CUMBERLAND RESOURCES LTD.

REPORT ON

DEEPEM SURVEY

SLATE LAKE PROPERTY

NTS: 52K/15
NORTHWESTERN ONTARIO

RECEIVED
JAN 10 1996
MINING LANDS BRANCH

Dual. # .2.8077

THUNDER BAY, ONTARIO
APRIL, 1995

SUBMITTED BY:
M.P. (PAT) LEWIS, B.Sc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDIX

LIST OF DRAWINGS

S U M A R Y

The Slate Lake property is located 60 km northeast of the community of Ear Falls and 90 km east of the mining town of Red Lake in Northwestern Ontario. The property is comprised of nine(9) contiguous unpatented mining claims, totalling 44 units in addition to six(6) mining leased claims that are part of an option agreement with Breakwater Resources. The property, and in particular the Breakwater optioned claims, contain a Cu-Zn rich massive sulphide horizon which had previously been defined by a 1979 HLEM survey and more recently by a Crone PEM survey. The massive sulphide horizon, which is hosted by felsic bedded ash tuffs, was intersected by 4 closely spaced and shallow drill holes in 1979-80 with deepest intersection assaying 8.70% Cu, 7.05% Zn and 2.17 opt Ag over o.50 meters at a vertical depth of 130 m.

Cumberland Resources LTD. of Thunder Bay recently completed a 24.0 km Crone PEM survey which covered 2.2 km of stratigraphic strike length and centred on the known HLEM anomaly. A detail survey was also carried out in order to establish ideal survey coupling and hence obtain maximum survey data over the known conductive horizon. The Slate Lake Horizon was defined as having limited strike length(approx. 200 m) with high conductances. No other significant anomaly was detected within the survey area.

A single hole that would test the Slate Lake Horizon at a vertical depth of 300 meters is recommended. Such a hole is warranted for the following reasons:

1) To test a base metal rich horizon down-dip/down plunge and below PEM depth.

2) To test a mineralized horizon and footwall stratigraphy for hydrothermal alteration. Positive results either in drill core or Borehole PEM survey would determine whether or not addition deep hole drilling is warranted.

1.0 INTRODUCTION

During the period January 28 to February 13, 1995 Crone Geophysics of Toronto carried out a program of pulse electromagnetic (PEM) surveying on behalf of Cumberland Resources Ltd. over a portion of its Slate Lake Property. In order to facilitate this survey a total of 26.25 kms of grid lines were constructed or refurbished by Vytll Explorations Services of Thunder Bay. All contractors and personnel involved in the survey are listed in Table 1

A total of 23.85 km of surface PEM was completed across the target area using two (2) transmitter loops with dimensions of 1100 x 1000m, and one smaller loop measuring 900 X 500m. The latter loop was utilized to obtain more detail characteristics of the known conductive horizon.

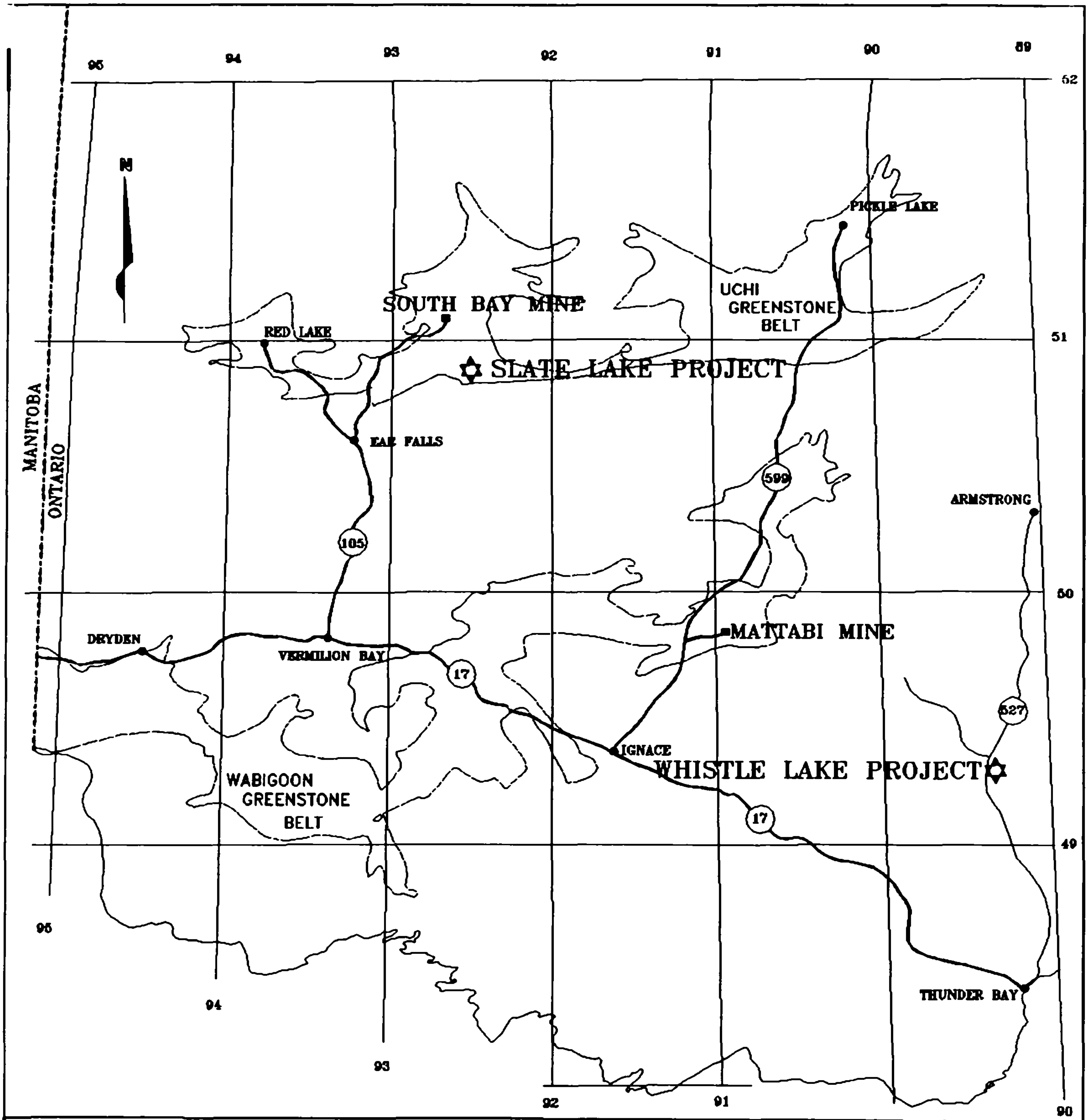
This report describes the survey methods and survey parameters, as well as, the presentation format and discusses the results of the PEM survey.

2.0 LOCATION, SIZE AND ACCESS

The Slate Lake property is located 60 km northeast of the town of Ear Falls and 90 km east of the mining community of Red Lake in Northwestern Ontario (Figure 1).

The property is comprised of nine(9) contiguous unpatented mining claims, totalling 44 units, in addition to six(6) mining lease claims that are part of an option agreement with Breakwater Resources Ltd Figure 2.

Access to the property area is provided by an all-weather logging road to within 0.5 km to Slate Lake and then by motorized boat or snowmobile to the southern portion of the property.



CUMBERLAND RESOURCES LTD.

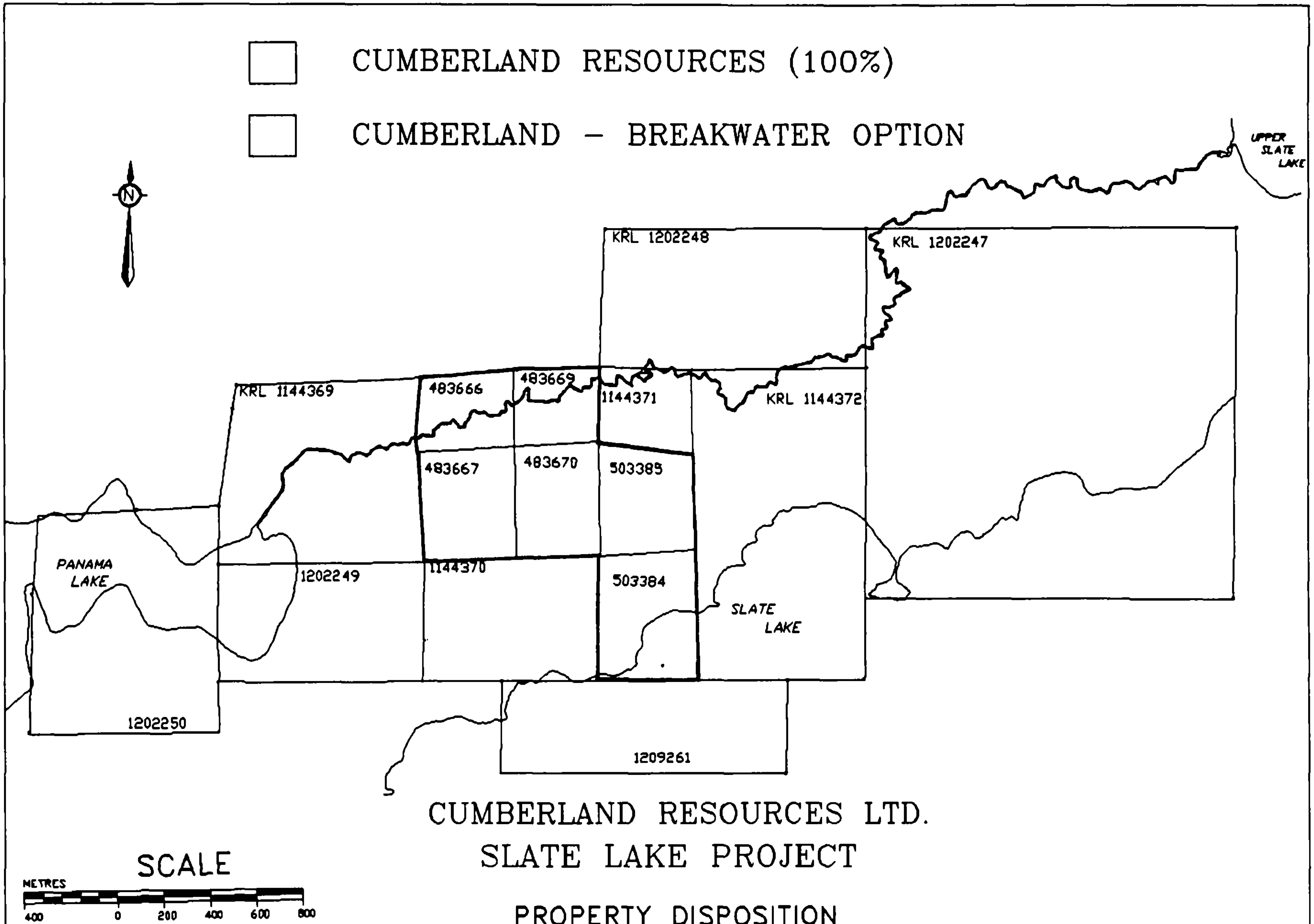
PROPERTY LOCATION

SLATE LAKE PROJECT

KMS

50 0 25 50 75 100

FIGURE 1



CUMBERLAND RESOURCES LTD.
SLATE LAKE PROJECT
PROPERTY DISPOSITION

FIGURE 2

TABLE I

LIST OF CONTRACTORS AND OTHER PERSONNEL

VYTLL EXPLORATION SERVICES 4283 LOCK LOMOND ROAD THUNDER BAY, ONTARIO P7C 4Z2 1-807-475-7383	LINECUTTING CONTRACTOR
CRONE GEOPHYSICS 3607 WOLFEDALE ROAD MISSISSAUGA, ONTARIO 1-905-270-0096	GEOPHYSICAL CONTRACTOR
Mr. BRAD MALPAGE TORONTO, ONTARIO	OPERATOR
Mr. PATRICK LEWIS THUNDER BAY, ONTARIO 1-807-767-0259	SUPERVISOR AND FIELD ASSISTANT
Mr. SCOTT McCRINDLE THUNDER BAY, ONTARIO 1-807-344-6598	FIELD ASSISTANT
Mr. BILLY HUNTER CORMORANT, MANITOBA	FIELD ASSISTANT

3.0 PROPERTY SUMMARY AND CLAIM DISPOSITION

The Slate Lake property is located in the Slate Lake Area, Map Sheet G-1884 and consists of 50 contiguous unpatented and leased mining claims (Figure 2). Schedule of claims is of follows:

TABLE II: SCHEDULE OF CLAIMS

CLAIM BLOCK	NO. OF UNITS	RECORDING DATE
CUMBERLAND RESOURCES LTD - 100%		
1144369	4	March 16, 1994
1144370	2	March 16, 1994
1144371	1	March 16, 1994
1144372	6	March 16, 1994
1202247	16	March 18, 1994
1202248	6	March 18, 1994
1202249	2	March 18, 1994
1202250	4	March 18,1994
1209261	3	June 22,1994
CUMBERLAND RESOURCES - BREAKWATER OPTIONED CLAIMS		
483666	1	
483667	1	
483669	1	
483670	1	
503384	1	
503385	1	
Total	**50**	

4.0 PREVIOUS WORK:

In 1979 St. Joseph Exploration Ltd., the predecessor to Breakwater Resources, carried out a regional airborne survey over the Slate Lake area. Subsequent ground follow-up, which included geological mapping, magnetometer and HLEM survey and diamond drilling, resulted in the discovery of a high-grade massive sulphide horizon immediately south of Panama Lake and north of Slate Lake.

In 1979-80 four closely spaced holes were drilled by St. Joseph Exploration to test a 900 m long HLEM anomaly. All holes intersected massive sulphide over narrow width containing significant base metal values. One of the deeper holes intersected 8.70% Cu, 7.05% Zn and 2.17 opt Ag over 0.50m.

During the summer of 1994 Cumberland Resources carried a reconnaissance geological mapping survey, in addition to whole-rock geochemistry over most of the Slate Lake property.

4.0 SUMMARY OF LOCAL GEOLOGY:

Mapping by Cumberland Resources indicate that the Slate Lake property is underlain by a succession of east-west striking, near vertical dipping, felsic and mafic volcanic rocks. The felsic rocks consist of finely bedded ash tuff with lesser coarse pyroclastic rocks which occupy an area north and south of Panama Creek. The mafic flows, which are andesitic in composition, occur along the north shore of Slate Lake. These mafic flows are intruded by sheet-like and conformable mafic dykes.

Mineralization in the form of finely disseminated pyrite has been observed in felsic outcrops. Diamond drilling has encountered pyrite, pyrrhotite mineralization with significant base metal values.

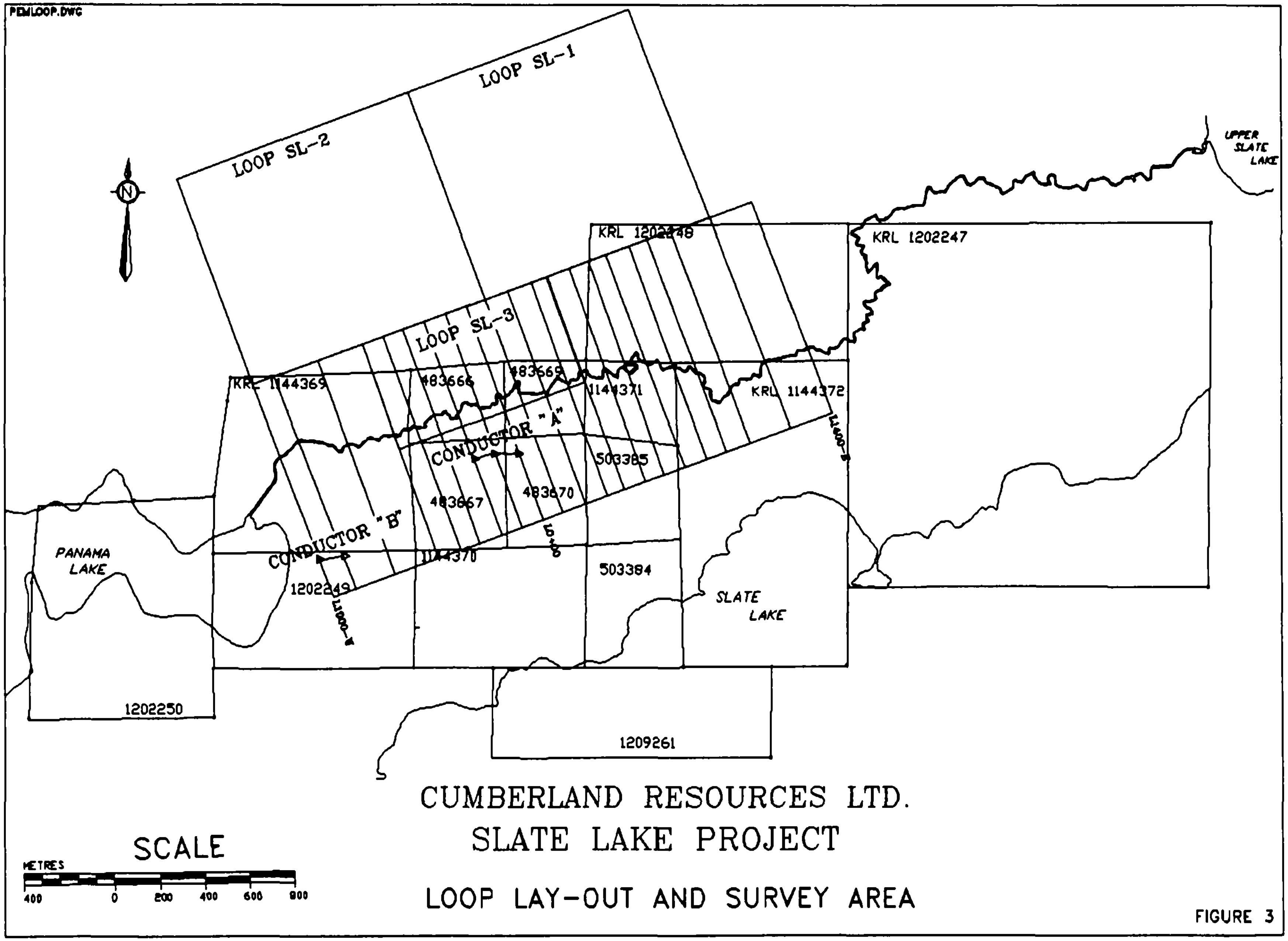
5.0 SURVEY DESCRIPTION AND DATA PRESENTATION

The Slate Lake property PEM or time-domain survey was carried out utilizing three transmit loops (Figure 3) which were powered by a Crone 4800 watt generator and transmitter. The receiver, which is moved along the survey line, consist of a analogue Datalogger which records secondary field information at 20 time windows. Detail description of the Crone PEM system is appended.

At each 25 meter station the operator measures the time derivative of the vertical component (Z) of the secondary magnetic field using a ferrite coil sensor, which is orientated in a vertical position . The sensor is then orientated parallel to the survey line and the horizontal component (X) is measured. Data is stored digitally and later dumped on to a portable computer.

A simple near vertical tabular conductor traversed at right angles will produced a single peak anomaly on the horizontal or x-component channels and a cross-over anomaly on the vertical or the Z-component channels. The conductivity of a conductive source is related to the time (decay time) it takes for the secondary field in the conductor to drop to zero. This decay time is usually reflected in the number of channel or window responses. Shallow , poorly conductive sources will produce responses in the early channels only, while shallow high conductivity sources will produce a response in all the channels. Shallow conductors will produce sharp narrow anomaly responses. A deep conductor will generally produce a response on all channels and such a response will be broad.

The survey data for the Slate Lake survey area is presented as a series of stacked profiles with the interpreted anomaly intercepts indicated on the horizontal component and the fraser filtered vertical component maps. Logistics Report by Crone Geophysics , which include individual line profiles, is appended as Appendix 1.



CUMBERLAND RESOURCES LTD.
SLATE LAKE PROJECT

LOOP LAY-OUT AND SURVEY AREA

FIGURE 3

6.0 SURVEY RESULTS:

Interpretation of the survey data has been assisted by conversations with and from brief written comments from Crone's chief geophysicist. Significant anomalous responses have been given an alphabetical designation with the conductor axis identified by a heavy dashed line on the horizontal component and fraser filtered vertical component maps.

The bulk of the PEM survey was carried-out utilizing two adjacent 1100 x 1000 meter loops that facilitated the surveying of 2.2 km of favourable stratigraphy. A number of conductive reponses are interpreted to be near surface, of very low conductances and are probably related to overburden, shears or faults. Only conductors A and B have high enough conductances to be sulphide related. Conductor "A" represents the known target area and is very clearly defined by a detailed survey (Loop #3). The detail loop location set up a much stronger eddy current, producing a very strong secondary field. Conductor "B" is open to the west and is actually strongest on the most westerly surveyed line. Additional surveying is required to define the true nature of this conductor. Conductors "A" and "B" are interpreted to contain the following characteristics:

CONDUCTOR	LOCATION	CONDUCTANCES	DEPTH TO TOP
A	200W, 390N	50 MHOS	SUBCROP
	100W, 370N	50 MHOS	SUBCROP
	00 , 350N	50 MHOS	SUBCROP
B	1000W, 200N	10-15 MHOS	50 m

7.0 CONCLUSIONS AND RECOMMENDATIONS

The DEEPEM survey over a portion of Cumberland Resources LTD's. Slate Lake property detected a number of overburden or shear related conductors. Two conductors have high enough conductances to be sulphide related. Conductor "A", which has been previously drill tested and is known to be associated with significant base metal mineralization, is strongly defined on three survey lines over a 200 meter strike length. This conductor has excellent conductances of 50 mhos, is located at or very close to surface on line 100W and is interpreted to plunge steeply on either side of L100W. This conductor (HLEM) was drill tested by a number of short drill holes in 1979-80 with the deepest hole(vertical deep of 130m) encountering 8.70% Cu, 7.05% Zn and 2.17 opt Ag over 0.50 meters. The limited strike length of this conductive sheet could be explained as an accumulation of base metal-rich sulphides along a localized fissure. Potential exist for greater accumulations at or below pulse depth along this inferred structure.

Conductor "B" was not completely defined, is of low conductance, and requires addition surveying in order to ascertain its complete characteristics.

A single hole to test Anomaly "A" at a vertical depth of at least 300 meters is recommended Figure 4. Such a hole is warranted for the following reasons:

1) To test a base metal rich horizon down-dip/down plunge and below PEM depth.

2) To test a mineralized horizon and footwall stratigraphy for hydrothermal alteration. Positive results either in drill core or Borehole PEM survey would determine whether or not addition deep hole drilling is warranted.

Respectively submitted,

Patrick Lewis

Patrick Lewis

SLLONG

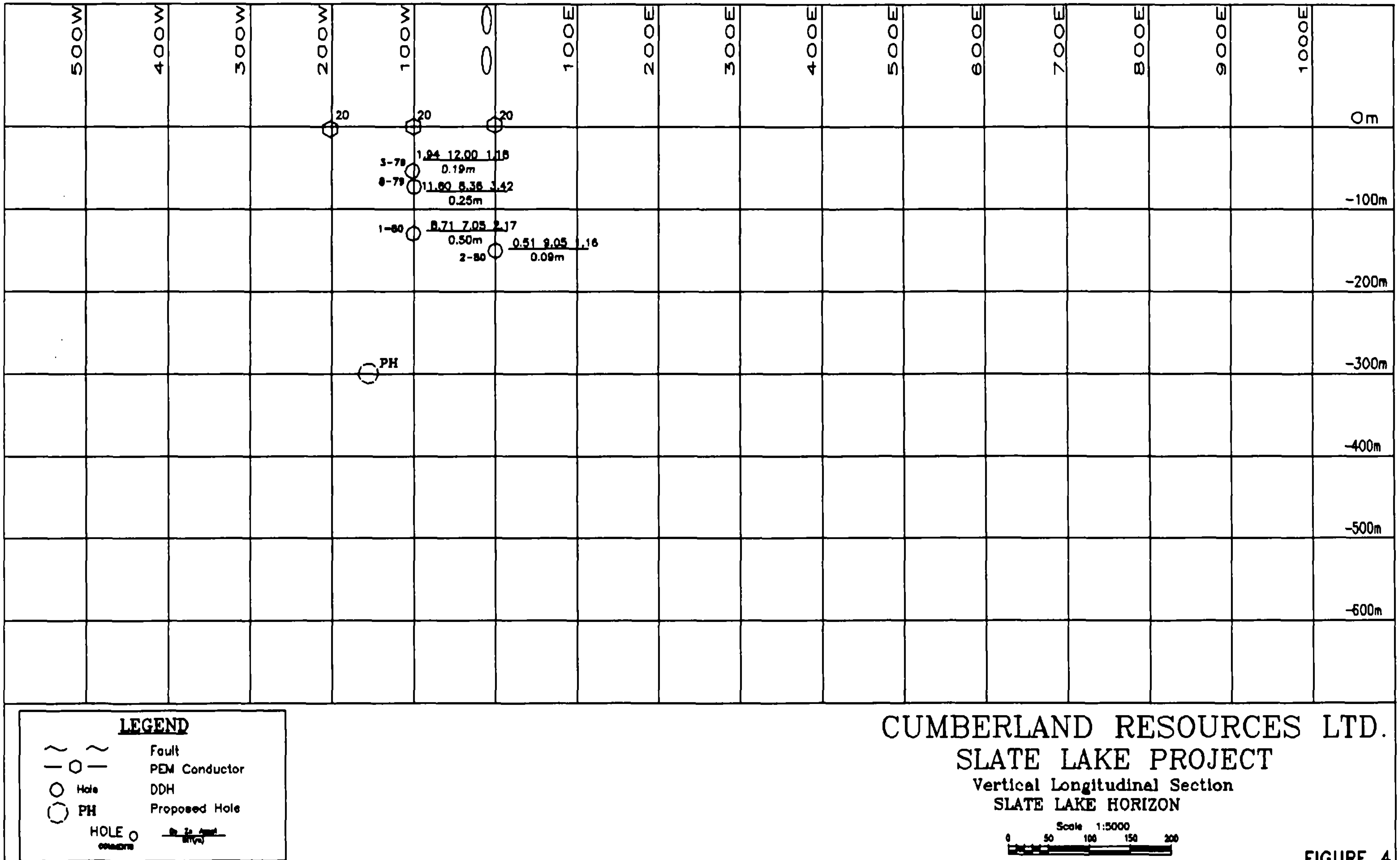


FIGURE 4

APPENDIX 1

LOGISTICS REPORT

BY

CRONE GEOPHYSICS

LOGISTICS REPORT
FOR
CUMBERLAND RESOURCES LTD.

BY
CRONE GEOPHYSICS & EXPLORATION LTD.

Survey Area:	**Slate Lake, Ear Falls, Ontario**
Survey Loops:	**SL-1, SL-2, SL-3,**
Survey Type:	**Surface Pulse EM Survey**
Report By:	**Brad Malpage, Survey Operator March 28, 1995**

LOGISTICS REPORT

Introduction

This field report covers the survey procedures and parameters for the surface PEM survey carried out for Cumberland Resources on the Slate Lake Property near Ear Falls Ontario. Three loops were surveyed: SL-1, SL-2 and SL-3. This report also contains an operator journal and comments.

Survey Equipment

The equipment used on the survey was the Crone Pulse EM system including a 4.8 kW transmitter and an 11HP motor generator. This gave 16 to 20 amps through the transmit loops. 10 gauge transmit wire was used.

Survey Procedure

The grid was read using the DEEPEM mode of surveying. In this method lines are read outside a large rectangular fixed loop and perpendicular to the long side of the loop. The in-line horizontal and the vertical component were recorded at 25 metre station intervals along lines 200 meters apart. No corrections are required for the data collected. Line profiles were produced on site at the end of each survey day and the digital data stored on diskettes.

Survey Parameters

SLATE LAKE PROPERTY

Loop SL-1	:1100 m x 1000 m	
Co-ordinates	1. 1+00E,10+50N	2. 12+00E,10+00N
	3. 12+00E,20+00N	4. 1+00E,20+00N
Current	:16	
Time Base	:16.66 ms	
Ramp Time	:1.0 ms	
Sync	:crystal clock	

Loop SL-2	:1100 m x 1000 m	
Co-ordinates	1. 1+00E,10+50N	2. 1+00E,20+00N
	3. 10+00W,19+50N	4. 10+00W,10+65N
Current	:18.5	
Time Base	:16.66 ms	
Ramp Time	:1.0 ms	
Sync	:crystal clock	

Loop SL-3	:900 m x 500 m	
Co-ordinates	1. 5+00W,10+50N	2. 5+00W,5+00N
	3. 4+00E,5+00N	4. 4+00E,10+25N
Current	:19.5	
Time Base	:16.66 ms	
Ramp Time	:1.0 ms	
Sync	:crystal clock	

Operator Journal

January 28: Drove to the Slate Lake Property. We got the equipment into the first TX location and finished laying out loop SL-1. I broke lines.

survey charge

January 29: Read lines on Slate Lake (SL-1) loop.
L1+00E from 10+50N to 0+00N
L2+00E from 10+00N to 0+00N
L3+00E from 10+00N to 0+00N

survey charge

January 30: The Honda motor generator seized up today. I could not survey today. Called the office and they cannot get another generator sent to me until tomorrow.

down day N/C

January 31: Drove to Dryden to pick up new motor at airport. It will not arrive until 2:30PM.

down day N/C

February 1: Read lines from SL-1.
L4+00E from 10+50N to 0+00N
L5+00E from 10+50N to 0+00N
L10+00N from 10+50N to 4+00N

survey charge

February 2: Read lines from SL-1.
L6+00E from 4+00N to 0+00N
L7+00E from 9+75N to 0+00N
L8+00E from 9+75N to 0+00N
L9+00E from 5+00N to 0+00N

survey charge

February 3: Read lines from SL-1.
L9+00E from 5+00N to 0+00N
L10+00E from 9+50N to 0+00N
L12+00E from 9+50N to 0+00N
Also re-read station 2+75N on L6+00N and station 3+75N.
These readings did not look proper from the last days' survey.

survey charge

February 4: Read lines from loop SL-2.
L0+00E from 10+00N to 0+00N
L1+00W from 9+50N to 0+00N
Receiver gave low battery sign. Very cold today.

survey charge

February 5: The transmitter keeps kicking out. Spent about 1 hour trying to figure out the problem. It seems that it could be the alternator. Called the office to find out if that sounded like the problem. It was a possibility. They will be sending me another alternator.

down day N/C

February 6: Drove to Dryden airport to pick up new equipment.

down day N/C

February 7: Put new alternator on. The system works but not 100%. I am getting 6.5 amps out of the system. I decided to read a couple of lines to see what the data is going to look like. Read lines

L3+00W from 9+75N to 0+00N
L2+00W from 6+00N to 0+00N

Plotted the data and it looks fine. The anomalous zone shows up just like the other lines.

1/2 day charge

February 8: Went out with Pat. We surveyed as much as we could. Everything was going well. We were still only getting 6.5 amps but the readings were reliable. We read

L2+00W from 6+00N to 9+75N
L4+00W from 9+75N to 0+00N
L5+00W from 9+75N to 0+00N
L7+00W from 9+75N to 7+50N

and then the receiver locked up. The batteries went dead. When we got back to motel I tried everything to get the data out of the RX but could not retrieve it. The whole day was lost.

down day N/C

February 9: Scott and I went out and read lines

L2+00W from 9+75N to 6+00N
L4+00W from 9+75N to 1+00N

Had a problem with the receiver again. I got to 0+75N and the receiver locked up. I tried a few things to get the receiver to continue but could not. Came back to motel and dumped data. Called office and they arranged another receiver to be flown to Red Lake tomorrow.

1/2 day charge

February 10: Travelled to Red Lake to pick up new receiver.

down day N/C

February 11: I read lines

L9+00W from 6+00N to 0+00N
L7+00W from 10+00N to 0+00N
L5+00W from 10+00N to 0+00N

survey charge

February 12: I read lines

L10+00W from 5+75N to 0+00N

Finished reading from loop SL-2. Moved wire and hooked up loop SL-3.

I read lines

L4+00E from 4+50N to 0+00N

L3+00E from 4+50N to 0+00N

L2+00E from 4+50N to 0+00N

survey charge

February 13: I read lines

L1+00E from 4+50N to 0+00N

L0+00E from 4+50N to 0+00N

L1+00W from 4+50N to 0+00N

L2+00W from 4+50N to 0+00N

L3+00W from 4+50N to 0+00N

Packed up all equipment and got it out.

