

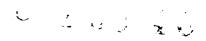
CUMBERLAND RESOURCES LTD.

REPORT ON

DEEPEM SURVEY

SLATE LAKE PROPERTY

NTS: 52K/15 NORTHWESTERN ONTARIO



JAN 1 0 1995

SUBMITTED BY: M.P. (PAT) LEWY

THUNDER BAY, ONTARIO APRIL, 1995



Page

SUMMARY

1.0	INTRODUCTION	1
2.0	LOCATION, SIZE AND ACCESS	1
3.0	PROPERTY SUMMARY AND CLAIM DISPOSITION	5
4.0	PREVIOUS WORK	6
5.0	SUMMARY OF LOCAL GEOLOGY AND METALLOGENY	6
6.0	SURVEY DESCRIPTION AND DATA RESENTATION	7
7.0	SURVEY RESULTS	9
8.0	CONCLUSIONS AND RECOMMENDATIONS	10

LIST OF FIGURES

FIGURE 1	PROPERTY LOCATION	2
FIGURE 2	CLAIM SKETCH	4
FIGURE 3	LOOP LAY-OUT AND SURVEY AREA	8
FIGURE 4	LONG SECTION - PROPOSED DRILL HOLE	11
	LIST OF TABLES	
TABLE 1	LIST OF CONTRACTORS AND OTHER PERSONNEL	3
TABLE 11	SCHEDULE OF CLAIMS	5
	LIST OF APPENDIX	

APPENDIX 1	LOGISTICS REPORT	- CRONE	12





LIST OF DRAWINGS

BFPEM-01	IN-LINE HORIZONTAL COMPONENT	IN POCKET
BFPEM-02	VERTICAL FIELD COMPONENT	IN POCKET
BFPEM-03	FRASER FILTERED VERTICAL COMPONENT	IN POCKET
BFPEM-04	LOOP LOCATION MAP	IN POCKET

SUMARY

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 six(6) mining leased claims that are part of an option to with Breakwater Resources. The agreement 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 0.50 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.

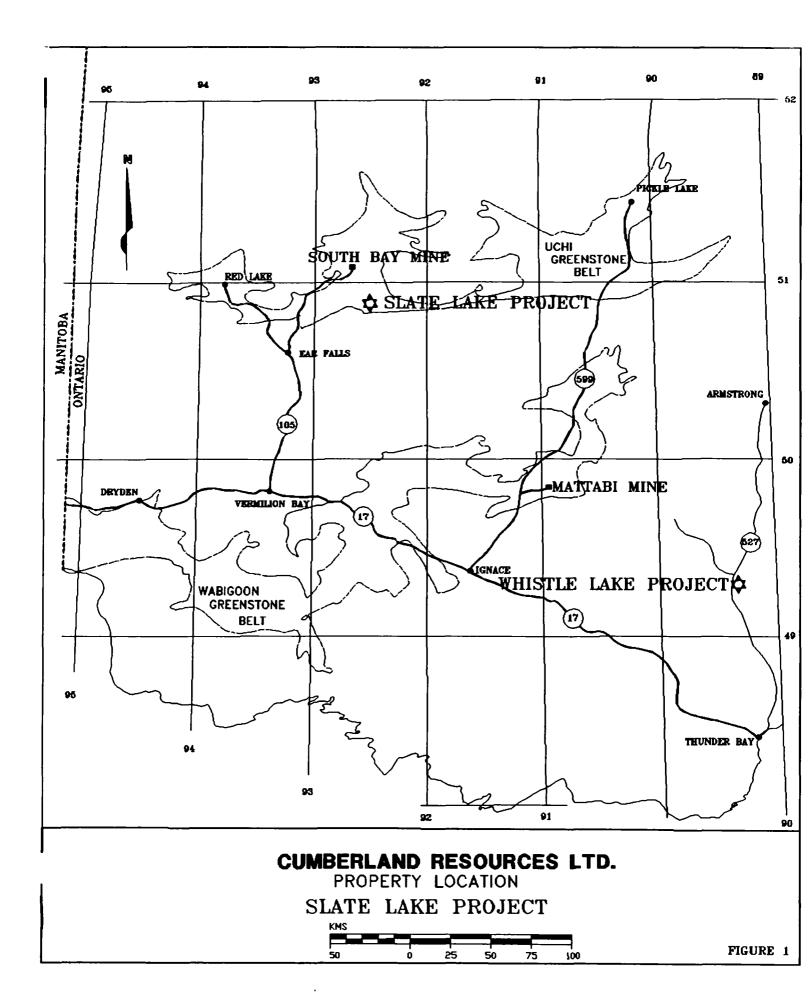
This report describes the survey methods and survey parameters, as well as, the presentation format and discusses the results of the PEM survey.

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.



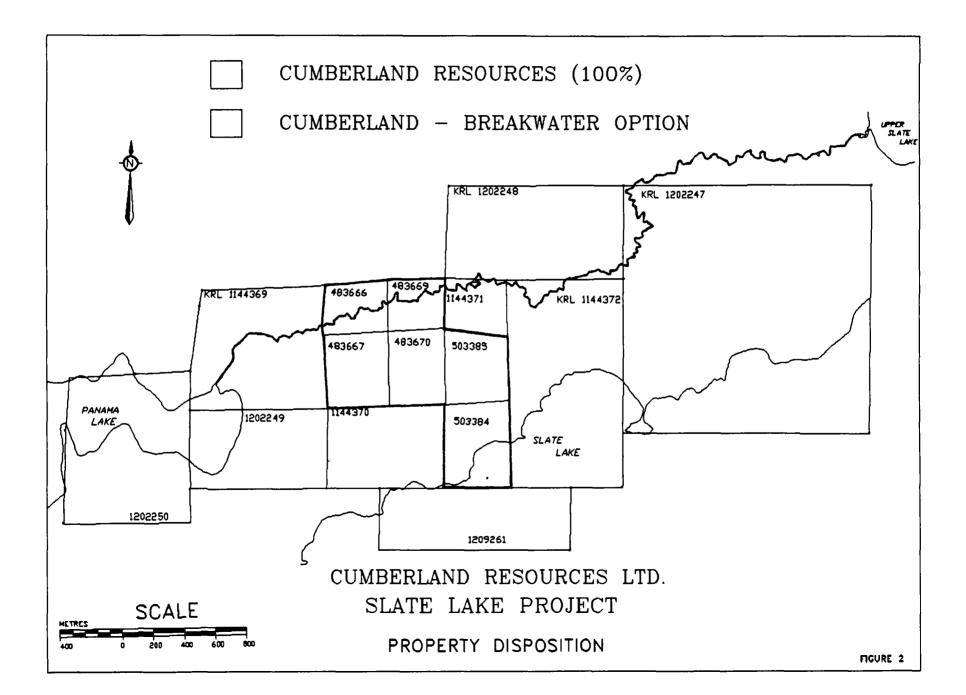


TABLE I

LIST OF CONTRACTORS AND OTHER PERSONNEL

VYTLL EXPLORATION SERVICES 4283 LOCK LOMOND ROAD THUNDER BAY, ONTARIO P7C 4Z2 1-807-475-7383

CRONE GEOPHYSICS 3607 WOLFEDALE ROAD MISSISSAUGA, ONTARIO 1-905-270-0096 LINECUTTING CONTRACTOR

GEOPHYSICAL CONTRACTOR

Mr. BRAD MALPAGE TORONTO, ONTARIO

Mr. PATRICK LEWIS THUNDER BAY, ONTARIO 1-807-767-0259

Mr. SCOTT McCRINDLE THUNDER BAY, ONTARIO 1-807-344-6598

Mr. BILLY HUNTER CORMORANT, MANITOBA

.

OPERATOR

SUPERVISOR AND FIELD ASSISTANT

FIELD ASSISTANT

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 RESC	OURCES 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	UMBERLANI
---	-----------

	Total	50
50338 5		1
503384		1
483670		1
483669		1
483667		1
483666		1

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 sheetlike 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.

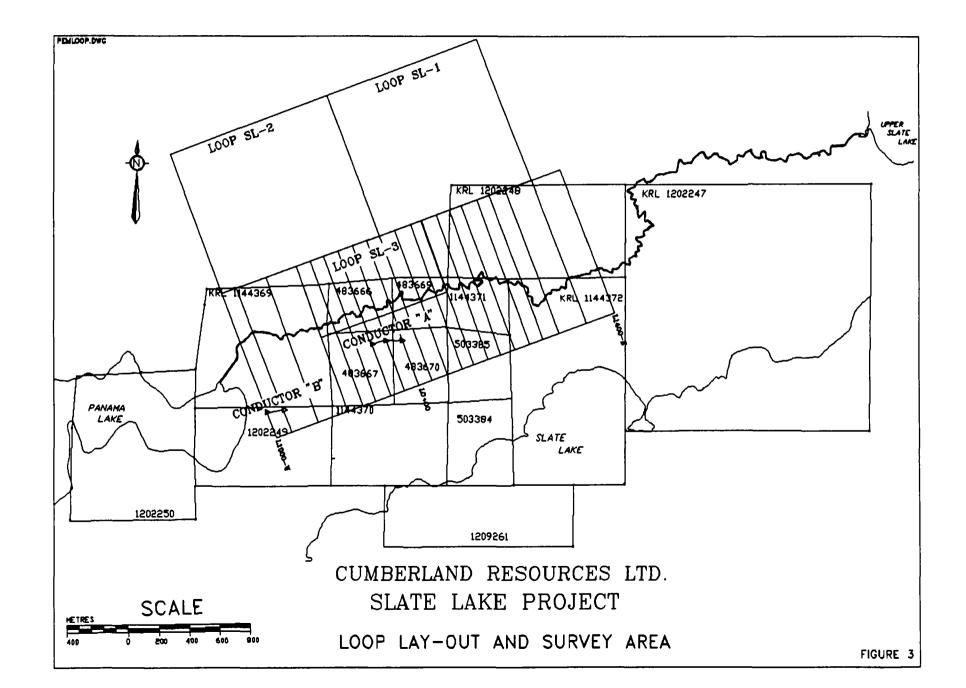
5.0 SURVEY DESCRIPTION AND DATA PRESENTATION

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 xcomponent 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 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.



