UTEM, MAGNETOMETER AND HLEM SURVEYS

ON THE

McNEIL CREEK PROJECT

FOR

SOUTH KOOTENAY GOLDFIELD INC.

BY

SJ GEOPHYSICS LTD. AND LAMONTAGNE GEOPHYSICS LTD.

FORT STEELE M.D.   N.T.S. 82G/5W

DECEMBER 1989

Report By
Syd J. Visser
SJ GEOPHYSICS LTD.

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INTRODUCTION

A UTEM (large loop time domain electromagnetic system), magnetometer and HLEM (frequency domain horizontal loop electromagnetic system) surveys were completed on the McNeil Creek project at the request of South Kootenay Goldfields INC. by SJ Geophysics LTD. during the period November 3 to December 4, 1989.

The purpose of the UTEM survey was to search for a massive sulfide type of deposit, at depth, in the Aldrige formation known to underlay the survey area. The HLEM survey was later conducted to aid in the difficulties in the interpreting and to detail, by surveying at a closer line spacing then the UTEM survey, the weak shallow conductors found in the survey area. The purpose of the magnetometer survey was to trace magnetite occurrences known to be associated with a major fault and possible economic sulphides and to aid in geological mapping.

DESCRIPTION OF UTEM SYSTEM

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

The field procedure consist of first laying out a large loop of single strand insulated wire and energizing it with current from a transmitter which is powered by a 2.2 kW motor generator. Survey lines are generally oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop.

The transmitter loop is energized with a precise triangular current waveform at a carefully controlled frequency (30.9 Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver module which has a digital recording facility on cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units which must be accurate to about one second in 50 years.

The receiver sensor coil measures the vertical or horizontal magnetic component of the electromagnetic field and responds to its time derivative. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square wave in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 10 channels of data at each station. The higher number channels (7-8-9-10) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will respond on channels 10, 9, 8, 7 and 6. Progressively better conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulfides or graphite will produce a response on all ten channels.

It was mentioned above that the UTEM receiver records data digitally on a cassette. This tape is played back into a computer at the base camp. The computer processes the data and controls the plotting on an 11" x 17" graphics printer. Data are portrayed on data sections as profiles of each of the first nine or ten channels, one section for each survey line.

FIELD WORK AND DISCUSSION OF FIELD PARAMETERS

Syd Visser and Rolf Krawinkel, geophysicists with SJ Geophysics LTD., the UTEM and magnetometer equipment were mobilized by truck from Vancouver to Cranbrook on November 3, 1989 an the UTEM and magnetometer surveys were completed on November 17, 1989. The survey area was accessed each day by truck from the hotel accommodations in Cranbrook. The UTEM survey was performed by SJ Geophysics LTD. and Lamontagne Geophysics LTD.

Twenty lines for a total of approximately 20Km were surveyed from five separate transmitter loops, as partially shown on the compilation map Plate G1. It was initially planned to possibly cover the whole survey area from one loop but the noise from the nearby power lines forced the placement of more loops so the survey length of the lines could be shortened. One line was surveyed from loop 3 to test if the noise could be reduced by reducing the size of the loops. The size of the loops made no significant difference. The resultant data was send to Lamontagne Geophysics LTD. to determine if there is a method of reducing the noise problem for future surveys in this area. The noise from the power lines and the windy conditions slowed the survey considerably.

Loop 4 was placed to survey 3 lines inside the loop to test for possible small flat lying conductors an to aid in interpretation of the data from the loops to the west. Loop 5 was placed to the east of the survey lines to survey one line from the easterly direction so that electromagnetic field would couple better with possible westerly dipping conductors.

Ten UTEM time channels, of the vertical component (Hz) of the electromagnetic field, were measured at each station along the lines. The resultant data was later reduced and plotted in town by computer. A base frequency of 30.9 Hz was used for the survey because of the strong conductors expected in the survey area and the experience has shown this to be the beat base frequency to use near large power line.

The magnetometer survey was completed during the same time as the UTEM survey when the helper was free from placing loops. Two Gem-19 Proton Precession memory magnetometers, one base station magnetometer and one field, magnetometer were used during the survey. The magnetometers automatically correct for diurnal variations at the end of the day before transferring the data to a field computer.

Because only numerous shallow conductors that were very difficult to interpret were encountered by the UTEM survey it was decided, after discussing the problems with Peter Kluchuck and Mike Bapty (South Kootenay Goldfields INC. representative) to resurvey part of the UTEM survey area at a closer (100m) line spacing to increase the interpretation of the data.

The HLEM surveyed, on 13 lines for a total of approximately 16 Km, using a Apex-Parametrics MAX-MIN 1 was completed by John Ashenhurst and Rob Gibbs during the period of November 21, to December 4, 1989. A test survey using a 150m and 100m coil separation at 440, 880, 1760, 3520, 7040 and 14080Hz was completed on line 5000N at the beginning of the survey to determine which frequencies and coil separation to use for the remainder of the survey. A coil separation of 150m was at 440, ~~7060~~ 1760, 7040, and 14080Hz was used for the majority of the survey. The correct distance and angle of the coils to use at each survey point was calculated from the chainage notes supplied by the line cutters, previous to the daily field work. The in-phase data collected from at 440Hz was subtracted from the higher frequencies to eliminate the remaining topographic error. This method can be employed on this property because the weak conductors found in the survey area do not have a significant response at 440Hz. The snow and icy conditions in the survey area slowed the survey considerably.

The elevation and the station location were calculated from the chainage notes supplied by the line cutters, assuming that lines 2400E, 3100E and 3500E were accurately chained and located. The results from the above calculations were used as the base map for all the profile, contour, topography and compilation maps.

DATA PRESENTATION

The results of the UTEM survey are presented on 48 data sections representing 20 lines of data (Appendix III) and one compilation map. The HLEM data for the three frequencies 1760Hz, 7040Hz and 14080Hz are presented on three profile maps, the elevation calculated from the chainage notes are presented along with the location of the roads on a contour map, and the magnetic data is presented on profiles and contour maps. A compilation of all the data is presented on a compilation map.

The maps are listed as follows:

Plate GM 1A	Magnetics Profiles Total Field
Plate GM 1B	Magnetics Contours Total Field
Plate GMM 1A	Horizontal Loop EM Profiles 14080 Hertz
Plate GMM 1B	Horizontal Loop EM Profiles 7040 Hertz
Plate GMM 1C	Horizontal Loop EM Profiles 1760 Hertz
Plate GT 1	Contoured Topography Map
Plate G1	UTEM, HLEM, Mag Surveys Compilation Map

Legends for the UTEM data sections are also attached (Appendix II).

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

a) For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - \text{PC}}{/\text{PT}/} \times 100$$

Where:

PC is the calculated primary field in the direction of the component from the loop at the occupied station

Ch.1 is the observed amplitude of Channel 1

PT is the calculated total field

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

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

where Ch.n is the observed amplitude of Channel n (2 to 9)

N = Ch.1 for Ch1 normalized

N = PT for primary field normalized

i is the data station for continuous normalized (each reading normalized by different primary field)

i is the station below the arrow on the data sections for point normalized (each reading normalized by the same primary field)

Subtracting channel 1 from the remaining channels eliminates the topographic errors from all the data except ch.1.

If there is a response in channel 1 from a conductor then this value must be added to do a proper conductivity determination from the decay curves. Therefore channel 1 should not be subtracted indiscriminately.

The data from each line is plotted on at least 2 separate sections consisting of a continues normalized section and a point normalized section. Point normalization data is the absolute secondary field at a "gain setting" related to the normalization point. The data is usually point normalize over the central part of the crossover anomaly to aid in interpretation.

INTERPRETATION

The compilation of the UTEM, HLEM, and magnetic anomalies is presented on the compilation map, Plate G1.

The following interpretation on the McNeil Creek project is mainly from the information collected by the HLEM survey, over the part of the grid where it is available, since the UTEM survey was mainly designed to search for deeper conductors of which more were located in the survey area.

The line spacing (200m) of the UTEM survey is to large to easily trace the weak short strike length conductors or contact zones found in the survey area.

An example of where the large line spacing is confusing, using the interpretation from the UTEM data, is the two conductors near 2800E on line 4000N, the two conductors at approximately 2875E and 3025E on line 4200N and the anomalies at approximately 3075E and 3225E on line 4400N which all have similar characteristics therefore could be considered a long strike length conductor but the data from the, closer line spaced HLEM suggests that these are separate anomalies.

The majority of the HLEM and UTEM anomalies appear to be contact zones which are either due to resistive dykes cutting the more conductive host rocks, resistive sills, or possibly the conductive (less resistive) shallow dipping layers being cut by topography. The contact zone between the diorite, known to strike across the grid, also appears to be more conductive then the surrounding rocks. Numerous small near vertical, with a very short strike length, massive sulfide veins are also located near the diorite contact. The combination of all these effects make interpretation of discrete conductors almost impossible since a few hundred metres wide flat lying conductive layer or block can look identical to, two very weak or short strike length, with short depth extent, near vertical conductors.

A number of anomalies labeled as H1 to H4 on the compilation map, appear to be weak (<1 mho) discrete near vertical conductors.

Anomaly H1 appears to be a weak conductor with a depth to top of approximately 30m that follows a weak magnetic anomaly which appears to be dipping steeply to the west, and a weak UTEM crossover anomaly. Because of the 30 degrees trend rotation used while gridding the magnetic data for the contour map (Plate GM 1B) the magnetic anomaly appears to strike in a much different direction than suggested by the profile plots (Plate GM 1A) and the HLEM and UTEM data. The combined HLEM UTEM and magnetic anomalies suggest that the anomaly may be due to pyrrhotite although because the EM anomalies are weak they may reflect a conductive edge of a magnetic dyke.

Anomaly H2 is very similar to anomaly H1 except that is only seen on one line and therefore appears to have a very short strike length.

Anomaly H3 appears to be a relatively long strike length shallow, less than 1 mho, UTEM and HLEM conductor. because of the anomaly directly to the west of this anomaly it is very difficult to get dip information. This anomaly does not have any magnetic expression and appears to be crosscut by magnetic anomaly on the southern extent. This anomaly appears to be offset and continue north to line 5000N (anomaly H3a). The anomaly may also continue to the south but it is much weaker, less well defined and appears more like a contact zone.

Anomaly H4 is likely due to the eastern edge of the magnetite rich fault zone known to exist in this area. The survey did not continue for enough to the west to completely outline this anomaly therefore further interpretation is not possible.

The UTEM data in the area that was not covered by the HLEM indicates that there is a weak shallow ((< 50m) which is the resolution of 50m station spacing) conductor or conductors extending from line 3600N to 4000N along the 3100E base line (U1, Plate G1). Because of the confusion with the offset in the lines in this area it is difficult to trace the anomalies from line to line and they therefore appear to be multiple short strike length conductors..

A second UTEM anomaly (U2, Plate G1) which is a weak shallow conductor with no apparent depth extent can be traced from line 3600N to line 4000N at approximately 2700E.

The cross structures shown on the compilation map were inferred from the discontinuities of the UTEM, magnetic and HLEM anomalies along strike.

CONCLUSION

The anomalies encountered in the UTEM, HLEM surveys indicate a large number of relatively weak anomalies which are suspected to be mainly due to abrupt changes in the resistivity of the shallow dipping rocks. The abrupt changes in resistivity could be due to crosscutting vertical dykes, topography cutting the shallow dipping rocks, faults,and the contact with the diorite sill.

Those anomalies encountered that may be due to discrete conductors are very weak (< 1 mho) and do not appear to have a large depth extent. Two of the above anomalies correlate well with a weak magnetic anomaly which is either due to pyrrhotite mineralization, or possible a conductive contact with a magnetic dyke. A conductor on the north west edge of the grid is likely due to a magnetic rich conductive fault.

Syd Visser F.G.A.C.
Geophysicist

SJ Geophysics LTD.

APPENDIX I

STATEMENT OF QUALIFICATIONS

I, Syd J. Visser, of 8081 - 112th Street, Delta, British Columbia, hereby certify that,

1) I am a graduate from the University of British Columbia, 1981, where I obtained a B.Sc. (Hon.) Degree in Geology and Geophysics.

2) I am a graduate from Haileybury School of Mines, 11971.

3) I have been engaged in mining exploration since 1968.

4) I am a Fellow of the Geological Association of Canada.

Syd J. Visser, B.Sc., F.G.A.C.
Geophysicist

APPENDIX II

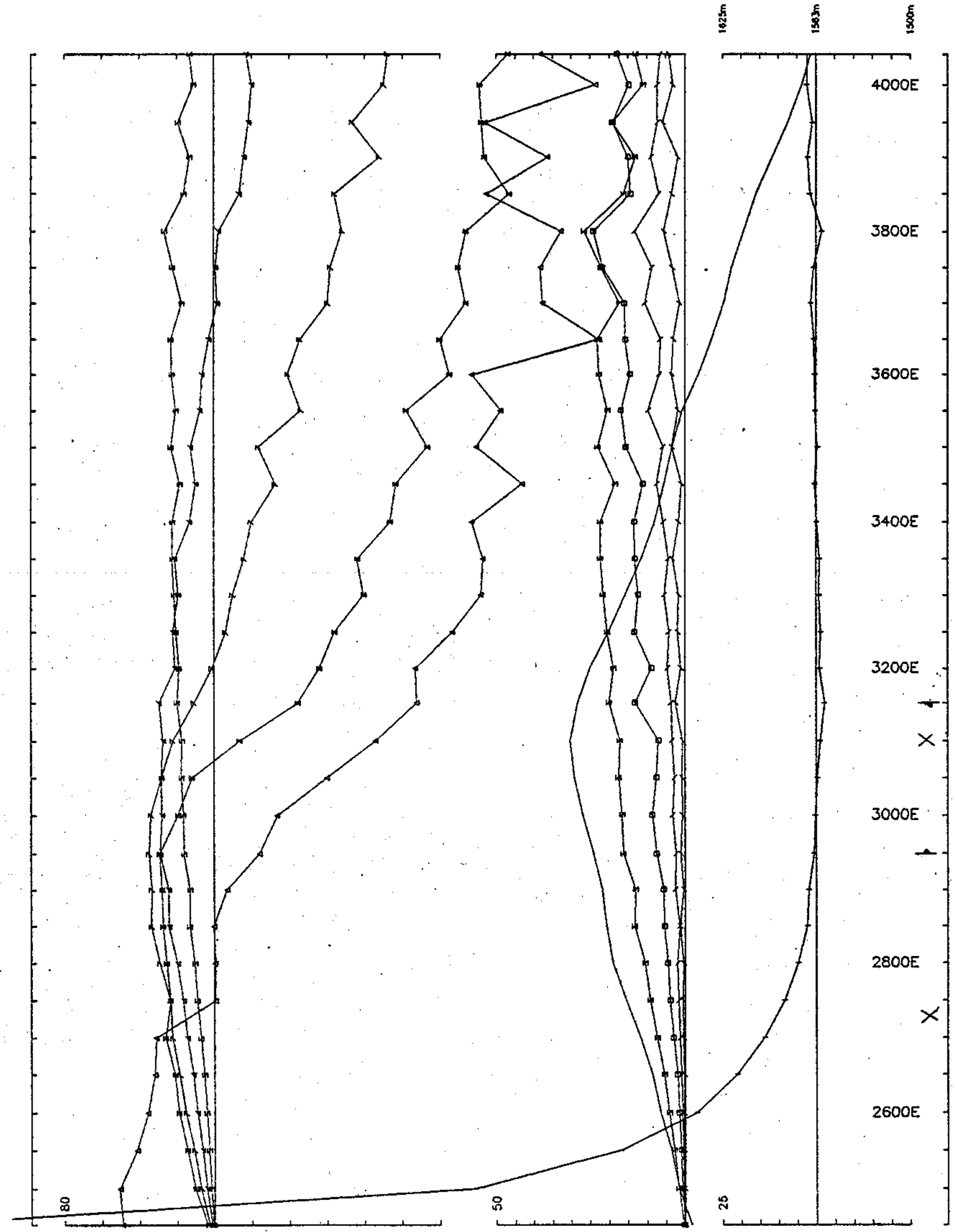
LEGEND

Channel	Mean delay time Base Freq. 54.4 Hz	Plotting symbol
1	6.9 ms	1
2	3.45	/
3	1.725	\
4	0.863	□
5	0.432	
6	0.216	
7	0.108	
8	0.054	⧗
9	0.027	△
10	0.014	◇

Change in conductivity:
Geological contact
Direction of increased conductivity
Top edge of shallow dipping plate

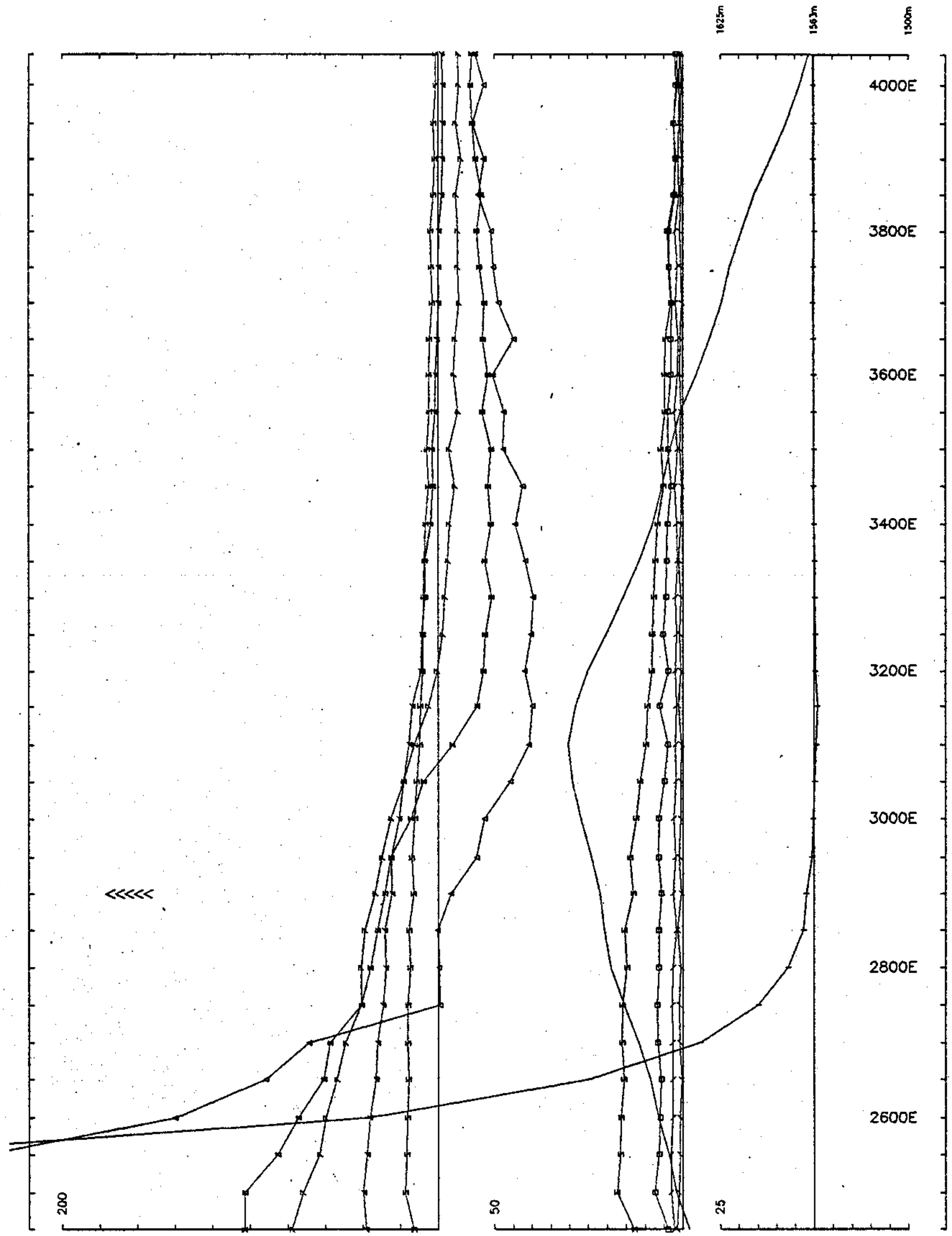
Crossover Axis: D╳CH
D = depth: S - Shallow depth
M - Medium depth
D - Deep depth
CH = Latest time channel

APPENDIX III



Area McNEIL CREEK client SOUTH KOOTENAY GOLDFIELDS INC. operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 1 Line 3600N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



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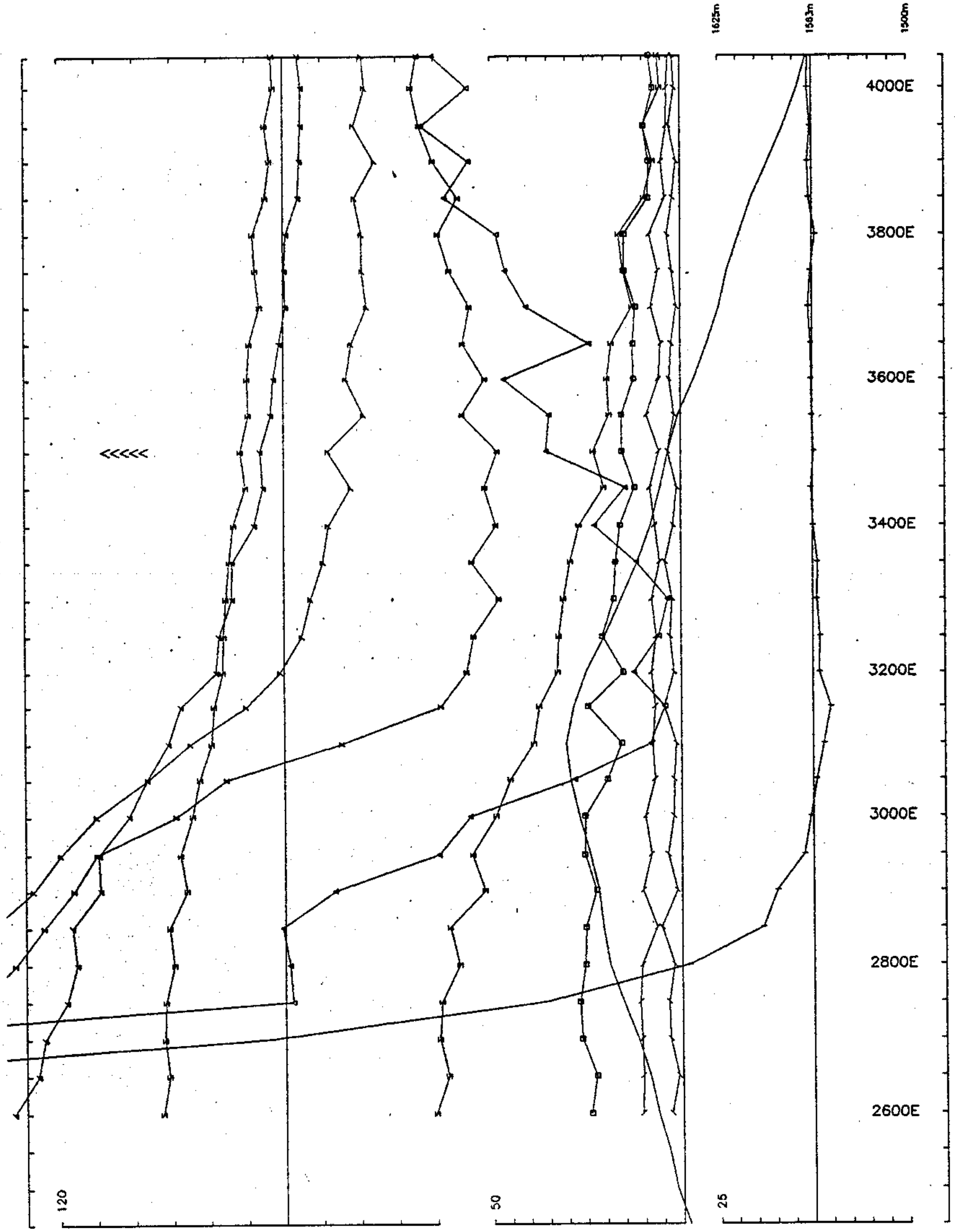

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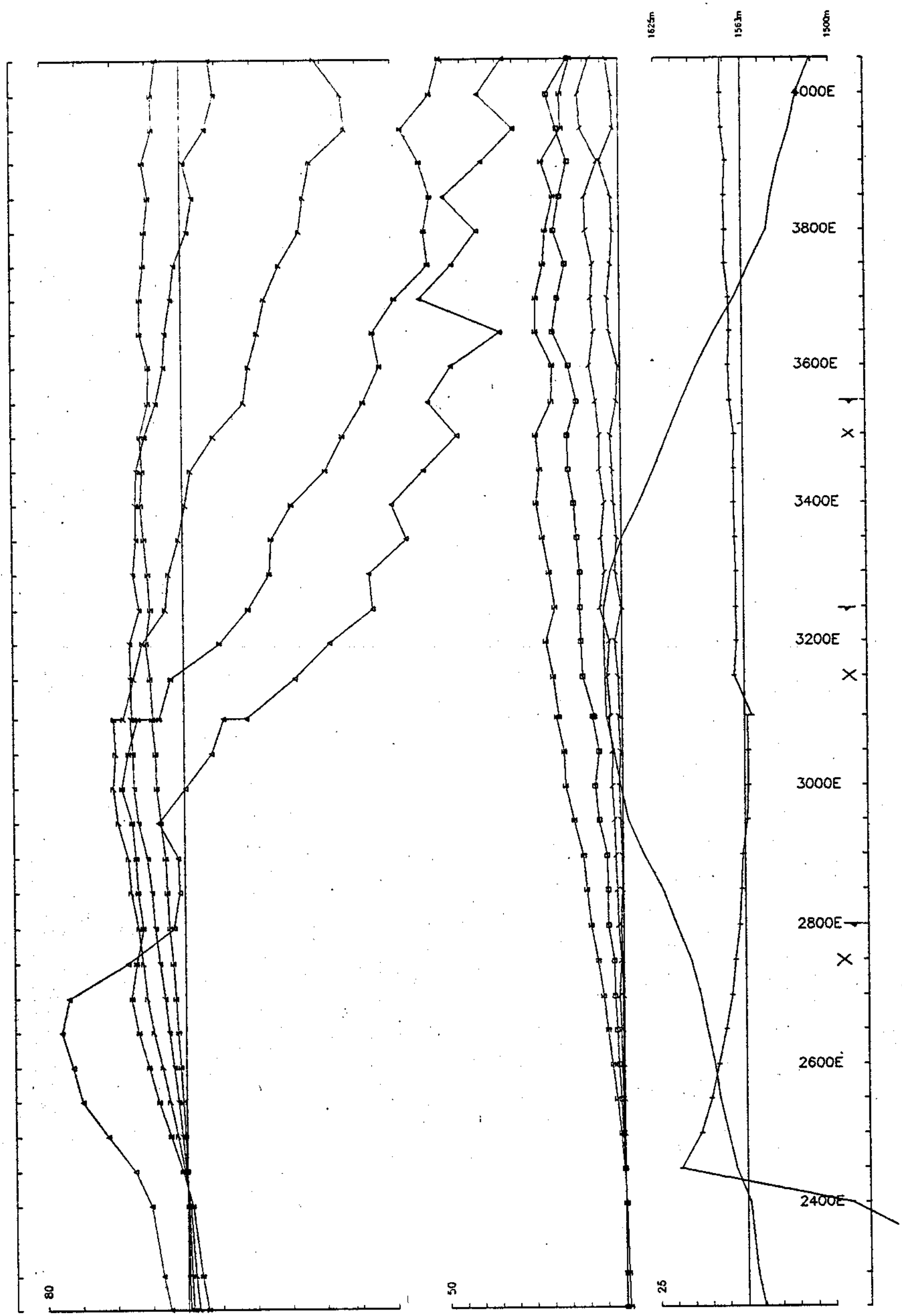