Done Slate Lake property.

survey charge

Respectfully submitted

Brad Malpage

APPENDIX

APPENDIX I
DATA PROFILES

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L1000W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 12, 1995	File name	: 10WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 48
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #102
Current	: 18 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

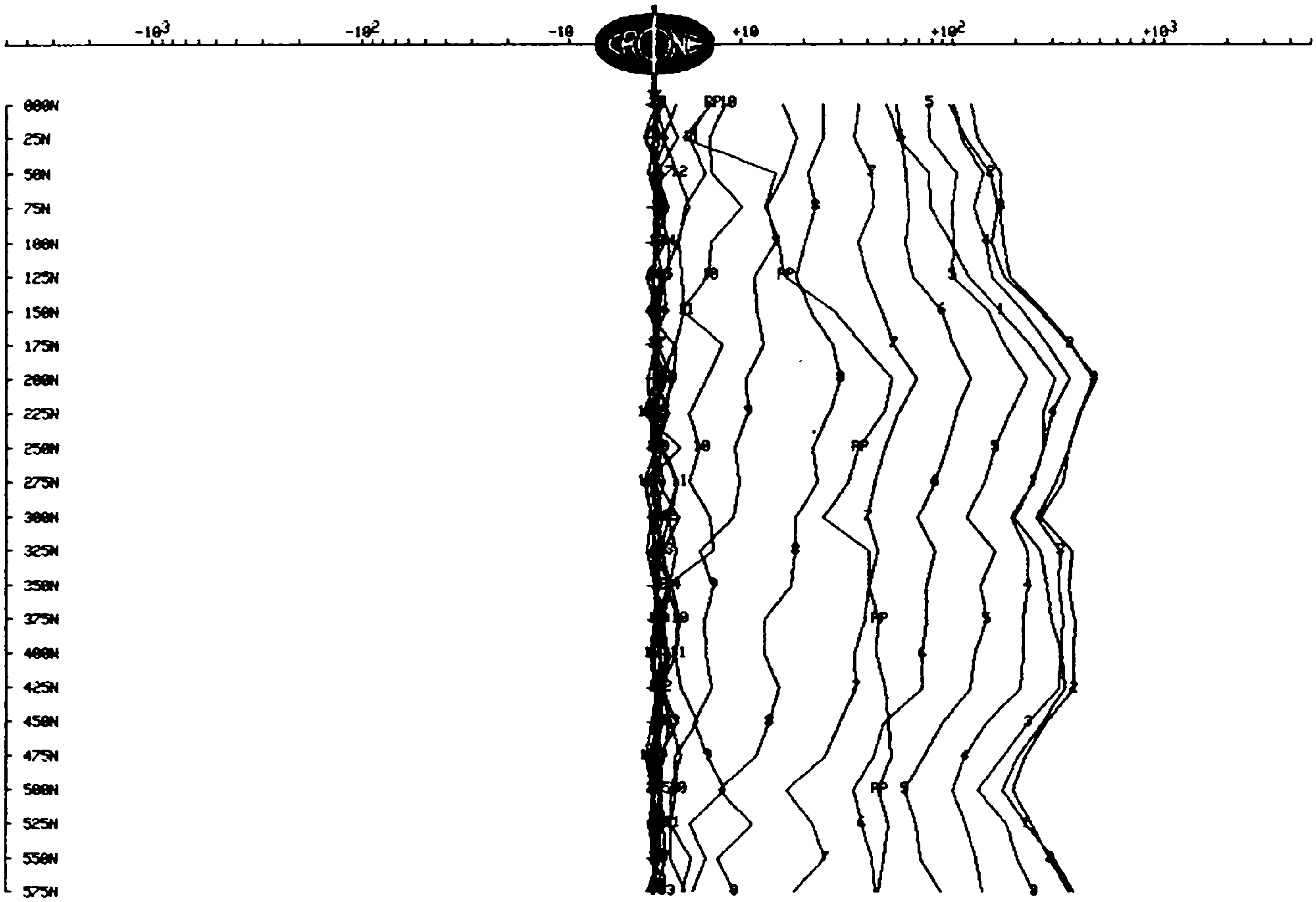
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD**	Line	:	**L1000W**
Grid	:	**SLATE LAKE**	Tx Loop	:	**SL-2**
Date	:	Feb 12, 1995	File name	:	10WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



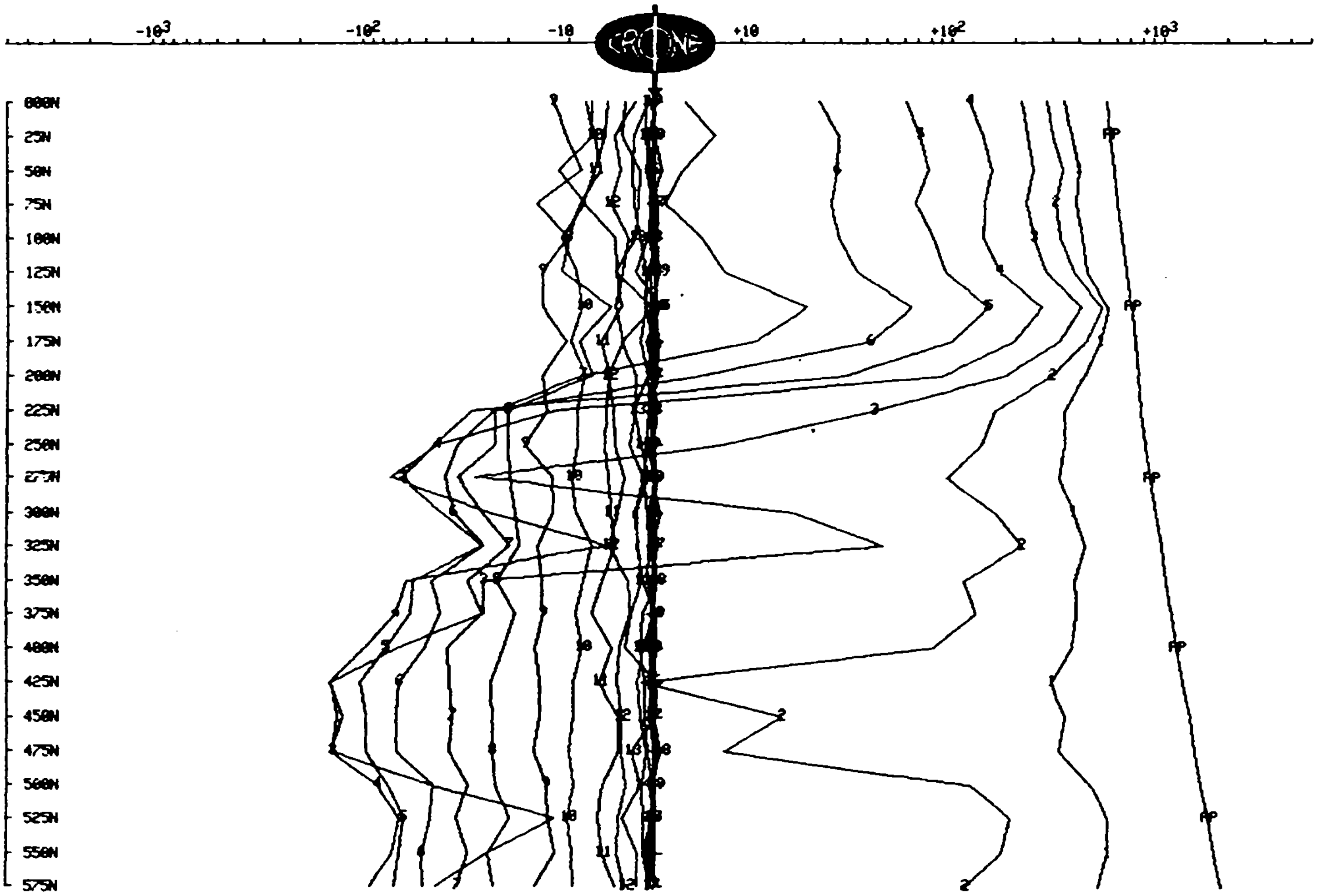
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L1000W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 12, 1995	File name	: 10WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L900W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 11, 1995	File name	: 9WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 56
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #102
Current	: 18.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

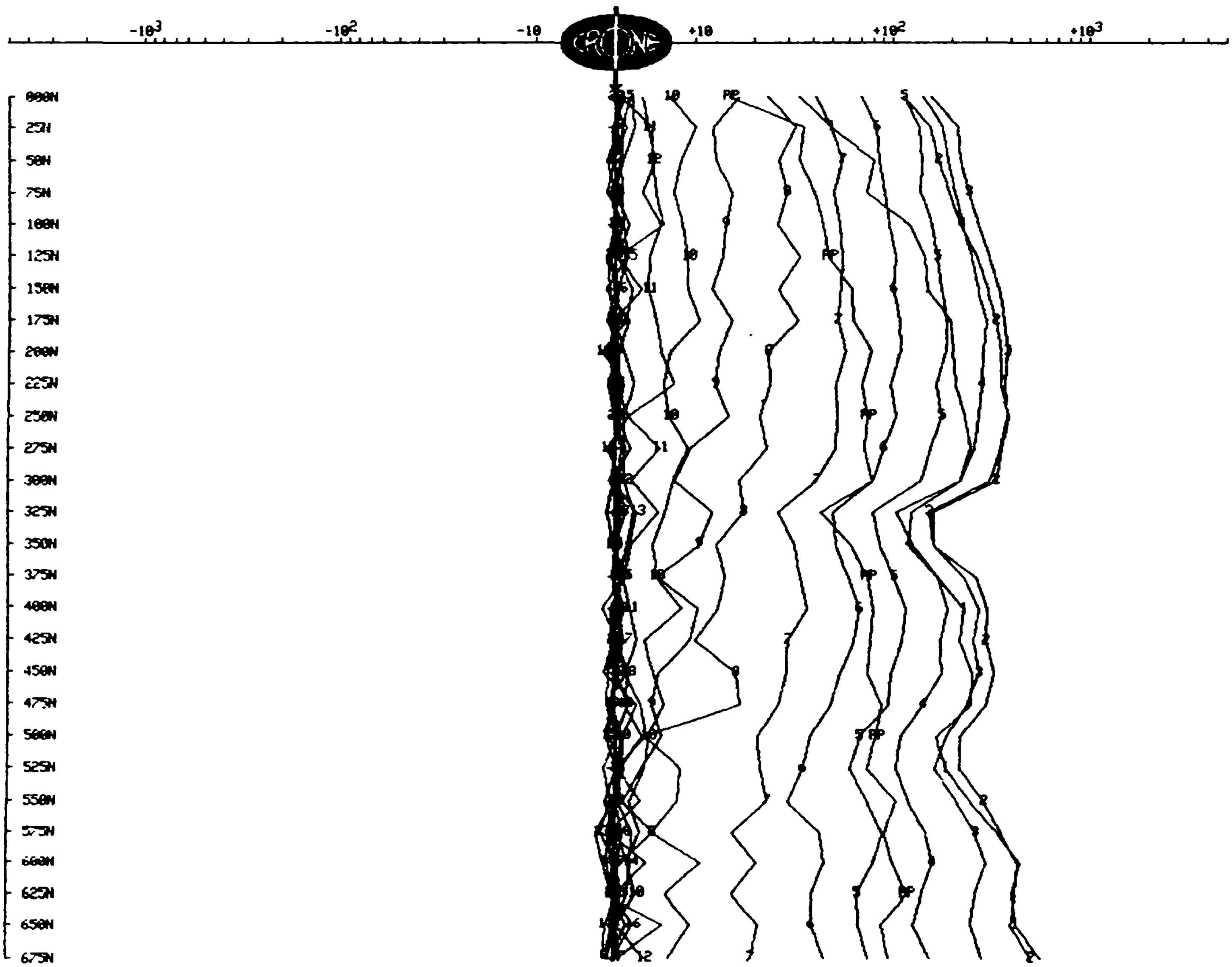
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L900W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 11, 1995	File name	: 9WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



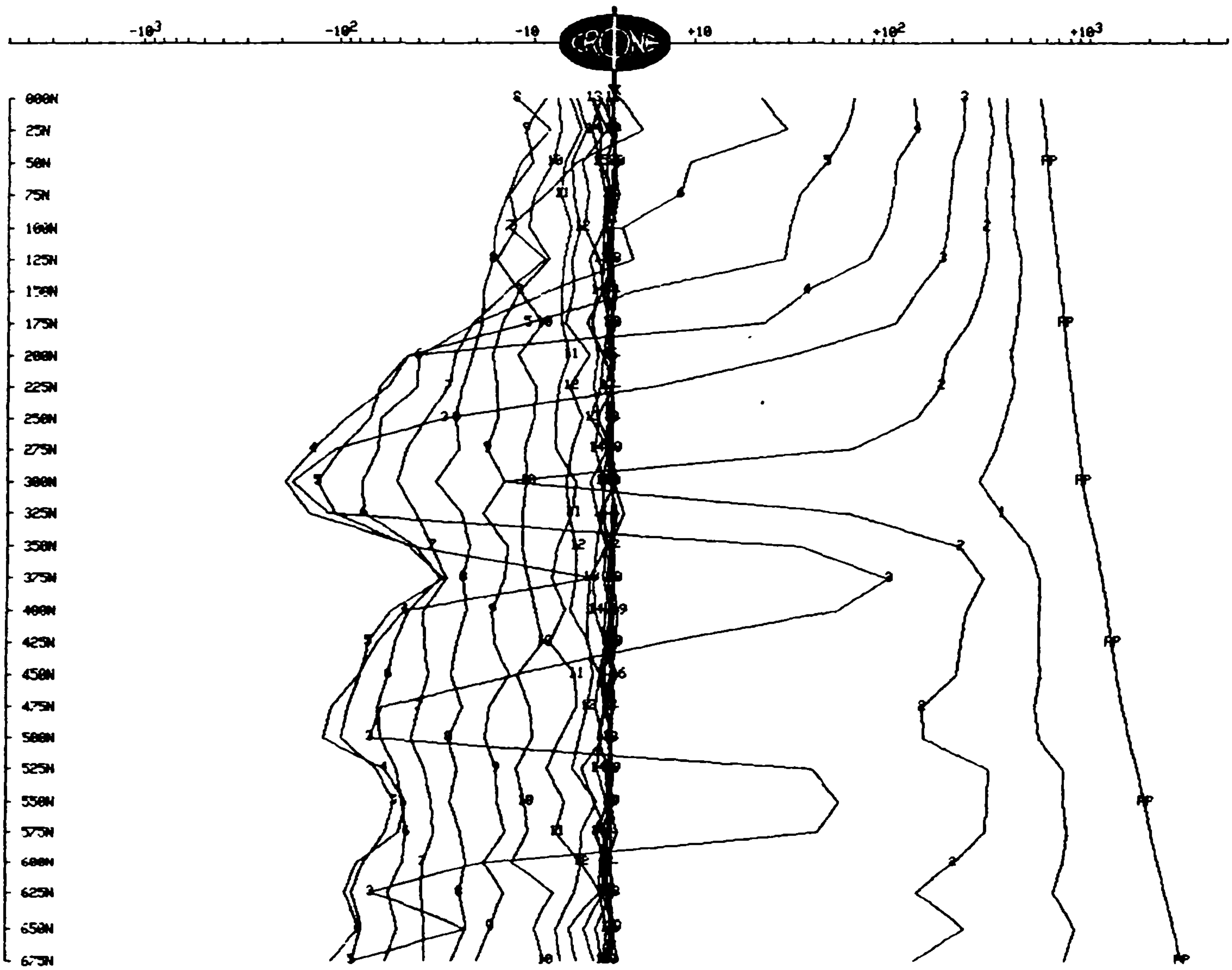
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L900W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 11, 1995	File name	: 9WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L700W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 11, 1995	File name	: 7WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #102
Current	: 18.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

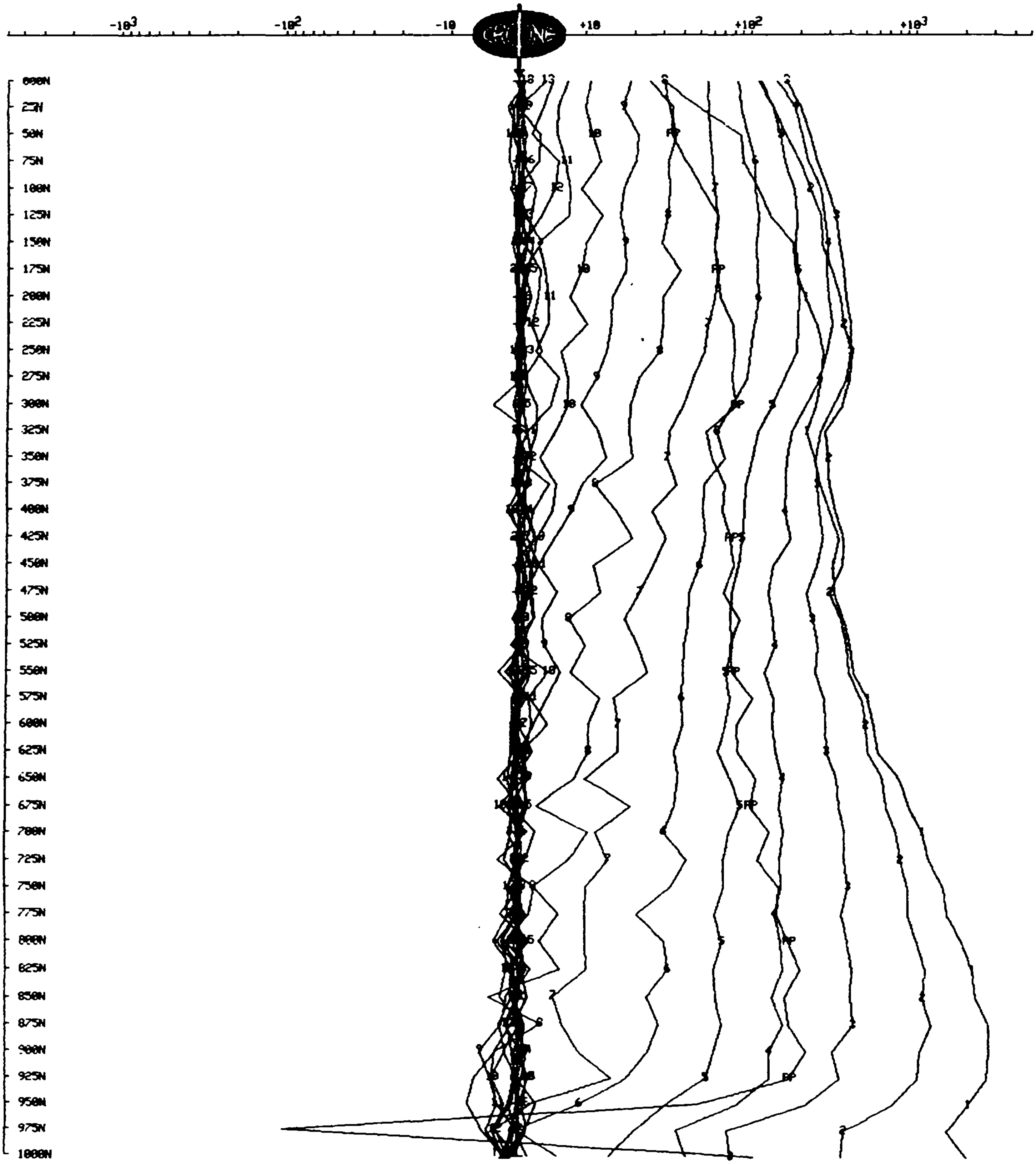
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L700W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 11, 1995	File name	: 7WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



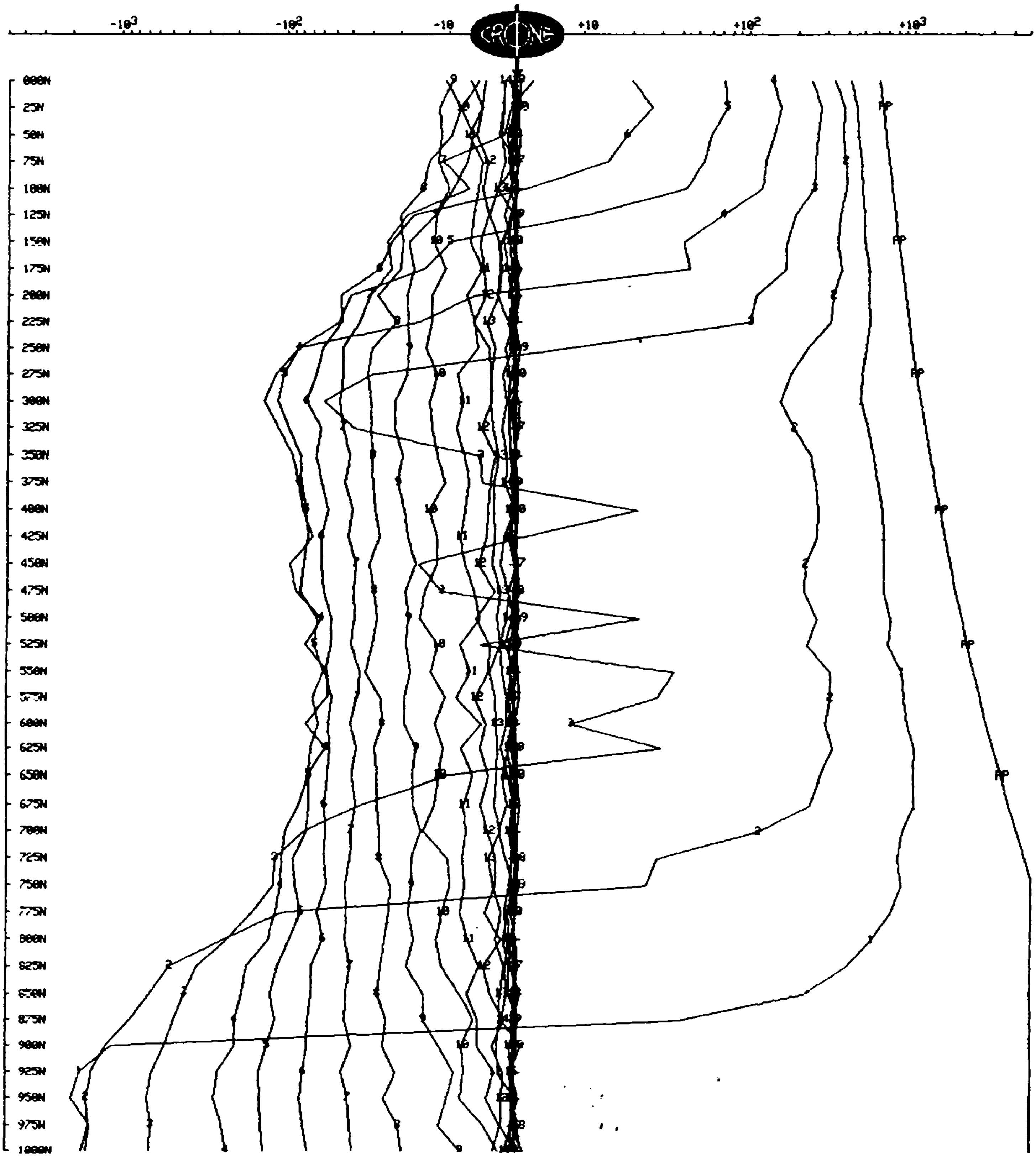
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L700W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 11, 1995	File name	: 7WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client : **CUMBERLAND RESOURCES LTD**
Grid : **SLATE LAKE**
Date : Feb 11, 1995
Time Base : 16.66 ms
Ramp Time : 1.00 ms
Channels: 20
Sync Type : Crystal(MASTER)
Loop Size : 1100m X 1000m
Current : 18.5 Amps

Line : **L500W**
Tx Loop : **SL-2**
File name : 5WSL2.PEM
Readings: 82
Stn Units : Metric
Coil Area : 4000 sq m
Polarity : +
Receiver : Digital #102
Operator : Brad Malpage

Loop Coordinates (X,Y,Z)
1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

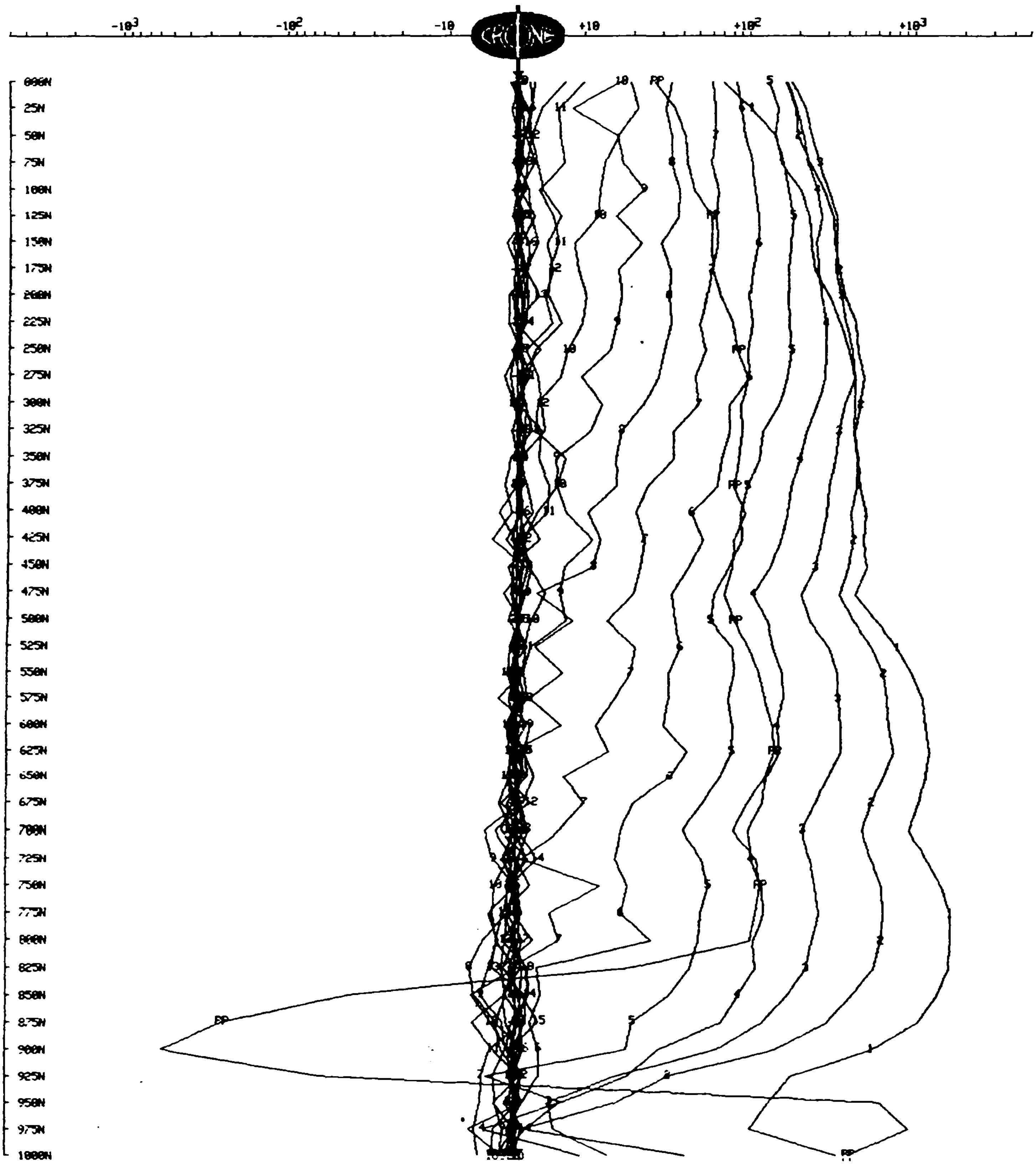
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L500W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 11, 1995	File name	: 5WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



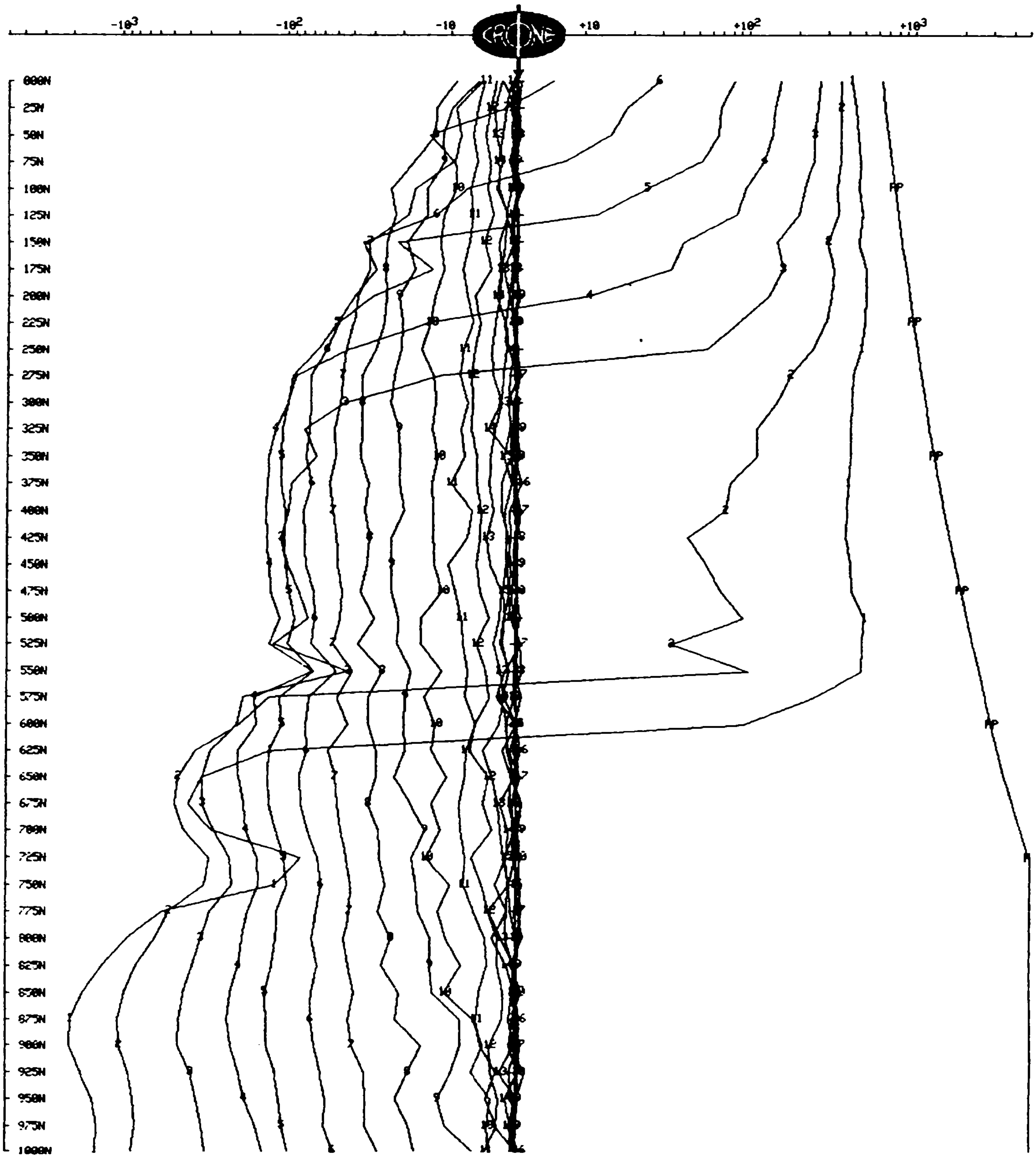
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L500W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 11, 1995	File name	: 5WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L400W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 9, 1995	File name	: 4WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 74
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 6.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

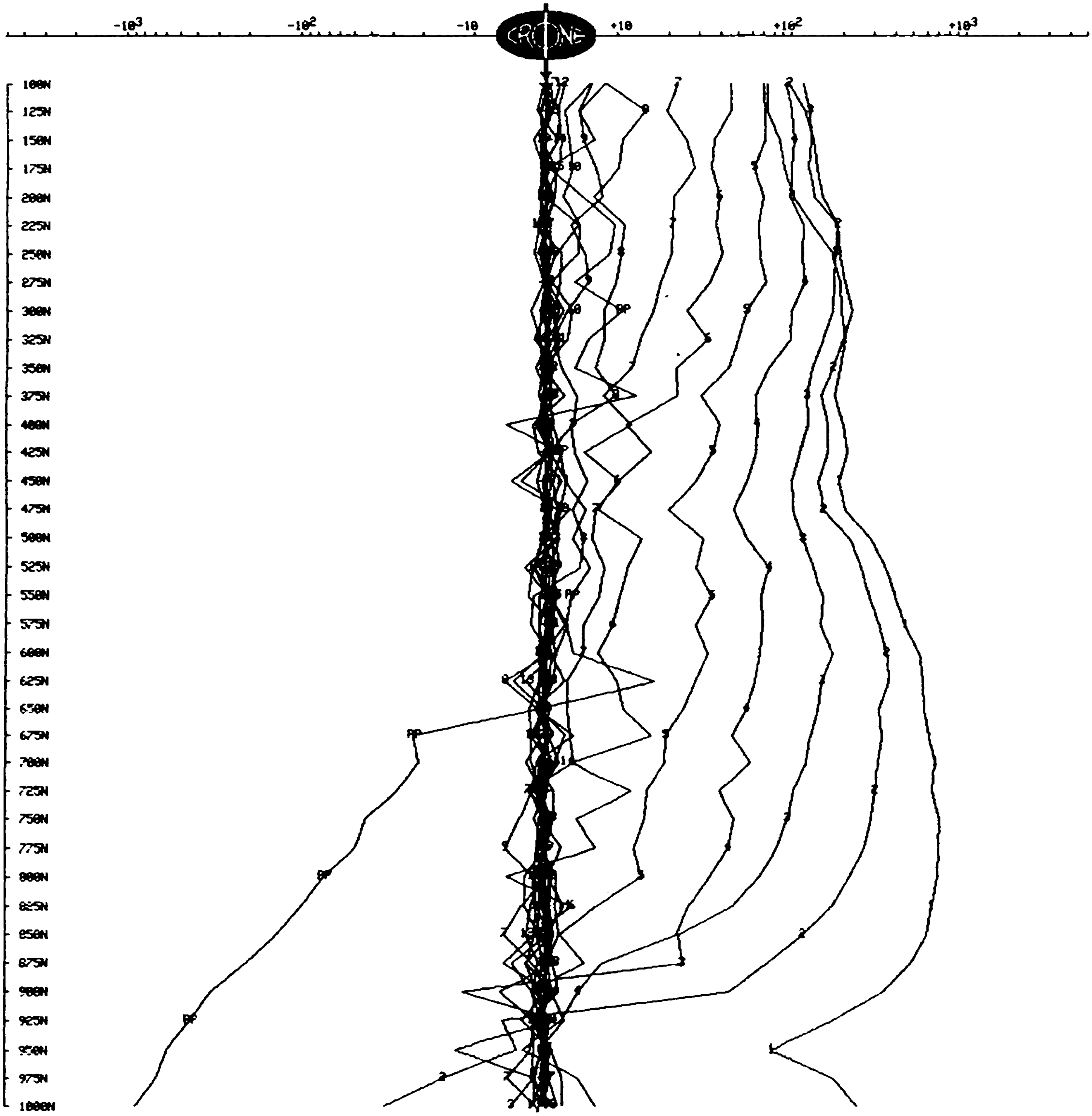
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD**	Line	:	**L400W**
Grid	:	**SLATE LAKE**	Tx Loop	:	SL-2
Date	:	Feb 9, 1995	File name	:	4WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



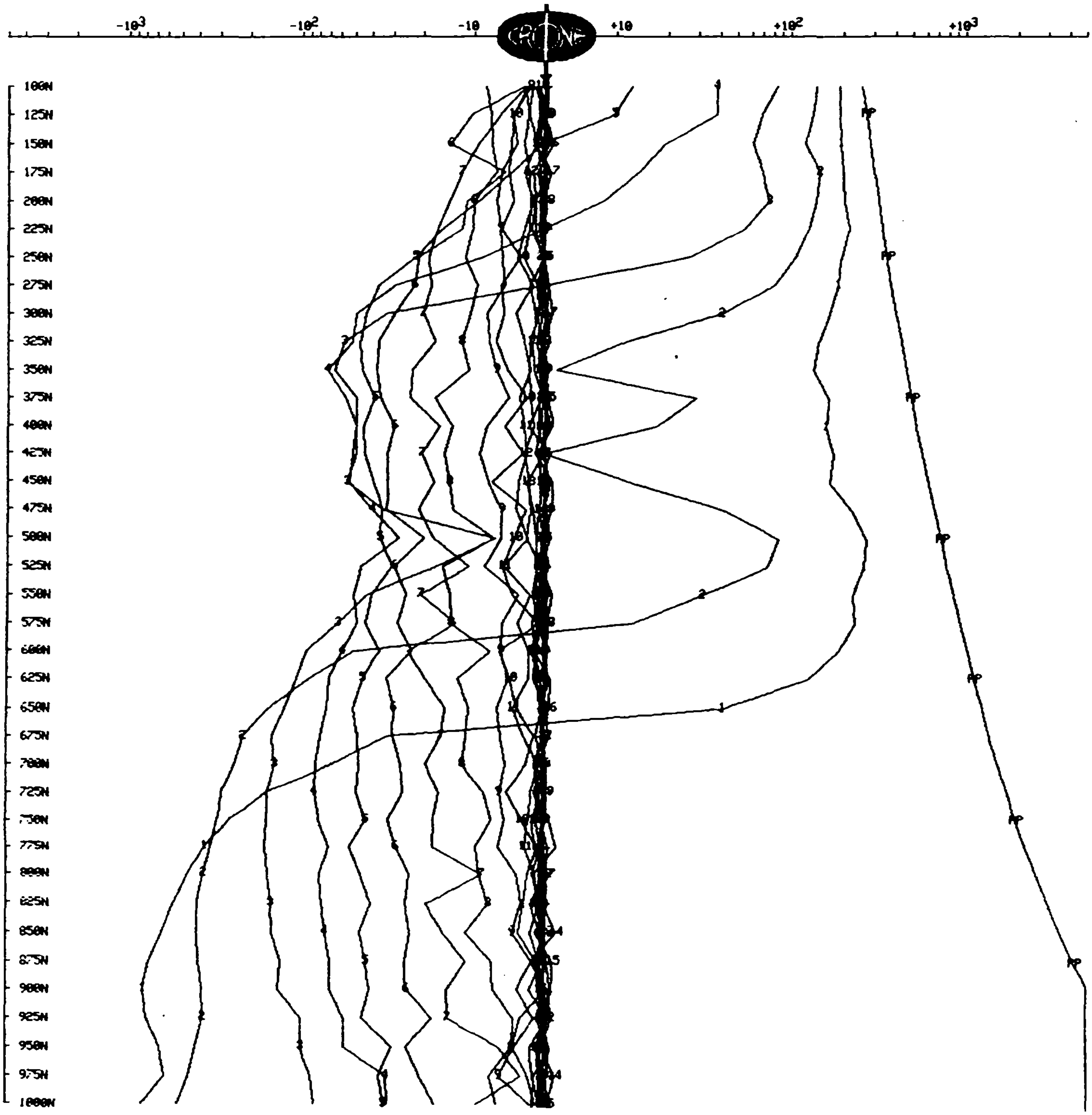
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L400W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 9, 1995	File name	: 4WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L300W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 7, 1995	File name	: 3WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 6.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