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 **``**Δ″ and **``B″** interpreted to are contain the following characteristics:

CONDUCTOR	LOCATION	CONDUCTANCES	DEPTH TO TOP
A	200W, 390N 100W, 370N 00 , 350N	50 MHOS 50 MHOS 50 MHOS	SUBCROP SUBCROP SUBCROP
В	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 1979-80 with the deepest hole(vertical deep of in 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

500%	4 0 3	0	20 20 20	0	0 0) (ы 0 2 2	Ш О О	700E	В О О В	ପ ର ଜ	1000E	
				20	20	20				l						Om
				3-78	1 <u>.94 12.00 1</u>) 0.19 <i>m</i>)1 <u>1.60 8.36 3</u> 0.25m	1B										- 100m
				1-80	<u>B.71 7.05</u> 0.50m 2-80	0.51 9.05 0.09m	.16									-200m
				O ^{PH}												-300m
																-400m
																-500m
			<u> </u>										<u> </u>	 		-600m
			<u> </u>													
LEGEND CUMBERLAND RESOURCES LT				LTD.												

APPENDIX 1

.

.

.

LOGISTICS REPORT

BY

CRONE GEOPHYSICS

LOGISTICS REPORT FOR

CUMBERLAND RESOURCES LTD.

BY CRONE GEOPHYSICS & EXPLORATION LTD.

Survey Area:Slate Lake, Ear Falls, OntarioSurvey Loops:SL-1, SL-2, SL-3,Survey Type:Surface Pulse EM SurveyReport 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 Co-ordinates Current Time Base Ramp Time Sync	:1100 m x 1000 m 1. 1+00E,10+50N 3. 12+00E,20+00N :16 :16.66 ms :1.0 ms :crystal clock	2. 12+00E,10+00N 4. 1+00E,20+00N
Loop SL-2 Co-ordinates Current Time Base Ramp Time Sync	:1100 m x 1000 m 1. 1+00E,10+50N 3. 10+00W,19+50N :18.5 :16.66 ms :1.0 ms :crystal clock	2. 1+00E,20+00N 4. 10+00W,10+65N
Loop SL-3 Co-ordinates Current Time Base Ramp Time Sync	:900 m x 500 m 1. 5+00W,10+50N 3. 4+00E,5+00N :19.5 :16.66 ms :1.0 ms :crystal clock	2. 5+00W,5+00N 4. 4+00E,10+25N

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
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

I	Data Profiles
II	Pulse EM System Description

APPENDIX I DATA PROFILES

SURFACE PEM

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current Loop Coor 1. 100m	: SLA : Feb : 16. : 1.0 : 20 : Cry : 110 : 18 rdinate	0 ms stal(MA Om X Amps s (X,Y,	8 995 ASTEF 1000	٤)		File : # Read Stn U Coil . Polar Recei	op name dings nits Area ity ver tor	<pre>3: 48 : Mets : 4000 : + : Dig: : Brace</pre>	2 SL2.PEN ric	102
3100	00m, 18	00m, 0m	3		4.	-1000m	, 105	50m, Or	n	
Channel 7	limes (usec)								
Ch Start	End C	enter	\mathbf{Ch}	Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198	-99	-149	1	76	104	90	2	104	131	117
	171	151		171	225	198	5	225	292	259
	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

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

<u>4 - 4 - 1, 4</u>	-10 ³ -10 ² -10 ² -10 ² -10 ² -10 ² +10 ² -10 ³ - 10 ³
1000H	
- 58N	
- 75N	$\mathbf{Y} > (\mathbf{Y} > \mathbf{Y}) + (\mathbf{Y} + \mathbf{Y})$
- 188N	
- 125N	
- 150N	
- 175N	
- 299N	$ = \left\{ \begin{array}{c} \\ \\ \\ \\ \end{array} \right\} / \left(\begin{array}{c} \\ \\ \\ \\ \end{array} \right) \rangle $
- 2254	₩ < } / / / / (/ / / / / / / / / / / / /
- 250N	₽₽ >
- 275N	
- 389N	
- 325N	
- 358N	$\mathbf{X} \neq \mathbf{X}$
- 375N	
- 499N	
- 425N - 450N	
475N	\mathbb{I}
- 500N	
- 525N	
- 550N	
575N	

'n

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

	3	19 CRI NE +10	+162	+10 ³
600N		NUM	X X X III	ł
- 23N				
- 59N		\mathcal{A}		}
- 75N				
- 166N				l l
- 125N				
150N		$\langle i \rangle \langle i $		》¶*
175N				2
- 2001				
- 225N	\square			
- 258N				
- 275H			$\langle \langle \rangle$	7
- 300N - 325N			\sim $>$ $>$	
- 356N		HTA		
375N			\ {	
488N	1 A			
- 425N	A			Ţ
- 458N			\mathbf{h}	l l
475N			[}
- 566N				
- 525N	VIT.		\mathbf{i}	\mathbf{h}
- 556N			J	
575N	11/1		2	/ \

.

1

SURFACE PEM

Client : COMBERLAND RE Grid : SLATE LAKE Date : Feb 11, 1995 Time Base : 16.66 ms Ramp Time : 1.00 ms # Channels: 20 Sync Type : Crystal(MASTE Loop Size : 1100m X 1000 Current : 18.5 Amps	R)	5 LTD	Line Tx Loo File n # Read Stn Un Coil A Polari Receiv Operat	ame ings its rea ty er	: 9WSI 3: 56 : Metr : 4000 : + : Dig:	2 L2.PEM ric) sq m ital #1	
Loop Coordinates (X,Y,Z) 1. 100m, 1050m, 0m 31000m, 1800m, 0m		2. 4.	100m, 1 -1000m,			n	
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					225		259
6 292 378 335 7			434			639	565
9 639 828 733 10		1075		11		1395	1235
12 1395 1809 1602 13		2348	•	14	2348	3046	2697
15 3046 3951 3498 16		5121		17	5121	6646	5884
18 6646 8617 7632 19	8617	11170	9894	20	11170	14490	12830

.

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

-183	-192	-19 CR(T)NE +10 .	+192	+18 ³
993N		the re		
254				
58N			$\langle \langle \rangle \rangle \langle \rangle$	
75N		₩ <\ < >	$\rightarrow \setminus \langle \mathcal{Q} \langle \mathcal{N} \rangle$	ł
100N				Λ
125N			> + 1 } +	N
15 0N				
175N		🔮 \ 🔎 \ .	$>$ $\{\langle \rangle \}$	} * {
200N		■ Y /	()) / /	
2258		V A 1) ({{ {\	11
258N		╉	〈 ヤ / ≯ \	
275H			>) (f)	¥ Į
309N			1 2 /	
325N				
350N				
375N				<i>J</i>
400N			2 11 11	<u>}]</u>
425N 459N				11
175N				Y)
500N		K K		/
525H				
55 6N			}/ /// //	
אביל			$ \setminus \vee \vee$	I.
560N			$\rightarrow \land \rightarrow$	
25N			(/
50N				
575N				1 1

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

 _	-103	-192	-10 CR()NE +10	+102	+18 ³
r 999N			6		2
- 25N			\times		
- 58N			XID		
- 75N					
- 1660N					
1250					
1790			NH		
1751					
- 200N			HT/ BM	/	
- 2251		β			
- 258N		AL		•	
- 275N		(AT)			
- 388N					
3251		left.			\mathbf{X}
- 358N		A.	1 7 4 1		۶ \ \
- 375N		X		\rightarrow	
400N		At	TT \ XMm		
425N		1			l Ap
458N			- The		
4.75N		IFF		ŕ	{ \
- Seen		444		\sim	
5250		\mathcal{A}			
- 556N		>} { f		\rangle	
- 575N		\mathcal{V}	1// 1/		
608N		1.H		× 1	
- 625N		1 th		\sim	
- 65 0 N		11	7 / _{{{	/	
- 67'5N			/ Jel / \G		i NP

SURFACE PEM

Gri Dat Tim Ram # C Syn Loo	e Base p Time hannel c Type	: SLA : Feb : 16. : 1.0 s: 20 : Cry : 110		2 995 ASTER 1000	٤)	5 LTD	File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: Meta : 4000	2 L2.PEM ric) sq m ital #:	
1	. 100m	, 1050	s (X,Y, om, Om OOm, On				100m, -1000m		•	n	
Cha	nnel T	imes (usec)								
Ch	Start	End C	enter	Ch	Start	End	Center	Ch	Start	End (Center
\mathbf{PP}	-198	-99	-149	1	76	104	90	2	104	131	117
З	131	171	151		171	225	198		225	292	259
6			335	7	378			8	490	639	
9	639	828	733	10		1075		11	1075	1395	1235
	1395	1809	1602	13		2348		14	2348	3046	2697
15	3046	3951		16		5121					
18	6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTI	D 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

	-1 8 3	-192	-19 (2)	+19	+192	
ODEN					N111 Å	
- 23N - 50N			J.		1×1	
- 75N				X_{1} T	X + W = V	
- 100N						\
- 125N				V		
159N						
- 175N			¥	(هر (رک	> + +	M
- 200N			- H	伸く了	$(\Lambda + \Lambda)$	
225N			- F	€) > .) 4)
256N			1	えく / ` /	* / /	Y }
- 275N))/(V	/
- 399N				} / * \ {	1 2 7 /1	//
- 325N - 358N			X	$\langle \rangle$	1 (\ / / V	
- 375N					X/I	
- 400N			4	$()$ \downarrow \sim		M
425N			¥.			
456N				\mathbf{K}	/ + \/ / /	
4751				> > 1		4
- 500N				\mathcal{V}		
- 525N			*	$\langle \rangle \rangle$		
- 558N				?१८ >	-) 教 ()	
- 575N - 600N				X / (
- 625N			S.		/ /{ \	
- 650N						
- 675N			1	$\langle \rangle$) yre (
- 788N				\sim	$\langle \langle \rangle \rangle$	
- 725N				/ >	$> \langle $	
758N				Κ /		
- 775N			. 🚀	$\rangle \langle$. ($\langle \langle \langle \rangle$
- 800N				Ý `) > Hr	
- 625N			蘆		()	
- 850N			S	ζ (
875N				*\		
- 900N - 925N			XAX	$ \setminus $		$\left\{ \right\}$
958N				- star		
975N				1		1
L 1999N		-				