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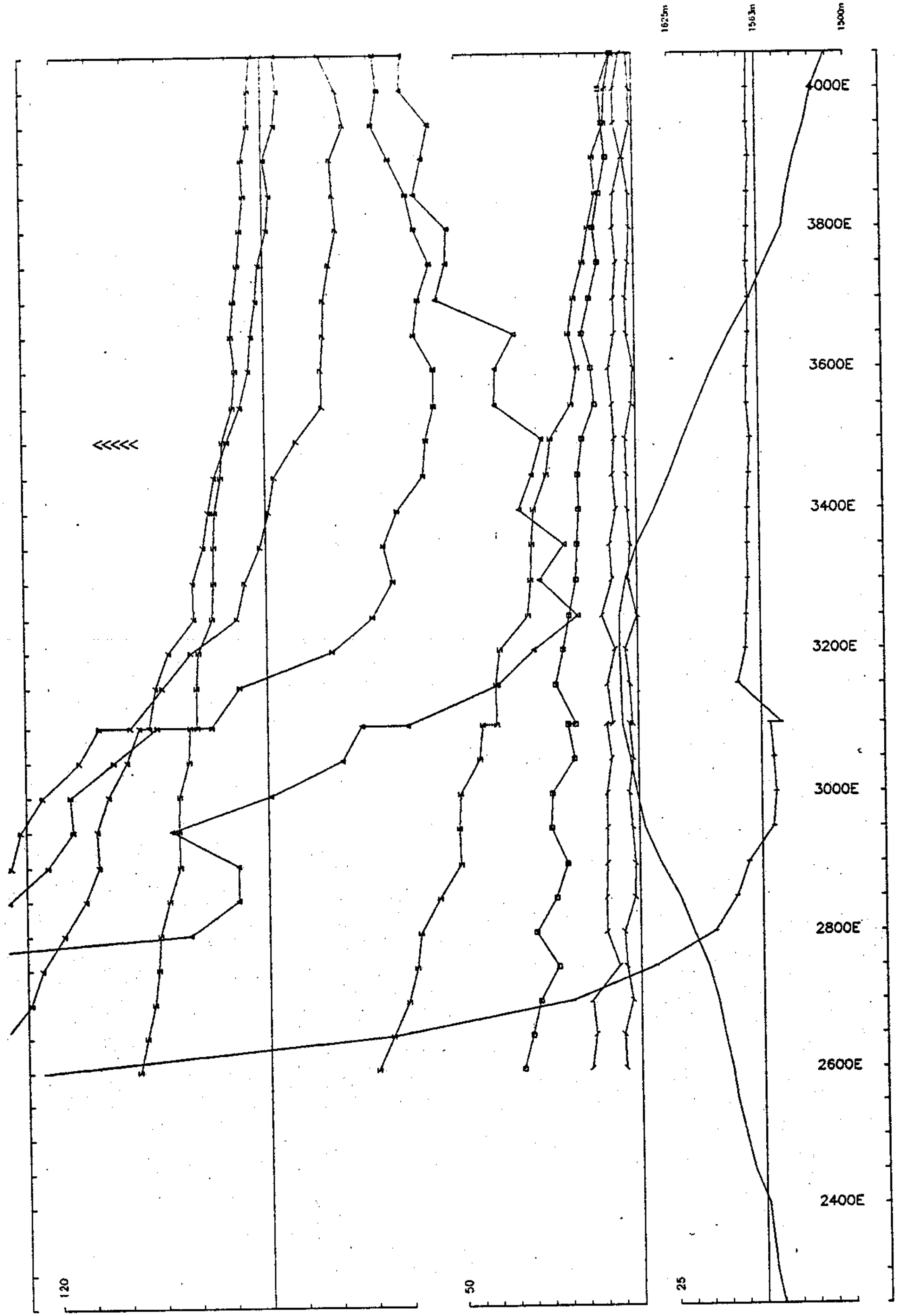

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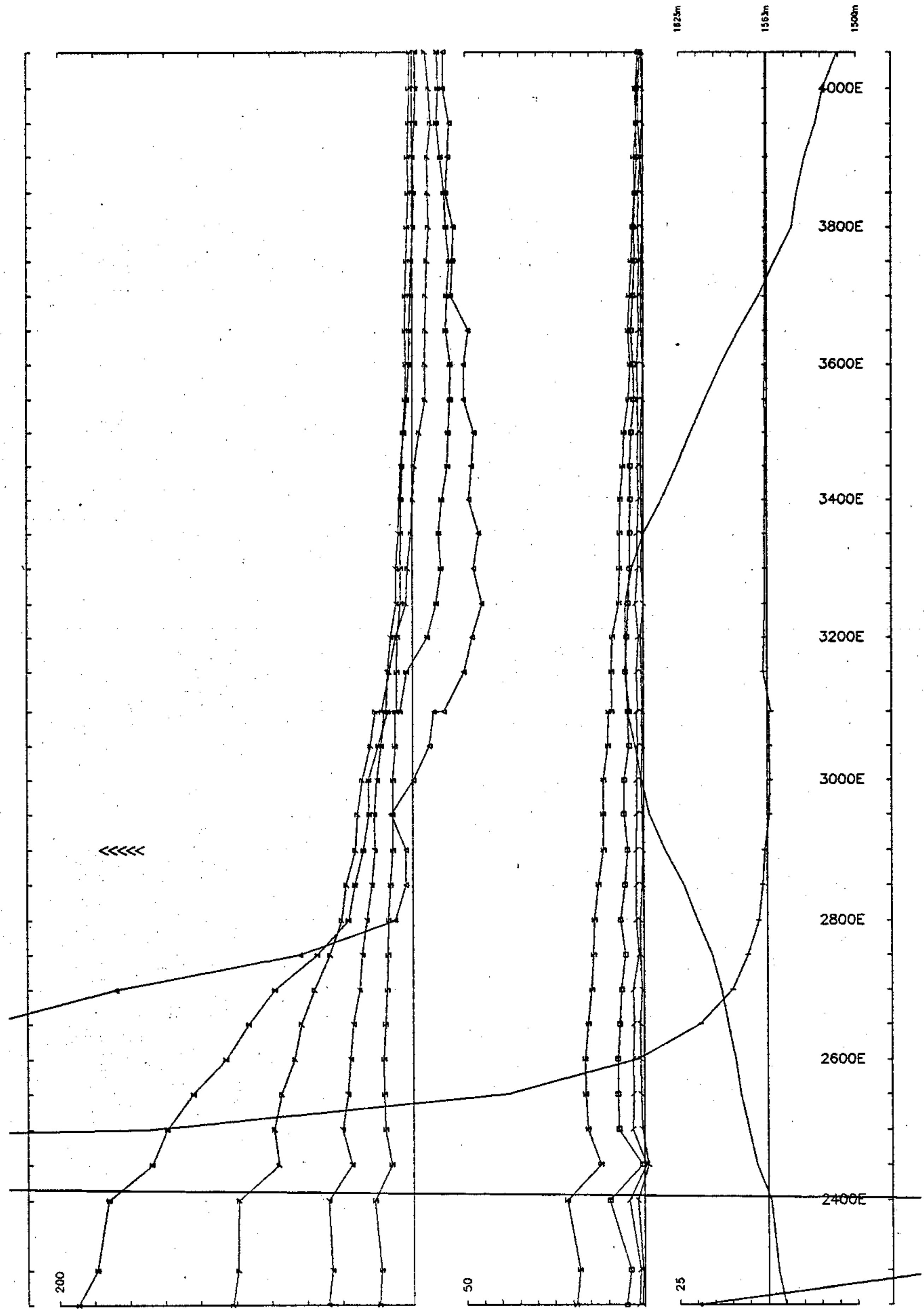

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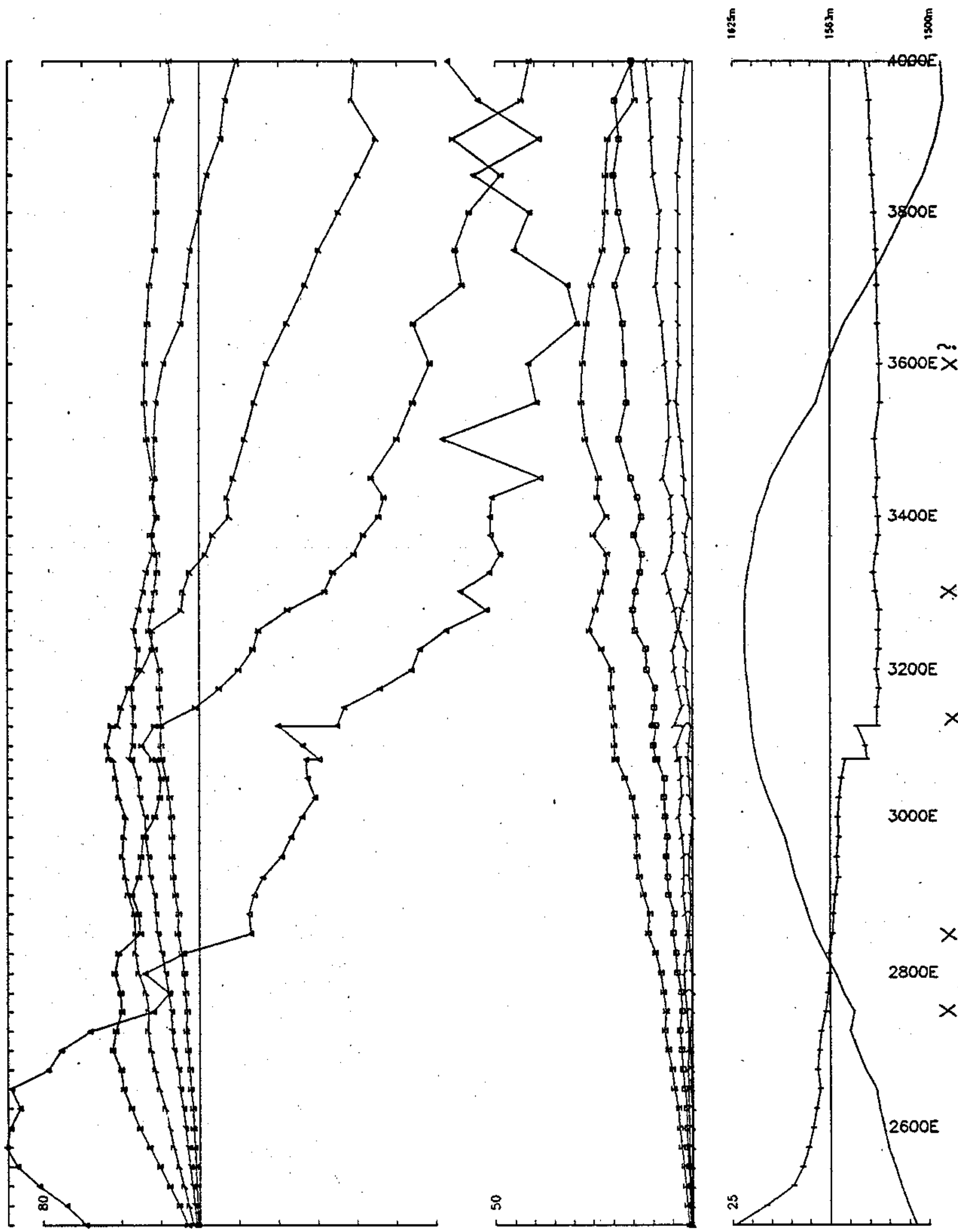

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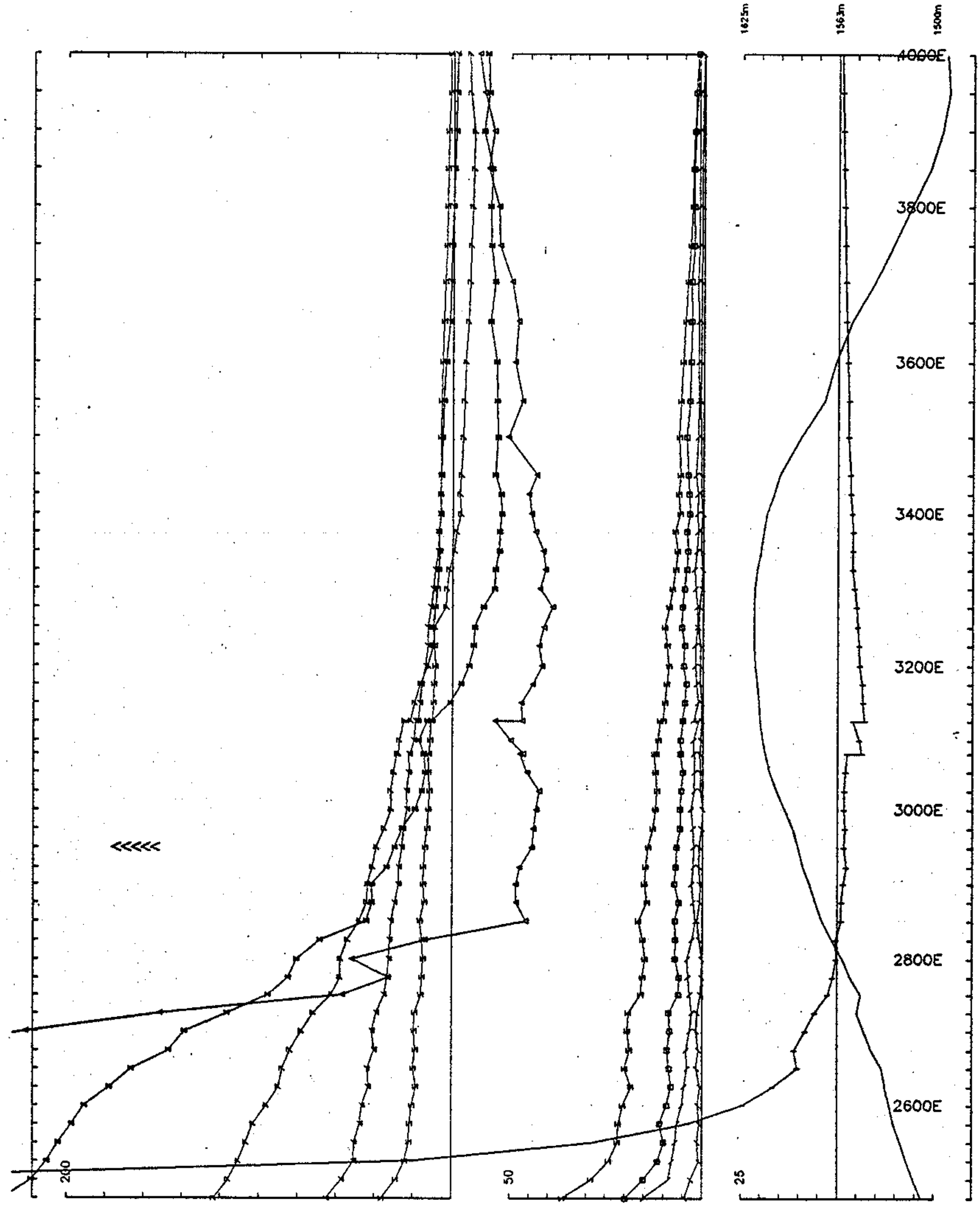

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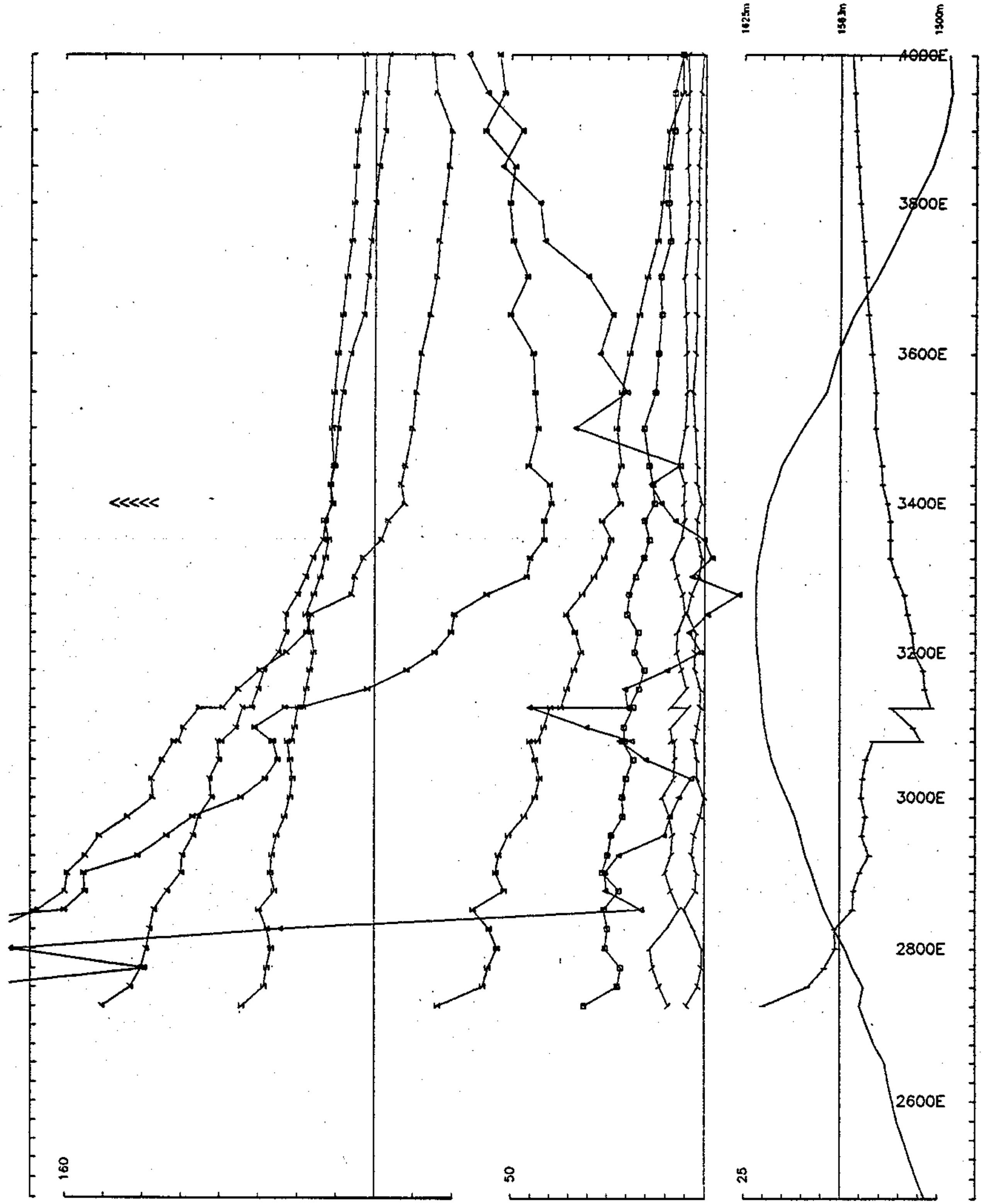

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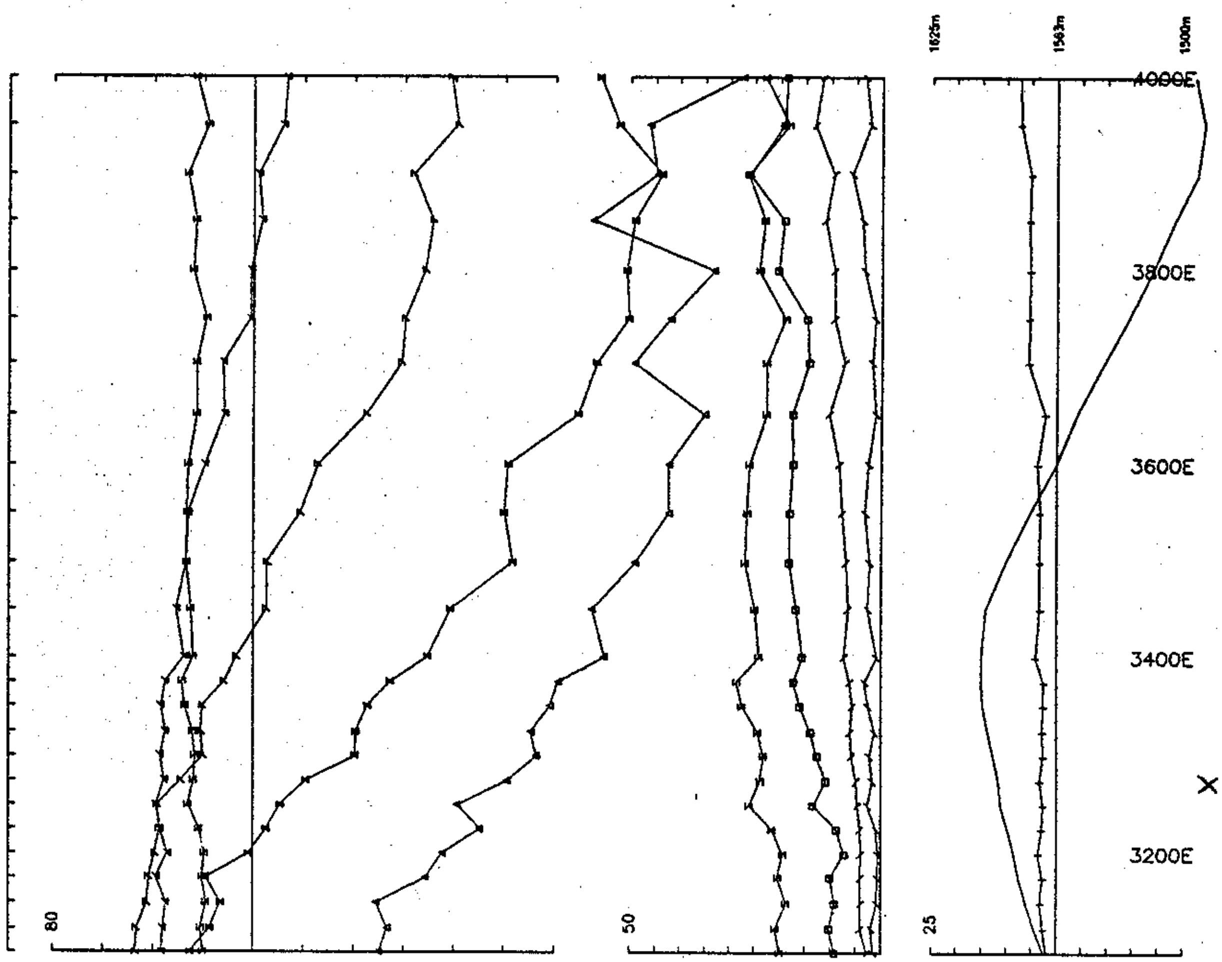

Area McNEIL CREEK client SOUTH KOOTENAY GOLDFIELDS INC. operator SJ GEOPHYSICS LTD. freq(hz) 30.970

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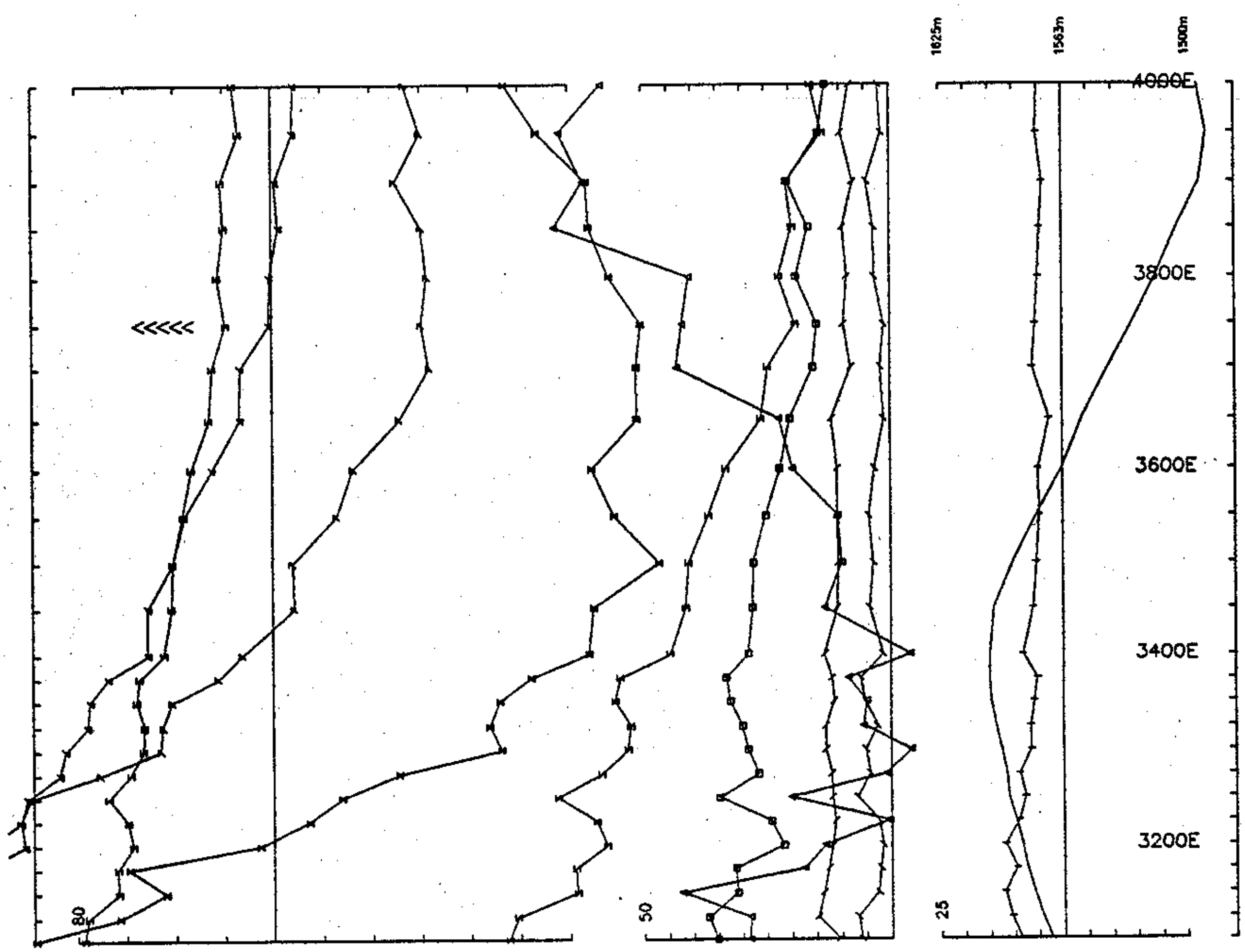