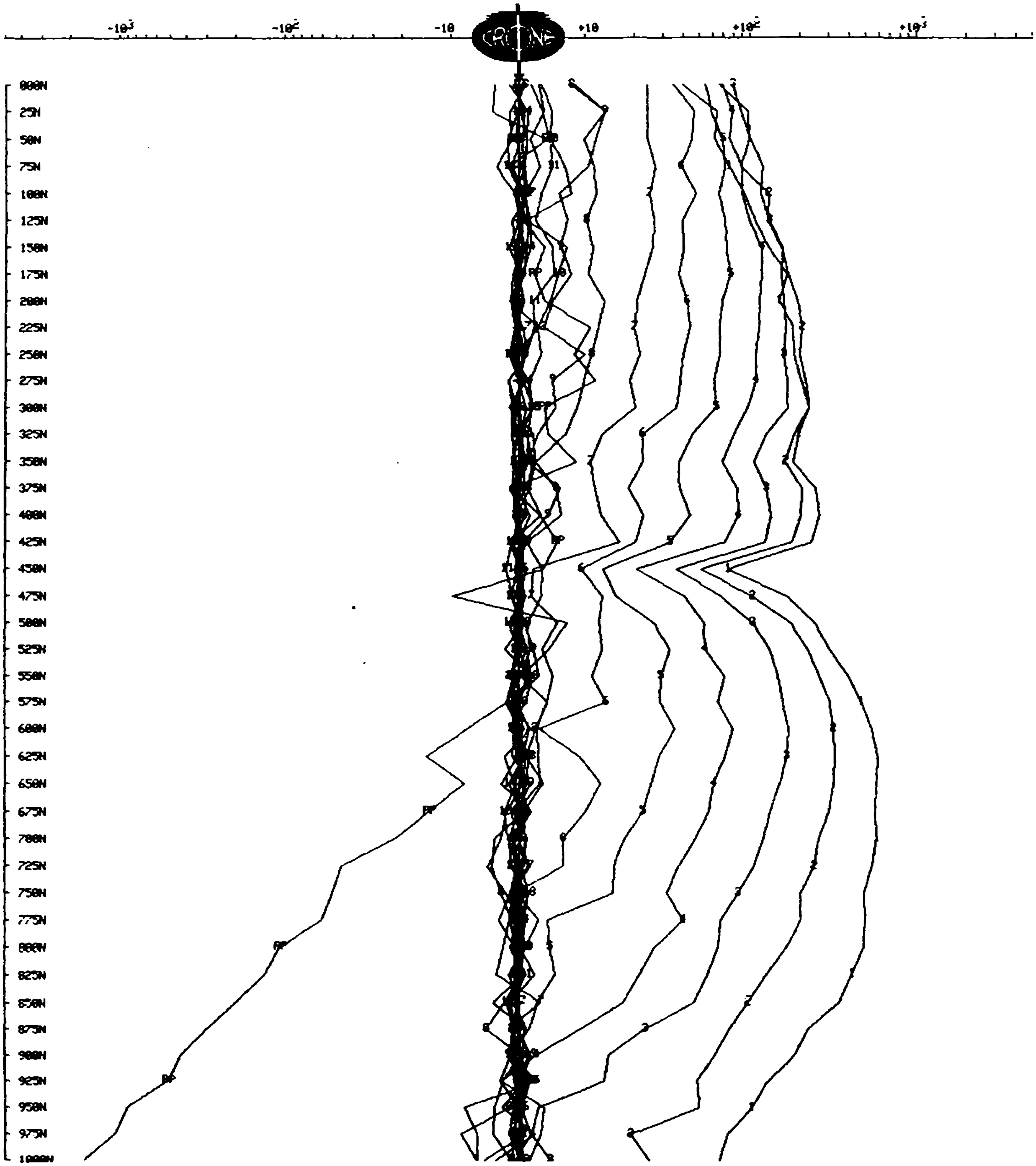
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD	Line	: L300W
Grid	: SLATE LAKE	Tx Loop	: SL-2
Date	: Feb 7, 1995	File name	: 3WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



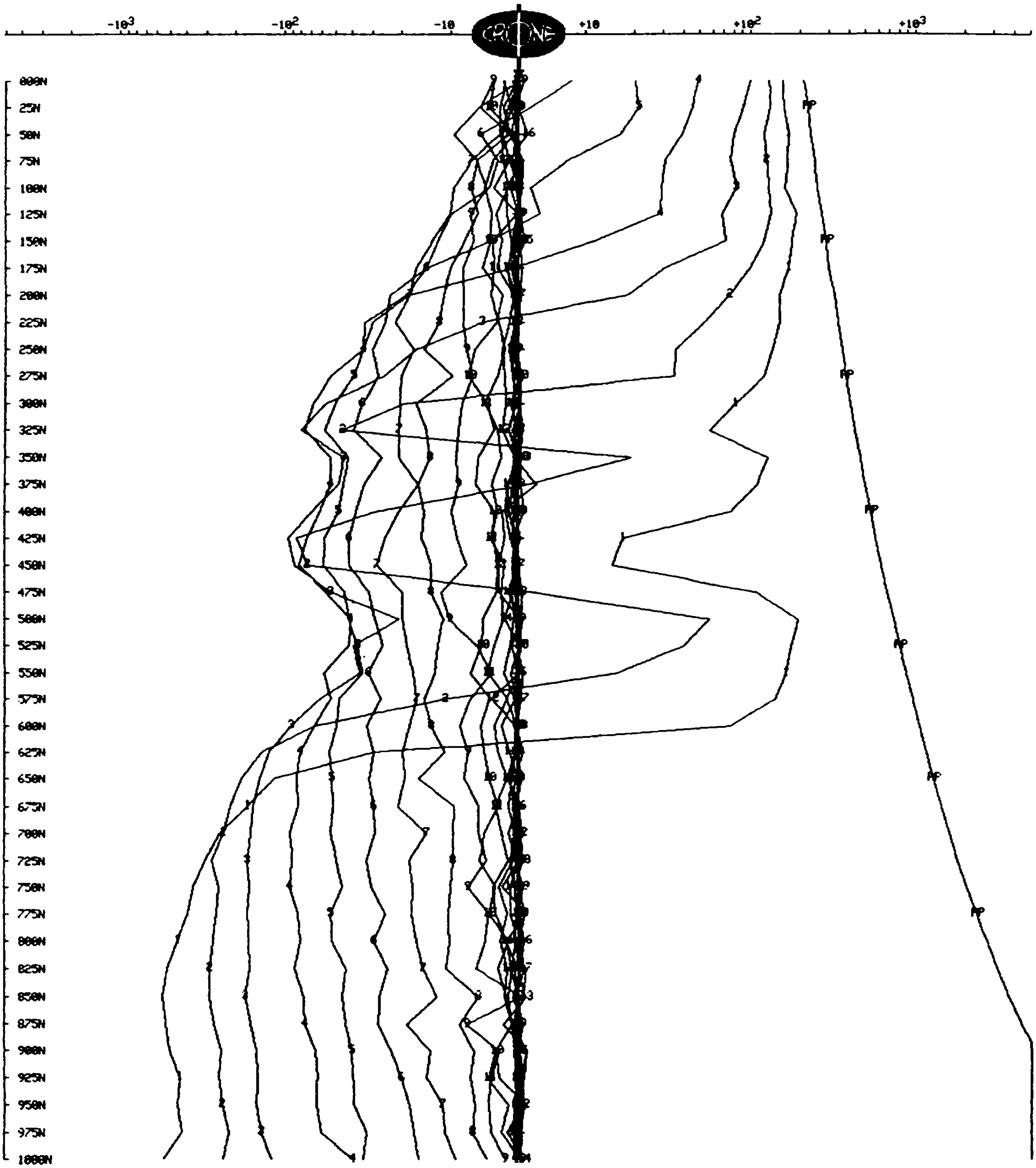
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L300W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 7, 1995	File name	: 3WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 3WSL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

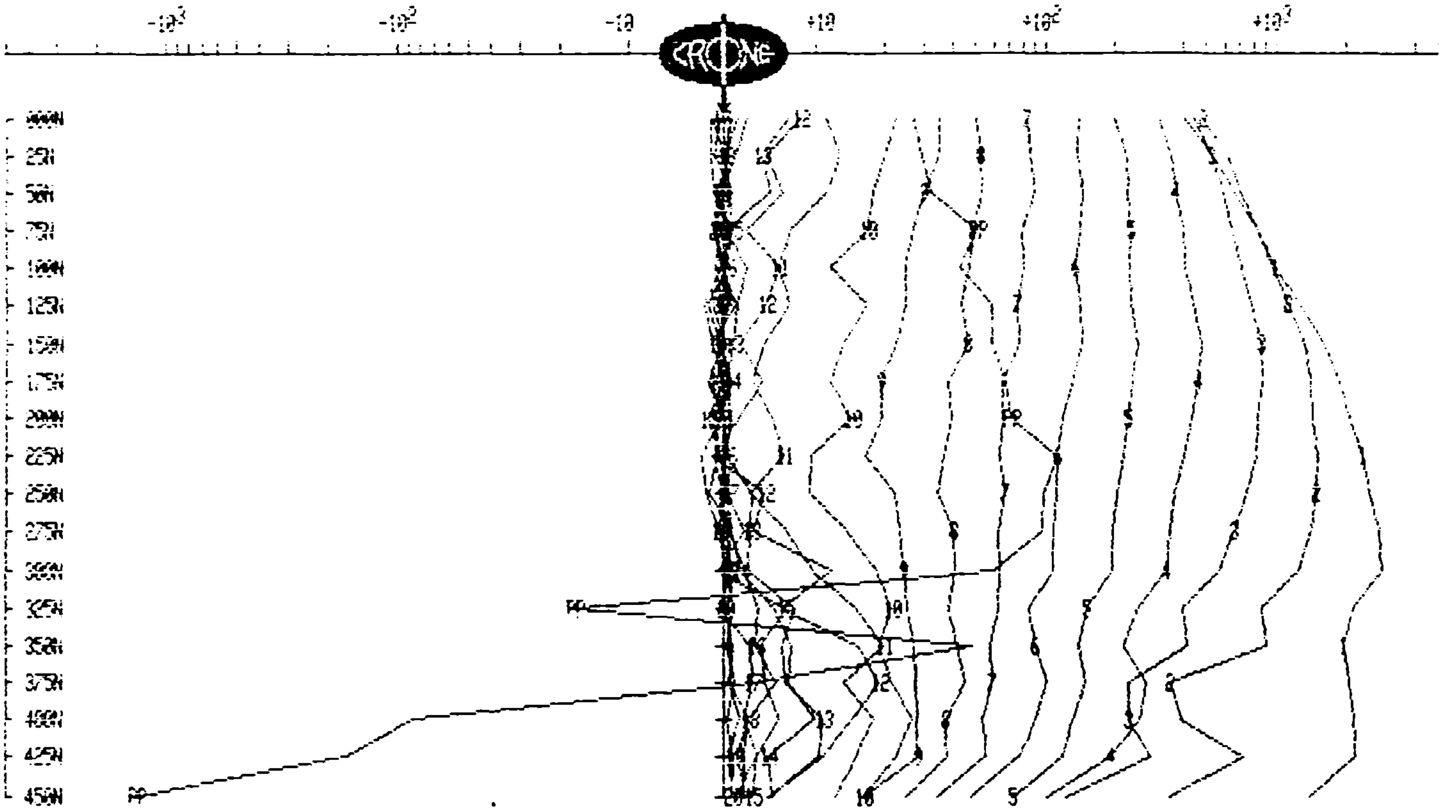
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 13, 1995	File name	: 3WSL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

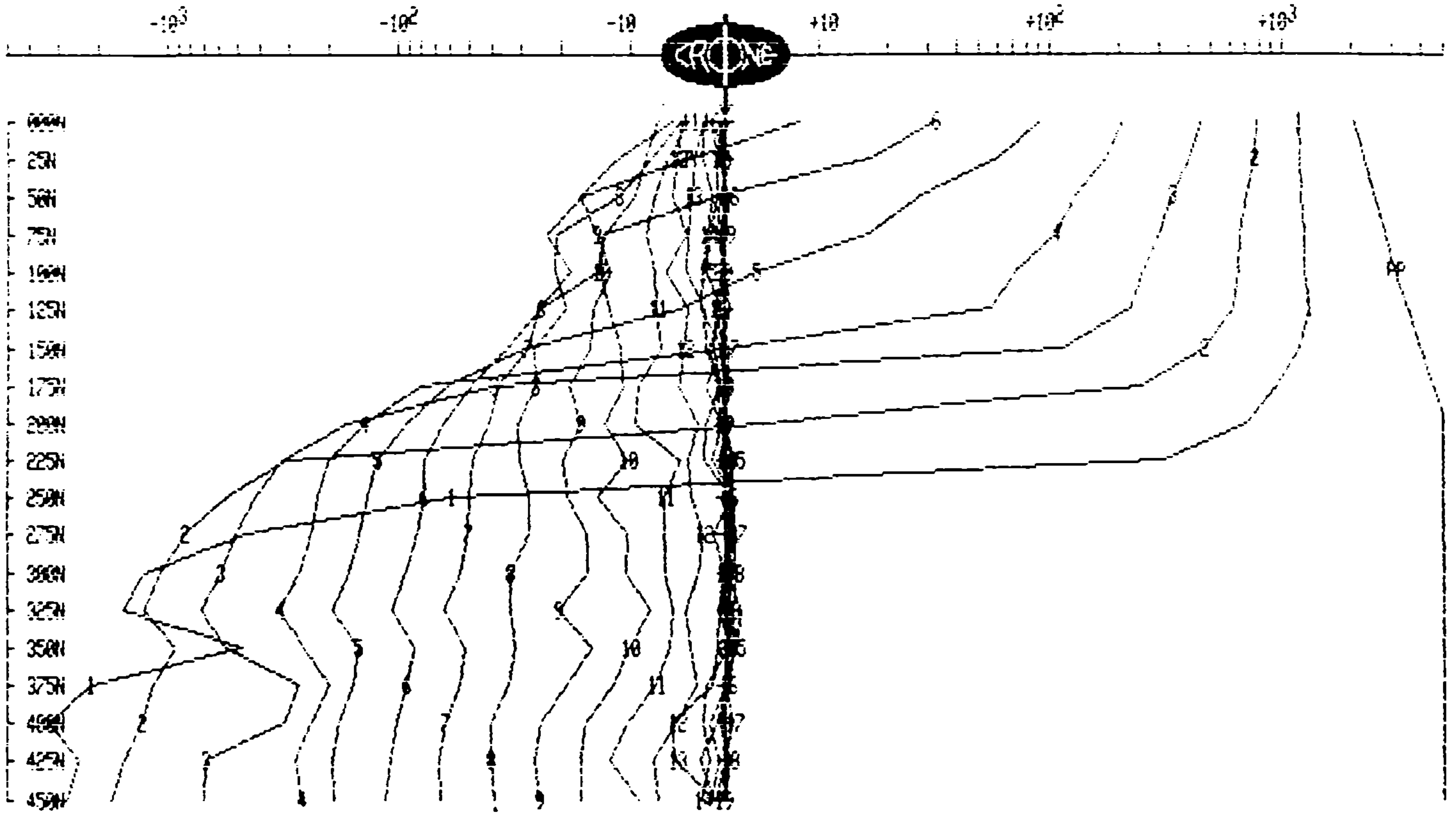
SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L300W
Grid	:	SLATE LAKE	Tx Loop	:	SL-3
Date	:	Feb 13, 1995	File name	:	3WSL3.PEM

Data Scaled by Factor of 1.00

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L200W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 7,9, 1995	File name	: 2WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 6.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

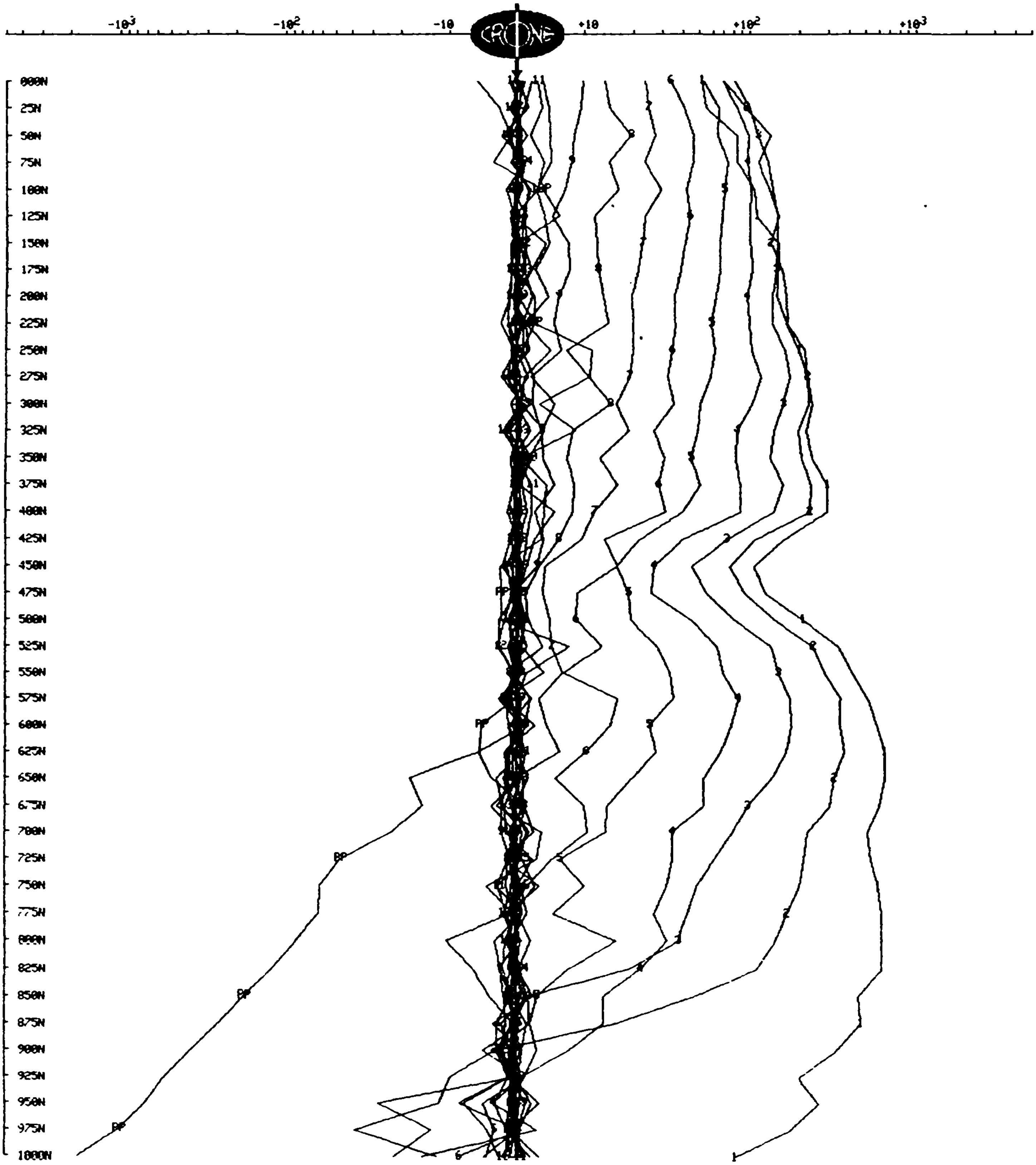
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L200W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 7,9, 1995	File name	: 2WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



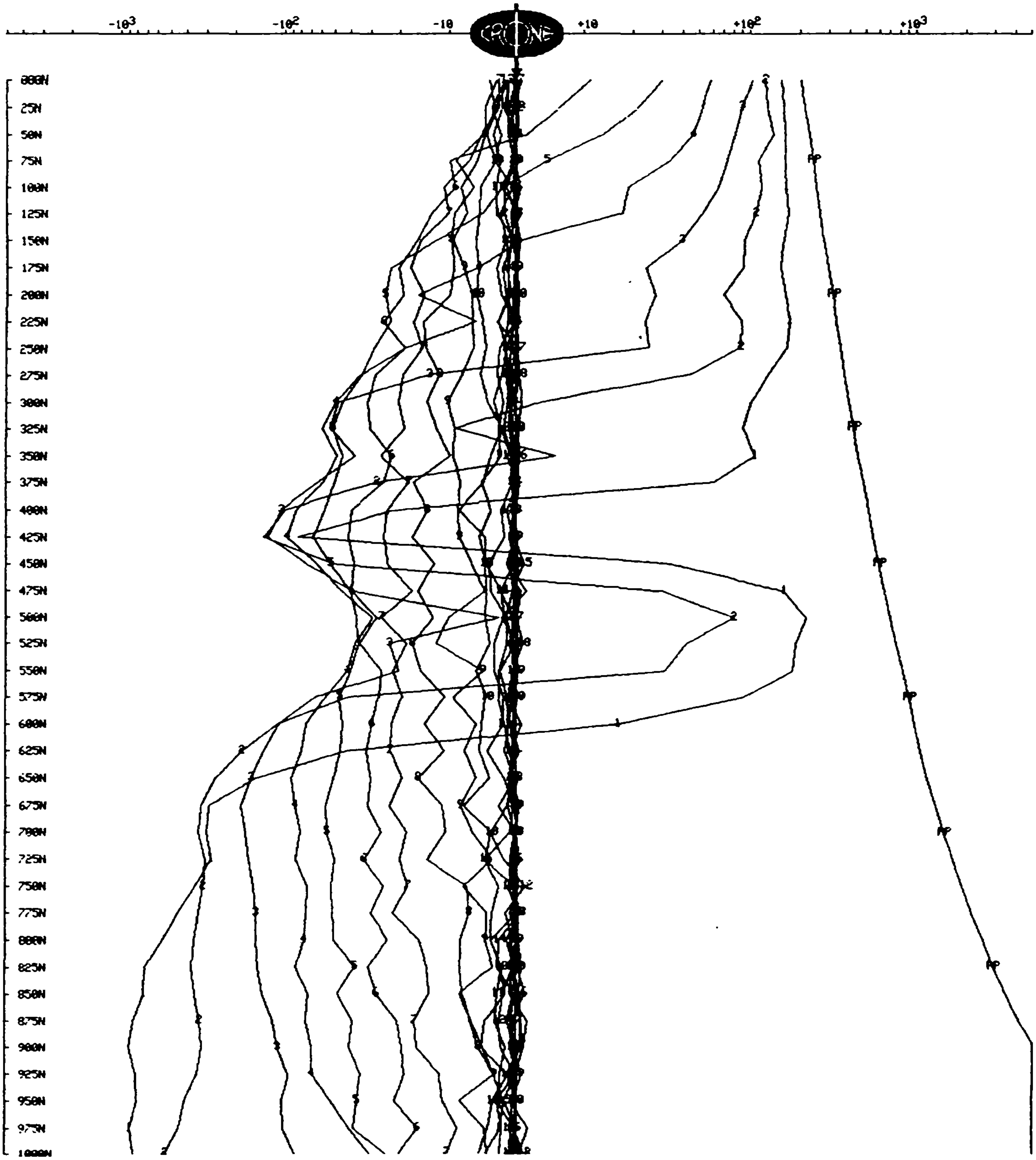
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD	Line	:	L200W
Grid	:	SLATE LAKE	Tx Loop	:	SL-2
Date	:	Feb 7,9, 1995	File name	:	2WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L200W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 2WSL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

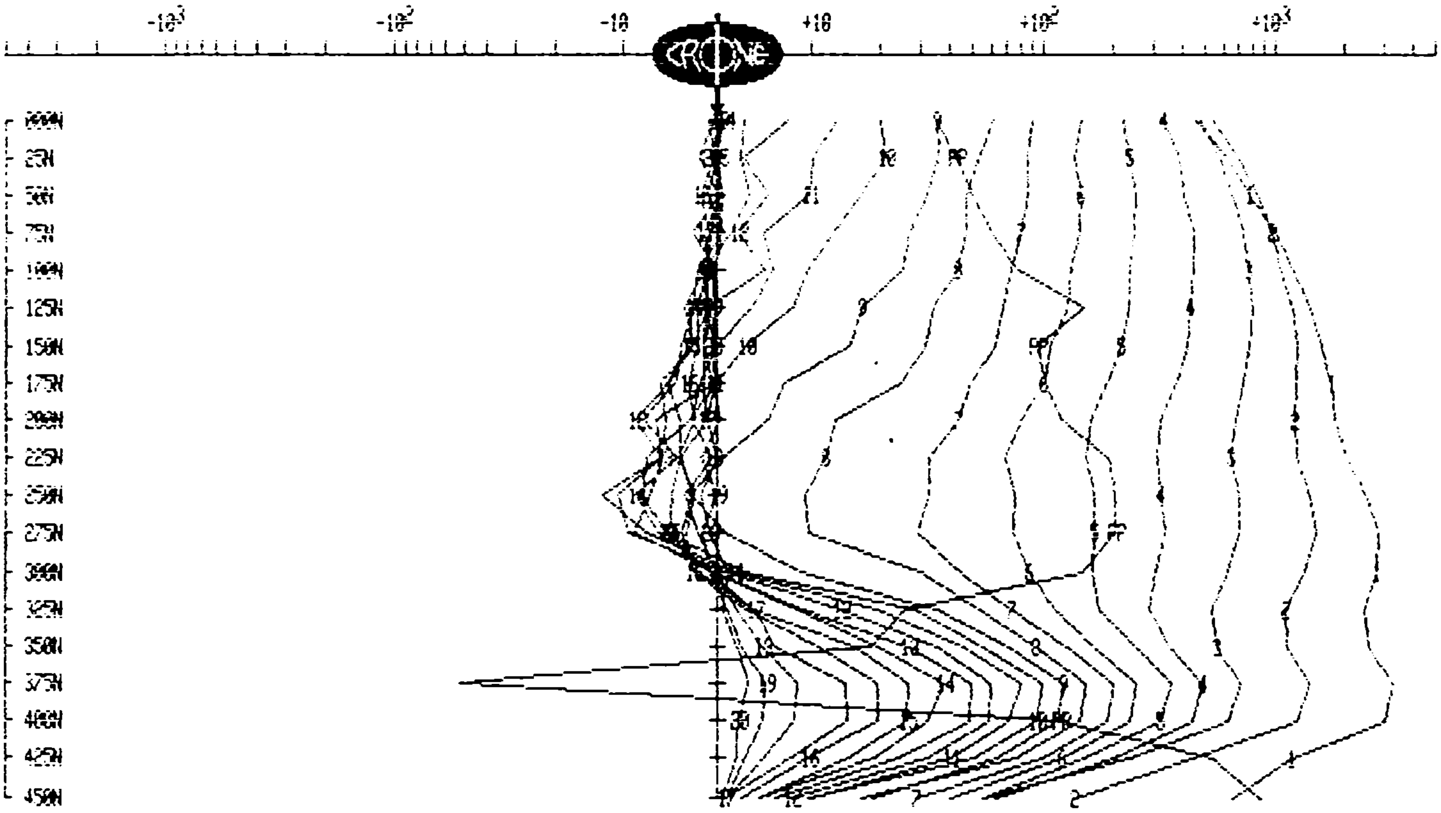
SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L200W
Grid	:	SLATE LAKE	Tx Loop	:	SL-3
Date	:	Feb 13, 1995	File name	:	2WSL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

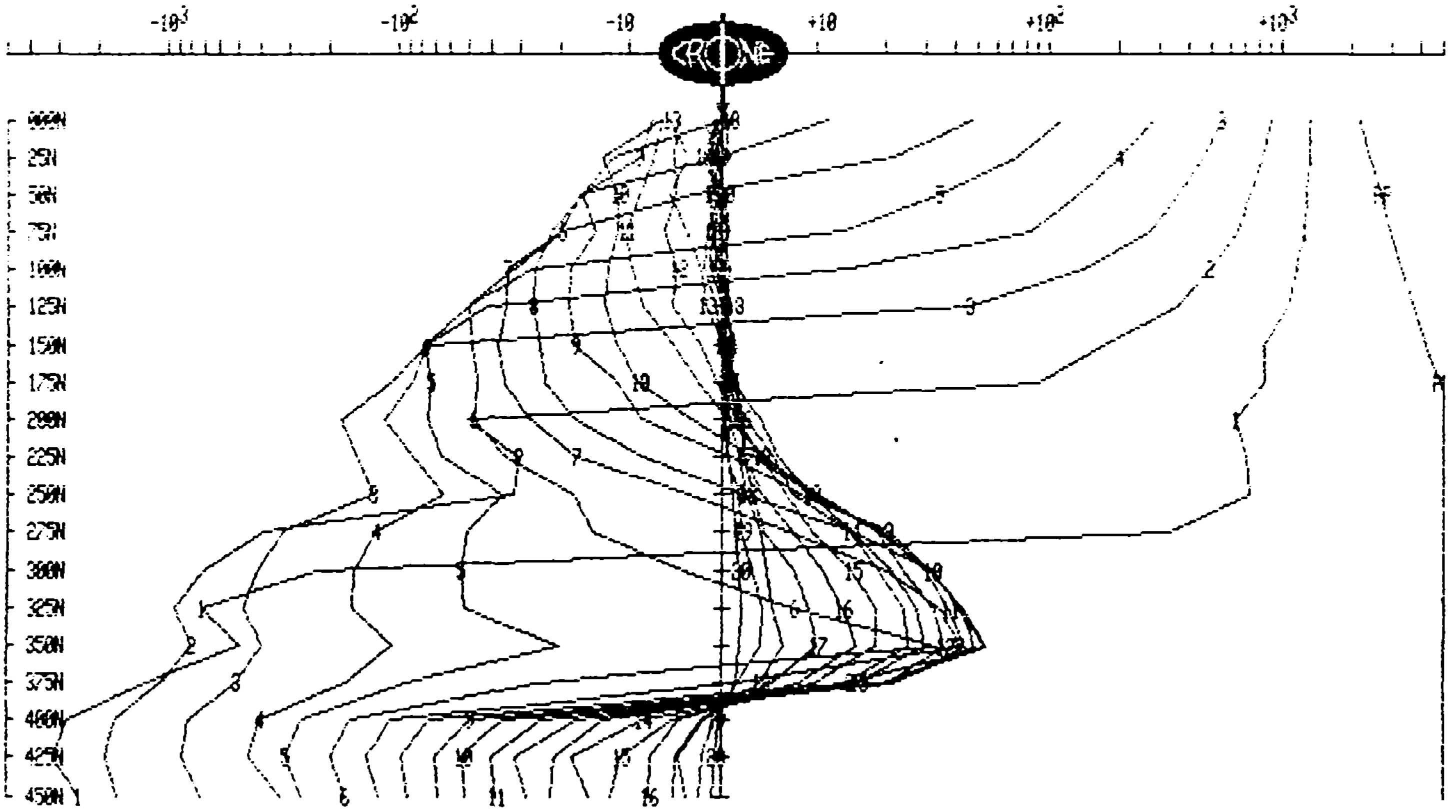
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L200W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 2WSL3.PEM

Data Scaled by Factor of 1.00

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L100W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 4, 1995	File name	: 1WSL2.PEM
Time Base	: 16.66 ms	# Readings	: 78
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

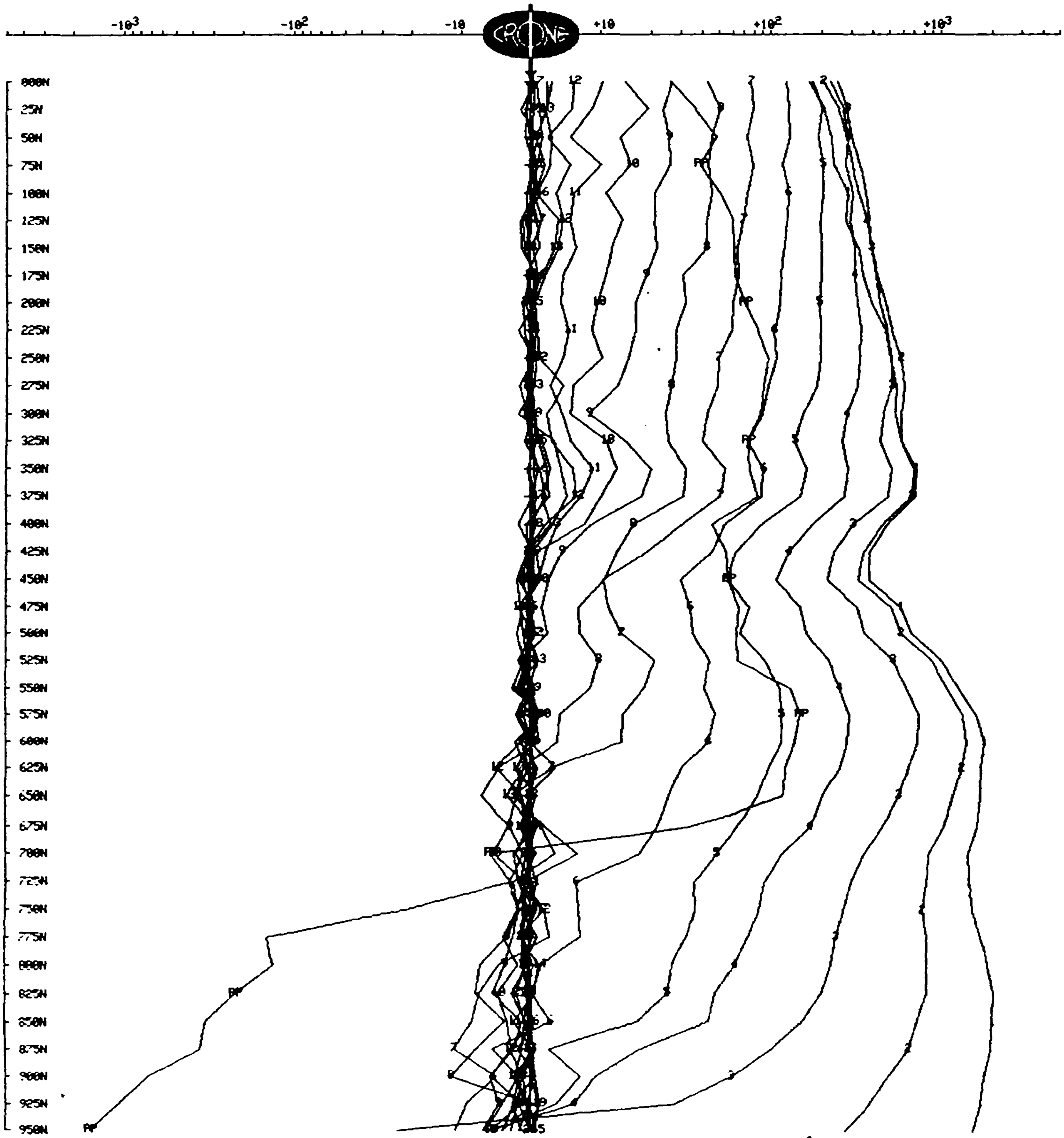
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD**	Line	:	**L100W**
Grid	:	**SLATE LAKE**	Tx Loop	:	SL-2
Date	:	Feb 4, 1995	File name	:	1WSL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



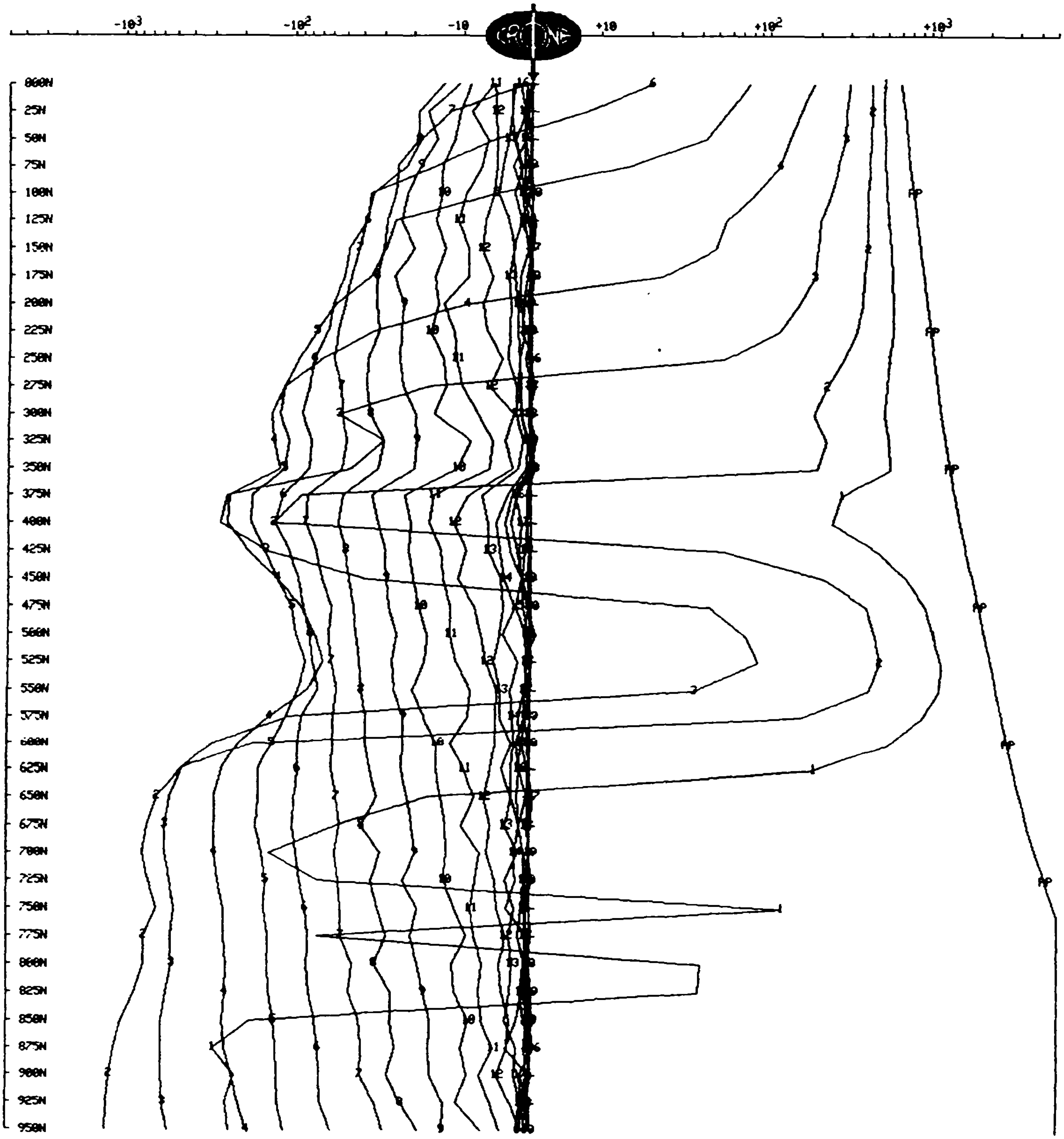
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L100W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-2**
Date	: Feb 4, 1995	File name	: 1WSL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100W**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 1WSL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