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

· · ·	-193	-192	-10 CR() N	+10	+19 ²	+1 0 ³
F BOON			X XI HE	- \		
258				\rightarrow	→ > >	11 +
- 58N				ý		
- 75N			K P			
- 188N						
- 125N			ATX -			$\{ \} $
- 159N			A Contraction		$\langle $	
- 175N						
2000		$\langle \cdot \rangle$	RIGHT		(¢ \
2258		XI.	AT YOU			
- 250N		AT			_ /	
275N		AL	HOTA		(}
- 300N) (()) /) /) /) /) /) /) /) /		(
- 325N		11)1			کر	
- 358N			1) They			
375H		₩\\{			\ \	
- 498N				\geq		1
425N		} } { {			}	
458N		(1)			4	
4750			(A)		(
586N)) (X ()	>>	\rangle	
- 525N		\ ()</td <td></td> <td></td> <td>ζ.</td> <td>{ he</td>			ζ.	{ h e
- 556N		X)(
- 57'5N		$\alpha +$	<u>∖</u> () < () { () }			
- 688N		Q((} \	<	(
- 625N		(\mathbf{N})	()) < (Kee	\rightarrow		
- 658N		<i>X</i> { {			/	he he
- 675N		ALT	+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$			
- 789N		(H)				
- 725N		71		ſ		$\langle \rangle$
- 758N]		
- 775N		11+++				
BOON	J.					1
- 625N	2	$\langle \langle \rangle \rangle$				
STON	/ /	$\left \left(\right) \right $	() \(\}			
875N		') { {				
- 988N	F-t+	+++	TYC			
- 925N	1 1 1	$(+ \langle$				
- 958N	((1 $\{$ $\}$	〈 /乀〈稱			
975H	} } \			ν,		
L 1999N	A E L	1 1 1	I 🍾 X			

SURFACE PEM

Client: CUMBERLAND RESOURCES LTDLine: L500WGrid: SLATE LAKETx Loop: SL-2Date: Feb 11, 1995File name : 5WSL2.PEMTime Base : 16.66 ms# Readings: 82Ramp Time : 1.00 msStn Units : Metric# Channels: 20Coil Area : 4000 sq mSync Type : Crystal(MASTER)Polarity : +Loop Size : 1100m X 1000mReceiver : Digital #102Current: 18.5 AmpsOperator : Brad Malpage									
Loop Coord 1. 100m, 31000	1050m	, Om			100m, 1 -1000m,			n	
Channel Ti	mes (u	sec)							
Ch Start	End Cer	nter Ch	Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198	-99 -	-149 1	76	104	90	2	104	131	117
3 131		151 4		225			225		259
6 292		335 7				8	490	639	
9 6 39		733 10				11			
		1602 13		2348	•	14			
		3498 16		5121			5121		
18 6646	8617 '	7632 19	8617	11170	9894	20	11170	14490	12830

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

L_1_1	-1 9 3	-1 8 ²	-19 CHI	+1 0	+182	+18 ³
[egen			ł	Y //		
- 25N				/ / < /	(A A)	
- 58H			Ť			
- 751					_ 11 (
- 100N			X			١
- 125N - 158N				Å Å / Č 📏		
1758						
- 2661					\downarrow \land \lbrace \downarrow \land	
- 225N						
- 250N			¥	¥ ¥)	·/ } +	W
275N				//	/ () / /)}
- 300N				ι f λ	/ / ((/ /	/∦
- 325N				ペノイ	() ()	# {
- 358N			/1	NZ I	2 11 +	/ }
- 3.75H - 488N			X			Λ.
- 425N			X	$K \setminus \langle$	$\mathbf{x} \in \mathbf{X} \setminus \mathbf{Z}$	
450N					1 / 8 / 1	7\
4751			X	St 1		11
5001					l de her l	
525N				\swarrow		
- 558N			-	\rightarrow	$() \setminus $	\ <u>}</u> \
575N			••••••••••••••••••••••••••••••••••••	< /	$\left\{ \left\{ \right\} \right\}$	₹ } }
- 600N				\rightarrow (< } ¥	
- 625N - 650N						/ / }
- 675N			<u>A</u>		/ / /	
799N						ΙΙ
725N						$\langle \langle \rangle$
- 756N				\sim		
777504				$\langle \langle \langle \rangle$		
BEEN				<u>ر</u> کر		†
825N				ér	イノノ	
850N				6		/ /
8751	ED			Ås j		
- 900H	\leq					
925N					Z	
- 958N			.].	A	1	
975N 1988N			NE			- 19
10001						10

• :

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

SURFACE PEM

Client Grid Date Time Base Ramp Time # Channels Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 s: 20 : Cry : 110	0 ms stal(MA	g 95 Astef	8)	6 LTD	# Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: 4WS] s: 74 : Metr : 4000 : + : Dig:	2 L2.PEM	
Loop Coord 1. 100m 31000	, 1050	m, Om				100m, -1000m			n	
Channel T	imes (usec)								
Ch Start	End C	enter	\mathbf{Ch}	Start	End	Center	Ch	Start	End (Center
PP -198	-99	-149	1	76	104	90	2	104	131	117
	171	151	4	171				225	292	259
	378	335	7	378	490		8	490	639	565
	828	733	10	828	1075		11		1395	1235
12 1395	1809	1602	13	1809		•	14			
15 3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

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

· · · ·	-103	-192	-10 CR(1)NE	+10	+16 ²	+10 ³
F 100N			J.H		1 11 17 1	
1251				$\langle \rangle \langle \rangle$		
- 158N				()		
1758				$\langle \cdot \rangle$	- { - { \ { } }	
200N				\checkmark (
- 225N			煮文			
- 258N						
- 275N			A C	\mathcal{N}		
- 388N) / * / <		
- 325N				// / ./	$\gamma / / h$	
- 358N				\mathcal{K}	/ / //	
- 375H - 400N				×		
425N				\land		
- 458N					/ / ///	
- 475N				$\langle \chi \rangle$		
- 500N				$\langle \rangle > >$	> \ \ \/	•
- 525N				እ /	$\langle \rangle \rangle \rangle \rangle \rangle$	\backslash
- 558N					$> \langle \rangle \setminus$	
5751				$\left(\right)$		
- 600N				K	\rangle \rangle \rangle	
625N				AI	/ f) (
650N					1	{ }
675N			T			$\left\{ \right\}$
- 788N - 725N				\searrow		
- 258N		/				
- 775N)		\mathcal{T}	1	
- 988N		94		لر آ		
8::5N				/ /		1
- 856N				í L)
875N						
- 900N				7		/
925N	,¥≉					
956N	(\leq	
975N				\backslash		
L 1896N	/	-	2 100	\		

•

SURFACE PEM

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

€↓	-1 0 3	-102	-19 CRUNE	+10 +10 ²	+193
F 100N			81		1.1
125N				*) /]	he .
- 158N					
175H					
- 200N					
- 225N			DIA		> \
- 250N					
- 275N		Ĺ	TH		\rightarrow
- 300N		M			/ \
- 325N		R(·	/ \
- 350N				- (
- 375N		N/N		\geq) *
- 400N					{ }
- 463N		/ \{			}
- 450N - 475N					$\langle $
- 588N		X			
- 525N		X]	1 1
- 550N		I.C.	tet M	2	
- 575N		X			}
GUGN		$\langle A \rangle$			
- 625N		Mis			4
- 658N		$A \mid \langle \rangle$			
- 675N		f(1)		~~~	
- 788N			$\langle \langle \langle \rangle \rangle$		\
- 7251	(FIL.)		\mathbf{h}
- 758N	V				he and the second se
- 775N	А		i < { (€)		
- 899N	/1				\backslash
625N	/	1 \ >	$\langle \langle \rangle \rangle$		\backslash
858N	/) \ <		\backslash
- 875N	/ \) ?			de la compactación de la compa
- 988N	1	$\langle \langle \rangle$			
- 925N	(1))			
- 958N	\ /	$\langle \rangle$			
- 975 N	21				
L TGGGN	/ /	s y			1

SURFACE PEM

Client : CUMBERLAND Grid : SLATE LAKE Date : Feb 7, 1995 Time Base : 16.66 ms Ramp Time : 1.00 ms # Channels: 20 Sync Type : Crystal(MAS Loop Size : 1100m X 1 Current : 6.5 Amps	TER)	6 LTD	Line Tx Loop File na # Read: Stn Un: Coil An Polaria Receive Operato	ame ings its rea ty ər	: 3WSI 3: 82 : Metr : 4000 : + : Digi	2 L2.PEM ric) sq m ital #1	
Loop Coordinates (X.Y,Z 1. 100m, 1050m, 0m 31000m, 1800m, 0m			100m, 18 -1000m,		-	n	
Channel Times (usec)							
Ch Start End Center	Ch Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198 -99 -149			90	2	104		
3 131 171 151			198		225		259
6 292 378 335			434			639	565
	10 828		952				
	13 1809						
		5121		17	5121	6646	5884
18 6646 8617 7632	19 8617	11170	9894	20	11170	14490	12830

•

.