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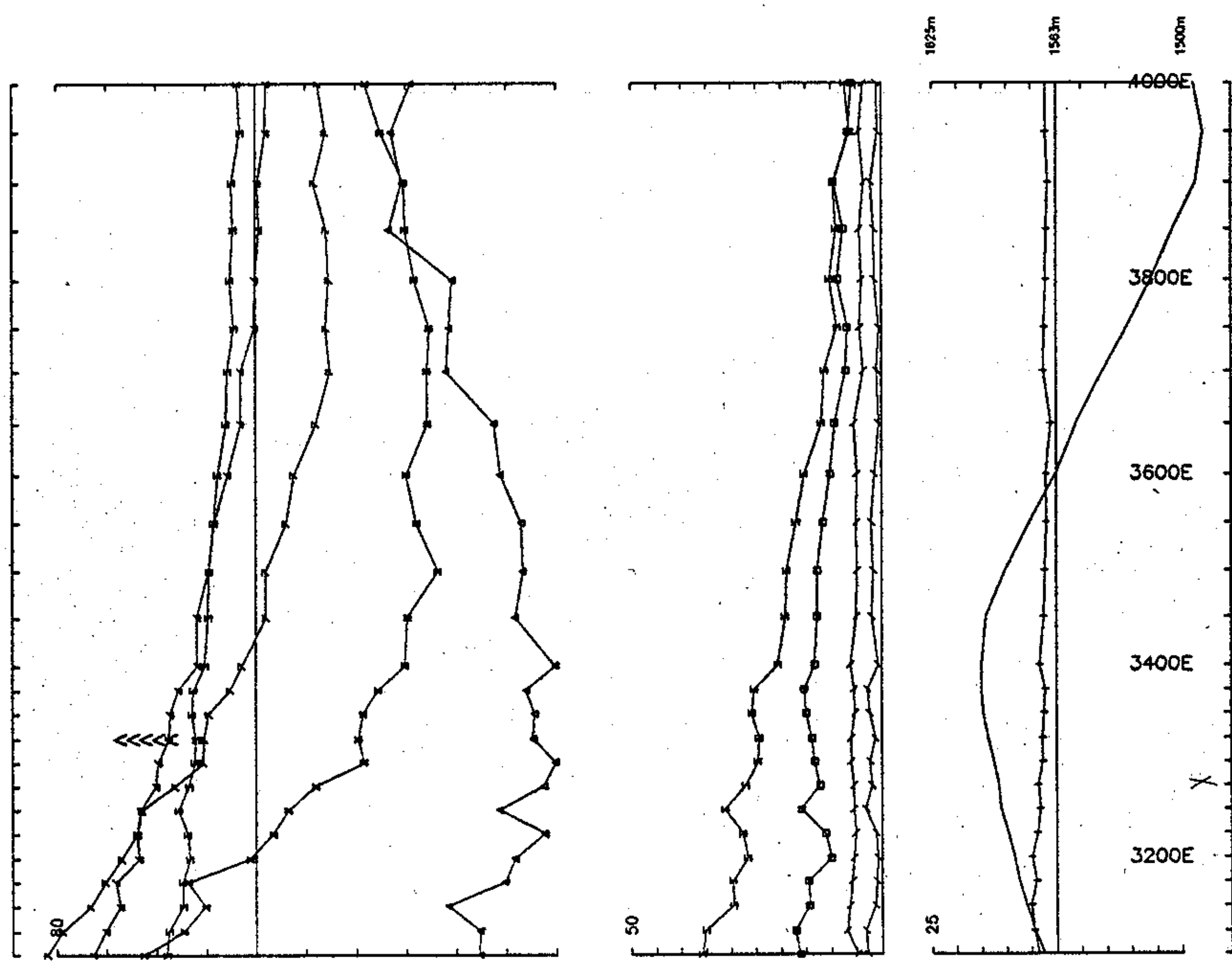

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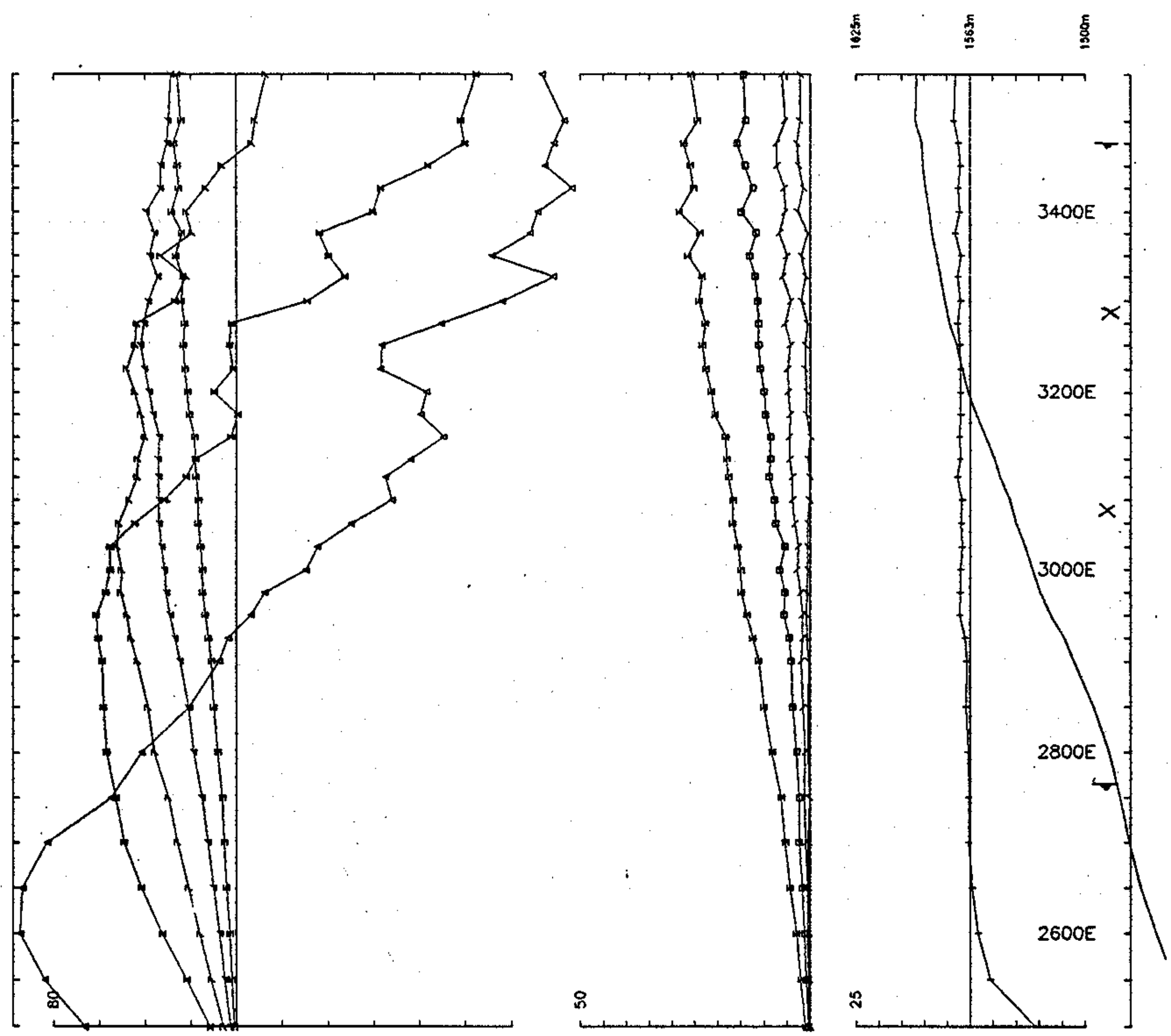

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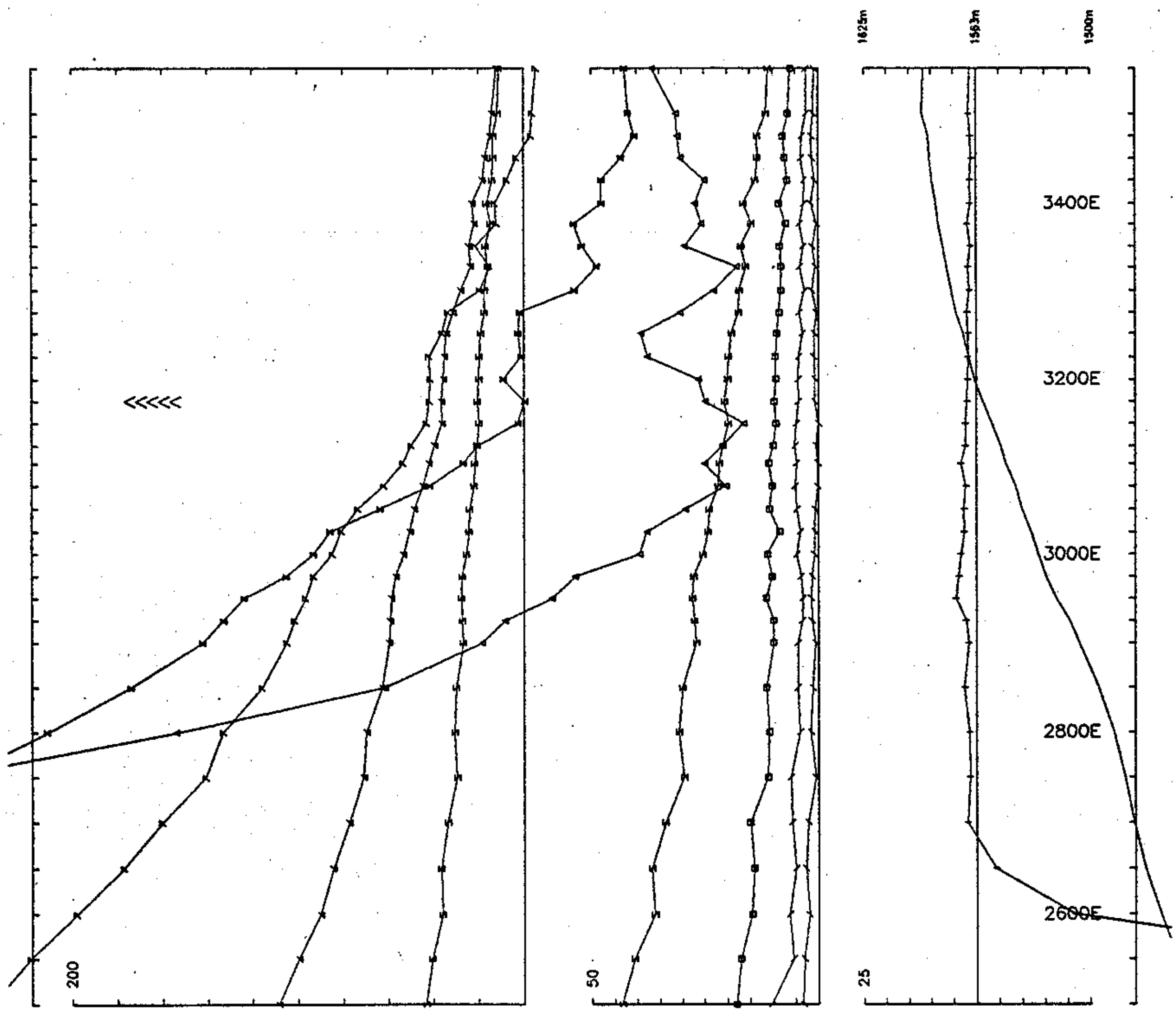

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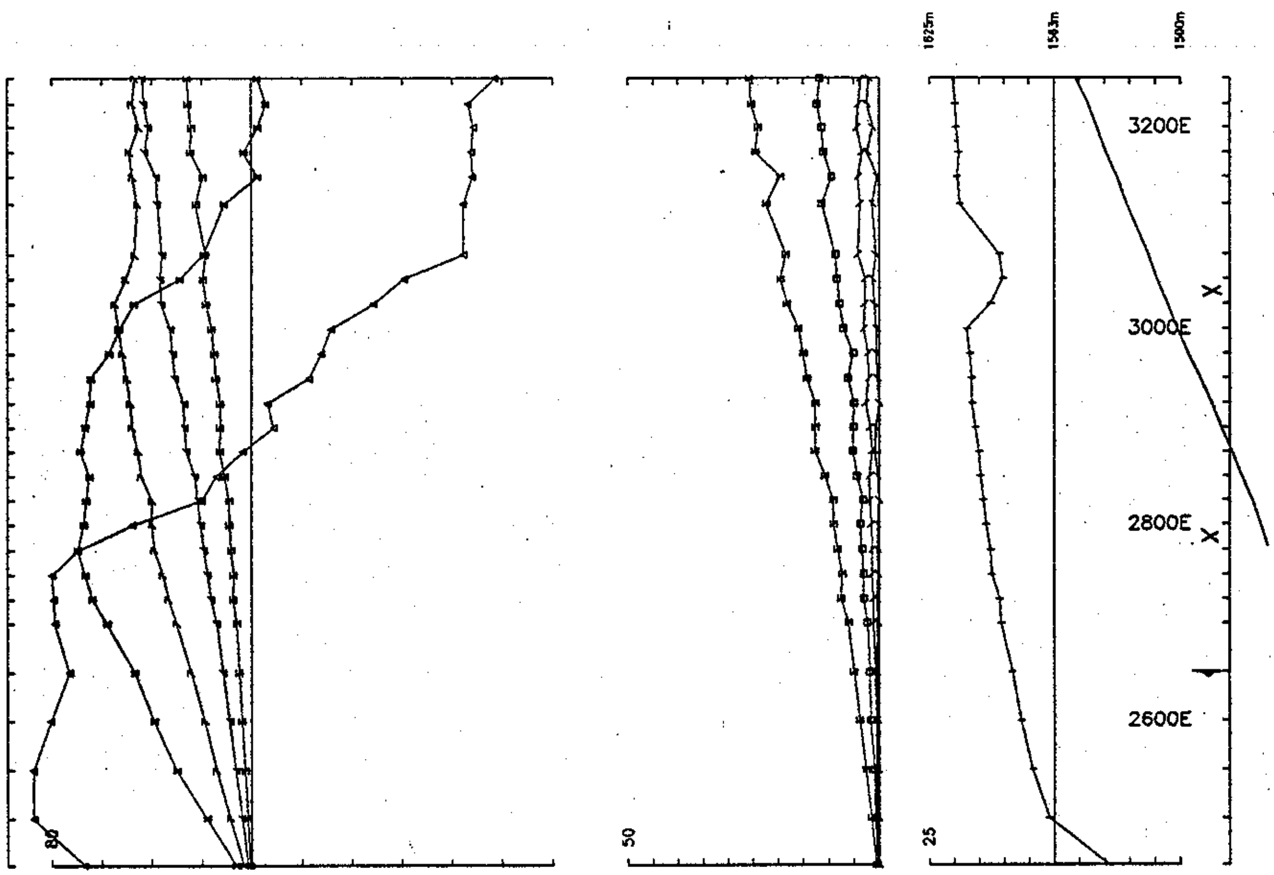

Area McNEIL CREEK client SOUTH KOOTENAY GOLDFIELDS INC. operator SJ GEOPHYSICS LTD. freq(hz) 30.970

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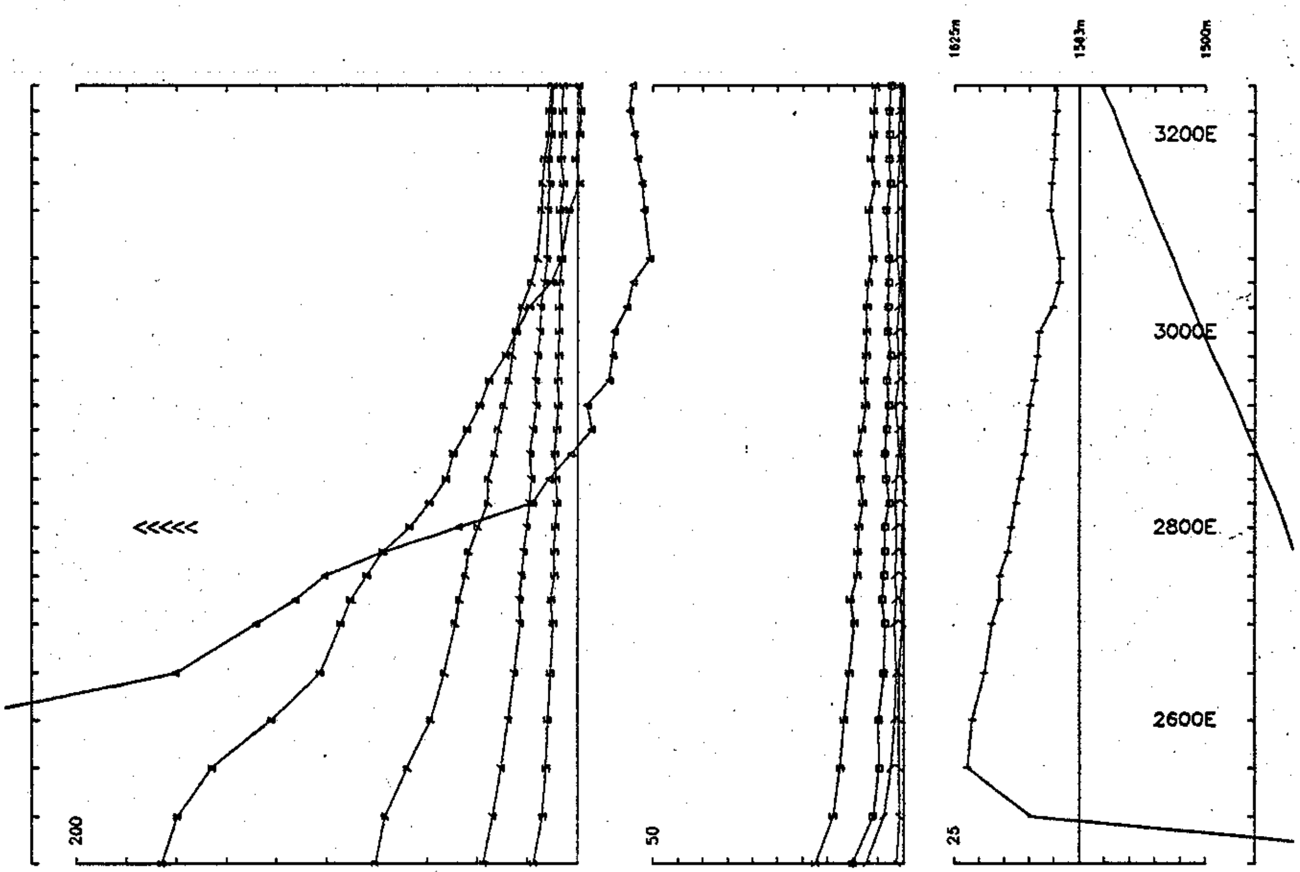

Area McNEIL CREEK client SOUTH KOOTENAY GOLDFIELDS INC. operator SJ GEOPHYSICS LTD. freq(hz) 30.970

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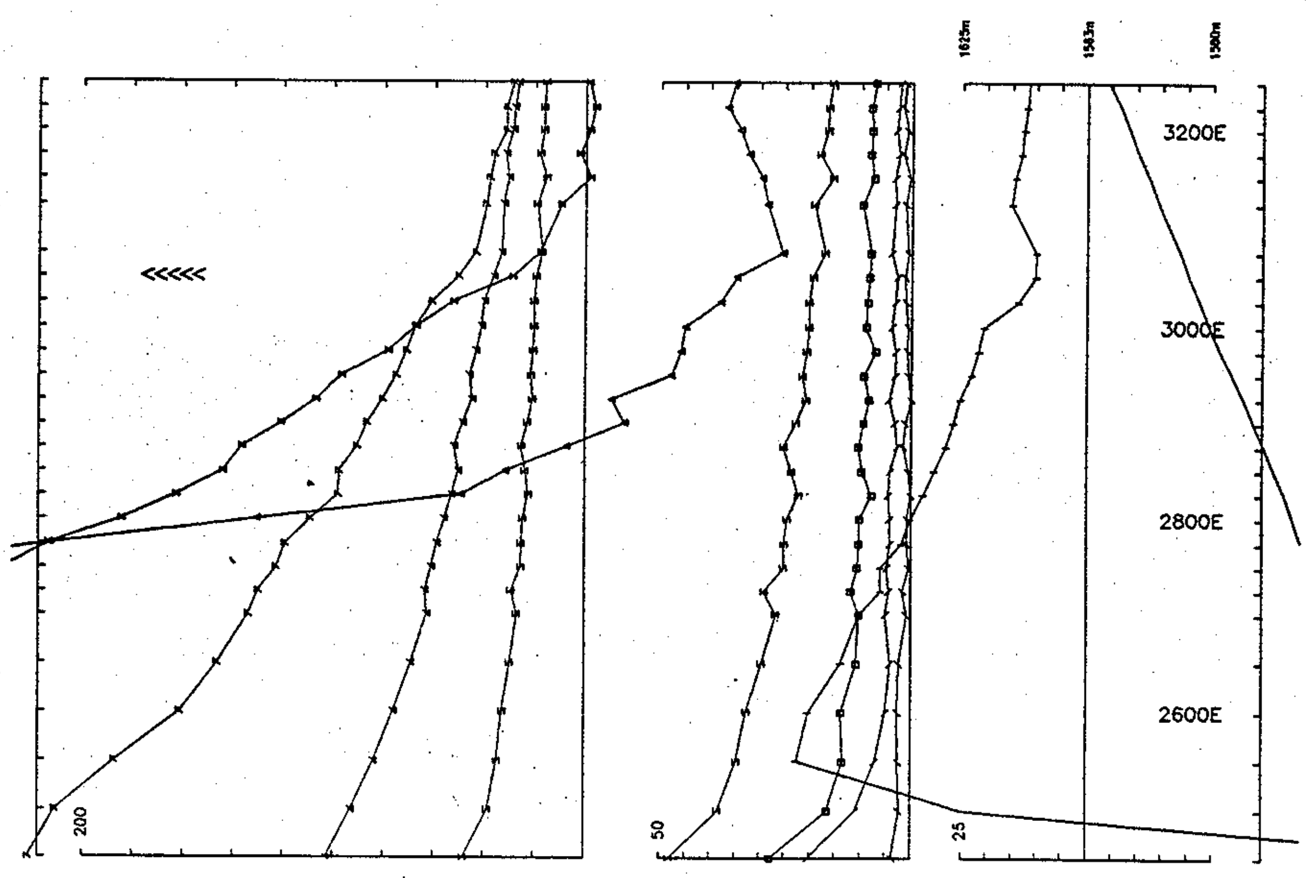

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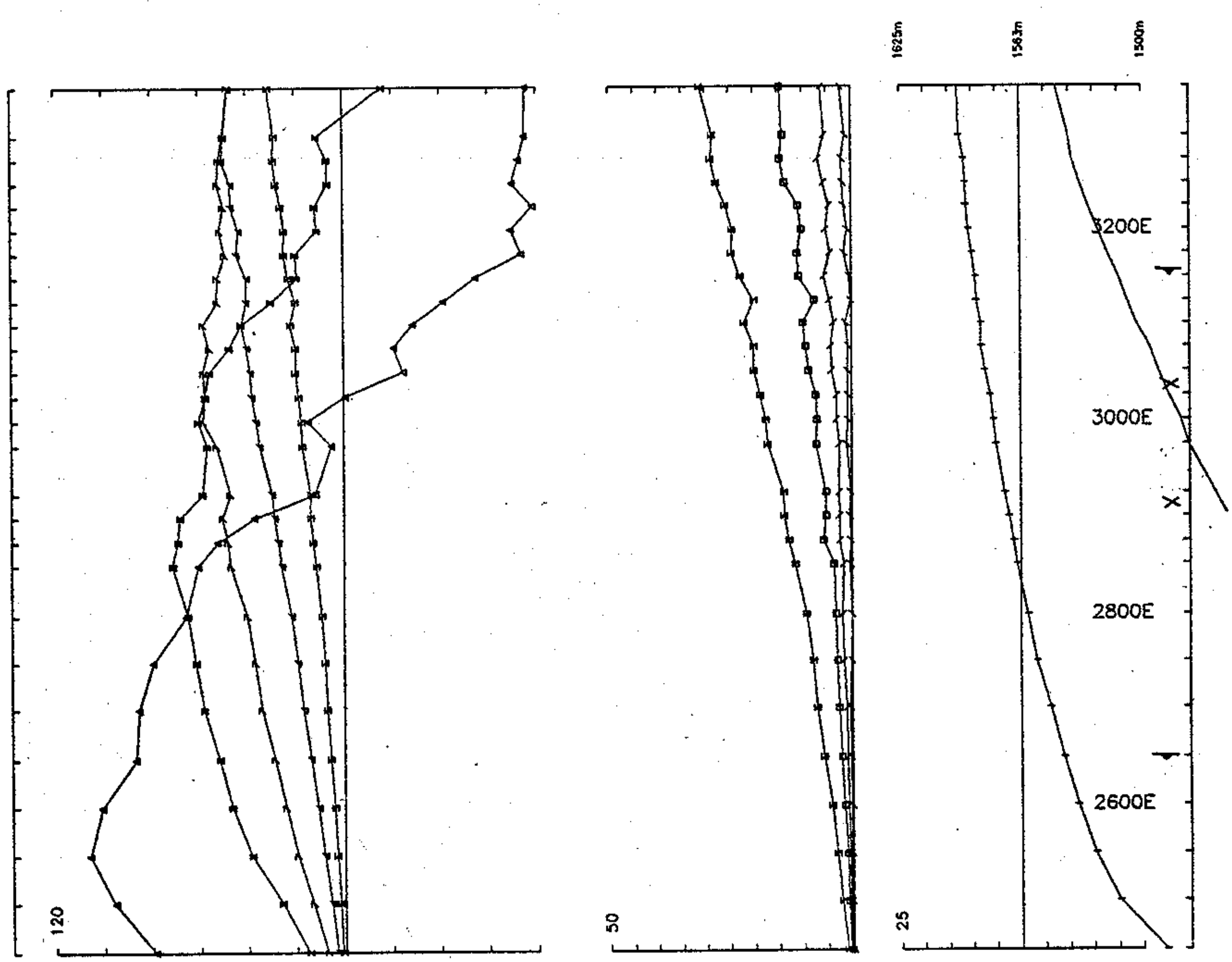

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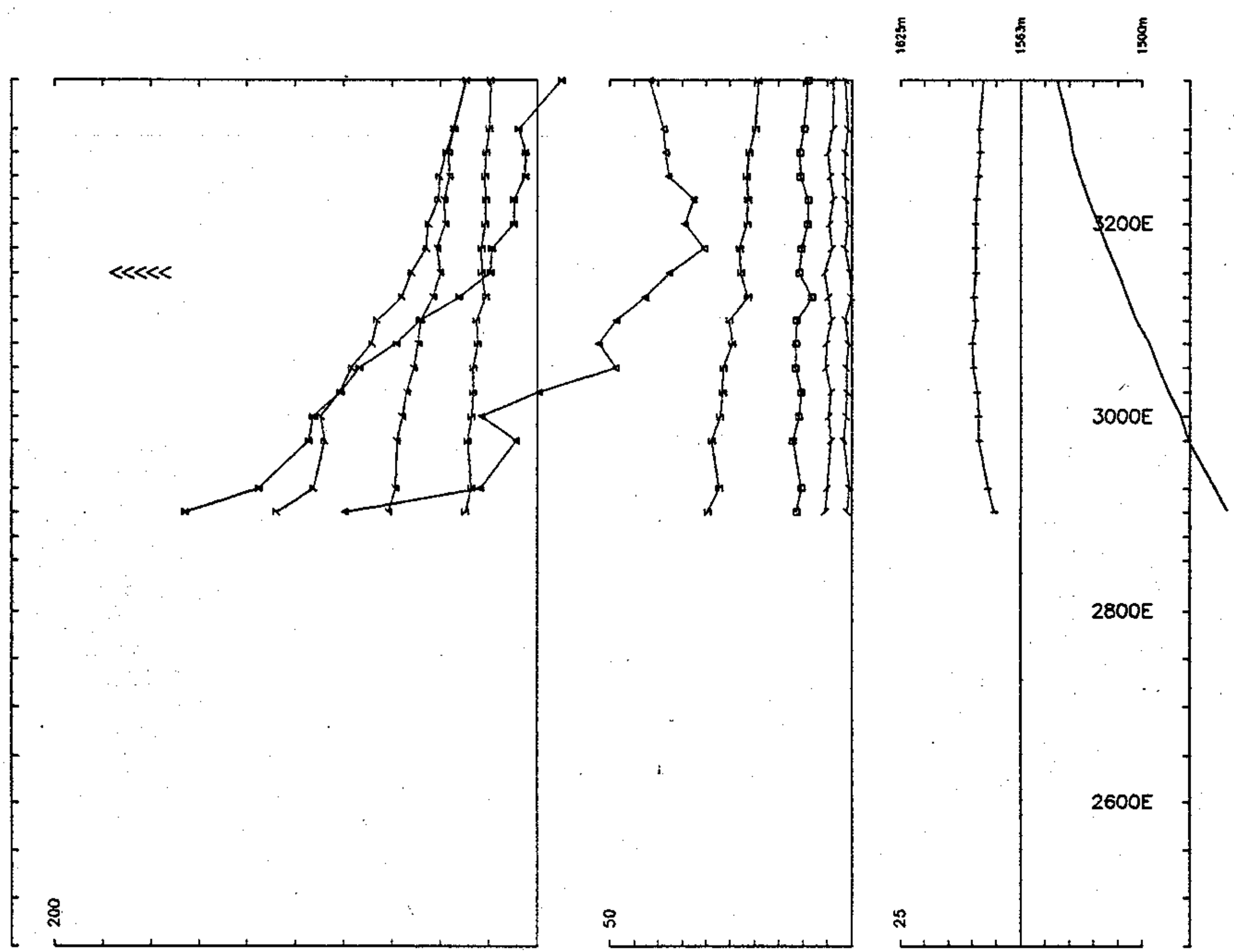

