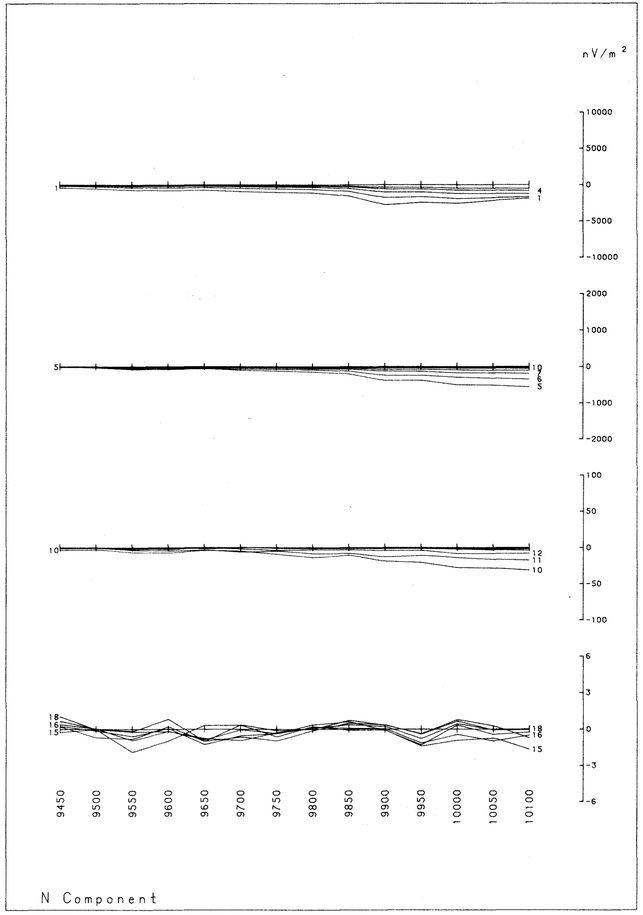
1

2

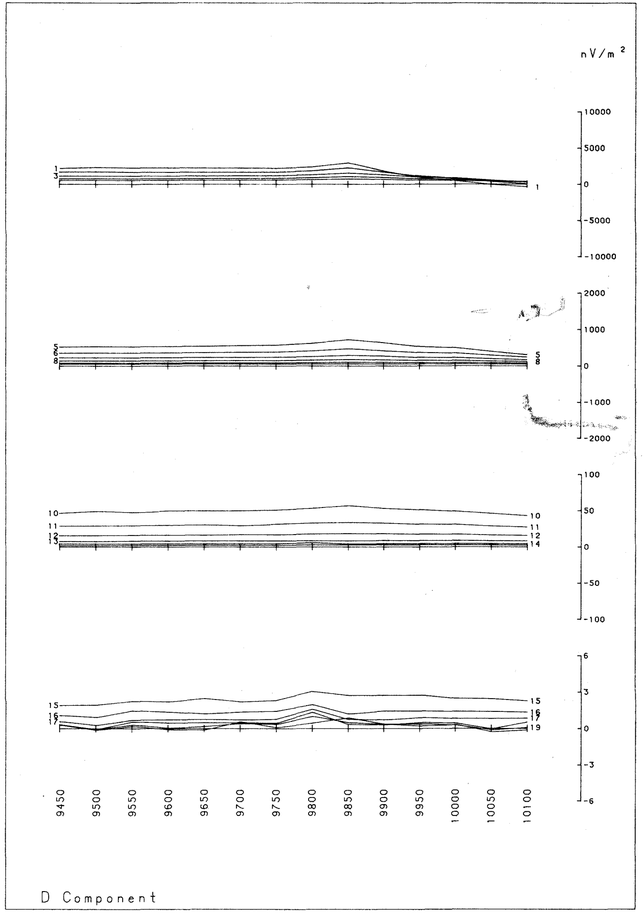
3



E Component



N Component

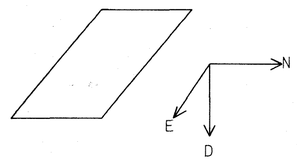


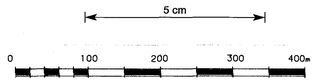
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 11200E

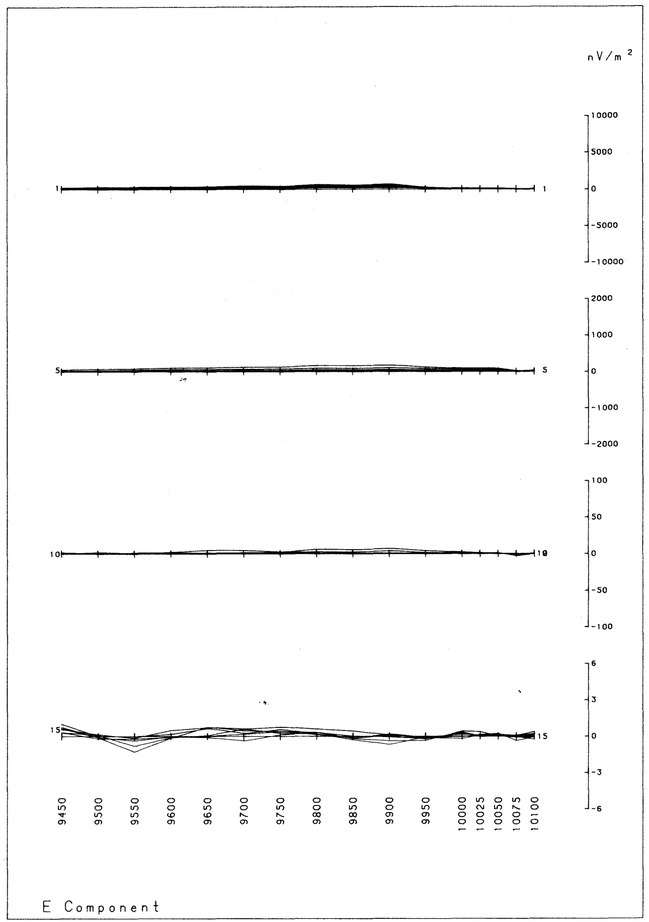
COMP. : E , N & D

Tx LOOP : Tx 2

0632349

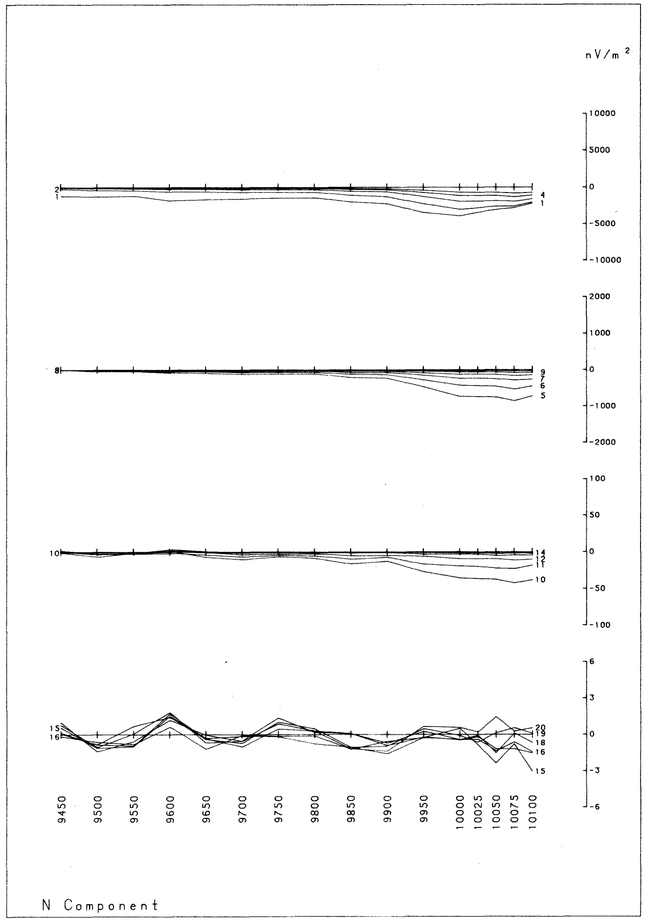
248

1



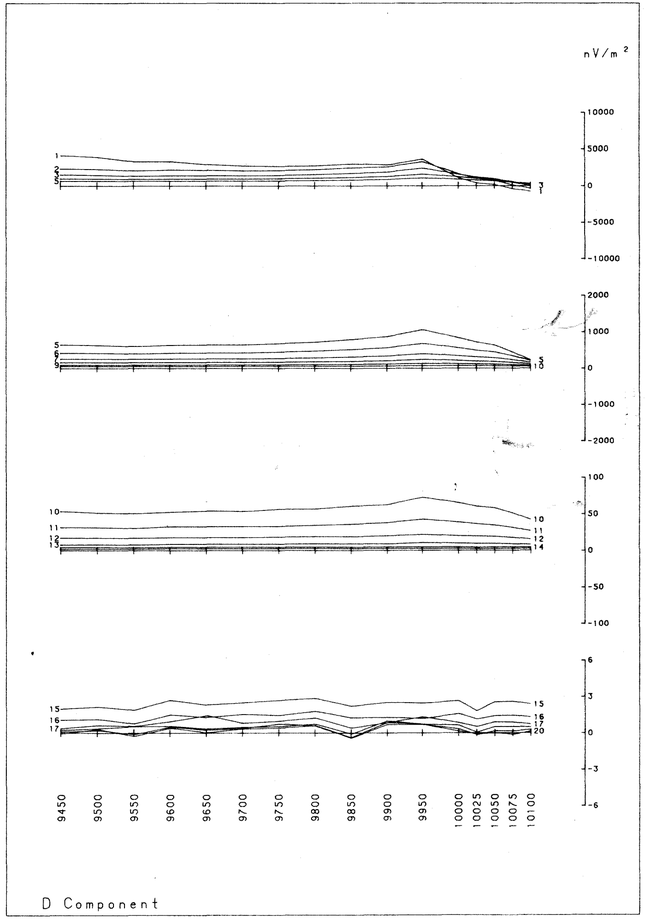
E Component

2



N Component

3

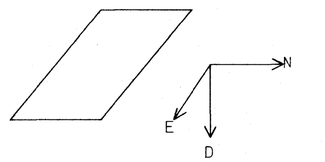


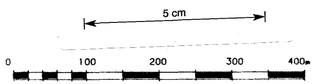
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

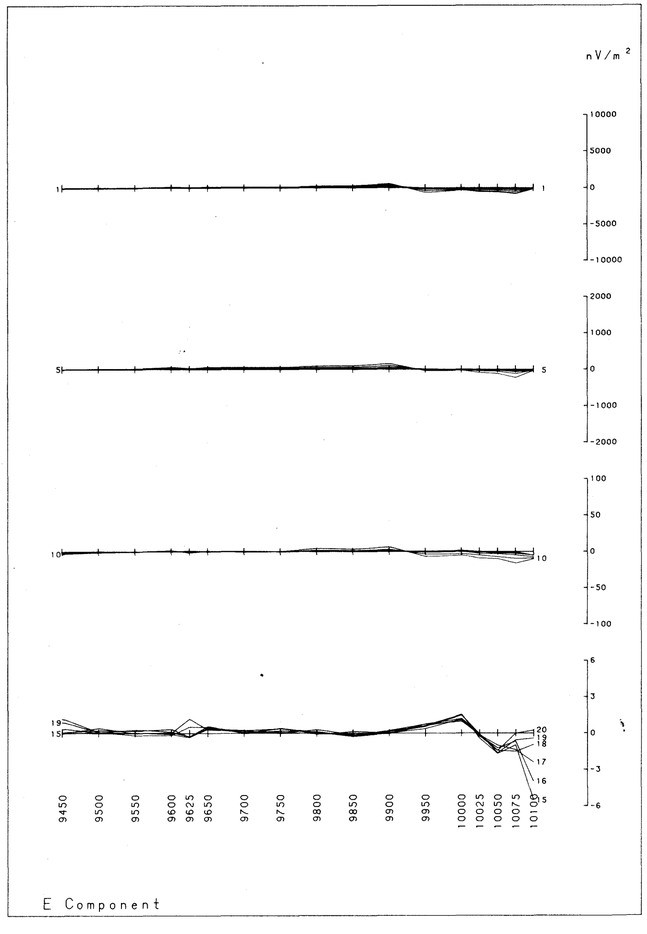
LINE : 11300E

COMP. : E , N & D

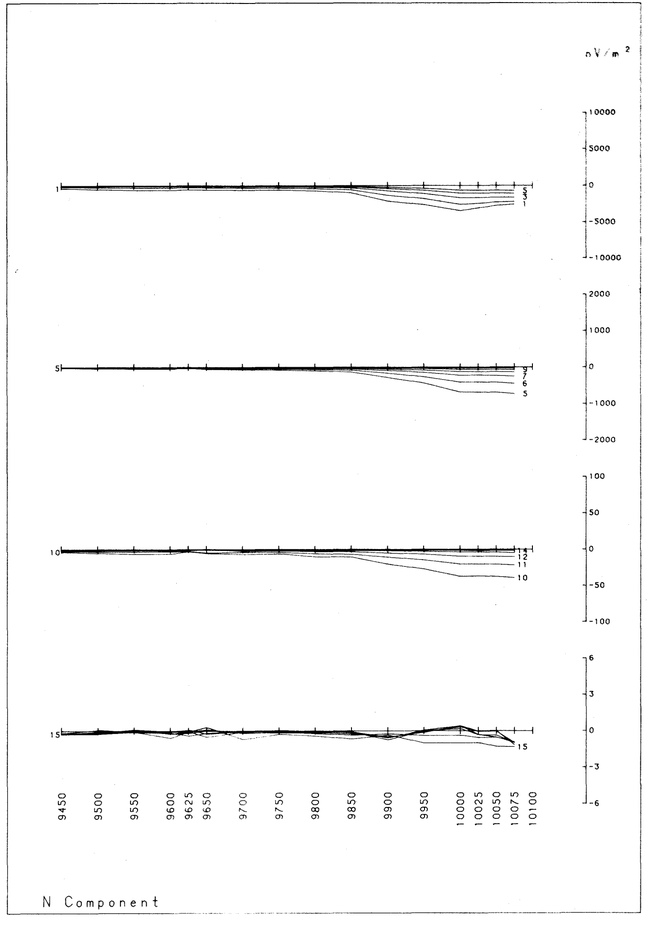
Tx LOOP : Tx 2

063250

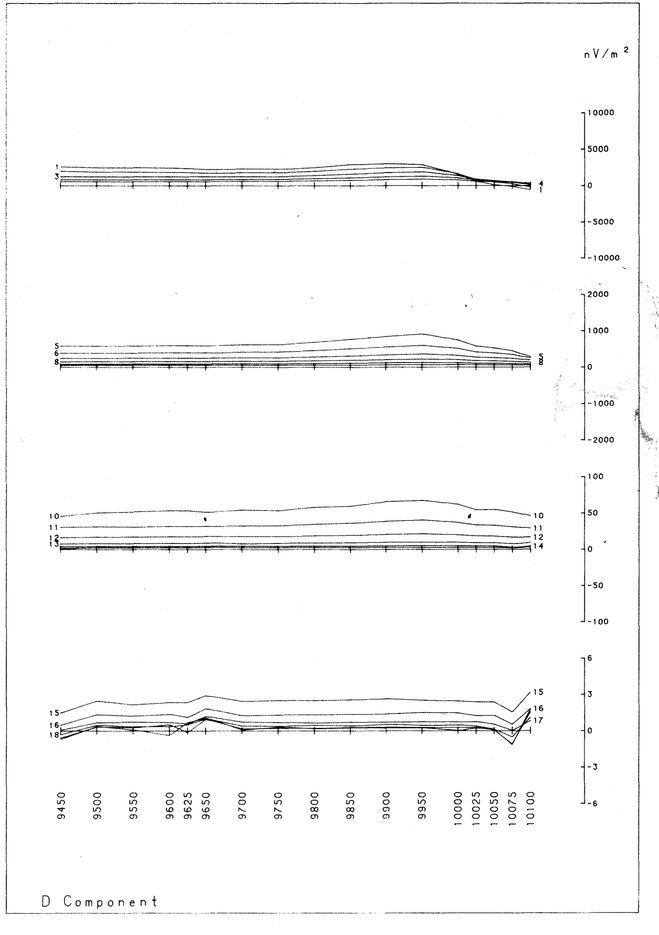
243



E Component



N Component

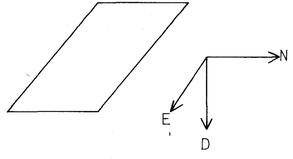


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

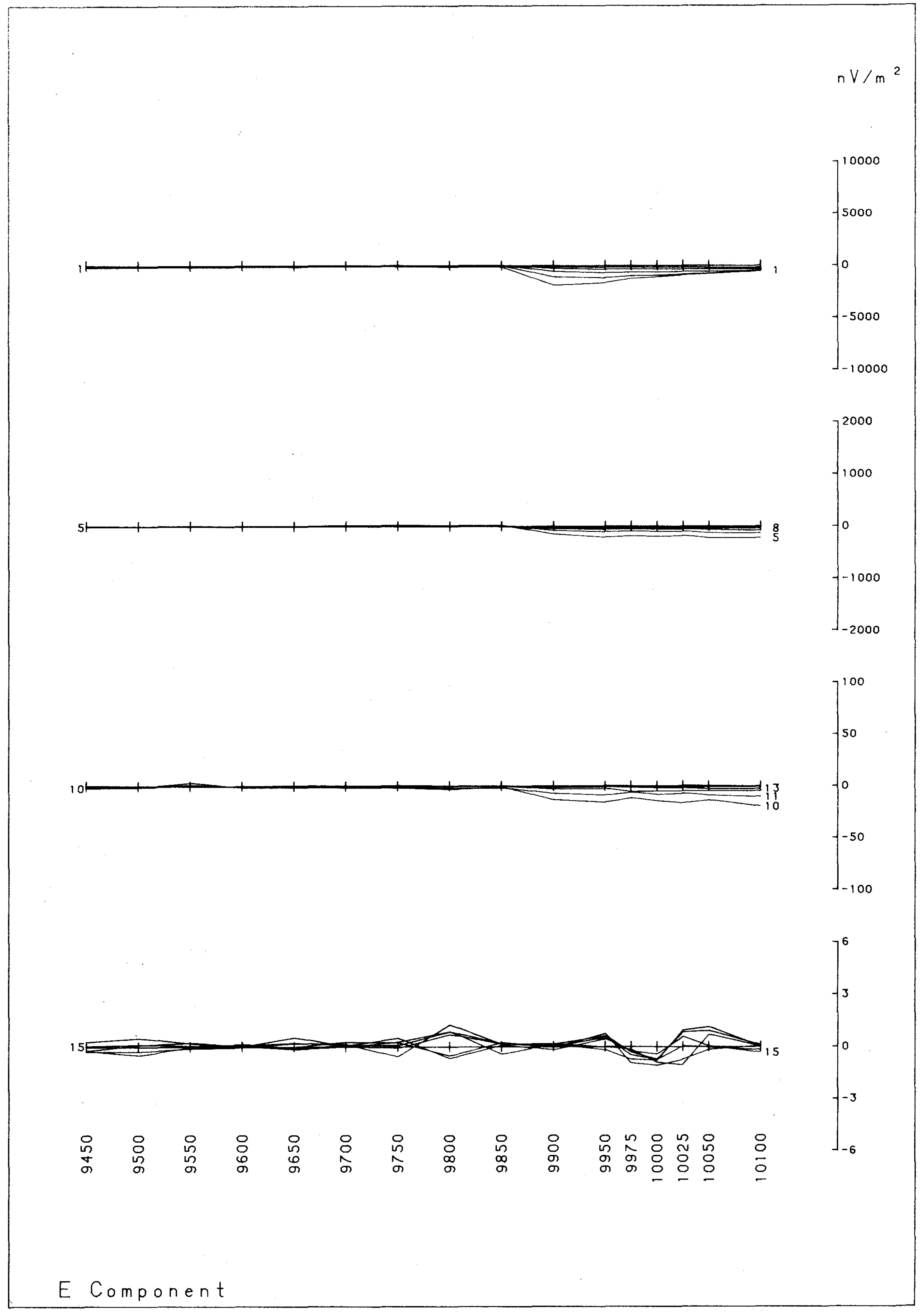
AREA : SPEELER CREEK

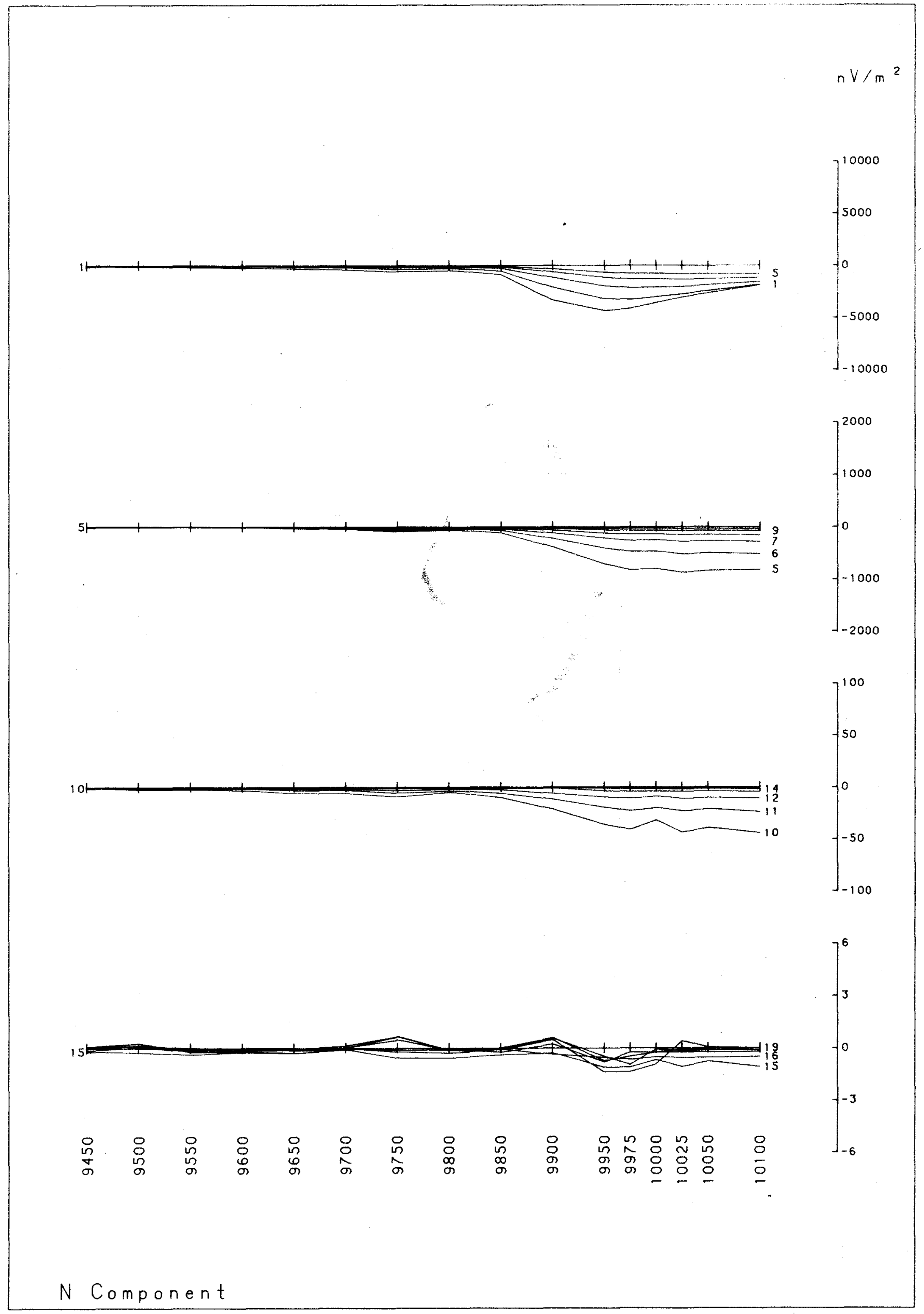
LINE : 11400E

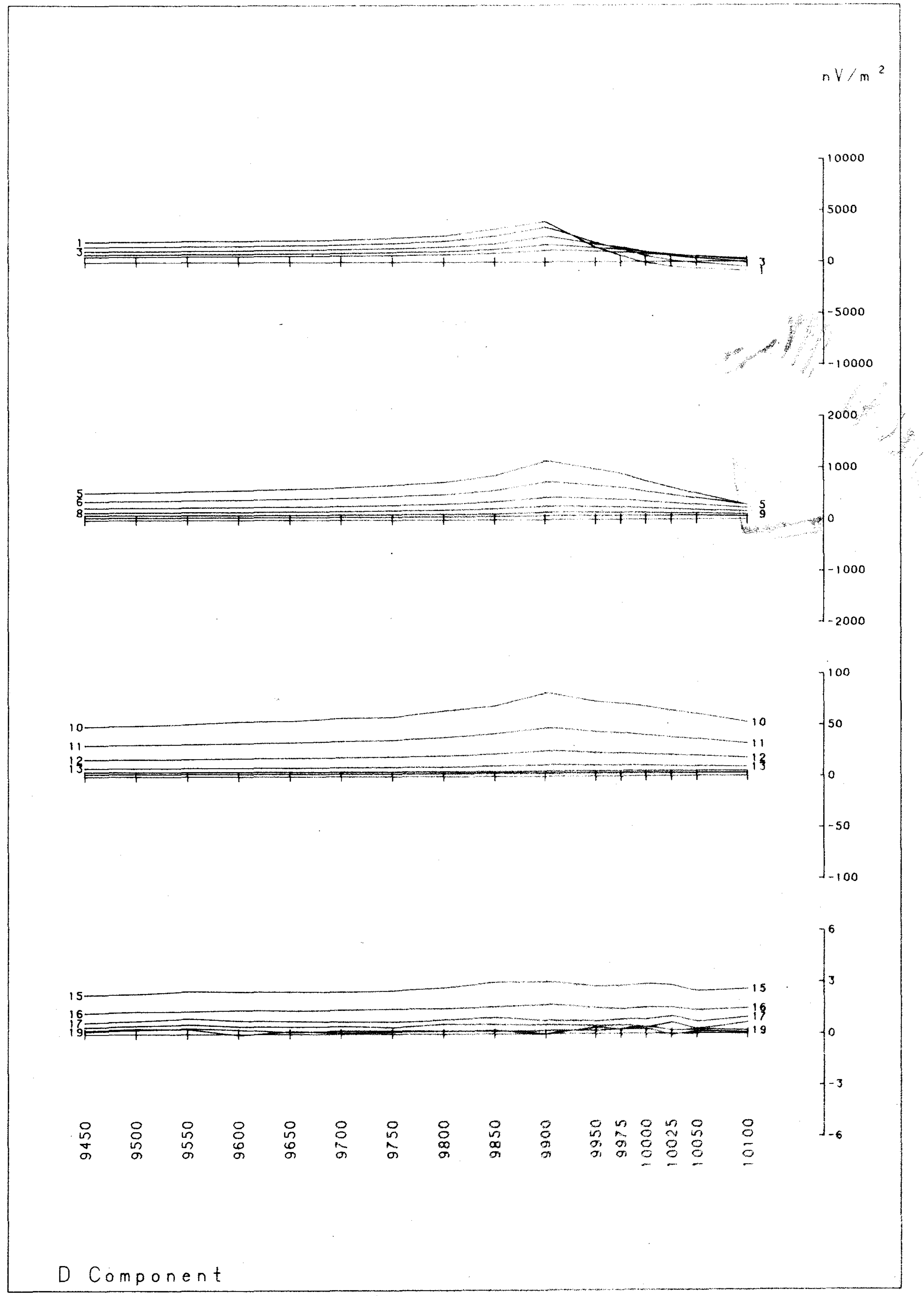
COMP. : E , N & D

Tx LOOP : Tx 2

063251

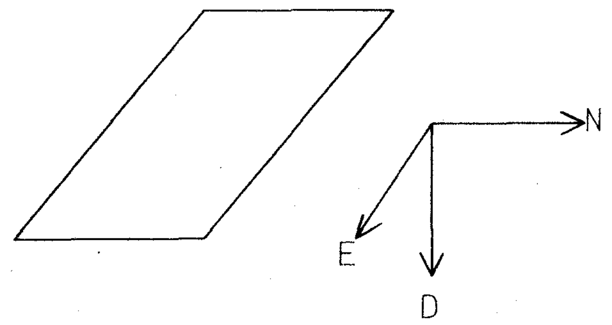


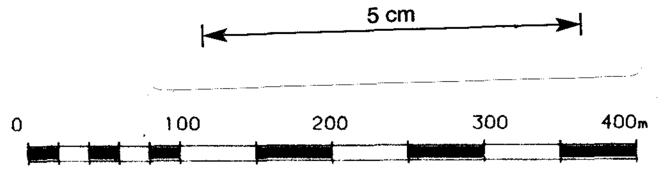




EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

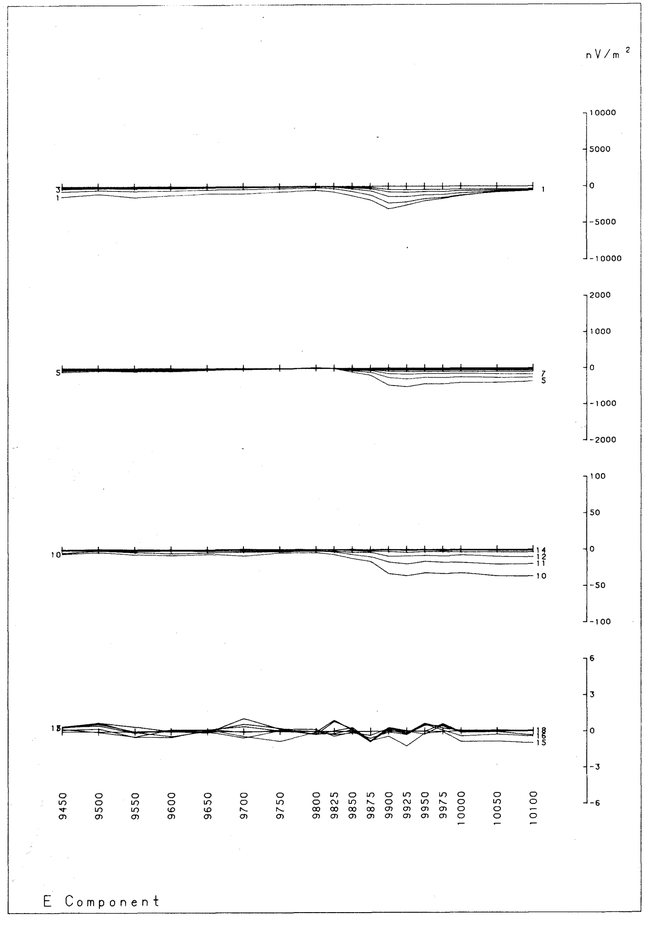
AMOCO MINERALS

PROJECT : MACINTOSH EAST
AREA : SPEELER CREEK
LINE : 11500E
COMP. : E , N & D
Tx LOOP : Tx 2

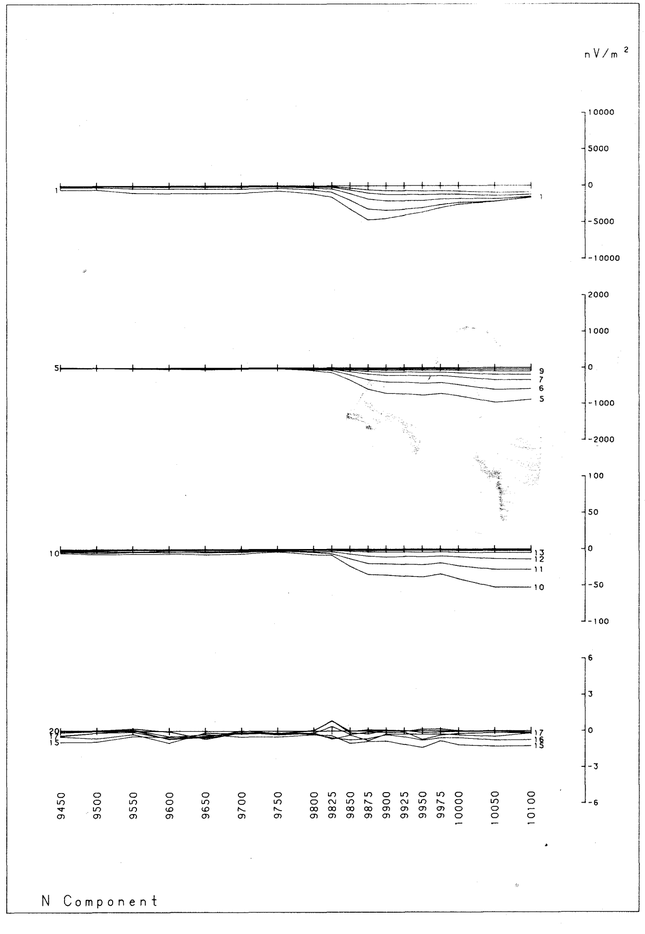
P & V GEOPHYSICAL SERVICES

063252

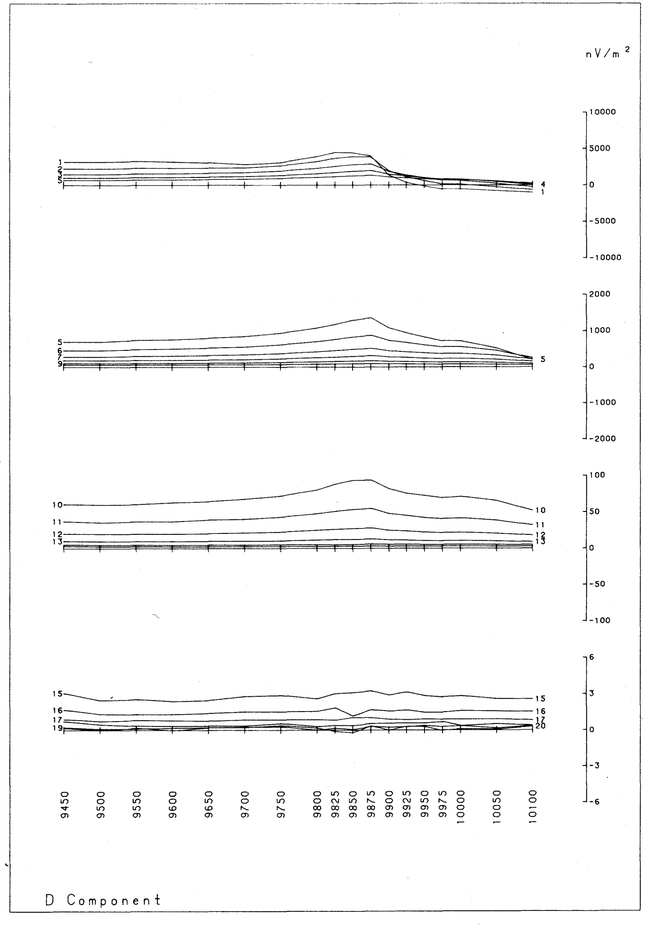
251



E Component



N Component

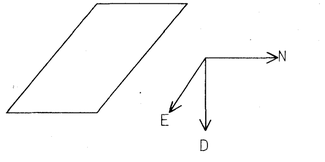


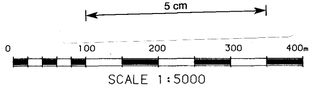
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11600E 9400N	11000E 9400N
	: 11600E 9100N	11000E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 242 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