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

► <u>▲_</u> ↓	- 18 ³	-18 ²	-10 CRIT	·10	+19 ²	+ 10³
					•	
1999N - 25N					INN	
- 58N						
- 75N				YA X	\mathcal{X}	
108N				$\{X\}$	$\left\{ \right\} \left\{ \right\} \left\{ \right\} \left\{ \right\} \left\{ \right\} \right\}$	
- 125N				$\langle \rangle$		
- 158N						
- 175N				₽\$} \$		
- 200H						
- 225N - 258N						
- 275H			X			
300H				ard /		
- 3525N				W	$\langle $	
358N				$\mathbf{k} \geq \{$) (((📢	
- 375N				() ()	$\langle \langle \rangle \rangle$	١
498N				$X \setminus$	1 > 1 + 1 + 1)
- 425N - 458N			$\mathbf{\Lambda}$	V		
475H						
588N		•		A (N N
5251					\rightarrow \langle \setminus \setminus	\backslash
- 556N						$\backslash \backslash$
575N				Y		
688N						₹ \
- 625N - 658N						
675N						
- 786N						
- 72 5 N						
- 758N		/		8		
2775N					> ()	
- 666M		7				
825N						1
- 650N - 875N				1 /		/
- 873N - 989N						
925N	D#					
958N	$\left(\right)$		The second	Y I		
975N			TU		< 1	
L 19291	/			× 12		

SURFACE PEM

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

<u></u>	-10-3	-10 ²	-18 CRIDNE	+10	+192	+10 ³
г өөөн			2		1	
- 258				<u> </u>		þ
SEN					/ ()	
- 75H			XX			
- 188N				{) { (
1251				<u></u>	$\langle \rangle$	
159N						r and a second se
175N						
- 200N			att b		1	
- 225N		1	The fitter			
- 256N		Å			$\langle $	
- 275N		(1)	$Y \rightarrow A$			r fer
- 399N		14	KAN		×	
- 325N		$\langle \langle \chi \rangle$			\leq	
- 350H				\geq	$\overline{}$	
375N		¥1	XIA			
400N		1H				T
- 425N		(T)		\mathcal{F}	-	
- 450N		Vert				
- 475N		R.				
- 586N		X.			$\overline{}$	l l
- 525H		X				*
- 559N					1	
575N			2 Ho TX			
- 6 8 8N		IT				
- 62 5 N		AL				Ľ
- 650N	/					Ţ
675N	V	1 / 1				\
- 200N	l l	1				\
725N	/\					
- 758N - 775N		$ \setminus \downarrow$				
- 275N - 896N	11					Г
		$\left\{ \right\}$	$\langle \rangle \rangle / X $			\backslash
825N	/ 1	$\downarrow \land \downarrow$				\backslash
- 858N - 875N	\ \					\backslash
- 8/3N - 900N		I				$\langle \cdot \rangle$
925N						
- 958N	1	{ { }				
- 975N	1	\downarrow \downarrow \downarrow				
1000N	/ /	\setminus				
- 100011			· · · · · · · · · · · · · · · · · · ·			·

SURFACE PEM

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 s: 20 : Cry : 900	0 ms stal(MA)	95 STEI		S LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: Metu : 4000 : + : Dig:	B L3.PEM ric	
Loop Coor 1. 1000 3. 500m	m, 500	m, Om	Z)			500m, 1000m,				
Channel T	'imes (usec)								
Ch Start	End C	enter	Ch	Start	End	Center	Ch	Start	End (Center
	-99	-149	1	76	104	90	2	104		
	171	151	4	171				225		259
	378	335	7	378	490		8	490	639	
9 639	828	733	10	828	1075		11		1395	
12 1395	1809	1602	13	1809	2348		14		3046	
15 3046	3951	3498	16		5121		17	5121	6646	5884
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

•

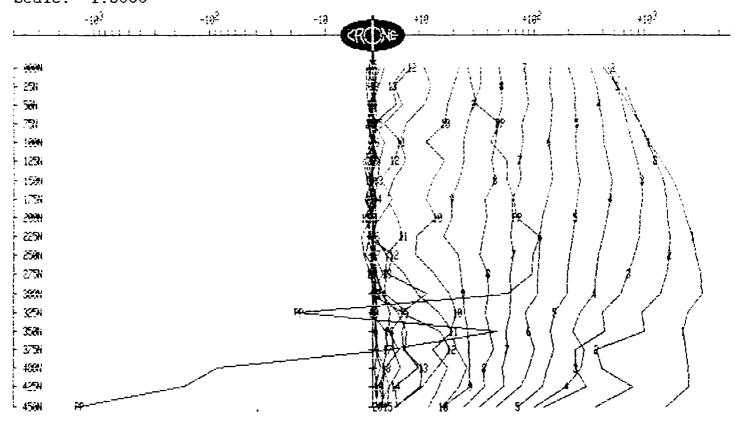
.

SURFACE PEM

Client	CUMBERLAND I	RESOURCES LTD. Li	ne :	L300W
Grid	SLATE LAKE	Tx	Loop :	SL-3
Date	Feb 13, 1995	5 Fi	le 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



SURFACE PEM

Client	CUMBERLAND RESOL	JRCES 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 +18³ - :93 ÷[9² -192 -19 +18 (111) _ 258 561 \mathbf{T} - 1644 - 125N 1584 1798 2000 225% 2531 2771 386N 3274 3581 375N 499 42-74 4530

SURFACE PEM

Ramp # Cha Sync Loop	Base Time annel Type Size	: SLA : Feb : 16. : 1.0 s: 20 : Cry	0 ms stal(MA Om X	: .995 .STEH	8)	5 LTD	File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: Metr : 4000 : + : Dig:	2 L2.PEM	
1.	100m	, 1050	s (X,Y, m, Om OOm, Om				100m, -1000m			n	
Chanr	nel T	imes (usec)								
Ch St	tart	End C	enter	\mathbf{Ch}			Center		Start	End (Center
	-198	-99	-149	1	76	104	90		104	131	117
З	131	171	151		171	225	198	5	225	292	259
	292	378	335	7	378	490	434	8	490	639	565
9	639	828	733	10	828	1075	952	11	1075	1395	1235
12 1	1395	1809	1602	13	1809	2348	2078	14	2348	3046	2697
15 3	3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18 6	646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

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

	·····	-10 ³	-192		+10	+182	+103
	- 0000					6 1	
						IAN	
				X /		IXIV	
					$\langle \rangle \rangle$		
					¥ (· [\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow	•
	- 175N						
	298N				$\mathbf{f} \setminus \mathbf{f}$	$\left\{ \right\}$	
	- 225N						
	250N				XI	<pre></pre>	
	- 275N				入1	(/) } }	
					{ } /	> { / / /	
					イノく	/ f / {{	
					$\langle \langle \rangle \rangle$		λ.
					212 1		
				<u> </u>			
					\bigvee		
				N	$ \land I $	$\langle \langle \langle \langle \rangle \rangle \rangle$	
55N 57N 66N 67N 67N 77N 77N 77N 77N 86N 86N 87N 86N 87N							
55N 57N 660 673 673 75N 75N 75N 75N 860 860 860 87N 860 87N 860 87N 87N 87N							
57N 66N 67N 75N 75N 86N 86N 87N 86N 87N 87N 97N 87N					$\frac{1}{2}$		$\langle \rangle$
627N 639N 673N 739N 739N 739N 759N 869N 869N 869N 869N 879N 869N 879N 869N 879N 869N 879N 869N 870N 870N							$\langle \rangle \rangle$
658N 673N 708N 725N 75N 75N 867N 867N 867N 875N 875N 975N 975N 975N 975N 975N 975N 975N	- 688N			P 3			
6-734 7064 7254 7254 7564 7575 8674 8674 8674 8754 8754 8754 8754 8754 8754 8754 87	6250) <i>/</i> /		
700H 725H 75H 825H 875H 925H 925H 925H	650N				< /	$\langle /$	<i>ŧ</i>
725N A A A A A A A A A A A A A A A A A A A					\mathcal{A}) 1	
750H 75N 86N 87N 87N 98N 950H 975H						r / ((
775H 825H 825H 825H 875H 925H 925H 925H 925H			8 0-	R /	×	1/ 1	1
een son son son son son son son so			{		/ /		
825N 87 850N 87 825N 990N 950N 950N 950N 950N 950N 950N 95			/		\leq (1 1	
850N 875N 875N 950N 975N 975N 975N 98				$\leq \overline{M}$	>		
875N 990N 975N 975N					\square		/
900N 925N 956N 975N J#		×	r				
925N 950N 975N JA				J.A.	\mathcal{I}		/
950N 975N BF						1	
975N P#				STA		\langle	
		Jac .	\sim				
	1880N /					ł	

SURFACE PEM

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

L-1, 1	-1 0 3	-102	-10 (R())NE	+1 0	+1 0 ²	+183
F 888N			VIII		1911	
- 251					\neq	
- 58N						
- 75N			ST. 2		1 (] +	
100N						
1250			<i>MAX</i>		<i>₹</i> }\	
- 158N					()	
- 17 5 N				5		
- 298N				· · · · · · · · · · · · · · · · · · ·	$\langle \rangle$	•
- 225N				{		
- 2 5 8N						ł
275N			CF 9/TT			
- 388N		K			(
325N		<u>}</u>			< <u> </u>	
- 358N		¥	\$ APP			
- 375N		A	TX IA-		-	
- 400N		TH	TIN			
- 425N		ATT.	1 1 1 5			T
- 458N		1 the				Ţ
- 475N - 566N		A A				
525H		Jan San San San San San San San San San S			~ /	
- 550N			Y =		J	
5758		Æ	The Anton			AP
- 600N		A			-	l l
- 625N		11	4311	_		
- 650N	/	H				
675N	1	7 1 1				
- 798N						he
- 725N	V	$\langle \langle \rangle$	< { < _¥¥ =			\backslash
- 758N	A		$\rangle \rangle \langle \rangle \rangle$			\backslash
- 775N	//	† []	<< //> </th <th></th> <th></th> <th>\backslash</th>			\backslash
- 88RN	/					\backslash
825N	$\langle \langle \rangle$	$\langle \rangle$				he
858N	\mathcal{F}	$\langle \rangle$	く <i>)、</i> (別)			\backslash
875N		$\langle \langle \rangle$				\backslash
- 986N	{ }	₹ } (
925N		> ₹ }				
- 958N) ($\{ \setminus \}$				
975N	$\left\{ \right\}$					
LIGGON	1 Z	· · ·				1

SURFACE PEM

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 : 1.0 : 20 : Cry : 900	00 ms vstal(MA	R 995 ASTEF 500m		S LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity .ver	: 2WS 5: 38 : Met : 4000 : + : Dig:	3 L3.PEM ric	
Loop Coor 1. 1000 3. 500m)m, 500	m, Om	,Z)		2. 4.	500m, 1000m.				
Channel 7	limes (usec)								
Ch Start	End C	lenter	Ch	Start	End	Center	Ch	Start	End (Center
	-99	-149	1	76	104	90	2	104		
	171	151		171		198	5	225		
	378	335	7	378	490	434	8	490	639	
	828	733	10	828		952	11			
12 1395	1809	1602	13	1809	2348	•	14	2348		
15 3046	3951		16		5121		17	5121		
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

.