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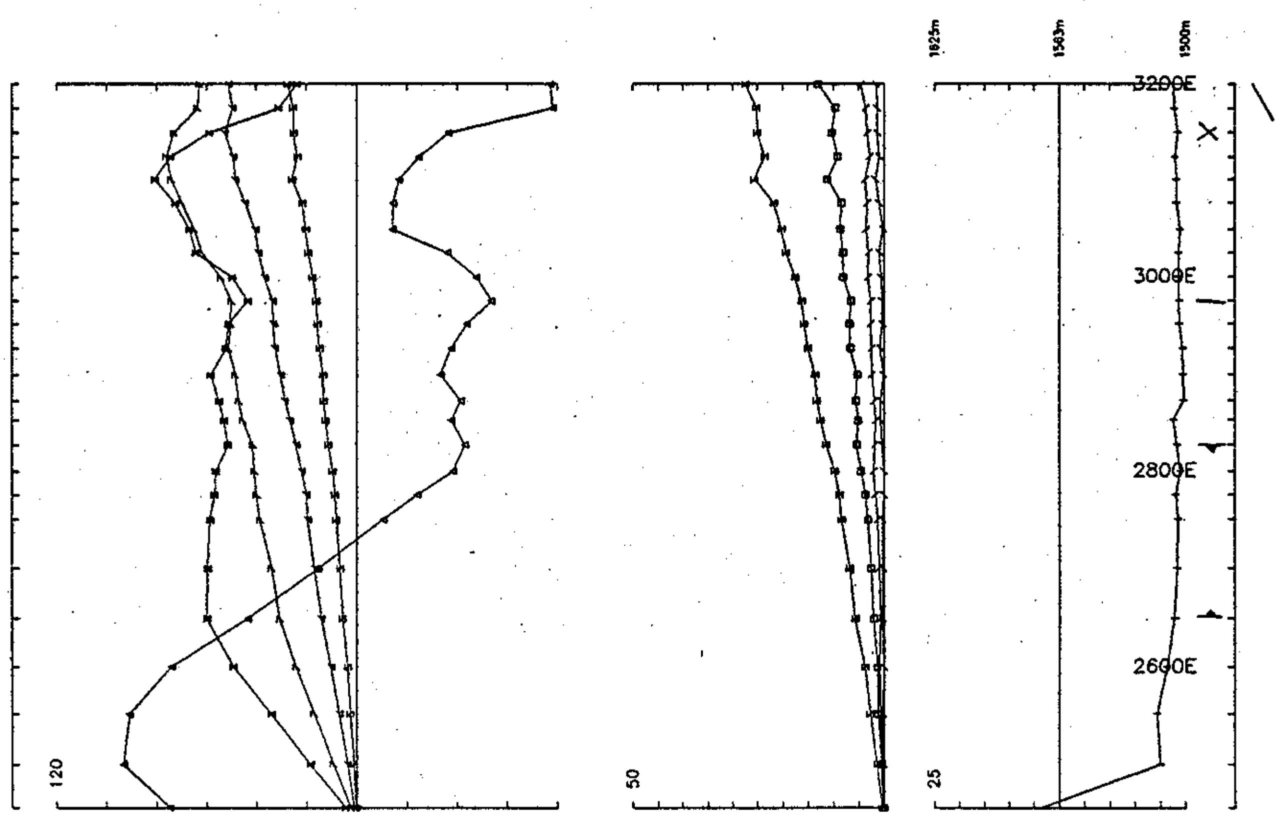

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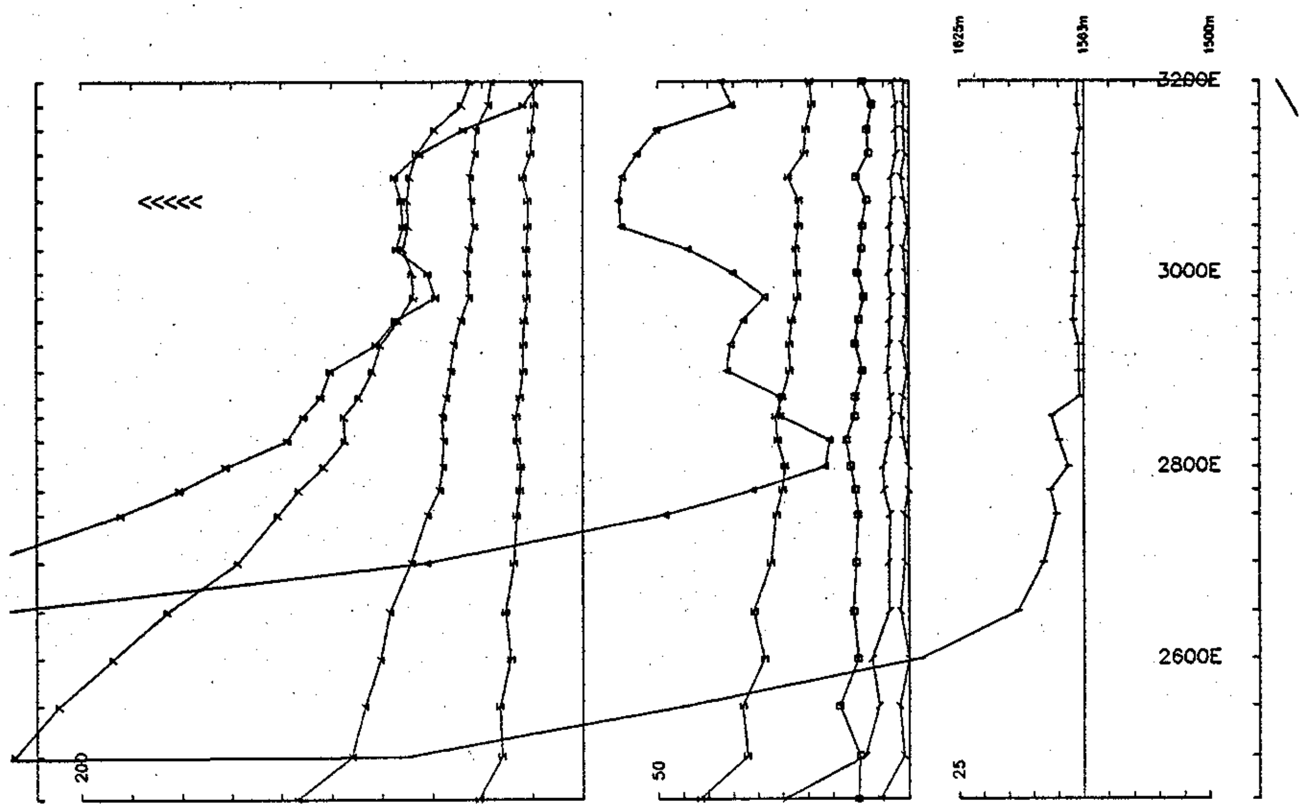

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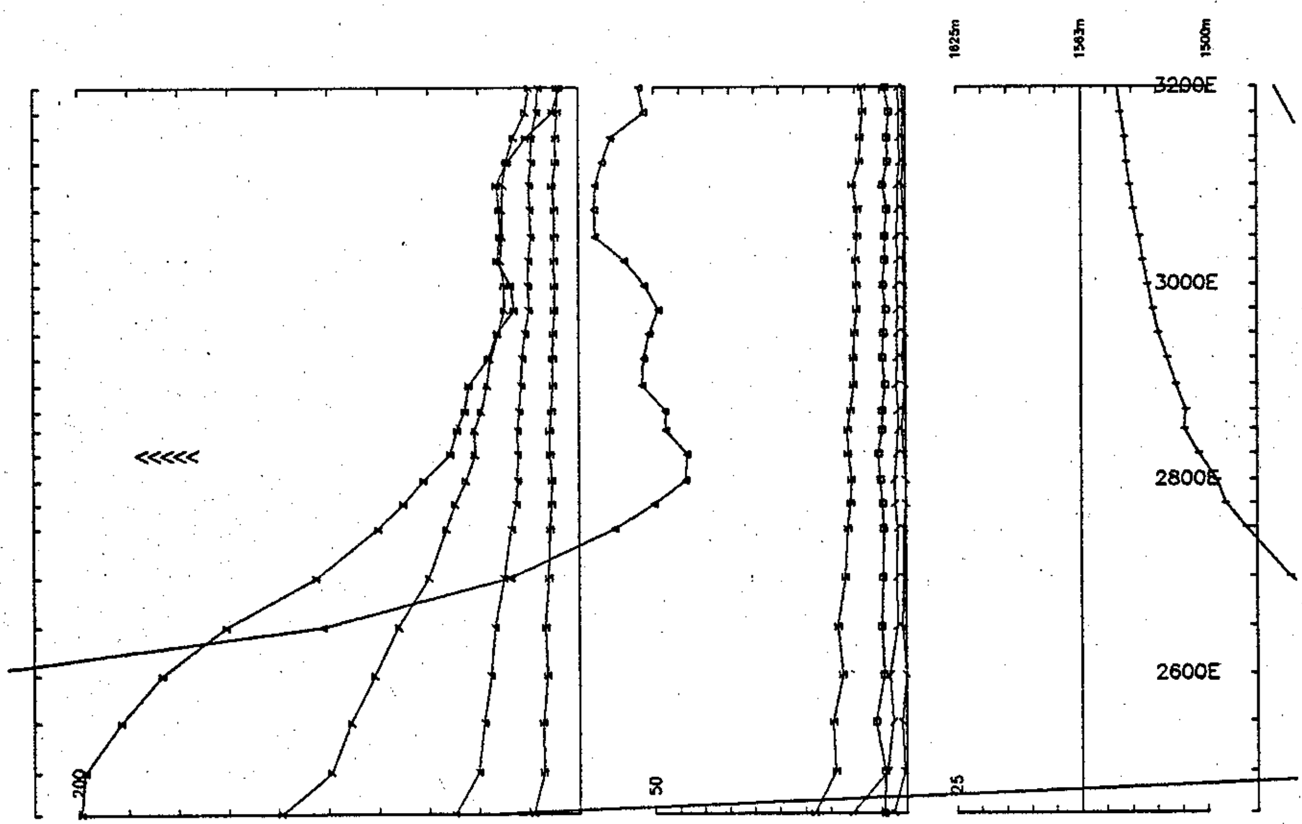

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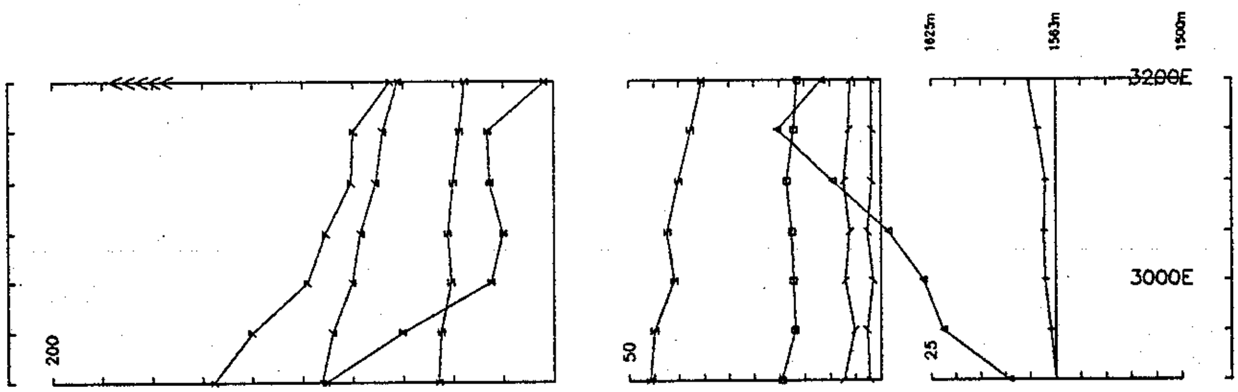

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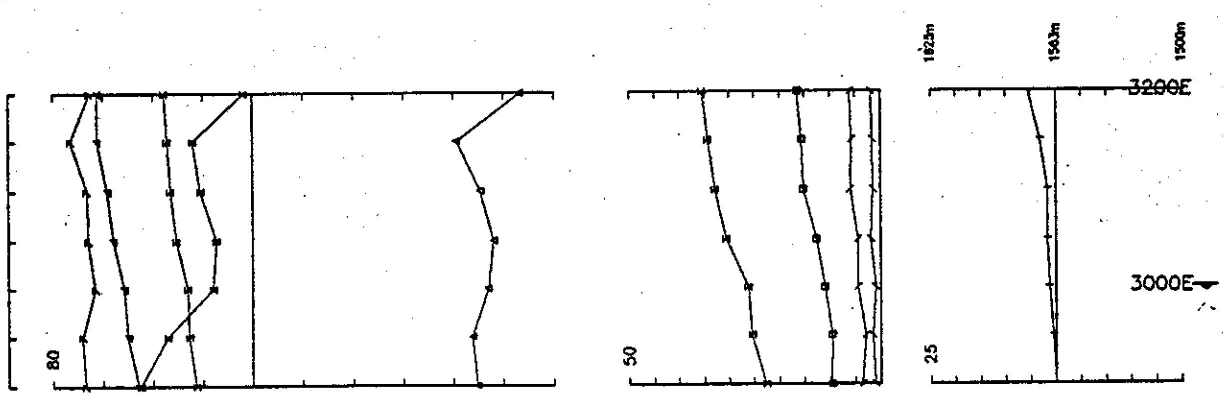

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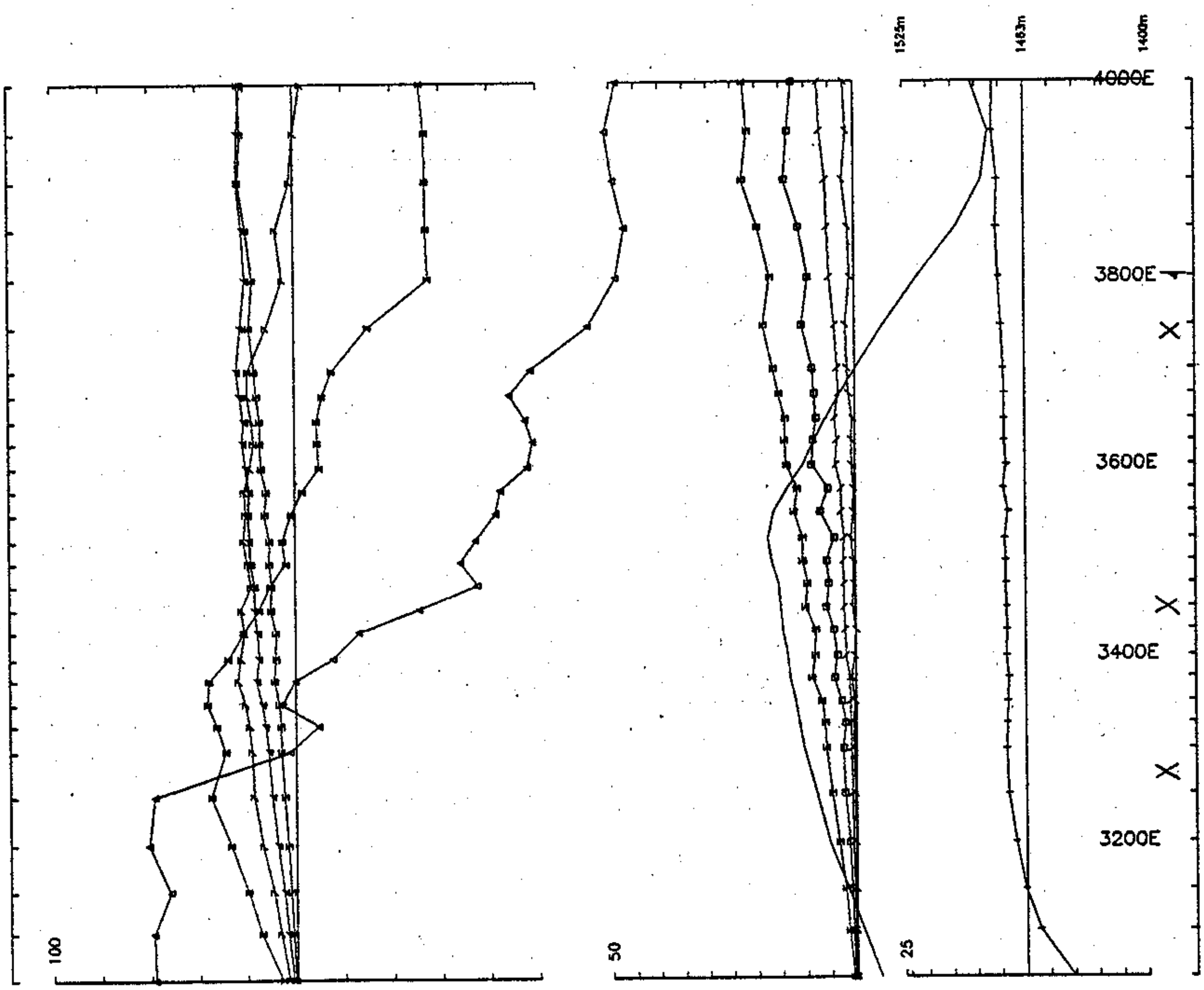

Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

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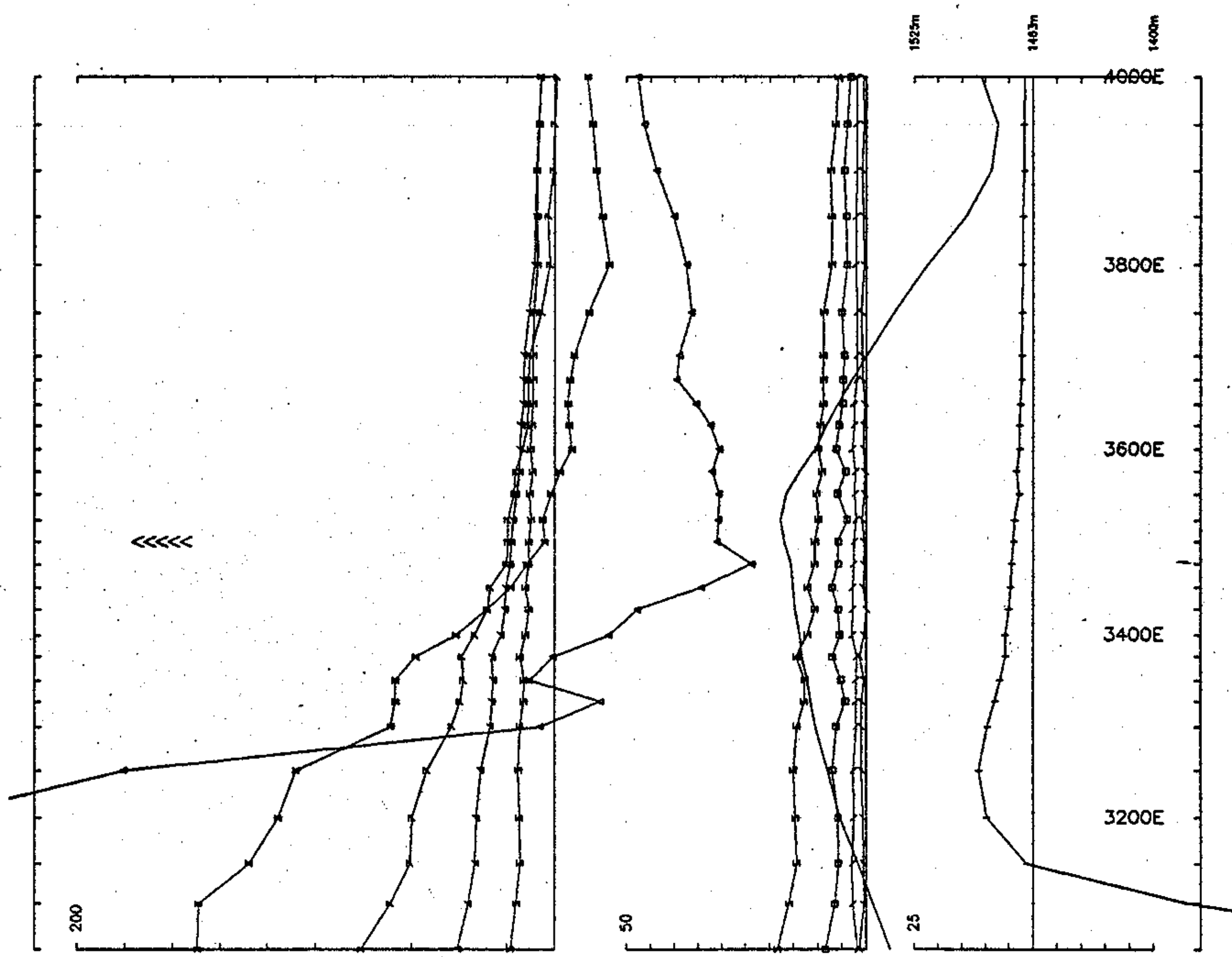
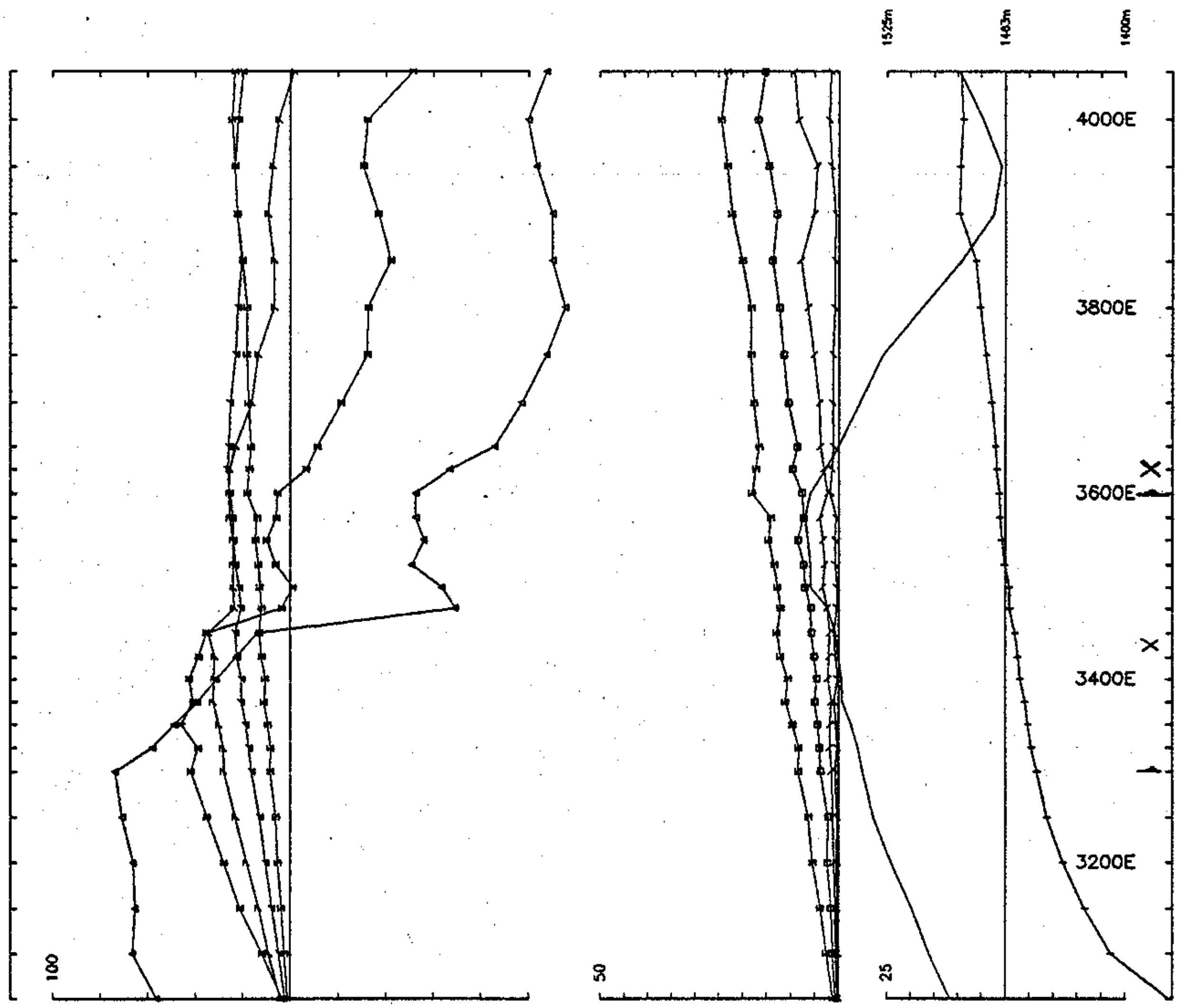


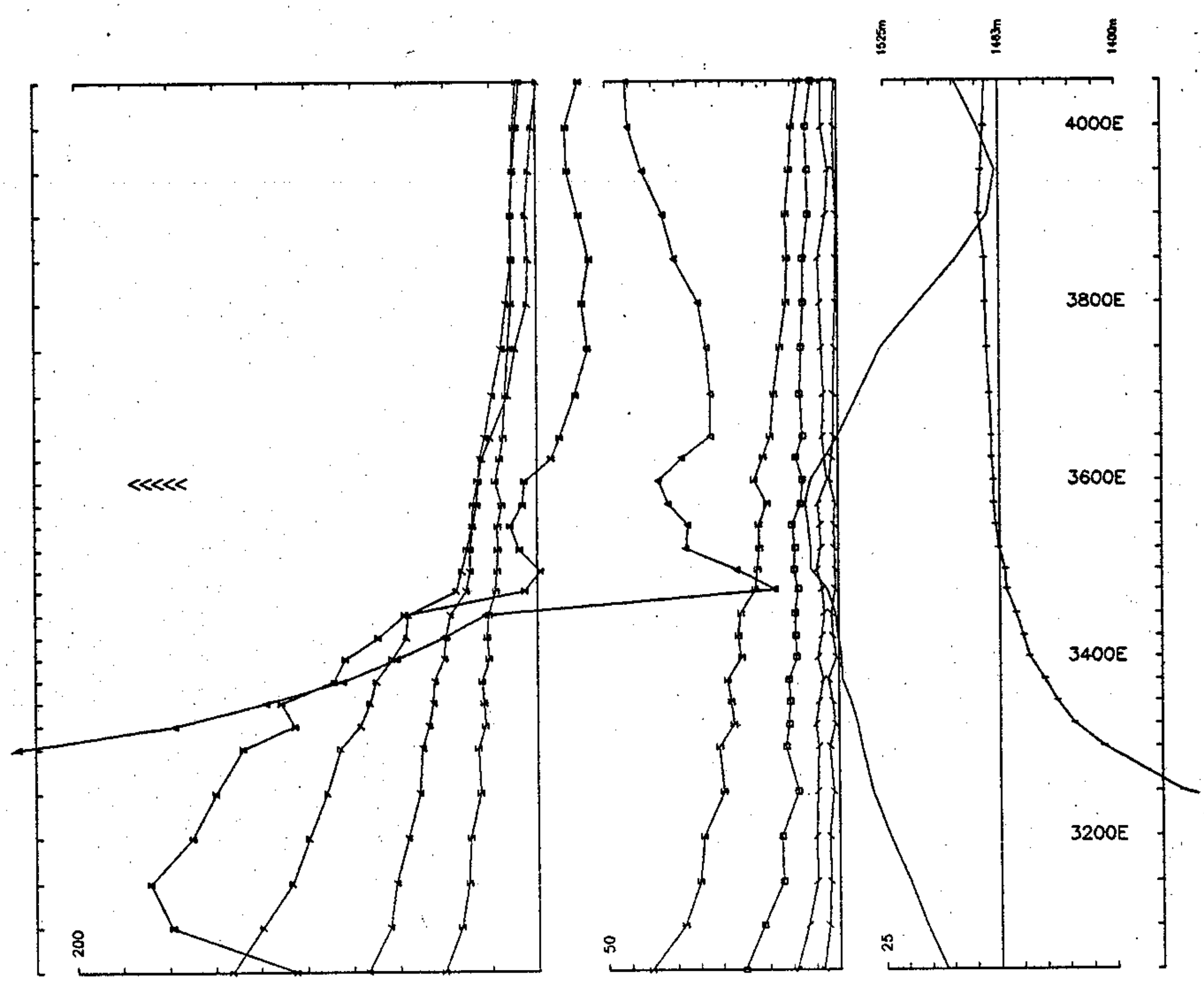
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4200N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