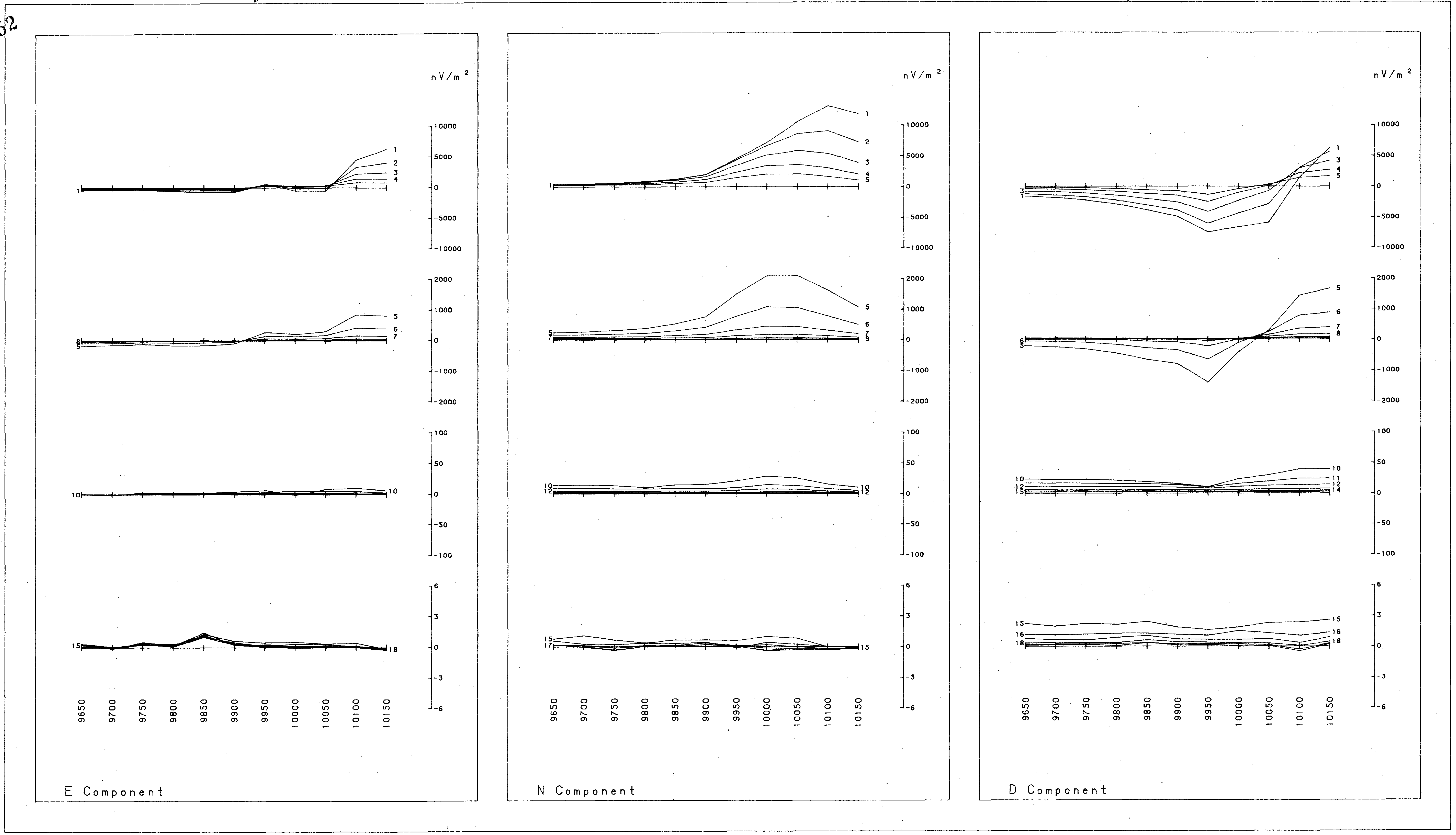
LINE : 11600E

COMP. : E , N & D

Tx LOOP : Tx 2

063253

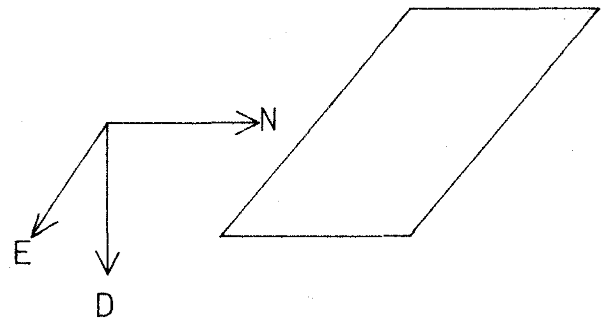
252

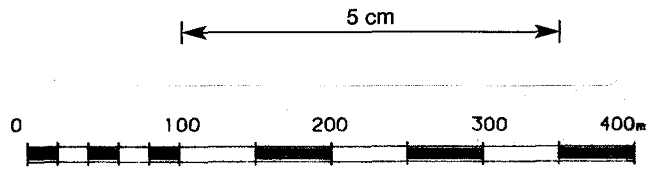


P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

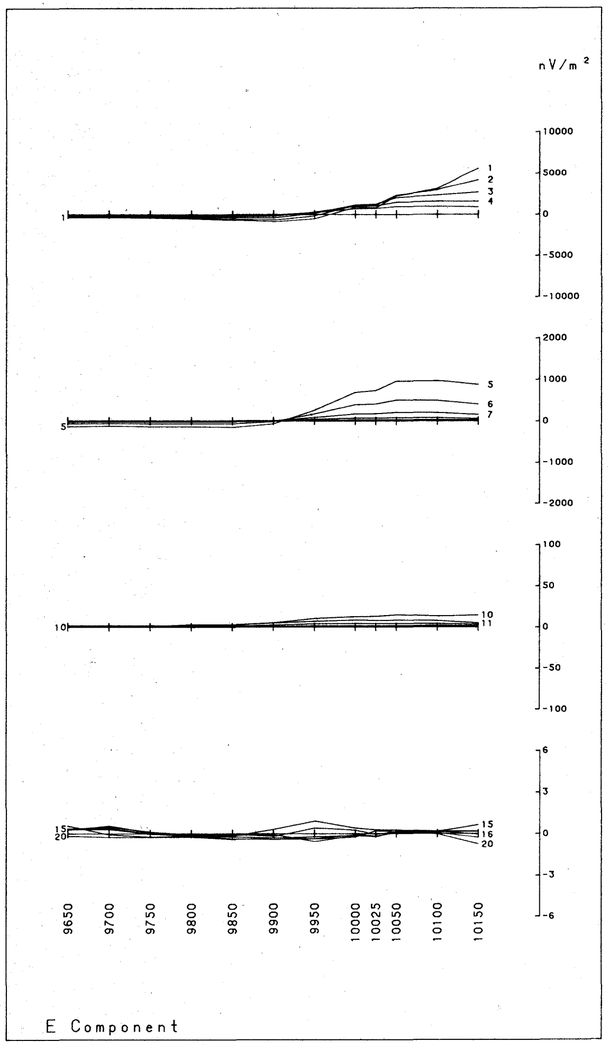
LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

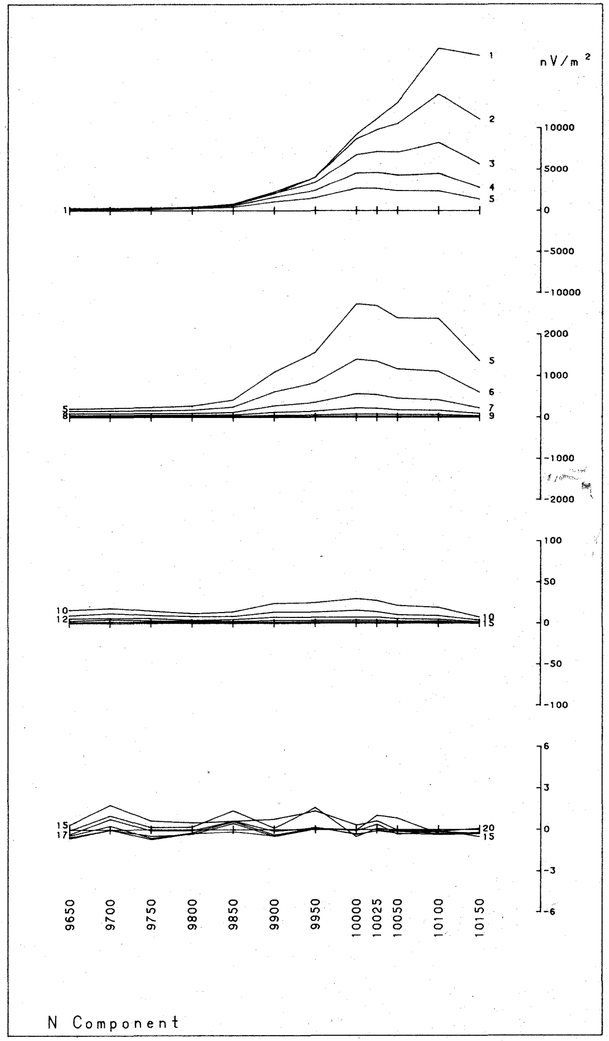
AMOCO MINERALS

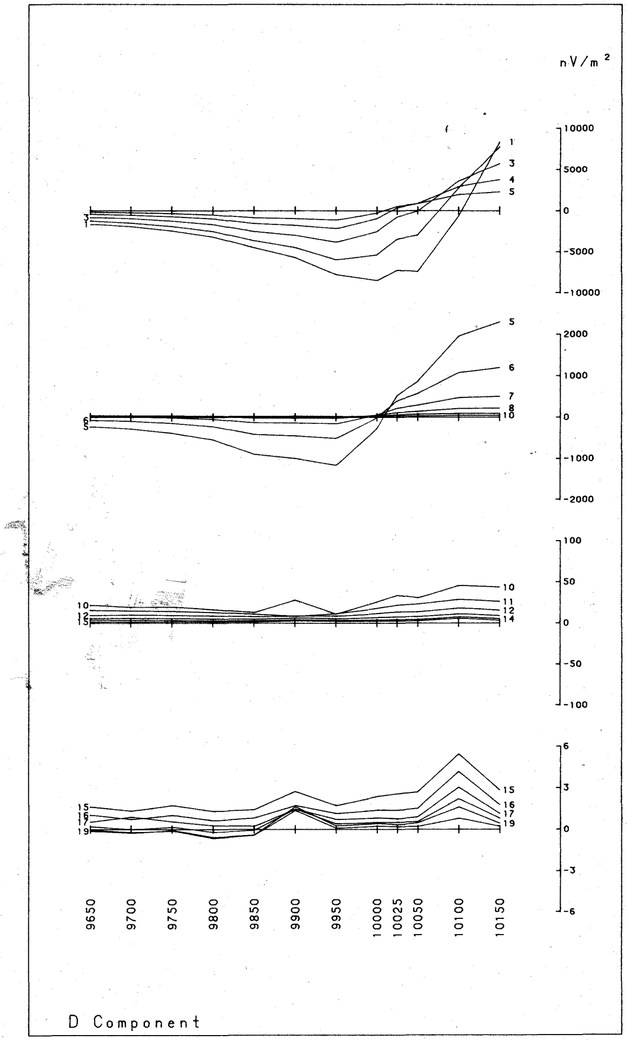
PROJECT	: MACINTOSH EAST
AREA	: SPEELER CREEK
LINE	: 11300E
COMP.	: E , N & D
Tx LOOP	: Tx 3

C63254

253



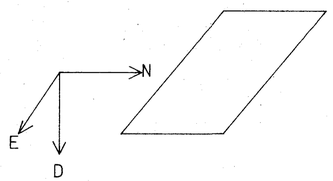


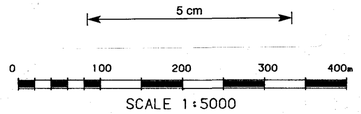


P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

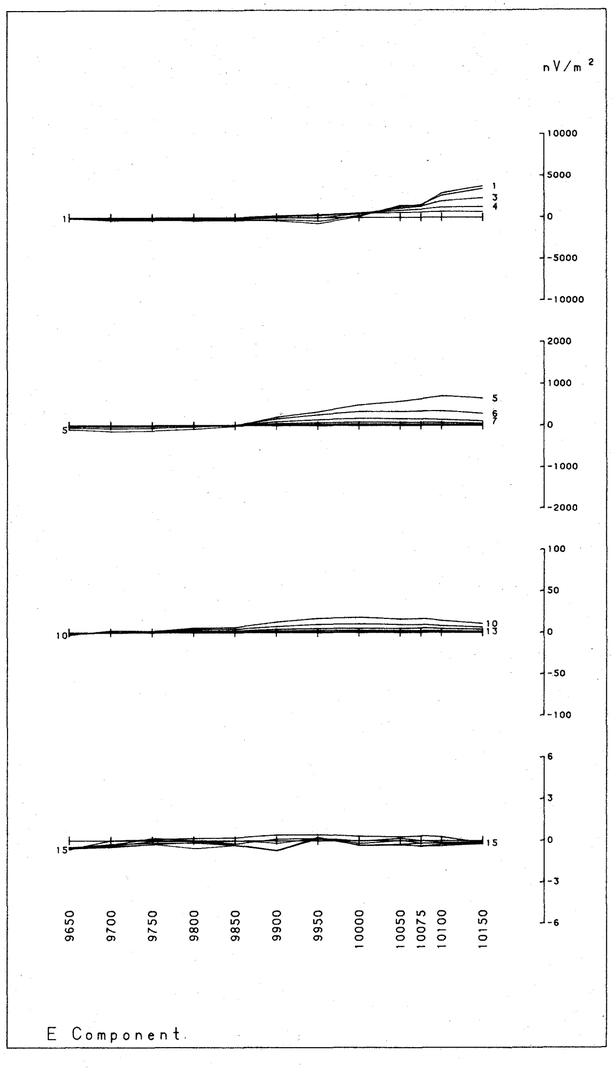
LINE : 11400E

COMP. : E , N & D

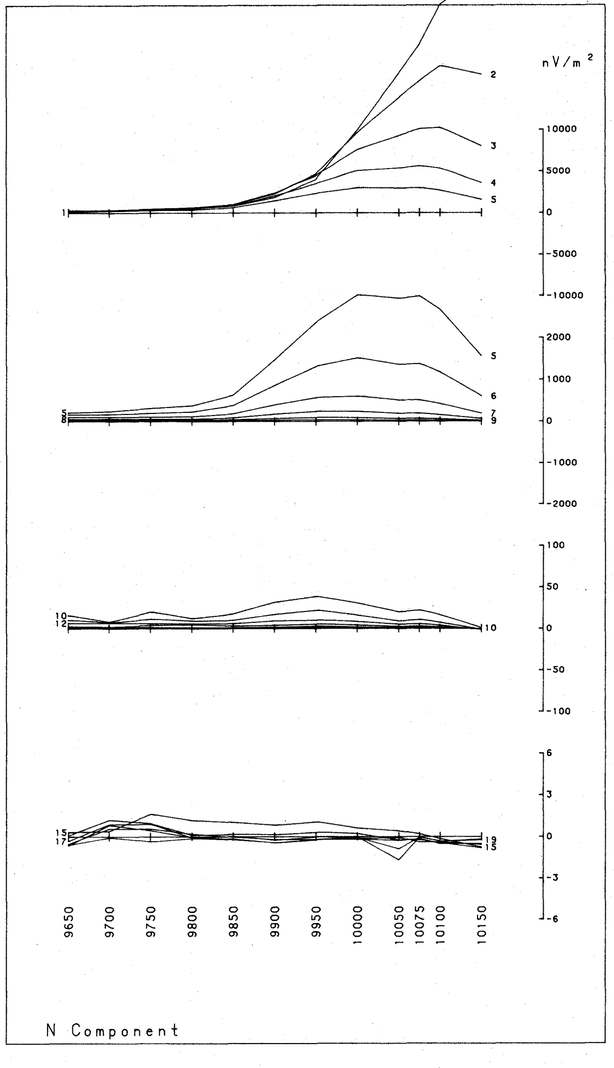
Tx LOOP : Tx 3

063255

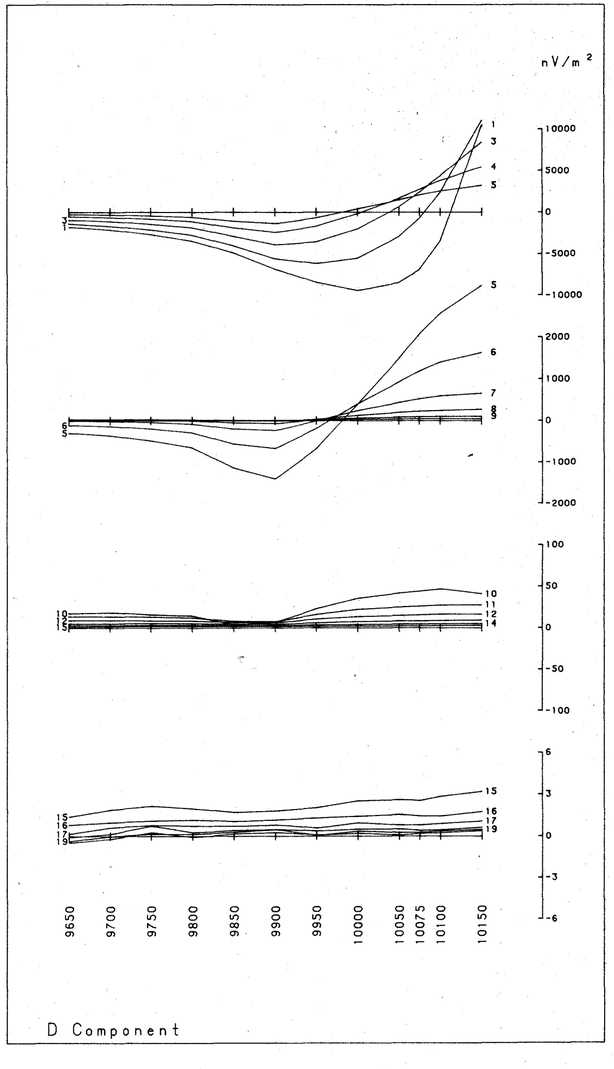
254



E Component.



N Component

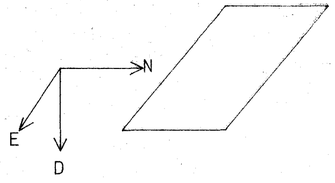


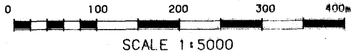
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

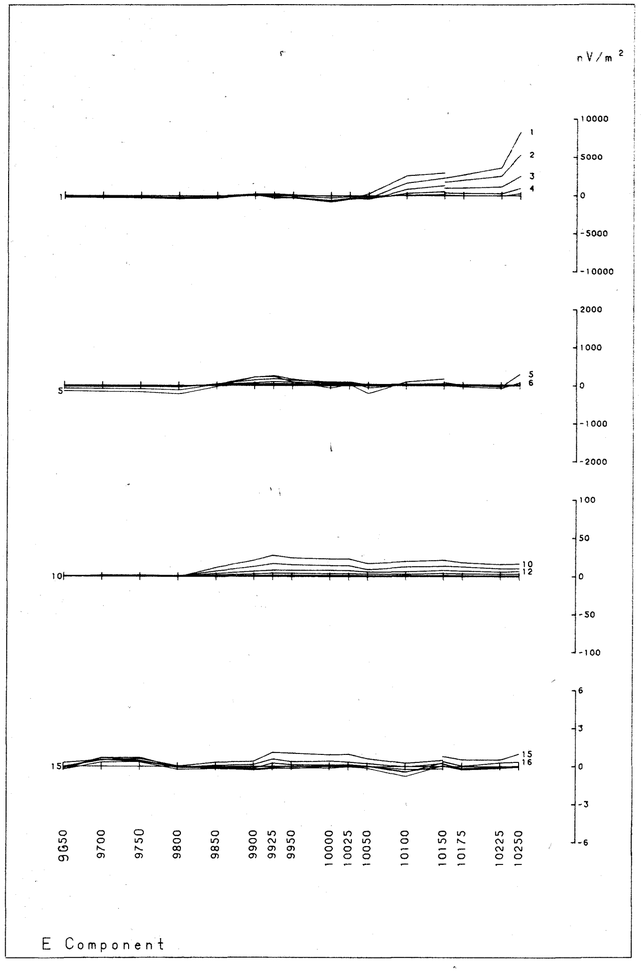
LINE : 11500E

COMP. : E , N & D

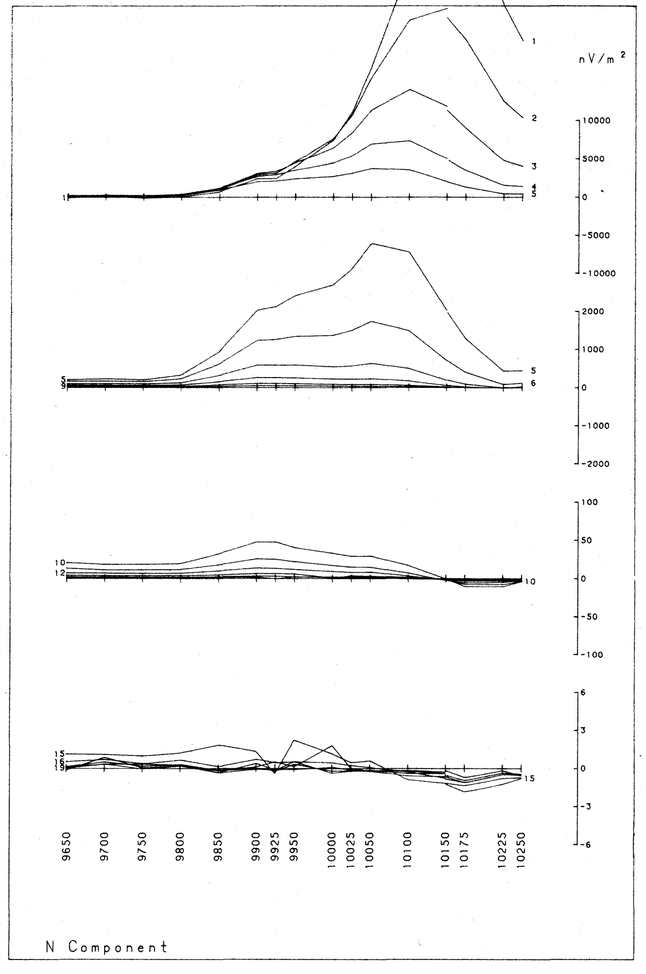
Tx LOOP : Tx 3

063256

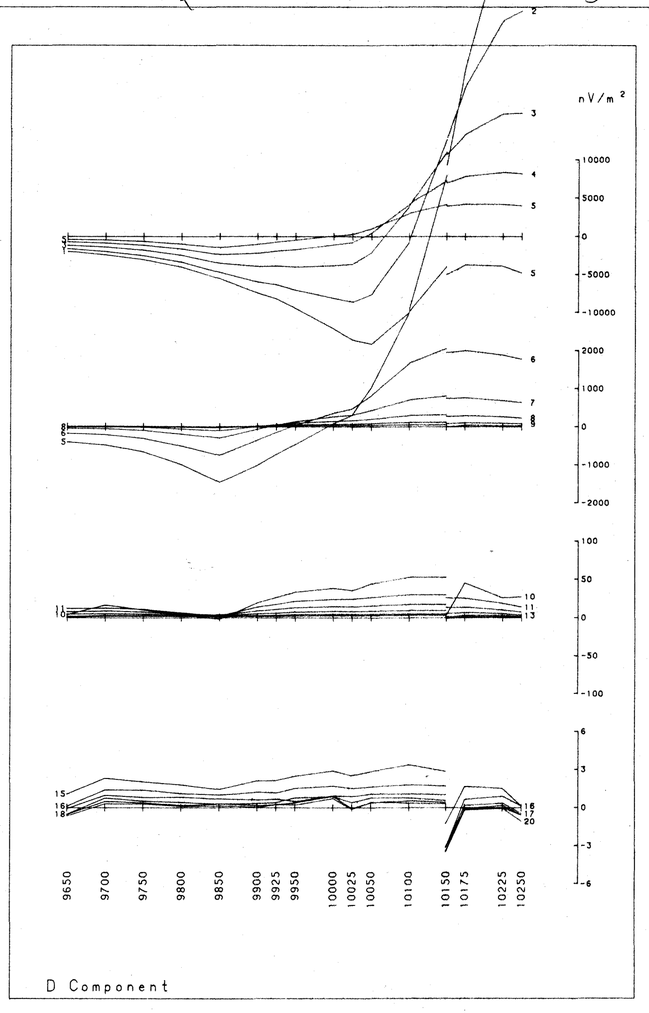
255



E Component



N Component

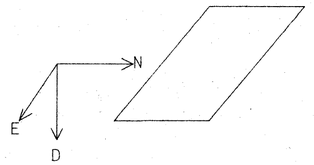


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

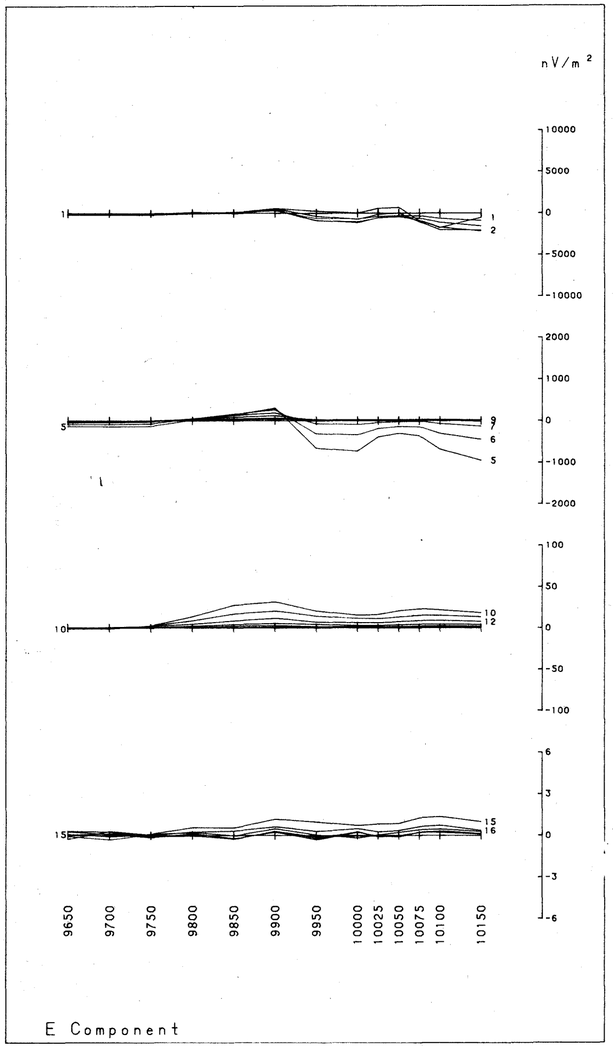
LINE : 11600E

COMP. : E , N & D

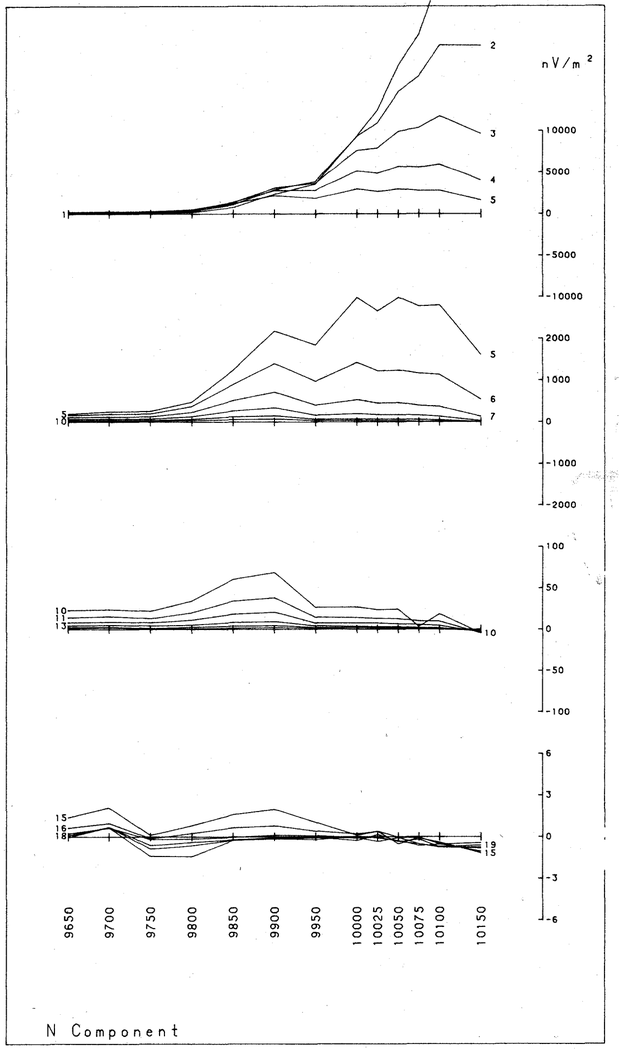
Tx LOOP : Tx 3

063257

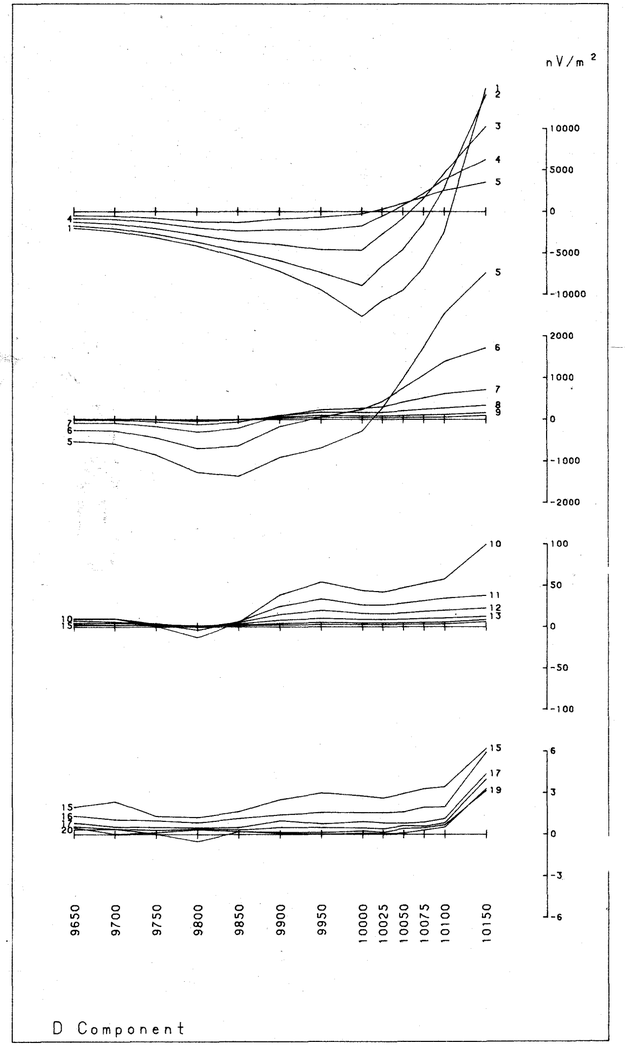
256



E Component



N Component

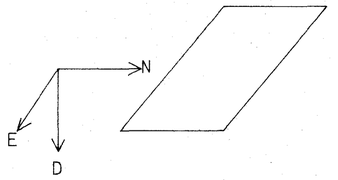


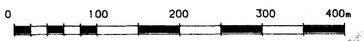
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