•

. •

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

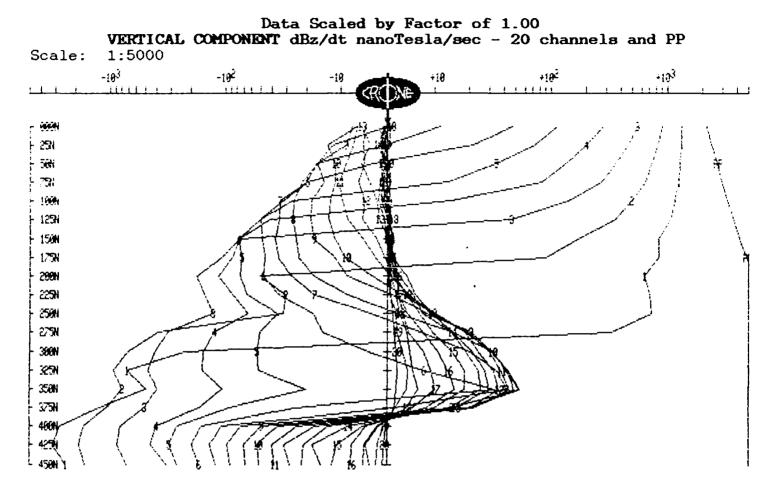
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

	-18 ³ 	-18 2 	-10 	+18	÷19 ² ⊥i	<mark>2¦8</mark> 3 <u>د (: ، : . : i : i</u>
- 2994 - 2934					\$me/ (
- 500 - 750						
- <u>1999</u> - 1258 - 1598						
- 1758 - 2998 - 2258				<u> </u>	IA	
- 350H 275N						
- 3968 - 3658 - 3568						
375N 400N - 425N			T +3	9		
[4200 4560			<i>⊺∥</i> ,			

•

SURFACE PEM

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



SURFACE PEM

Client : CUMBERLAND RESOURC Grid : SLATE LAKE Date : Feb 4, 1995 Time Base : 16.66 ms Ramp Time : 1.00 ms # Channels: 20 Sync Type : Crystal(MASTER) Loop Size : 1100m X 1000m Current : 19.5 Amps	Tx Loop File nam # Readin Stn Unit Coil Are Polarity Receiver	: SL-2 ne : 1WSL2.PEM ngs: 78 ns : Metric na : 4000 sq m
Loop Coordinates (X,Y,Z) 1. 100m, 1050m, 0m 31000m, 1800m, 0m	2. 100m, 180 41000m, 1	
Channel Times (usec)		
Ch Start End Center Ch Star	t End Center C	Ch Start End Center
PP -198 -99 -149 1 7	6 104 90	2 104 131 117
3 131 171 151 4 17	1 225 198	5 225 292 259
6 292 378 335 7 37	8 490 434	8 490 639 565
9 639 828 733 10 82	8 1075 952 1	1 1075 1395 1235
12 1395 1809 1602 13 180	9 2348 2078 1	4 2348 3046 2697
15 3046 3951 3498 16 395	1 5121 4536 1	7 5121 6646 5884
18 6646 8617 7632 19 861	7 11170 9894 2	0 11170 14490 12830

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

-193	~182	-19 RONE +10	+162	
L 9990N		RH P IN N	1 7 (13)	
- 254		$(\mathbf{A} \to (\mathbf{A} \to (A$	$\langle \rangle$	
58N			¥ () (\¶	
- 751		$ (\circ (\circ)) $	₩) (}(()	A la
- 1 00N		₩{+ < {		V
- 125N				
- 158N				N ŧ
- 175N				
- 298N				
- 225N		(1) ¹ () , () 1 (
- 258N		■ 1 1 1 1	1)))	
- 275N				1
- 399N				IN
- 325N - 358N		XIN T \ \	I I I	
- 375N				
- 400N				
425N			X/ / [
- 450N			∕¥ (((l
- 475N		¥(/\ '		
- 566N				
525N			$\langle \langle \rangle \rangle$	<i>k //</i>
- 550N			$\langle \gamma \rangle$	
575N			> + 7 >	
- 688N				
- 625N				
- 650N			11	/ / /
- 675N - 799N				/ / /
- 200N - 725N				/ / /
- 750N		VII.	} / /	
- 775N			/ / }] \
- 890N	}			
- 825N	54	VII AN I	/ /	
850N	(
875N	J			
- 966N			×	
925N '		Y Comment		
L958N PF			. /	r 1

SURFACE PEM

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

	-183	~19 ²	-19 (81) NB	18 +19 ²	+183
F 866N			1111	× 1	7 1 1 1 1
- 25H			(21 P		/ / # \
- 58H			N/ HA		´ ≱ { }
- 75N					
- 100N			1 efte		/ / / +
1258		8		(
- 159N		(†)	>) * !		
- 175N					7 1 1 1
- 298N		n	LAAT		
- 225N		ILT	「や」 ())	. /	/ / ヤ
- 258N		IT I			
275N		111	+ / TEM		7
- 300N					
- 325N - 358N		V A			
- 3275N		ATH			
- 400N					
- 425N		NUT			
450N		VTH			
4751		$\mathbb{N} \setminus \mathbb{N}$			
SEEN					
- 525H)) } { }		7	
- 558N		\mathcal{N}	3		
- 373N		Att			
GBBN		TH			4
- 625N	ſ				
- 65 8 N	Ĩ [$ 1\rangle$	++J+M		
675N	/†				
- 799N	{ }				
- 7250		1114	$\left(\left(\left(\left(\right) \right) \right) \right)$		h e
- 758N			/ 19		}
- 775N	f L	1 1 177	FAM		
- 866N - 825N	11				
- 859N	/ /				
- 825N					
- 988N		$N \mid I \mid I$			
- 925N		Λ $ $ $ $ \wedge			
958N	\		$\land \land \land \land \blacksquare$		
					•

SURFACE PEM

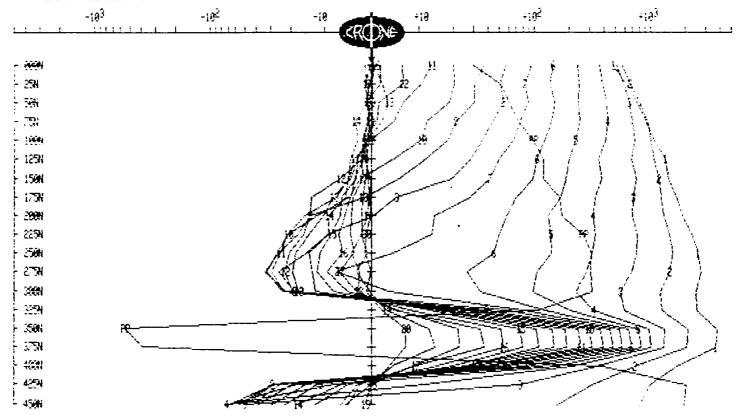
Grid Date Time Base Ramp Time # Channels Sync Type Loop Size	: SLA : Feb : 16. : 1.0 : 20 : Cry : 900	0 ms stal(MA	95 STEI		5 LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: 1WS) s: 38 : Meta : 4000	3 L3.PEM ric) sg m ital #	102
Loop Coord 1. 1000m 3. 500m,	. 500	m, Om	Z)			500m. 1000m.				
Channel Ti	mes (usec)								
Ch Start	End C	enter	Ch	Start	End	Center		Start	End	Center
PF -198	-99	-149	1 4	.76	$ \begin{array}{r} 104 \\ 225 \end{array} $	90	2 5	$\begin{array}{c}104\\225\end{array}$	$ \begin{array}{r} 131 \\ 292 \end{array} $	117 259
3 131		151	7	171	490				639	
6 292 9 639		335	10	828			11		1395	
		733								
	1809	1602	13	1809			14	2348	3046	
	3951	3498	16	3951			17	5121	6646	
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