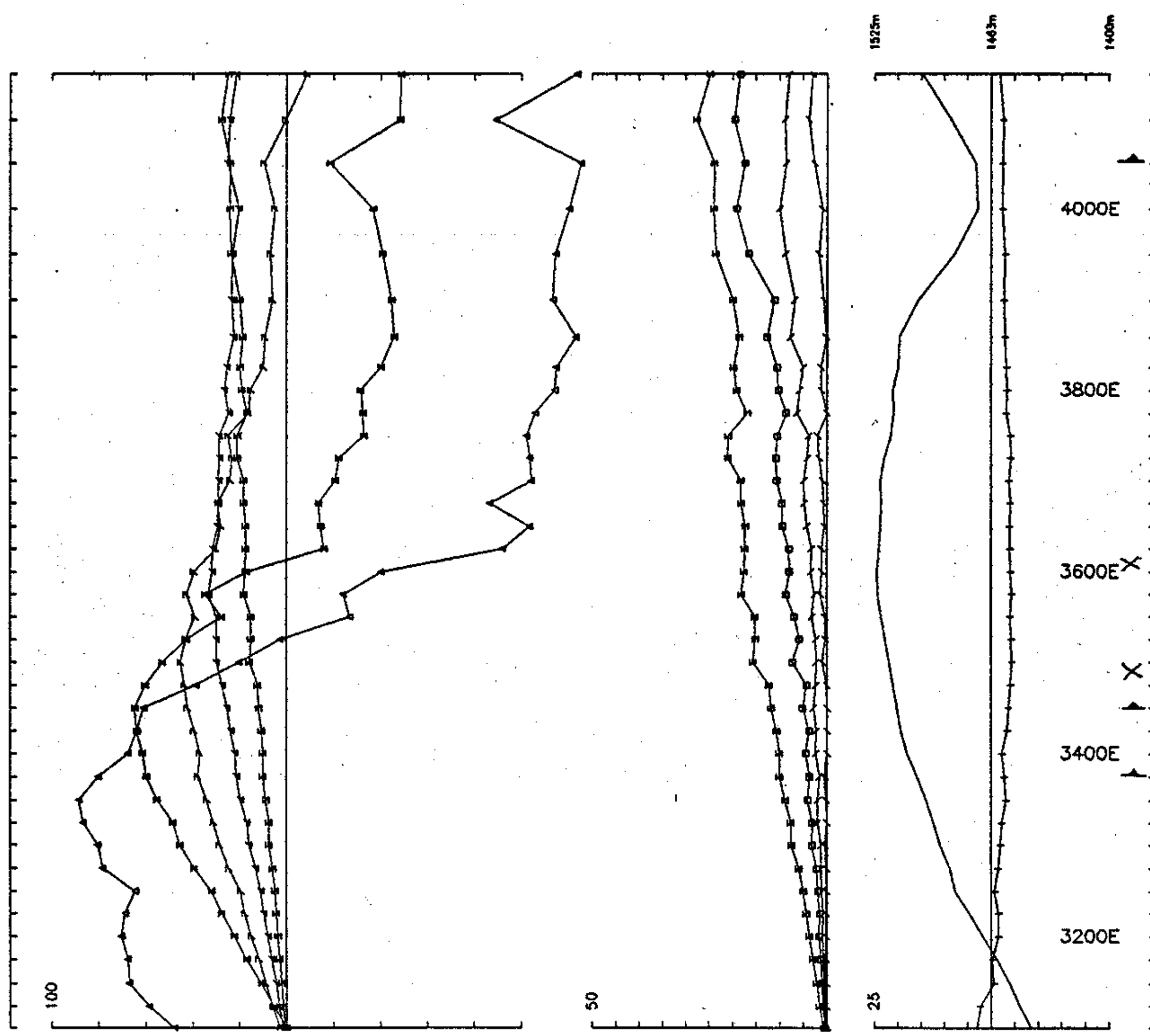
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4400N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



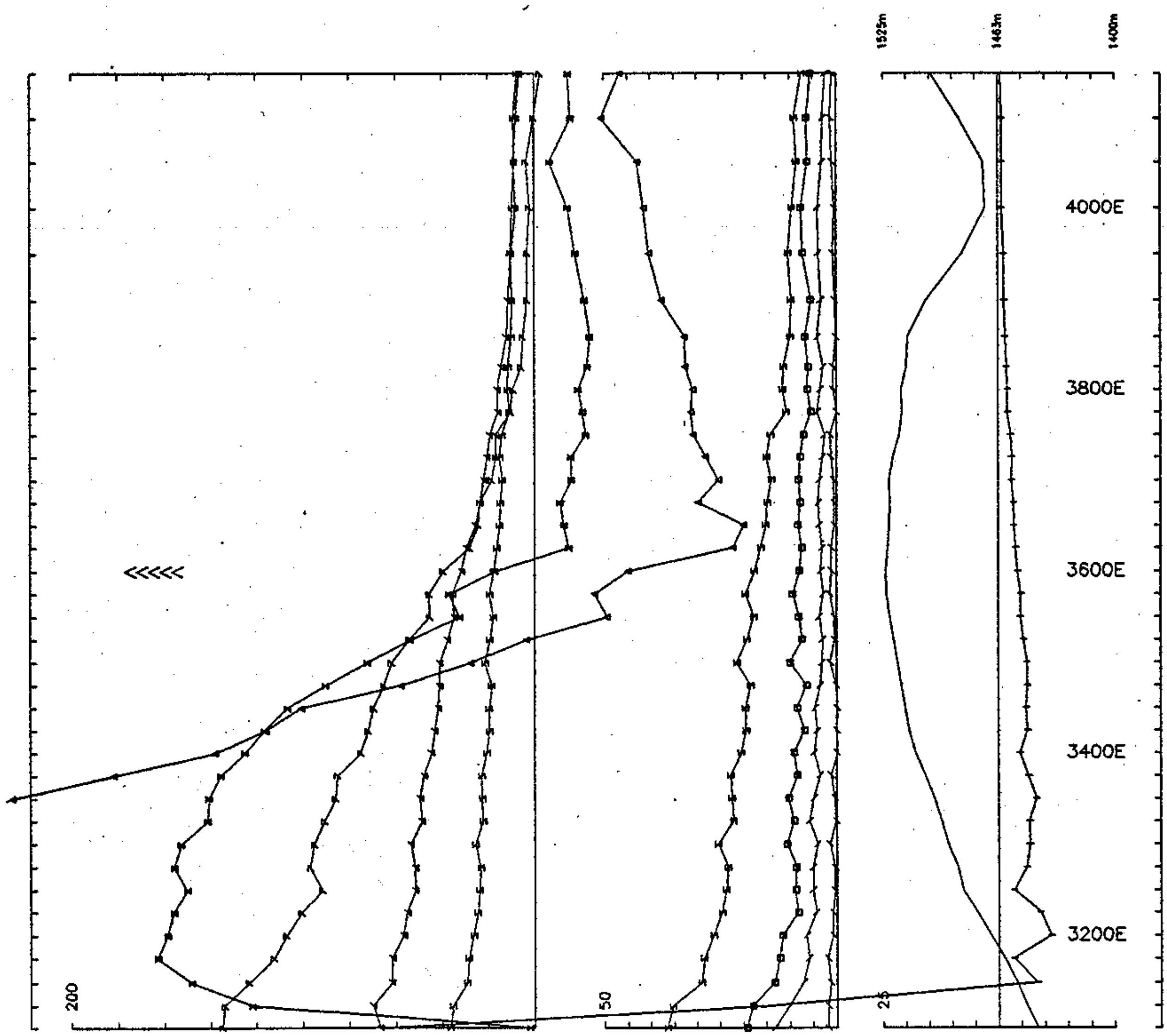
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4400N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



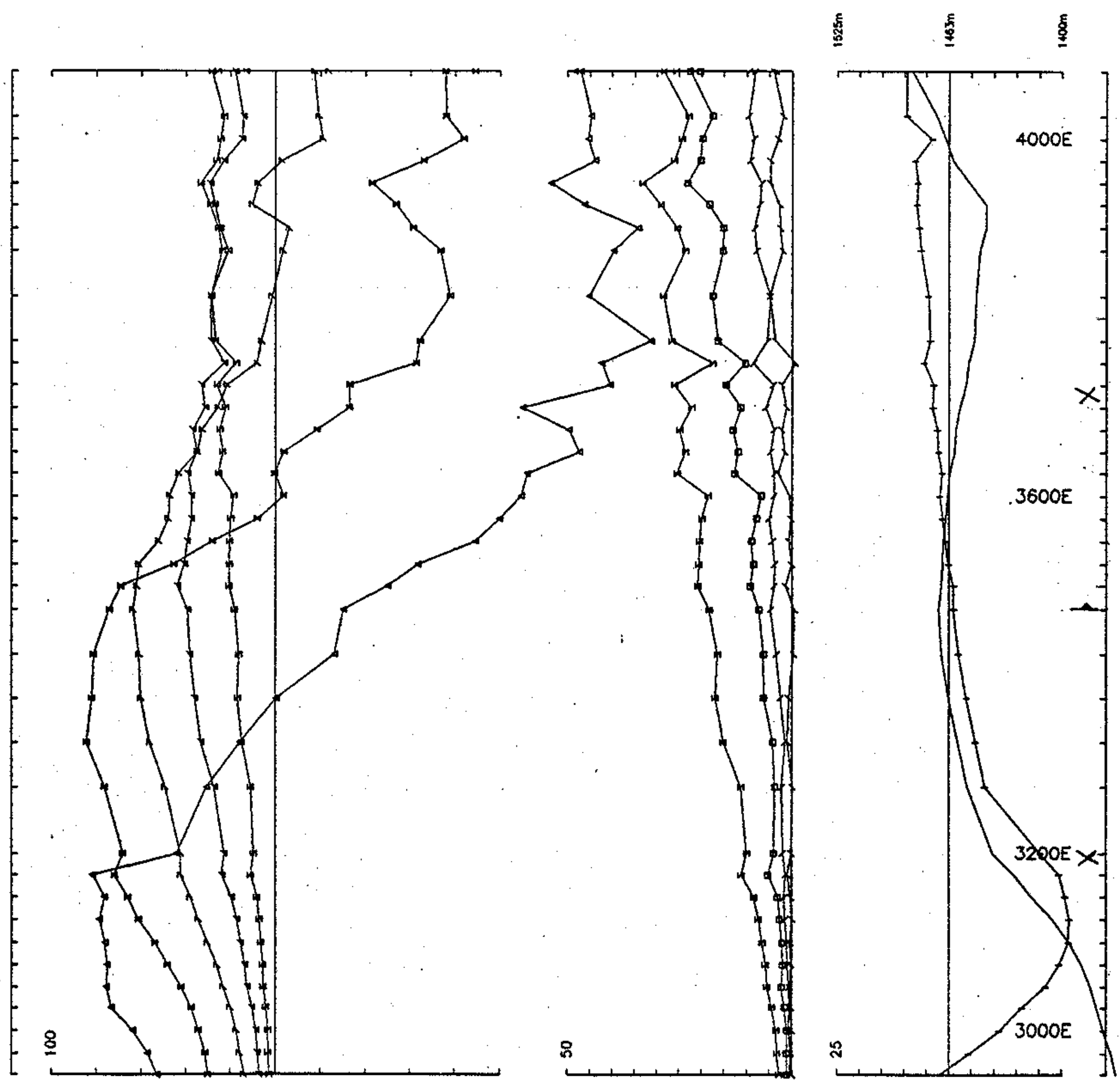
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4600N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



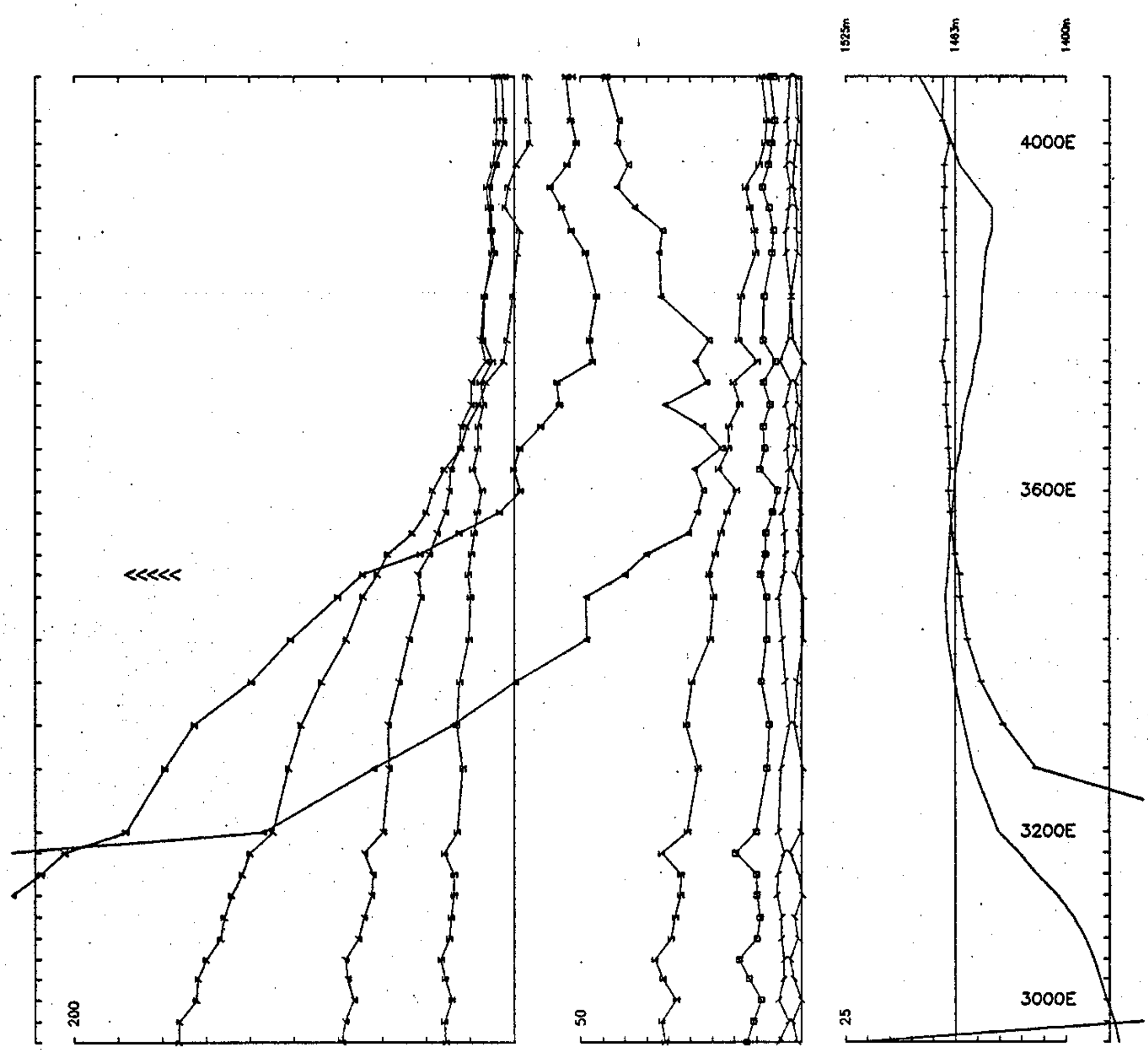
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4600N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



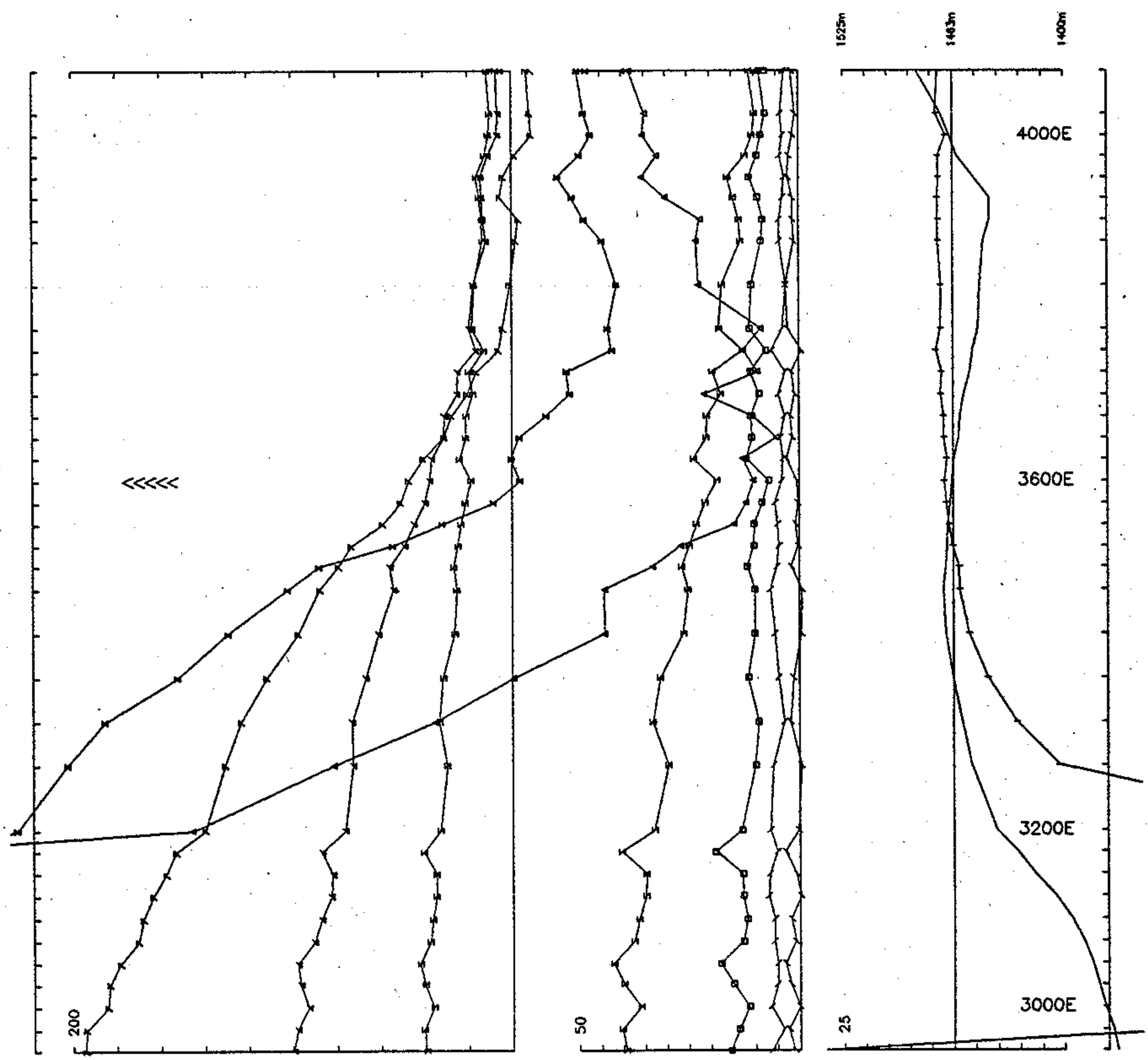
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4800N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



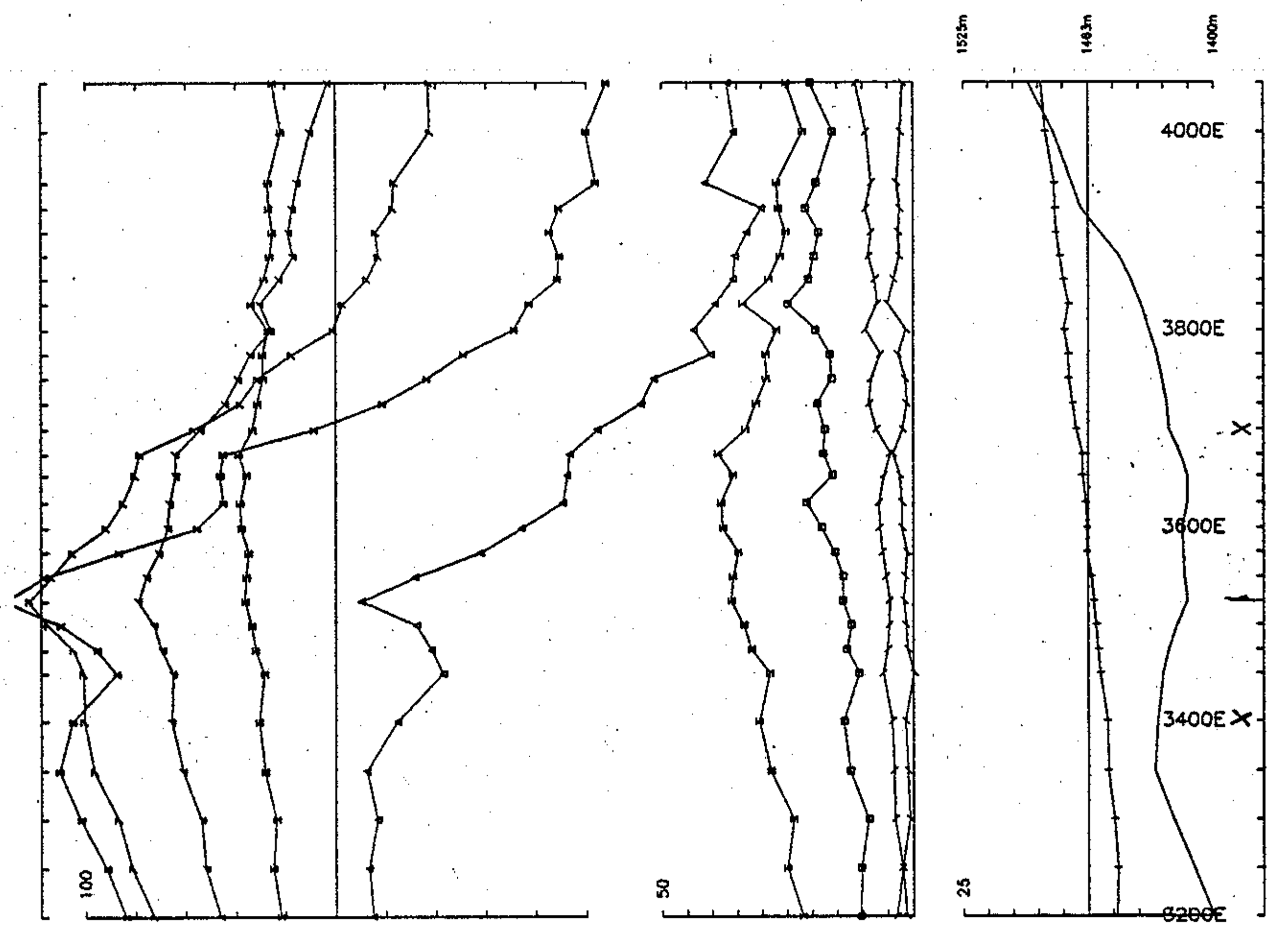
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4800N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



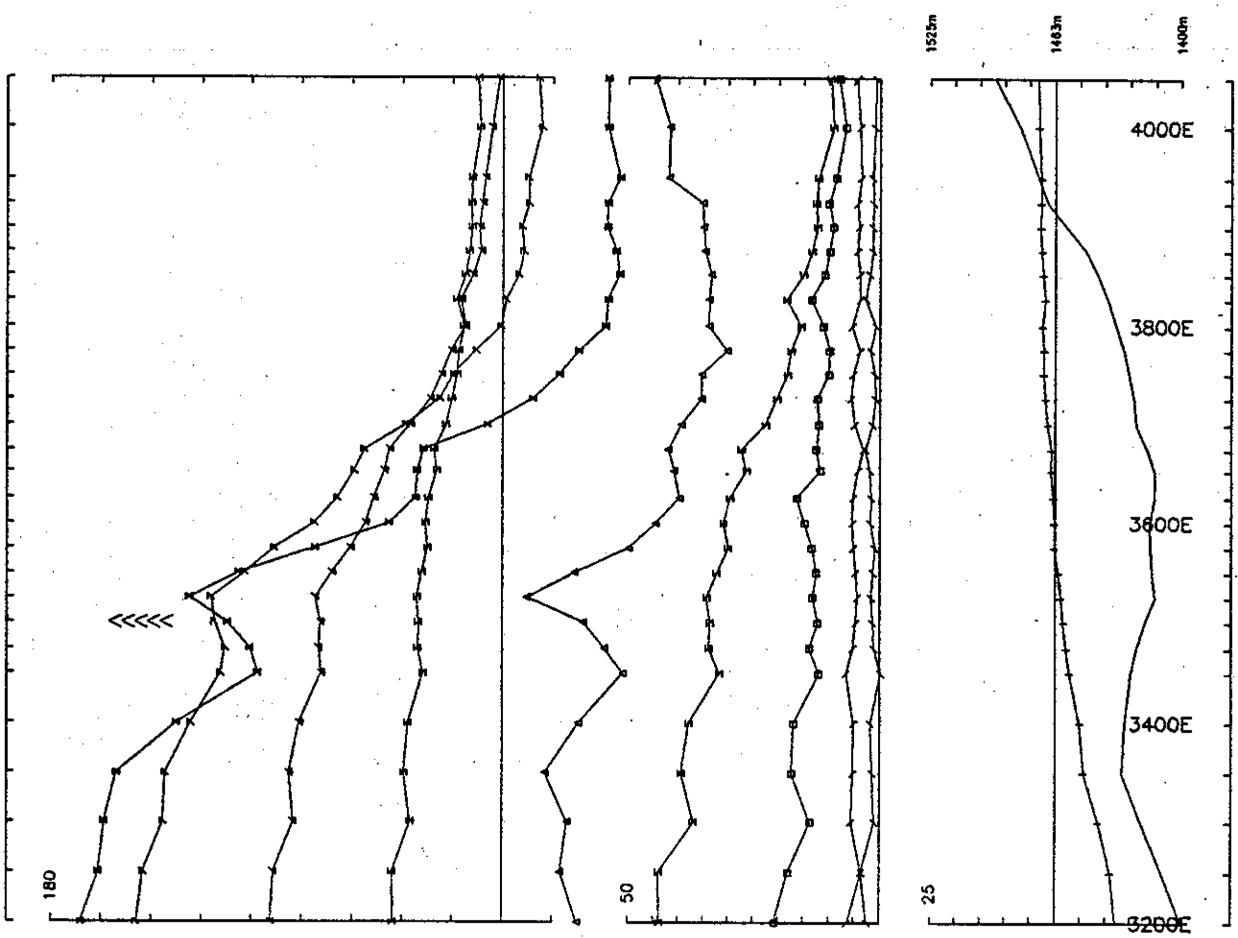
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 4800N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