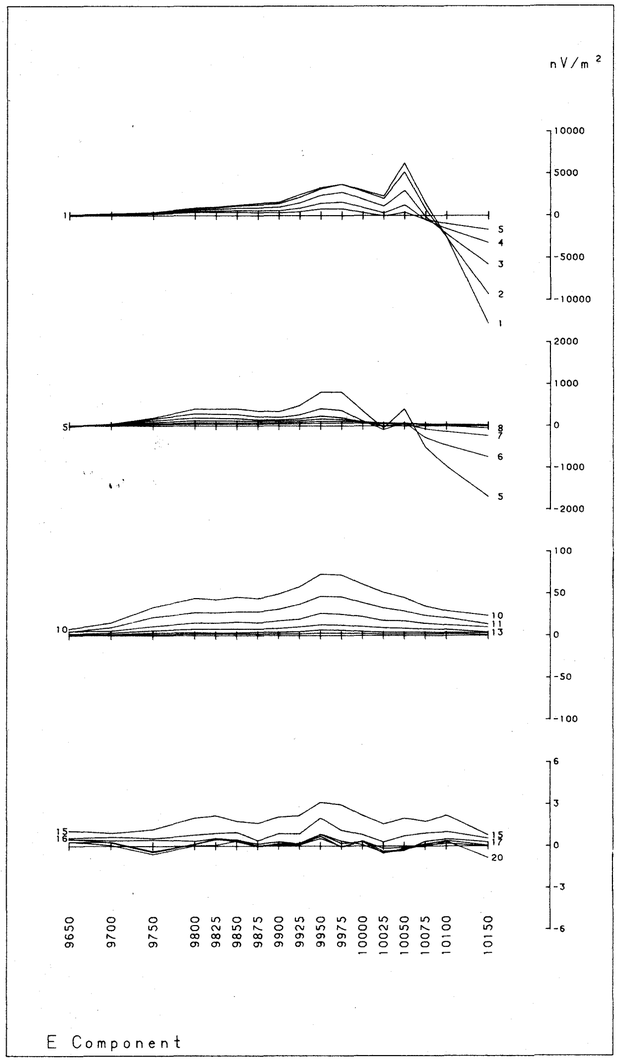
LINE : 11700E

COMP. : E , N & D

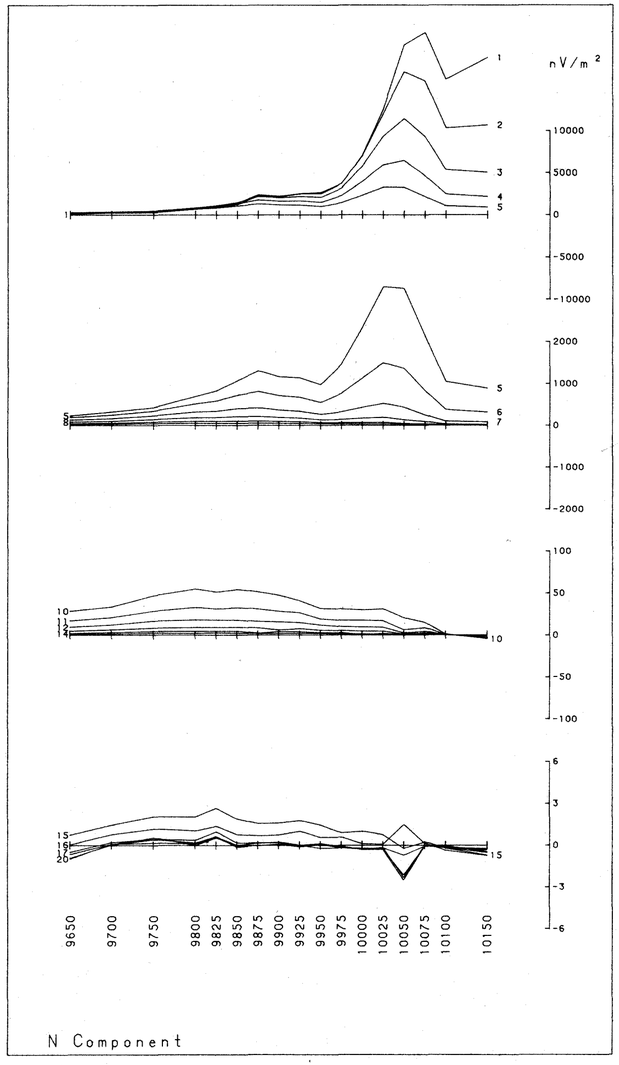
Tx LOOP : Tx 3

063258

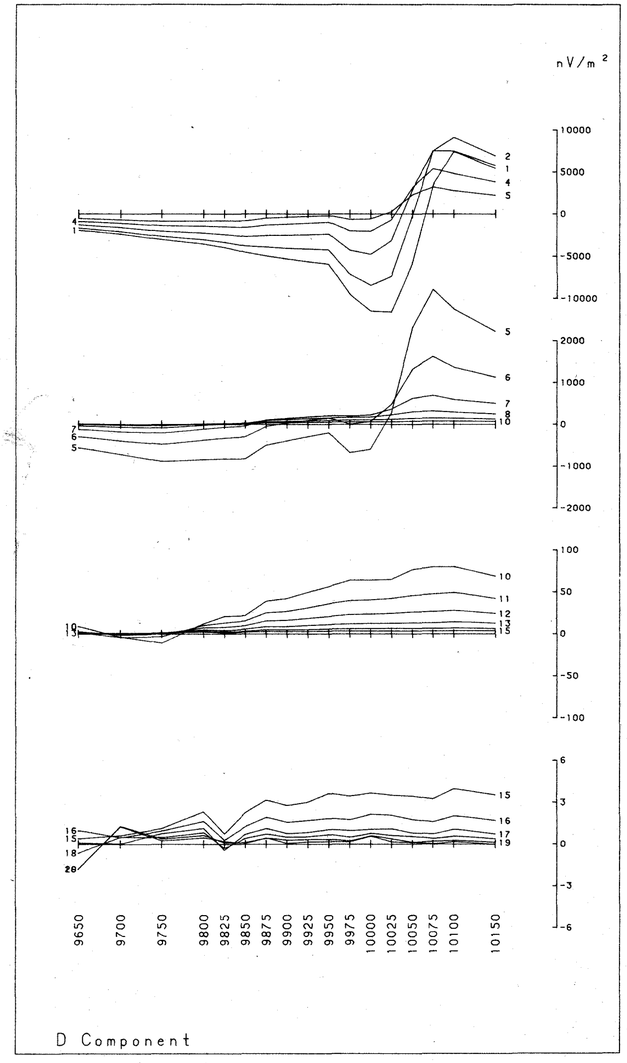
257



E Component



N Component

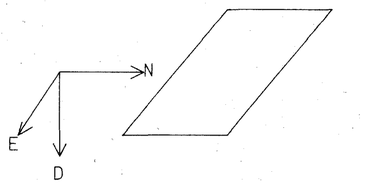


D Component

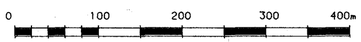
P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm



SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 11900E 10200N 11300E 10200N
	: 11900E 10500N 11300E 10500N
LOOP SIZE	: 600m x 300m
Tx TURN OFF TIME	: 240 usec
FIRST GATE TIME	: 0.08 msec
CURRENT	: 14.8 amps
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 256
SYNC. MODE	: XTAL
SURVEYED BY	: P.P
DATE	: MAY -JULY 1985
JOB NUMBER	: 327
PROCESSING	: TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 11800E

COMP. : E , N & D

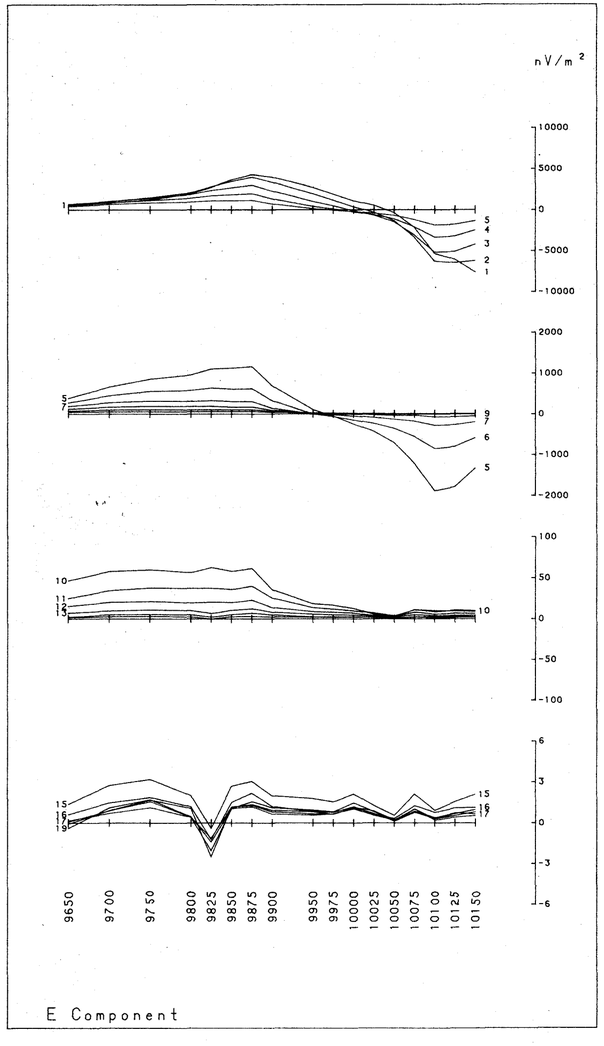
Tx LOOP : Tx 3

063239

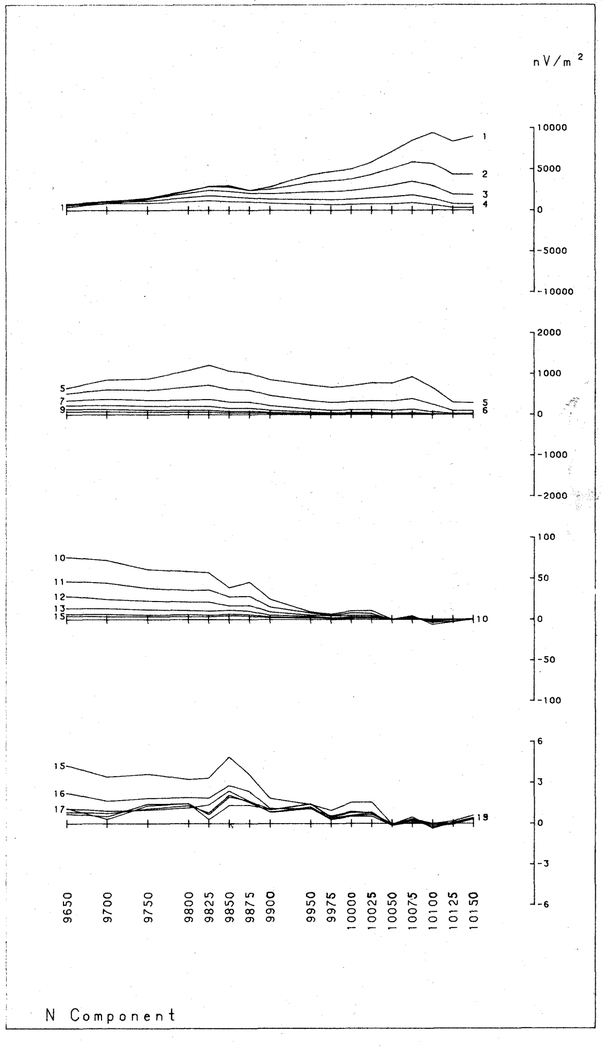
258

1

2



E Component



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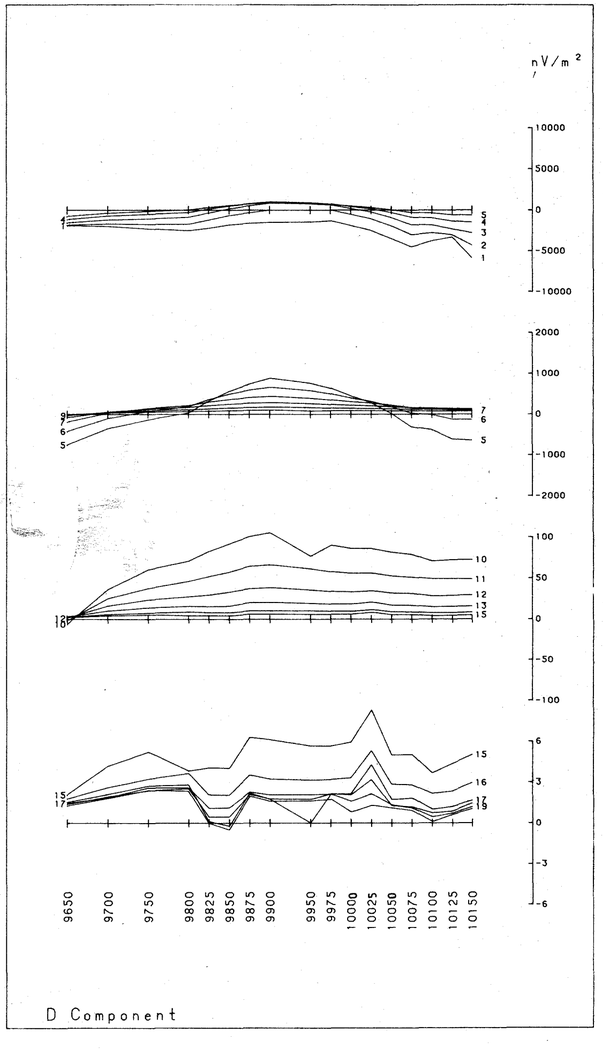
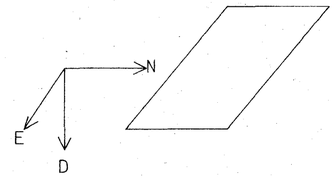


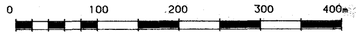
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	:	11900E 10200N 11300E 10200N
	:	11900E 10500N 11300E 10500N
LOOP SIZE	:	600m x 300m
Tx TURN OFF TIME	:	240 usec
FIRST GATE TIME	:	0.08 msec
CURRENT	:	14.8 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256
SYNC. MODE	:	XTAL
SURVEYED BY	:	P.P
DATE	:	MAY -JULY 1985
JOB NUMBER	:	327
PROCESSING	:	TESLA 10 PTY LTD

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : SPEELER CREEK

LINE : 11900E

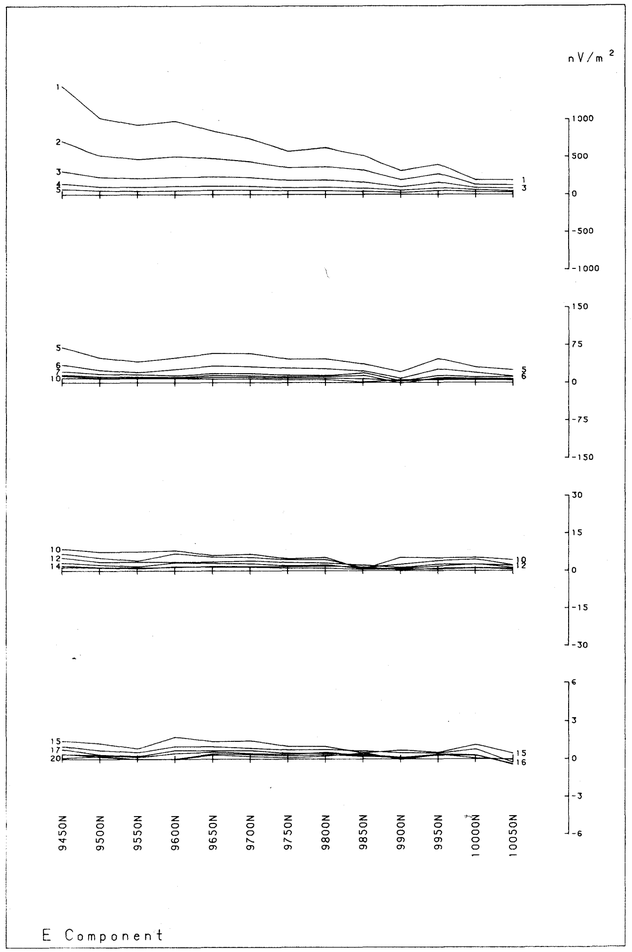
COMP. : E , N & D

Tx LOOP : Tx 3

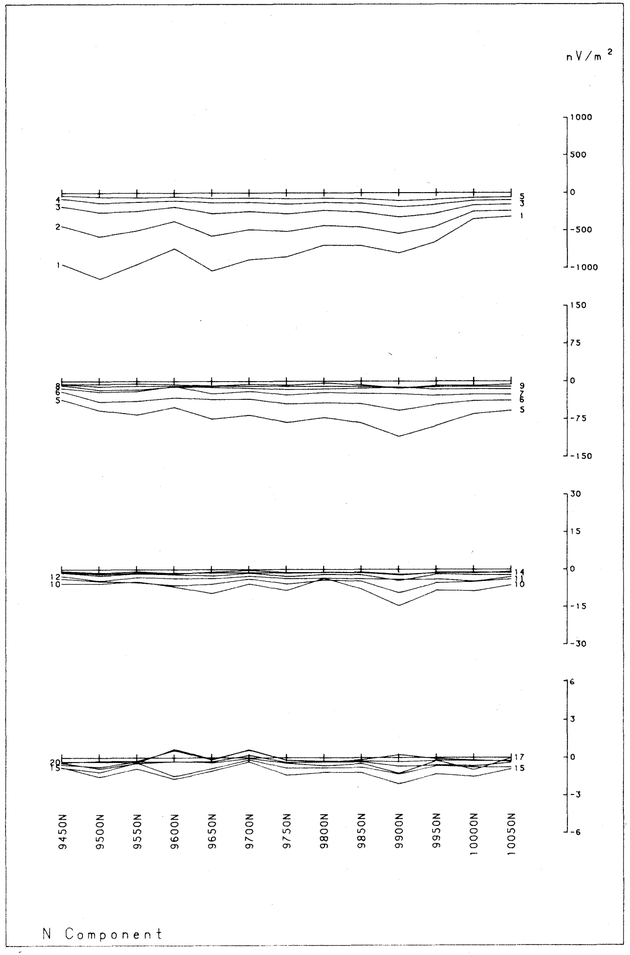
063260

259

1



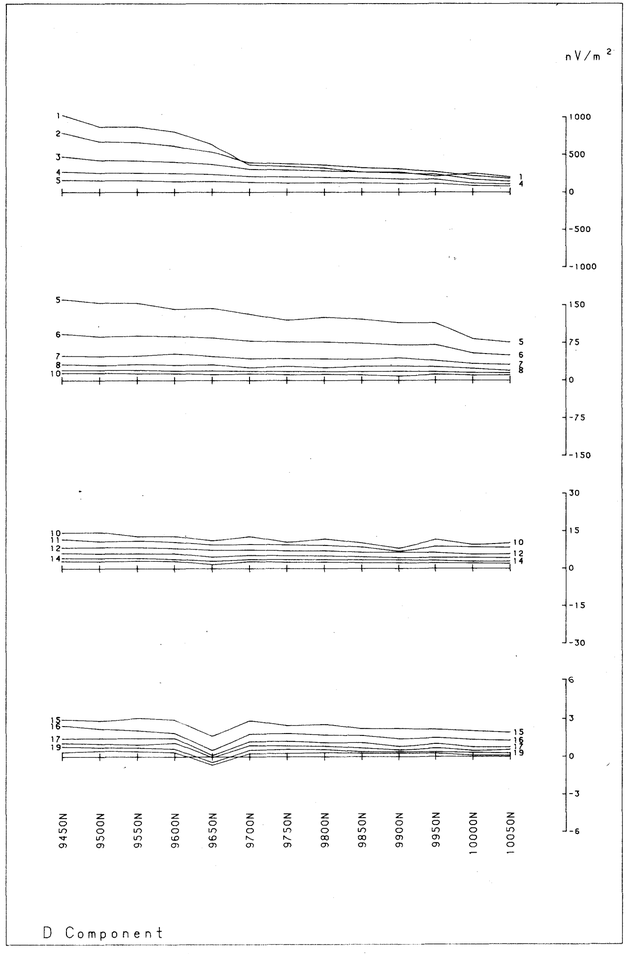
E Component



N Component

2

3

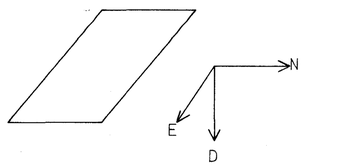


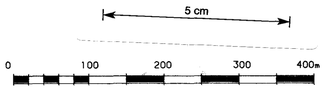
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

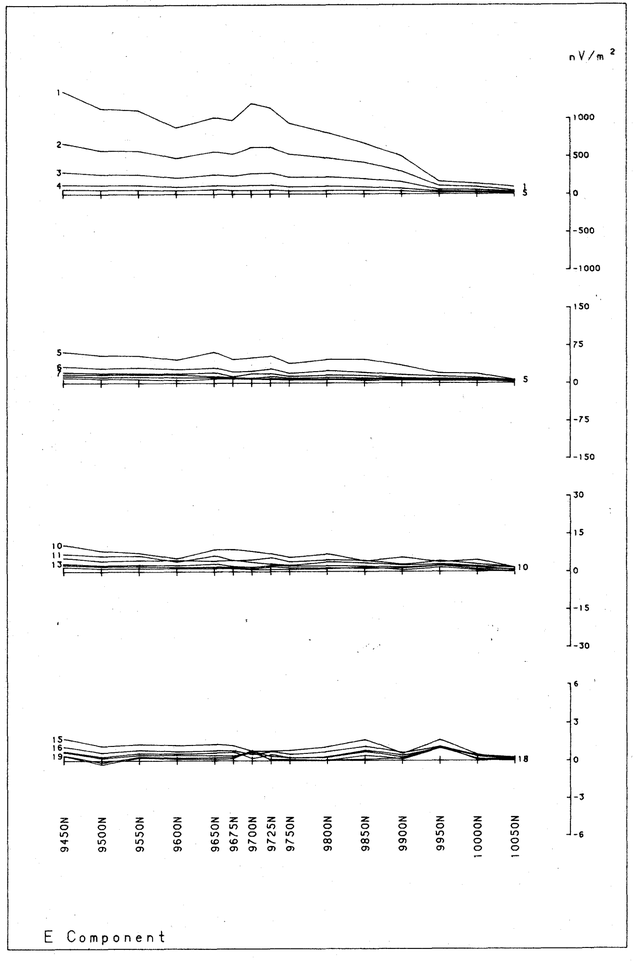
AREA : CARTERS

LINE : 9350E

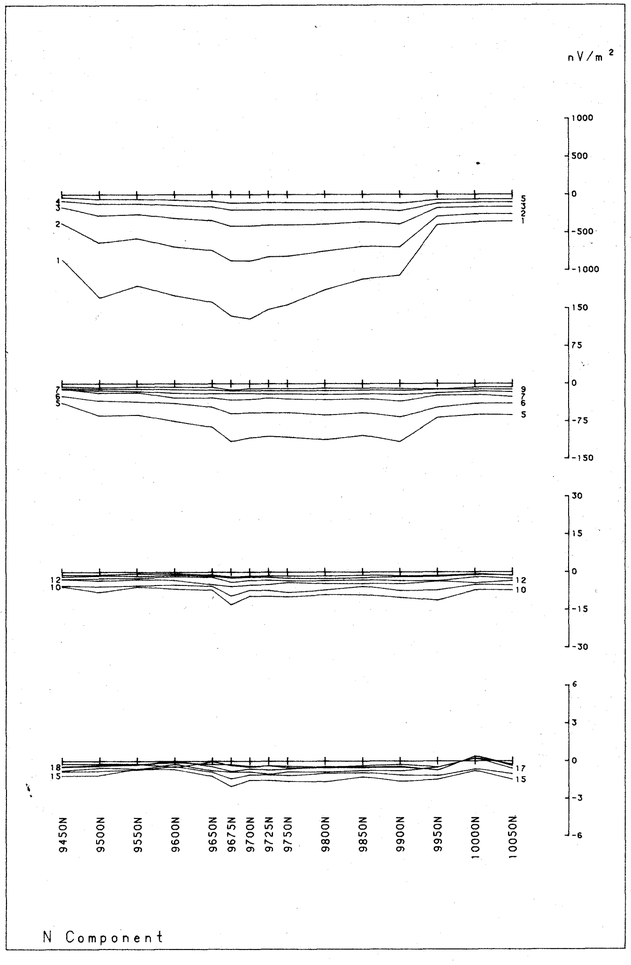
COMP. : E , N & D

Tx LOOP : Tx 6

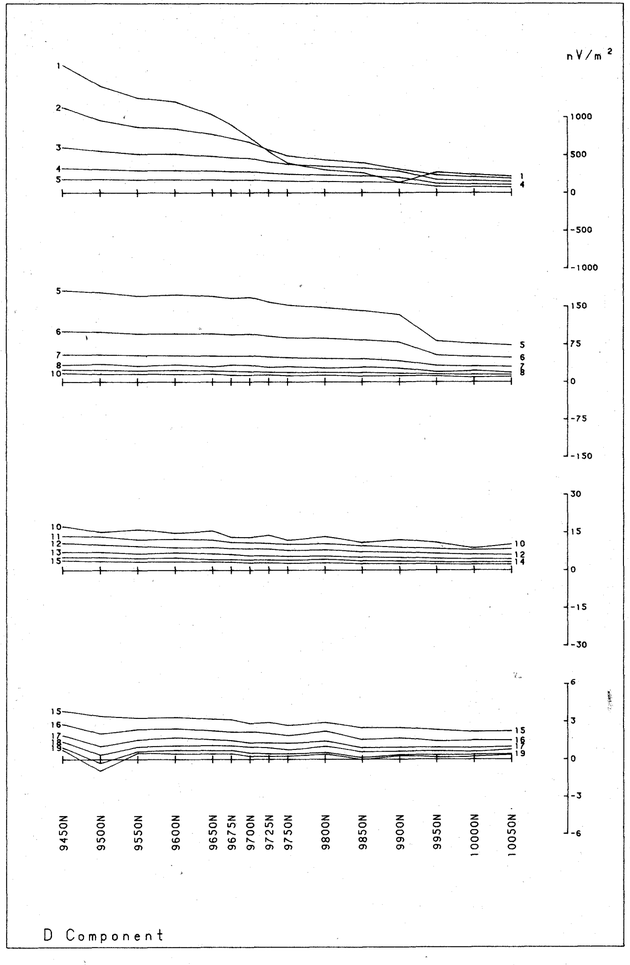
0632261



E Component



N Component

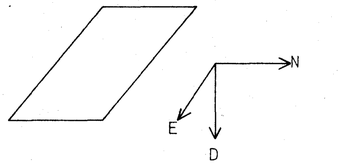


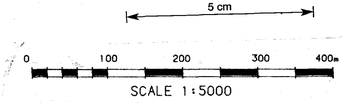
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

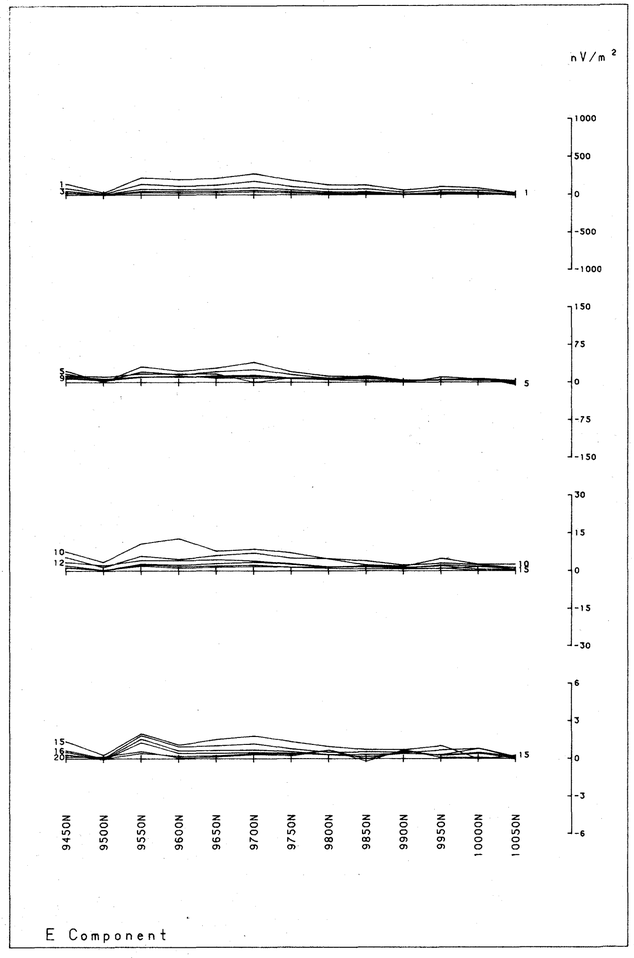
AREA : CARTERS

LINE : 9450E

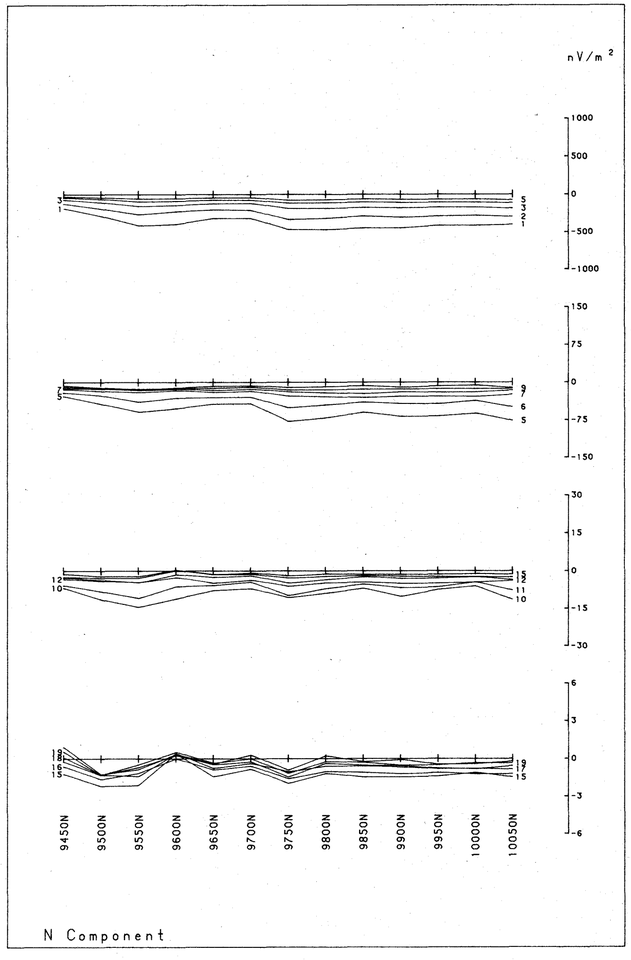
COMP. : E , N & D

Tx LOOP : Tx 6

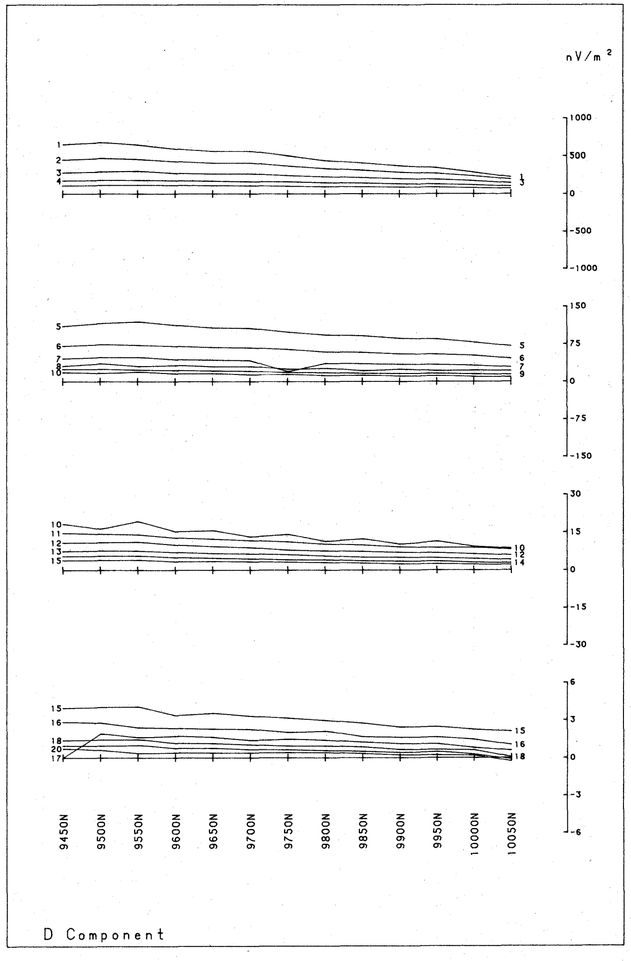
261



E Component



N Component

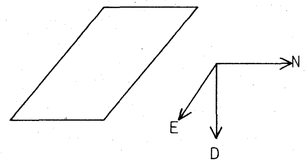


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 9550E

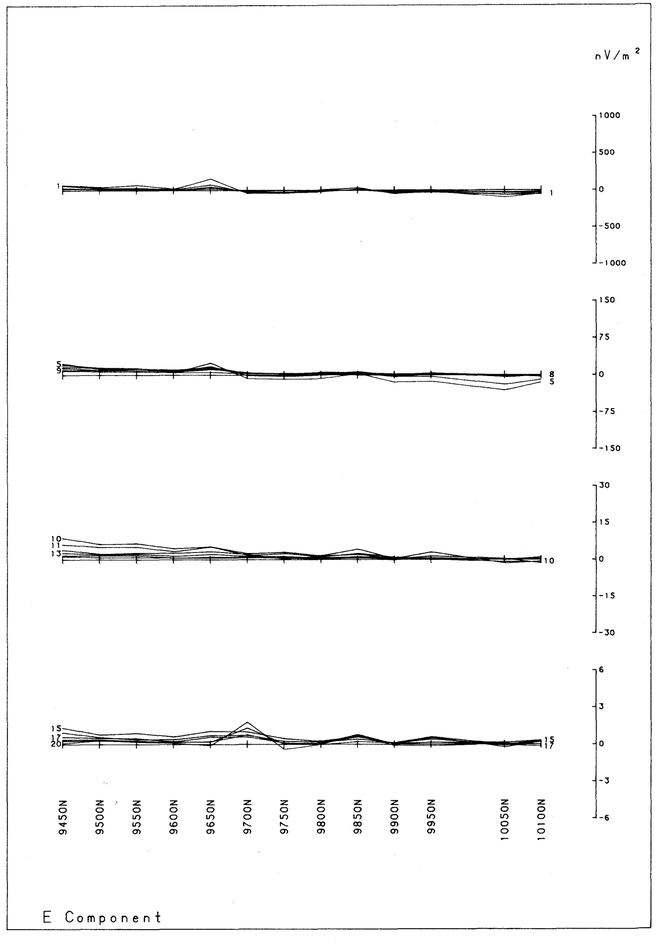
COMP. : E , N & D

Tx LOOP : Tx 6

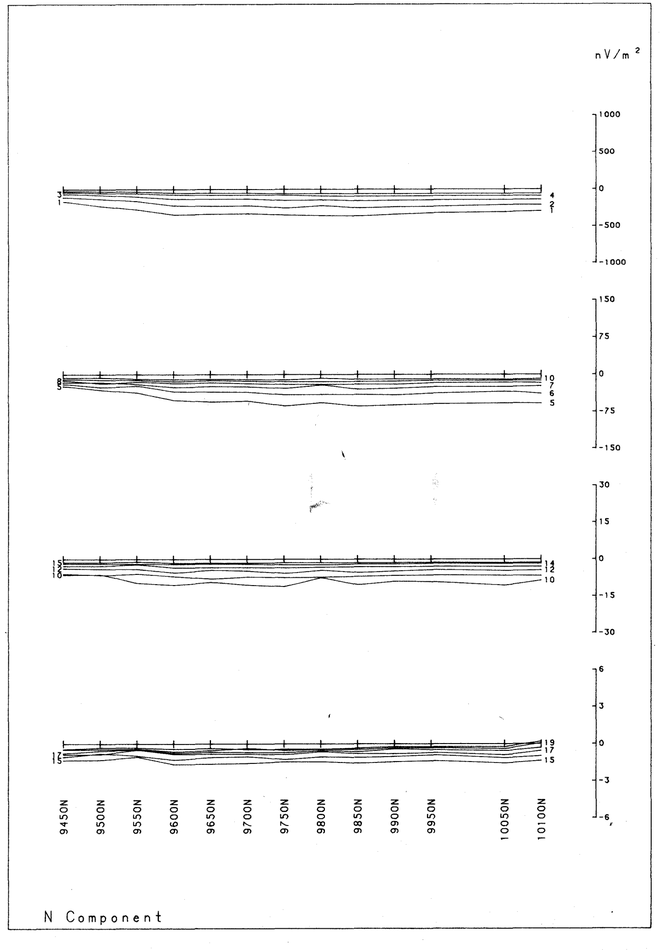
063263

262

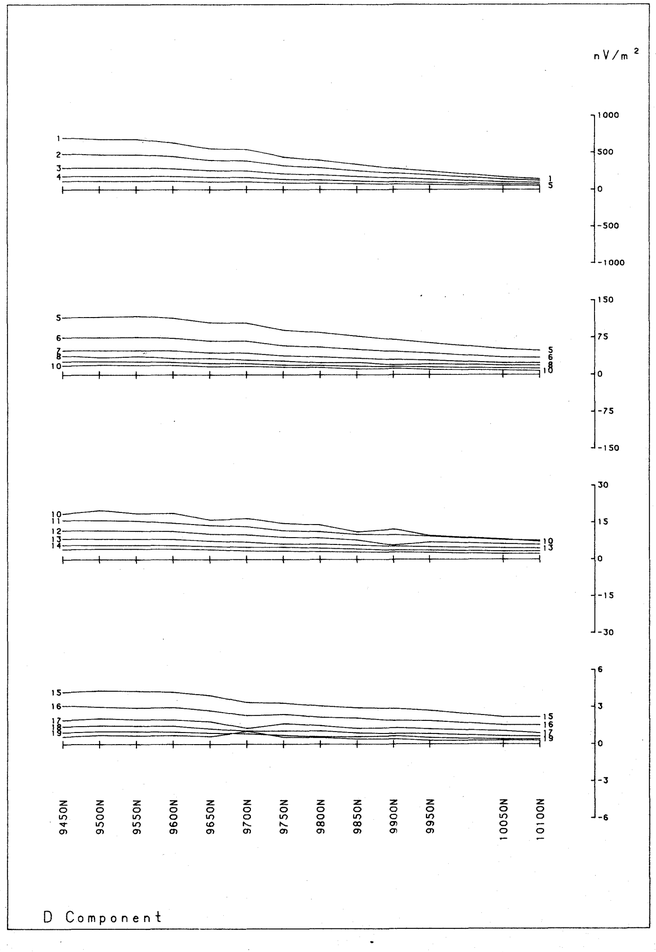
1 2 3



E Component



N Component

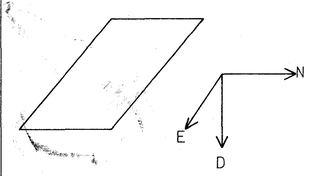


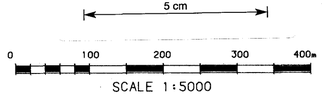
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 9650E