SURFACE PEM

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

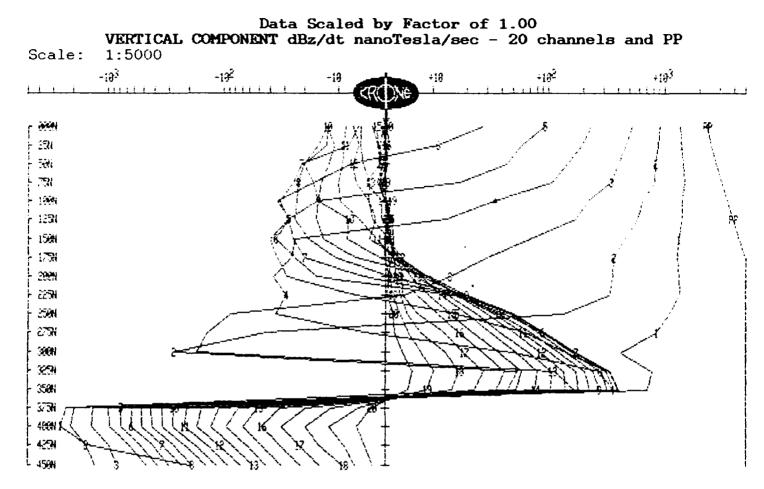
Data Scaled by Factor of 1.00

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



SURFACE PEM

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



ï,

SURFAÇE PEM

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current Loop Coor 1. 100m	: SLA : Feb : 16. : 1.0 s: 20 : Cry : 110 : 19. dinate	66 ms 0 ms stal(MAS 0m X 5 Amps	5 5tei 1000 2)	R) Om	2.	File r # Read Stn Ur Coil A Polari Receiv Operat	pp hame lings hits Area ity ver tor 1800m	: Met) : 4000 : + : Dig: : Brad	2 L2.PEM C sq m ital #1 d Malpa	
3100	Om, 18	00m, 0m			4.	-1000m,	, 105	50 m , 0r	n	
Channel T	imes (usec)								
Ch Start	End C	enter	\mathbf{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
	378	335	7	378	49 0	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

•

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD	Line	: LOOOE
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

-10 ³ -10 ²	-10 CR NE +10	+10 ⁻²	+1 0 3
		<i>,</i> ,	
			4
- 254		$\left\{ \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	
Sen			
- 75N		$\lambda / 1$	11
- 188N - 125N			M
- 156N			
175N			
- 299N			↓ ¥(
- 2258) 🕂 🁌	
- 256N			
- 275N		1 (/ (/ { •
- 300N	\mathbb{R}	(/ / /
- 325H			+
- 358N	$\mathbb{P}(\mathbb{P})$)	
375N		* (()	
- 409N		8///	₹ {
- 425N		$\langle \langle $	
- 450N		N	
- 475N . - 566N		$\angle \neg \land$	
525N			
- 336N			
- S73N			
- 600N			
- 625N			
650N		-1/	
675N			<i>¥</i>
799N		/	
725N PK	\times		
759N			
7754			
Seen .		1 1	\downarrow
825M 856N 5F		1 /	/)
875N 56		//	
9001			/ /
9254			1
959N			
ST. H	-		
L 2000N	XIX	<u></u>	

SURFACE PEM

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

	- 183	-192	-19 CRI NE +10	+19 ²	+18 ³
eeen			P1 1/1 P11		ÎLI
- 25N					
- 58N				+	
- 75 N		M	(ref T (#P
- 100N		413			
- 125N		(U			<i>‡</i> { }
- 159N		XT		1	$\left(\right)$
175N			+ JTH		/
- 208N		1HT) t e < < // 451e		
- 225N		\mathcal{A}		/	
- 258N		114		2	
- 275N		181			$\langle \rangle$
- 399N		$ \mathcal{X} $			
- 325N - 358N		NH	TTVI		
- 375N				۲.	
- 409N			HI TON		
425N		CHII			\setminus
- 458N					
475N		¥ \ [
SORM		\}		7	
525N		ИЦ			
550N		Att	++/+/10		
- 575N	0	4+++	101140		-
- 600N		14+			
· 625N	<i>¥</i> //	H			
650N					
675N					
- 200N		\uparrow	()		٣
· 725N	115	Λ $\{$ $\{$ $\{$ $\}$	V Y M		
7 58N					\
775N		$\{ \{ \} \} \{ \P$			
- 800N	17				
825N	XI	/ / / / '	$\backslash \rangle / / / / / / / / / / / / / / / / / / $		
858N	Y1 (1111			
6.75N					
908N	\} T	$\langle \rangle \rangle \rangle \langle \rangle$			
925N	// \	$\langle \langle \rangle \rangle$			
959N	1				
975N	1				

SURFACE PEM

Date Time Base Ramp Time # Channels Sync Type Loop Size Current Loop Coord 1. 1000m	: SLA : Feb : 16. : 1.0 : 20 : Cry : 900 : 19. inate . 500	66 ms 0 ms stal(MA) m X 50 5 Amps s (X.Y.) m, 0m	95 STER DOm	1)	2.	File # Rea Stn U Coil Polar Recei Opera	oop name dings nits Area ity ver tor 500m.	5: 38 : Met : 400 : + : Dig : Bra	3 L3.PEM ric 0 sq m ital # d Malp	102
3. 500m.	-400	n. Om			4.	1000m.	-400	Jm, Om		
Channel Ti	mes (usec)								
Ch Start	End C	enter	$\mathbf{C}\mathbf{h}$	Start	End (Center	Ch	Start	End	Center
PF -198	-99	-149	1	76			2	104	131	117
3 131	171	151		171					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

•

.

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	:	LOOOE
Grid	: SLATE LAKE	Tx Loop	:	SL-3
Date	: Feb 13, 1995	File name	:	OESL3.PEM

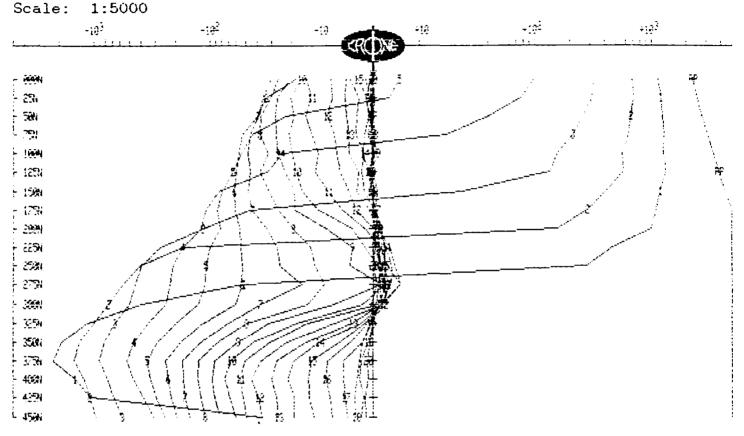
Data Scaled by Factor of 1.00 IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

	-19 ³	-19 ² 1	-19	61+	÷10 ²	- @ ³
<u> </u>			SFR			
- 10.00			t t		• • • • •	
- 251			6			
- 581			1		2	
- 794			<u>i</u>	9 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
- 1998			4	a ja ja	一 – – – – – – – – – – – – – – – – – – –	
r 1251			ž			
- 1599						
- 1758				V / 7		
- 2009						
2254				70		
- 2598			×	and a start and the second and a		
E754			-	A CONTRACT		
- 3361			-		1111811 1	
- 3278			-	1 1 1 1 1 1		
- 3501			-	-30)() 55>	/)) bo/) km2_	<i>ا</i> ر / / <i>ا</i>
3758			-	رمر مظر (لا		X-L X
4000			-	Water and the second second		XT
4291			-		A CONTRACT OF THE OWNER	
459N		•			teres of the second sec	

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	:	LOOOE
Grid	: SLATE LAKE	Tx Loop	:	SL-3
Date	: Feb 13. 1995	File name	:	OESL3.PEM

Data Scaled by Factor of 1.00



SURFACE PEM

	Client Grid Date Time Base Ramp Time # Channel: Sync Type Loop Size Current	: SLA : Jan : 16. : 1.0 : 20 : Cry : 110	0 ms stal(MAS 0m X 1	95 STEF	t) Om		Tx Loo File n # Read	ings ings its rea ty er	: 1ESI s: 82 : Metr : 4000 : + : Digi	L1.PEM Sic Sg m Ital #2	
	Loop Coord 1. 100m 3. 1200m	. 1050	n. Om				1200m. 100m. 2				
	Channel T. Ch Start PF -198 3 131	End C -99	enter -149	1 4	76 171	104 225	Center 90 198	2	Start 104 225	131	117
-	6 292	378 828 1809	335		828 1809 3951	1075 2348	4536	11 14 17	2348 5121	1395 3046	1235 2697 5884

•

.

*** _**

CRONE GEOPHYSICS & EXPLORATION LTD SURFACE PEN.

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

	-1 0 3	-18-2	-19 CRIDNE	+10	+10 ²	+10 ³
1. 988N			PF 191/	// ¹ / ¹	۱//ħ	VI
- 258				(* ((
- 58N					$\left\{ \left\{ \left\{ \right\} \right\} \right\}$	
- 75N				$\left(\right) $	+	
- 100N					$\left \right $	11
12571					////	<u>}</u> }
- 159N				\downarrow ((M
175N				$ T_1\rangle $	1	
- 500H				$\{ \{ X \} \}$		
- 225N			T X/	1/N/	111	1
- 258N					/ / 1	/ N
- 275N				H		/ //
- 398N - 325N				$\setminus \sqrt{1}$		
- 358H				$ \land $		11
375N		EP			/ /	
400N			IV.	A/C		1
4251				$\langle \rangle \langle \rangle$	$(\land \land \land$	
- 458N					$\backslash \backslash \backslash$	le la
4751				11		
- 588N		•	le la	Re) }	
525N				> / >	4	
- 550N					')	
- 575N				\rightarrow		
- 6981				F		×
- 623N					7 /	
- 658N				je menter and a second s		
- 675N) 7	$\langle /$		× /
- 799N		{		' <	$\langle \langle \langle \rangle$	$\langle \langle \rangle$
- 725N		2]		$\langle \rangle$
- 756N		Τ		· •		
- 775N - 900N	1		// N		/ /	
- 500H	/	/				
- 630N			XXX	- 1		
8.75N	P		No.			/ }
9900N	/		- XX			- y
- 925N			XXX		2	
- 958N	L	*	XX			
975N			1 the			\rangle
L 1000H		\mathcal{P}				1