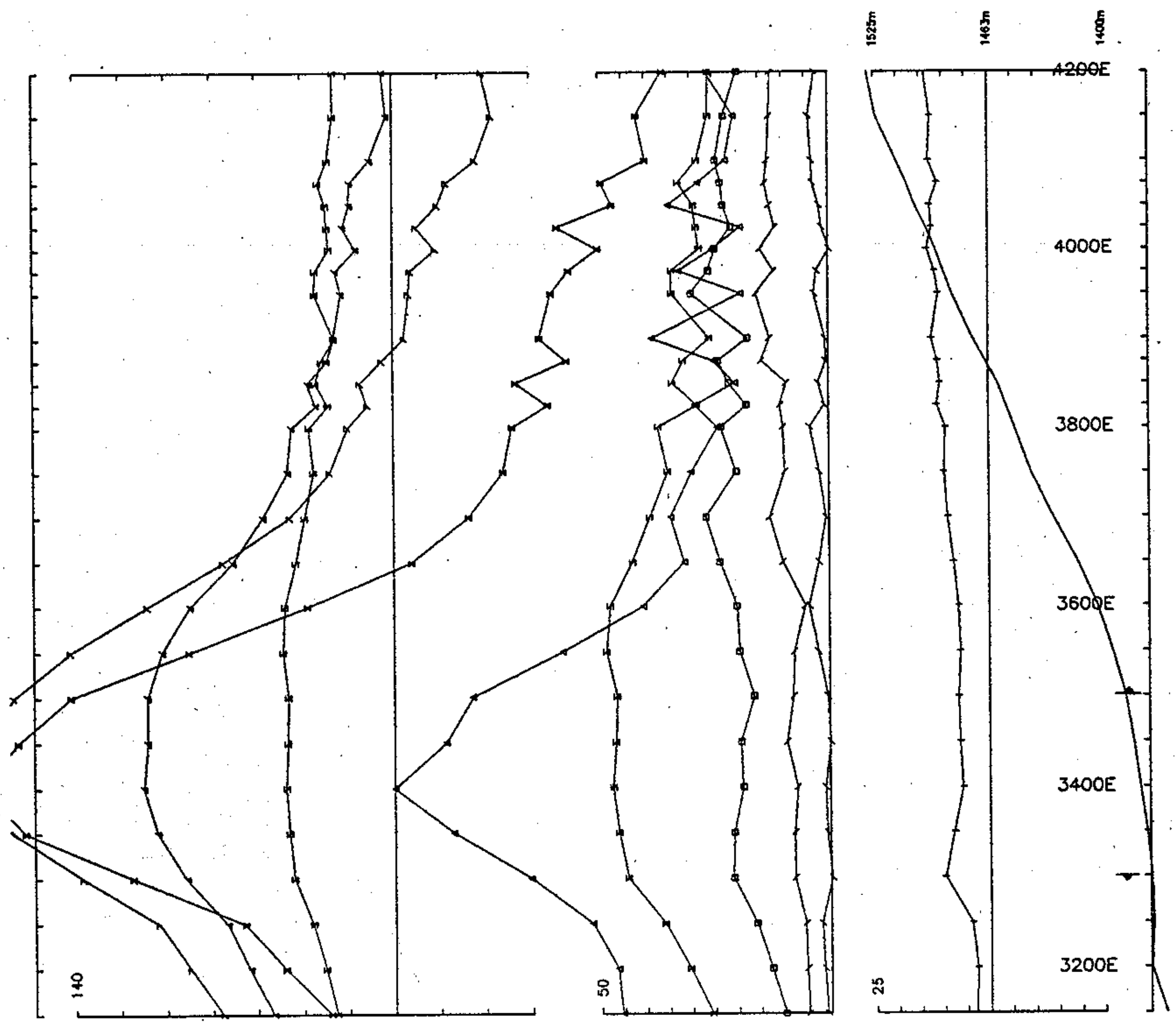
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



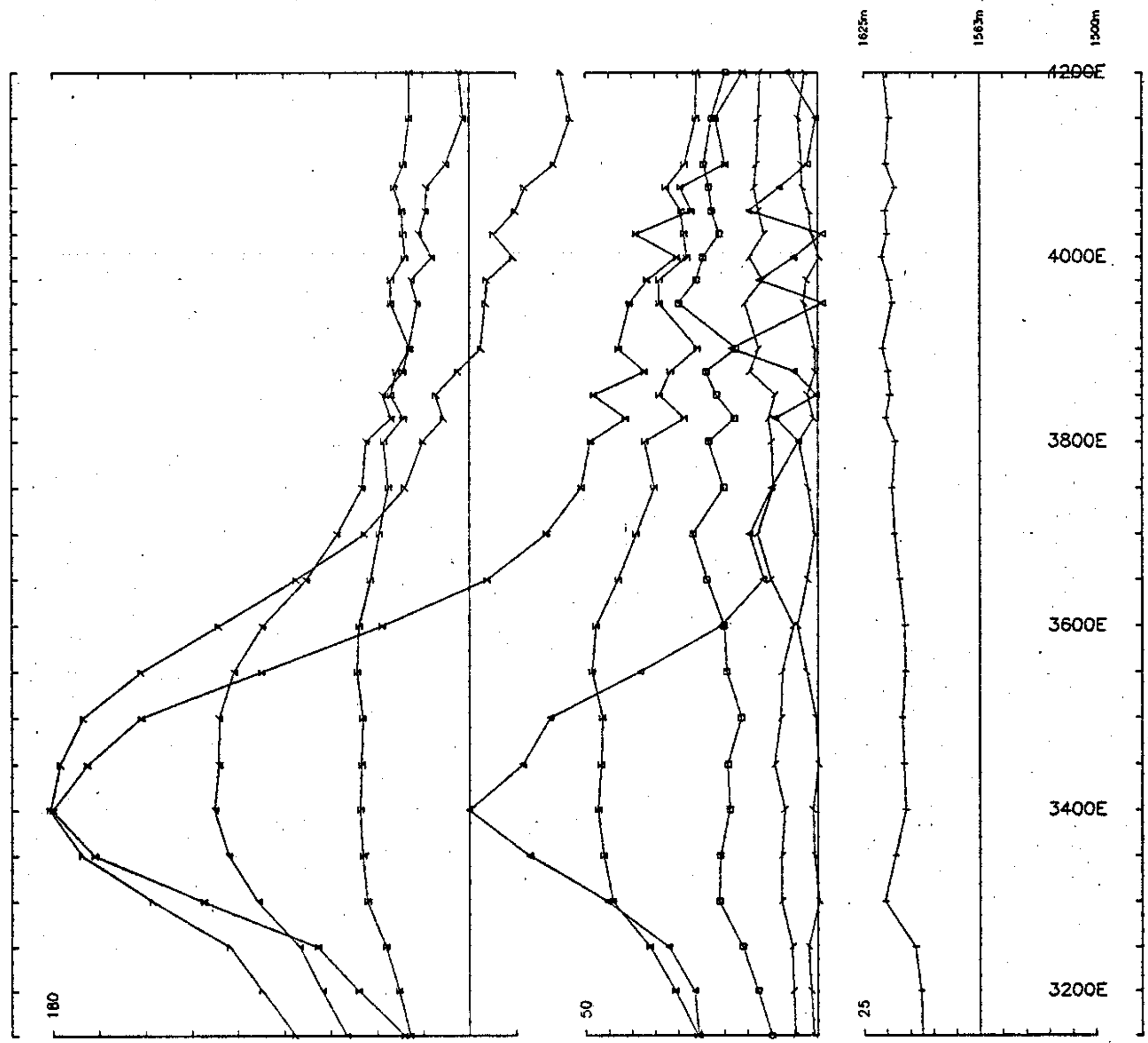
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



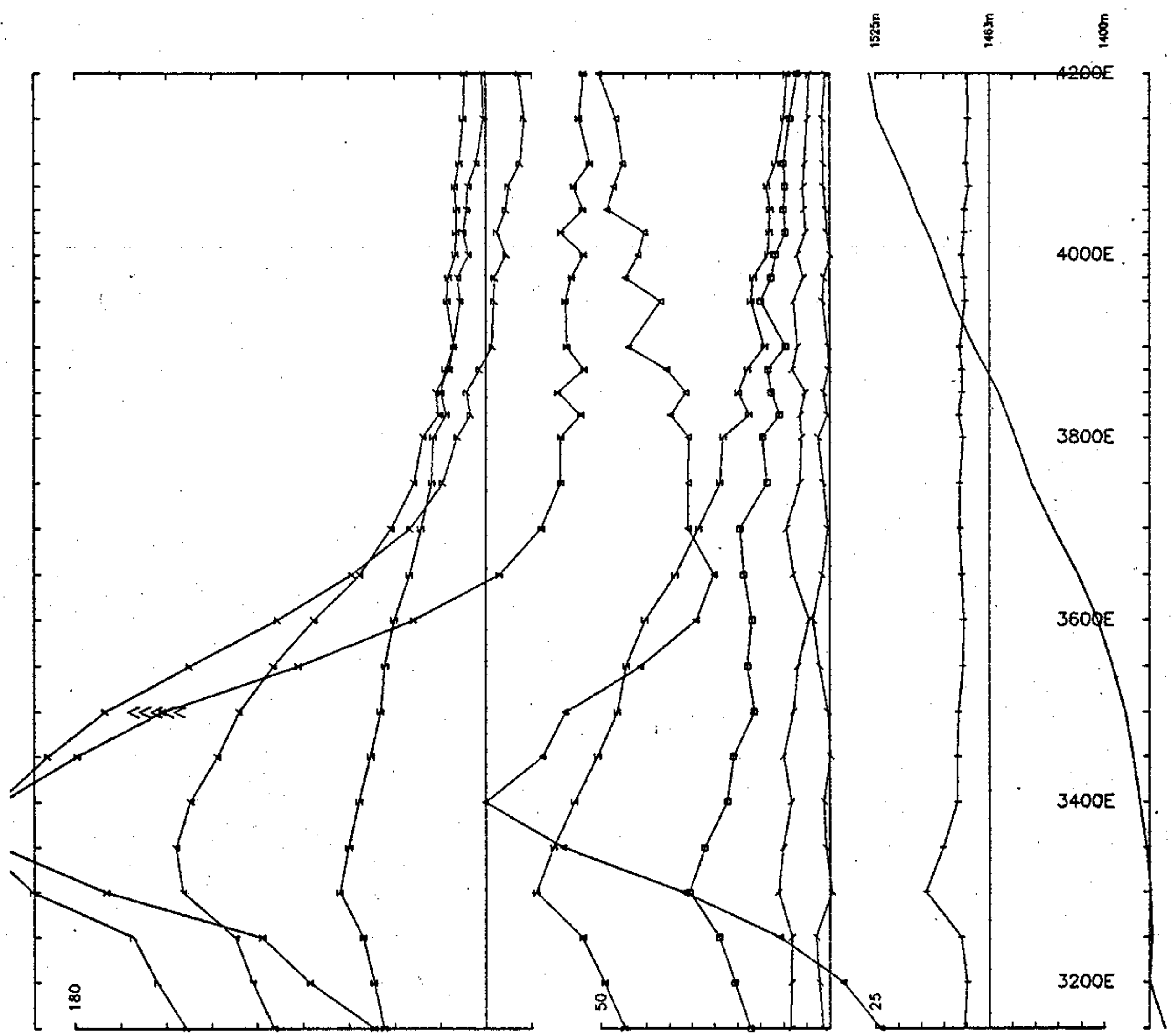
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 5200N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



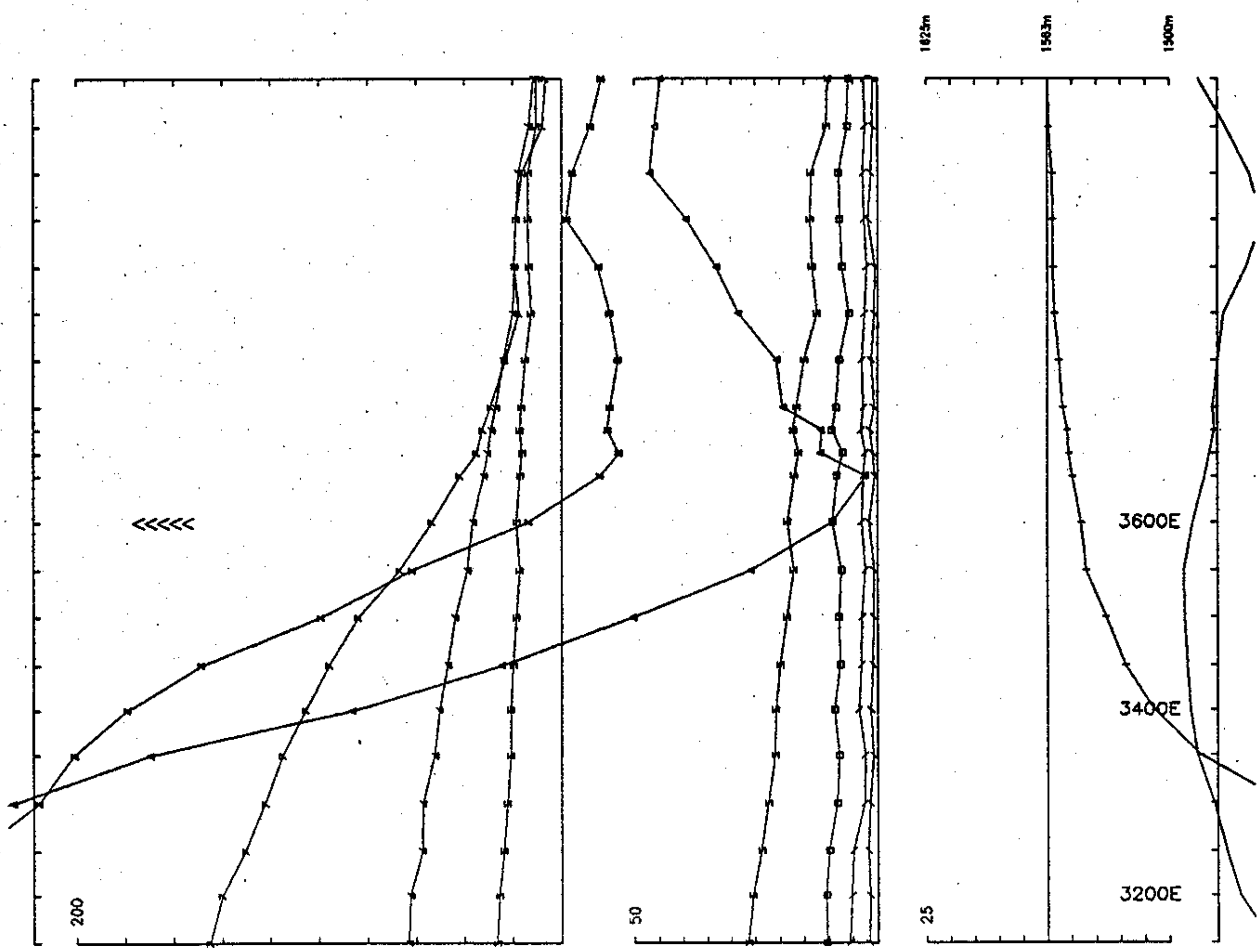
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 5200N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.

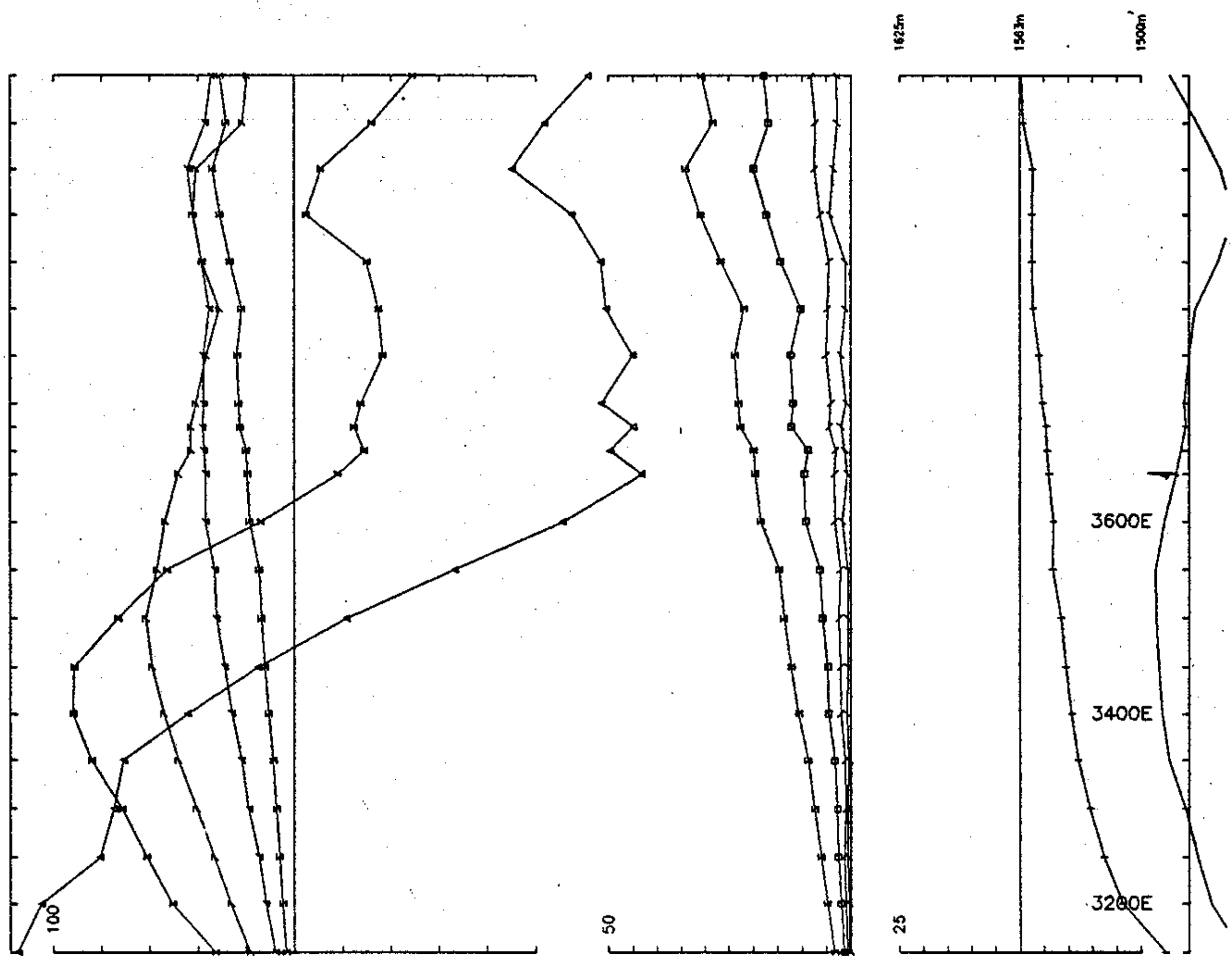


Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 2 Line 5200N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.

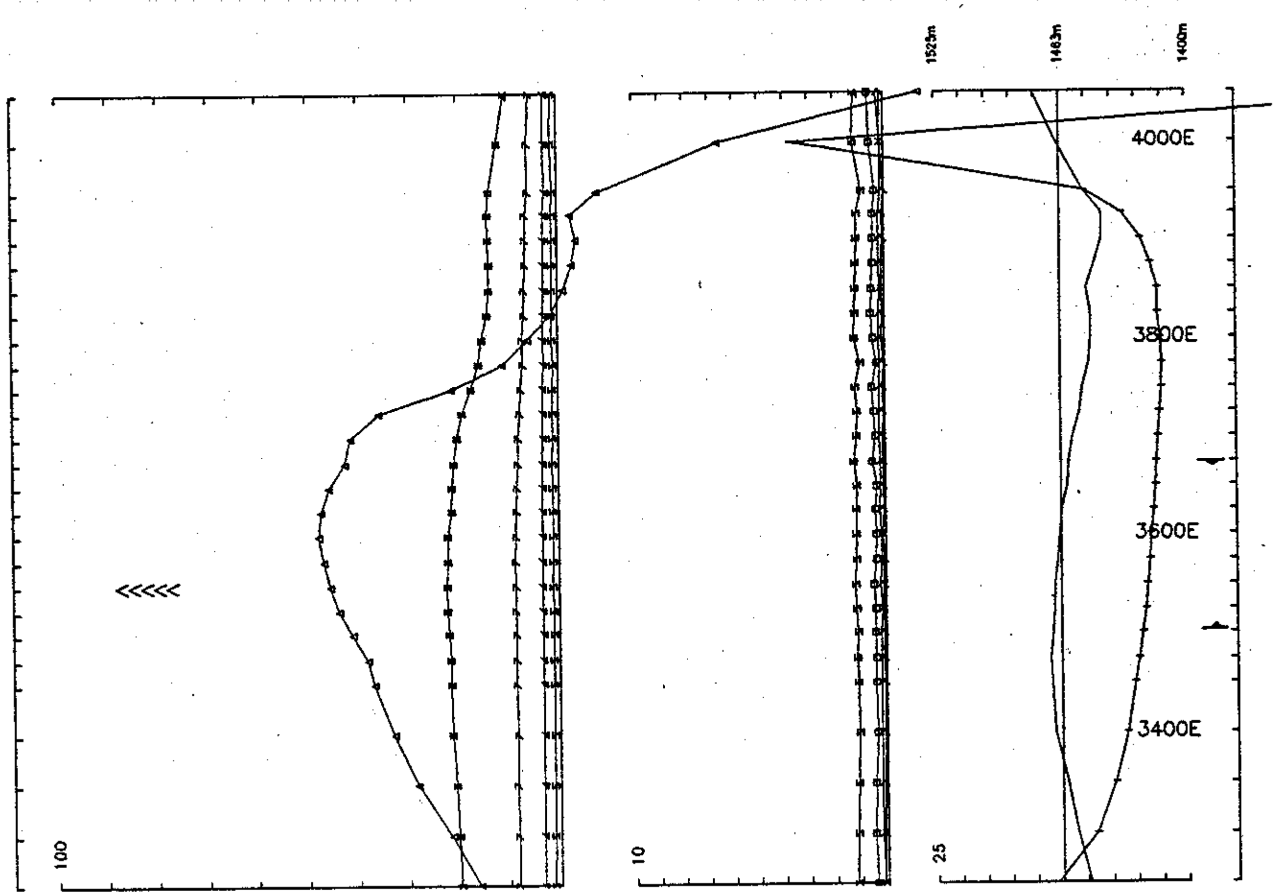


Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970



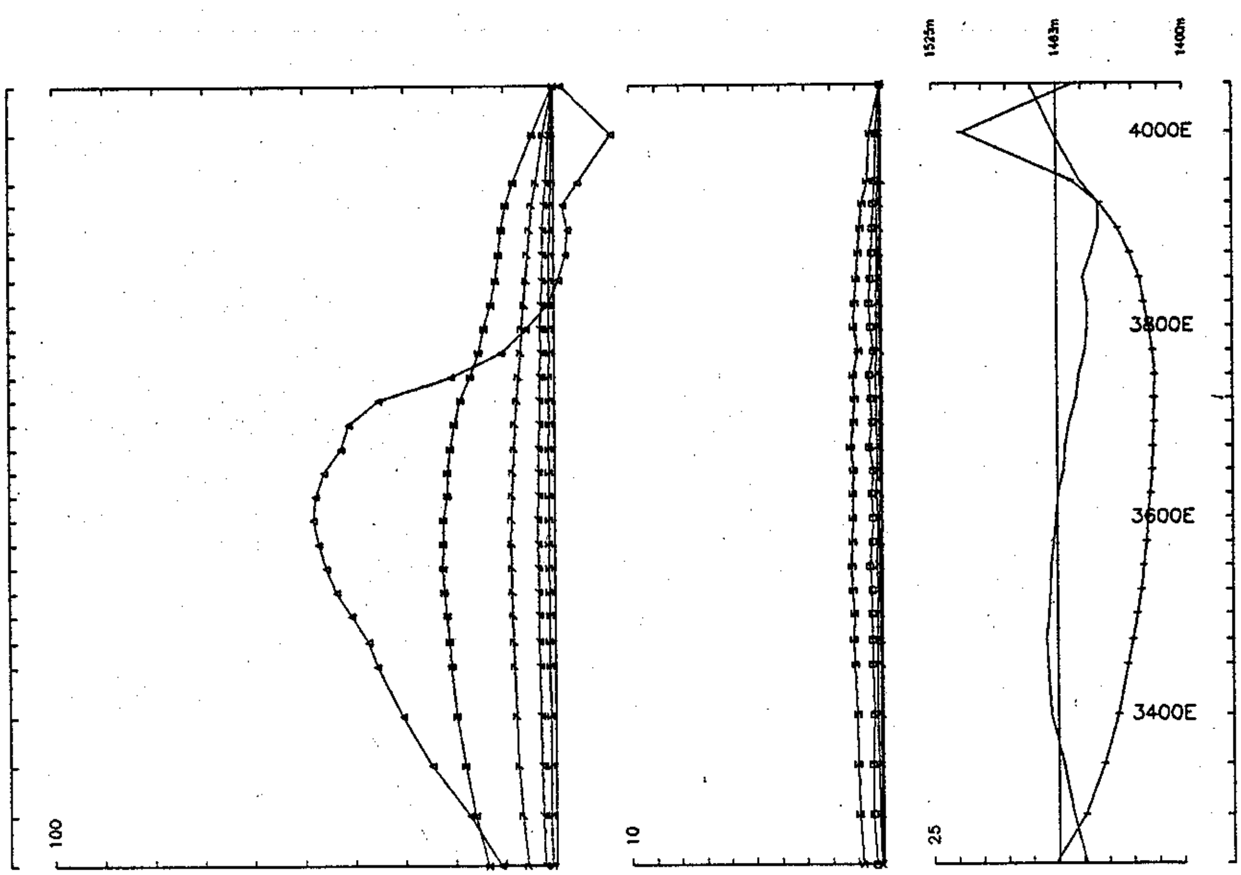
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 3 Line 4700N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



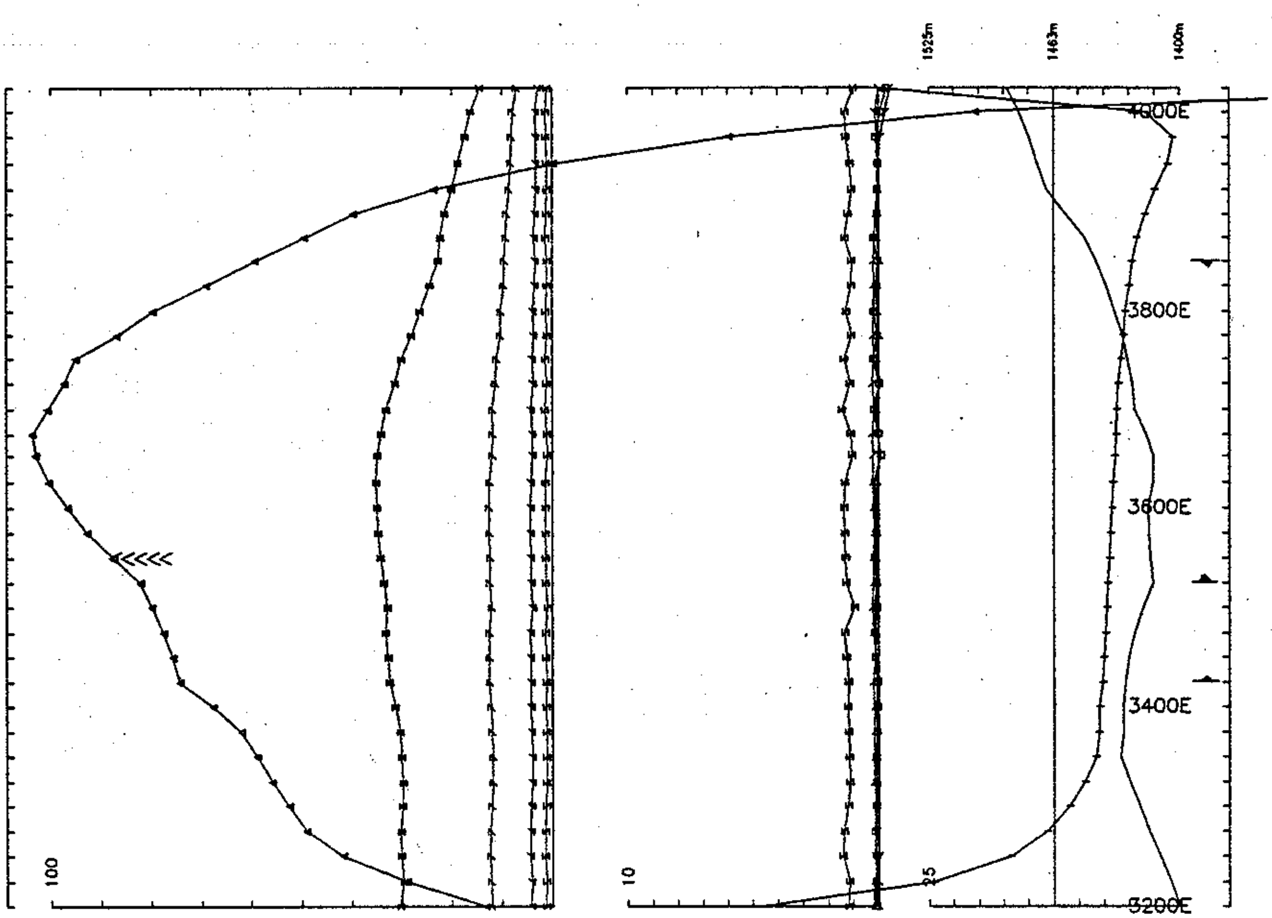
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 4800N component Hz secondary primary field normalized Ch 1 reduced point norm.