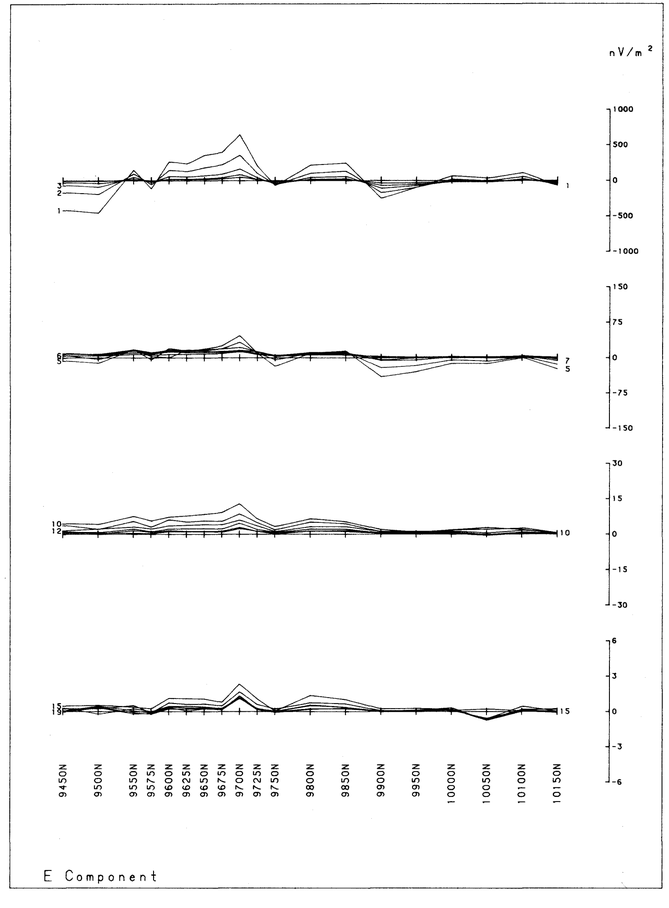
COMP. : E , N & D

Tx LOOP : Tx 6

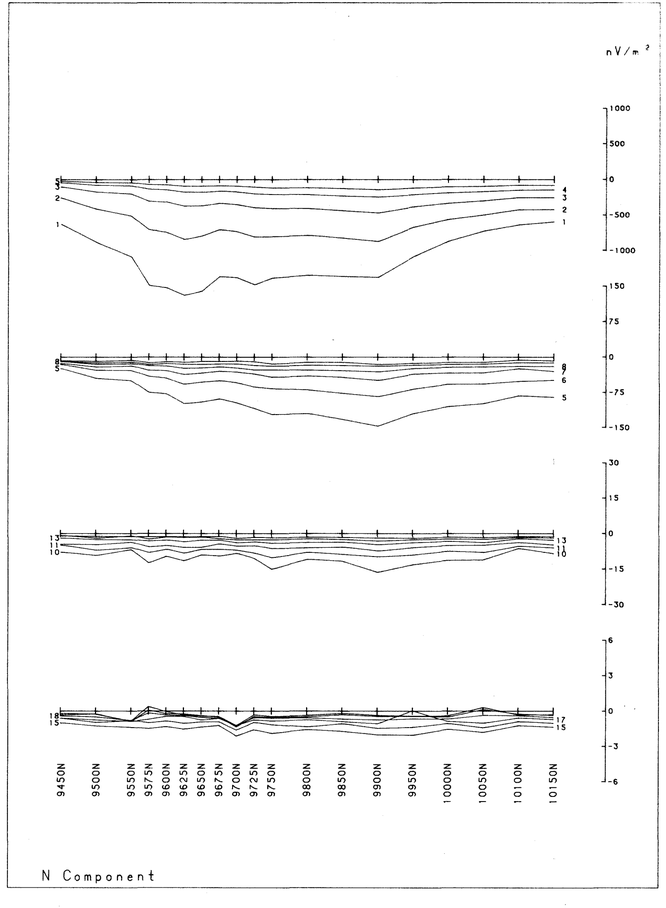
063264

263

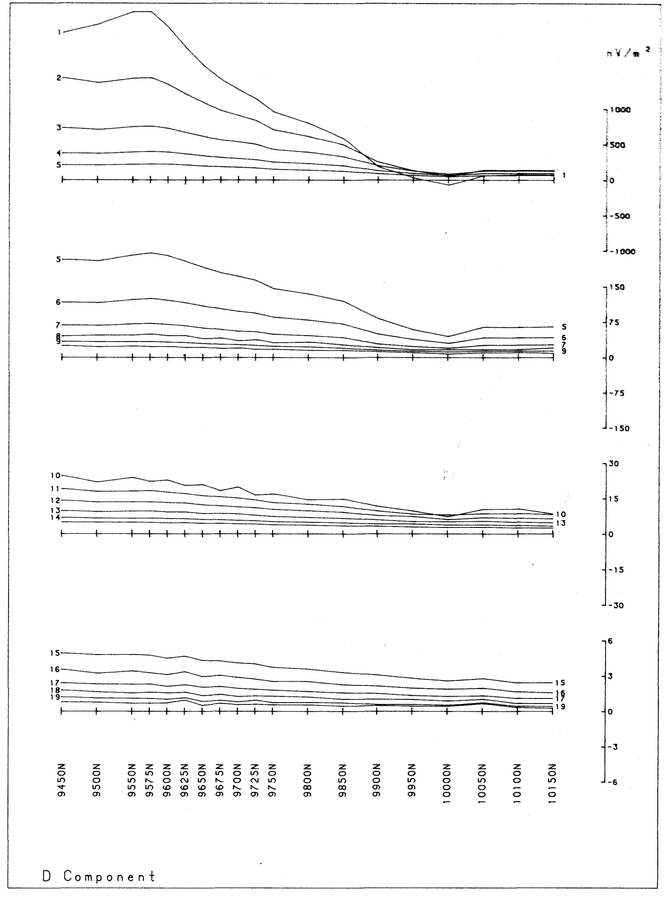
1 2 3



E Component



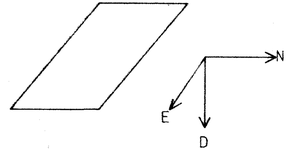
N Component



D Component

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 9750E

COMP. : E , N & D

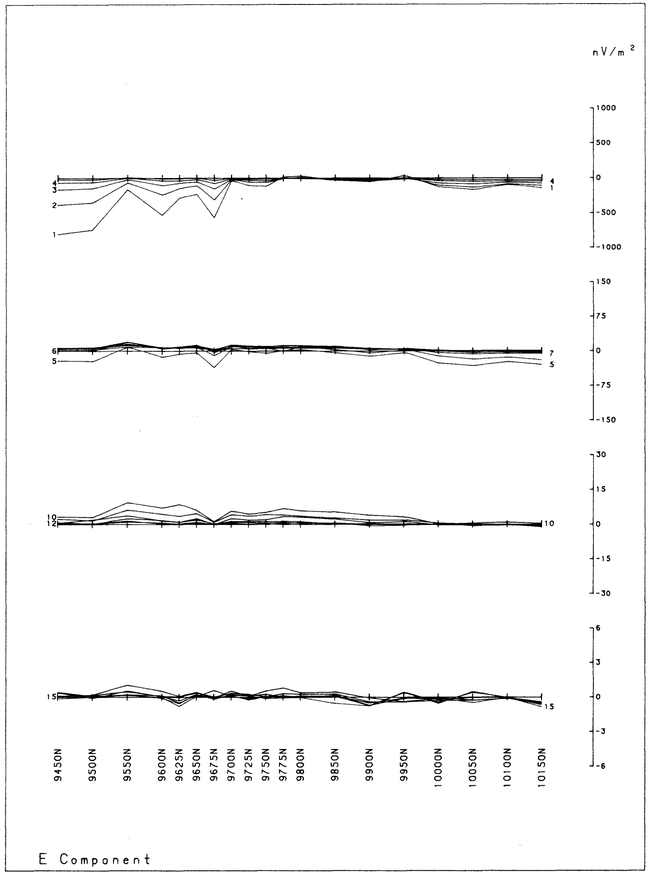
Tx LOOP : Tx 6

P & V GEOPHYSICAL SERVICES

063265

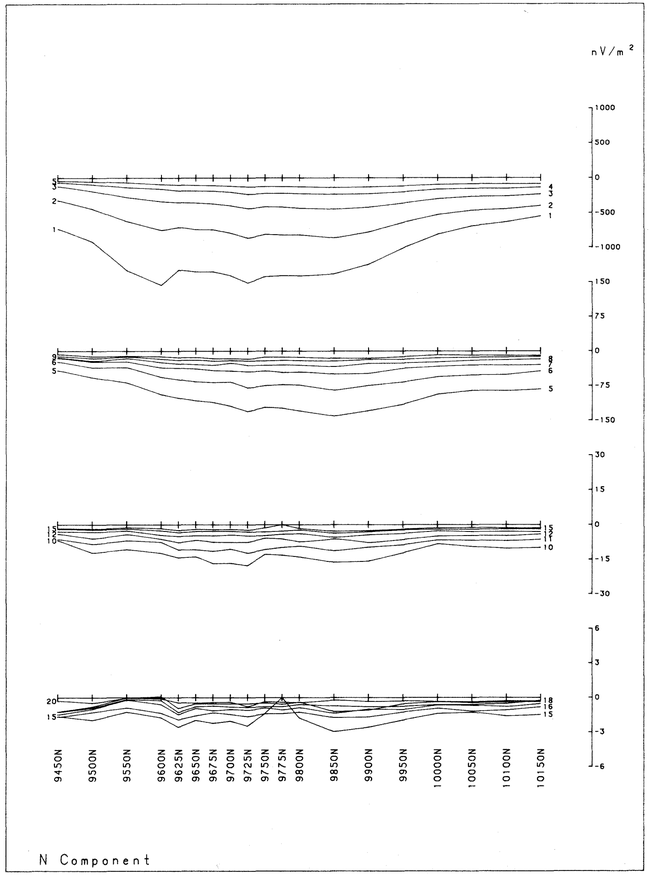
264

1



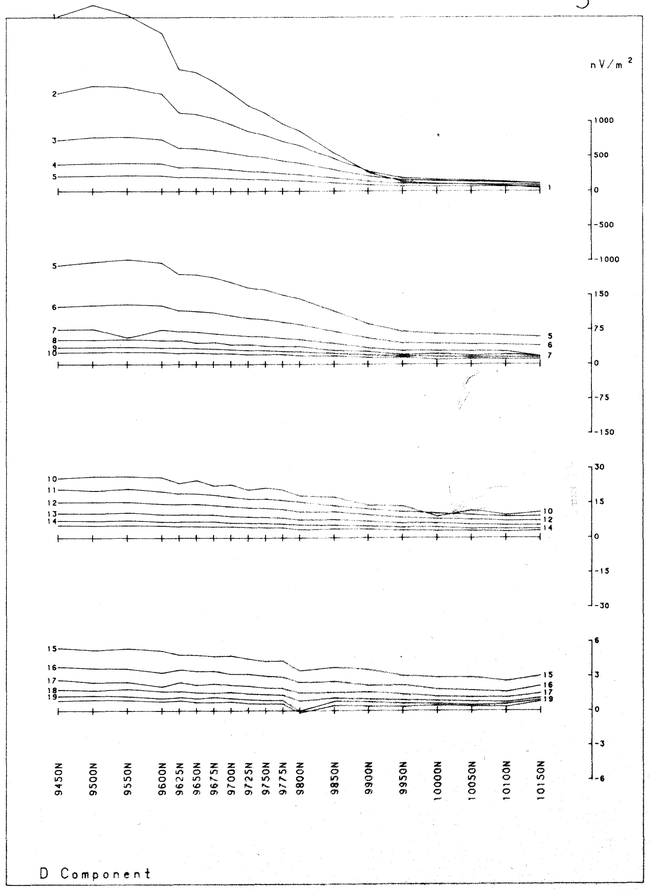
E Component

2



N Component

3

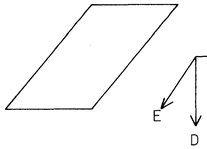


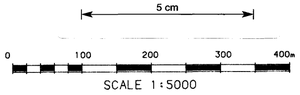
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 9850E

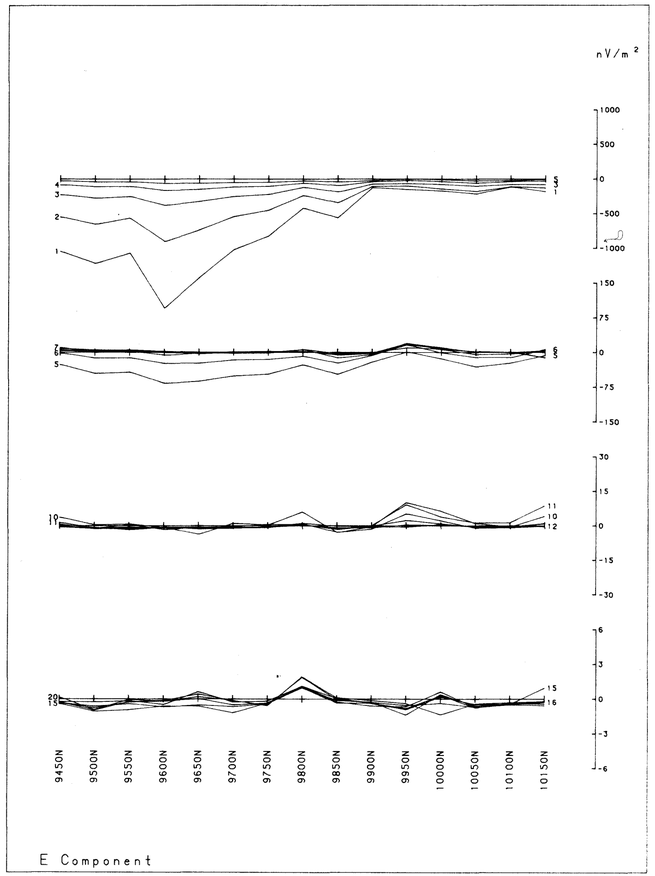
COMP. : E , N & D

Tx LOOP : Tx 6

063266

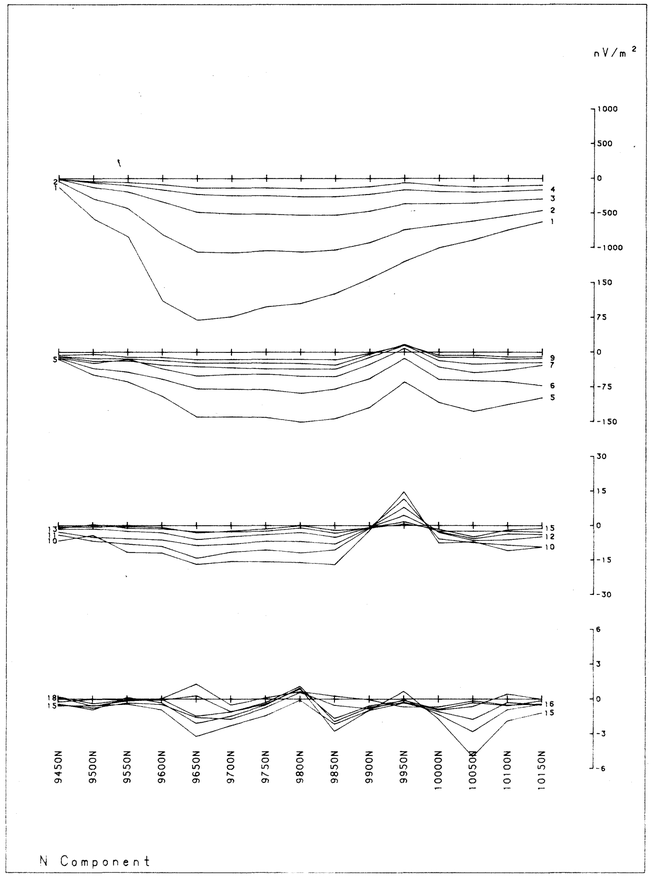
265

1



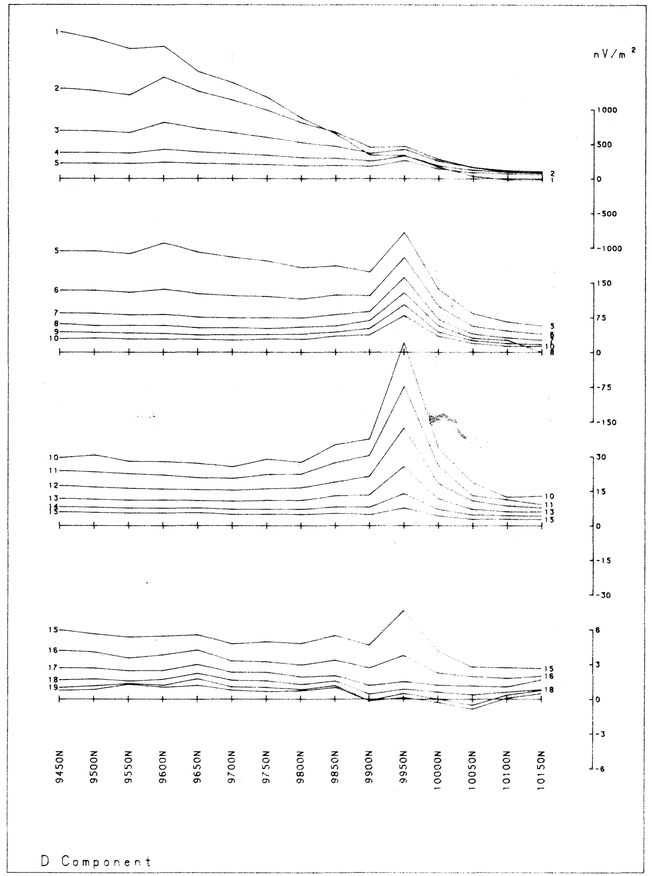
E Component

2



N Component

3

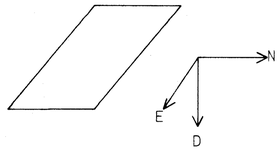


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9350E 9400N	9950E 9400N
	: 9350E 9100N	9950E 9100N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 235 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 9950E

COMP. : E , N & D

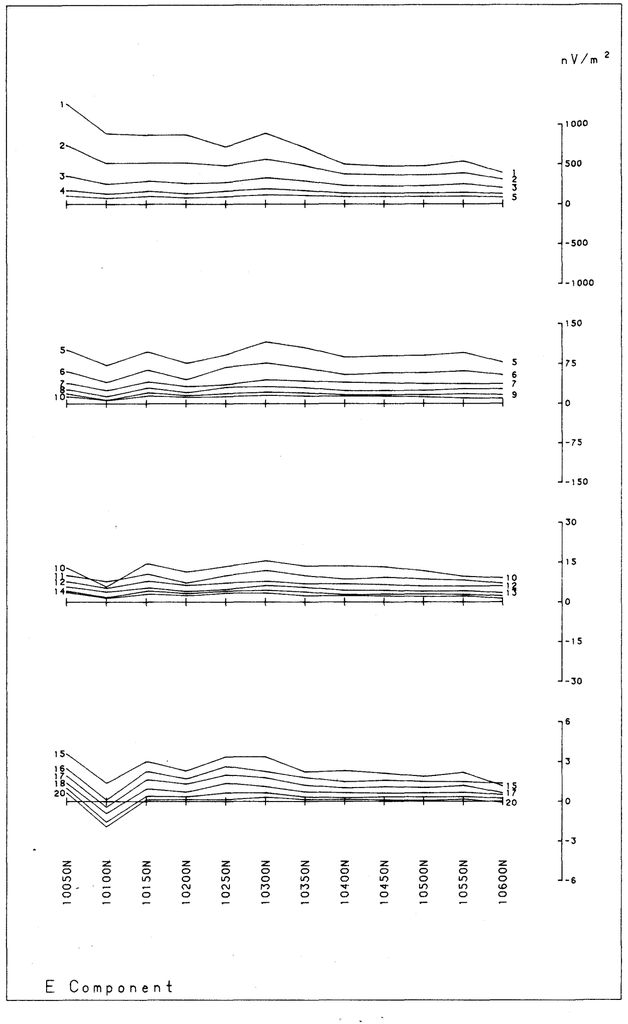
Tx LOOP : Tx 6

063267

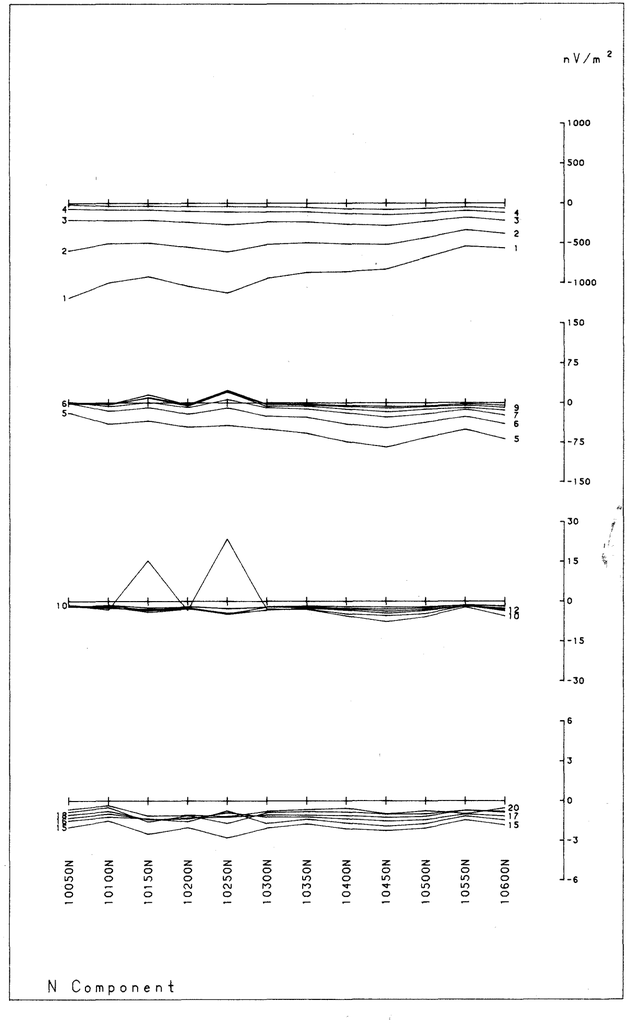
266

1

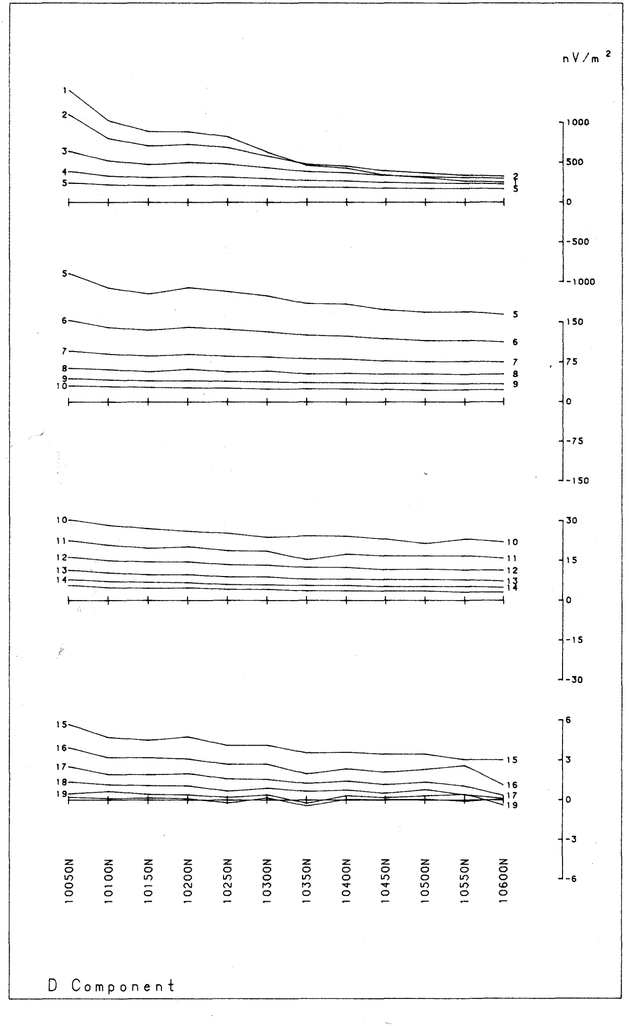
2



E Component



N Component

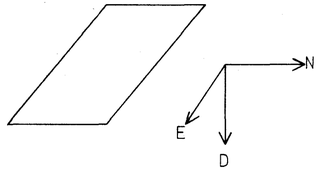


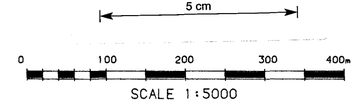
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

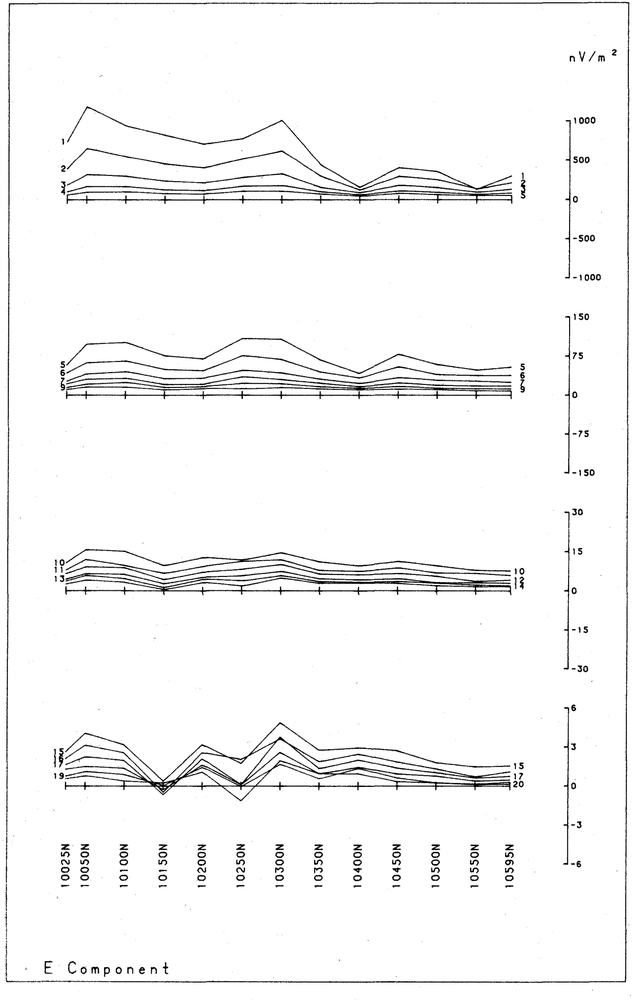
AREA : CARTERS

LINE : 9950E

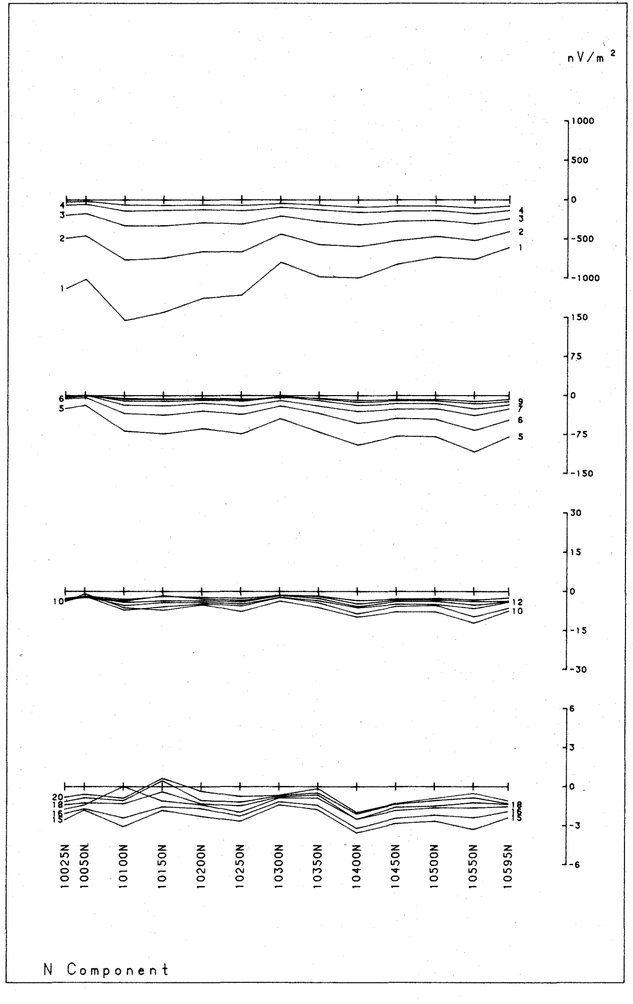
COMP. : E , N & D

Tx LOOP : Tx 7

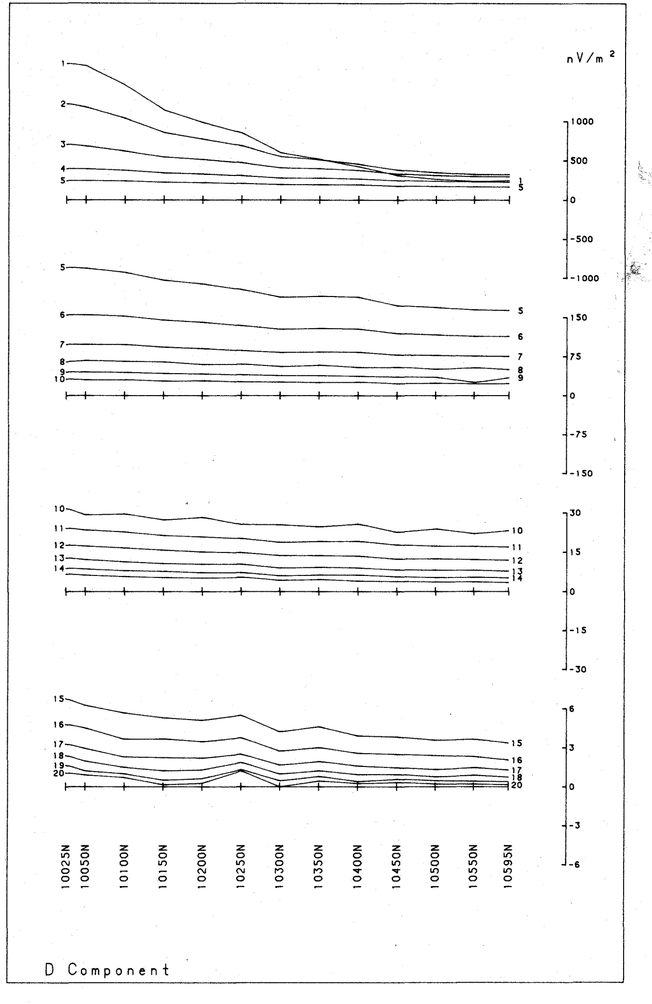
0633268



E Component



N Component

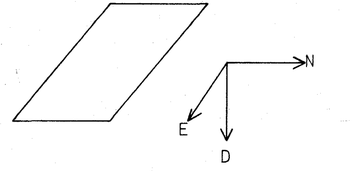


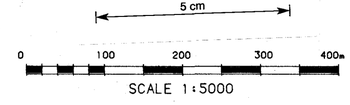
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