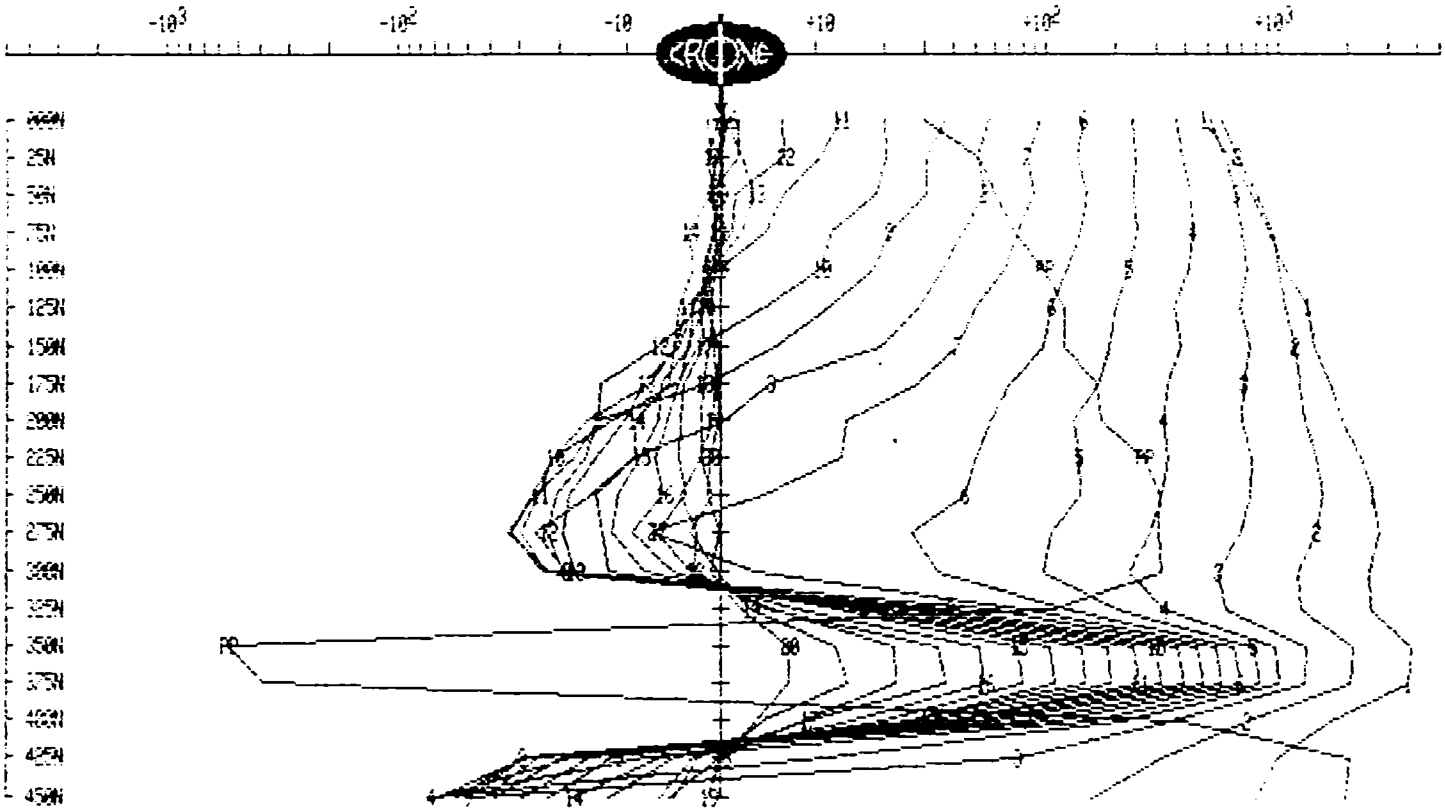
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100W**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 13, 1995	File name	: 1WSL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

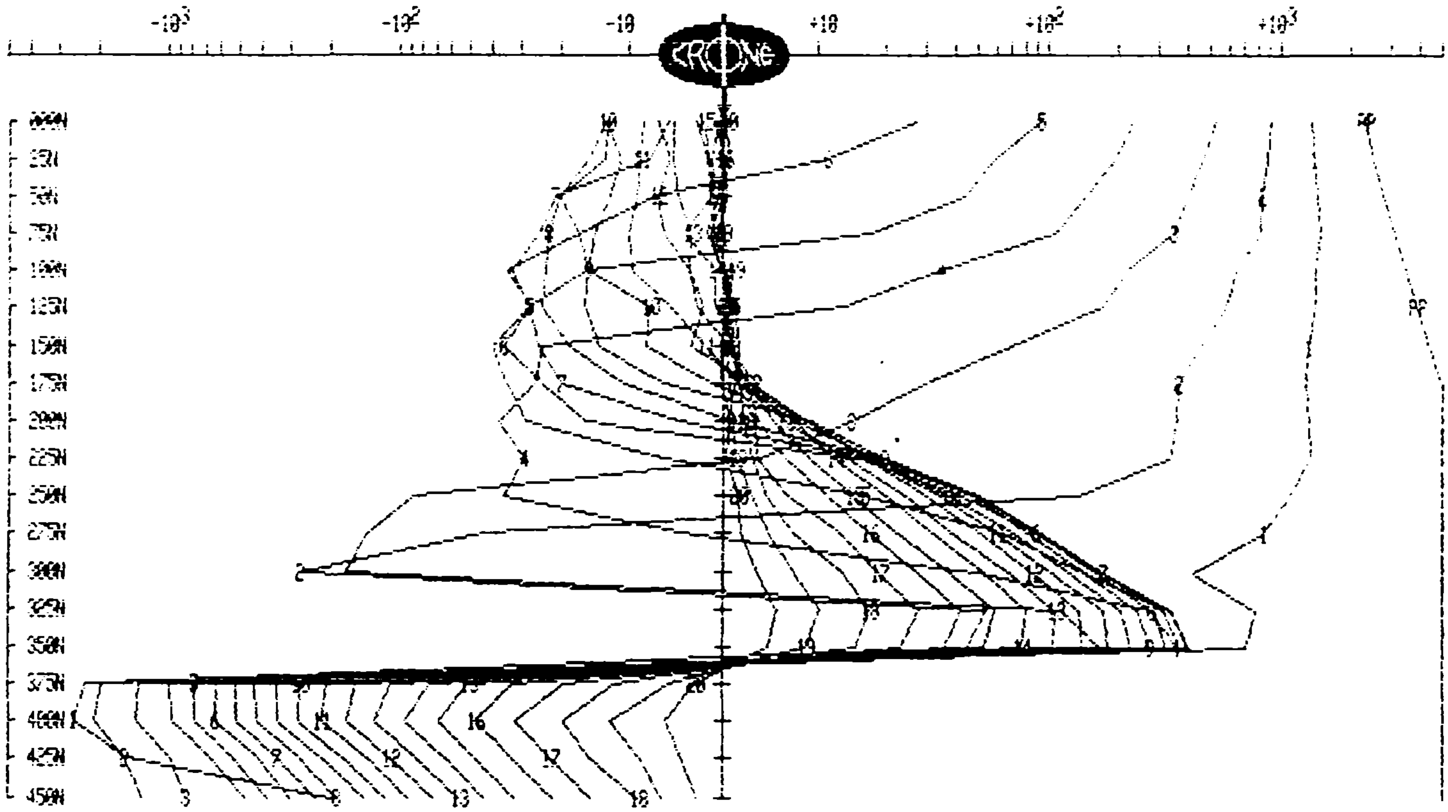
SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD.**	Line	:	**L100W**
Grid	:	**SLATE LAKE**	Tx Loop	:	**SL-3**
Date	:	Feb 13, 1995	File name	:	1WSL3.PEM

Data Scaled by Factor of 1.00

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L000E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 4, 1995	File name	: 0ESL2.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 100m, 1800m, 0m
3. -1000m, 1800m, 0m
4. -1000m, 1050m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

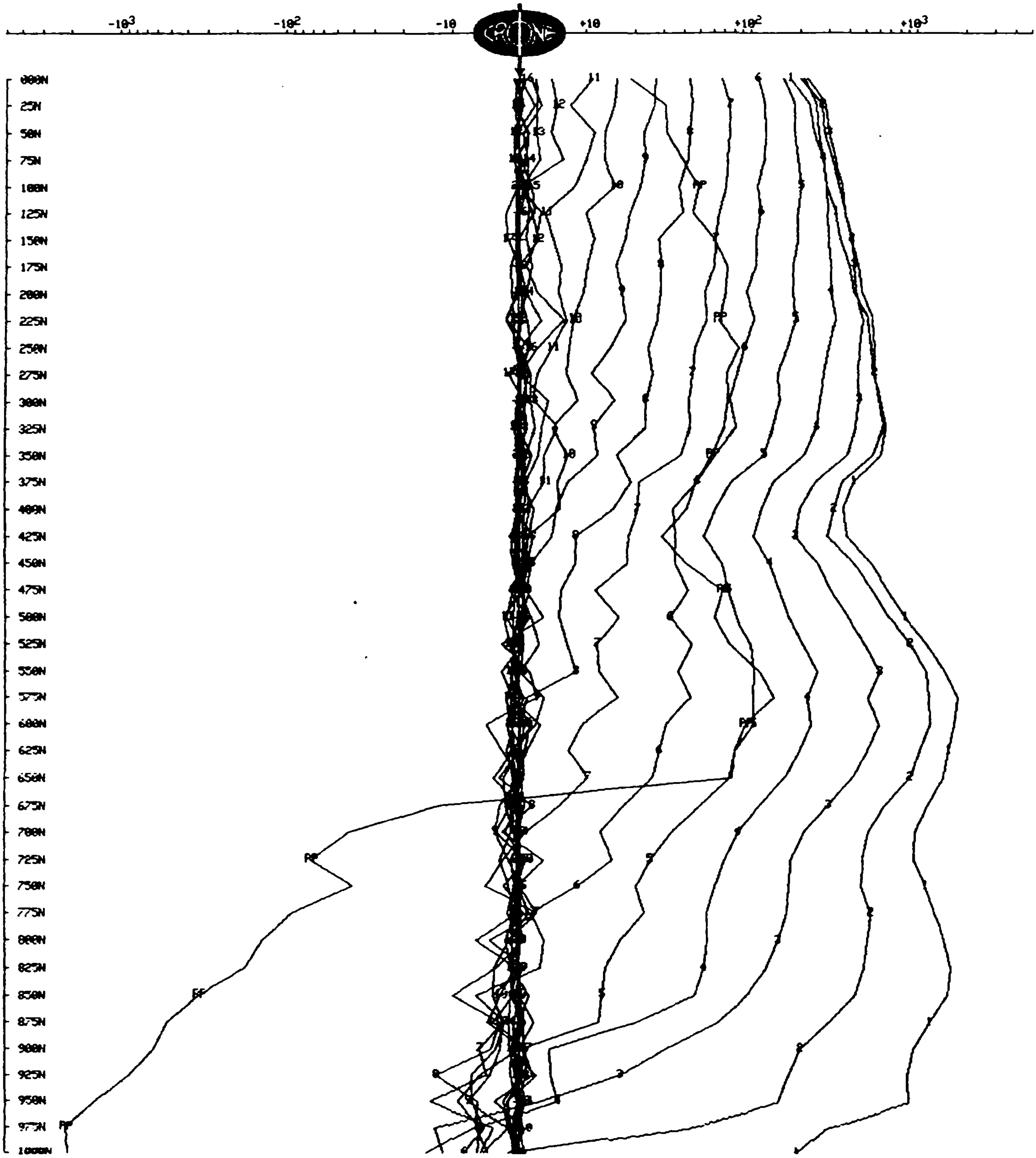
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD**	Line	: **L000E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-2
Date	: Feb 4, 1995	File name	: OESL2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



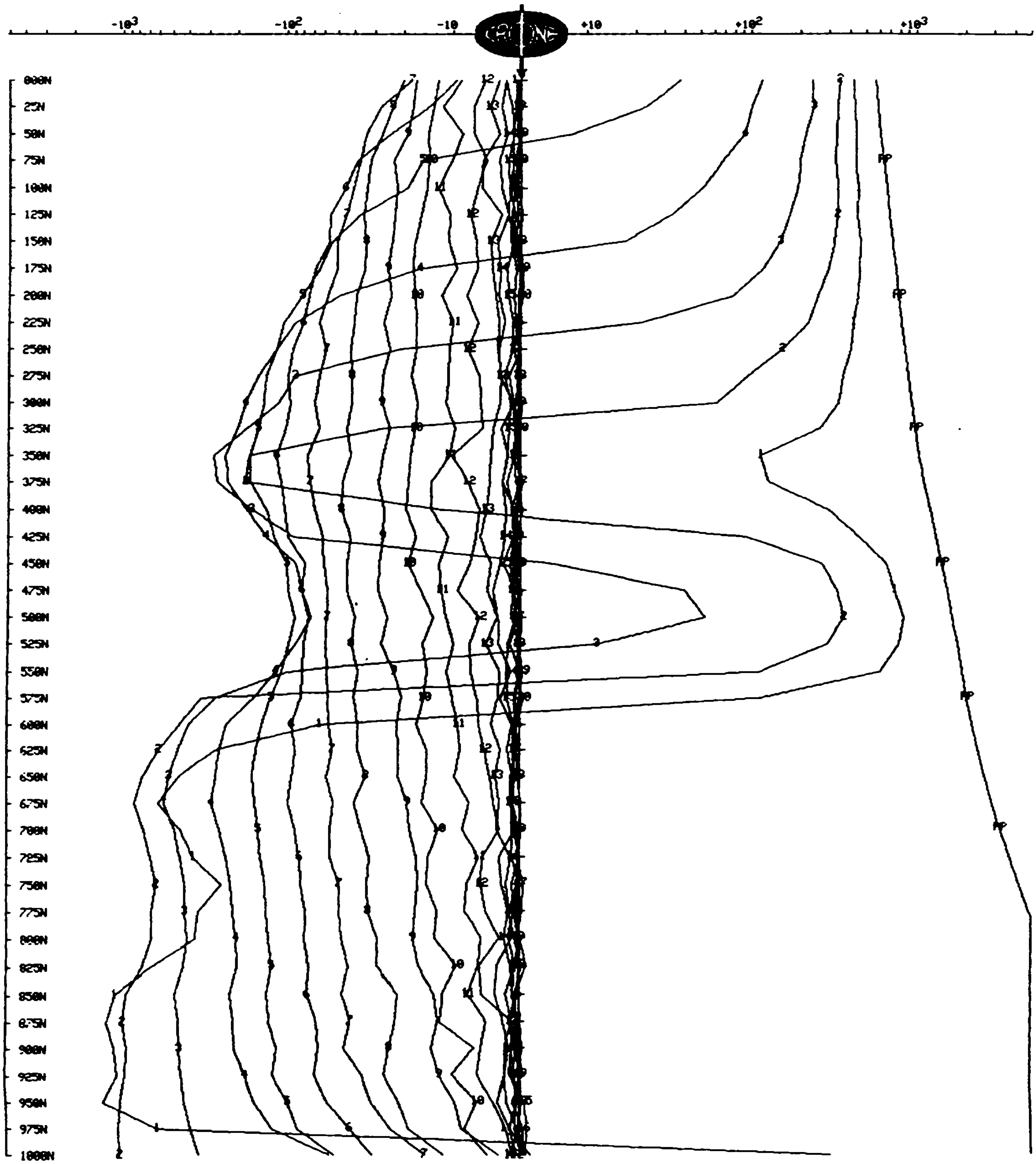
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD	Line	: LOOOE
Grid	: SLATE LAKE	Tx Loop	: SL-2
Date	: Feb 4, 1995	File name	: OESL2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **LOOOE**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: OESL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

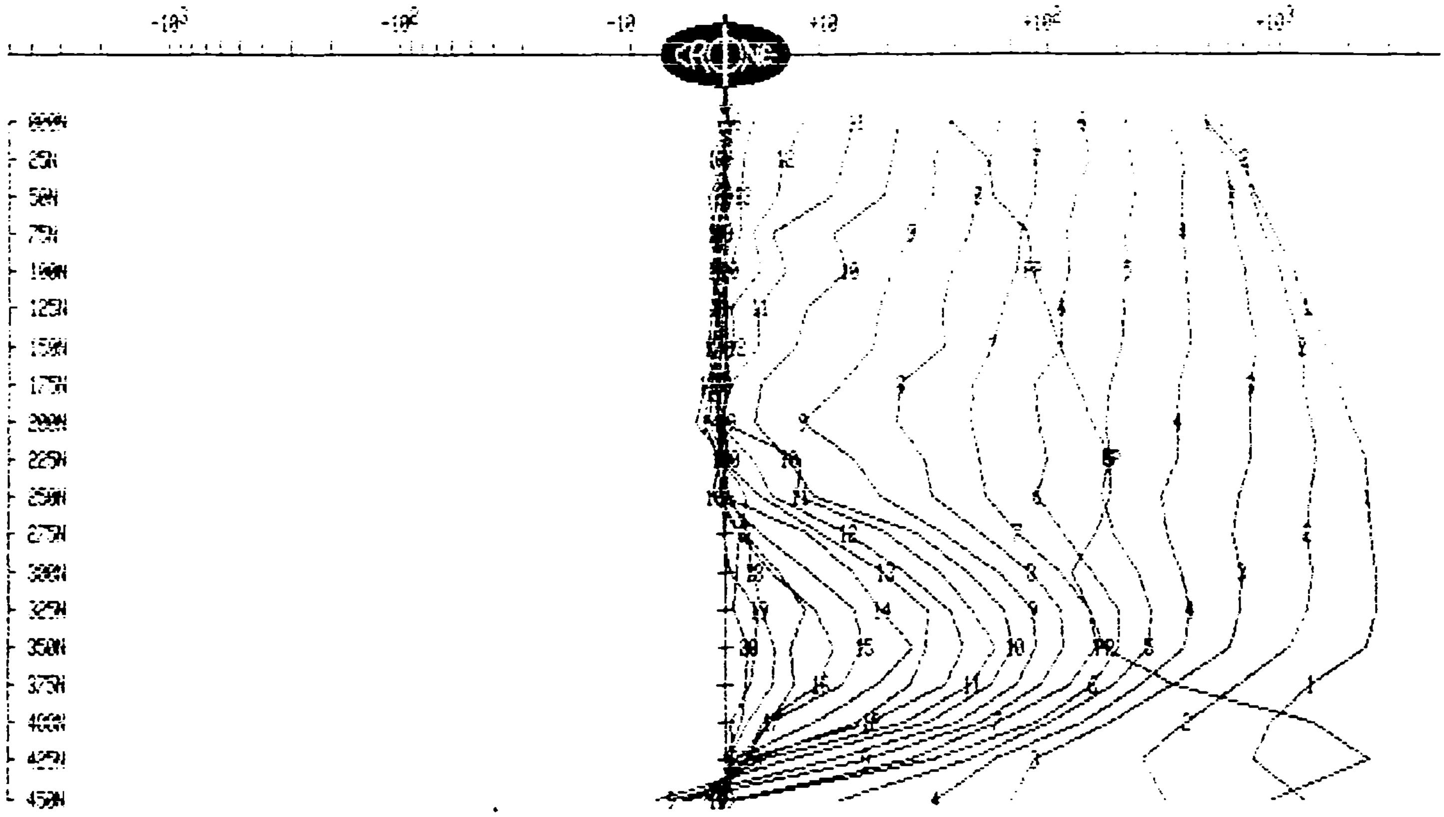
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L000E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 0ESL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

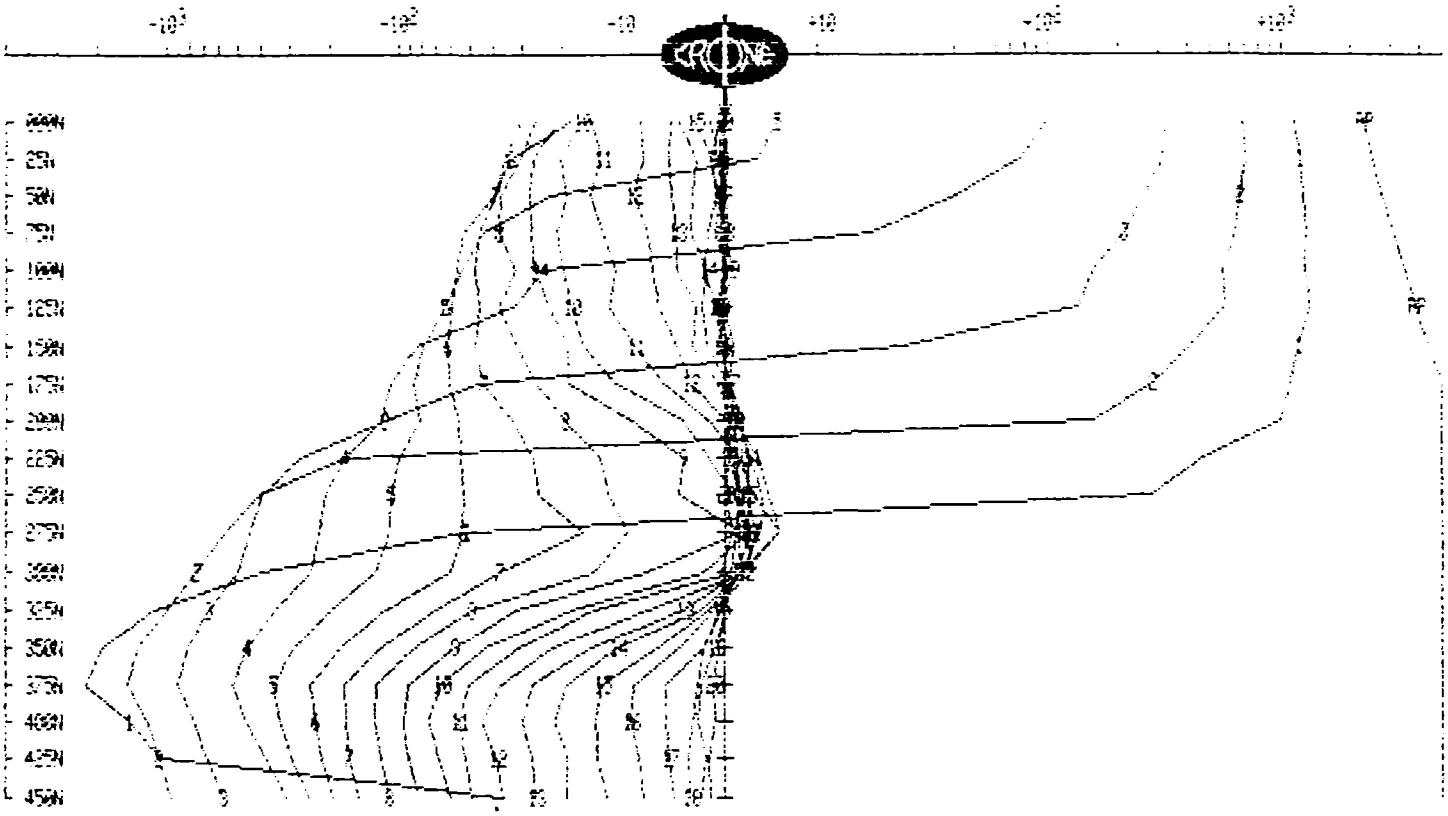
SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD.**	Line	:	**L000E**
Grid	:	**SLATE LAKE**	Tx Loop	:	**SL-3**
Date	:	Feb 13, 1995	File name	:	0ESL3.PEM

Data Scaled by Factor of 1.00

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Jan 29. 1995	File name	: 1ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

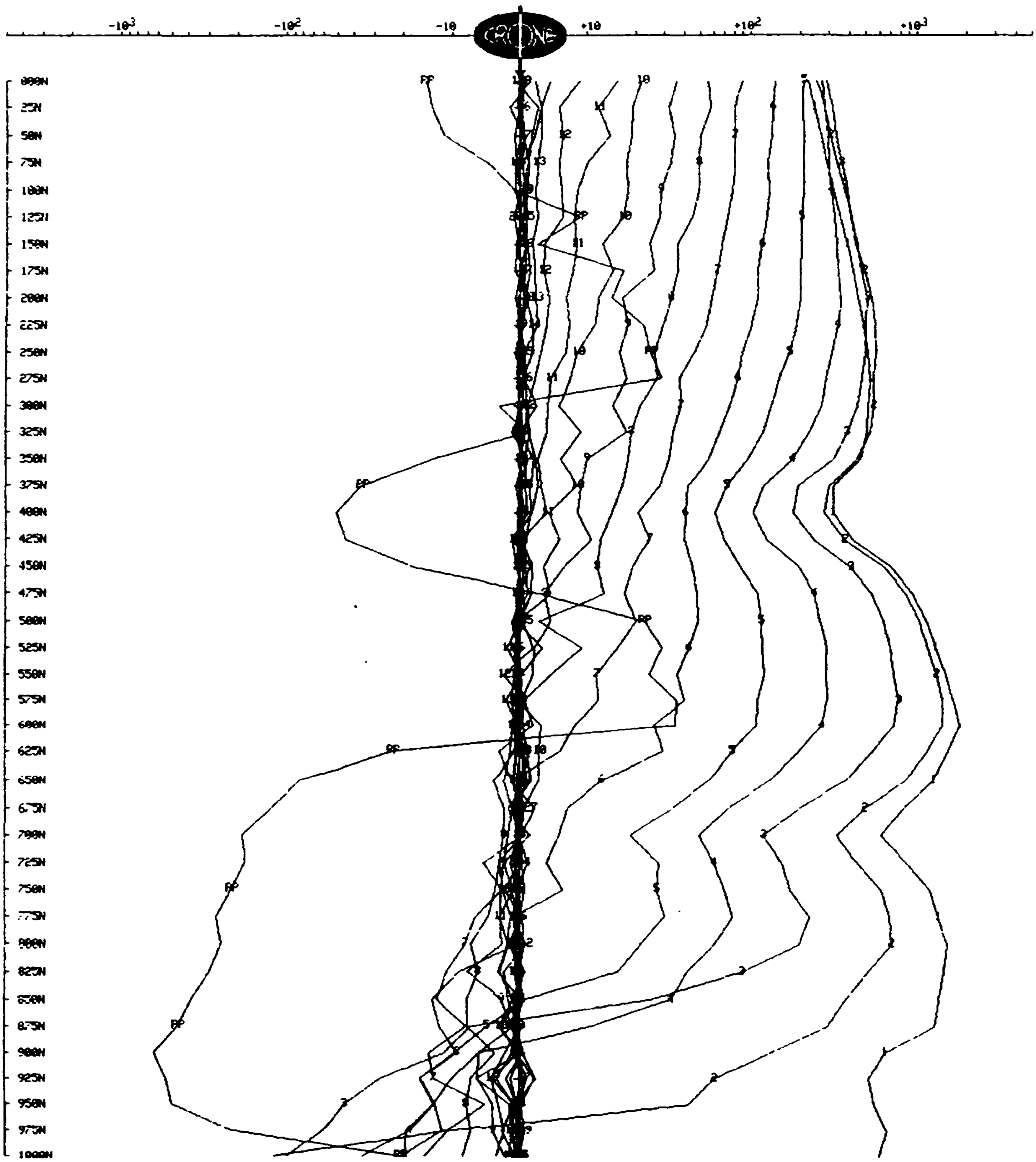
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Jan 29, 1995	File name	: 1ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



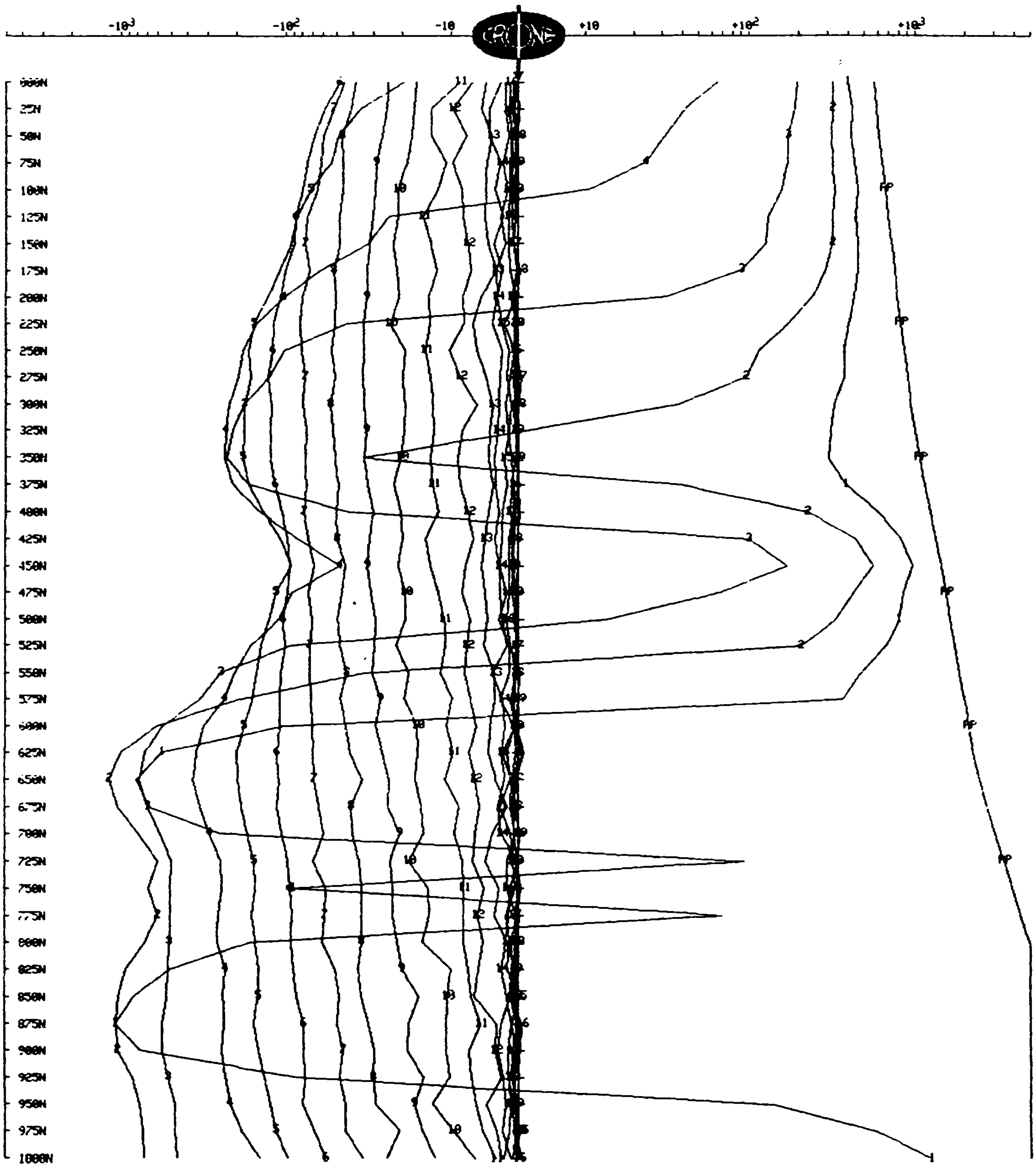
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Jan 29, 1995	File name	: 1ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 1ESL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

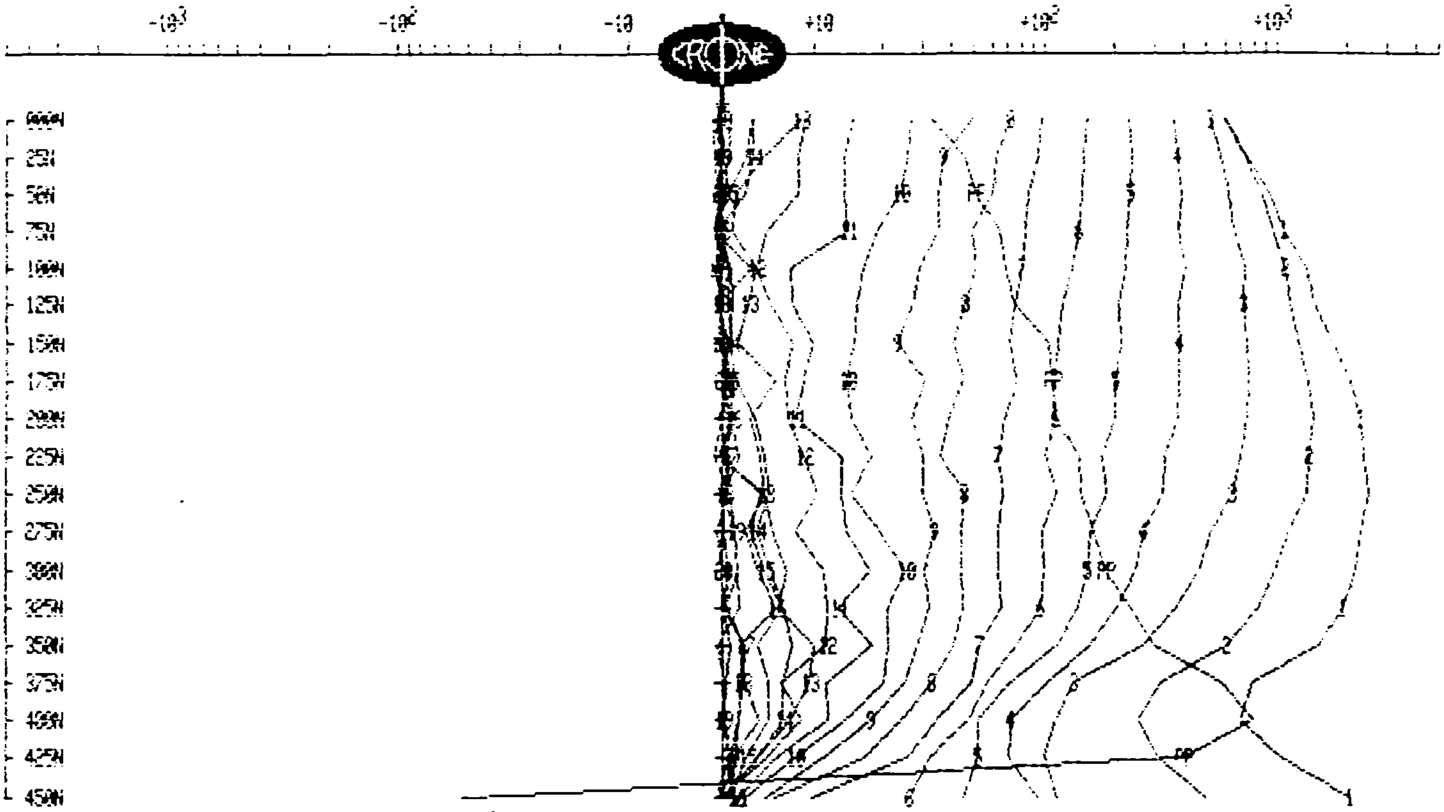
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 13, 1995	File name	: 1ESL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

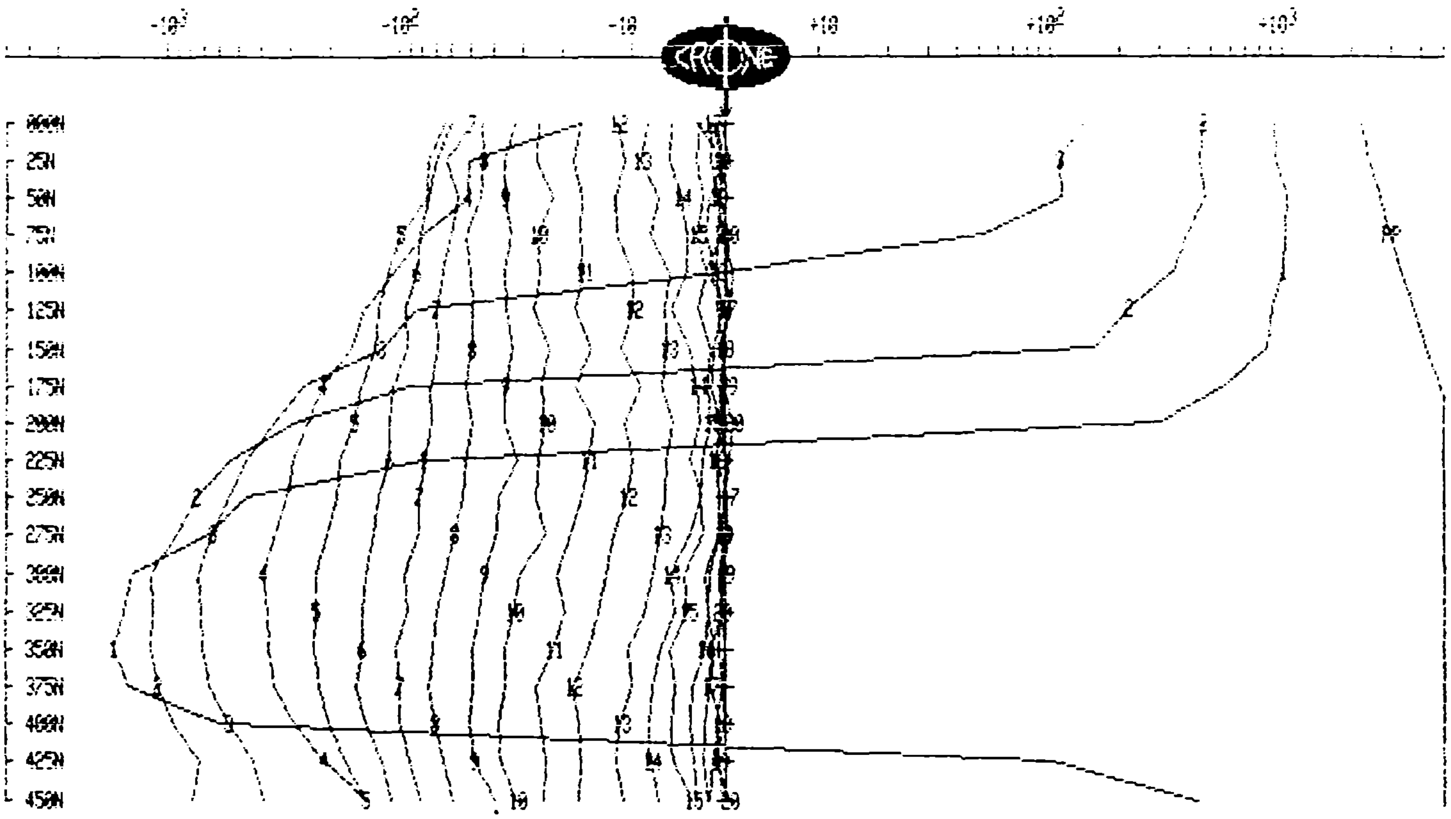
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L100E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 13, 1995	File name	: 1ESL3.PEM