SURFACE PEM

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

<u>+_+_ + +</u>	-1 0 3	-182	-19 RING -19	+19-2	+18 ²³
NOON		ħΙ.	KI MIN	_	1 1 1 1
- 254		AV			/ } } }
- 58N					
- 75N		V			
- 100N		171		-) f e
- 125N		11		(
1500		AL		}	
1750				X	
598H					
- 225N		1 Ltt			
- 258N) * ())	(
- 275N					
- 399H					
- 325N					
- 358H		NIIF	*TIM		
- 375N		MALI I			
- 498N		NIT		3	
- 425N - 450N		VN.			$ \setminus \setminus $
- 475N		ATT			
500M		$II \setminus I \cdot \setminus$			
525N		AH			
- 558N		ATT I			
- 575N		HT)			
- 599N		7 ++++	- Ha		
- 625N	at	7111)))((((
- 650N	$\{X\}$				
6758	IKI				ĺ
- 799N	$\langle \rangle $	+++			
- 725N	\rangle	+ + < +	10 110-		he
- 758N	(1 1 1 ++++			
- 7758) 				\
- 888N	/ +	1++++	1 (1)		Ņ
825N	17		X > \/ +∰		
- 858N	$ \rangle $) + K \		
- 875N	KI		() ¹)/)		
- 900N		+ + + + + + + + + + + + + + + + + + +			
- 925N	1 4	17+++			
- 958N		$\mathbf{A} \setminus \{\mathbf{A}\}$			
- 975N			> \ ¥ \\ /		
L 1999N	1)	· · · · · ·			\mathbf{A}

SURFACE PEM

Grid Date Time Base Ramp Time # Channels Svnc Type Loop Size	SLATE Feb 13 16.66 1.00 m 20 Crysta	5, 1995 ms 55 1(MASTE X 500m	R)	S LTD.	Tx Lo File # Rea Stn U Coil Folar Recei	op name dings nits Area ity .ver	: 1ES s: 38 : Metr : 4000 : + : Dig:	3 L3.FEM	
Loop Coordinates (X,Y,Z) 1. 1000m, 500m, 0m 3. 500m, -400m, 0m 4. 1000m, -400m, 0m									
Channel Tim	nes (use	c)							
Ch Start I	End Cent	er Ch	Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198		.49 1	76			2	104		
3 131						5	225		
	378 3					8	490	639	
9 639	828 7	'33 10	828	1075	952	11	1075	1395	1235
		502 13				14			
		98 16		5121		17	5121	6646	
18 6646 8	8617 76	i 32 19	8617	11170	9894	20	11170	14490	12830

•

.

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

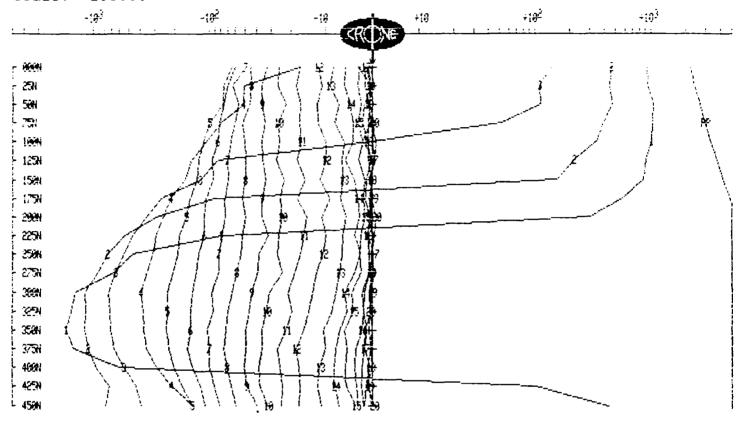
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

	-(<u>8³</u>	-(94	-18	+19	÷∰2	÷[9 ³
<u> </u>		<u></u>) ''-		<u></u>
- (444)			ŧ.	H : :	5. 2 8 1 1	$+ + \lambda$
251				$\langle \rangle$	$\tilde{\gamma}$	
- 561					N/	
- 754				1/1		
- 1999				$\langle c \rangle \langle c \rangle$		
- 1258			<u>ព</u> ្រំ ស្ថា		\$ X /	
1598			¥.	$\langle \rangle \rangle + \langle \langle \rangle$		
- 1758				>(豊二)	•	
- 2004				ing (
- 2254				lê j	$\{\langle i \rangle \}$	
- 2599			¥ ¥) 3))
2751			₽	$\langle \langle \langle \rangle \rangle$) / X	
- 3881				5) })9	(s à	el / / /
- 32591			L)	X 14 (}	\times / / /
- 3581			- AY	() $k > 1$	01/22	× × /
3758				KAL /	8)////	
- 435N				18/8/	1.XXV	$\langle \lambda \rangle$
- 42524						
L 450N				A second de		

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



SURFACE PEM

Date Time Ramp # Ch Sync Loop	Base Time annel Type	: SLA : Jan : 16. : 1.0 s: 20 : Cry : 110		95 STEI	R) .		Tx Lo File # Rea Stn U Coil Polar Recei	oop name adings Jnits Area rity iver	: L200 : SL-: : 2ESI : 82 : Metu : 4000 : + : Dig: : Brac	1 L1.PEM ric) sg m ital #	109
1.	Loop Coordinates (X,Y,Z) 1. 100m, 1050m, 0m 3. 1200m, 2000m, 0m 4. 100m, 2000m, 0m										
Chan	nel T	imes (usec)								
Ch S	tart	End C	enter	Ch	Start	End	Center	Ch	Start	End	Center
\mathbf{PP}	-198	-99	-149	1	76	104	90	2	104	131	117
З	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

SURFACE PEM

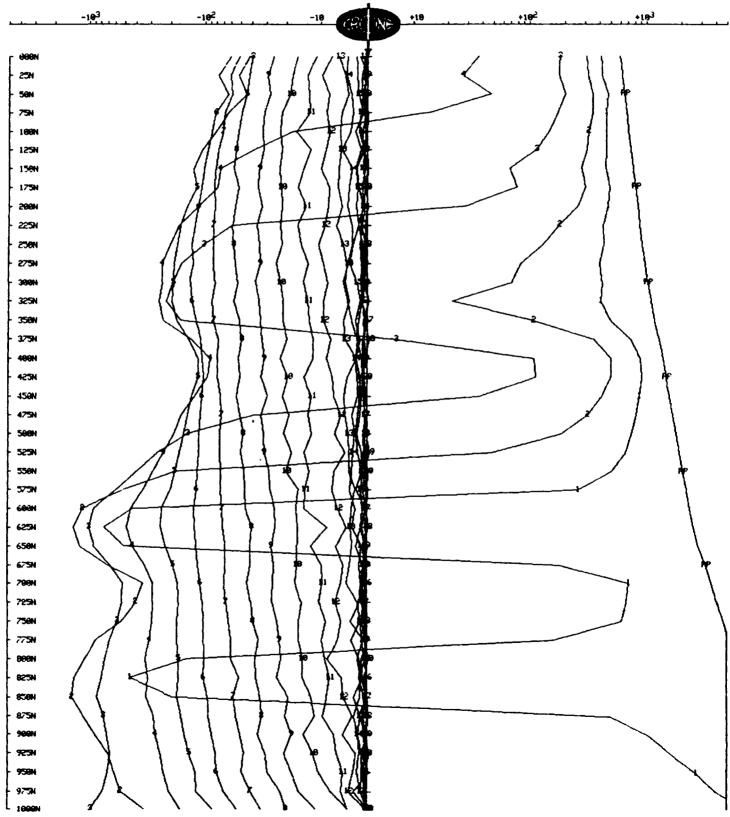
Client	: CUMBERLAND RESOURCES LTD.	Line	: L200 e
Grid	: SLATE LAKE	Tx Loop	: SL-1
Date	: Jan 29, 1995	File name	: 2ESL1.PEM

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

	4 <u>-4 6 4</u>	-1 9 3	-18 ²	-19 CRI	+10	+1 0²	+10-3
	1 (1991)						î
	254				₽ { }) / (((
	- 58N					$(\neq ())$	
	- 75H			R	Q() (
	- 100N			4			
	- 125N			-		() +)	
	- 156N				MS /) { / / / ((\{
	- 175N			4		$\{ \} \{ \{ \} \}$	
	4				X (PR	2/ 2 } \$	
	1			t i i i i i i i i i i i i i i i i i i i	X > (())
	•				() ^e)(11 1 1	
				1	4+	7 []]	/ 11
	4						1
	1		_	- 1	\mathbf{N}		
	1			Ţ			ſ (]
	1					$1 \mid \setminus \setminus$	
			\sim		$\langle \rangle \rangle$	$/ \land \land$	$\langle \mathbf{N} \rangle$
	1				K al		$\backslash \backslash \backslash$
	1			2	$\sqrt{7}$		
	1		•	l l			
	5250				H L		
	- 558N				\mathcal{V}	> $>$ $<$	
6254 6364 6754 7364 7364 7364 7574 7584 7594	- 575N			4	5		
538N 673N 796N 775N 775N 756N 855N	- 600N				, (
675N 726N 725N 775N 865N 865N 865N 865N 865N 865N 865N 86	- 625N			1 Alexandre			
799N 775N 775N 775N 775N 775N 775N 775N	1	5			*		
725N 775N 775N 860N 850N 875N 950N 950N	1	\rangle		ji na katala na katal	$^{\prime}$	\downarrow \langle \langle	
758N 775N 880N 860N 867N 960N 950N 950N 950N		/*					
	1	/		×.	e f		1
	1	/				/ /	
825M 8 856M 956M 956M 956M 956M 975M					р 		/ / /
500N 575N 960N 975N)				F 	~ / _ /	/ / /
975N	1	Ţ					
	1	/					
975N	[{		AM	·		$I \setminus$
9560N 975N	1						$\langle \rangle$
975W	1			J XI			$\langle \rangle$
	1			())) <i>"</i> ()			$\langle \langle \rangle$
				X.// / X.	:		