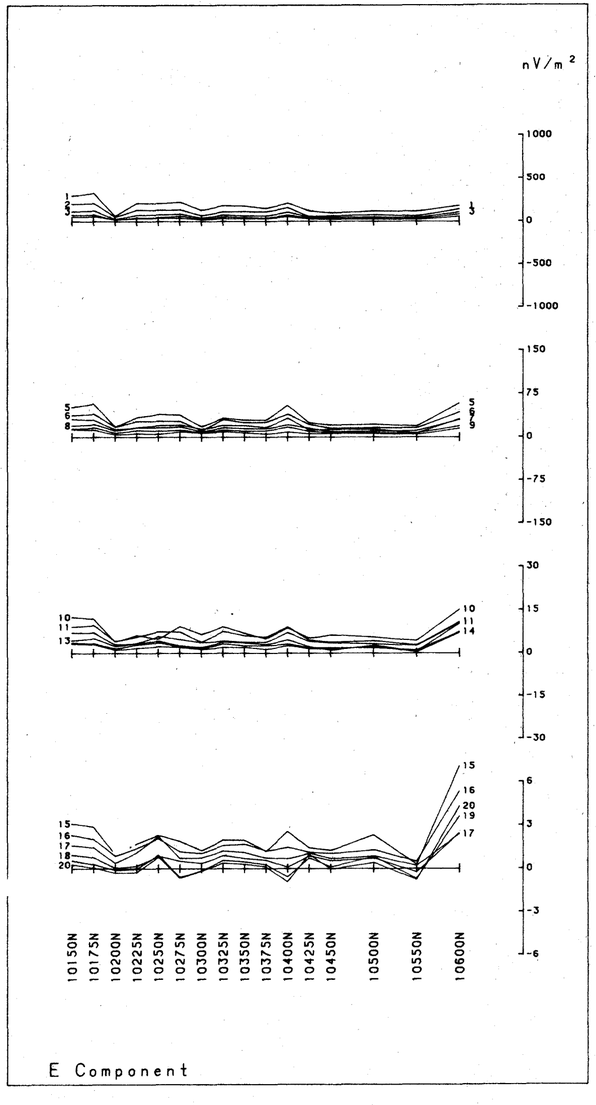
PROJECT : MACINTOSH EAST

AREA : CARTERS

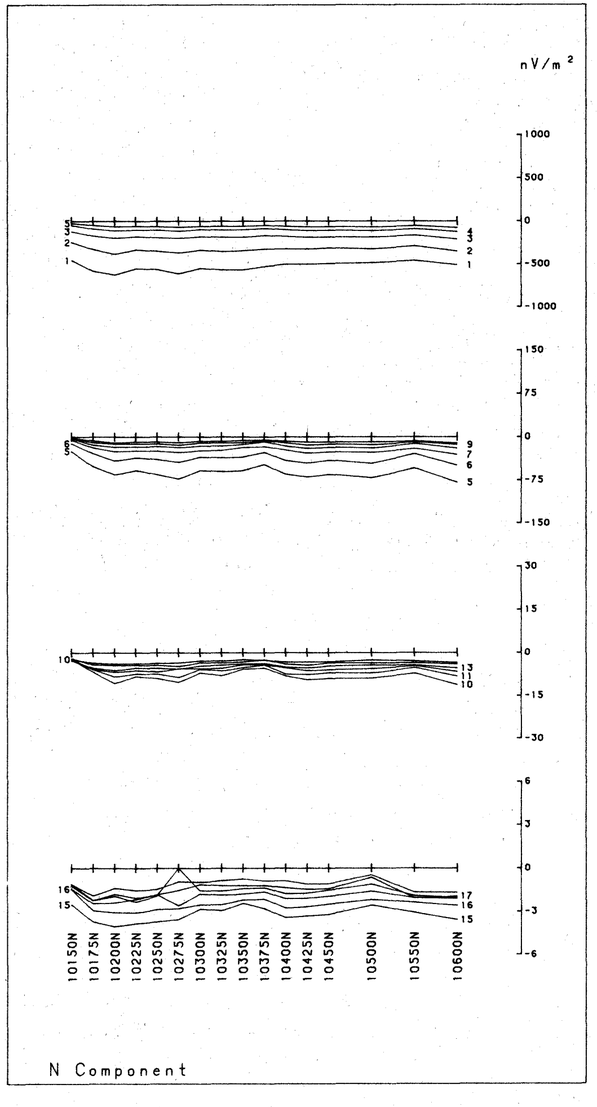
LINE : 10050E

COMP. : E , N & D

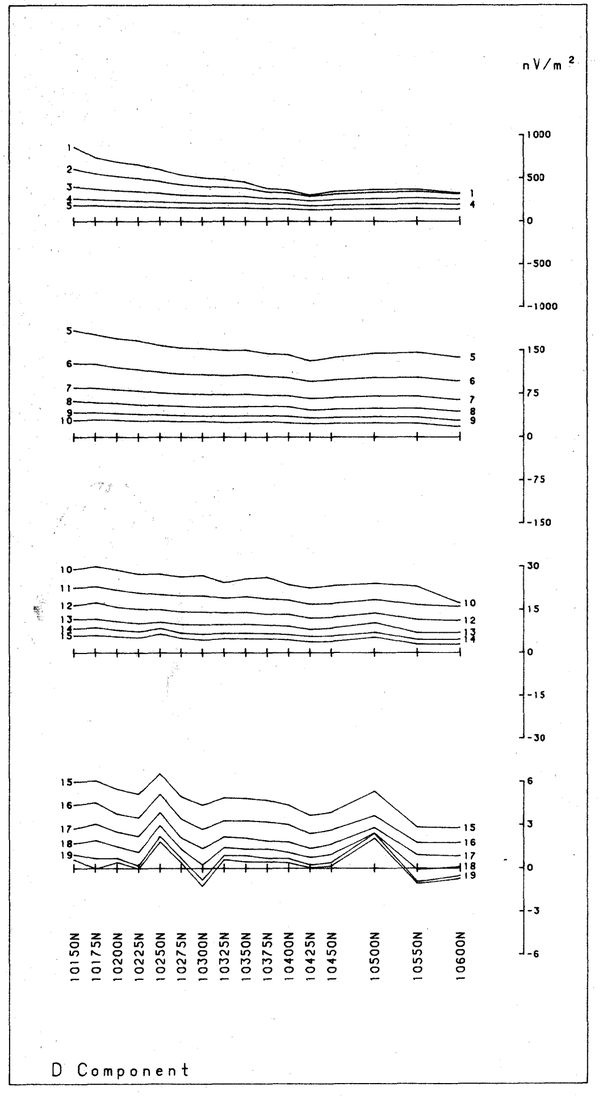
Tx LOOP : Tx 7



E Component



N Component

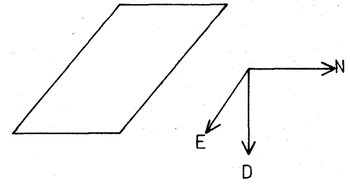


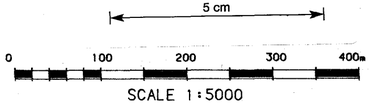
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

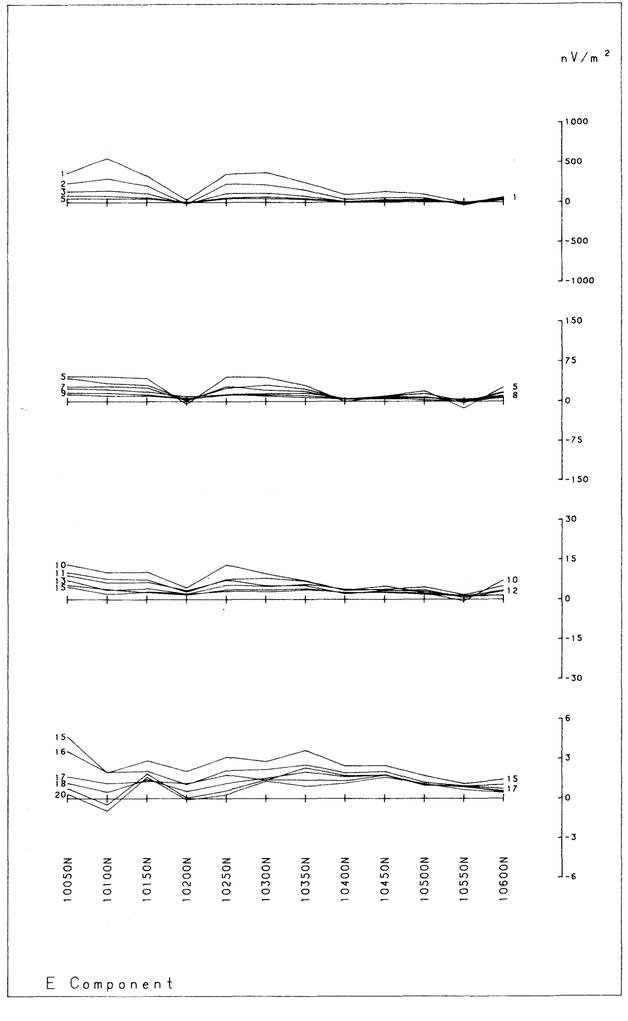
PROJECT : MACINTOSH EAST

AREA : CARTERS

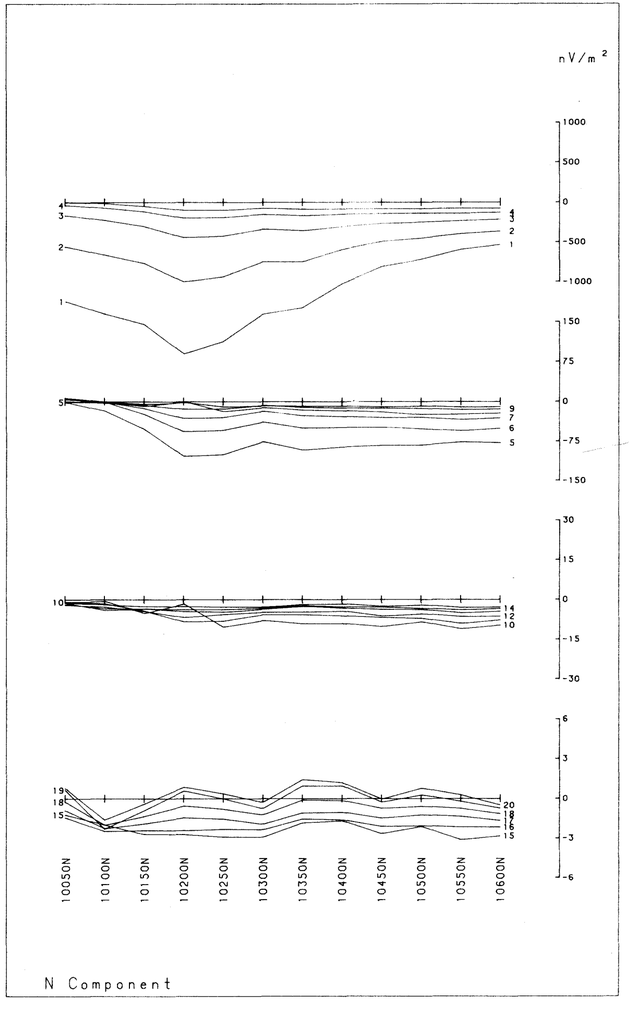
LINE : 10150E

COMP. : E , N & D

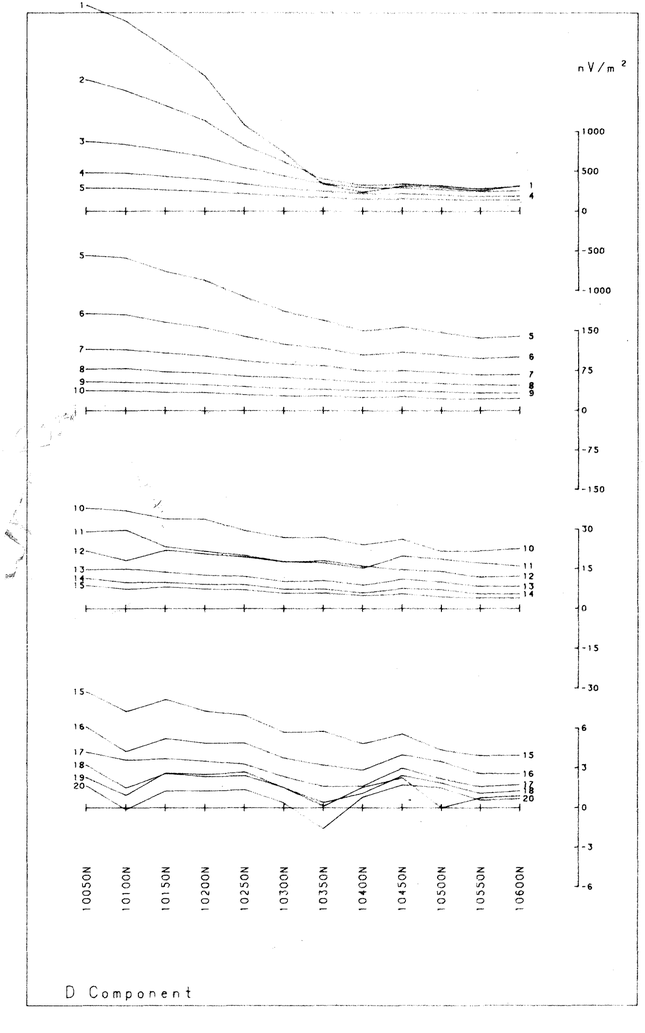
Tx LOOP : Tx 7



E Component



N Component

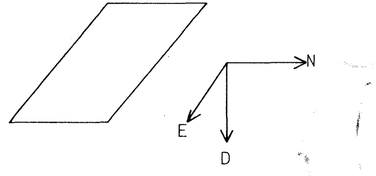


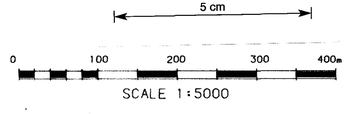
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

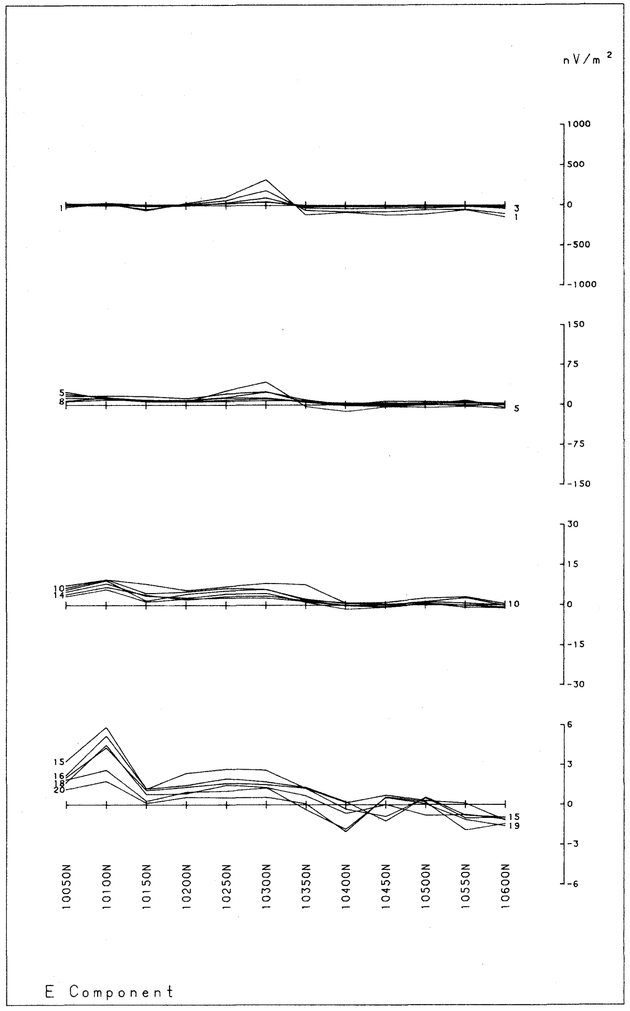
PROJECT : MACINTOSH EAST

AREA : CARTERS

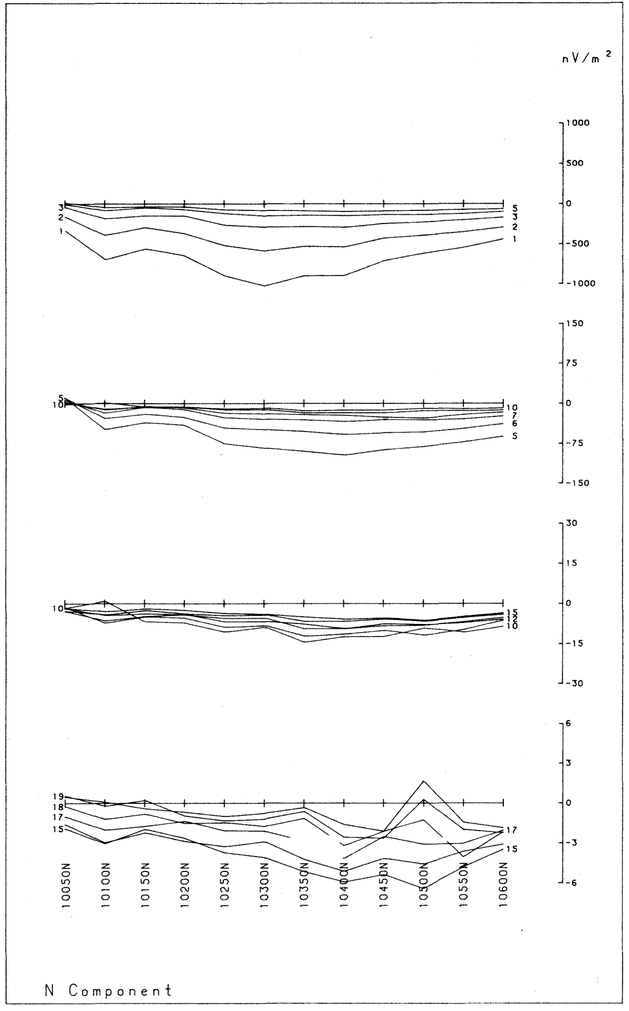
LINE : 10250E

COMP. : E , N & D

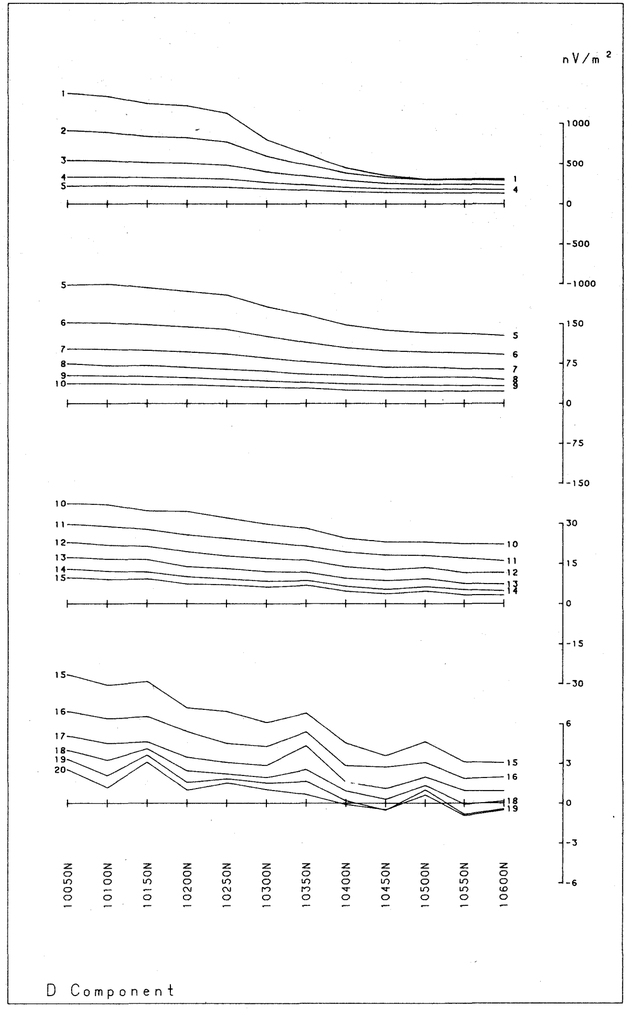
Tx LOOP : Tx 7



E Component



N Component

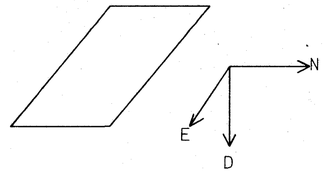


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

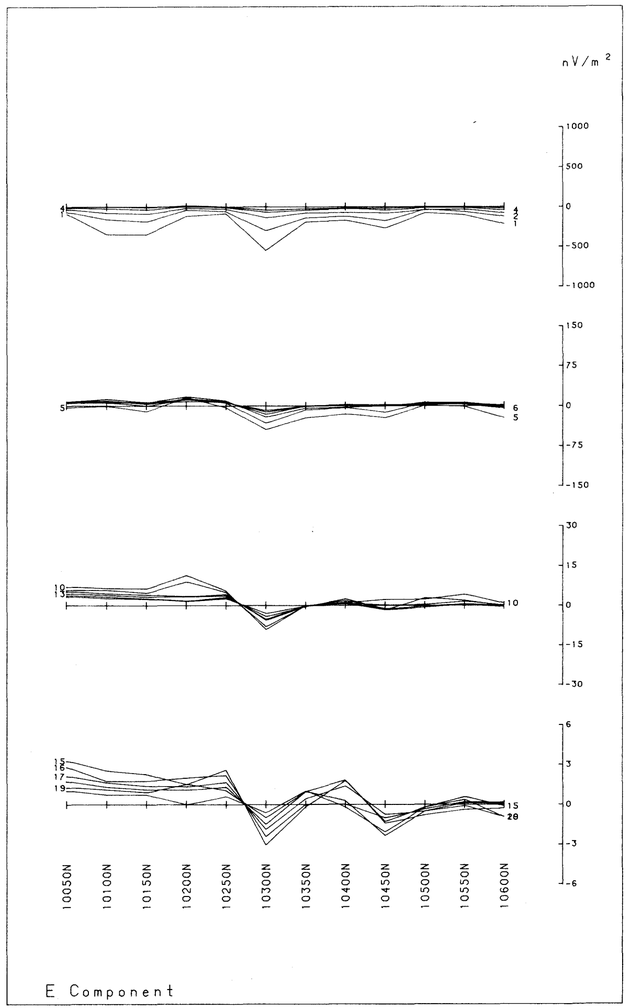
AREA : CARTERS

LINE : 10350E

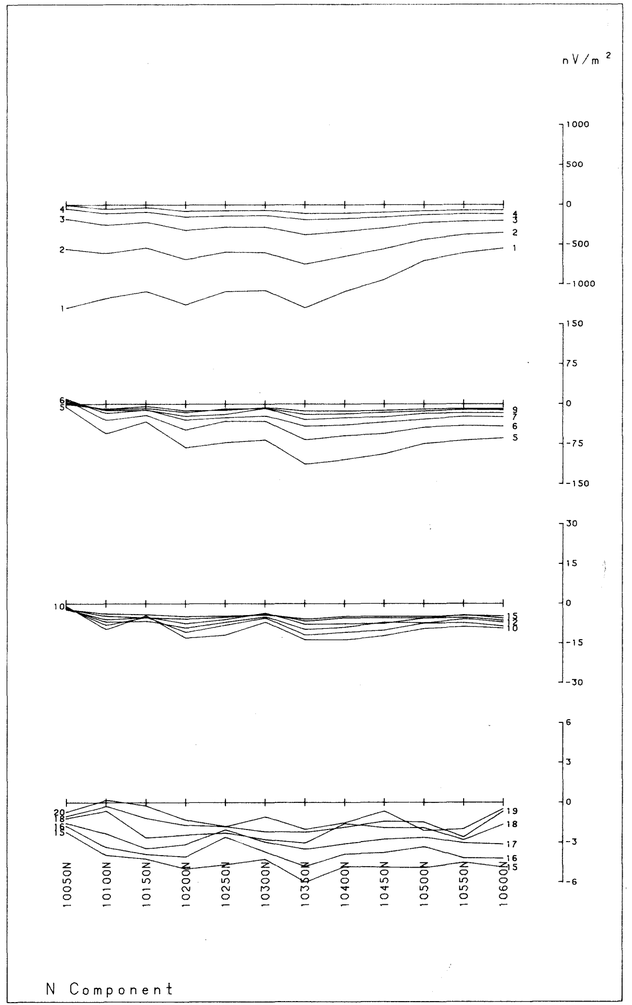
COMP. : E , N & D

Tx LOOP : Tx 7

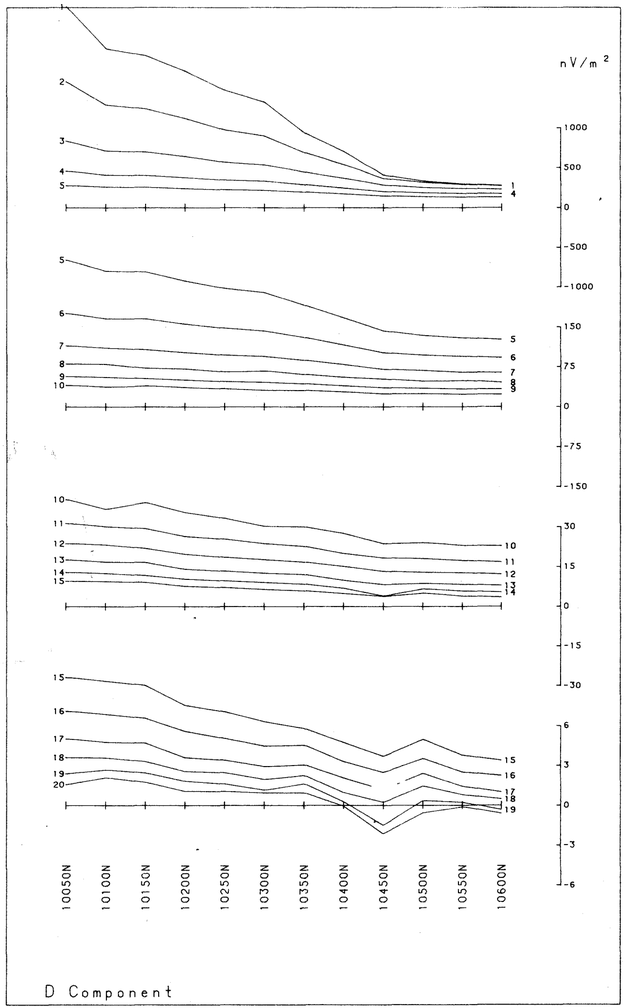
271



E Component



N Component

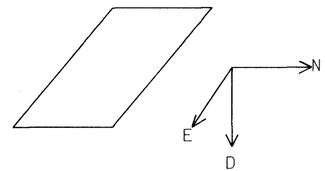


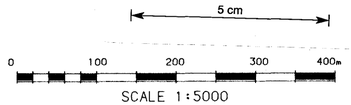
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

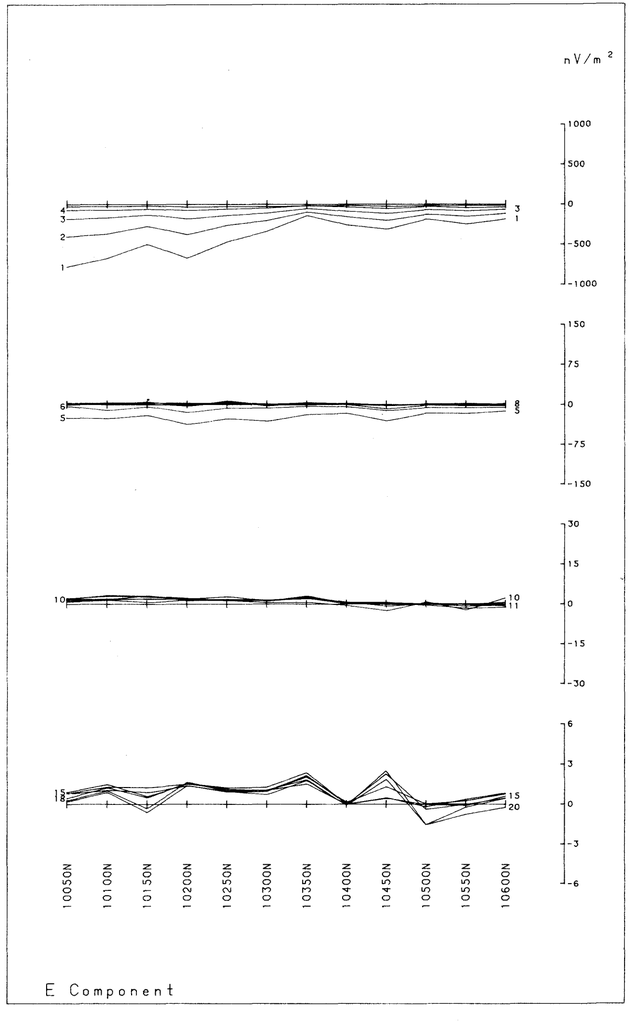
LINE : 10450E

COMP. : E , N & D

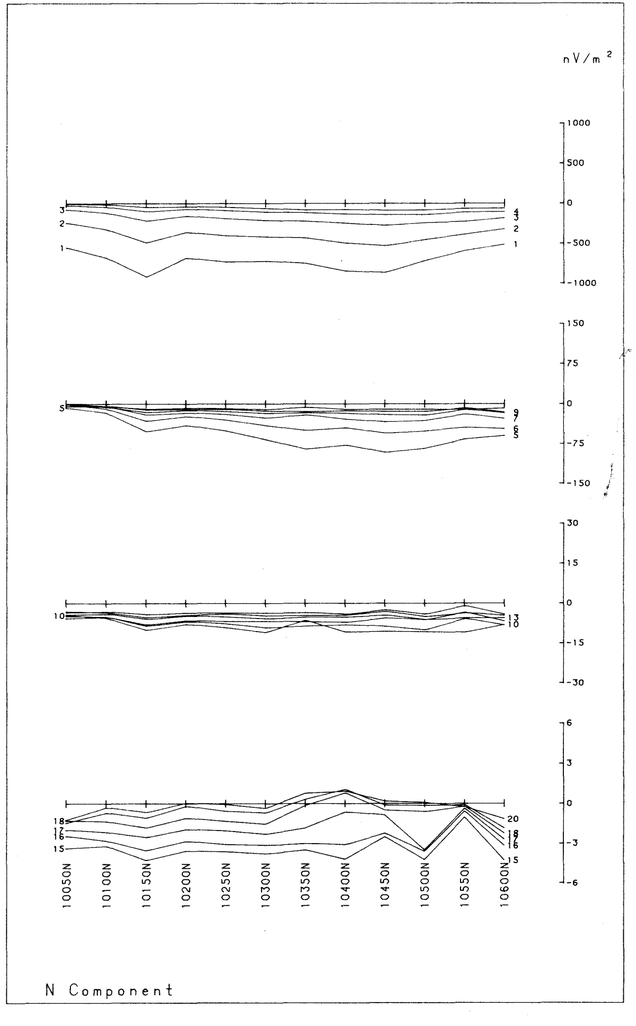
Tx LOOP : Tx 7

063273

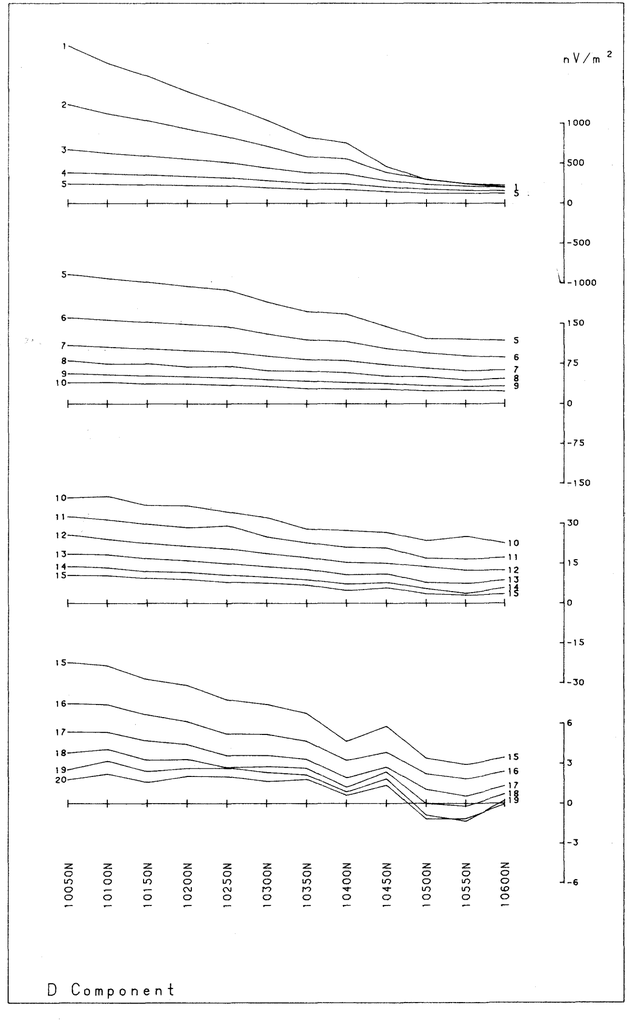
272



E Component



N Component

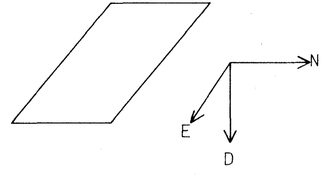


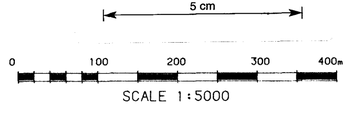
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9950E10000N	10550E10000N
	: 9950E 9700N	10550E 9700N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 210 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.4 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : CARTERS