Data Scaled by Factor of 1.00

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**		Line	: **L200E**
Grid	: **SLATE LAKE**		Tx Loop	: **SL-1**
Date	: Jan 29, 1995		File name	: 2ESL1.PEM
Time Base	: 16.66 ms		# Readings	: 82
Ramp Time	: 1.00 ms		Stn Units	: Metric
# Channels	: 20		Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)		Polarity	: +
Loop Size	: 1100m X 1000m		Receiver	: Digital #109
Current	: 16.5 Amps		Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

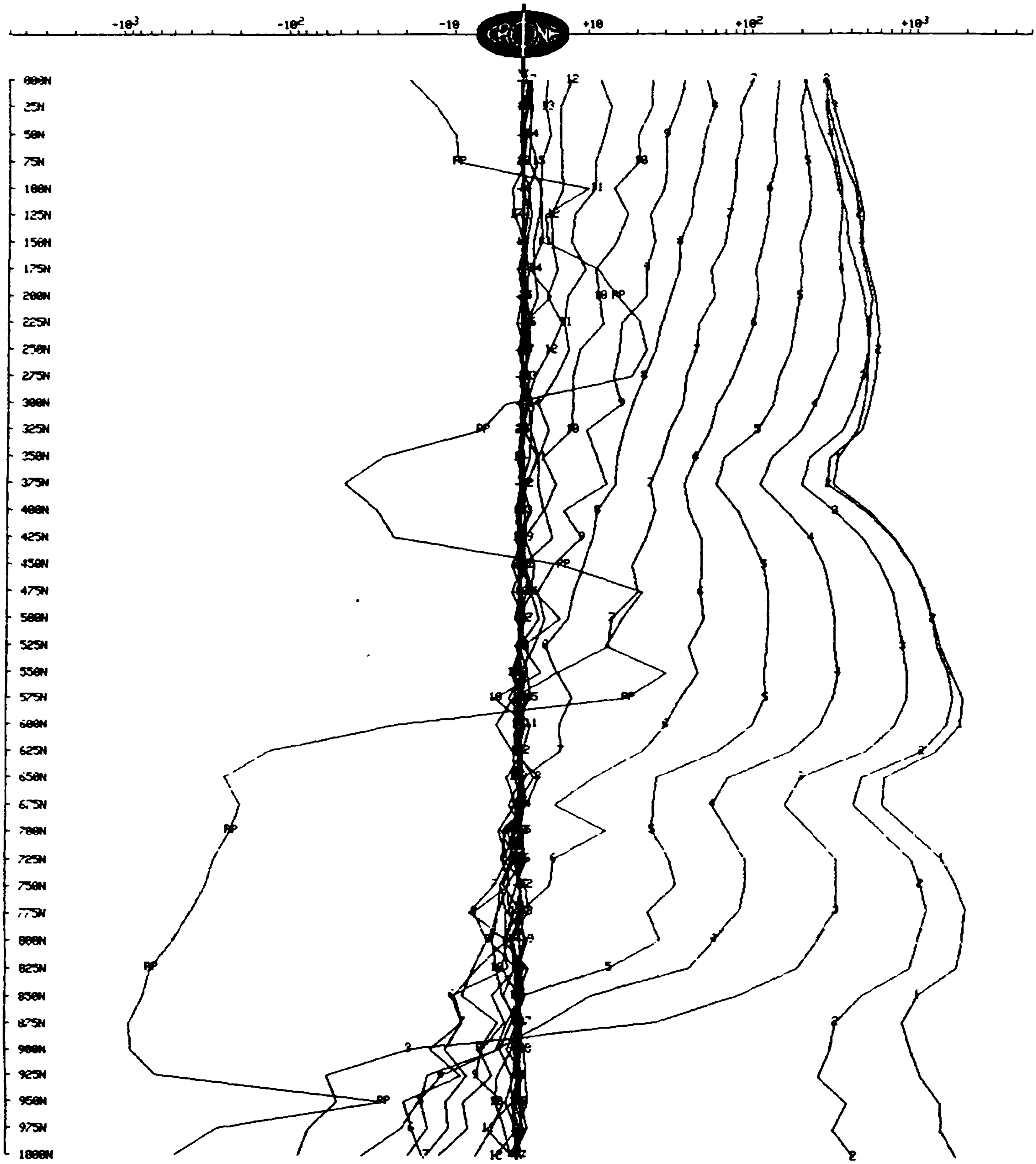
Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L200E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Jan 29, 1995	File name	: 2ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP
Scale: 1:5000



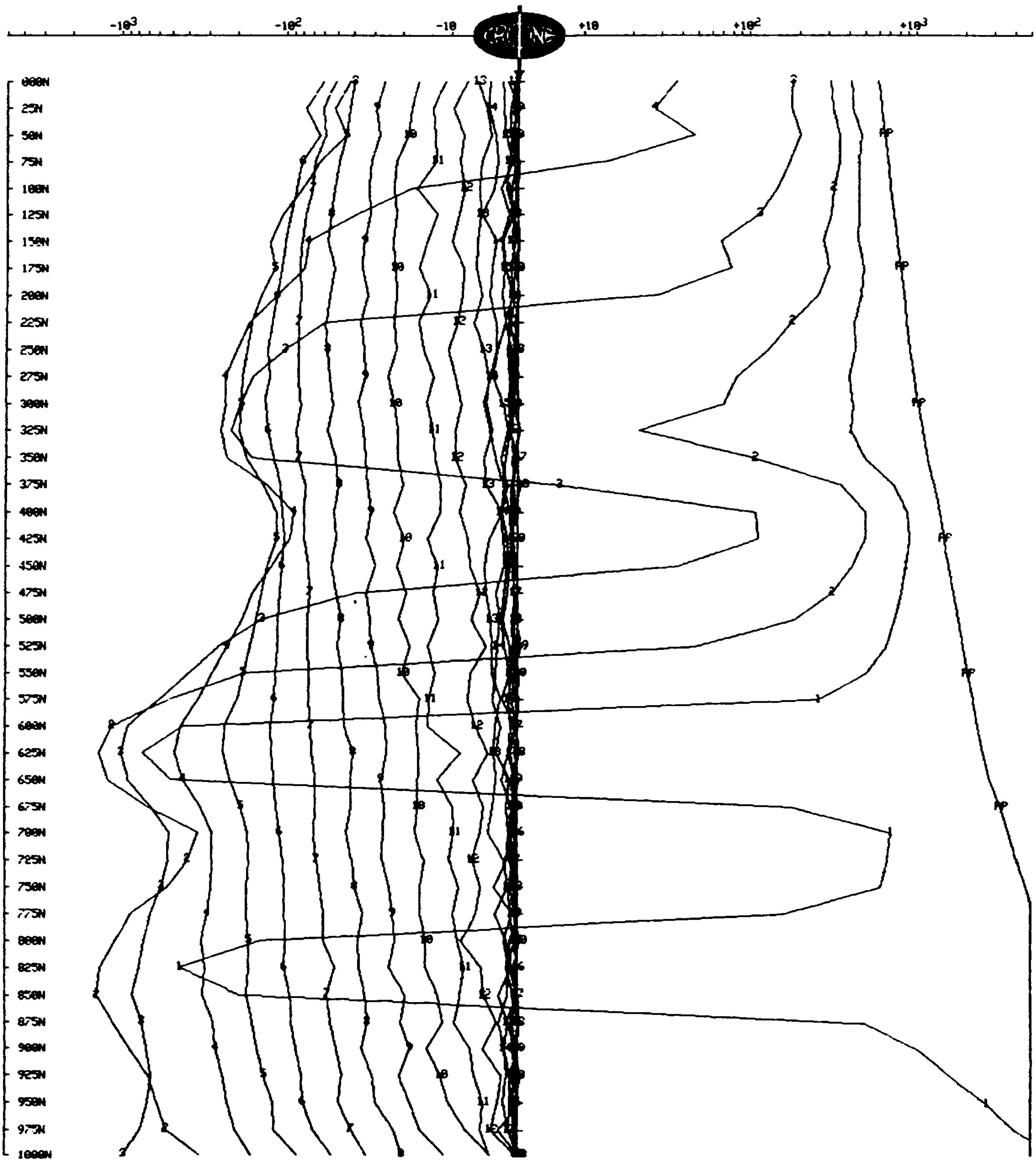
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD.**	Line	:	**L200E**
Grid	:	**SLATE LAKE**	Tx Loop	:	SL-1
Date	:	Jan 29, 1995	File name	:	2ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L200E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 12, 1995	File name	: 2ESL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

CRONE GEOPHYSICS & EXPLORATION LTD

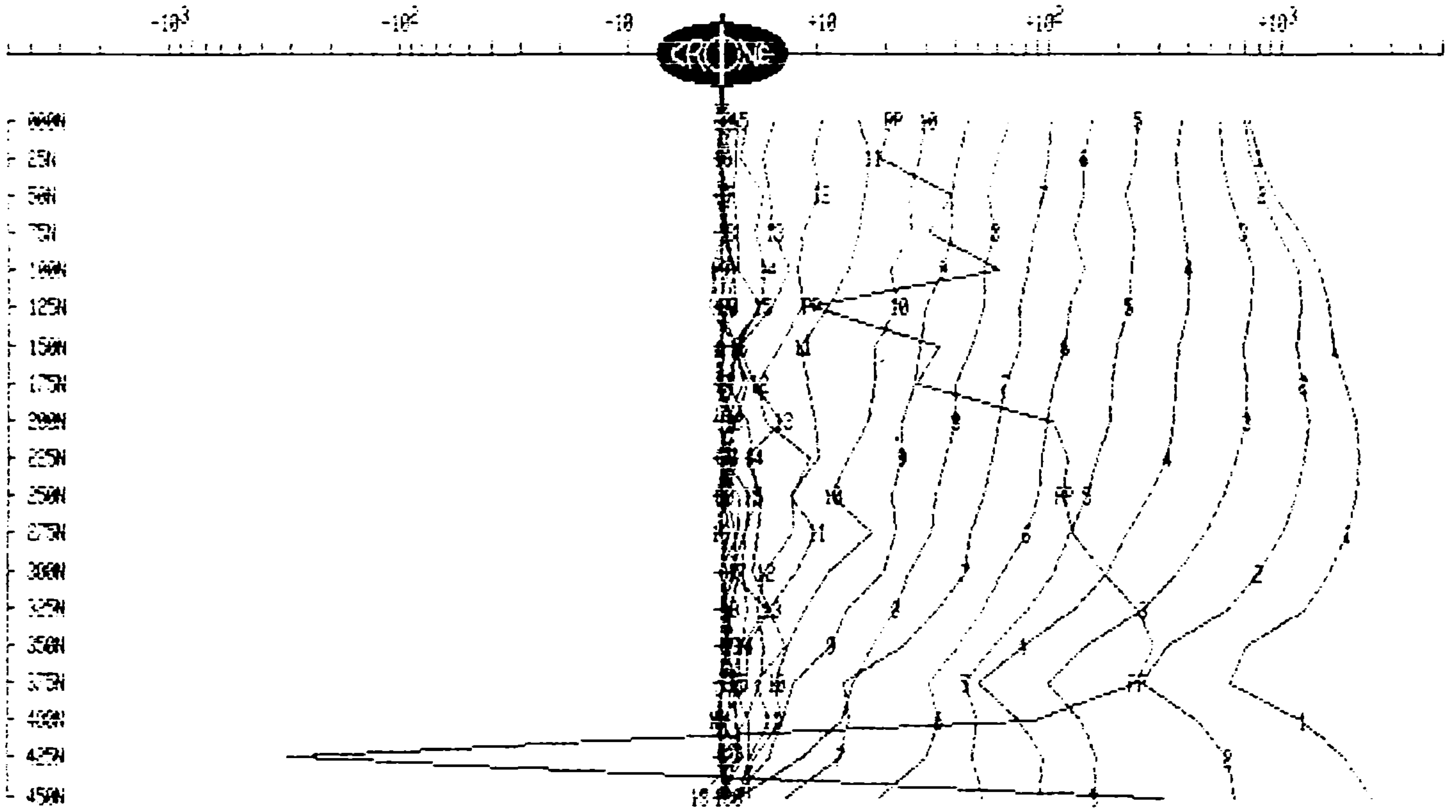
SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L200E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 12, 1995	File name	: 2ESL3.PEM

Data Scaled by Factor of 1.00

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



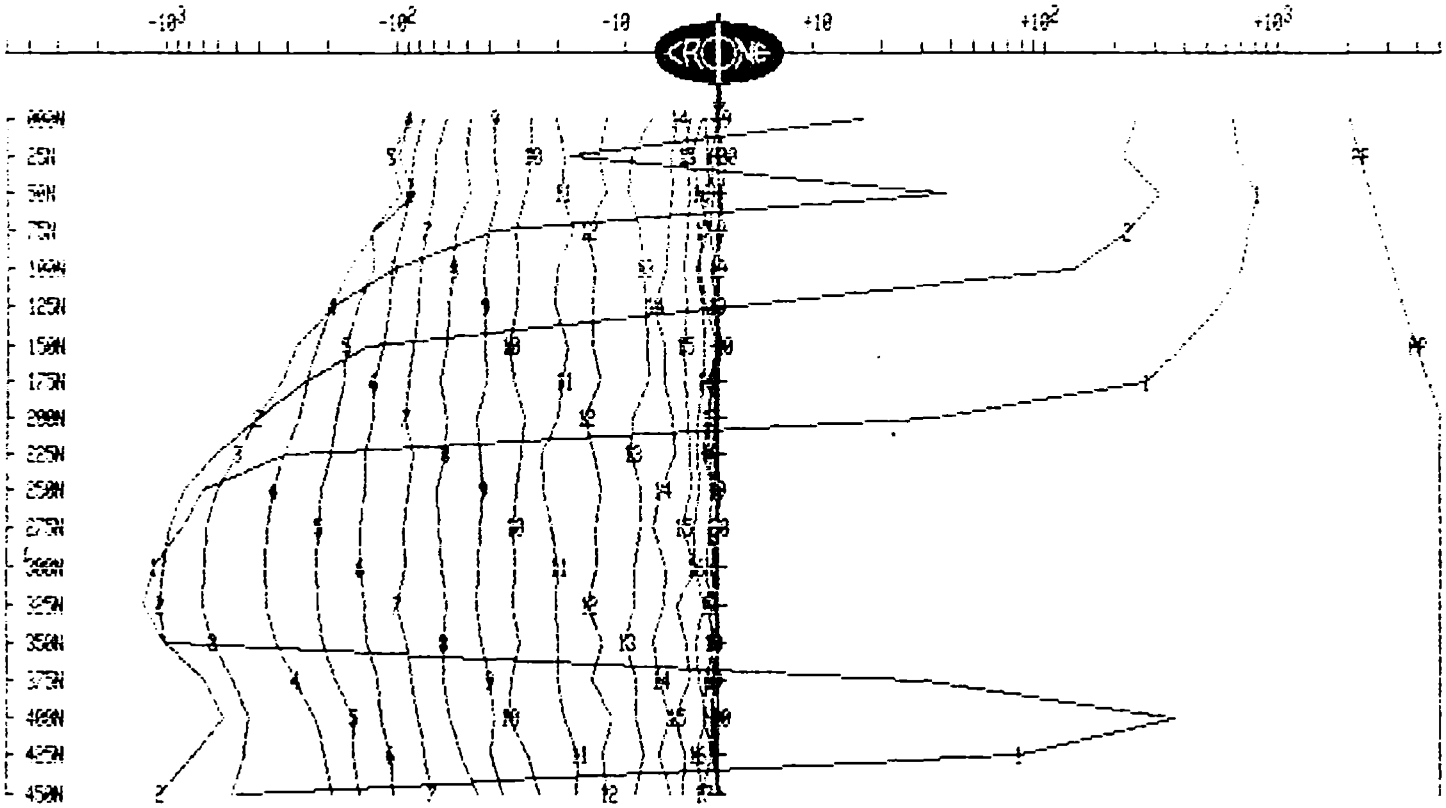
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client : CUMBERLAND RESOURCES LTD.
Grid : SLATE LAKE
Date : Feb 12, 1995

Line : L200E
Tx Loop : SL-3
File name : 2ESL3.PEM

Data Scaled by Factor of 1.00
VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP
Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Jan 29, 1995	File name	: 3ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

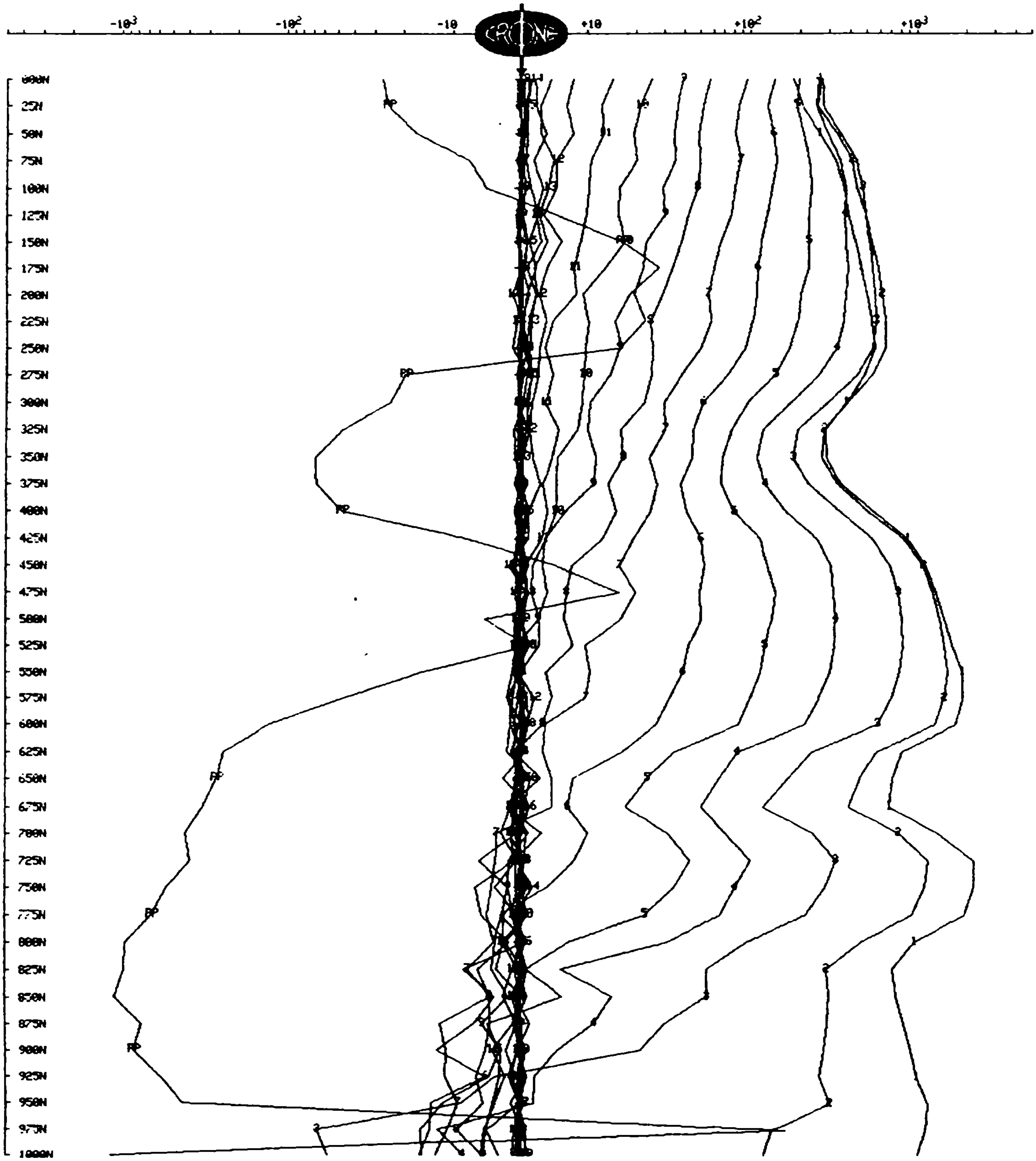
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Jan 29, 1995	File name	: 3ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



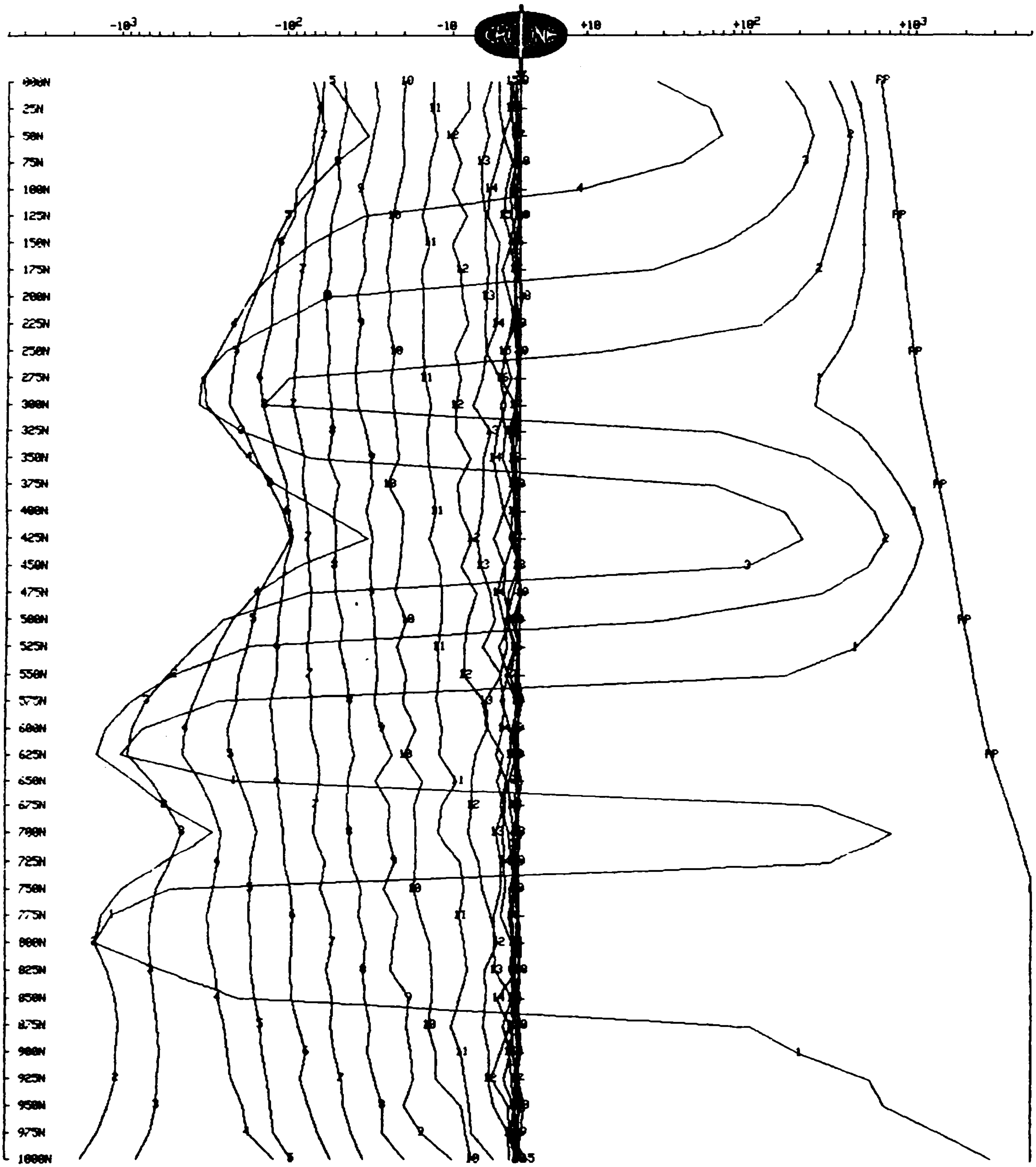
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Jan 29, 1995	File name	: 3ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 12, 1995	File name	: 3ESL3.PEM
Time Base	: 16.66 ms	# Readings	: 38
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

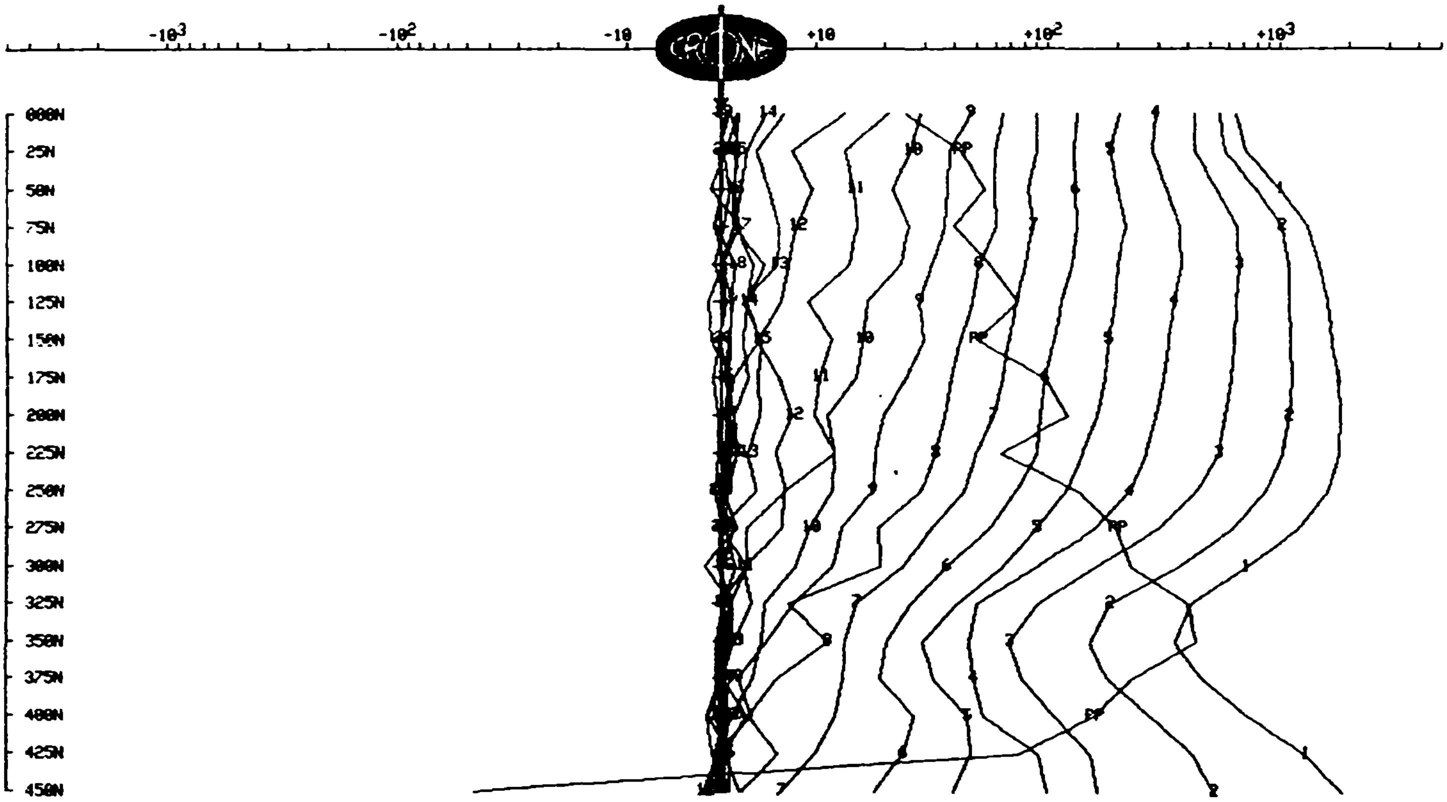
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 12, 1995	File name	: 3ESL3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



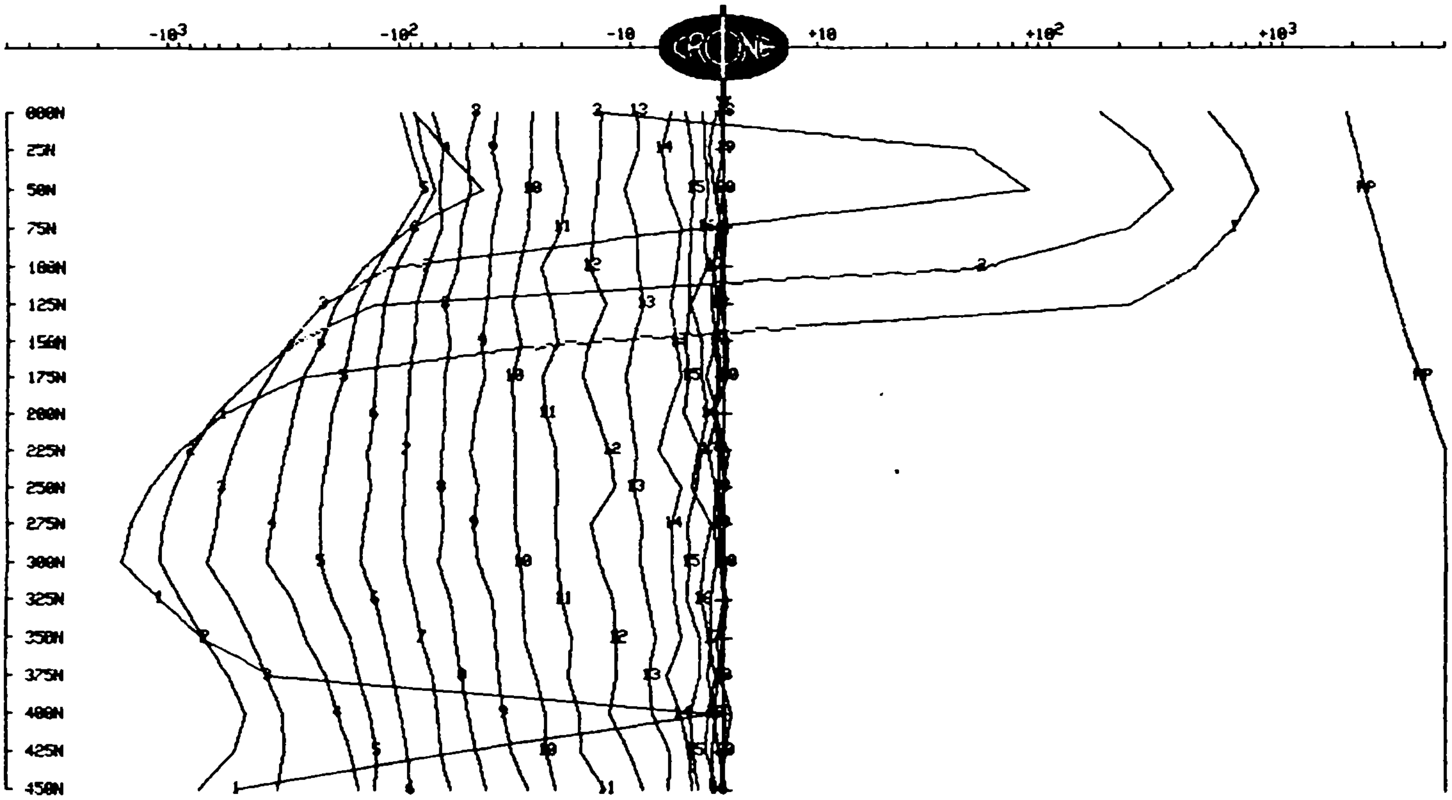
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L300E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 12, 1995	File name	: 3ESL3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD.**	Line	:	**L400E**
Grid	:	**SLATE LAKE**	Tx Loop	:	**SL-1**
Date	:	Feb 1, 1995	File name	:	4ESL1.PEM
Time Base	:	16.66 ms	# Readings	:	82
Ramp Time	:	1.00 ms	Stn Units	:	Metric
# Channels	:	20	Coil Area	:	4000 sq m
Sync Type	:	Crystal(MASTER)	Polarity	:	+
Loop Size	:	1100m X 1000m	Receiver	:	Digital #109
Current	:	16.5 Amps	Operator	:	Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

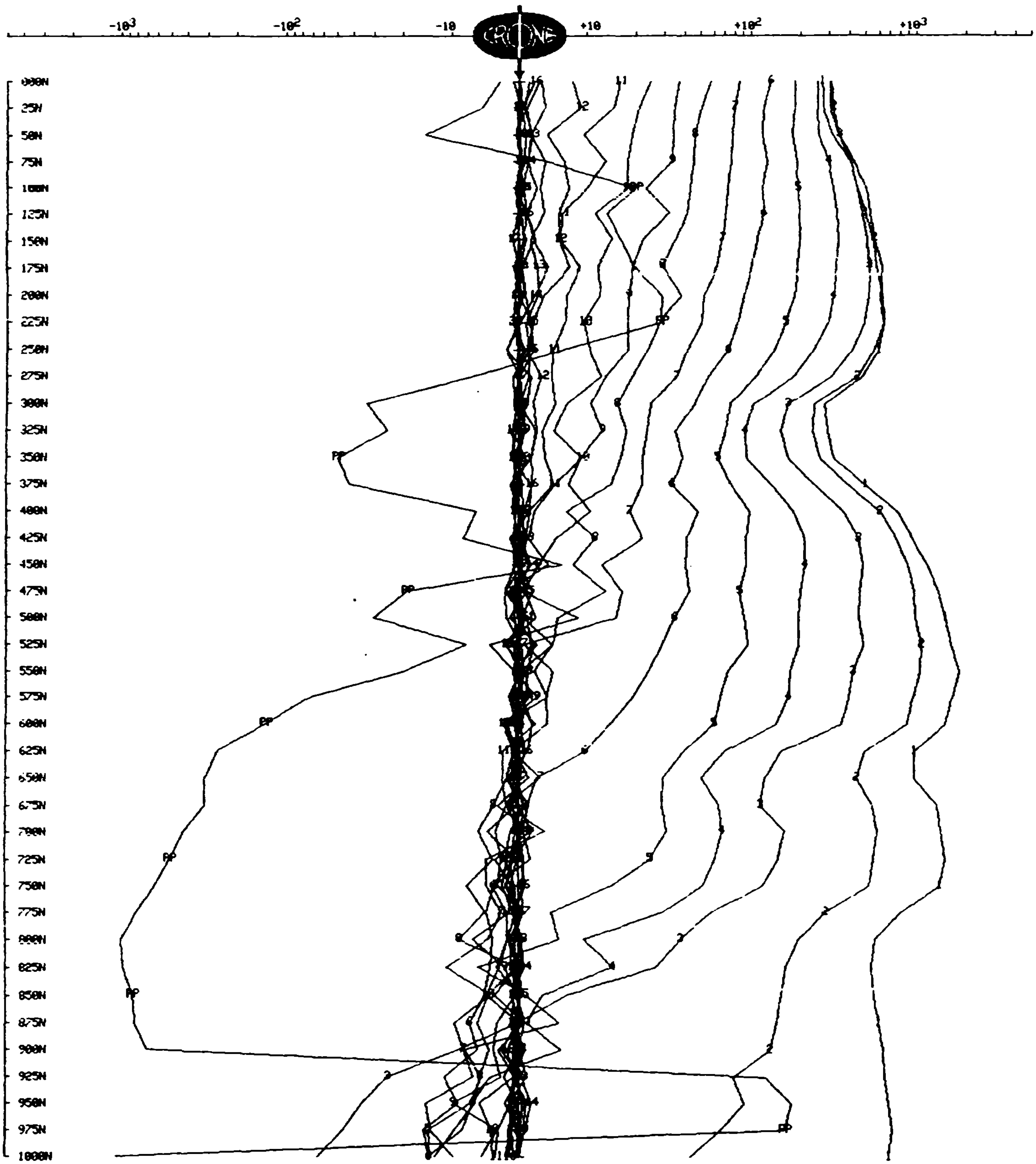
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	: L400E
Grid	: SLATE LAKE	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 4ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