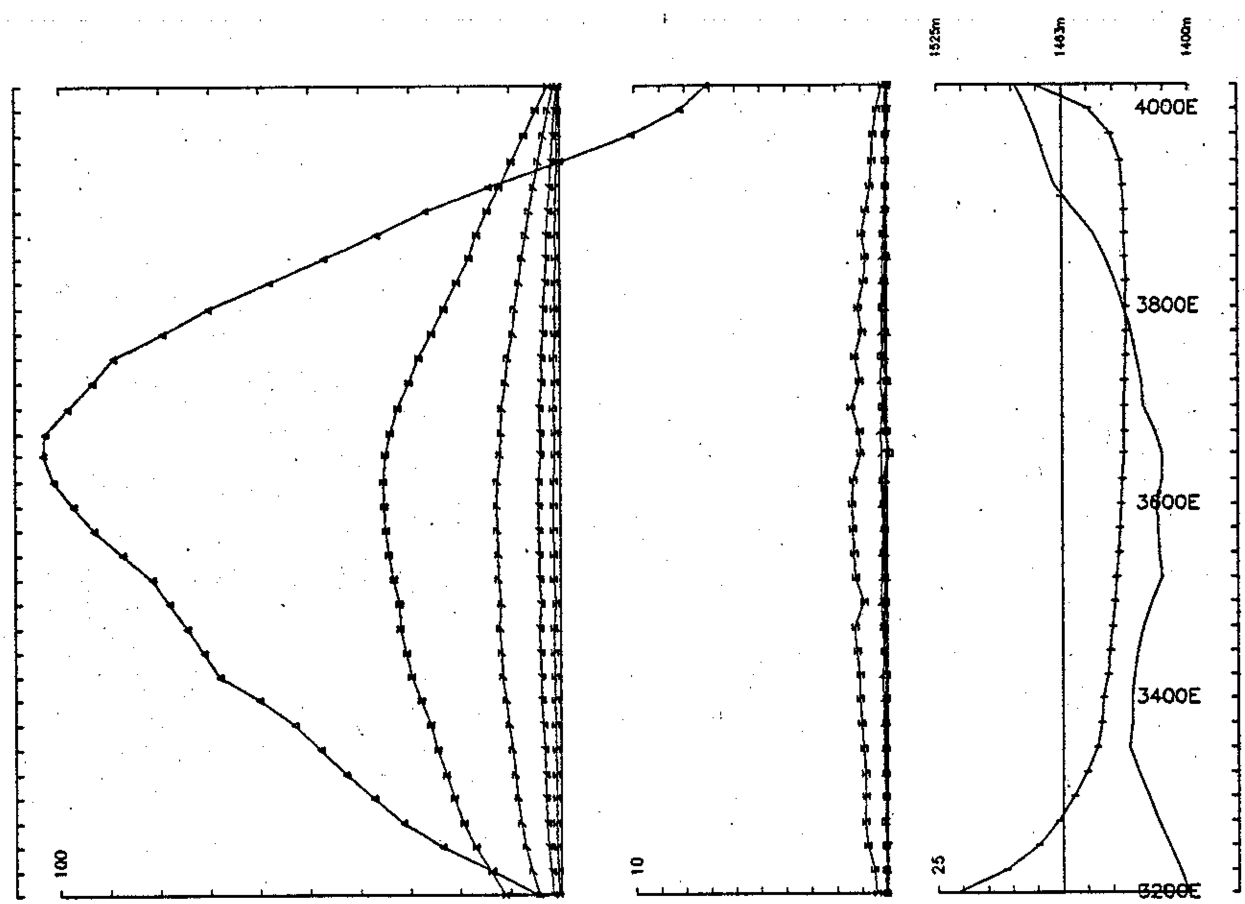
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 4800N component Hz secondary primary field normalized Ch 1 reduced contin. norm.



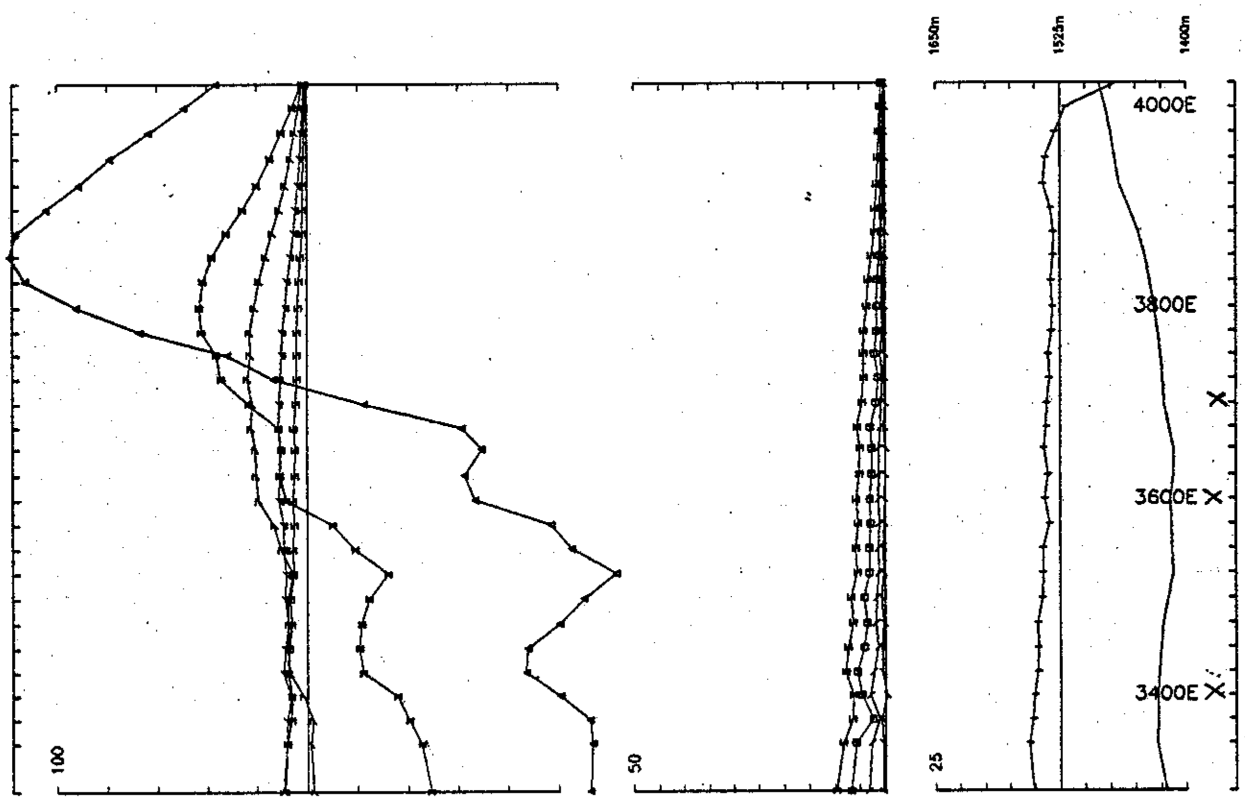
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 5000N component Hz secondary primary field normalized Ch 1 reduced point norm.



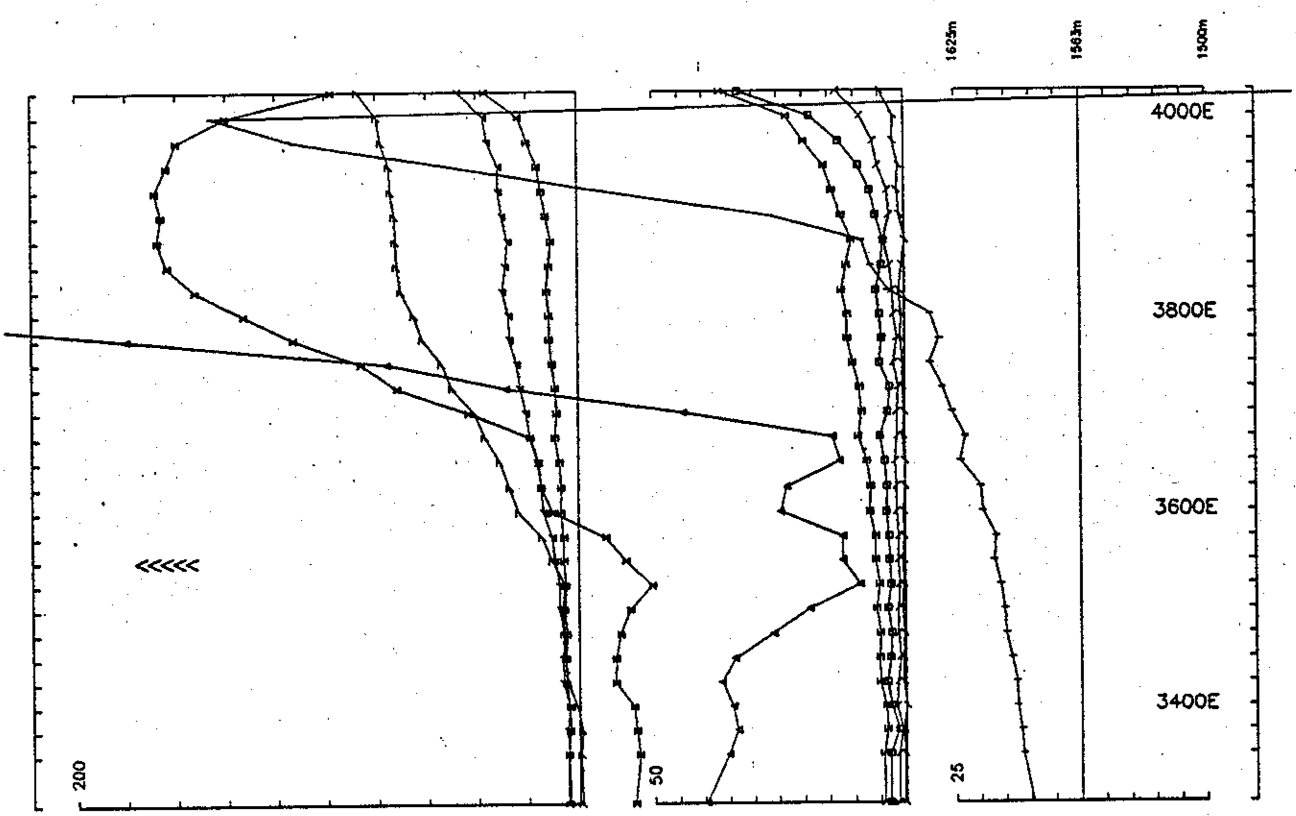
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 5000N component Hz secondary primary field normalized Ch 1 reduced contin. norm.



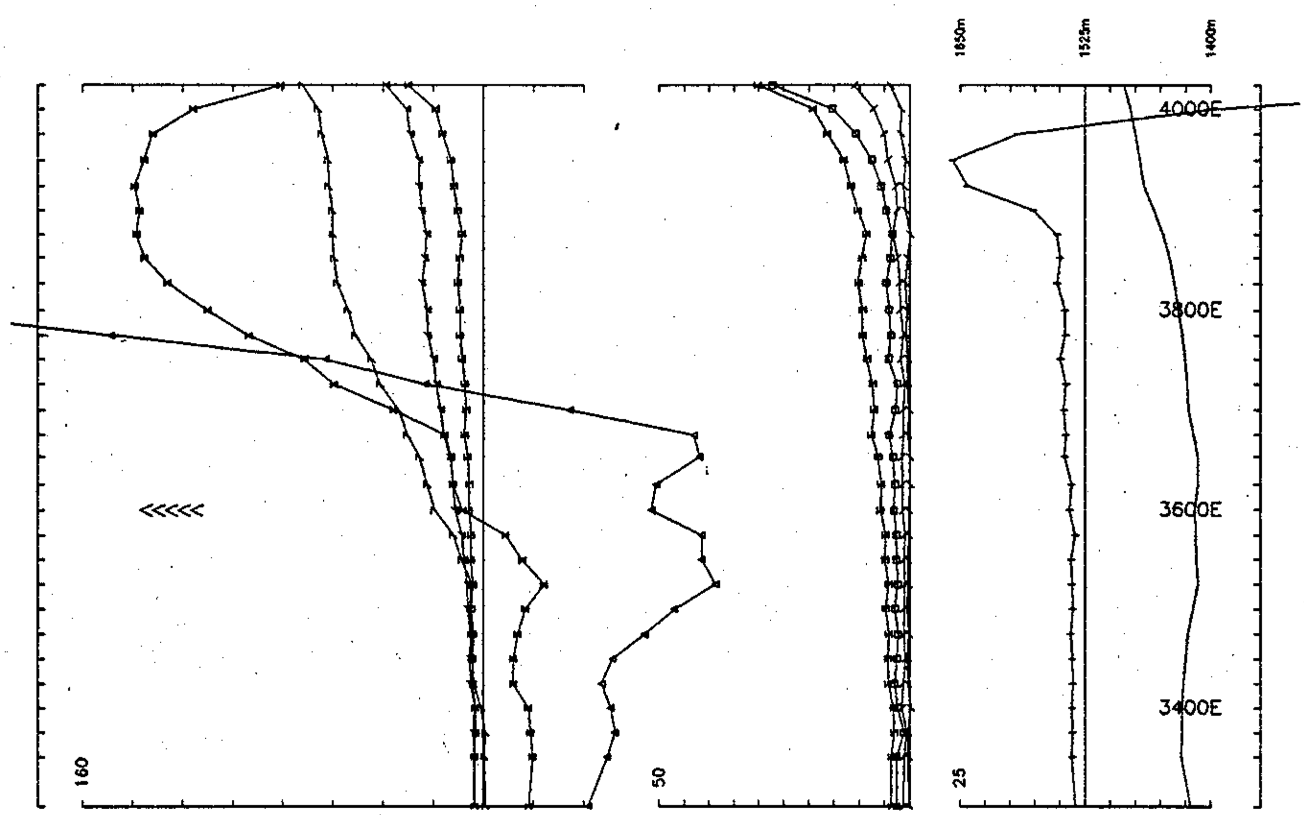
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 5 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced contin. norm.



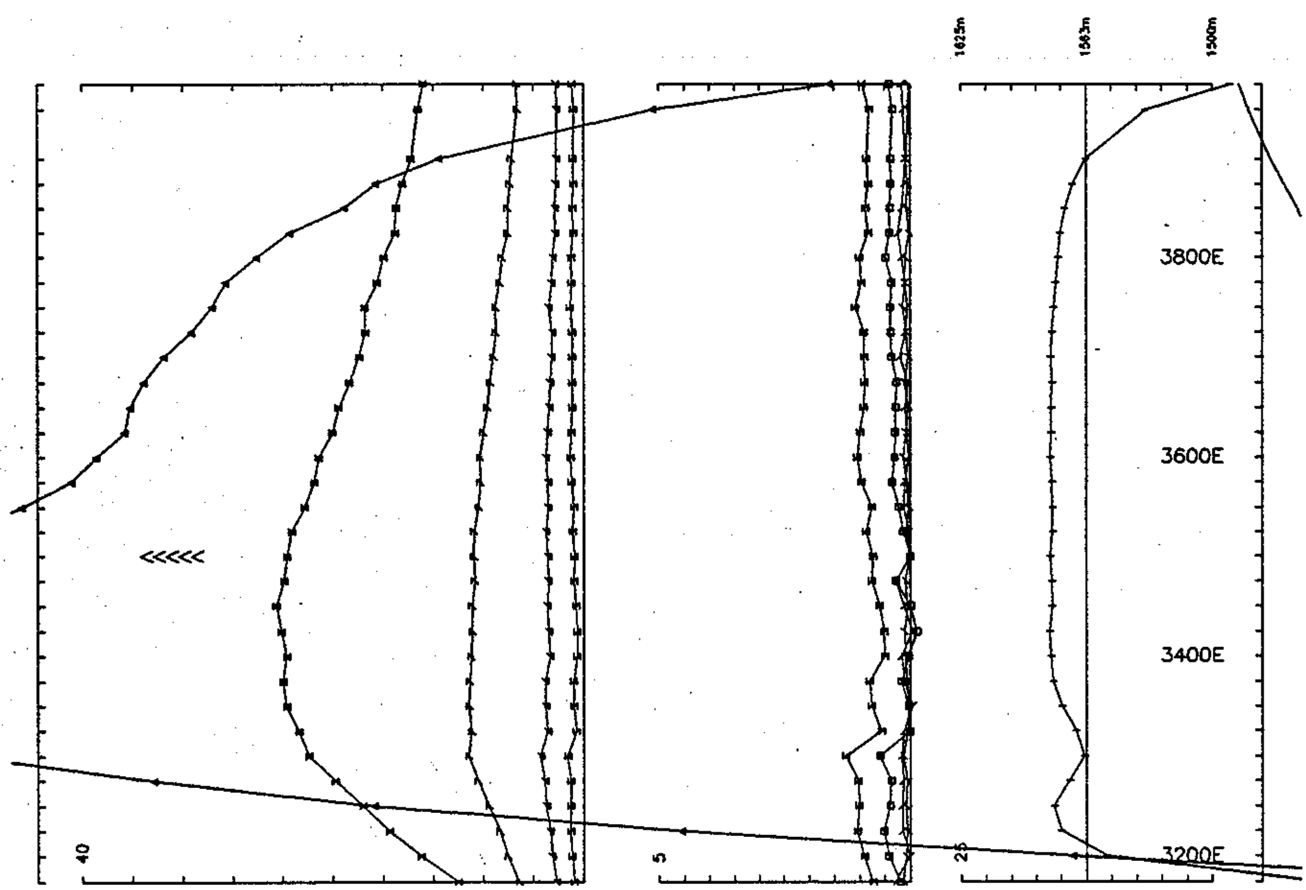
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 5 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



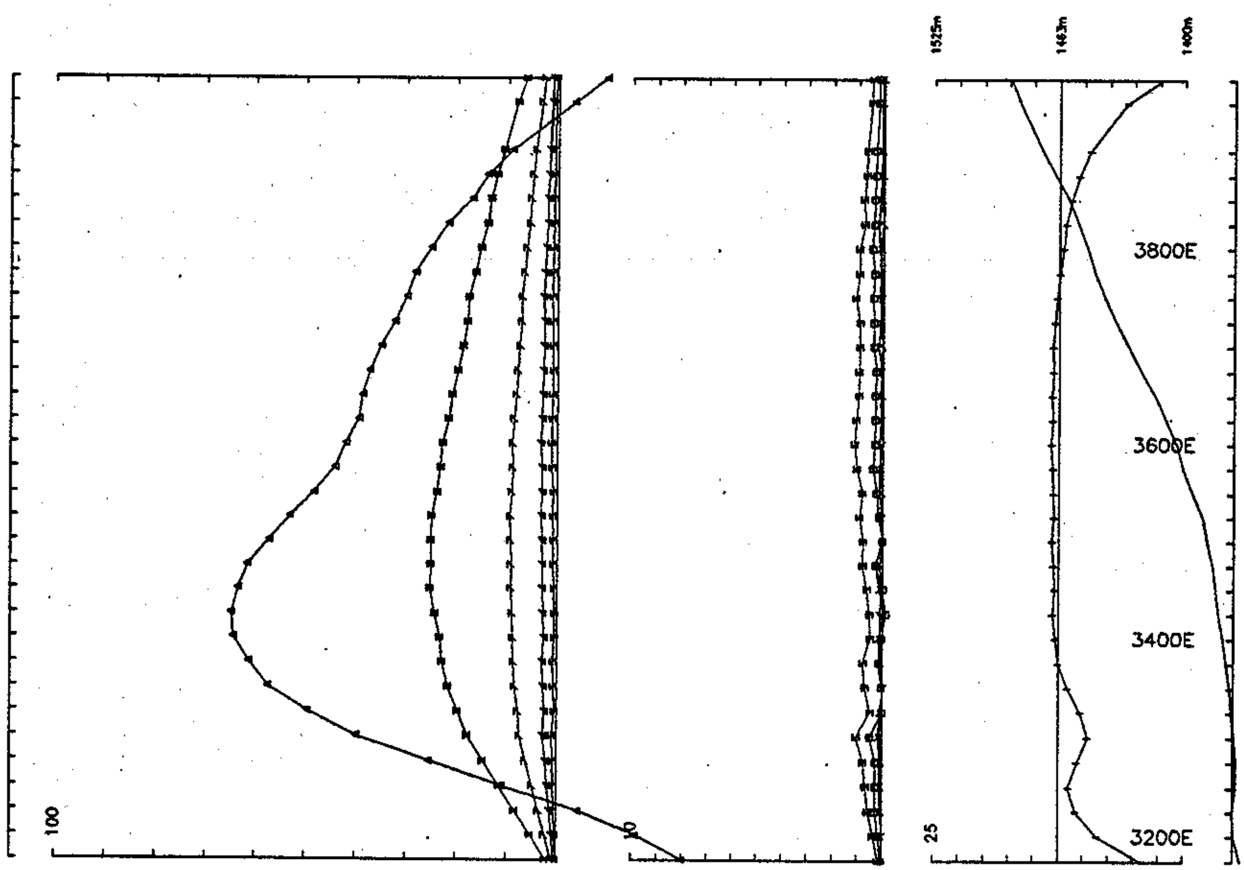
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 5 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced point norm.



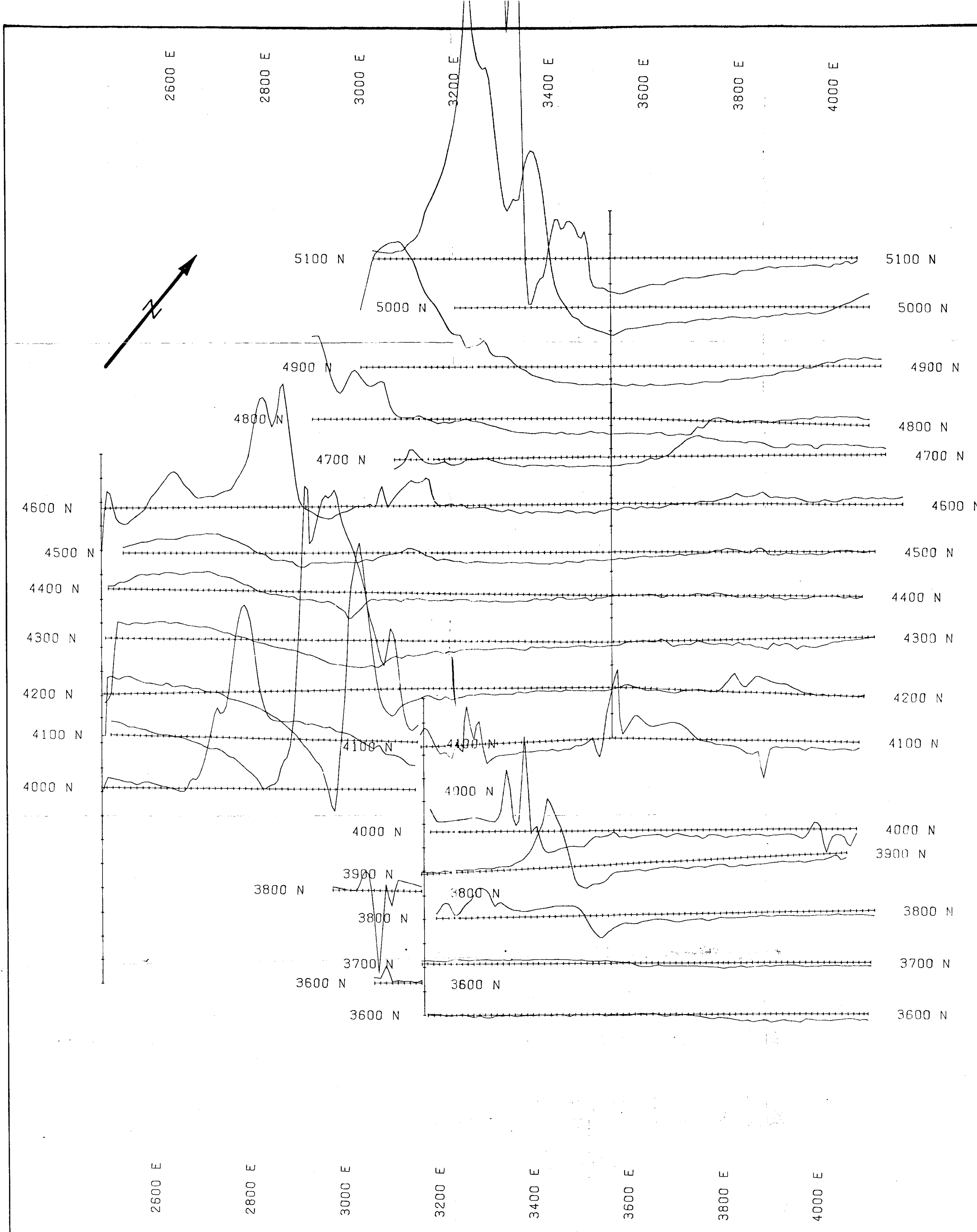
Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 5200N component Hz secondary primary field normalized Ch 1 reduced point norm.