LINE : 10550E

COMP. : E , N & D

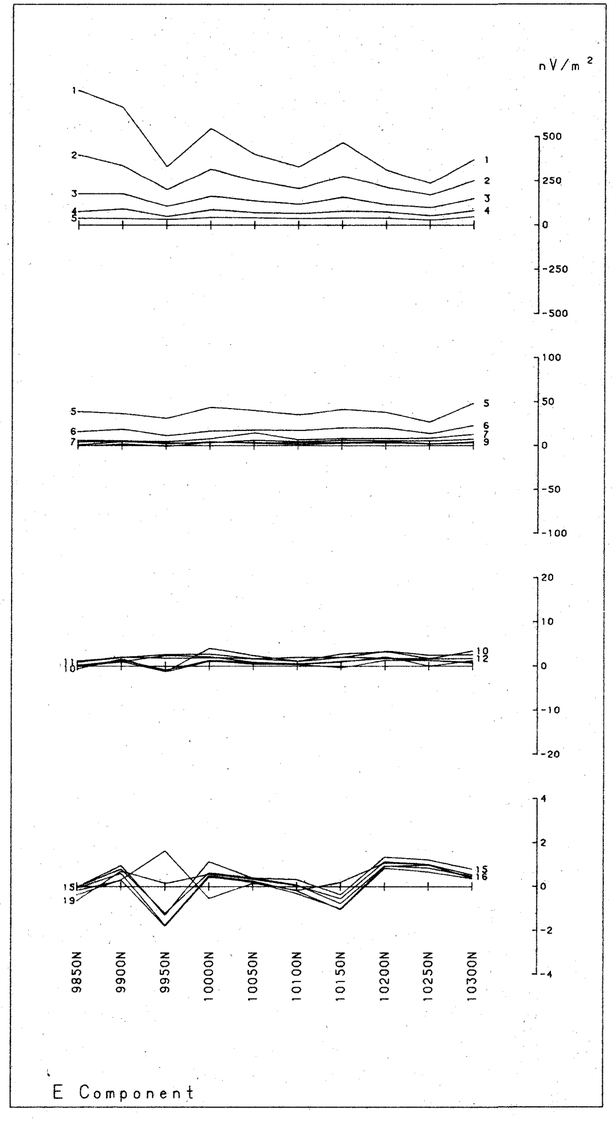
Tx LOOP : Tx 7

063274

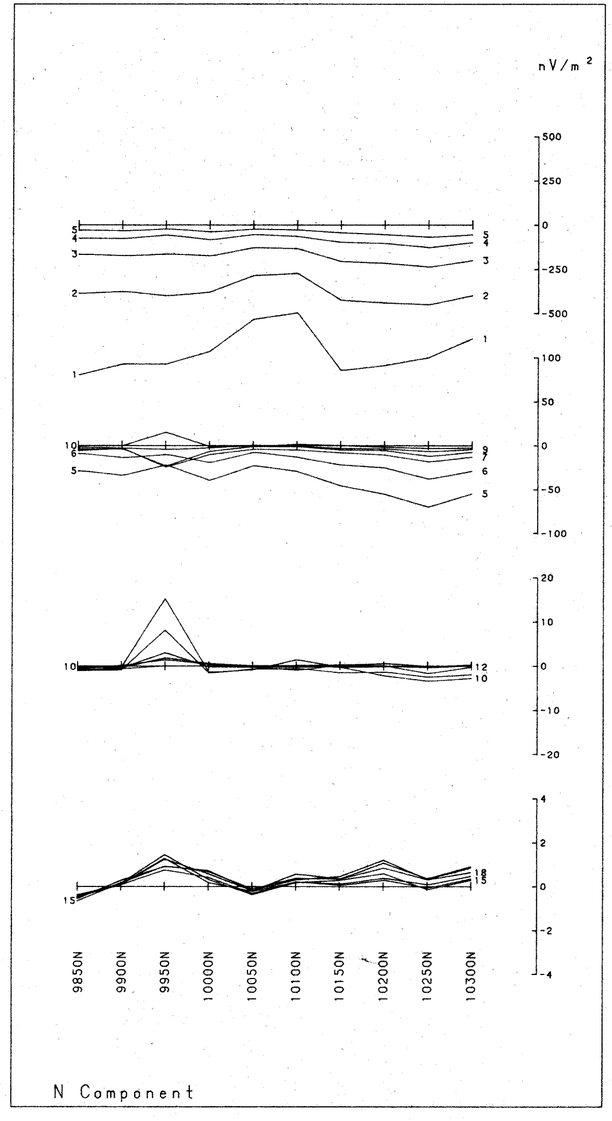
273

1

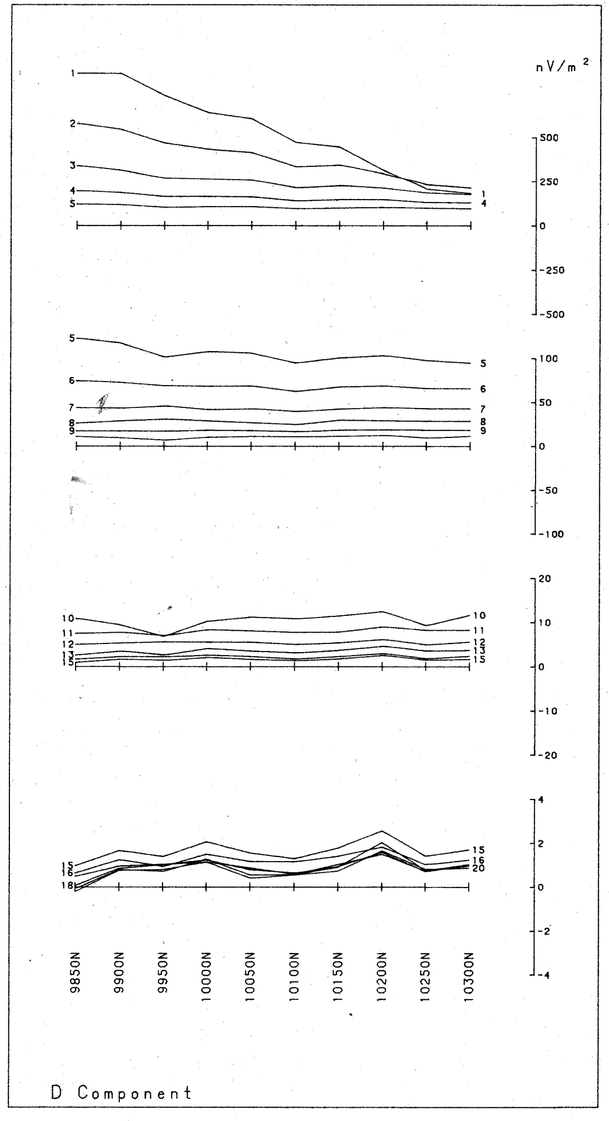
2



E Component



N Component

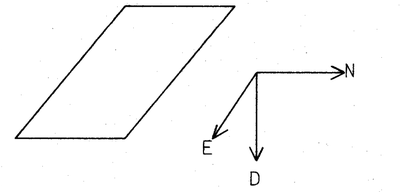


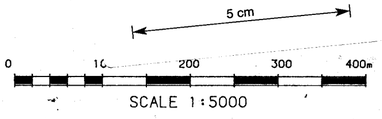
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 9200E

COMP. : E , N & D

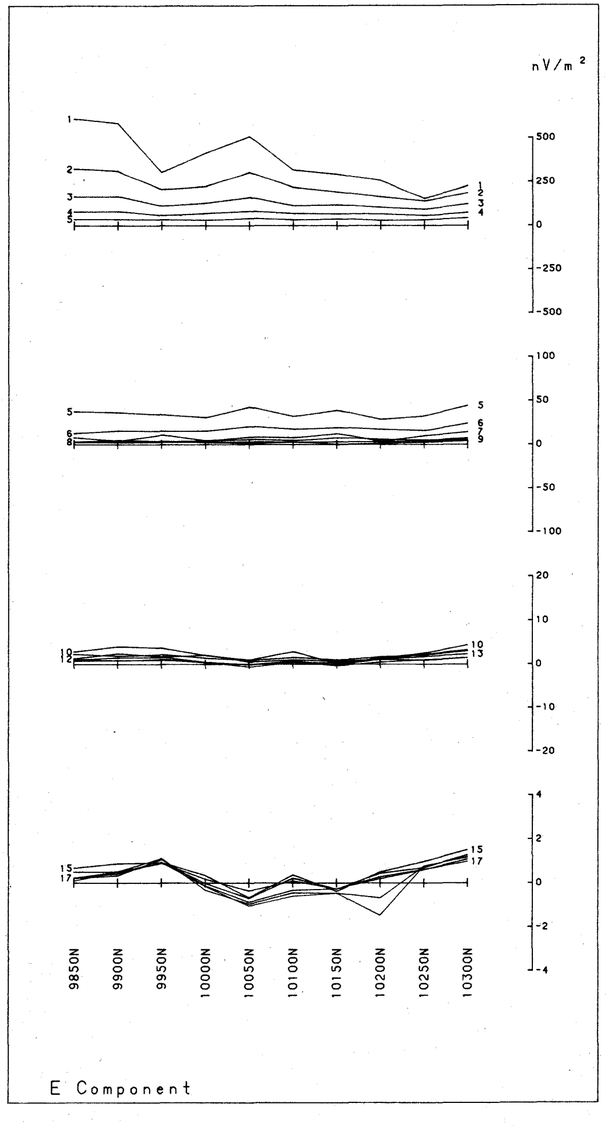
Tx LOOP : Tx 4

063275

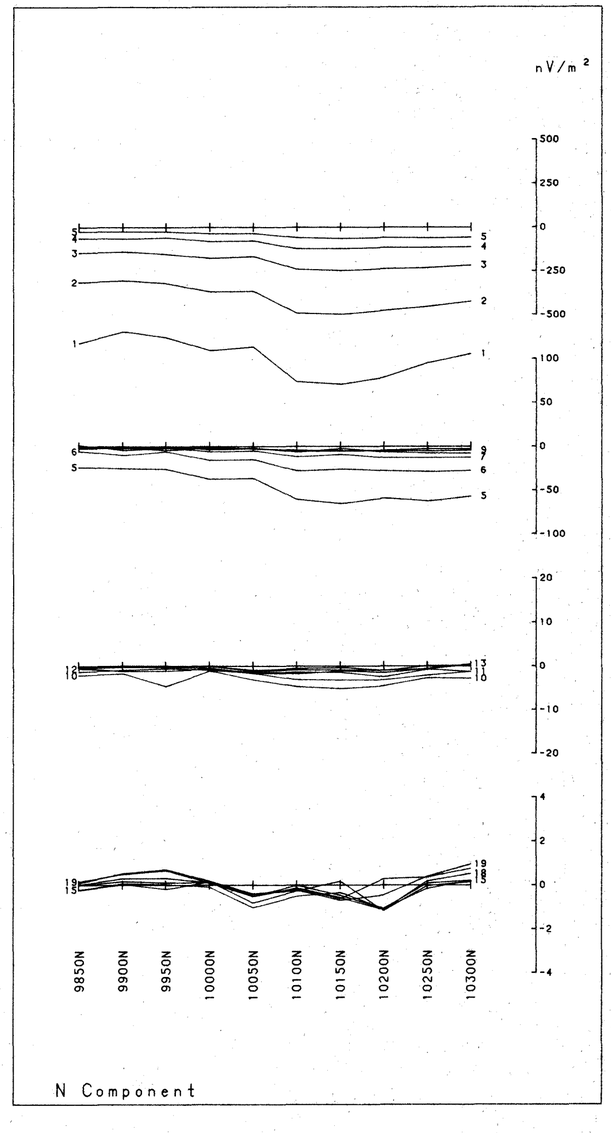
274

1

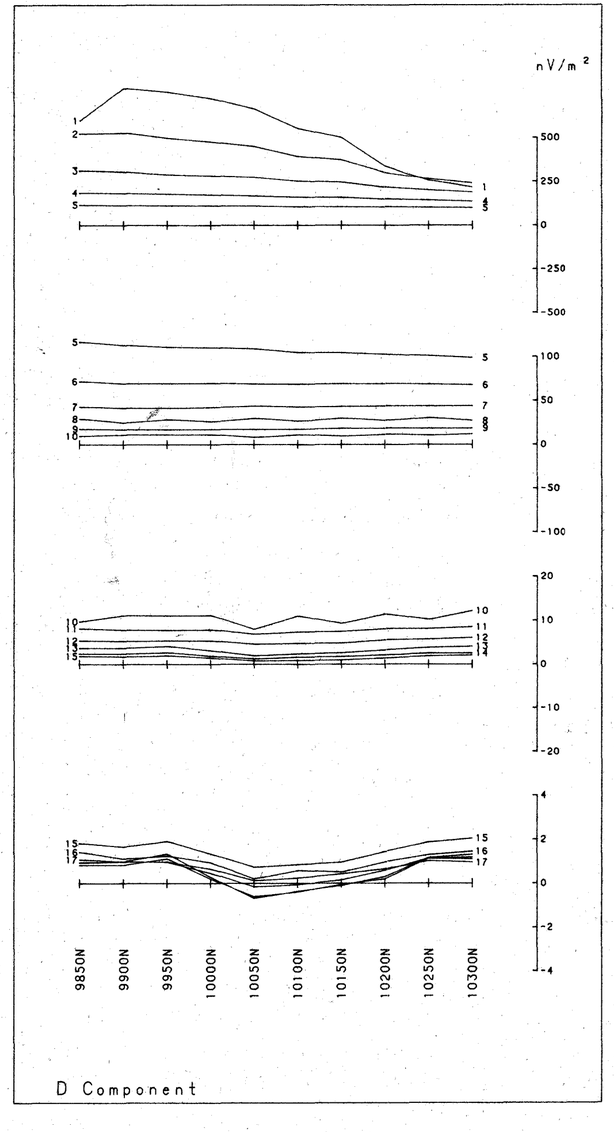
2



E Component



N Component

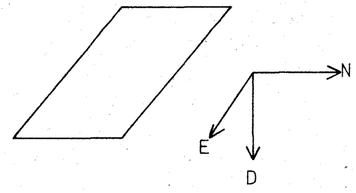


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

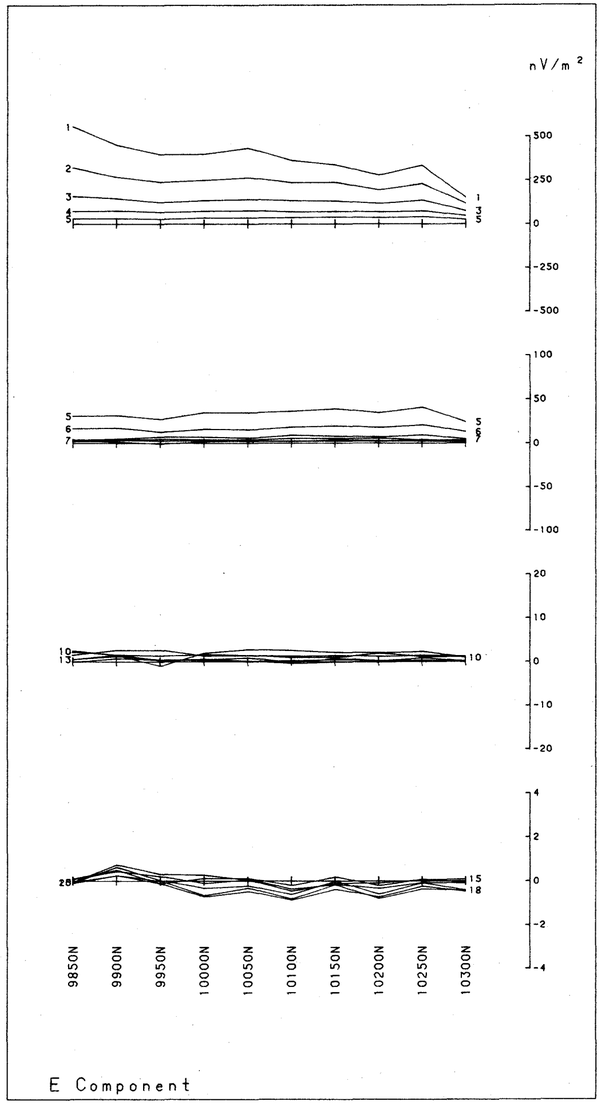
AREA : HEAP OF ROCKS

LINE : 9300E

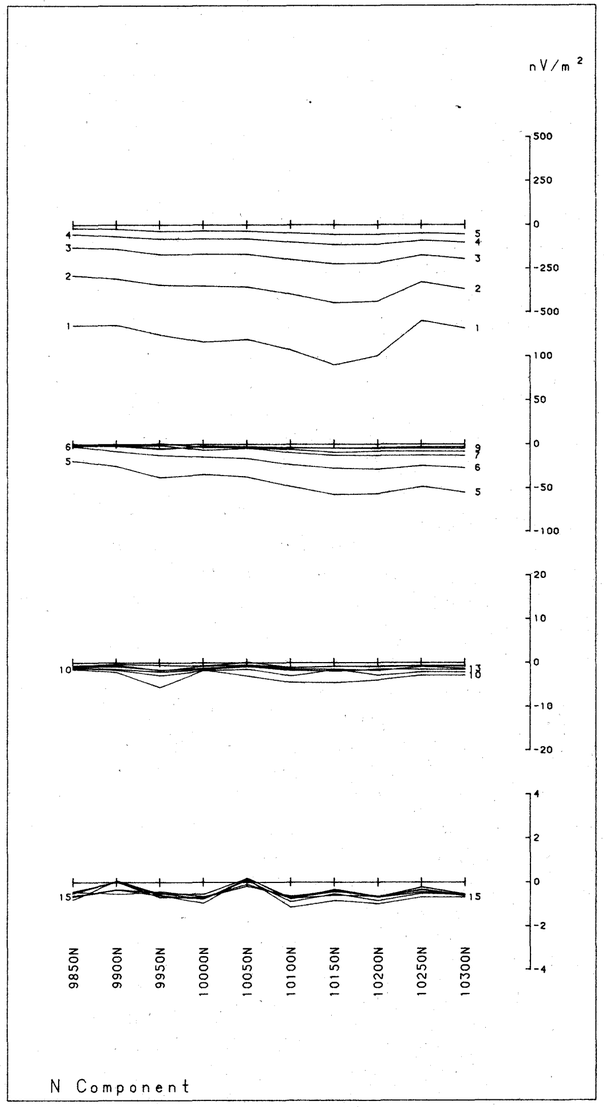
COMP. : E , N & D

Tx LOOP : Tx 4

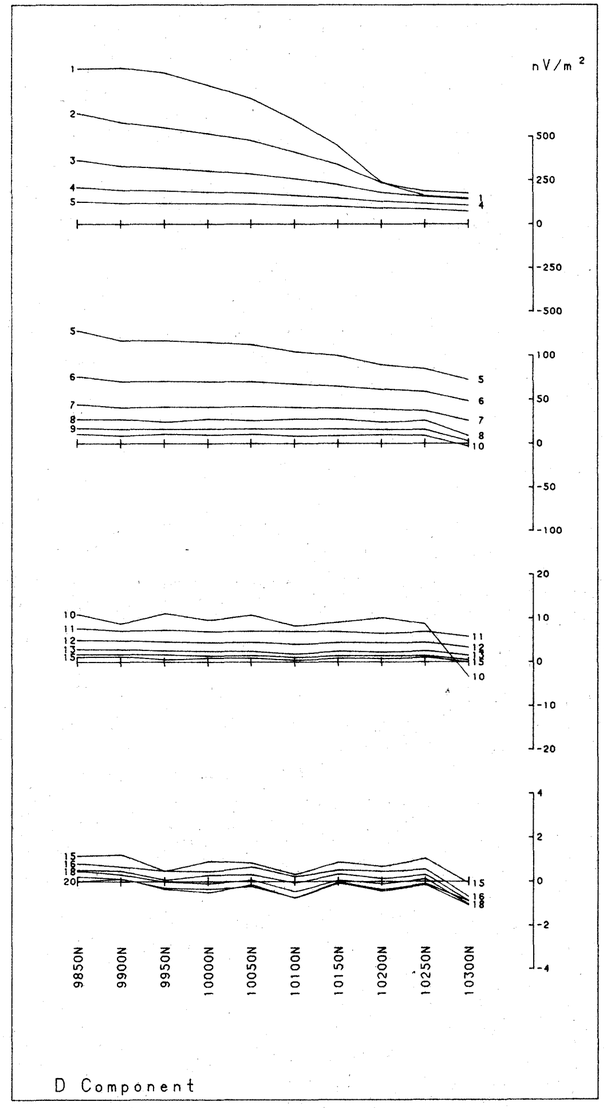
063276



E Component



N Component

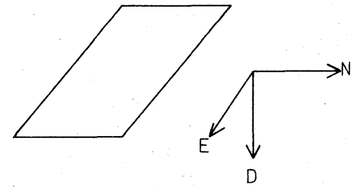


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 9400E

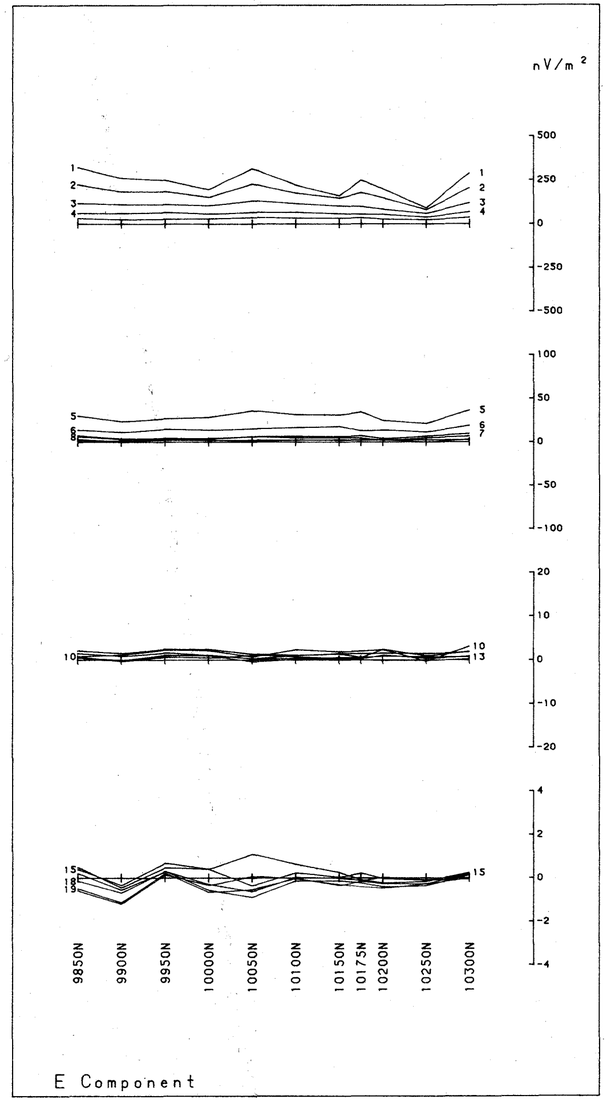
COMP. : E , N & D

Tx LOOP : Tx 4

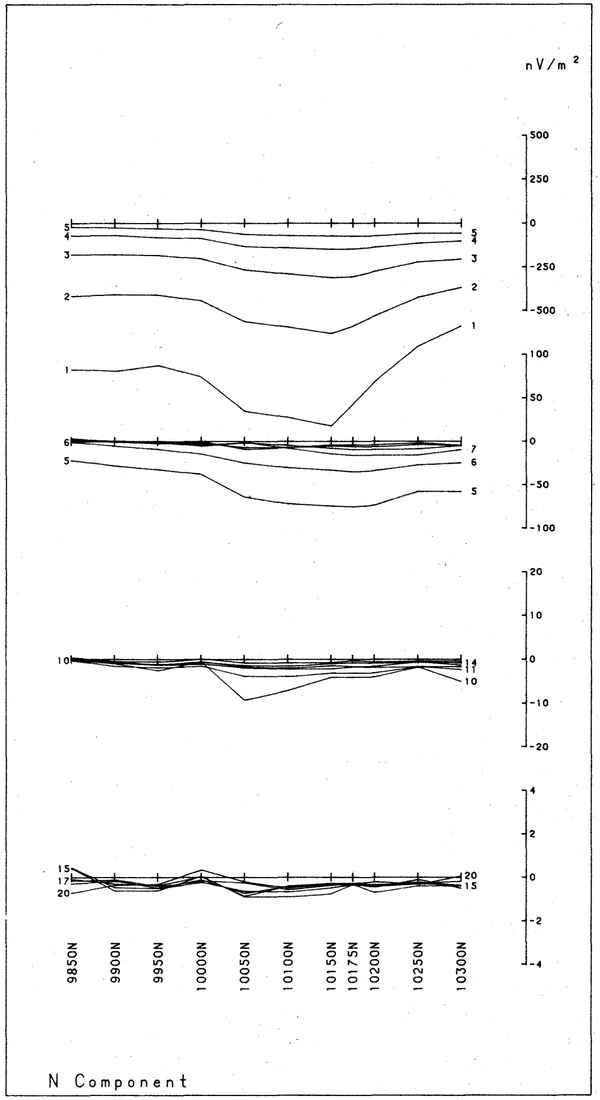
276

1

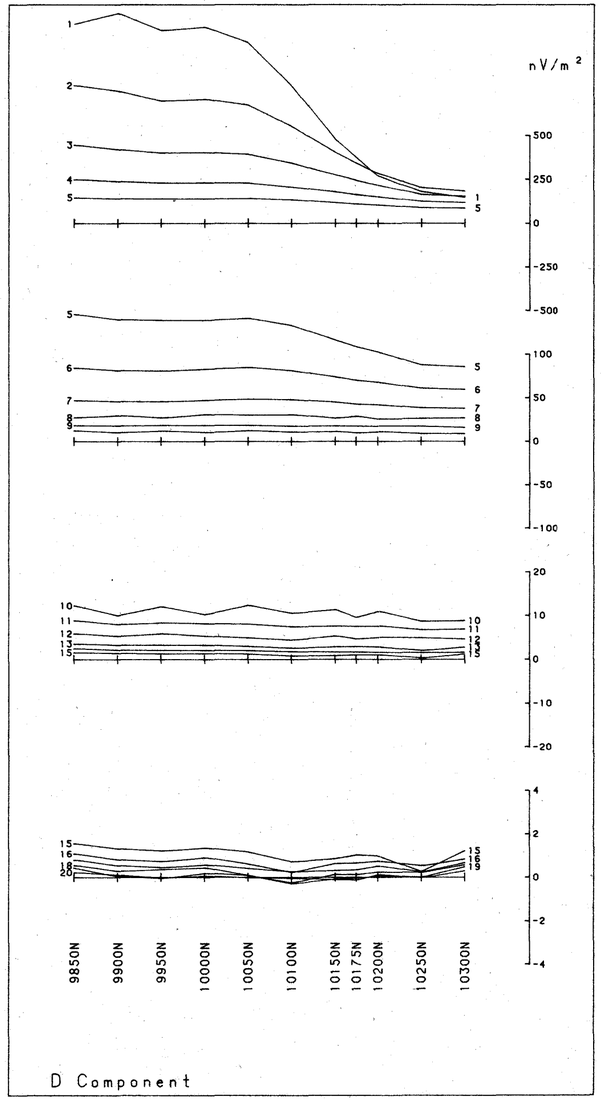
2



E Component



N Component

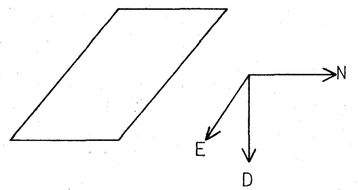


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 9500E

COMP. : E , N & D

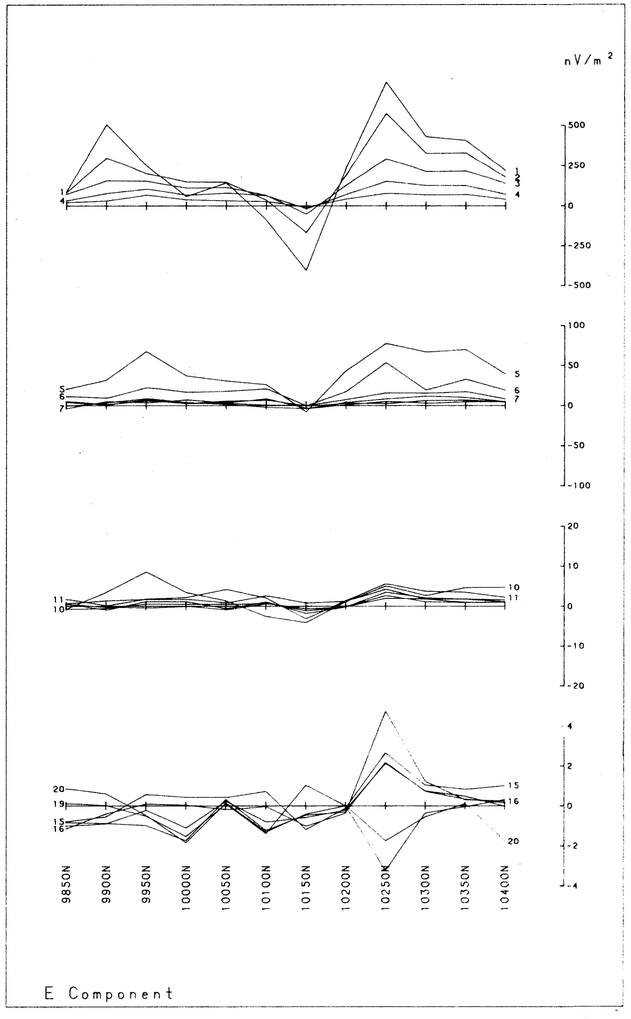
Tx LOOP : Tx 4

063278

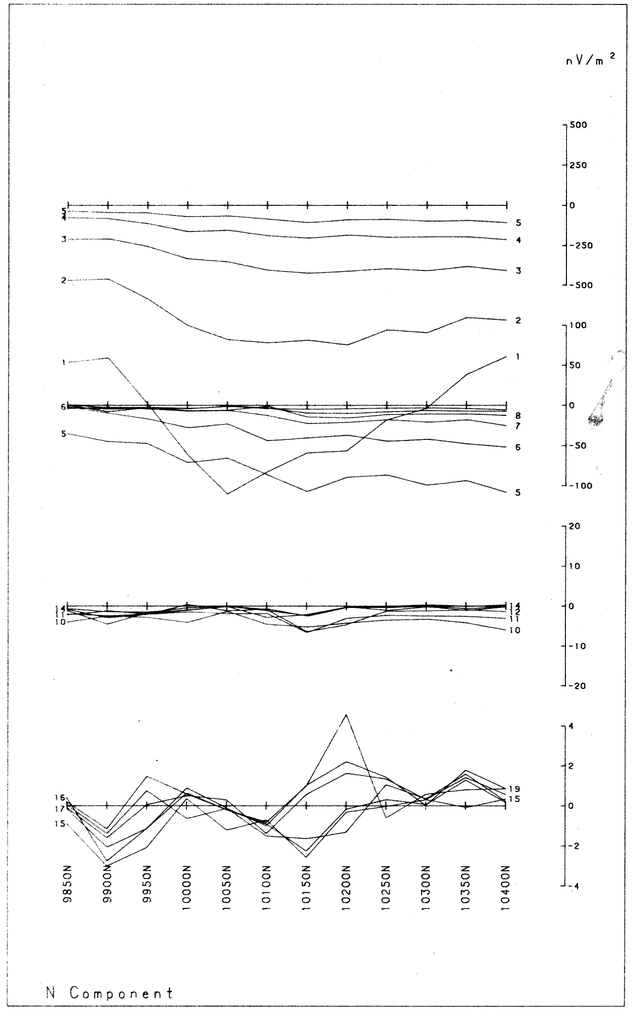
277

1

2



E Component



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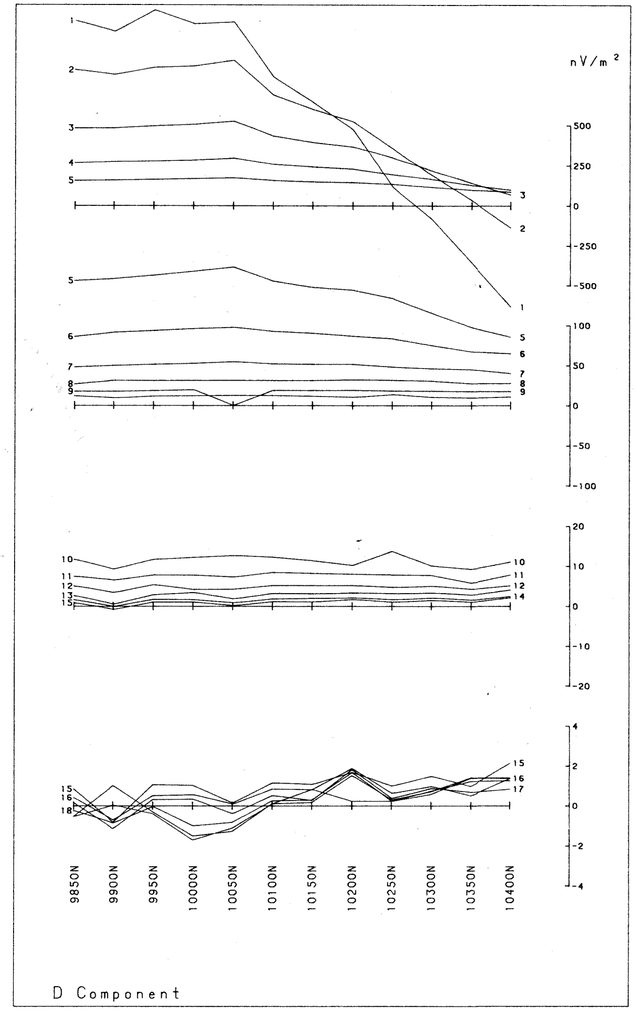