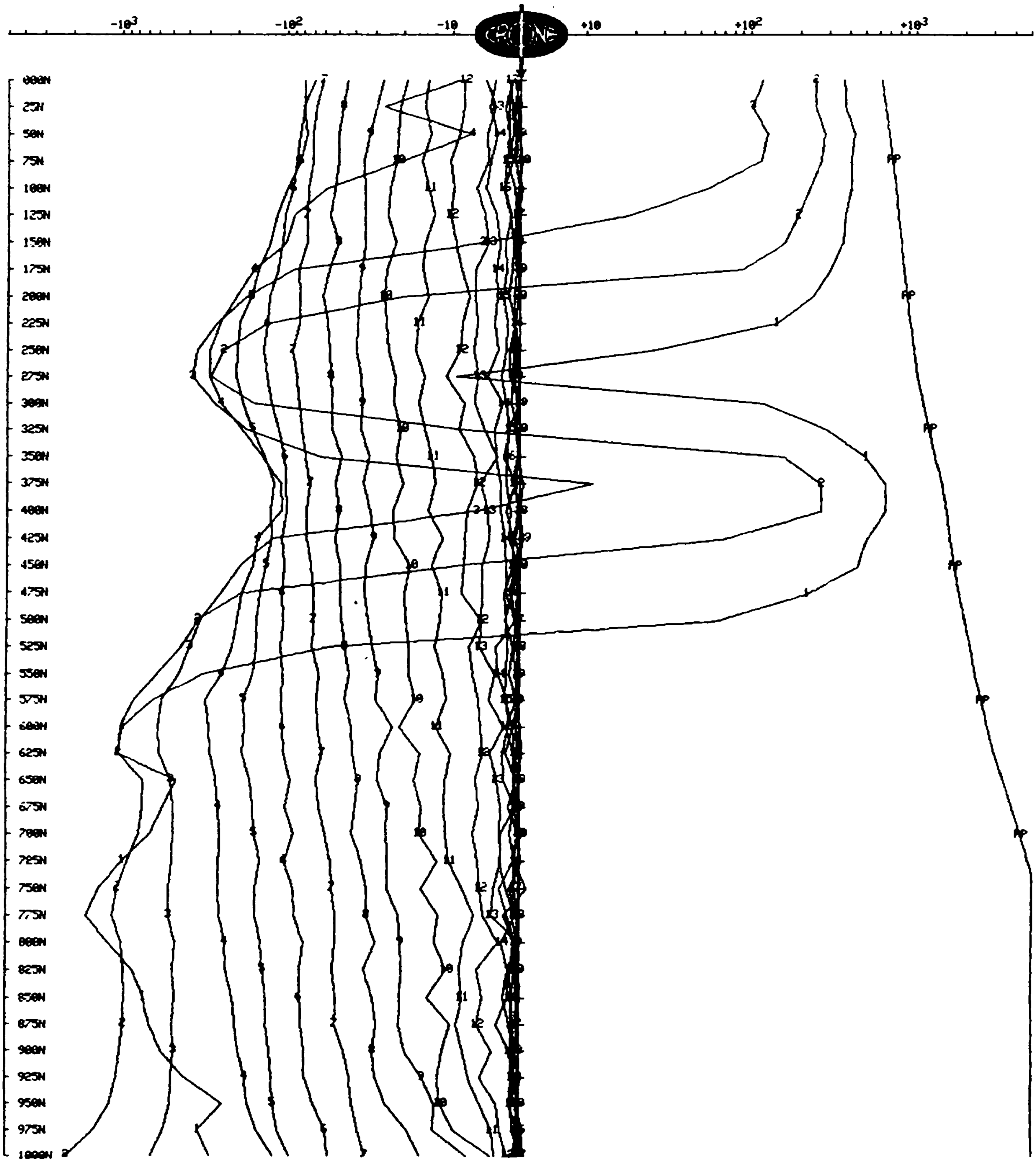
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L400E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 4ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L400E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 12, 1995	File name	: 4ESL3.PEM
Time Base	: 16.66 ms	# Readings	: 36
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 900m X 500m	Receiver	: Digital #102
Current	: 19.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 1000m, 500m, 0m
2. 500m, 500m, 0m
3. 500m, -400m, 0m
4. 1000m, -400m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

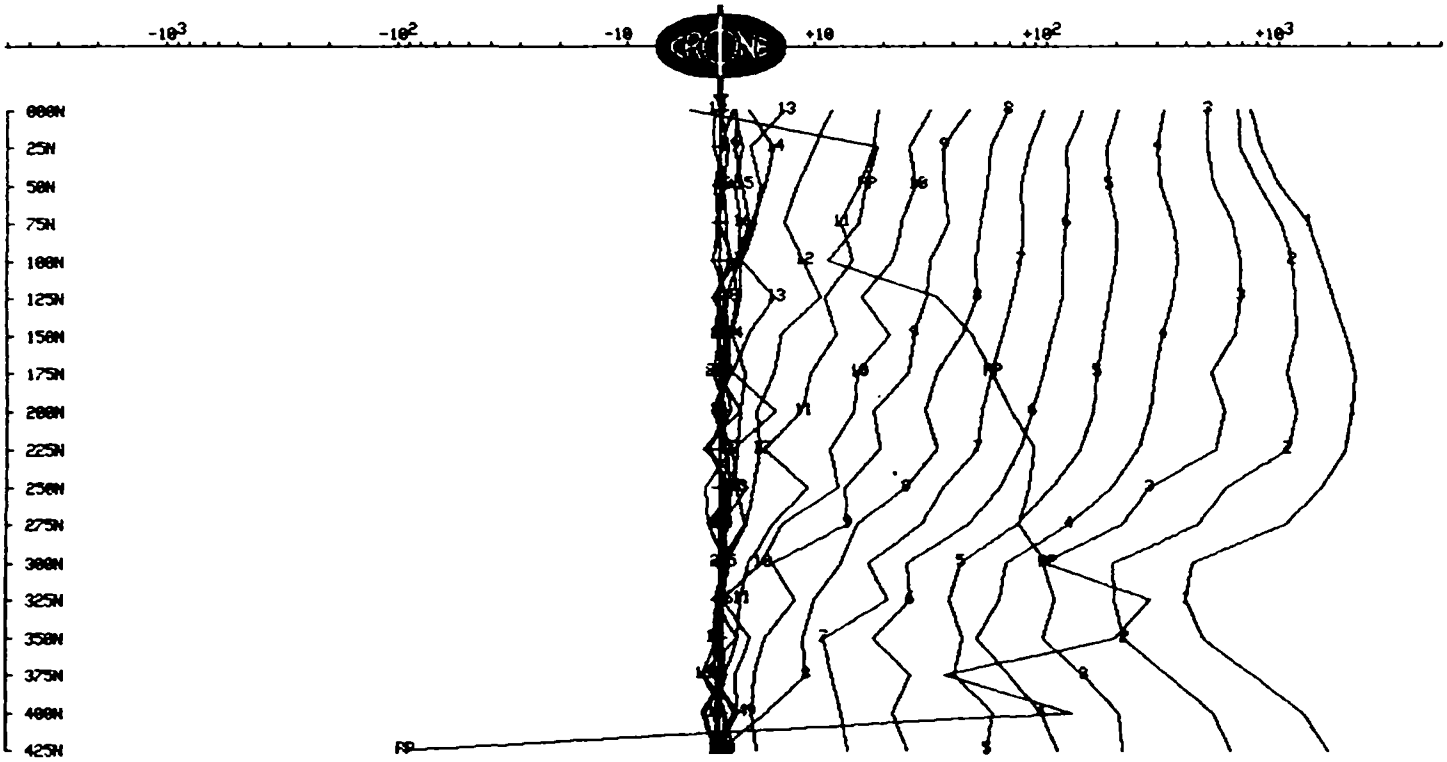
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L400E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-3
Date	: Feb 12, 1995	File name	: 4ESL3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



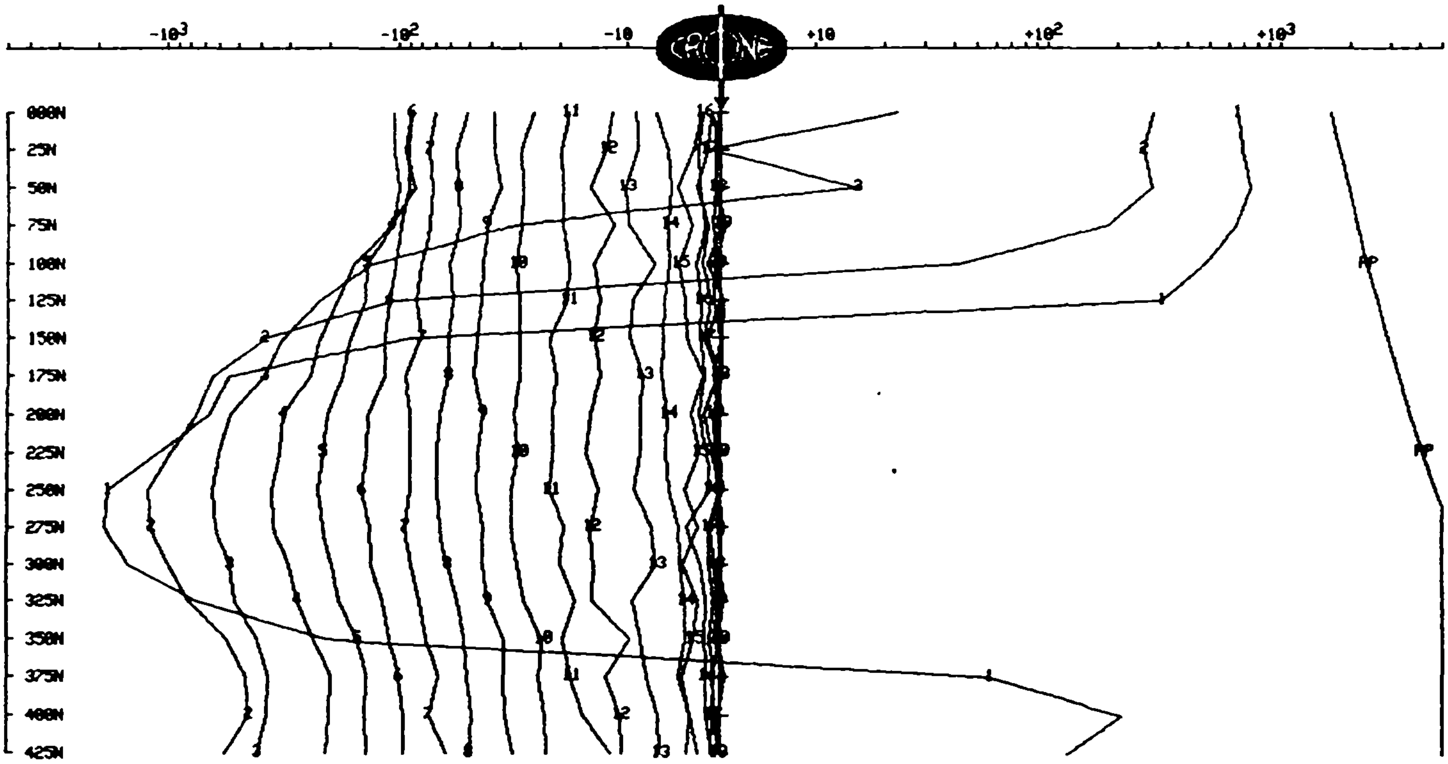
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L400E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-3**
Date	: Feb 12, 1995	File name	: 4ESL3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L500E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 1, 1995	File name	: 5ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 82
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

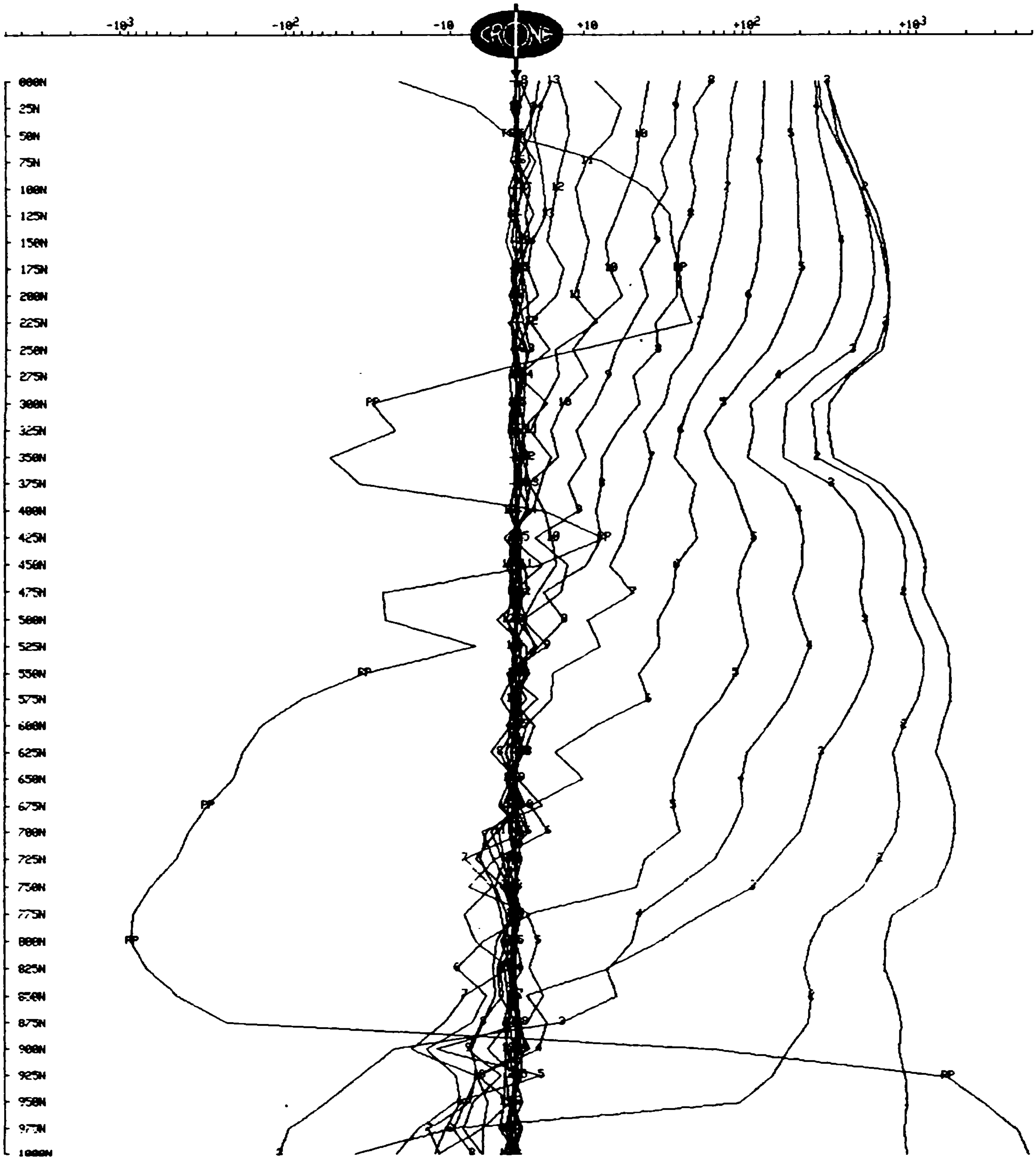
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	: L500E
Grid	: SLATE LAKE	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 5ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



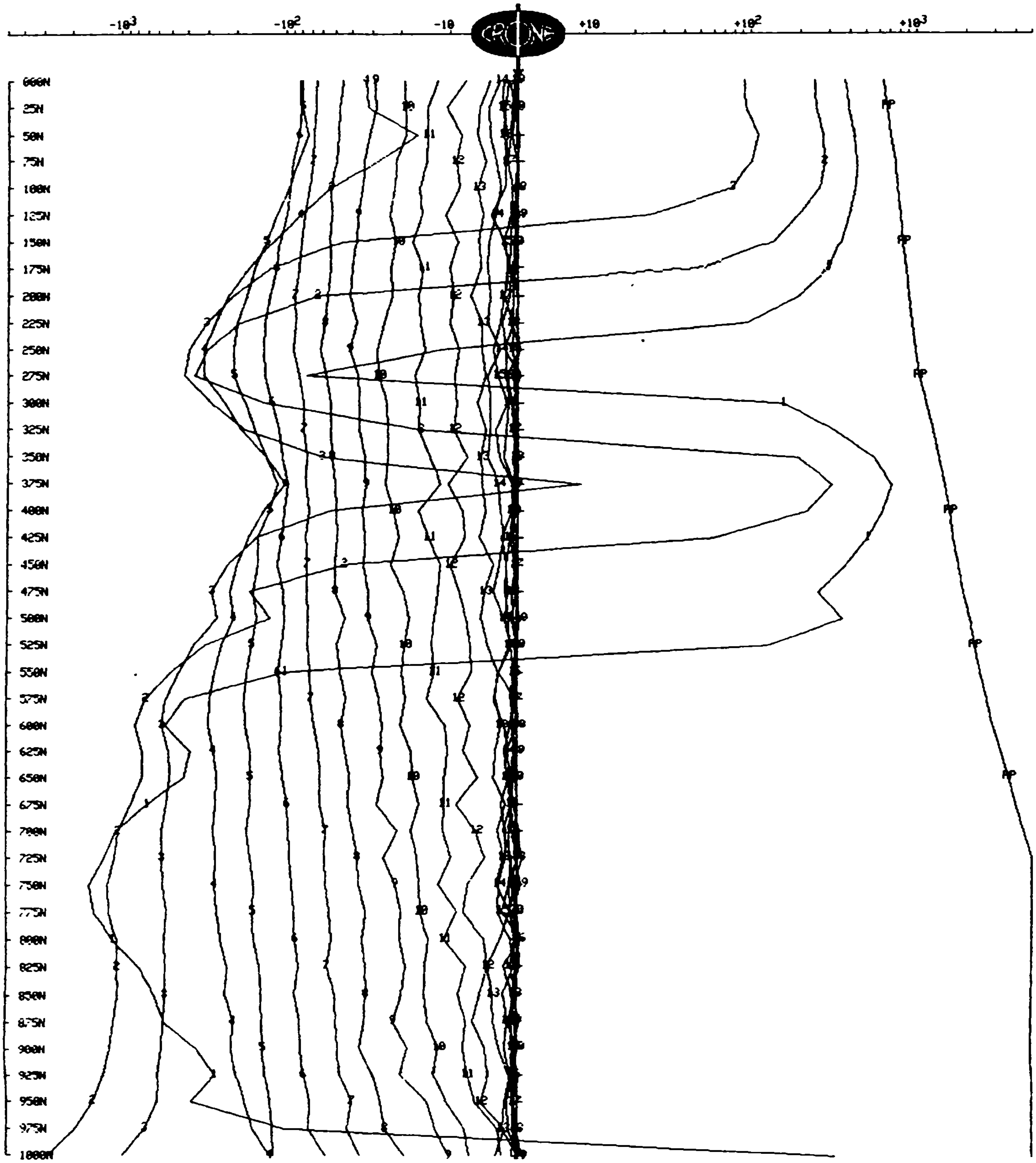
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L500E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 5ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L600E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 6ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 80
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

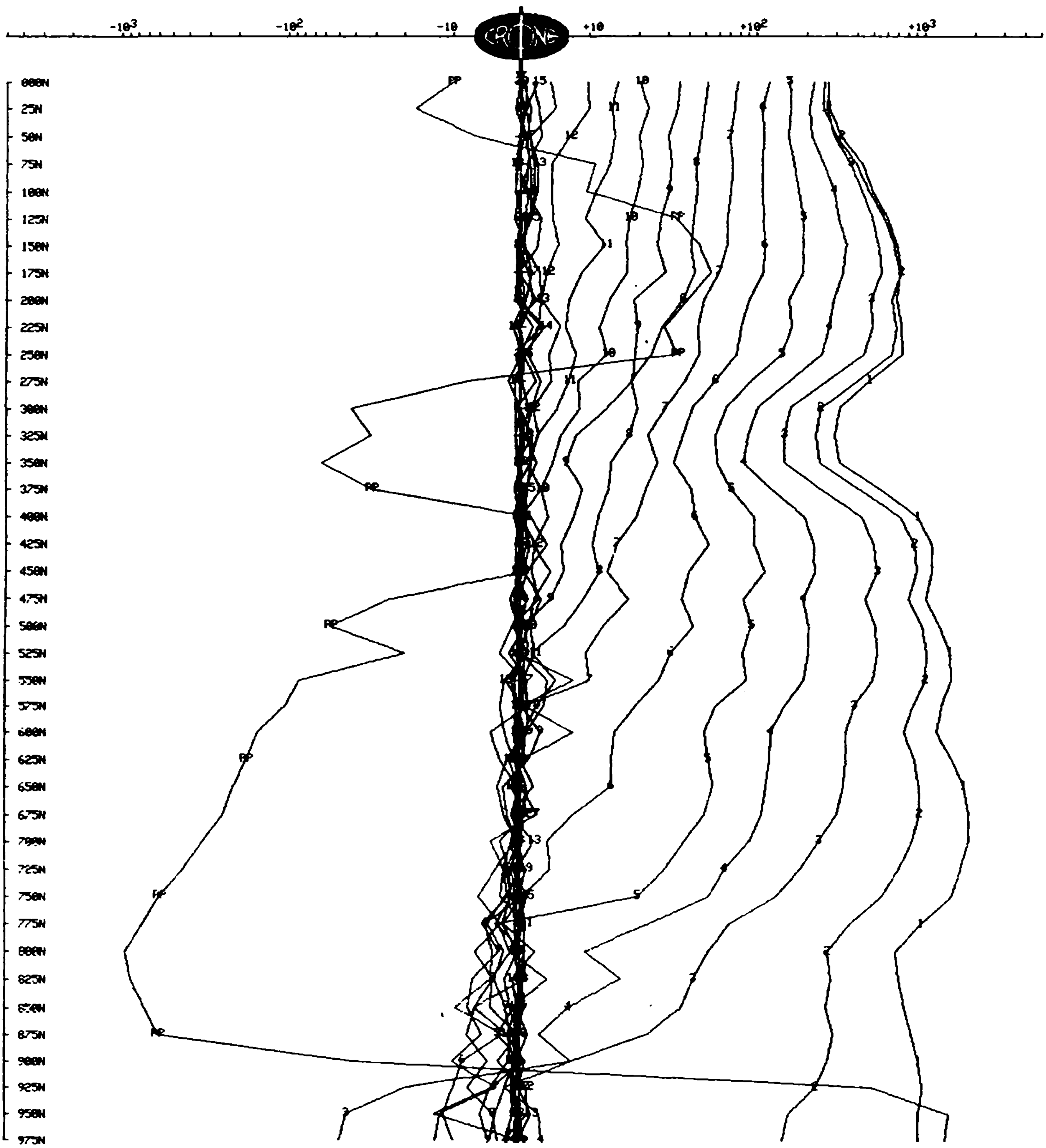
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L600E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 1, 1995	File name	: 6ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



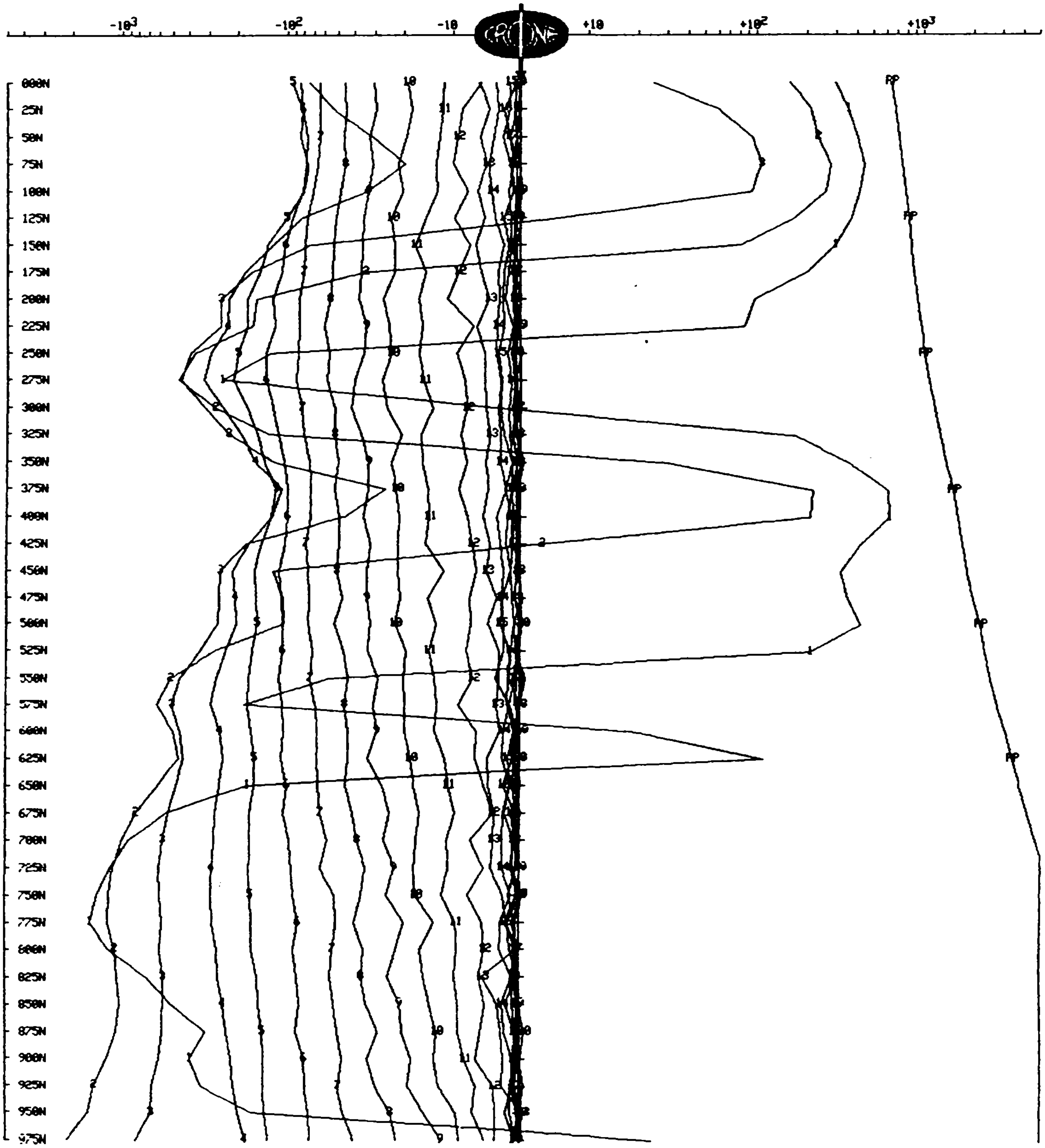
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L600E
Grid	:	SLATE LAKE	Tx Loop	:	SL-1
Date	:	Feb 1, 1995	File name	:	6ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L700E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2, 1995	File name	: 7ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 80
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

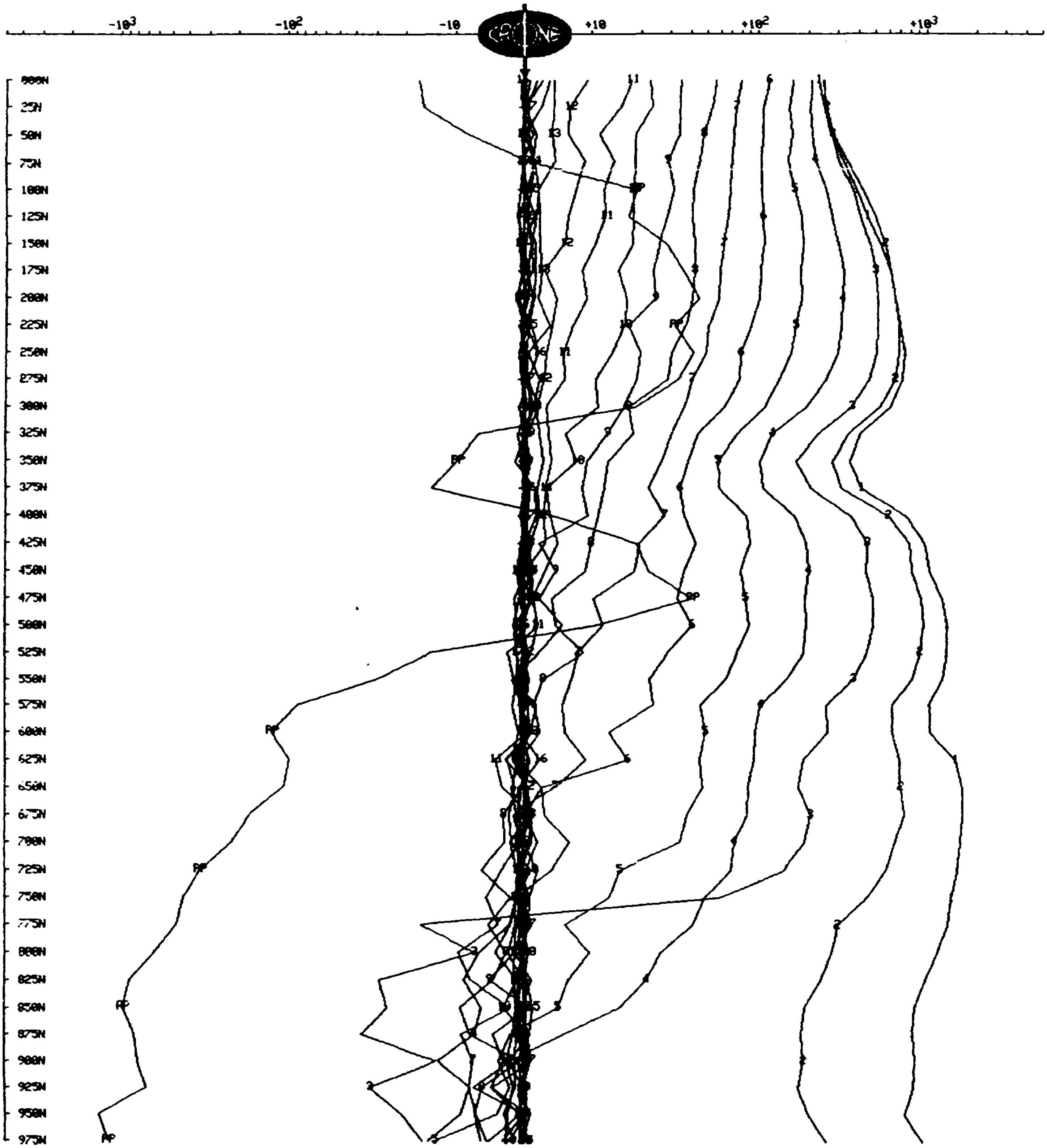
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L700E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 2, 1995	File name	: 7ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



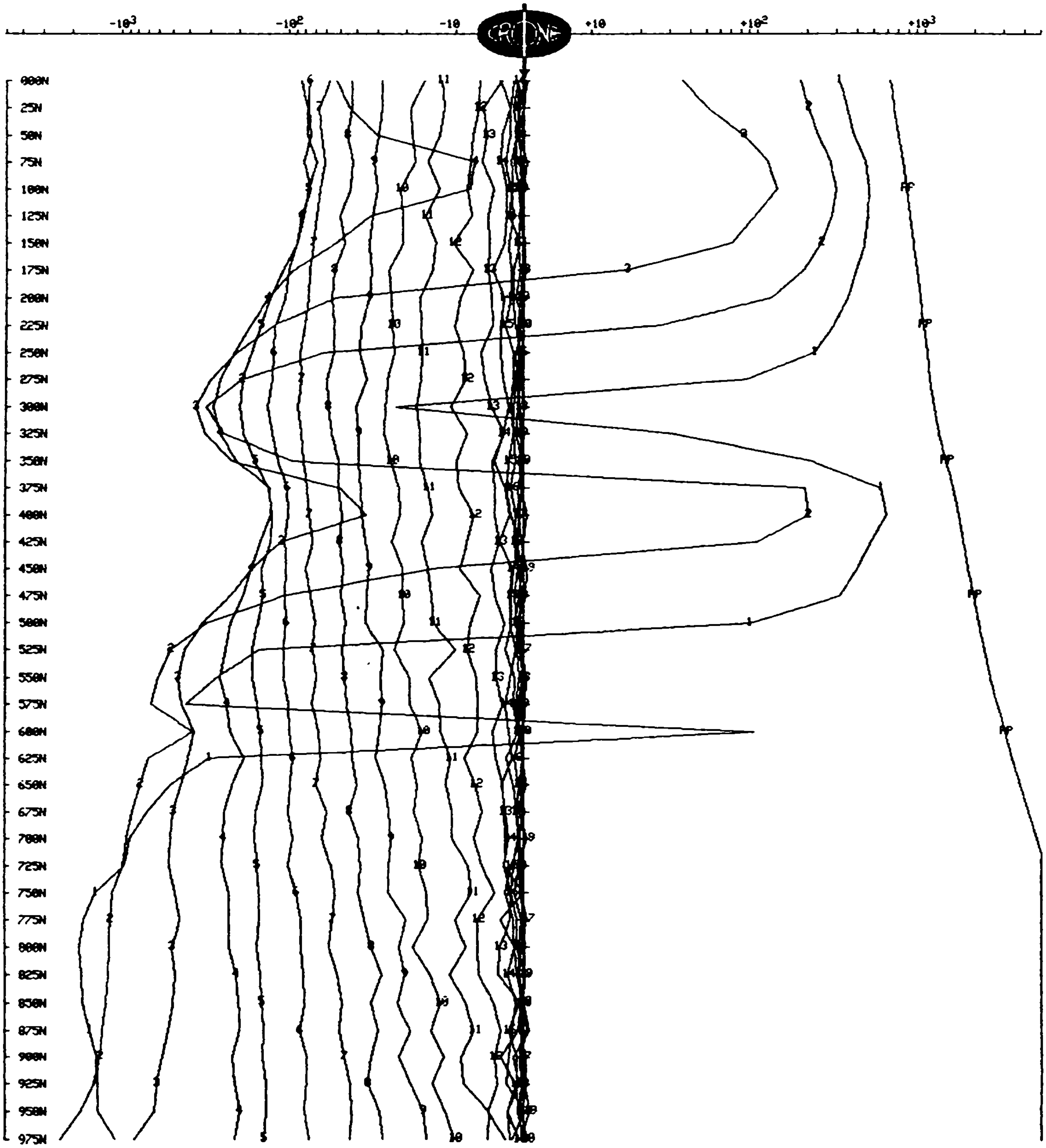
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L700E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2, 1995	File name	: 7ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L800E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2, 1995	File name	: 8ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 80
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