Area McNEIL CREEK client SOUTH KOOTENAY GOLD FIELDS INC operator SJ GEOPHYSICS LTD. freq(hz) 30.970

Loopno 4 Line 5200N component Hz secondary primary field normalized Ch 1 reduced contin. norm.



LEGEND

PROFILES POSITIVE UP

PROFILE SCALE : 1 CM = 100 NT
BASE VALUE : 57600 NT

RANGE - HIGH : 59,593.1 NT
- MEDIAN : 58,345.9 NT
- LOW : 57,099.2 NT

INSTRUMENTATION
GEM SYSTEMS LTD.
GSM-8 PROTON PRECESSION MAGNETOMETER
LOOP CORRECTED DATA

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,989

Part 1 of 3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

MAGNETICS PROFILES

TOTAL FIELD

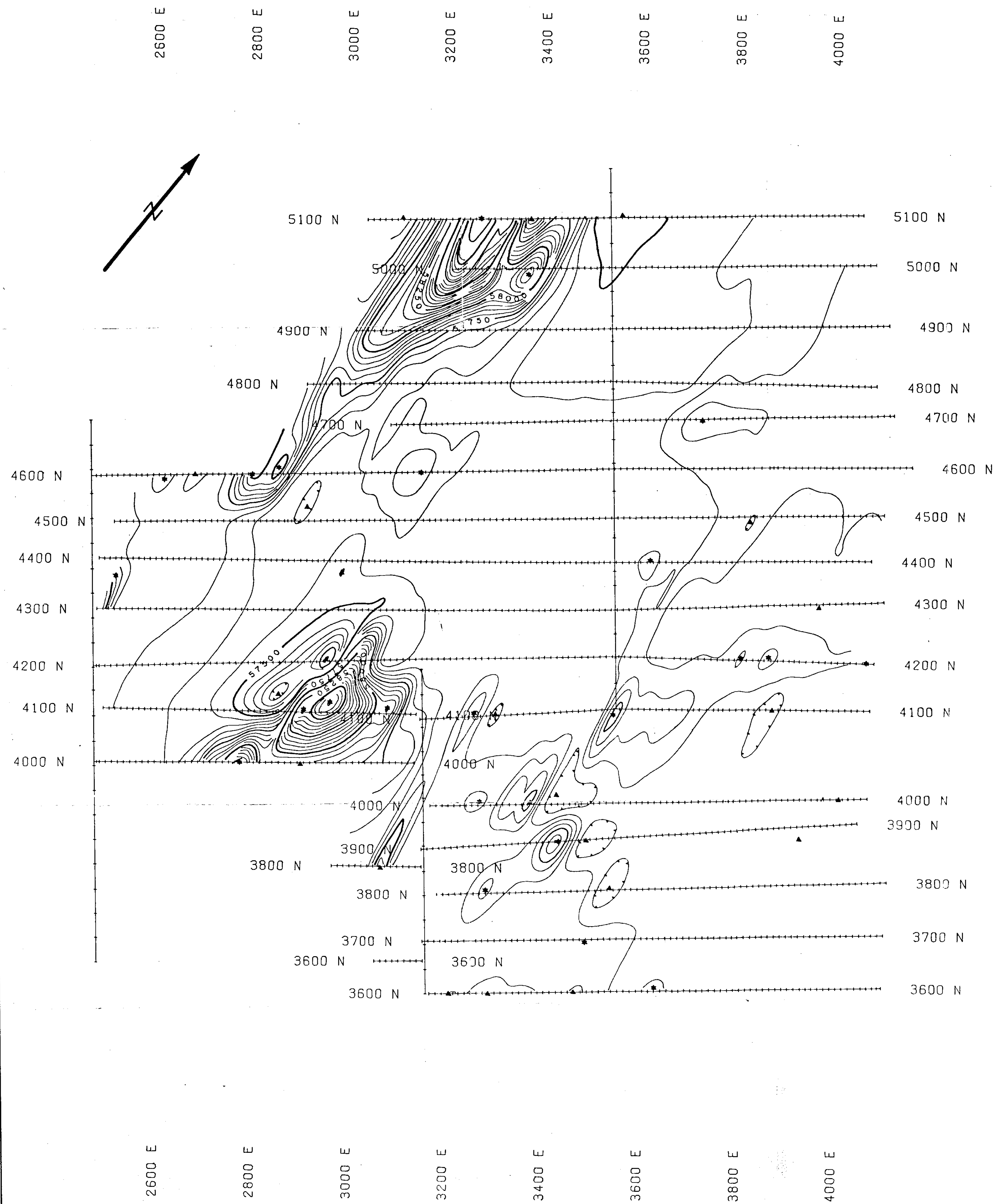
SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE GM 1A

SJ GEOPHYSICS LTD.



LEGEND

CONTOUR INTERVAL : 50 NT
POSTED : 250 NT
TREND ROTATION ANGLE : 30 DEGREES

FLAGS - STAR : LOCAL MAGNETIC HIGH
- DIAMOND : LOCAL MAGNETIC LOW

RANGE - HIGH : 59,593.1 NT
- MEDIAN : 58,345.9 NT
- LOW : 57,099.2 NT

INSTRUMENTATION
GEM SYSTEMS LTD.
GSM-8 PROTON PRECESSION MAGNETOMETER
LOOP CORRECTED DATA

GEOLOGICAL BRANCH ASSESSMENT REPORT

19,989

Part 1 o3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

MAGNETICS CONTOURS

TOTAL FIELD

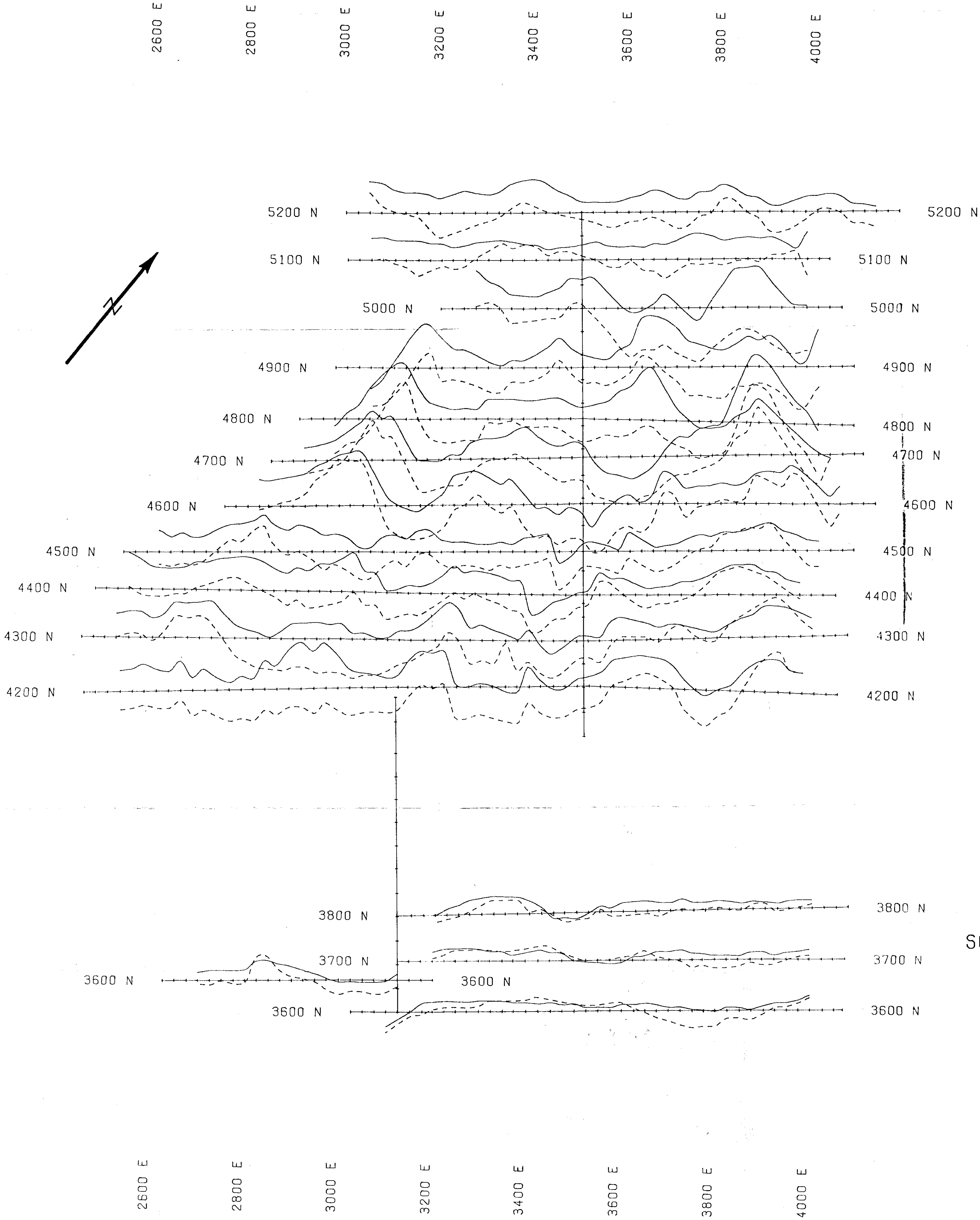
SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE GM 1B

SJ GEOPHYSICS LTD.



LEGEND

PROFILES POSITIVE UP
IN-PHASE - SOLID LINE
OUT-OF-PHASE - DASHED LINE
PROFILE SCALE : 1 CM = 20 %
BASE VALUE : 0 %

COIL SEPARATION -
LINES 3600 N TO 5000 N : 150 M
LINES 5100 N AND 5200 N : 100 M

IN-PHASE REDUCED BY LOWEST FREQUENCY

INSTRUMENTATION
APEX PARAMETRICS LTD.
MODEL : MAX-MIN I-9
S/N : 5306

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

HORIZONTAL LOOP EM PROFILES

14080 HERTZ

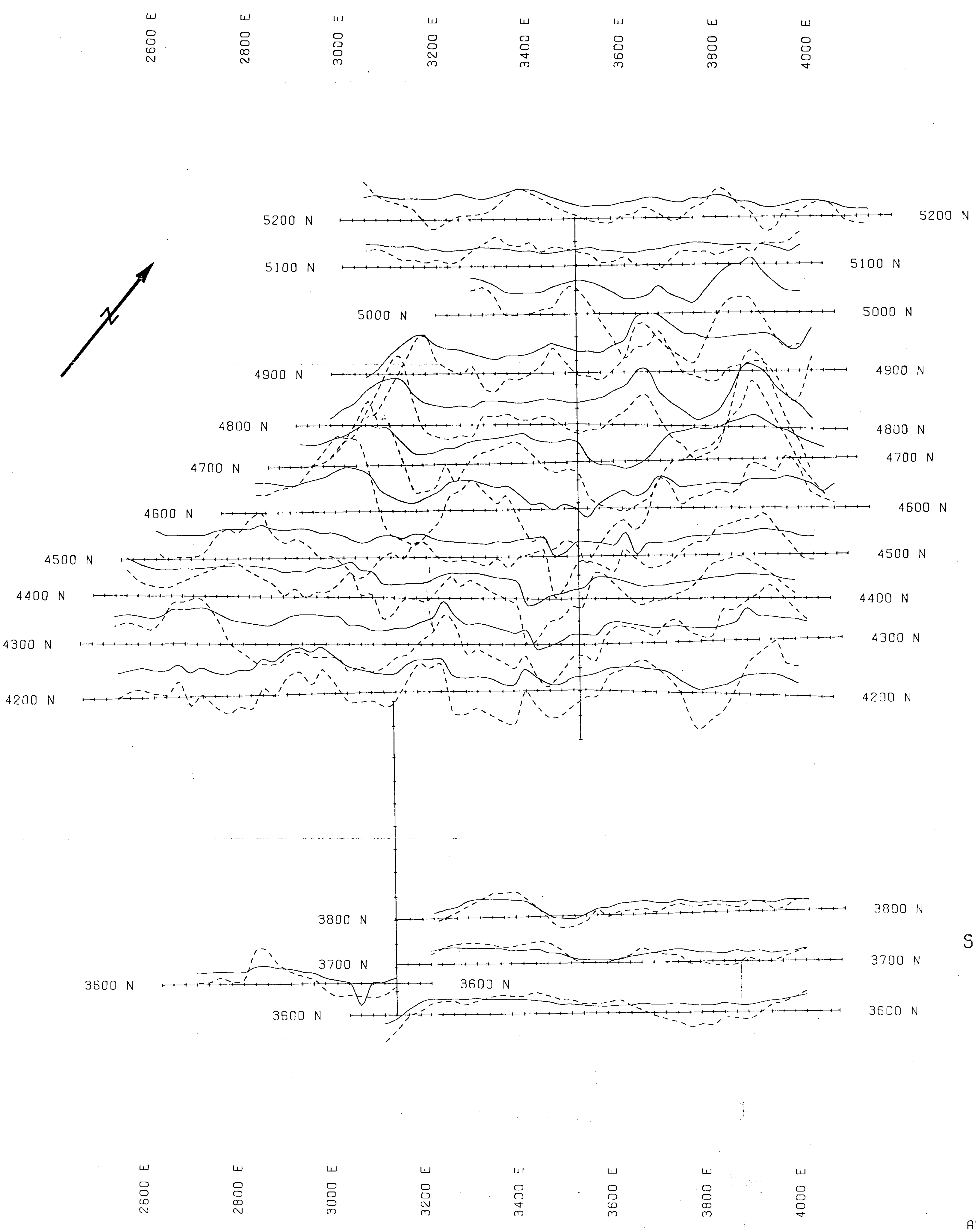
SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE GMM 1A

SJ GEOPHYSICS LTD.



LEGEND

PROFILES POSITIVE UP
IN-PHASE - SOLID LINE
OUT-OF-PHASE - DASHED LINE
PROFILE SCALE : 1 CM = 10 %
BASE VALUE : 0 %

COIL SEPARATION -
LINES 3600 N TO 5000 N : 150 M
LINES 5100 N AND 5200 N : 100 M

IN-PHASE REDUCED BY LOWEST FREQUENCY

INSTRUMENTATION
APEX PARAMETRICS LTD.
MODEL : MAX-MIN I-9
S/N : 5306

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,989
Part 1 of 3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

HORIZONTAL LOOP EM PROFILES

7040 HERTZ

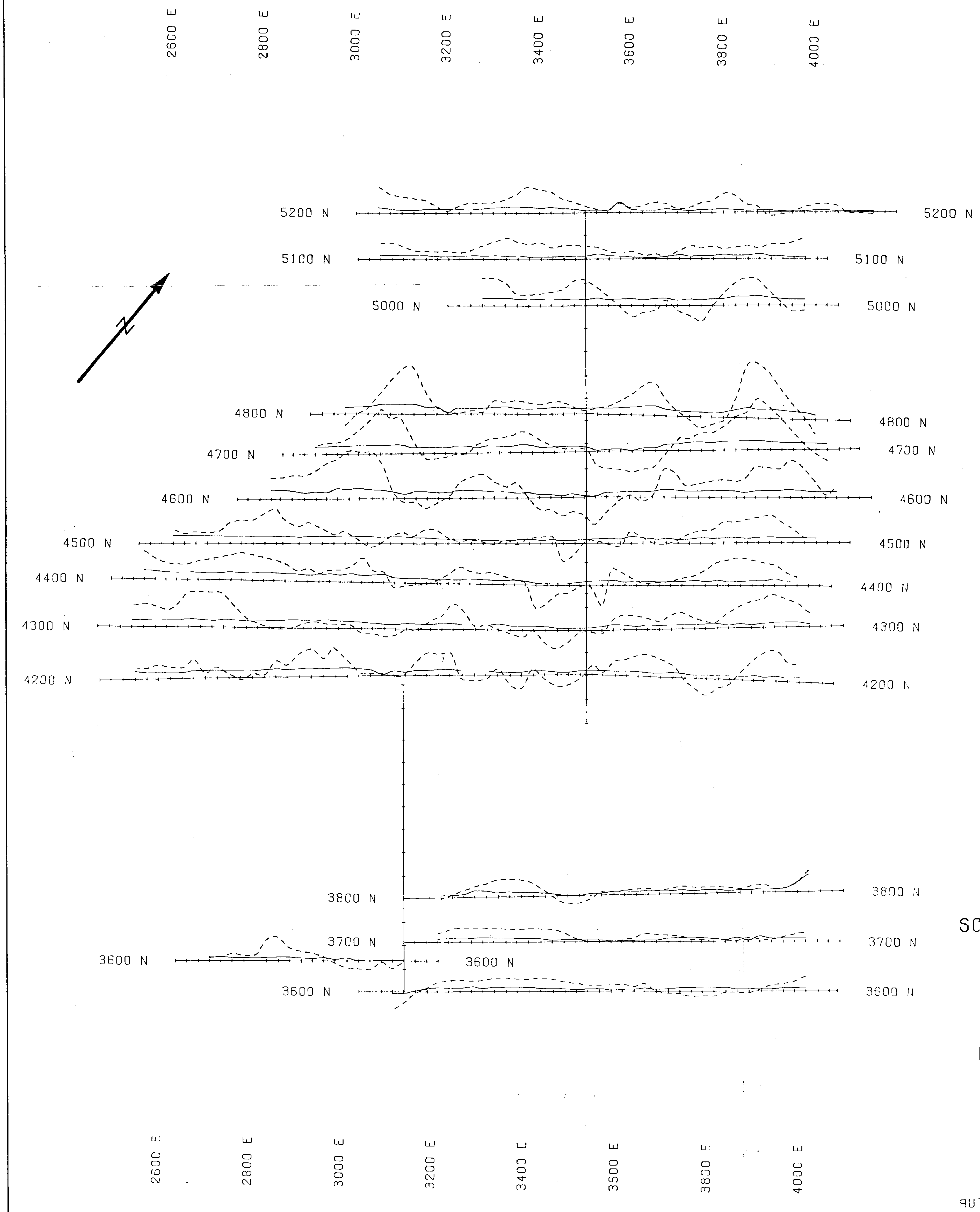
SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE GMM 1B

SJ GEOPHYSICS LTD.



LEGEND

PROFILES POSITIVE UP
IN-PHASE - SOLID LINE
OUT-OF-PHASE - DASHED LINE
PROFILE SCALE : 1 CM = 5 %
BASE VALUE : 0 %

COIL SEPARATION -
LINES 3600 N TO 5000 N : 150 M
LINES 5100 N AND 5200 N : 100 M

IN-PHASE REDUCED BY LOWEST FREQUENCY

INSTRUMENTATION
APEX PARAMETRICS LTD.
MODEL : MAX-MIN I-9
S/N : 5306

GEOLOGICAL BRANCH ASSESSMENT REPORT

19,989

Part 1 of 3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

HORIZONTAL LOOP EM PROFILES

1760 HERTZ

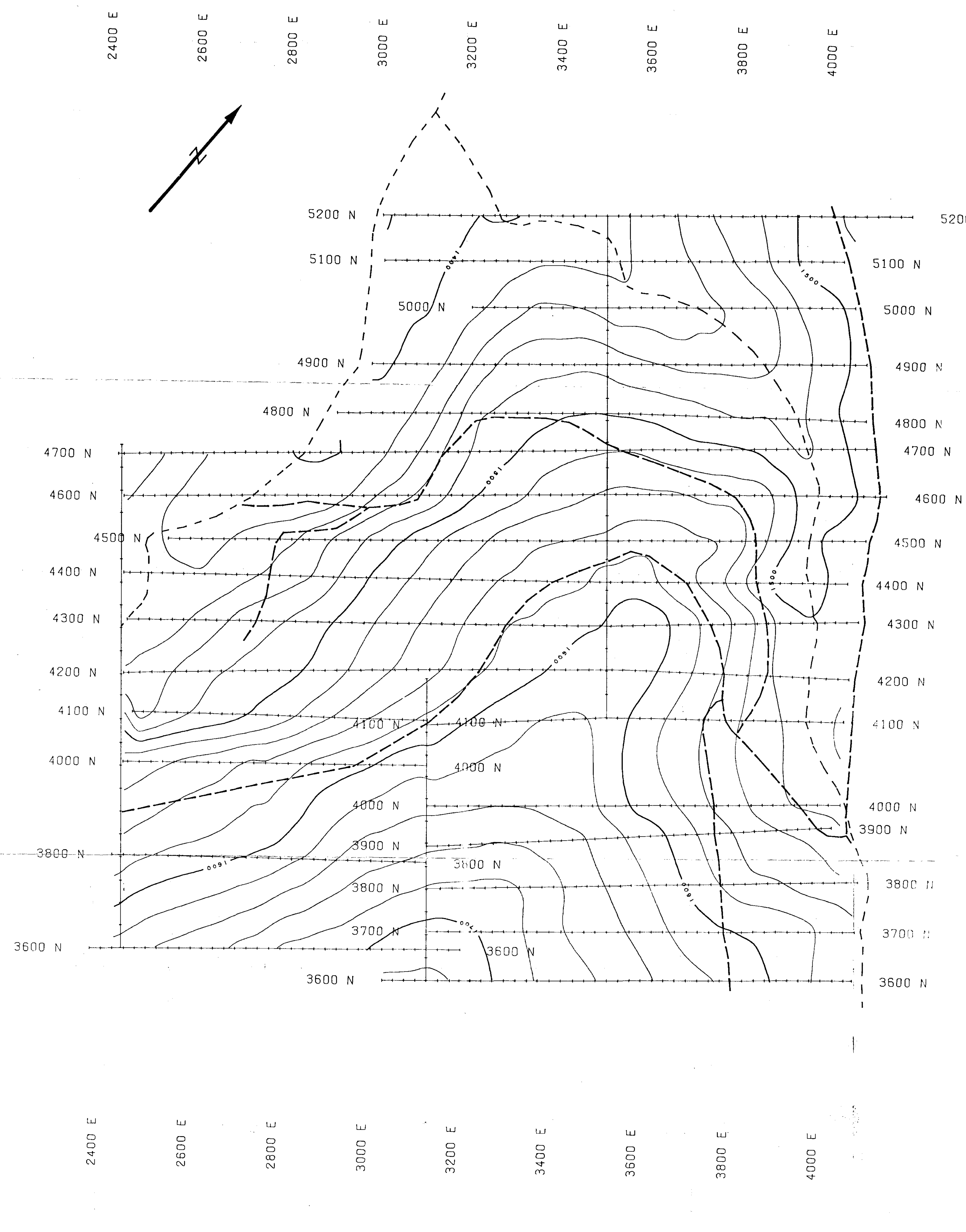
SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE GMM 1C

SJ GEOPHYSICS LTD.



LEGEND

ELEVATIONS IN METRES   CONTOURS AT 20 METRES

LOGGING ROADS

CREEKS

~~GRID CORRECTED FROM AVAILABLE CHAINAGE NOTES~~
ASSUMING THAT TL2400E, TL3100E, AND TL3500E
ARE STRAIGHT AND ACCURATELY CHAINED.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,989
Part 1 of 3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

CONTOURED

TOPOGRAPHY MAP

SCALE : 1:5000

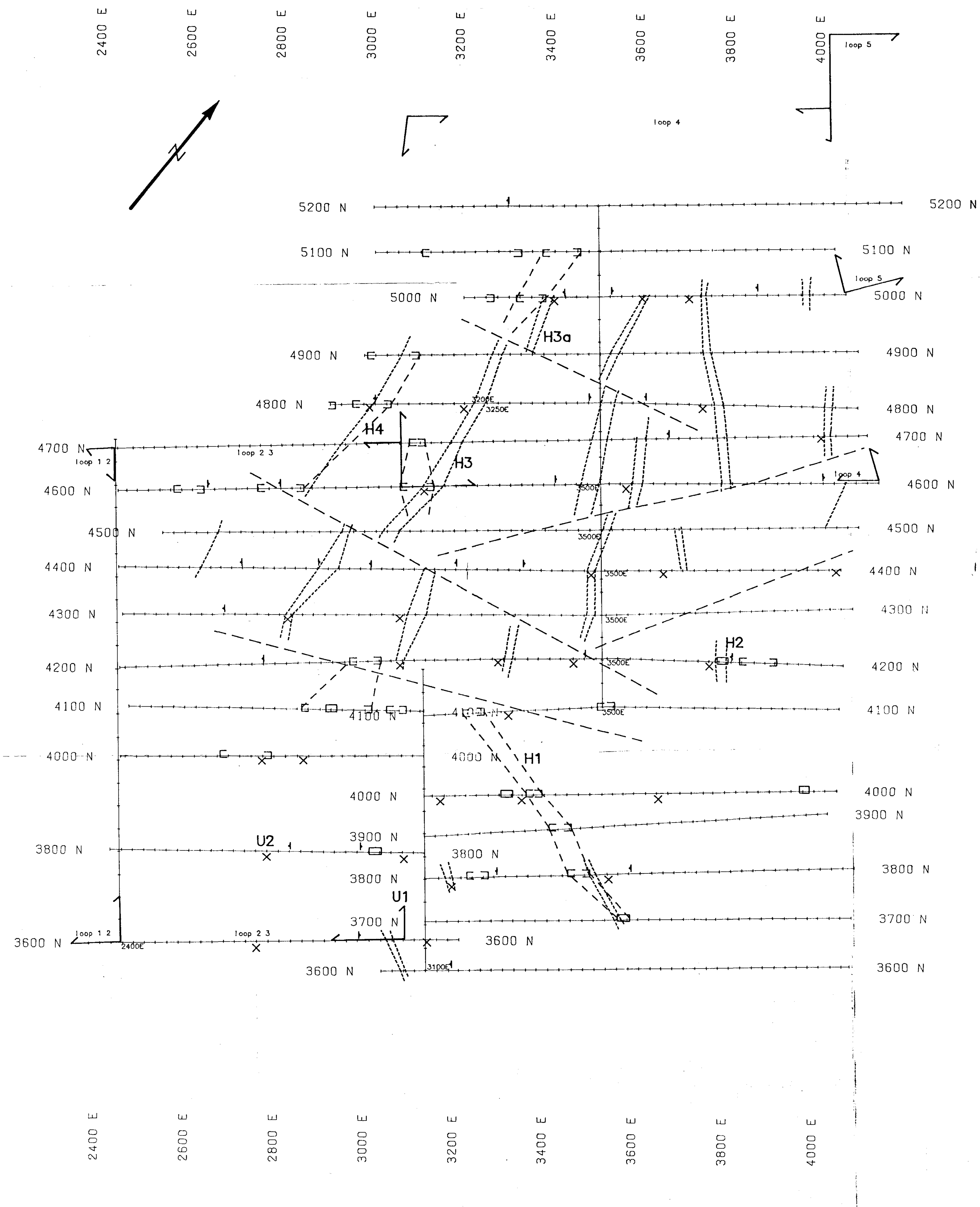
100 0 100 200 300

METRES

AUTUMN, 1989

PLATE GT1

SJ GEOPHYSICS LTD.



LEGEND

- HLEM ANOMALY (SHOWING WIDTH)
- CROSS STRUCTURE
- MAGNETIC ANOMALY (SHOWING WIDTH)
- UTEM CROSSOVER ANOMALY
- UTEM CONTACT ZONES
- APPROX. LOOP CORNERS LOCATIONS

NOTE:
NOT ALL OF THE LINES SHOWN WERE SURVEYED BY UTEM, HLEM AND MAG.
SEE:
UTEM SECTION IN APPENDIX OF REPORT
HLEM PROFILE PLOTS
MAGNETIC PROFILE AND CONTOUR MAPS

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,989

Part 1 of 3

SOUTH KOOTENAY GOLDFIELDS INC.

MCNEIL CREEK PROJECT

FORT STEELE M.D., B.C.

N.T.S. : 82 G/5W

UTEM, HLEM, MAG SURVEYS

COMPILATION MAP

SCALE : 1:5000

100 0 100 200 300
METRES

AUTUMN, 1989

PLATE G1

SJ GEOPHYSICS LTD.