D Component

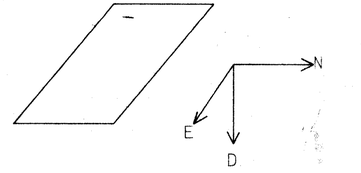
P & V GEOPHYSICAL SERVICES

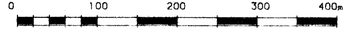
EM 37

TRANSIENT

ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

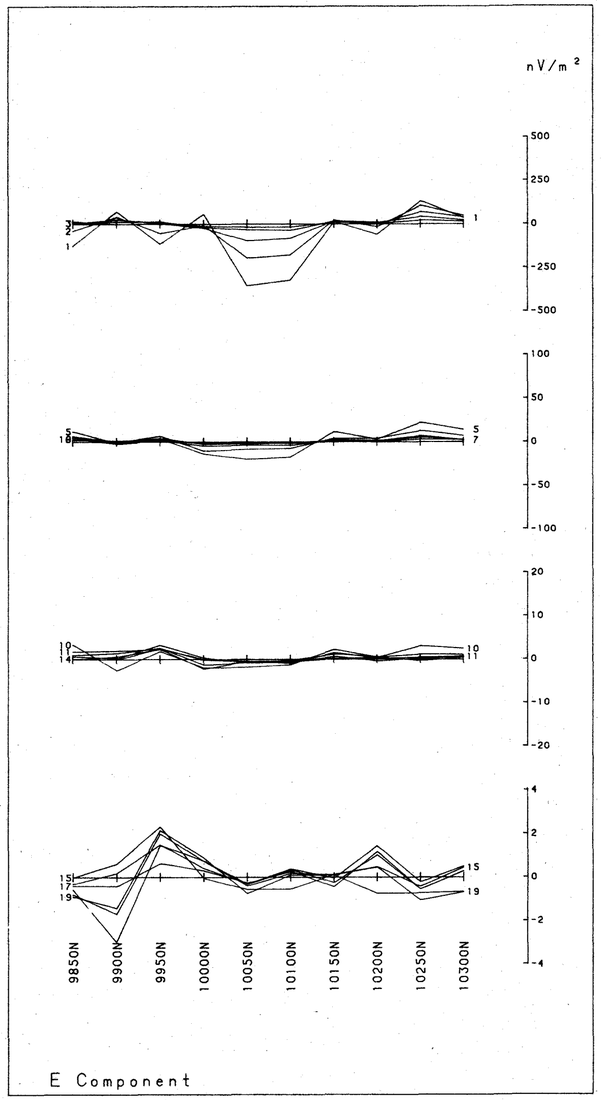
LINE : 9600E

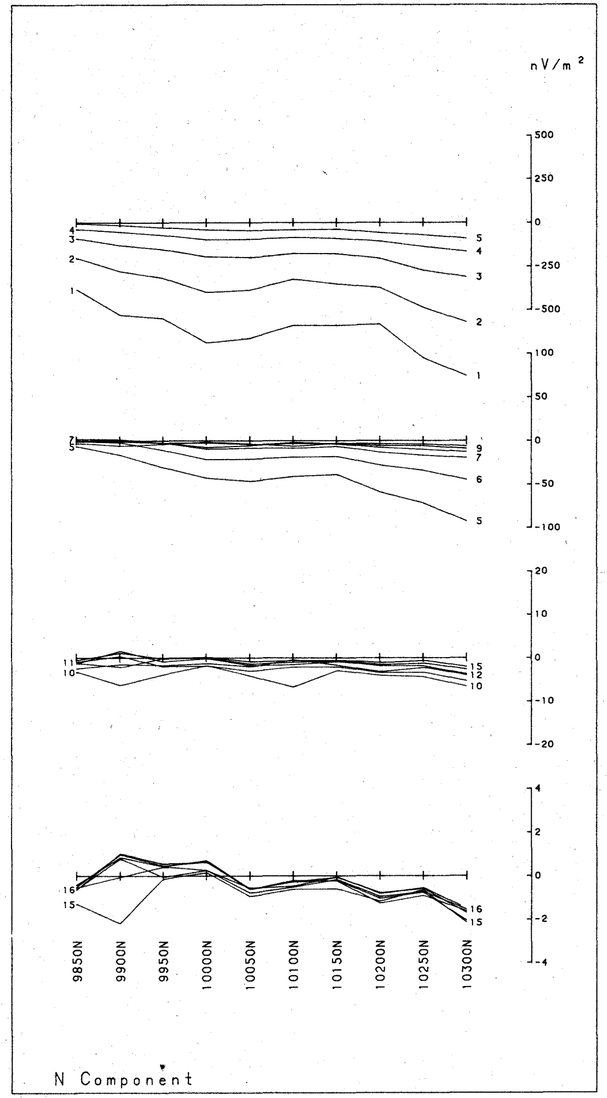
COMP. : E , N & D

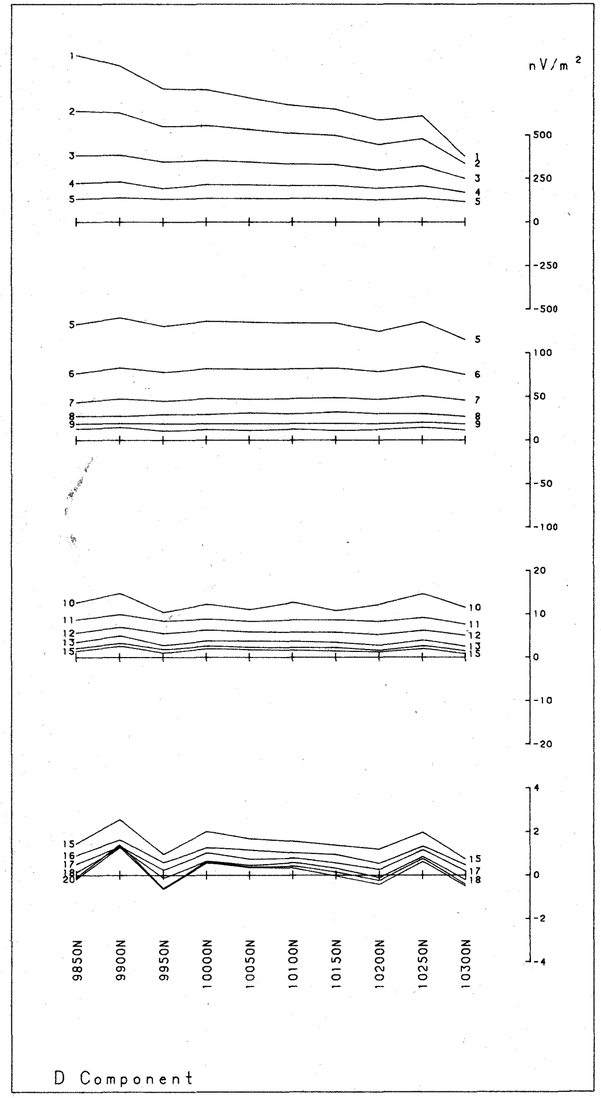
Tx LOOP : Tx 4

063339

278



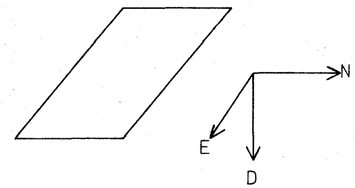




P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

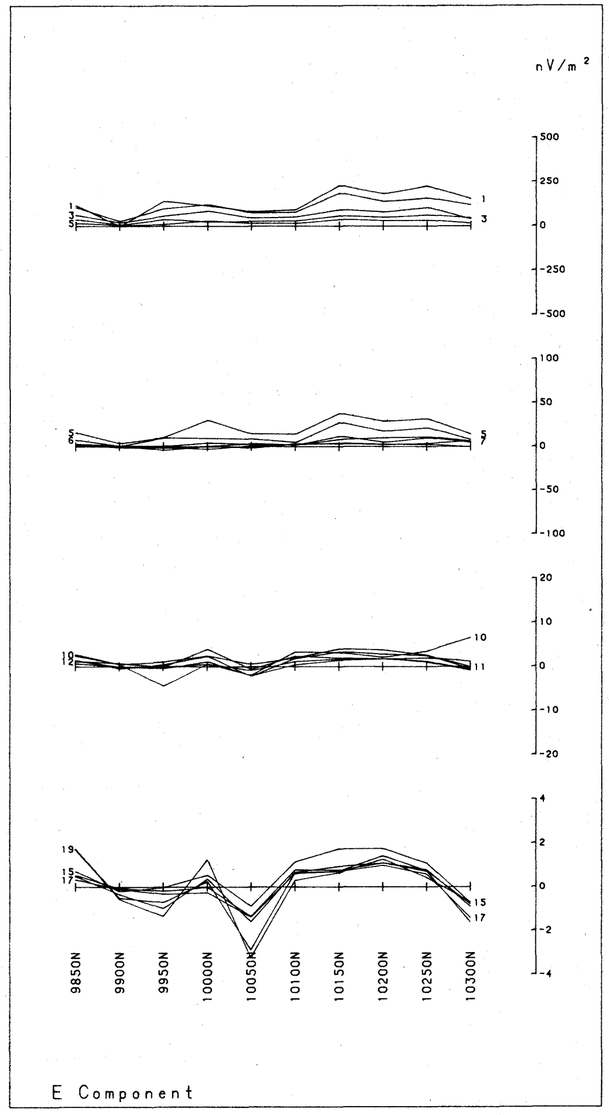
AREA : HEAP OF ROCKS

LINE : 9700E

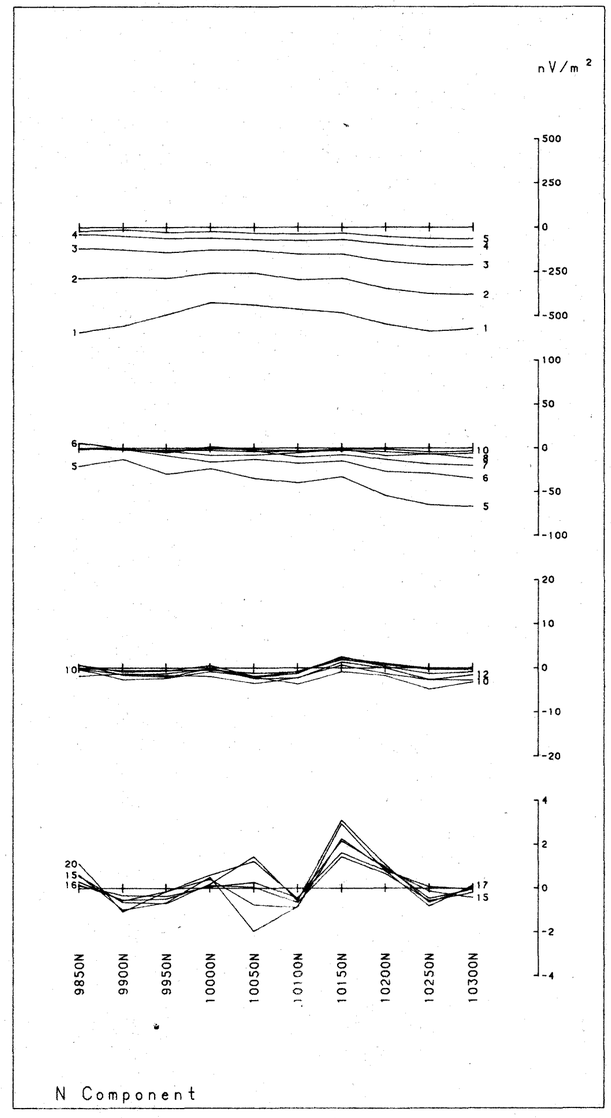
COMP. : E , N & D

Tx LOOP : Tx 4

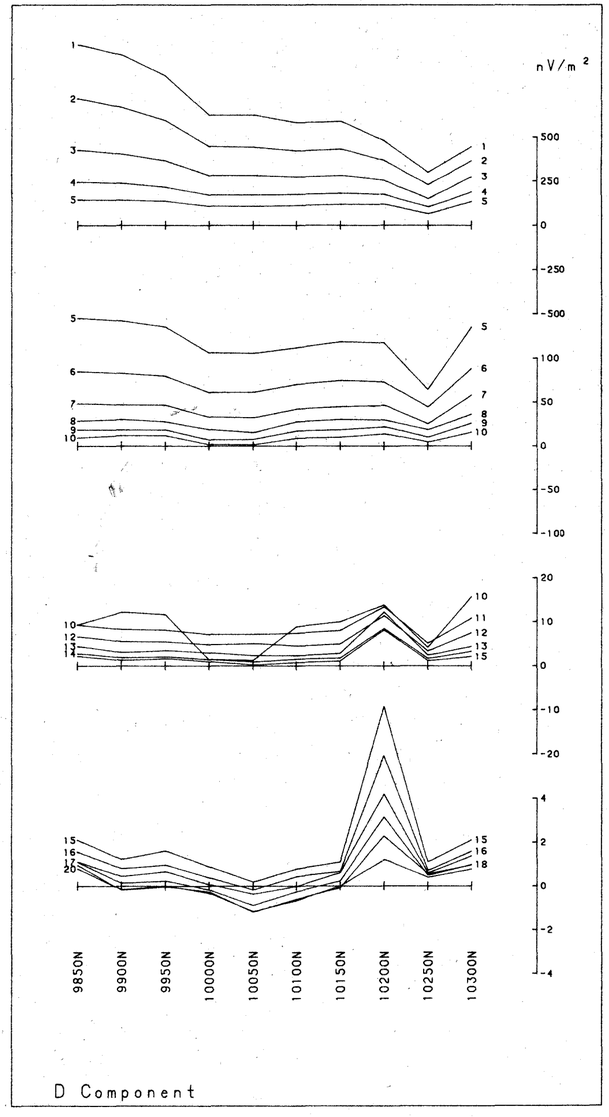
0063280



E Component



N Component

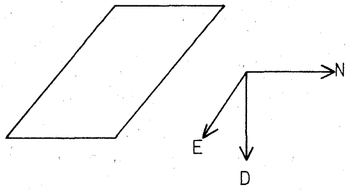


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9200E 9800N	9200E 9500N
	: 9800E 9500N	9800E 9800N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 285 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 14.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 9800E

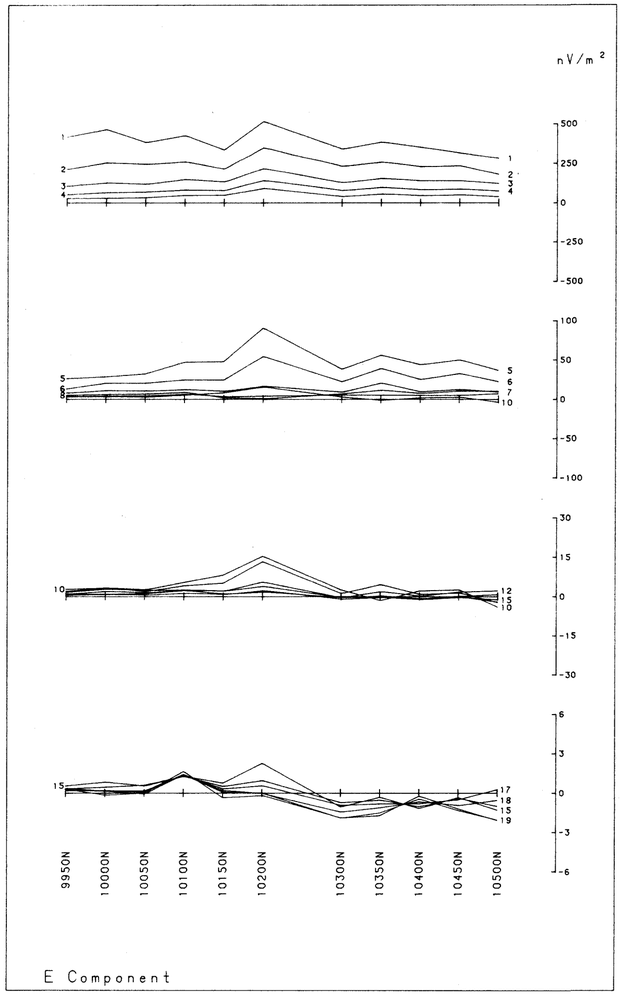
COMP. : E , N & D

Tx LOOP : Tx 4

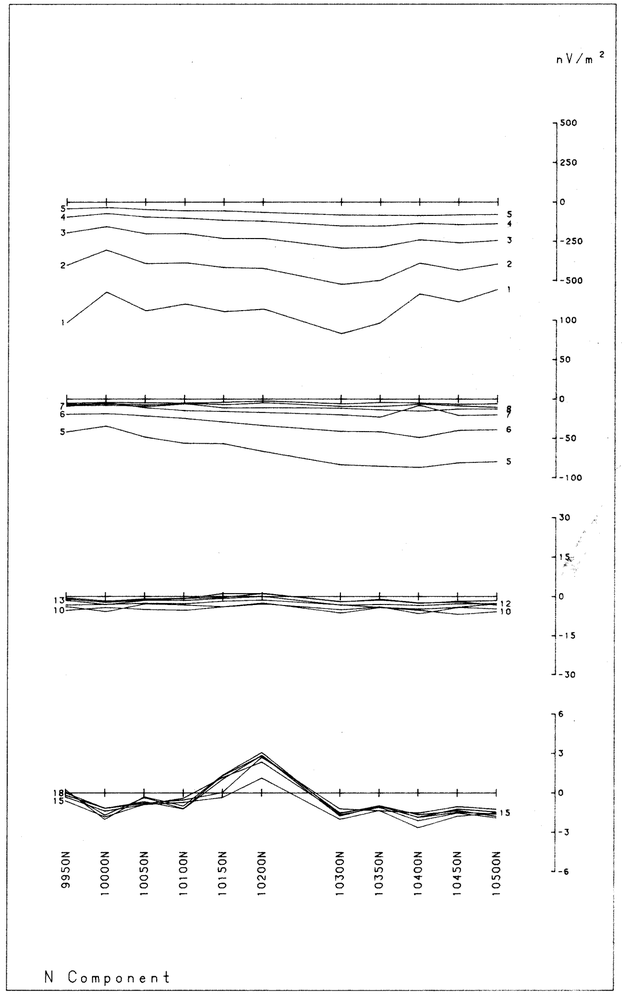
0932881

280

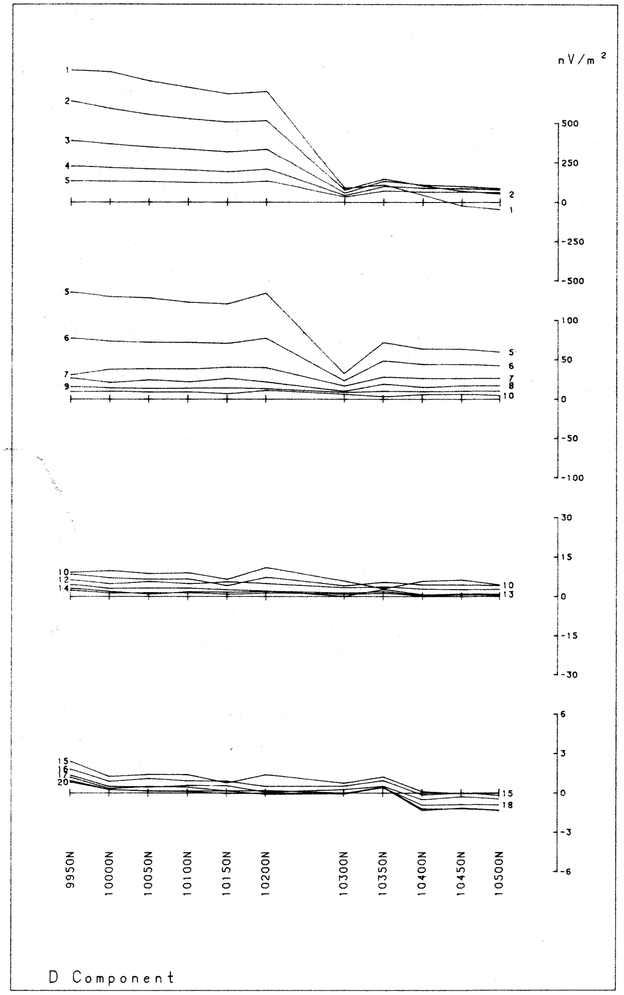
1



E Component



N Component

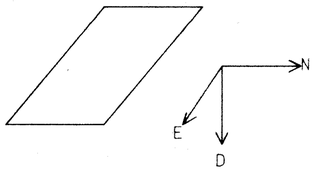


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm

0 100 200 300 400m

SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

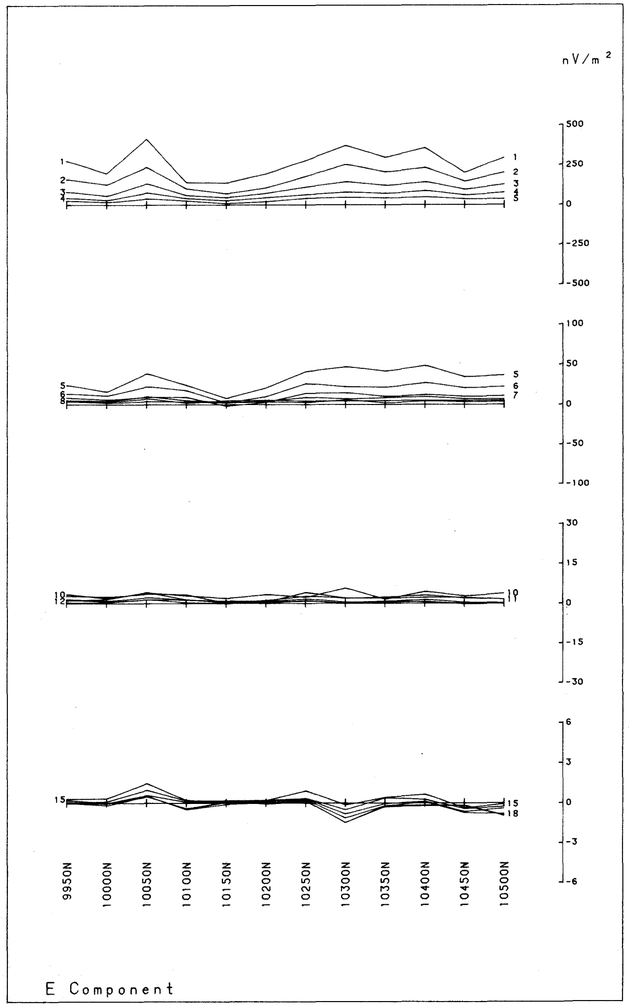
LINE : 9800E

COMP. : E , N & D

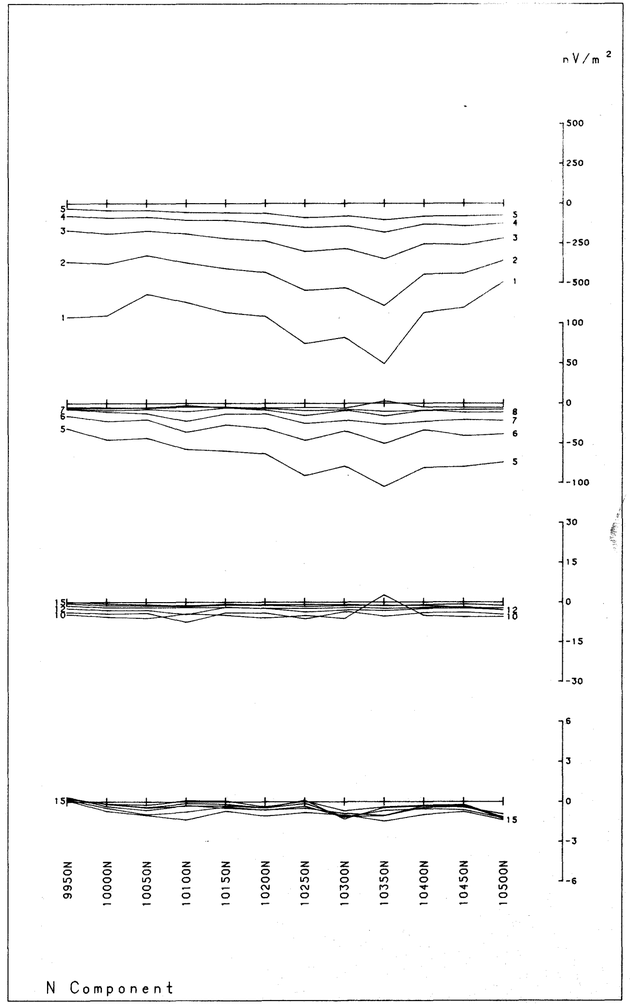
Tx LOOP : Tx 5

063282

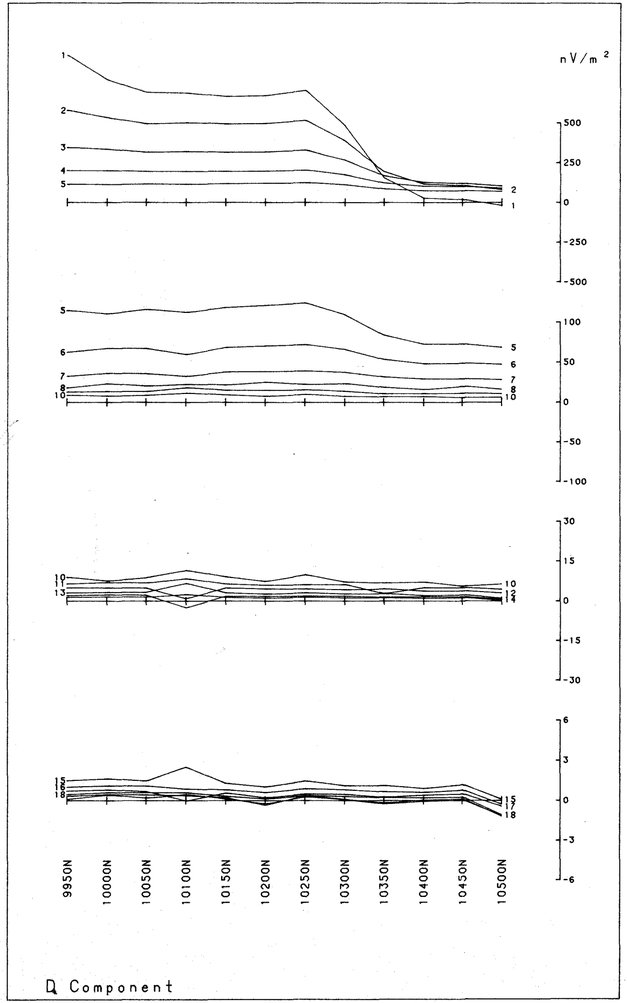
281



E Component



N Component

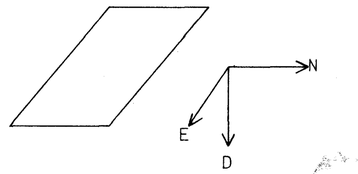


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 9900E

COMP. : E , N & D

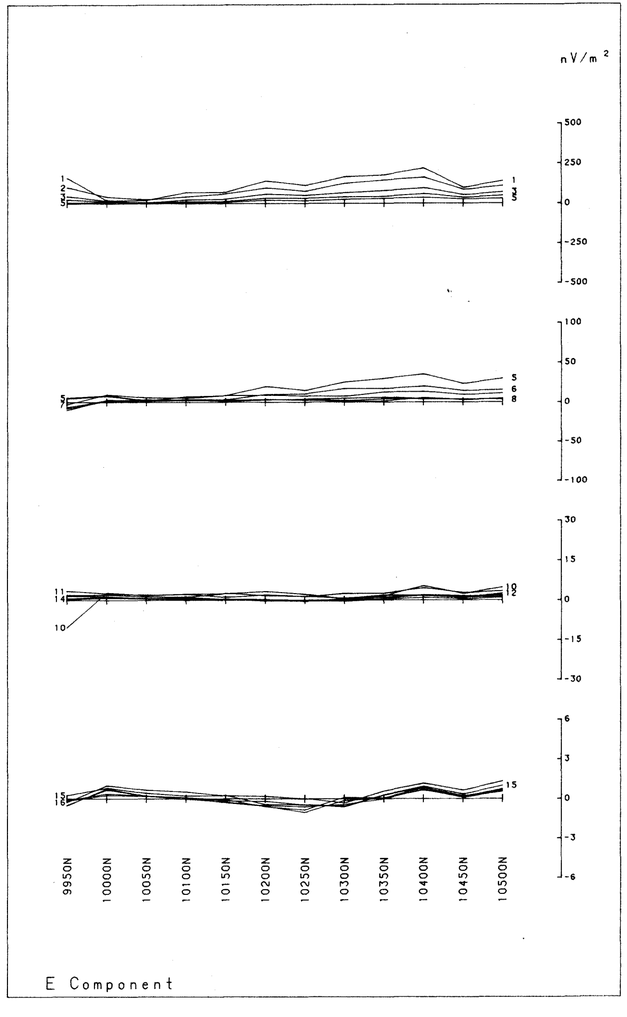
Tx LOOP : Tx 5

063283

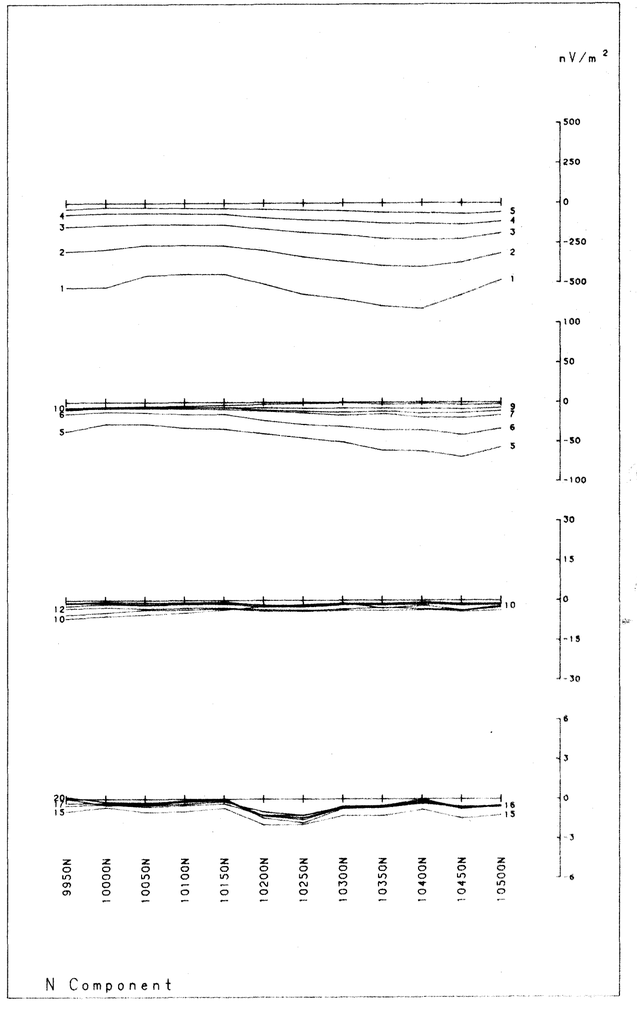
282

1

2



E Component



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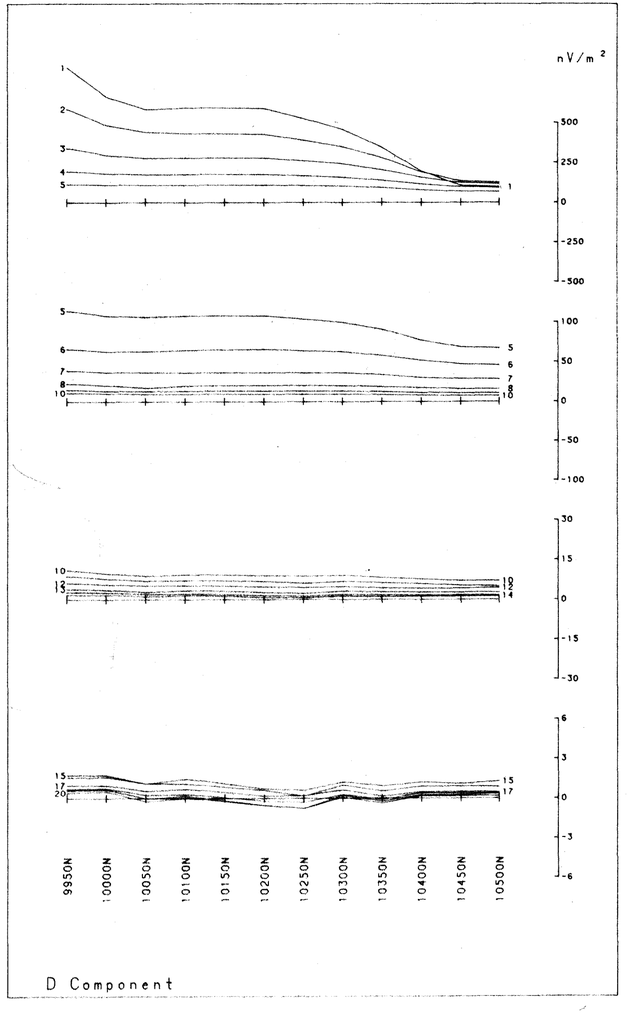
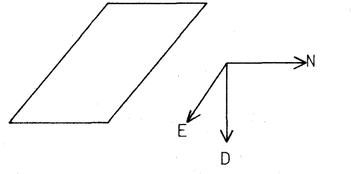