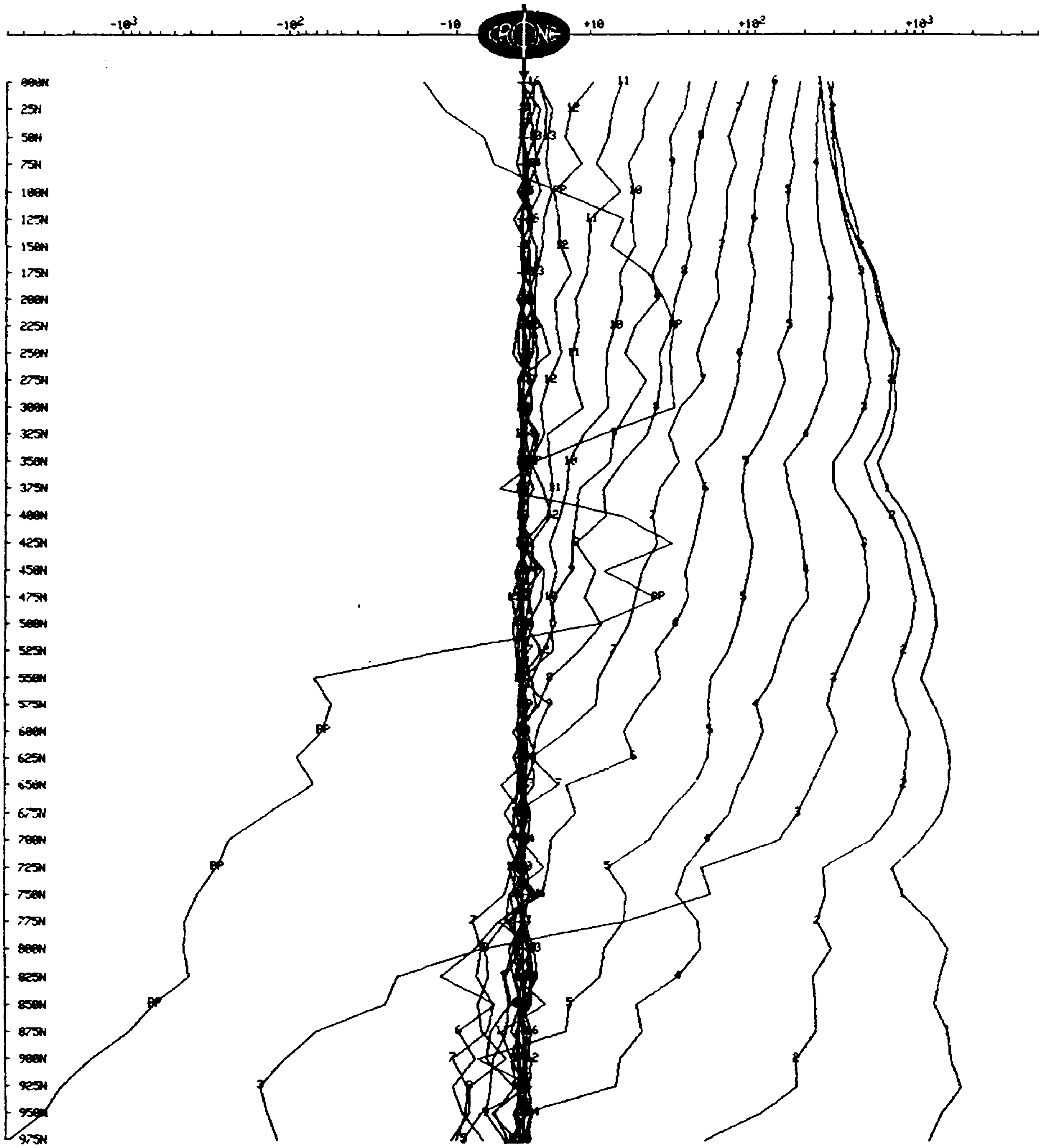
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L800E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2, 1995	File name	: 8ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



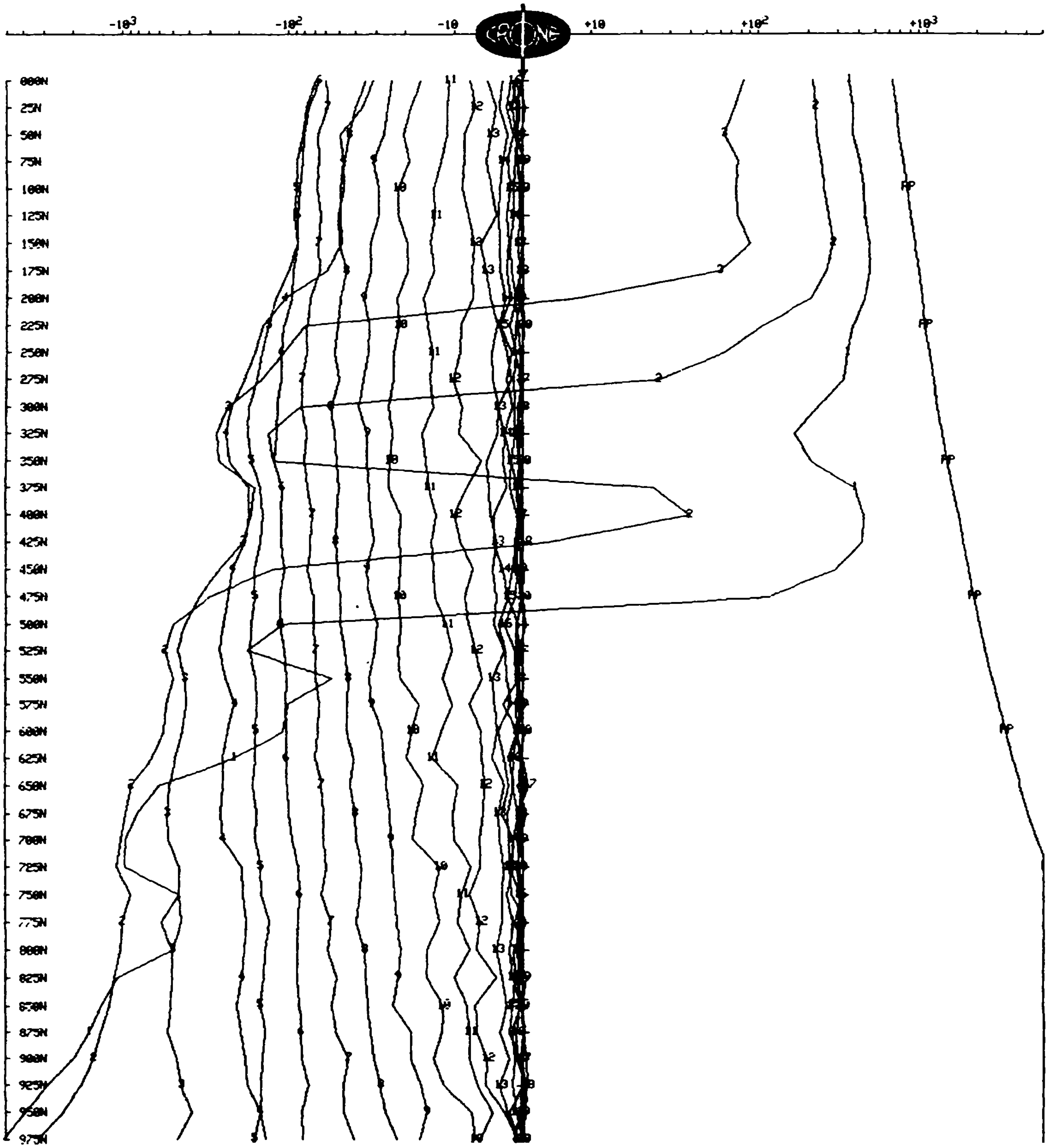
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L800E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 2, 1995	File name	: 8ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L900E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2,3, 1995	File name	: 9ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 80
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

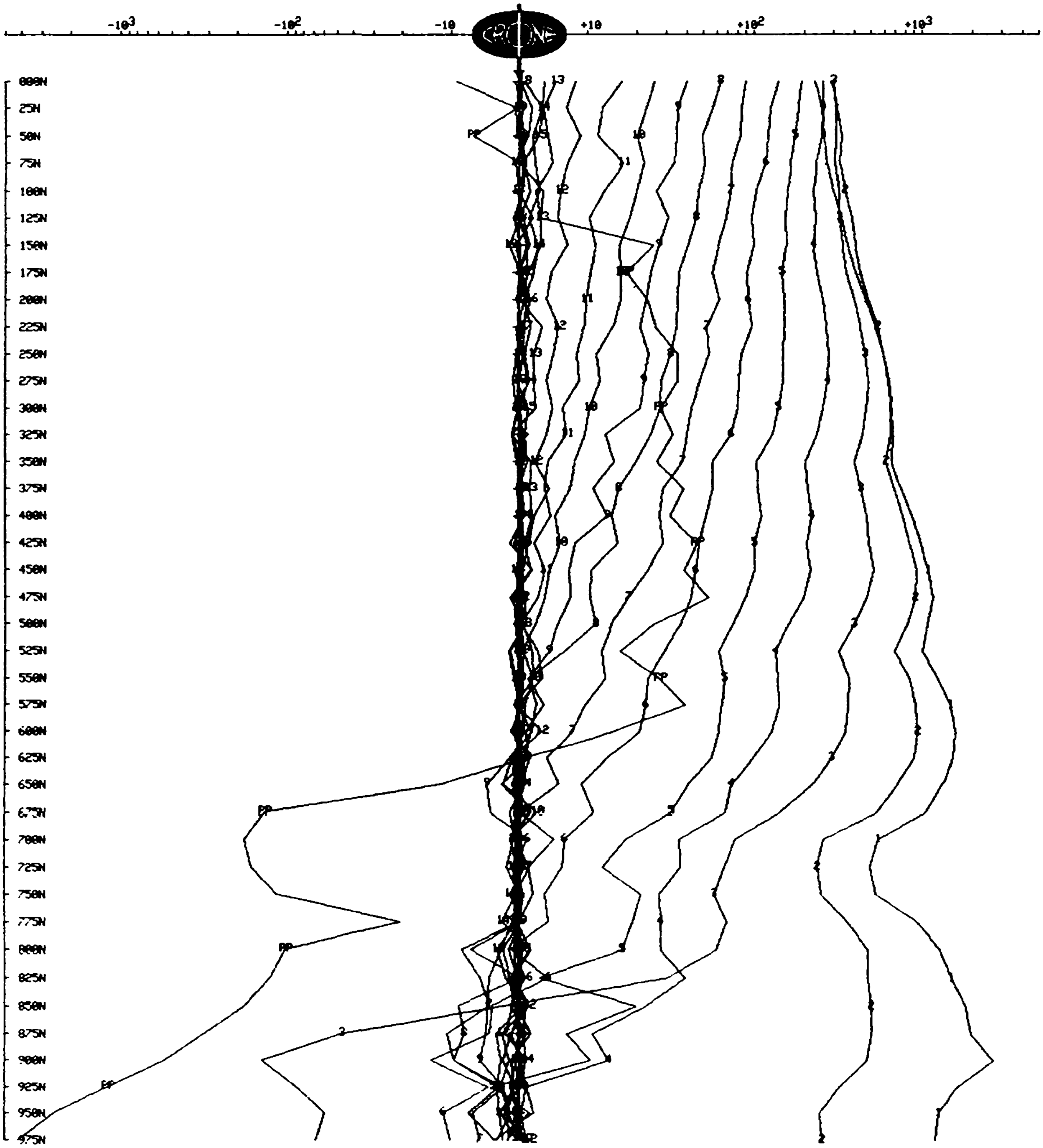
CRONE GEOPHYSICS & EXPLORATION LTD.

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	: L900E
Grid	: SLATE LAKE	Tx Loop	: SL-1
Date	: Feb 2,3, 1995	File name	: 9ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



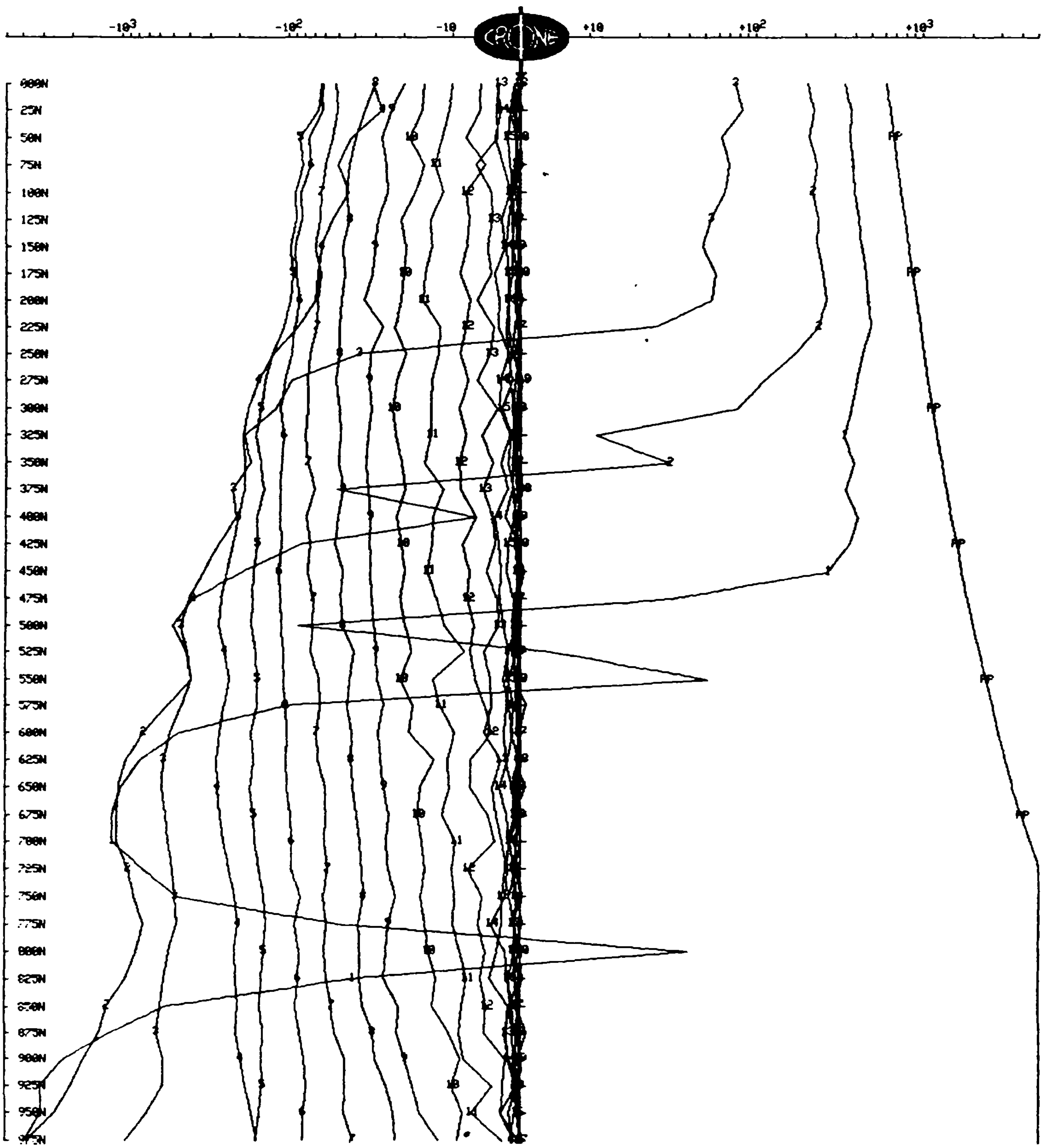
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L900E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 2,3, 1995	File name	: 9ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD.

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L1000E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 3, 1995	File name	: 10ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 80
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

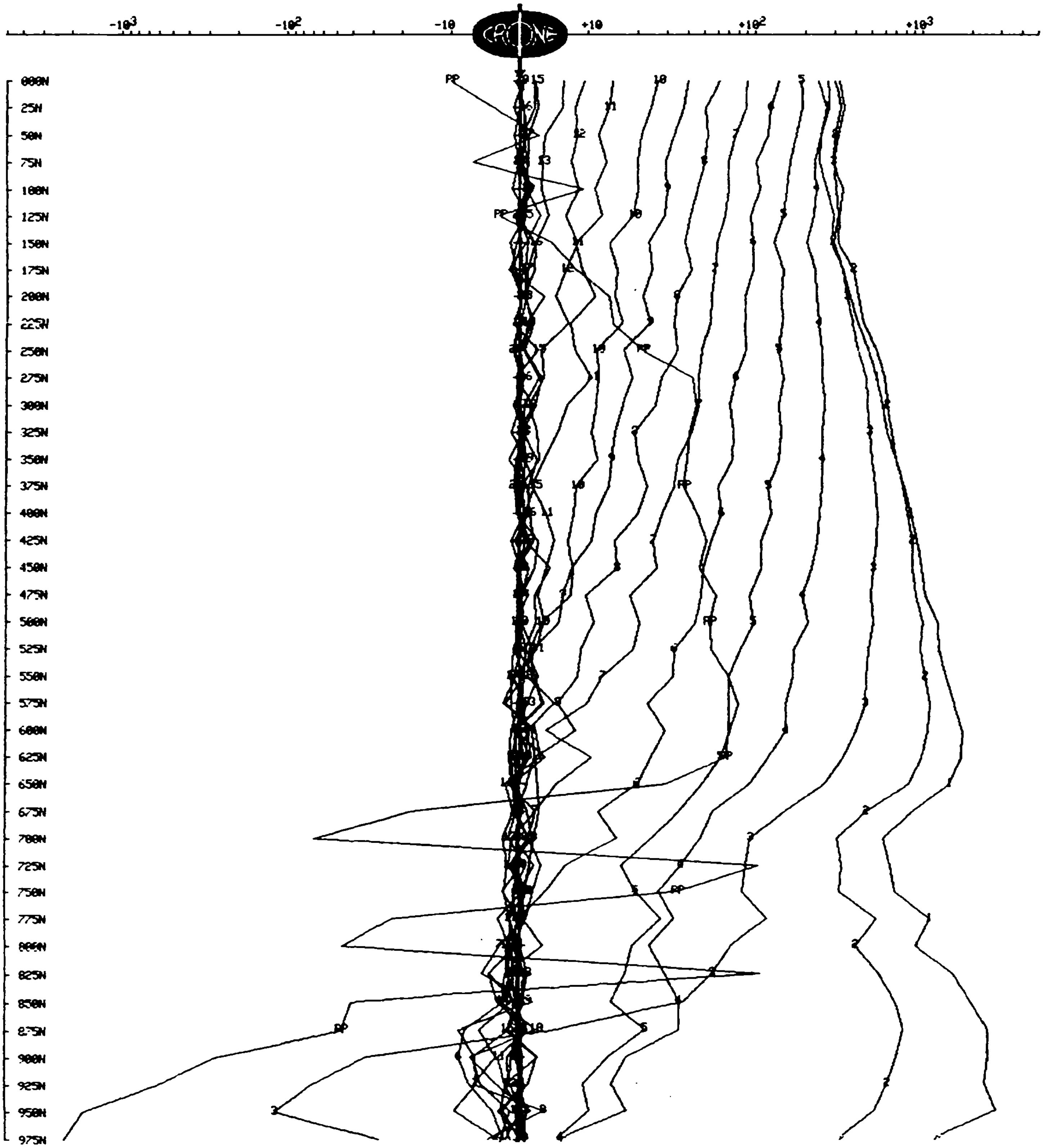
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L1000E
Grid	:	SLATE LAKE	Tx Loop	:	SL-1
Date	:	Feb 3, 1995	File name	:	10ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



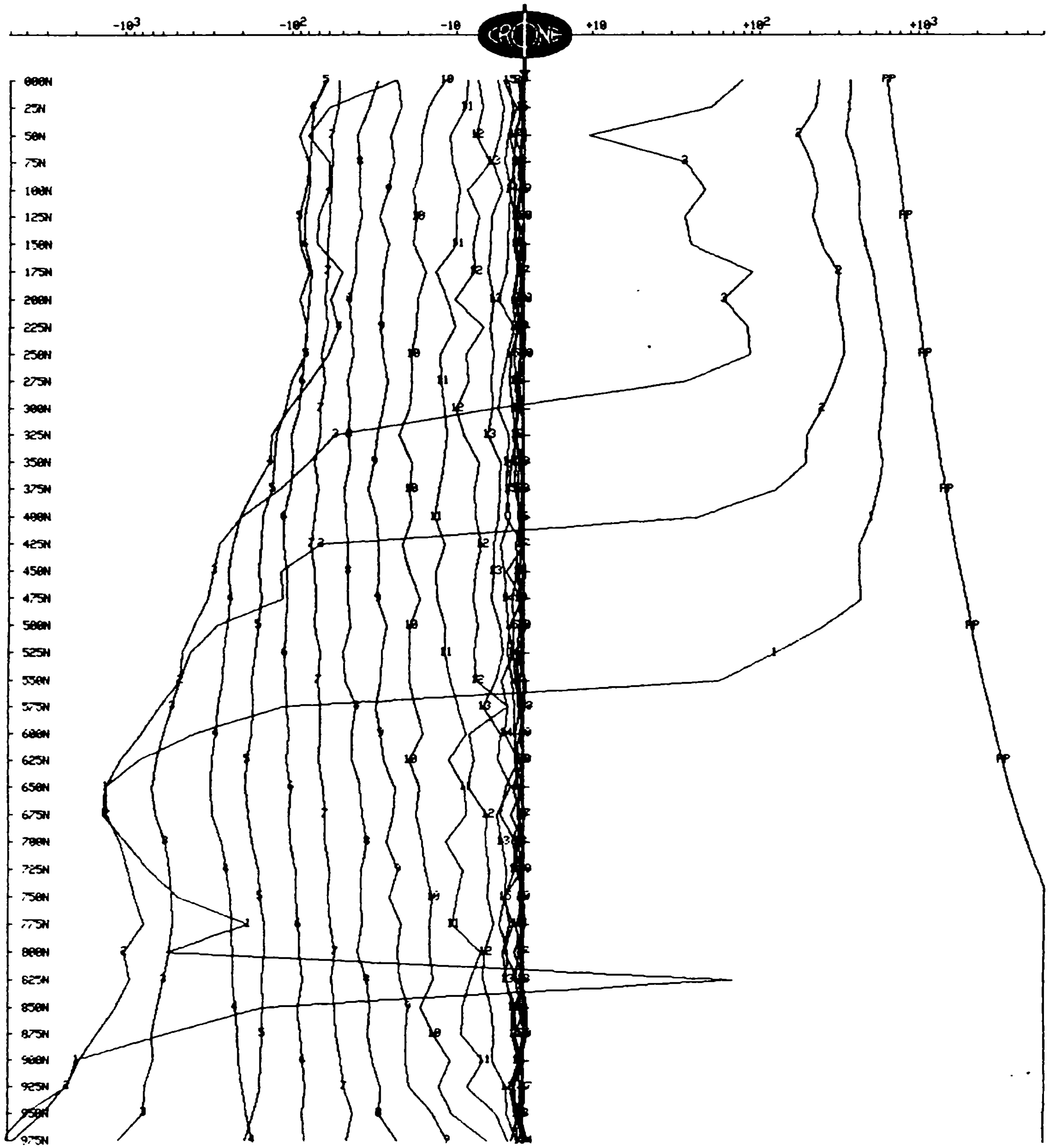
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	:	**CUMBERLAND RESOURCES LTD.**	Line	:	**L1000E**
Grid	:	**SLATE LAKE**	Tx Loop	:	**SL-1**
Date	:	Feb 3, 1995	File name	:	10ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L1200E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 3, 1995	File name	: 12ESL1.PEM
Time Base	: 16.66 ms	# Readings	: 78
Ramp Time	: 1.00 ms	Stn Units	: Metric
# Channels	: 20	Coil Area	: 4000 sq m
Sync Type	: Crystal(MASTER)	Polarity	: +
Loop Size	: 1100m X 1000m	Receiver	: Digital #109
Current	: 16.5 Amps	Operator	: Brad Malpage

Loop Coordinates (X,Y,Z)

1. 100m, 1050m, 0m
2. 1200m, 1000m, 0m
3. 1200m, 2000m, 0m
4. 100m, 2000m, 0m

Channel Times (usec)

Ch	Start	End	Center	Ch	Start	End	Center	Ch	Start	End	Center
PP	-198	-99	-149	1	76	104	90	2	104	131	117
3	131	171	151	4	171	225	198	5	225	292	259
6	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

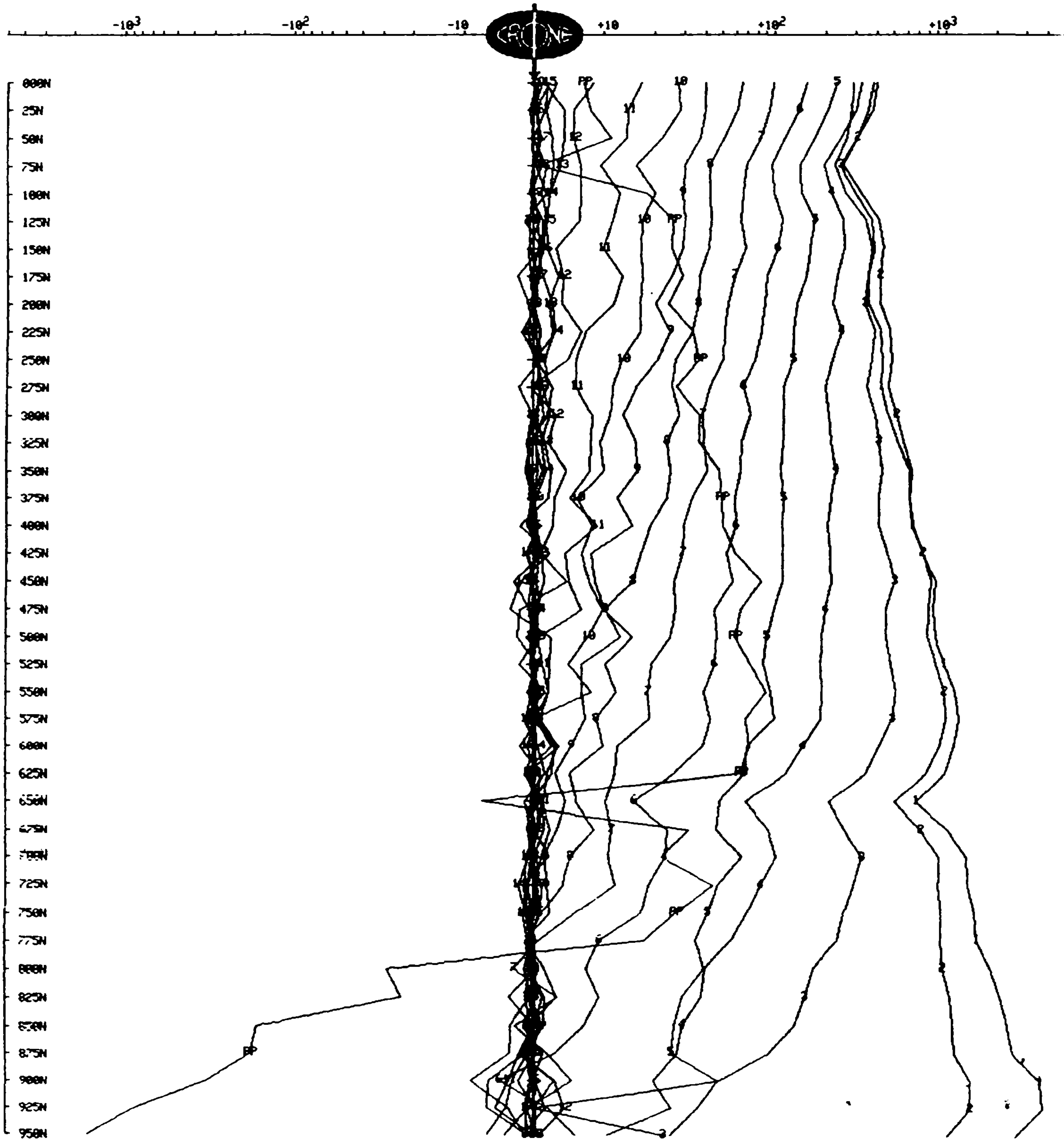
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L1200E**
Grid	: **SLATE LAKE**	Tx Loop	: **SL-1**
Date	: Feb 3, 1995	File name	: 12ESL1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



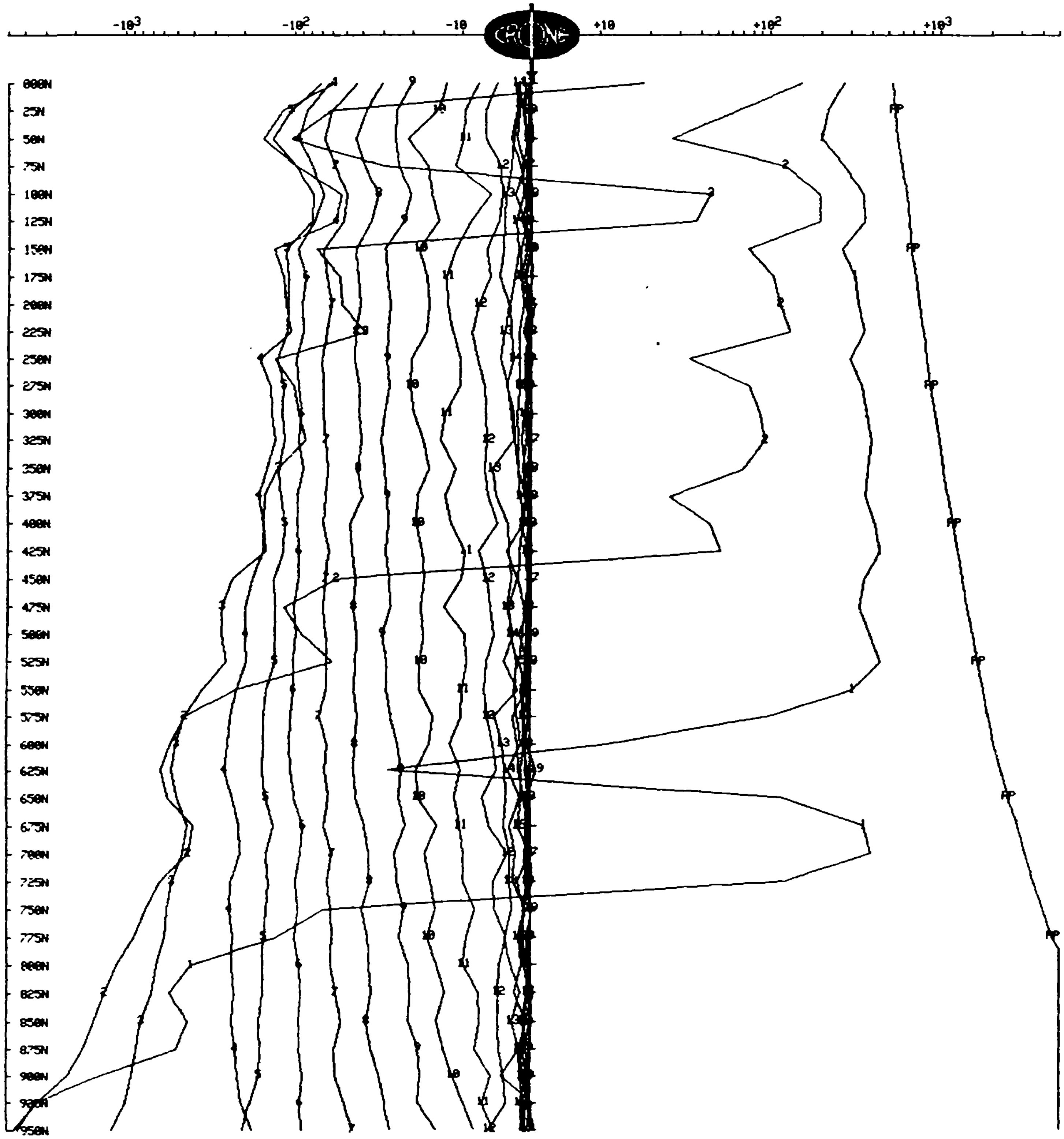
CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client	: **CUMBERLAND RESOURCES LTD.**	Line	: **L1200E**
Grid	: **SLATE LAKE**	Tx Loop	: SL-1
Date	: Feb 3, 1995	File name	: 12ESL1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 20 channels and PP

Scale: 1:5000



APPENDIX II

CRONE PULSE EM

SYSTEM DESCRIPTION

CRONE PULSE EM SYSTEM

SYSTEM DESCRIPTION

The Crone Pulse EM system is a time domain electromagnetic method (TDEM) that utilizes an alternating pulsed primary current with a controlled shut-off and measures the rate of decay of the induced secondary field across a series of time windows during the off-time. The system uses a transmit loop of any size or shape. A portable power source feeds a transmitter which provides a precise current waveform through the loop. The receiver apparatus is moved along surface lines or down boreholes.

The transmitter cycle consists of slowly increasing the current over a few milliseconds, a constant current, abrupt linear termination of the current, and finally zero current for a selected length of time in milliseconds. The EMF created by the shutting-off of the current induces eddy currents in nearby conductive material thus setting-up a secondary magnetic field. When the primary field is terminated, this magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor. The receiver, which is synchronized to the off-time of the transmitter, measures this transient magnetic field where it cuts the surface coil or borehole probe. These readings are across fixed time windows or "channels".

SYSTEM TERMINOLOGY

Ramp Time

"Ramp time" refers to the controlled shut-off of the transmitter current. Three ramp times are selectable by the operator; 0.5ms, 1.0ms, and 1.5ms. By controlling the shut-off rather than having it depend on the loop size and current ensures that the same waveform is maintained for different loops so data can be properly compared.

The 1.5ms ramp is the normally used setting for good conductors. It keeps the early channel responses on scale and decreases the chance of overload. The faster ramp times of 1.0ms and 0.5ms will enhance the early time responses. This can be useful for weak conductors when data from the higher end of the frequency spectrum is desired.

Time Base

Time base is the length of time the transmitter current is off (it includes the ramp time). This also equals the on time of the current. Eight time bases are selectable by the operator. They include the original time bases used in the analog system as well as time bases to eliminate the effects of powerline interference. The eight time bases are as follows: compatible to analog Rx: 10.89ms, 21.79ms; 60hz powerline noise reduction: 8.33ms, 16.66ms, & 33.33ms; 50hz powerline noise reduction: 10.00ms, 20.00ms, & 40.00ms

Since readings are taken during the off cycles, the time base will have an effect on the receiver channels. Normally, a standard time base is selected for the type of system and survey being used, but this can be changed to suit a particular situation. A longer time base is preferred for conductors of greater time constants, and in surveys such as resistive soundings where more channels are desired.

Zero Time Set

The term "zero time set" or "ZTS" refers to the starting point for the receiver channel measurements. It is manually set on the receiver by the operator thus allowing adjustments for the ramp times and fine tuning for any fluctuations in the transmitter signal.

Receiver Channels

The rate of decay of the secondary field is measured across fixed time windows which occupy most of the off-time of the transmitter. These time windows are referred to as "channels". These channels are numbered in sequence with "1" being the earliest. The analog and datalogger receivers measured eight fixed channels. The digital receiver, being under software control, offers more flexibility in the channel positioning, channel width, and number of channels.

PP Channel

The PEM system monitors the primary field by taking a measurement during the current ramp and storing this information in a "PP channel". This means that data can be presented in either normalized or unnormalized formats, and additional information is available during interpretation. The PP channel data can provide useful diagnostic information and helps avoid critical errors in field polarity.

Synchronization

Since the PEM system measures the secondary field in the absence of the primary field, the receiver must be in "sync" with the transmitter to read during the off-time. There are three synchronization methods available: cable connection, radio telemetry, and crystal clock. This flexibility enhances the operational capabilities of the system.

SURVEY METHODS

The wide frequency spectrum of data produced by a Pulse EM survey can be used to provide structural geological information as well as the direct detection of conductive or conductive associated ore deposits. The various types of survey methods, from surface and borehole, have greatly improved the chances of success in deep exploration programs. There are eight basic profiling methods as well as a resistivity sounding mode.

Moving Coil

A small, multi-turn transmitter loop (13.7m diameter) is moved for each reading while the receiver remains a fixed distance away. This method is ideal for quick reconnaissance in areas of high background conductivity.

Moving Loop

Same as Moving Coil method, but with a larger transmit loop (100 to 300 meters square). This method provides deeper penetration in areas of high background conductivity, and works best for near-vertical conductors. This method can be used in conjunction with the Moving In-loop survey for increased sensitivity to horizontal conductors.

Moving In-Loop

A transmit loop of size 100 to 300 meters square is moved for each reading while the receiver remains at the center of the loop. This method provides deep penetration in areas of very high background conductivity, and works best for near-horizontal conductors. It can be used in conjunction with the Moving Loop survey.

Large In-Loop

A very large, stationary transmit loop (800m square or more) is used, and survey lines are run inside the loop. This mode provides very deep penetration (700m or more) and couples best with shallow dip conductors (<45 deg.) under the loop.

Deepem

A large, stationary transmit loop is used, and survey lines are run outside the loop. This mode provides very deep penetration, and couples best with steeply dipping conductors (>45 deg.) outside the loop.

Borehole (Z Component only)

Isolated Borehole: A drill hole is surveyed by lowering a probe down a hole and surveying it with a number of transmit loops laid out on surface. The data from multiple loops gives directional information on the conductors.

Multiple Boreholes: One large transmit loop is used to survey a number of closely spaced holes. The change in anomaly from hole to hole provides directional information.

These methods have detected conductors to depths of 2500m from surface and up to 200m from the hole.

3-D Borehole

Drill holes are surveyed with both the Z and the XY borehole probes. The X and Y components provide accurate direction information using just one transmit loop.

Since the probe rotates as it moves down the hole a correction is required for the X-Y data. This is accomplished in one of two ways. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe which is produced in co-operation with IFG Corp. This attachment uses dipmeters to calculate the probe rotation.

Underground Borehole

Underground drill holes can be surveyed in any of the above mentioned borehole methods with one or more transmit loops on the surface. Near-horizontal holes can be surveyed using a push-rod system.

Resistivity Soundings

By reading a large number of channels in the centre of a transmit loop it is possible to perform a decay curve analysis giving a best-fit layer earth model using programs such as ARRTI or TEMIX.

EQUIPMENT

Transmit Loops

The PEM system can operate with practically any size of transmit loop, from a multi-turn circular loop 13.7m in diameter, to a 1 or 2 turn loop of any shape up to 1 or 2 kilometers square using standard insulated copper wire of 10 or 12 gauge. The multi-turn loop is made in two sections with screw connectors. The 10 or 12 gauge loop wire comes on spools in either 300m or 400m lengths. The spools can be mounted on packframe winders for laying out or retrieving.