D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 10000E

COMP. : E , N & D

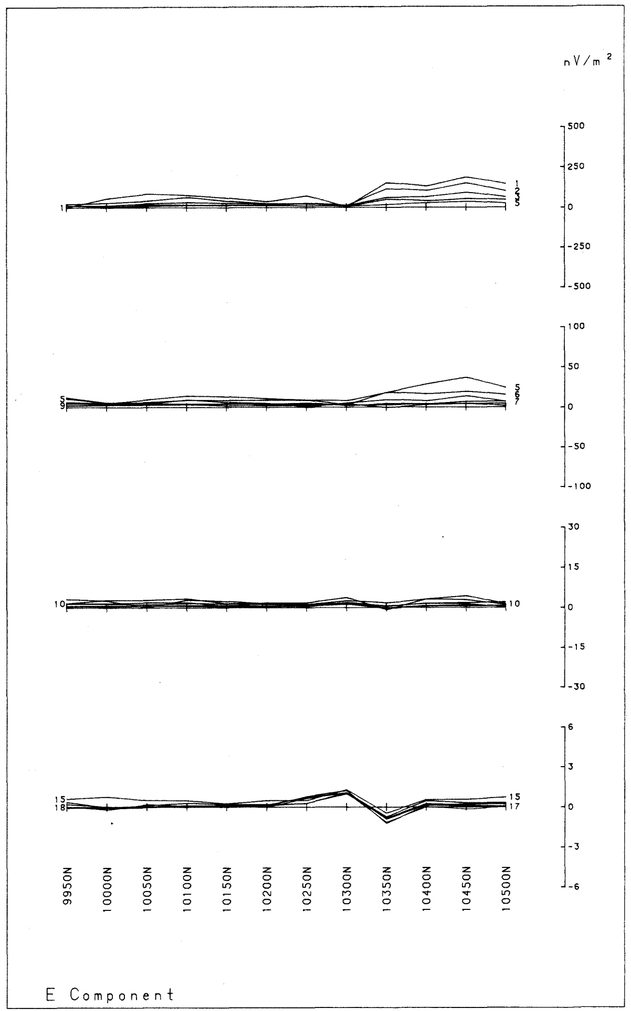
Tx LOOP : Tx 5

063284

283

1

2



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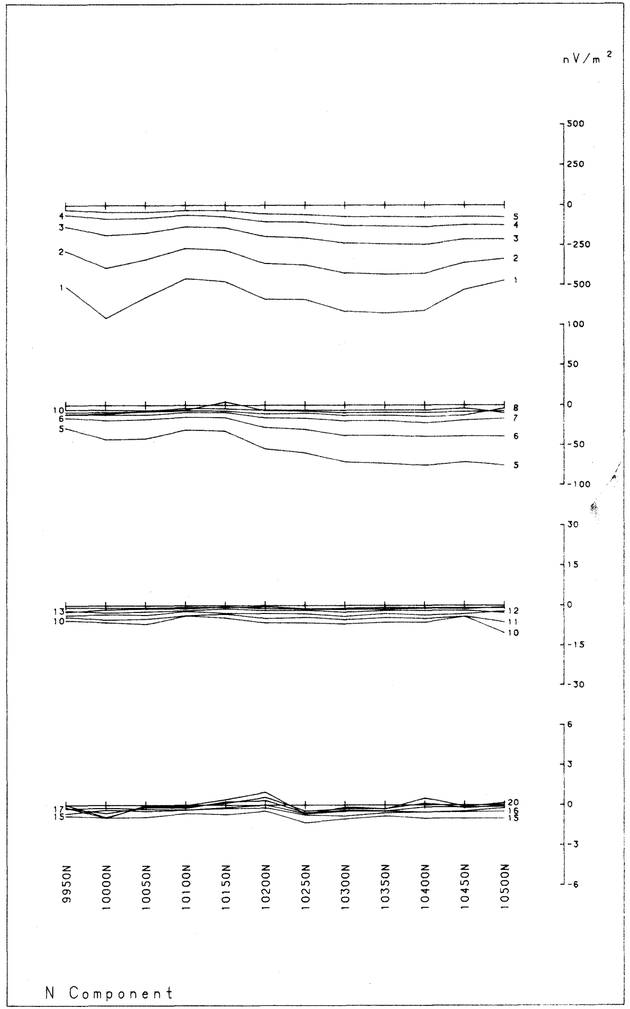

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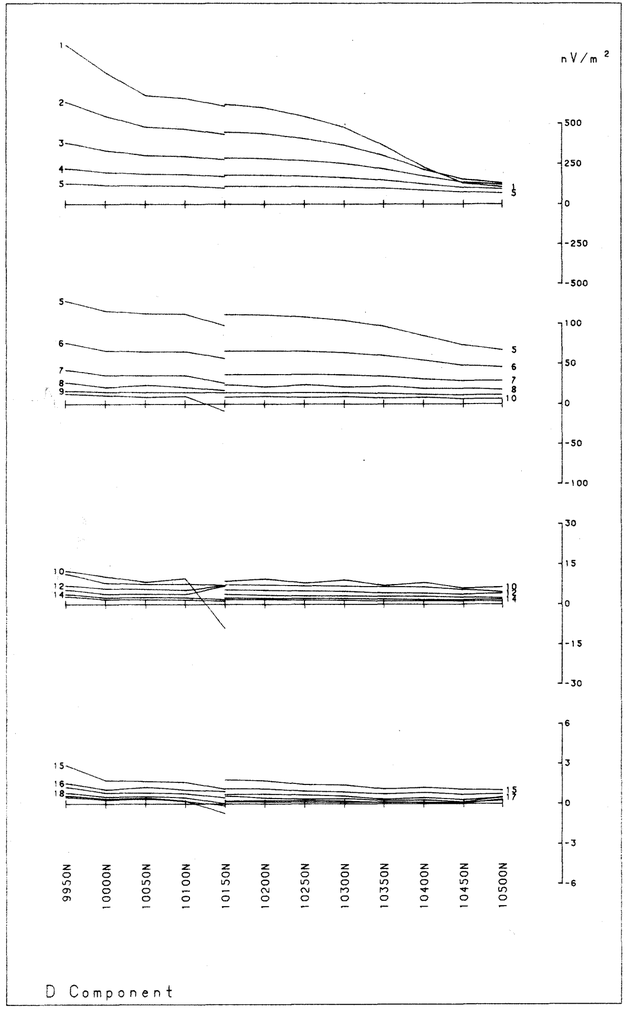
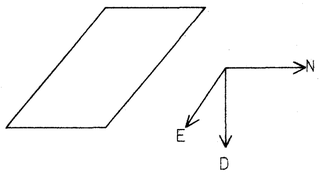


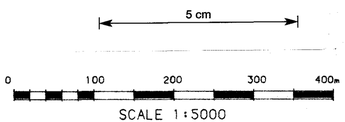
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
LOOP SIZE	: 600m x 300m	
Tx TURN OFF TIME	: 200 usec	
FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

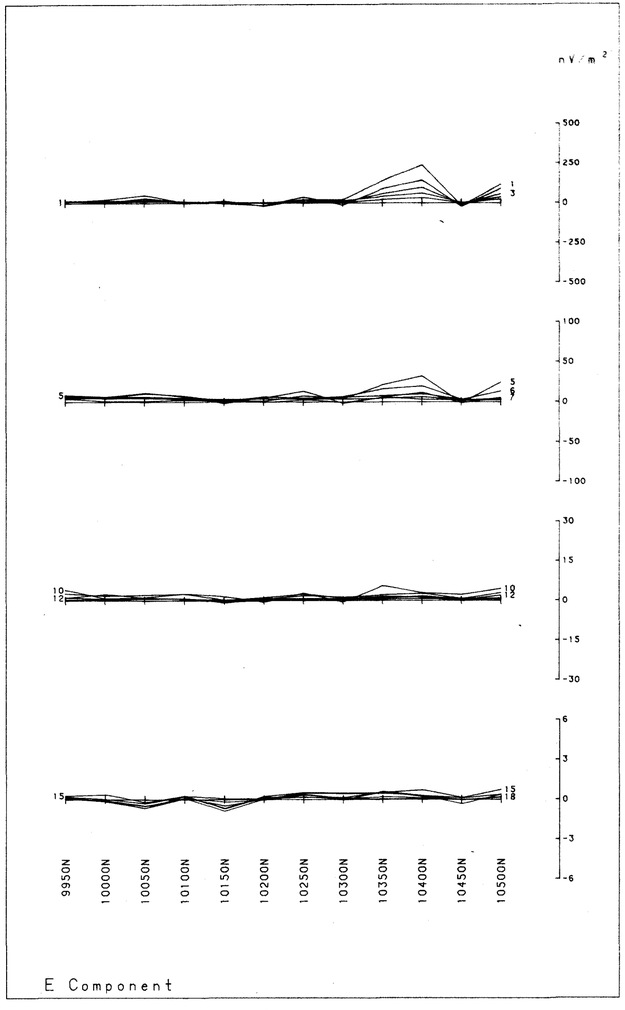
LINE : 10100E

COMP. : E , N & D

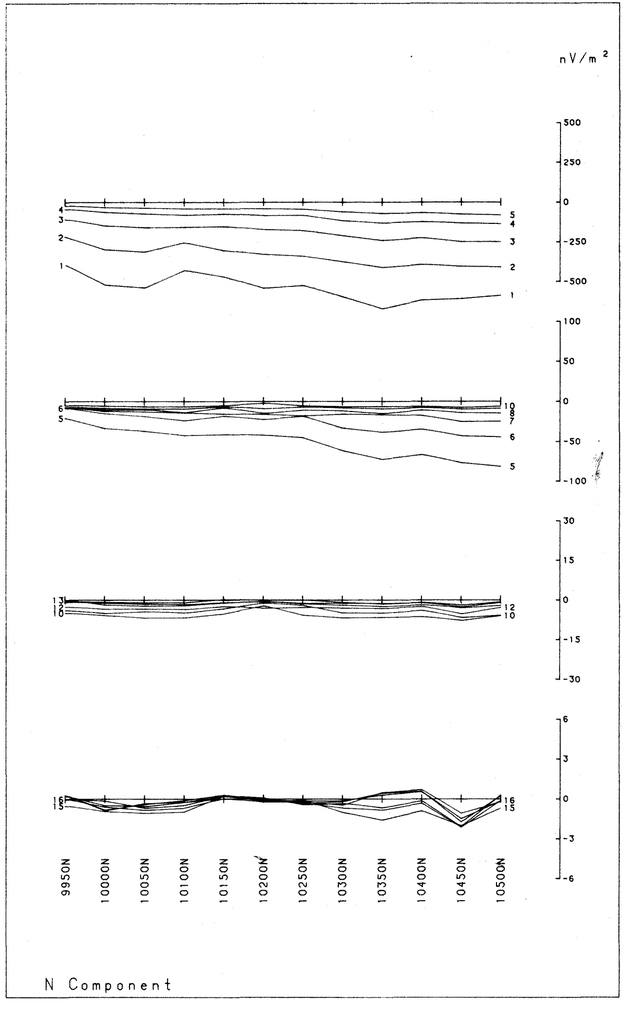
Tx LOOP : Tx 5

063285

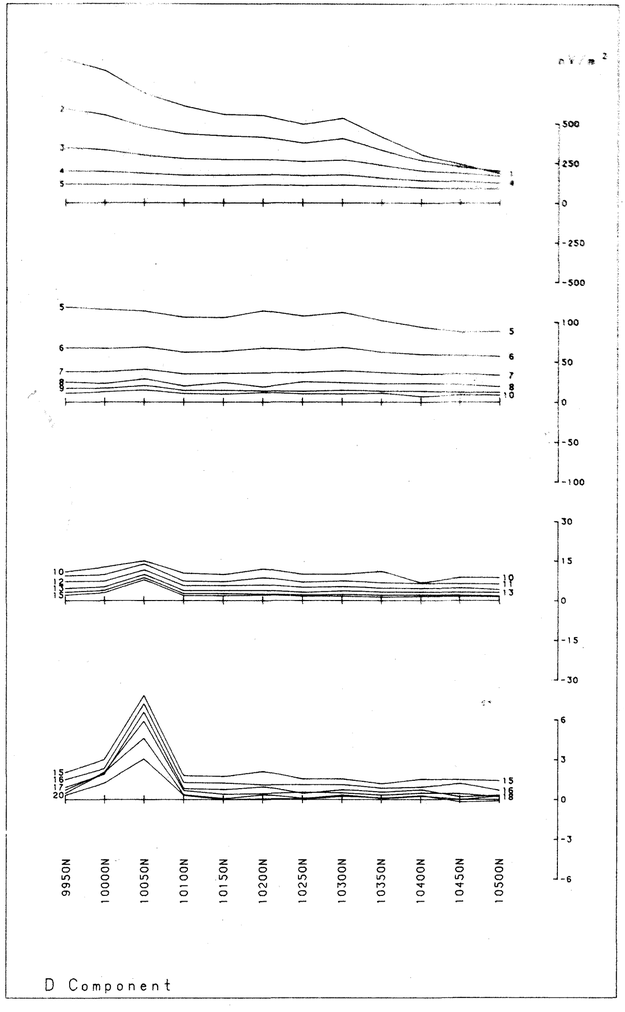
284



E Component



N Component

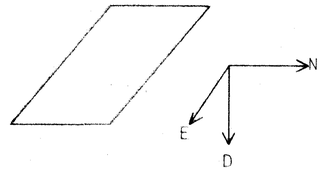


D Component

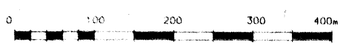
P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm



SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
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FIRST GATE TIME	: 0.08 msec	
CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY - JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

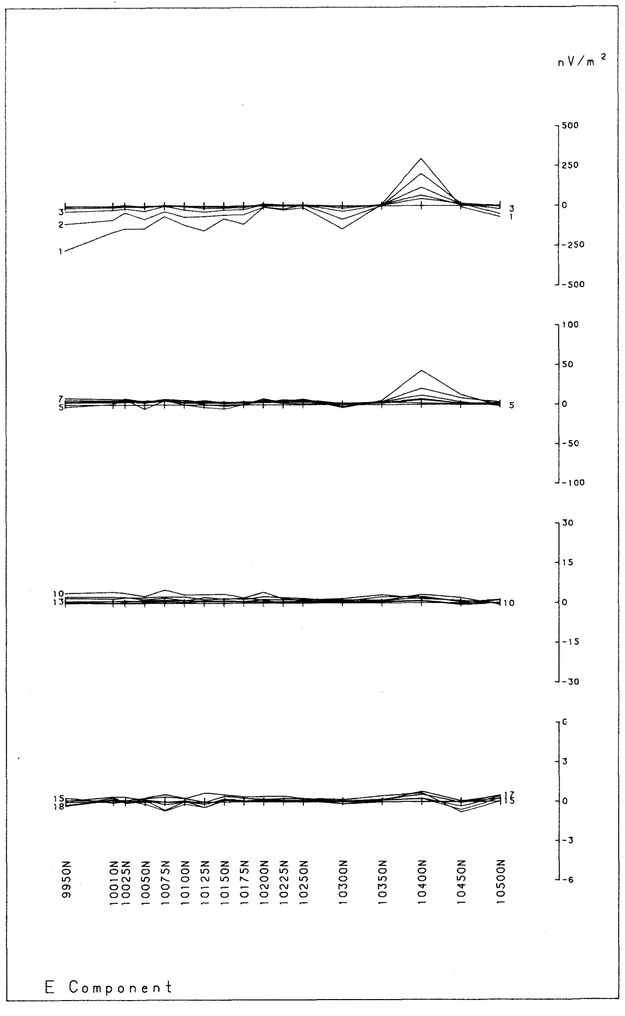
LINE : 10200E

COMP. : E , N & D

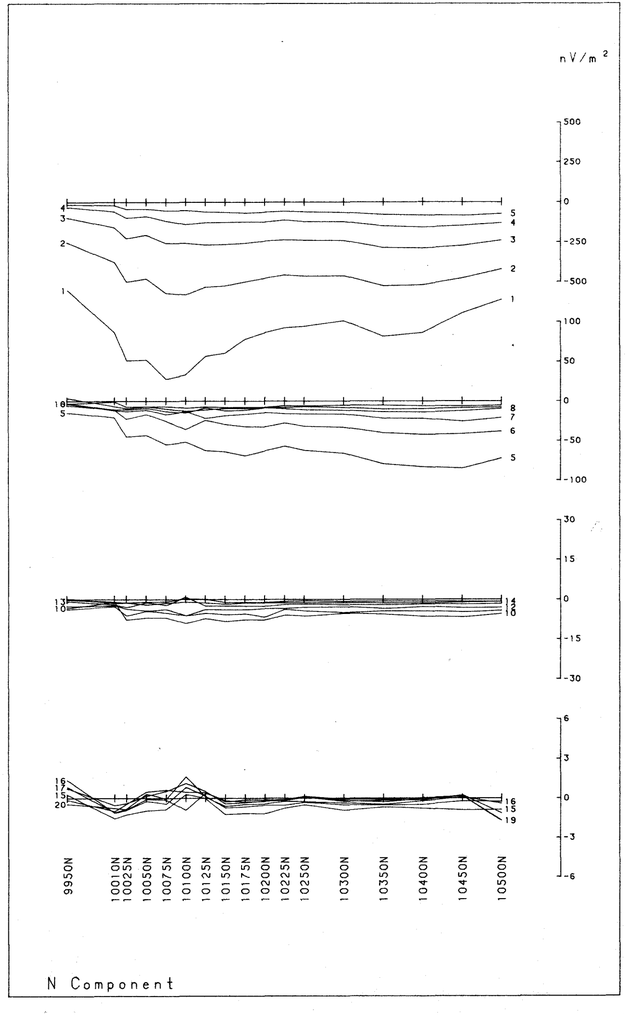
Tx LOOP : Tx 5

0632286

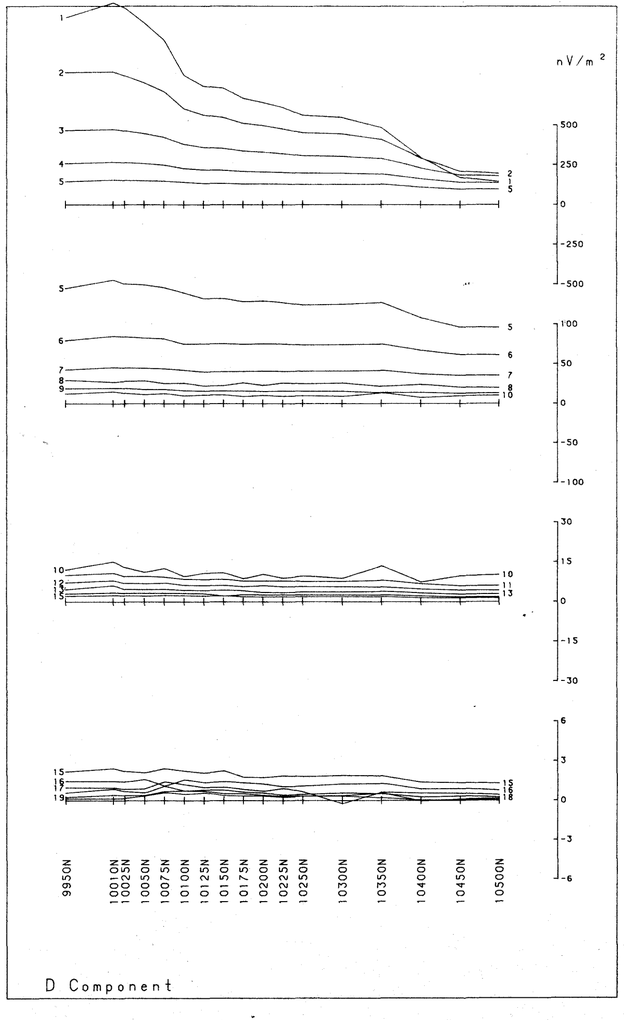
285



E Component



N Component

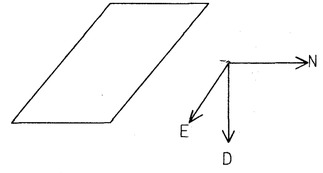


D Component

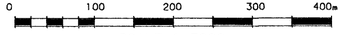
P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION



5 cm



SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
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CURRENT	: 12.0 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

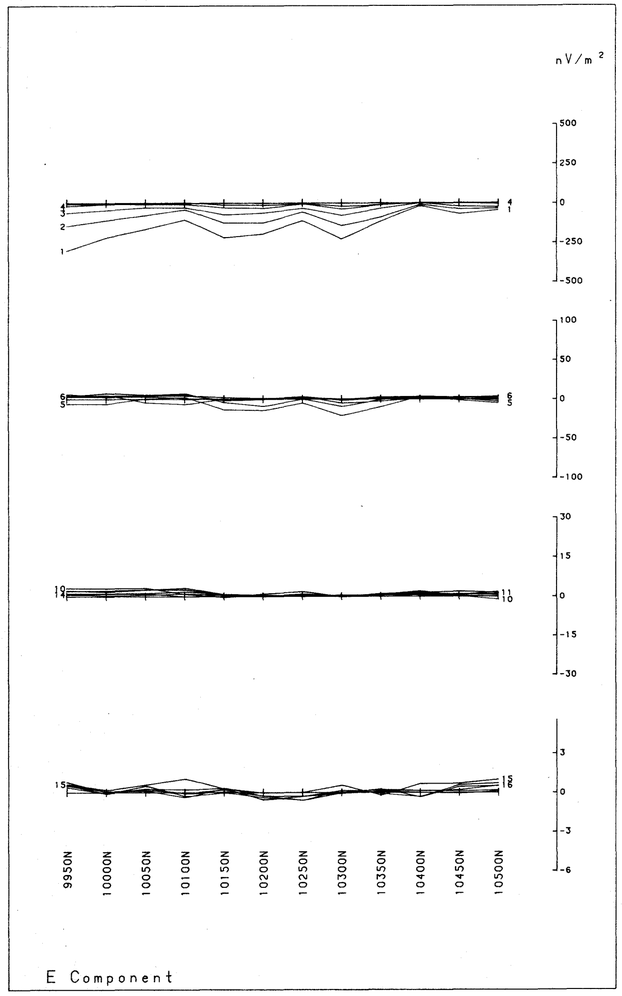
LINE : 10300E

COMP. : E , N & D

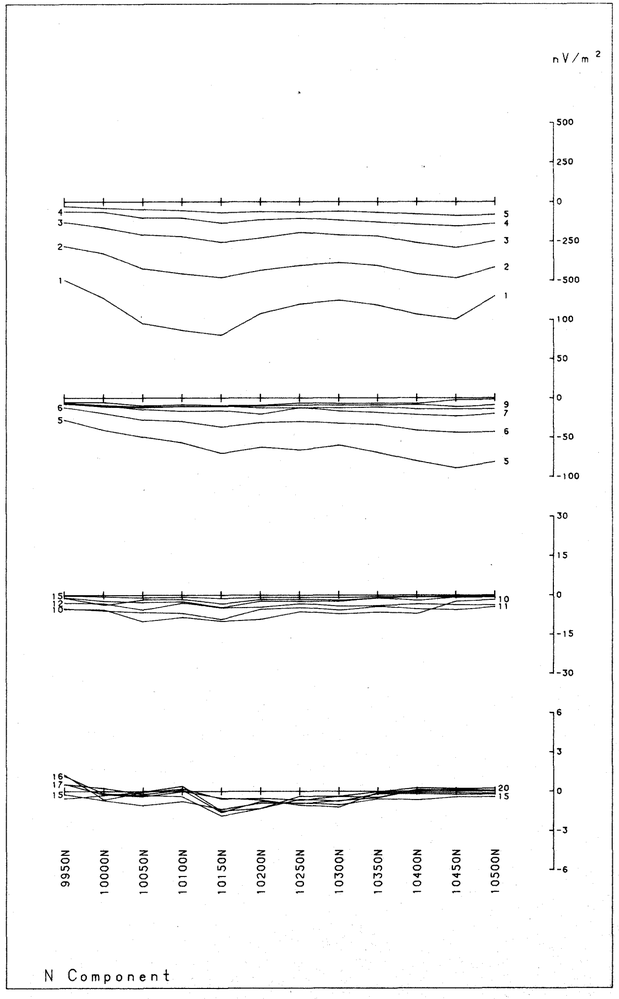
Tx LOOP : Tx 5

063287

286



E Component



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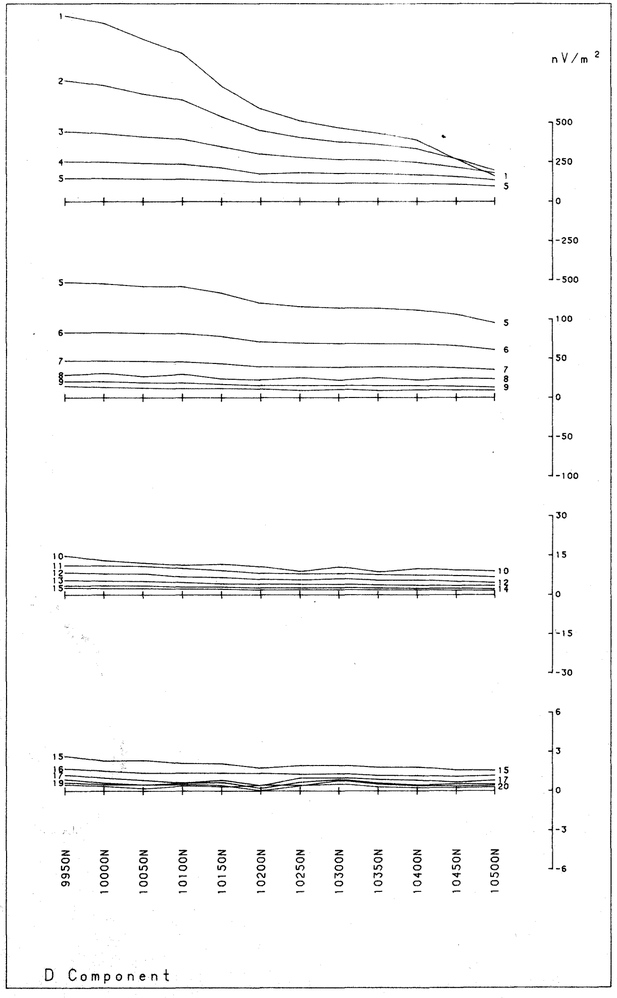
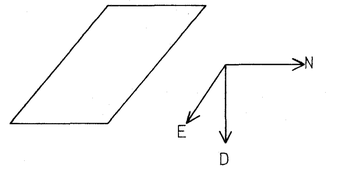


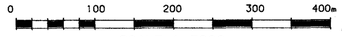
D Component

P & V GEOPHYSICAL SERVICES

EM 37
TRANSIENT
ELECTROMAGNETIC SURVEY

FIXED LOOP CONFIGURATION





SCALE 1:5000

SURVEY SPECIFICATIONS

LOOP CO-ORDS	: 9800E 9900N	10400E 9900N
	: 9800E 9600N	10400E 9600N
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CURRENT	: 12.0 amps	
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INTEGRATION TIME	: 256	
SYNC. MODE	: XTAL	
SURVEYED BY	: P.P	
DATE	: MAY -JULY 1985	
JOB NUMBER	: 327	
PROCESSING	: TESLA 10 PTY LTD	

AMOCO MINERALS

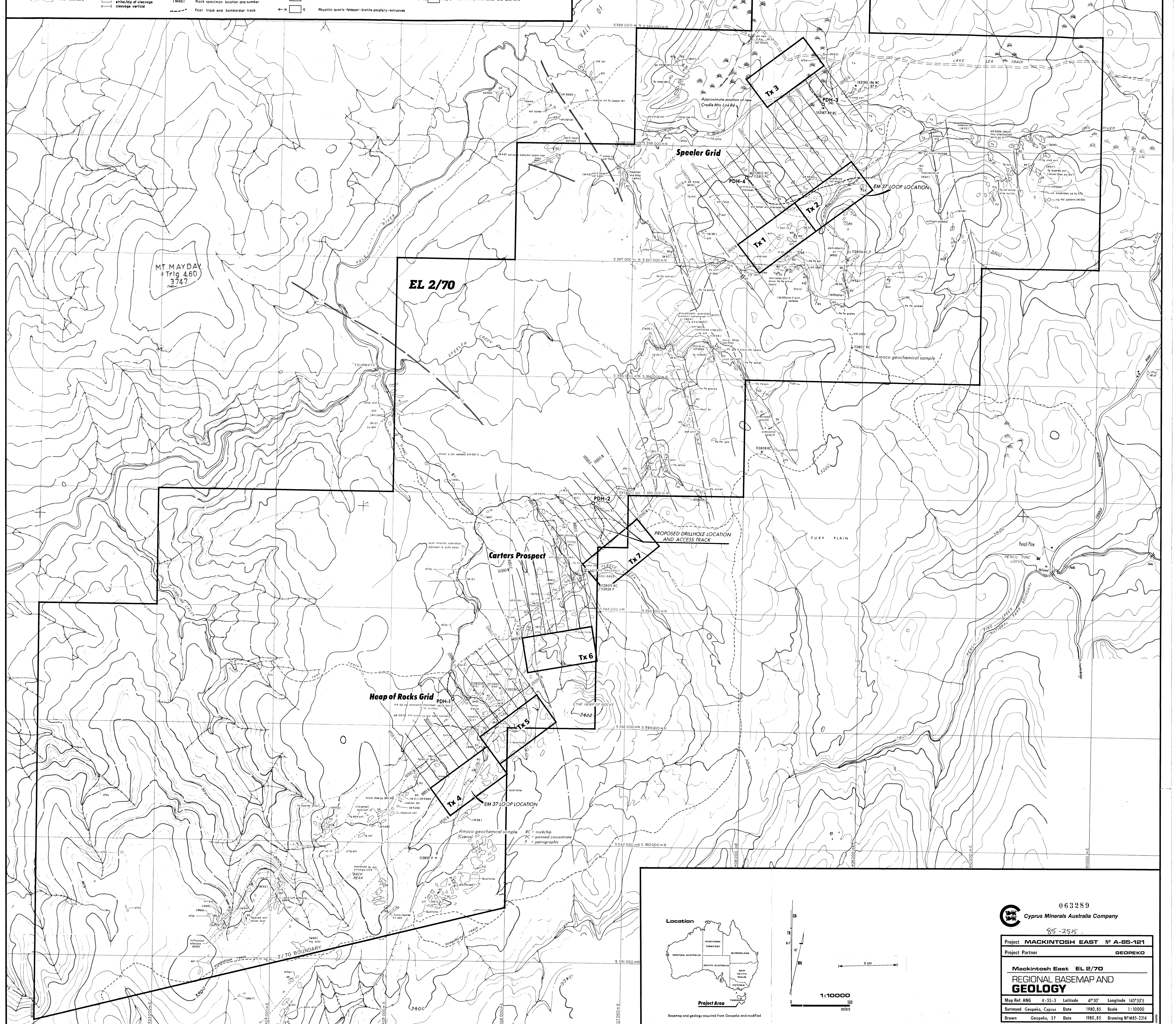
PROJECT : MACINTOSH EAST

AREA : HEAP OF ROCKS

LINE : 10400E

COMP. : E , N & D

Tx LOOP : Tx 5



MT MAYDAY
Trig 460
3747
EL 2/70
Speeler Grid
Tx 1
Tx 2
Tx 3
PDH-3
PDH-4
EM 37 LOOP LOCATION
Approximate position of new Cradle Mtn Link Rd
LAKE LEA TRACK
IRIS RIVER
VALE RIVER
SPEELER CREEK
FOURWAYS
Amoco geochemical sample
PDH-2
PROPOSED DRILLHOLE LOCATION AND ACCESS TRACK
Carters Prospect
Tx 7
FURY PLAIN
Pencil Pine
PENCIL PINE LODGE
Tx 6
Heap of Rocks Grid
PDH-1
Tx 5
Tx 4
THE HEAP OF ROCKS
EM 37 LOOP LOCATION
RC = rockchip
PC = panned concentrate
P = petrographic
BACK PEAK
2/70 BOUNDARY
Location
WESTERN AUSTRALIA
NORTHERN TERRITORY
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA
Project Area
Basemap and geology acquired from Geopeko and modified
1:10000

063289

Cyprus Minerals Australia Company

85-2515.

Project	MACKINTOSH EAST			Nº A-85-121	
Project Partner					GEOPEKO

Mackintosh East EL 2/70

REGIONAL BASEMAP AND GEOLOGY

Map Ref. ANG	K-55-3	Latitude	41°30'	Longitude	145°50'E
Surveyed	Geopeko, Cyprus	Date	1980,85	Scale	1:10000
Drawn	Geopeko, SF	Date	1980,85	Drawing Nº	M85-2314

Report 470

6385

Enclosure 1

6385

LEGEND

Geological Boundary
- mapped
- inferred
- unconformity
- unconformity inferred
- boundary tertiary basalt
- outcrop boundary
- float boundary

Faults
- mapped
- inferred
- fault breccia (bx)
- strike/dip of lithological layering/ bedding
- strike/dip of flow layering in volcanic rocks
- strike/dip of schistosity (Metamorphic foliation)
- strike/dip of schistosity parallel to bedding / lithological layering
- strike/dip of cleavage
- cleavage vertical

- strike/dip of prominent joints
- strike/dip of vertical joints
- minor fold axis (in folded foliation) with plunge
- lineation (crenulation of metamorphic foliation)

Miscellaneous
- KR 5600 — Rock sample location and number for geochemical analysis
- (M66) — Rock speciman location and number
- Foot track and bombardier track

5 cm

GEOLOGICAL INTERPRETATION

Pencil No.			
19-58	TERT.	Basalt	
19- 5	ORDO.	Limestone, impure limy siltstone	
19- 7	ORDO.	Sandstone, conglomeratic sandstone	
19-21	€	Quartz - feldspar - biotite porphyry - intrusive	
19-19	€	Rhyolitic quartz - feldspar - biotite porphyry - extrusives	
19-28	€	Rhyolitic quartz crystal tuff, minor crystal lithic tuff	
19-24	€	Rhyolitic fine grained massive or laminated vitric tuffs	
19-17	€	Fine grained volcaniclastic sediments	
19-70	PRE €	Psammo - pelitic schist and quartzite	

EL 2/70

Speeler Grid

Carters Prospect

Heap of Rocks Grid

PDH-1, PDH-2, PDH-3, PDH-4

Tx 1, Tx 2, Tx 3, Tx 4, Tx 5, Tx 6, Tx 7

EM 37 LOOP LOCATION

PROPOSED DRILLHOLE LOCATION AND ACCESS TRACK

Approximate position of new Cradle Mtn Link Rd

Amoco geochemical sample (Cyprus)

RC = rockchip
PC = panned concentrate
P = petrographic

MT MAYDAY
+Trig 4.60
3747
(1140m)

THE HEAP OF ROCKS
3400

FURY PLAIN

Pencil Pine

PENCIL PINE LODGE

PENCIL PINE — CRADLE MOUNTAIN NATIONAL PARK BOUNDARY

VALE OF BELVOIR

SPEELER CREEK

IRIS RIVER

LAKE LEA TRACK

FOURWAYS

TIMBERLINE PEAK

BACK PEAK

063289

Cyprus Minerals Australia Company

85-2515.

Location