Power Supply

The PEM system normally operates with an input voltage from 24v to 120v. Modifications have recently been made to increase the power to 240 volts. The maximum current is still 20 amps. For low power surveys a 20amp/hr 24v battery can be used. The power supply requires a motor generator and a voltage regulator to control and filter the input voltage to the transmitter.

Specifications: PEM Motor Generator

- 4.5 hp Wisconsin, (2 kw) - 11 hp Honda (4 kw); 4 cycle engine
- belt drive to D.C. alternator
- cable output to regulator
- maximum output: 120v, 20amp (2 kw); 240v, 20amp (4 kw)
- fuse type overload protection
- steel frame
- external gas tank
- unit weight: 33kg (2 kw); 52kg (4 kw)
- optional packframe
- wooden shipping box
- shipping weight: 47kg (2 kw); 80kg (4 kw)

Specifications: PEM Variable Voltage Regulator

- selectable voltage between 24v and 120v or 48v and 240v
- 20amp maximum current
- fuse and internal circuit breaker protection
- cable connections to motor generator and transmitter
- anodized aluminum case
- unit weight 10kg; shipping weight 18kg
- padded wooden shipping box

Transmitter

The transmitter controls the bi-polar on-off waveform and linear current shut-off ramp. The latest 2000w PEM Transmitter has the following specifications:

Specifications: PEM Transmitter

- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, 30ms
- ramp times: 0.5ms, 1.0ms, 1.5ms
- operating voltage: 24v to 120v (2 kw); 48v to 240v (4 kw)
- output current: 5amp to 20amp
- monitors for input voltage, output current, shut-off ramp, tx loop continuity, instrument temperature, and overload output current
- automatic shut-off for open loop, high instrument temperature, and overload
- fuse and circuit breaker overload protection
- three sync modes: 1) built-in radio and antenna
  2) cable sync output for direct wire link to receiver or remote radio
  3) connectors for the crystal clock
- anodized aluminum case
- optional packframe
- unit weight 12.5kg; shipping weight 22kg
- padded wooden shipping box

Receiver

The receivers measure the rate of decay of the secondary field across several time channels. Three types of receivers are available with the PEM system: Analog Rx, Datalogger Rx, and Digital Rx. The Analog Rx and Datalogger Rx read eight fixed time channels while the Digital Rx, under software control, offers a variety of channel configurations. The Digital Rx has been used in the field for contract surveys since 1987.

Specifications: Digital PEM Receiver

- operating temperature -40°C to 50°C
- optional packframe
- unit weight 15kg; shipping weight 25.5kg
- padded wooden shipping box

Hardware:

- 24v rechargeable gel cell battery supply
- two CMOS microprocessors (NSC800)
- alphanumeric keyboard
- 2 x 16 character cold weather display
- 16 x 40 character (256 x 128 pixels graphic) display
- 64k byte solid state memory storage
- cable, radio or crystal clock synchronization
- RS-232 serial I/O

Sampling process features:

- 16 bit A/D conversion
- digital recording of data in nano-tesla/sec
- rejection of atmospheric noise samples based on digital threshold detection
- automatic gain control to optimize receiver signal to noise ratio

Menu driven operating software system offering the following functions:
- controls channel positions, channel widths, and number of channels using a basic slice of 4.5μsec
- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, and 30ms
- ramp time selectable in 4.5μsec steps
- sample stacking from 512 to 65536
- scrolling routines for viewing data
- graphic display of decay curve and profile with various plotting options
- routines for memory management
- control of data transmission
- provides information on instrument and operating status

Sync Equipment

There are three modes of synchronization available; radio, cable, and crystal clock. The radio sync signal can be transmitted through a booster antenna from either the PEM Transmitter internal radio or through a Remote Radio.

Specifications: Sync Cable
- 2 conductor, 24awg, Teflon coated
- approx. 900m per aluminum spool with connectors

Specifications: Remote Radio
- operating frequency 27.12mhz
- 12v rechargeable gel cell battery supply
- fuse protection
- sync wire link to transmitter
- coaxial link to booster antenna
- anodized aluminum case
- unit weight 2.7kg

Specifications: Booster Antenna
- 8m, 4 section aluminum mast
- guide rope support
- ¼ wave CB fiberglass antenna
- range up to 2km
- coaxial connection to transmitter or remote radio

Specification: Crystal Clocks
- heat stabilized crystals
- 24v rechargeable gel cell battery supply
- anodized aluminum case
- rx unit can be separate or housed in the receiver
- outlet for external supplementary battery supply

Surface PEM Receive Coil

The Surface PEM Receive Coil picks up the EM field to be measured by the receiver. The coil is mounted on a tripod that can be positioned to take readings of any component of the field.

Specifications: Surface PEM Receive Coil
- ferrite core antenna
- built-in preamplifier
- VLF filter
- 10khz bandwidth
- 23:1 amplifier gain
- two 9v transistor battery supply
- tripod adjustable to all planes
- unit weight 4.5kg; shipping weight 13.5kg

- padded wooden shipping box

Borehole PEM Z Component Probe

The Z component probe measures the axial component of the EM field. The Z component data is not affected by probe rotation so no correction are required.

Specifications: Borehole PEM Z Component Probe

- ferrite core
- built-in preamplifier
- dimensions: length - 1.6m; dia - 3.02cm (3.15cm for high pressure tested probes)
- internal rechargeable ni-cad battery supply
- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths 1300m, 2000m, and 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total weight 17kg

Borehole PEM XY Component Probe

The XY probe measures two orthogonal components of the EM field perpendicular to the axis of the hole. Correction for probe rotation can be achieved by two methods. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe that uses dipmeters to calculate the probe rotation.

Specifications: Borehole PEM XY Component Probe

- ferrite core
- built-in preamplifier
- dimensions: length - 2.01m; dia - 3.02cm
- internal rechargeable ni-cad battery supply
- selection of X or Y coils by means of a switch box on surface or automatic switching with Digital receiver
- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths to 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 20kg

Orientation Device

The orientation device is an optional attachment for the XY probe which measures the rotation of the probe using two dipmeters.

Specifications: Orientation Device

- 2 axis tilt sensors
- sensitivity +/- 0.1 deg.
- operating range -89.5 to -10 deg.
- dimensions: length - 0.94m; dia - 28.5cm
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 11kg

Borehole Equipment

To lower the probe down a drill hole requires a cable and spool, winch assembly frame and cable counter. Borehole surveys also require equipment to "dummy probe" the hole before doing the survey.

Specifications: Borehole Cable

- two conductor shielded cable
- kevlar strengthened
- lengths are available up to 2600m on three sizes of spools.
- shipped in wooden box

Specifications: Slip Ring

- attaches to side of borehole cable spool providing a connection to the receiver while allowing the spool to turn.
- VLF filter
- pure silver contacts

Specifications: Borehole Frame

- welded aluminum frame
- removable axle
- chain driven, 3 speed gear box
- hand or optional power winding
- hand brake and lock
- two sizes: standard for up to 1300m cable; larger for longer cables
- shipped in wooden box

Specifications: Borehole Counter

- attaches to the drill hole casing
- calibrated in meters
- shipped in wooden box; total weight 13kg

Specifications: Dummy Probe and Cable

- solid steel or steel pipe
- same dimensions as borehole probe
- shear pin connection to dummy cable
- steel dummy cable on aluminum spool
- cable mounts on borehole frame
- various lengths to 2600m on 3 spool sizes.

APPENDIX 2

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, M.P. Lewis, hereby certify that:

1. I am a practicing Geologist and sole proprietor of M.P. (Pat) Lewis Geological Services, with an office at 269 Chercover Drive, Thunder Bay, Ontario.

2. I am a graduate of Memorial University of Newfoundland (1976) with a Bachelor of Science Degree - Major in Geology.

3. I have practiced my profession as an Exploration Geologist continuously for the past 17 years.

4. I have an indirect interest in the Properties described in this report.

Signature: Pat Lewis
M.P. Lewis

Date: ____________________

Ministry of Northern Development and Mines

Ontario

Report of Work Conducted After Recording Claim

Mining Act

Transaction Number: W9520 · 00083

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

2.16340

Instructions:
- Please type or print and submit in duplicate.
- Refer to the Mining Act and Regulations for requ
  Recorder.
- A separate copy of this form must be completed
- Technical reports and maps must accompany th
- A sketch, showing the claims the work is assign

52K15NE0003 2 16340 SLATE LAKE

900

Recorded Holder(s)	Client No.
CUMBERLAND RESOURCES LTD.	122924
Address	**Telephone No.**
74 WINNIPEG AVE, THUNDER BAY, ONT	807-344-6598

Mining Division	Township/Area	M or G Plan No.
RED LAKE	SLATE L. G. 1884	G-1884

Dates Work Performed — From: JAN 28, 1995 — To: FEB 13, 1995

Work Performed (Check One Work Group Only)

	Work Group	Type
✓	Geotechnical Survey	PULSE EM GEOPHYSICS & LINECUTTING
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
	Assays	
	Assignment from Reserve	

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Total Assessment Work Claimed on the Attached Statement of Costs $ 36,558

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address
CRONE GEOPHYSICS	3607 WOLFEDALE ROAD, MISSISSAUGA, ONT
PAT LEWIS	269 CHERCOVER DR. THUNDER BAY
	ONT. P7G 1A2

(attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

	Date	Recorded Holder or Agent (Signature)
I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	DEC 13/95	Pat Lewis

Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.

Name and Address of Person Certifying: PAT LEWIS 269 CHERCOVER DRIVE, THUNDER BAY, ON

Telephone No.	Date	Certified By (Signature)
807-767-0259	DEC 13/95	Pat Lewis

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Received Stamp
$ 36,559.00	December 22/95	Barbara Thomp	RECEIVED RED LAKE MINING DIV. ... 1995 AM PM 7,8,9,10,11,12,1,2,3,4,5,6
	Deemed Approval Date March 21/96	**Date Approved**	
	Date Notice for Amendments Sent		

0241 (03/91)

Assessment Work Distribution, file#2.16340

Claim number	Units	value of assessment work done on this claim	value applied to this claim	value assigned from this claim	Reserve: Work to be calimed at a future date
483668	1	$ 2,970.00		$ 2,970.00	
483667	1	$ 4,608.00		$ 4,608.00	
483369	1	$ 2,626.00		$ 2,626.00	
483670	1	$ 3,312.00		$ 3,312.00	
503385	1	$ 1,994.00		$ 1,994.00	
KRL1144369	4	$ 6,057.00	$ 3,200.00	$ 2,857.00	
KRL1144370	2	$ 191.00	$ 1,600.00		
KRL1144371	1	$ 3,325.00	$ 800.00	$ 2,525.00	
KRL1144372	6	$ 3,703.00	$ 4,800.00		
KRL1202247	16	$ -	$ 12,800.00		
KRL1202248	6	$ 6,223.00	$ 4,800.00	$ 64.00	$ 1,359.00
KRL1202249	2	$ 1,550.00	$ 1,600.00		
KRL1202250	4	$ -	$ 3,200.00		
KRL1209261	3	$ -	$ 2,400.00		
TOTALS	49	$ 36,559.00	$ 35,200.00	$ 20,957.63	$ 1,359.00

March 20 1996

Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units	Value of Assessment Work Done on this Claim	Value Applied to this Claim	Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
2.10340 ✓	483668 +	1	2,269		2269	
✓	483667 +	1	6,174		6,174	
✓	483669 +	1	2,518		2,518	
✓	483670 +	1	5,562		5,562	
~~✓~~	~~503384 +~~	~~1~~				
✓	503385 +	1	3,006		3,006	
	1144369	4	4,880	3200	~~4,880~~ 1680	
	1144370	2	3,109	1600	~~3,109~~ 1509	
	1144371	1		800		
	1144372	6	2,705	4800	~~2,705~~	
	1202247	16		12,800		
	1202248	6	5,405	4800	~~4046~~	1359
	1202249	2	931	1600	~~931~~	
	1202250	4		3200		
	1209261	3		2400		
		49			22,718.	
	14		36,559	~~$~~35,200	~~35,200~~	1359
	Total Number of Claims		Total Value Work Done	Total Value Work Applied	Total Assigned From	Total Reserve

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0241 (03/91)

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to priorize the deletion of credits. Please mark (✓) one of the following:

1. ☐ Credits are to be cut back starting with the claim listed last, working backwards.
2. ☐ Credits are to be cut back equally over all claims contained in this report of work.
3. ☐ Credits are to be cut back as priorized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

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... LAKE MINING DIV.
DEC 22 1995
AM 7,8,9,10,11,12,1,2,3,4,5,6 PM

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented or leased land at the time the work was performed.	Signature: Pat Lewis	Date: DEC 13/95

Ministry of Northern Development and Mines
Ontario
Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit
État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de transaction: W9520.00083

2.16340

Personal information collected on this form is obtained under the authority of the **Mining Act**. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sc recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un regis des concessions minières. Adresser toute quesiton sur la collece de c renseignements au chef provincial des terrains miniers, ministère Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbu (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre	2,462	2,462
	Field Supervision Supervision sur le terrain		2,462
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type GEOPHYSICS	20,294	
	LINECUTTING	8,000	
			28,294
Supplies Used Fournitures utilisées	Type MISC	73.09	
			73.09
Equipment Rental Location de matériel	Type NIL		
	Total Direct Costs Total des coûts directs		30,829

2. Indirect Costs/Coûts indirects

** **Note:** When claiming Rehabilitation work Indirect costs are not allowable as assessment work.
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type GROUND	2,155	
			2,155
Food and Lodging Nourriture et hébergement	~~HOTEL~~ MEALS	3,575	3,575
Mobilization and Demobilization Mobilisation et démobilisation			

RECEIVED JAN 10 1996 MINING LANDS BRANCH

Sub Total of Indirect Costs Total partiel des coûts indirects: 5,730

Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs): ~~6,165~~ 5,730

Total Value of Assessment Credit (Total of Direct and Allowable indirect costs) Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles): 36,559

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dai le présent état des coûts dans les 30 jours suivant une demande à c: effet. Si la vérification n'est pas effectuée, le ministre peut rejeter to. ou une partie des travaux d'évaluation présentés.

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.
2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit		Total Assessment Claimed
	× 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluatio
2. Les travaux déposés trois, quatre ou cinq ans après leur achèveme sont remboursés à 50 % de la valeur totale du crédit d'évaluatio susmentionné. Voir les calculs ci-dessous:

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Valeur totale du crédit d'évaluation		Évaluation totale demandée
	× 0,50 =	

Certification Verifying Statement of Costs

I hereby certify:
that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as CONTRACT GEOLOGIST (Recorded Holder, Agent, Position in Company) I am authorized

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possible et que ce dépenses ont été engagées pour effectuer les travaux d'évaluatio sur les terrains indiqués dans la formule de rapport de travail ci-join

Et qu'à titre de ______________ (titulaire enregistré, représentant, poste occupé dans la compagnie) je suis autoris

à faire cette attestation.

Signature	Date
Pat Lewis	NOV 30/95

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre

Ontario

Ministry of Northern Development and Mines
Ministère du Développement du Nord et des Mines

MINING LANDS
6th Fl. 933 Ramsey Lk. Rd.
Sudbury, Ontario
P3E 6B5

March 22, 1996

Our File: 2.16340
Transaction #: W9520.00083

Mining Recorder
Ministry of Northern Development and Mines
Ontario government building
227 Howey Street
Box 324
Red lake, Ontario
P0V 2M0

FAXED

posted

Dear Mr. Rivett:

Subject: Approval of Assessment Work Credits om Mining Claims KRL1144369 et al in the Slate lake Area

Assessment cerdits have been approved as outlined on the attached Assessment Work distribution table. The credits have been approved under Secion 14 Geophysical surveys) of the Mining Act Regulations.

The approval date is March 20, 1996.

If you have questions regarding this correspondence, please contact Blair Kite at (705) 670-5855.

Yours Sincerely,
ORIGINAL SIGNED BY:

Ron Gashinski
Senior Manager, Mining Lands Section
Mining and Land management Branch
Mines and Minerals Division

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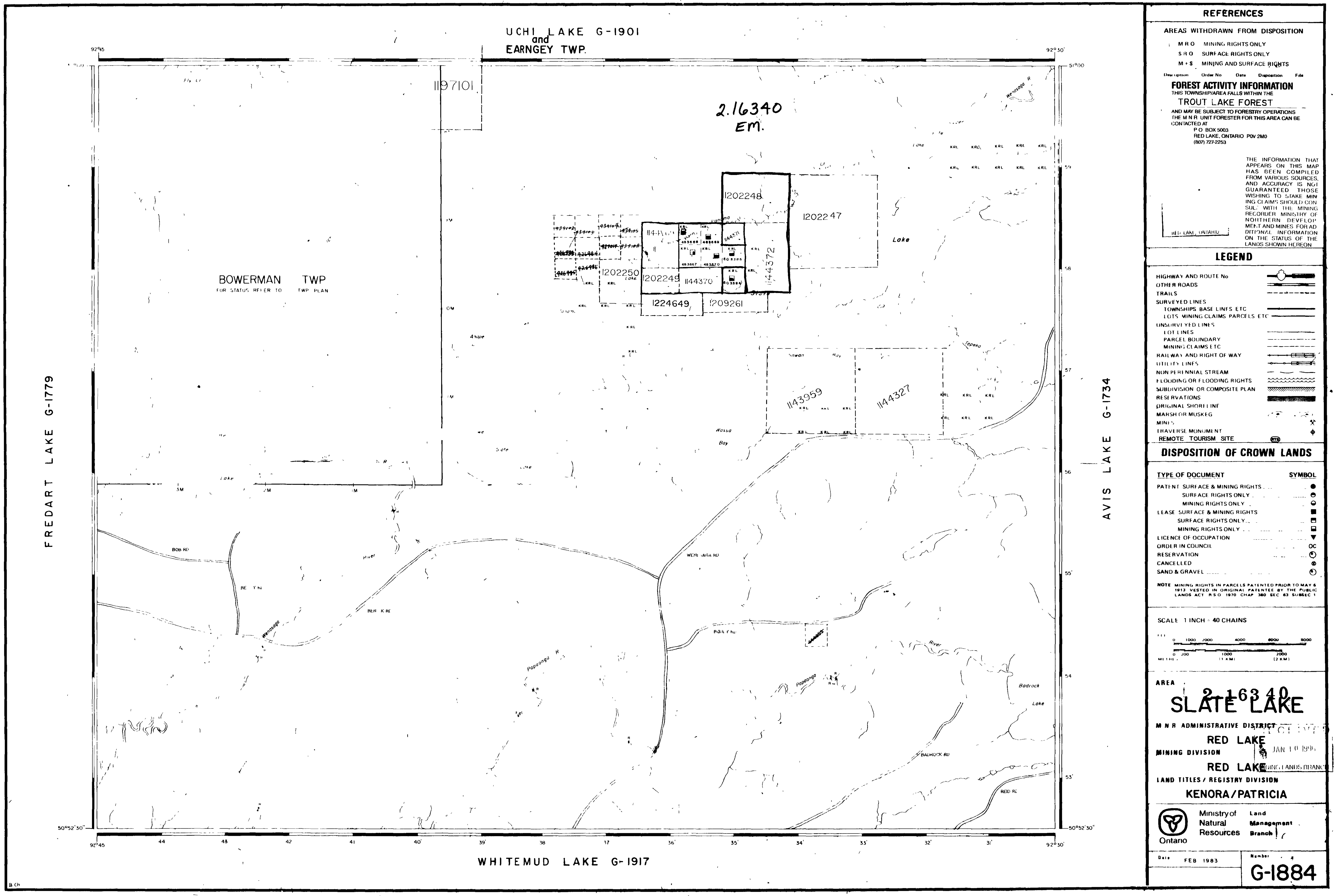
RED LAKE MINING DIV.
MAR 22 1996
AM PM
7,8,9,10,11,12,1,2,3,4,5,6



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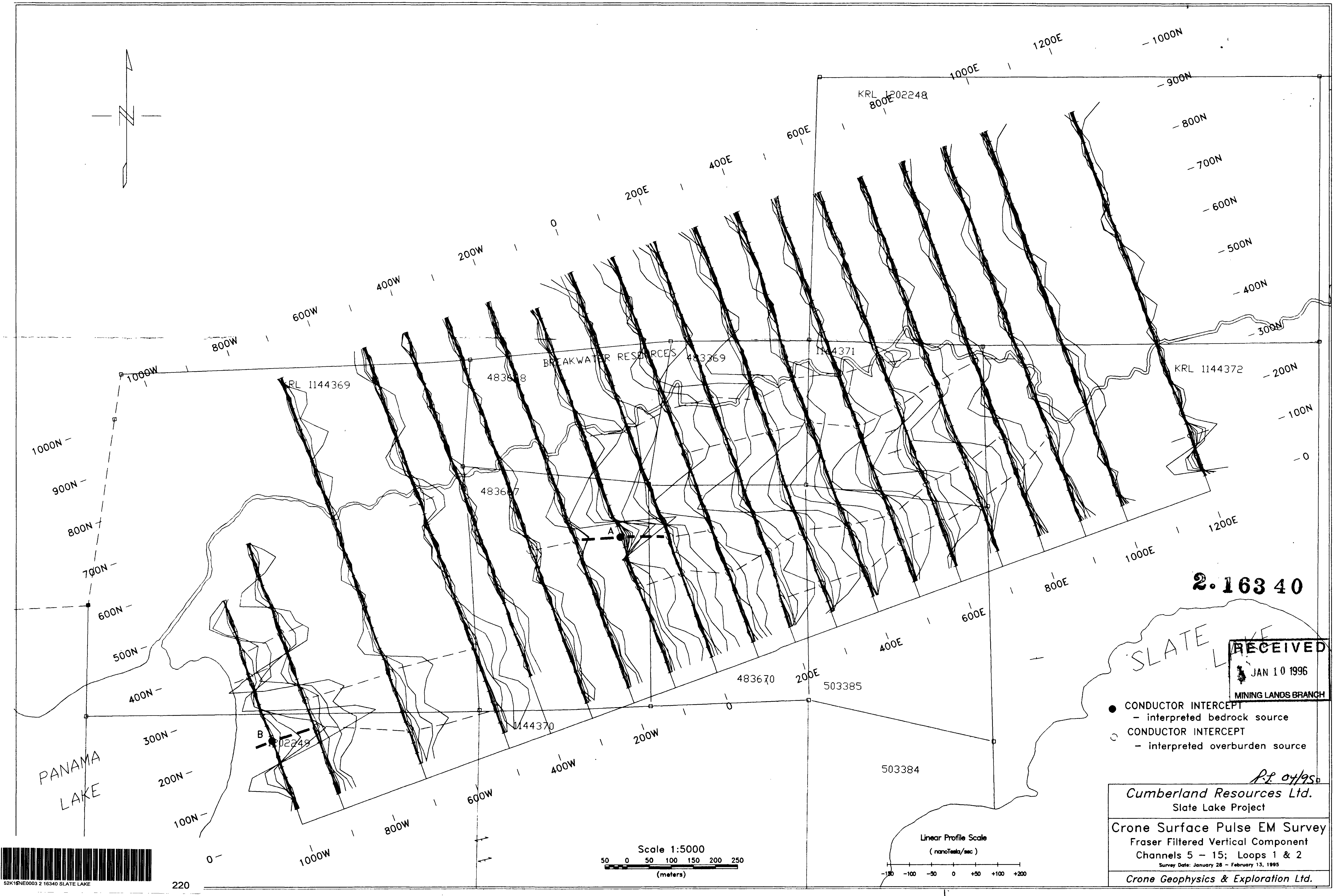
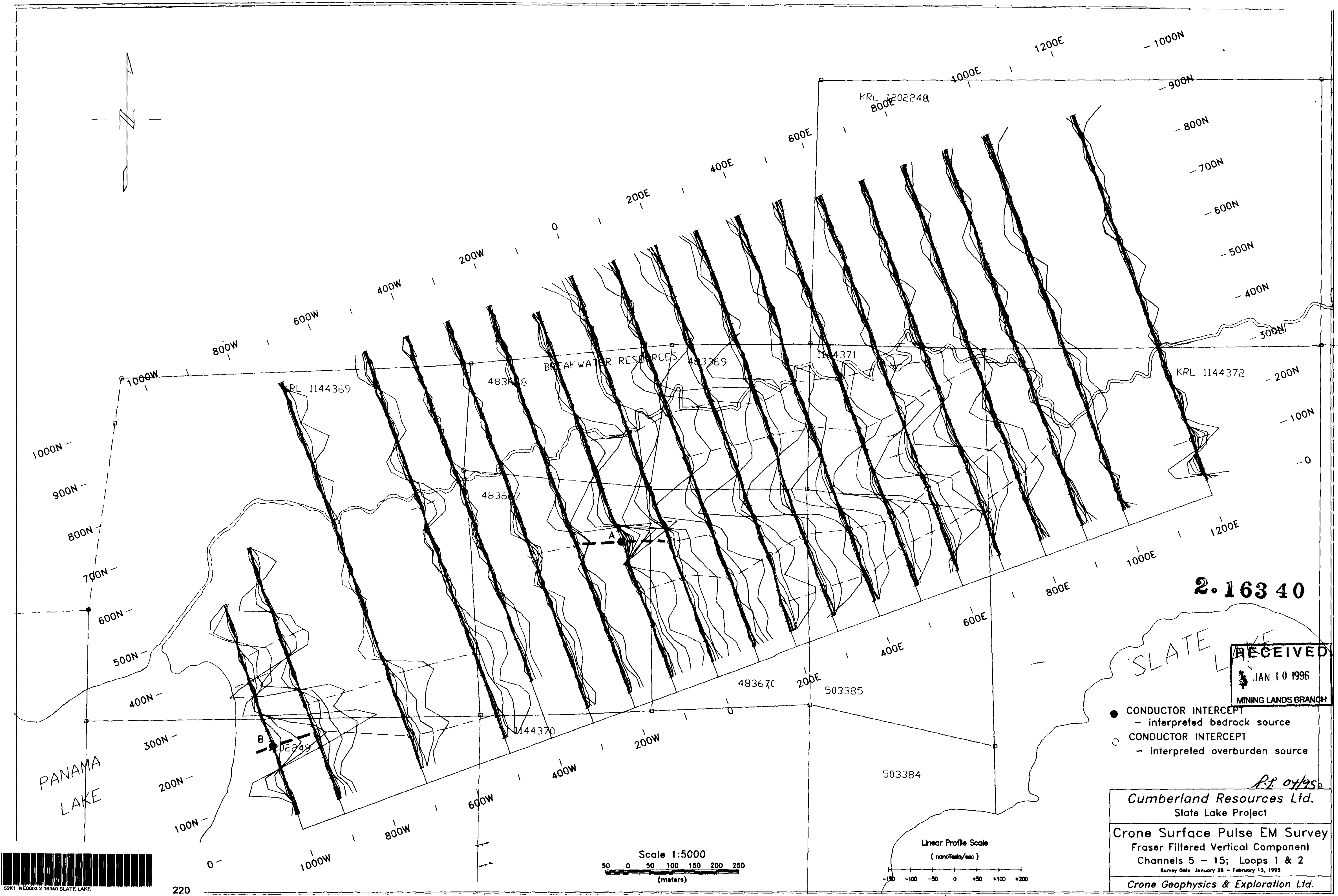
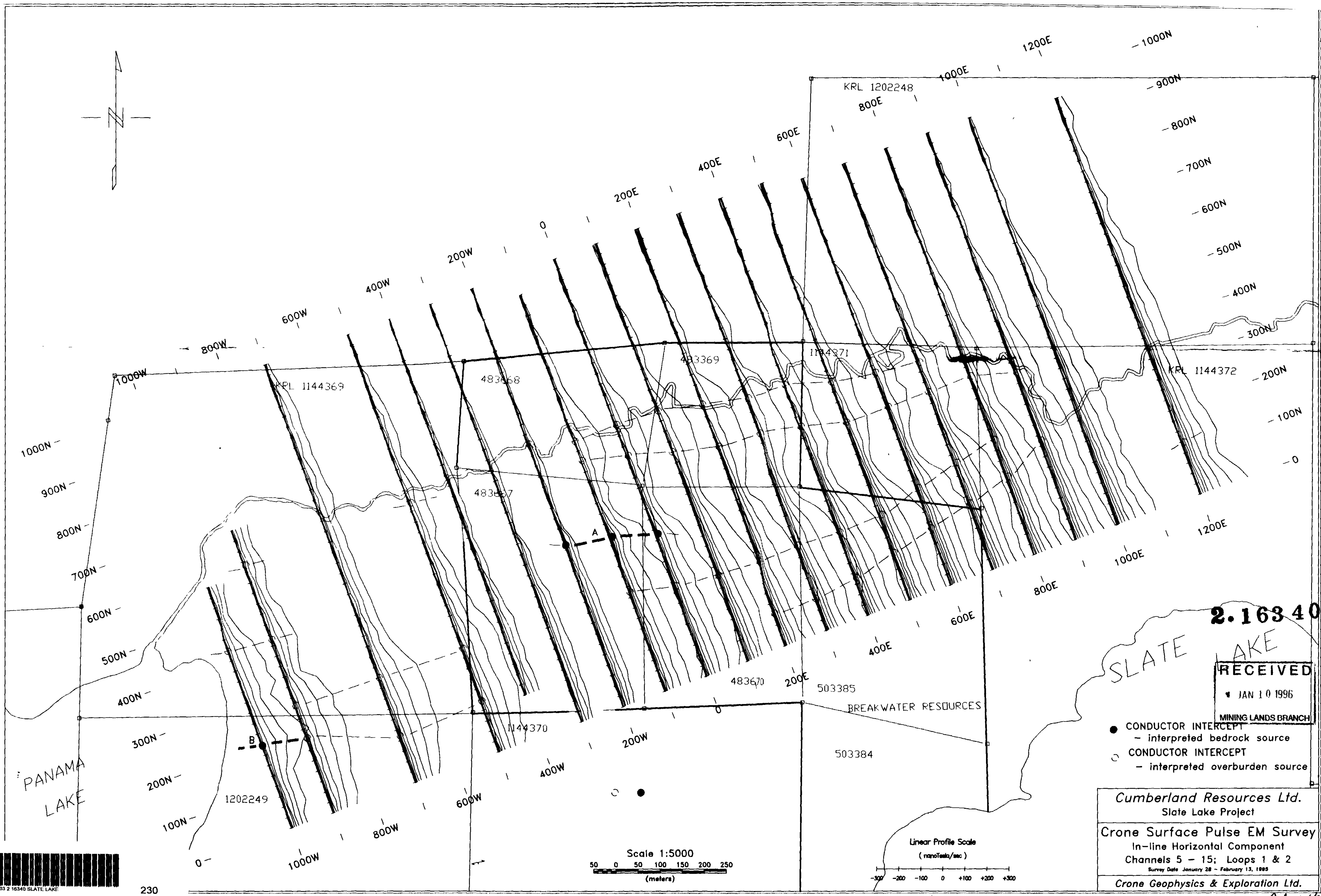


52K16NE0003 2 16340 SLATE LAKE

220



N
BREAKWATER RESOURCES
KRL 1202248
KRL 1144369
KRL 1144372
1144371
483368
483369
483367
483670
503385
503384
1144370
1202249
PANAMA LAKE
SLATE LAKE
A
B
1000N
900N
800N
700N
600N
500N
400N
300N
200N
100N
0
1000W
800W
600W
400W
200W
0
200E
400E
600E
800E
1000E
1200E
2.16340
RECEIVED
JAN 10 1996
MINING LANDS BRANCH
● CONDUCTOR INTERCEPT - interpreted bedrock source
○ CONDUCTOR INTERCEPT - interpreted overburden source
Cumberland Resources Ltd.
Slate Lake Project
Crone Surface Pulse EM Survey
Fraser Filtered Vertical Component
Channels 5 – 15; Loops 1 & 2
Survey Date January 28 – February 13, 1995
Crone Geophysics & Exploration Ltd.
Scale 1:5000
50 0 50 100 150 200 250
(meters)
Linear Profile Scale
(nanoTesla/sec)
-150 -100 -50 0 +50 +100 +200
52K1 NE0003 2 16340 SLATE LAKE
220



KRL 1202248
KRL 1144369
KRL 1144372
483368
483369
1144371
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503385
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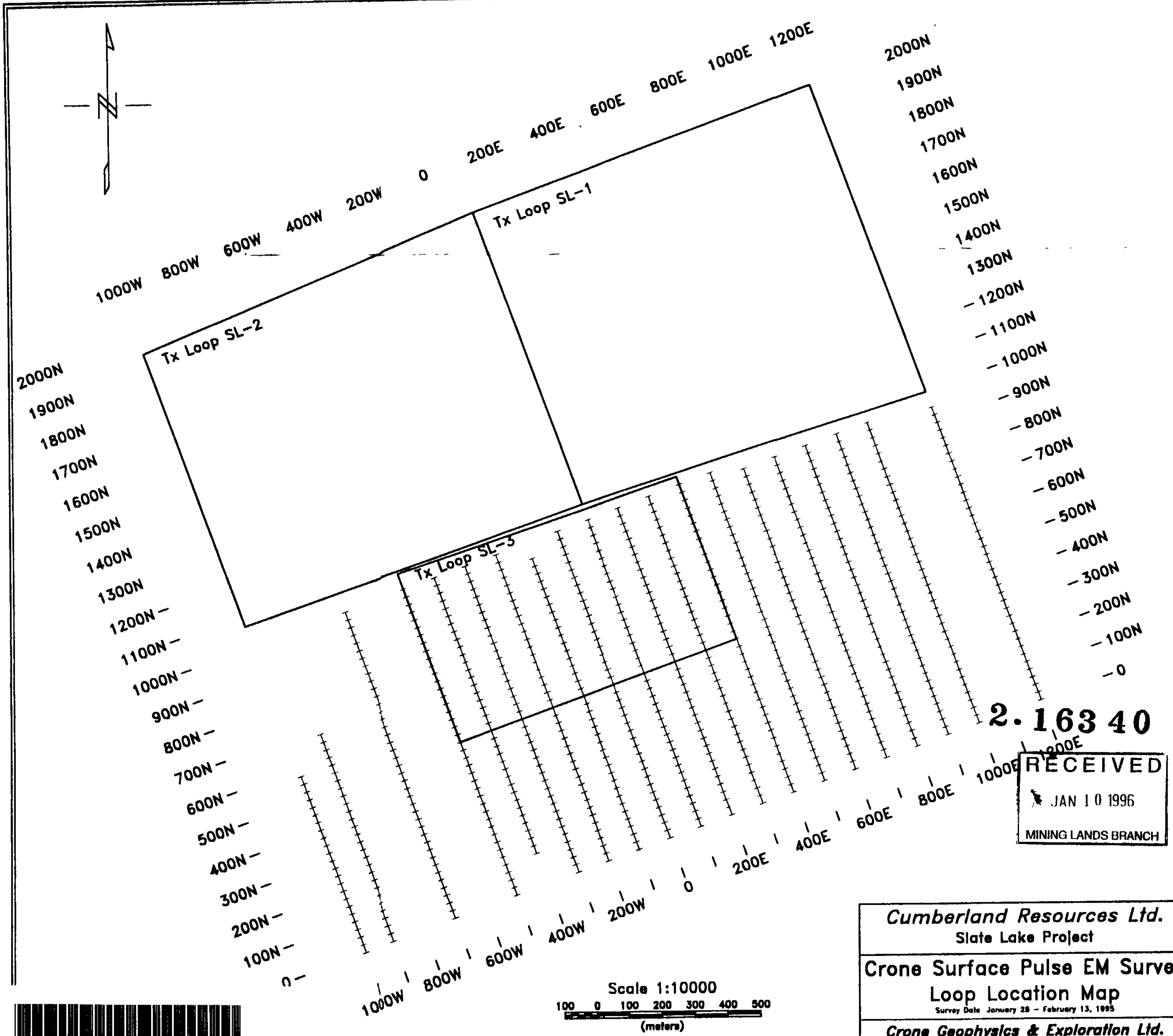
1144370
1202249
BREAKWATER RESOURCES
PANAMA LAKE
SLATE LAKE
2.16340
RECEIVED
JAN 10 1996
MINING LANDS BRANCH
CONDUCTOR INTERCEPT - interpreted bedrock source
CONDUCTOR INTERCEPT - interpreted overburden source
Cumberland Resources Ltd.
Slate Lake Project
Crone Surface Pulse EM Survey
In-line Horizontal Component
Channels 5 - 15; Loops 1 & 2
Crone Geophysics & Exploration Ltd.
Scale 1:5000
(meters)
Linear Profile Scale
(nanoTesla/sec)

230



2.16340

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JAN 10 1996
MINING LANDS BRANCH

Cumberland Resources Ltd.
Slate Lake Project

Crone Surface Pulse EM Survey
Loop Location Map
Survey Date January 28 – February 13, 1995

Crone Geophysics & Exploration Ltd.

52K15NE0003 2.16340 SLATE LAKE

240

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