SURFACE PEM

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



SURFACE PEM

Client Grid Date Time Base Ramp Time # Channels Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 : 20 : Cry : 900	0 ms stal(MA m X 5	95 Stei		5 LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity .ver	: Dig:	3 L3.PEM ric	
Loop Coordinates (X,Y,Z) 1. 1000m, 500m, 0m 3. 500m, -400m, 0m 4. 1000m, -400m, 0m										
Channel Ti	imes (usec)								
Ch Start	End C	enter	\mathbf{Ch}	Start	End	Center	Ch	Start	End (Center
	-99	-149		76			2	104	131	117
3 131		151				198		225		
6 292 9 639	378	335	7		490			490	639	565
			10	828		952				1235
12 1395	1809	1602	13	1809		•		2348		
15 3046	3951	3498	16	3951	5121	4536	17	5121	6646	5884
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

SURFACE PEM

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

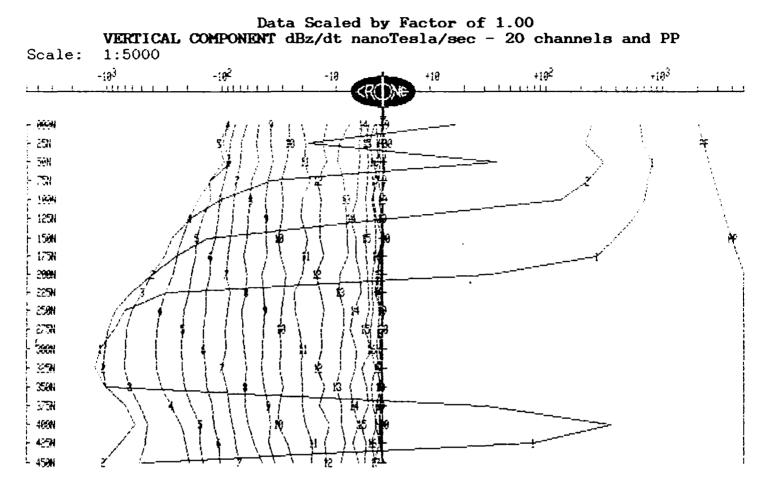
Data Scaled by Factor of 1.00 IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

	-10 ³	-182	-18	÷iệ	+ ; 9 ²	-193
<u></u> .				Ne		
- 000				$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	PP H	2 \$ 2 3 K
- 25K				() () i (
- 500				· 注 · 注	\mathbb{Z}	$\langle \langle \langle \rangle \rangle \rangle$
- <u></u> 21			÷.			
- 1998						
- 1254				F For	10 / / /	\$
- 158N			Ĥ			
- 659			H.		K-+- 1 /	
- 299N				1201/	1 + T-k	
- 23594				# >> / -		
- 256N				H (H	(
- 2 7 54				$ / \mu >$) / / # X	
- 306N				1×////	(\rightarrow / f)	\times / \neq /
- 32594					\$ / / / / /	
- JEGN				1 × × /	1 1 1 × 1	
- 37 5 N			#	1.4/	\neg (if \leq \leq	-#
415(8) TUNET		<u></u>		112-2-		and the second s
- 4.77						
- 450N			15 f	¥ 7		∳

.

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line :	: L200B
Grid	: SLATE LAKE	Tx Loop :	: SL-3
Date	: Feb 12. 1995	File name :	: 2ESL3.PEM



SURFACE PEM

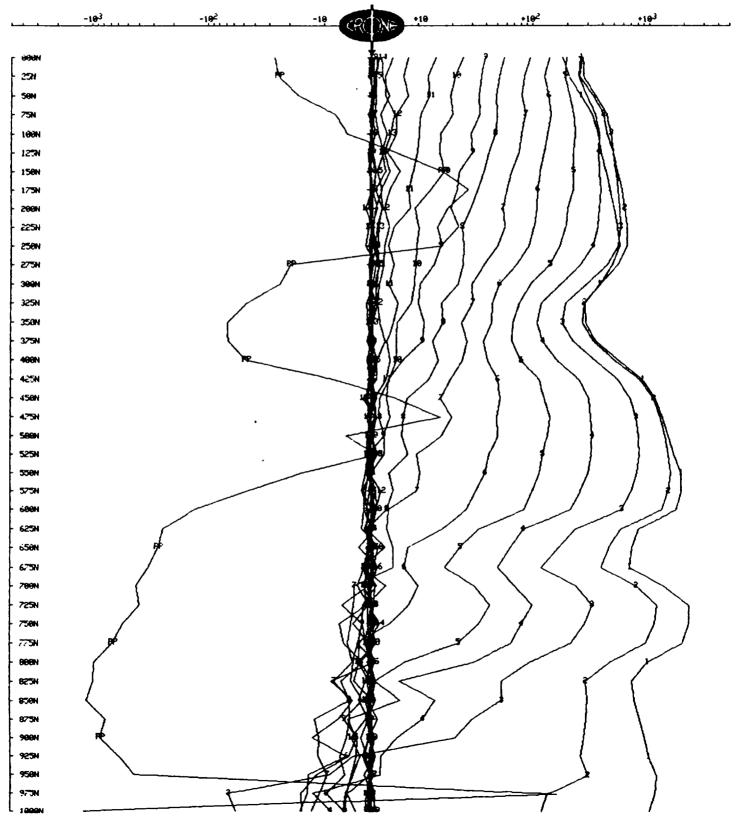
Ramp Time # Channel: Sync Type	: Crystal(M : 1100m X	E .995 IASTER) 1000m	ES LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	oop name ading: Jnits Area rity iver	: 3ES s: 82 : Met : 4000 : + : Dig:	1 L1.PEM ric	
1. 100m	dinates (X,Y , 1050m, Om n, 2000m, Om		· 2. 4.	1200m. 100m.				
Channel T	imes (usec)							
Ch Start	End Center	Ch Star	rt End	Center	Ch	Start	End (Center
PP -198	-99 -149	1 7	'6 104	90	2	104	131	117
	171 151		'1 225			225		259
	378 335	7 37	'8 490	434	8	490	639	565
9 639	828 733	10 82	8 1075	952	11	1075	1395	1235
12 1395	1809 1602	13 180	9 2348		14	2348	3046	
15 3046	3951 3498	16 395	51 5121	4536	17	5121	6646	5884
18 6646	8617 7632	19 861	7 11170	9894	20	11170	14490	12830

•

SURFACE PEM

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

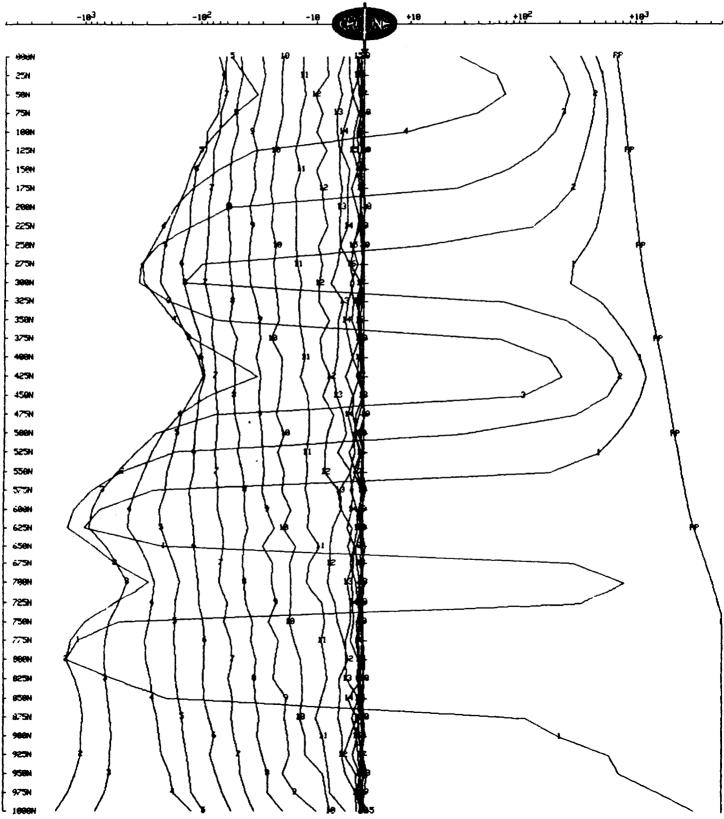
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000



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



SURFACE PEM

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 s: 20 : Cry : 900	00 ms stal(M	E 995 ASTEI 500m		S L TD .	Tx Lo File # Rea Stn U Coil Polar Recei	oop name dings Jnits Area ity .ver	: Dig:	3 L3.PEM ric	
Loop Coor 1. 1000 3. 500m	m, 500	m. Om	,2)			500m, 1000m,				
Channel I	'imes (usec)								
Ch Start	End C	enter	Ch	Start	End	Center	Ch	Start	End (Center
PP -198			1	76	104		2	104	131	117
3 131			4		225		5			259
	378		7			434		490		
	828		10	828		952				
12 1395	1809		13	1809	2348	-				
15 3046		3498	16		5121					5884
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

•

•

SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L300K
Grid	:	SLATE LAKE	Tx Loop	:	SL-3
Date	:	Feb 12, 1995	File name	:	3ESL3.PEM

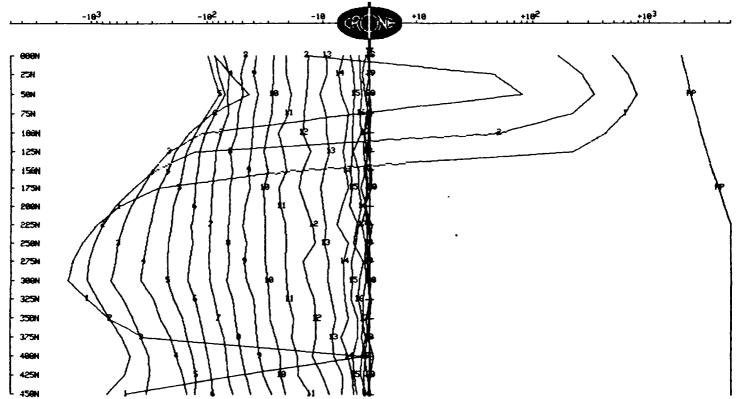
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

<u>k_atk</u>	-18 ³	-182	-19 (20)	+10	+102	+19 ³
				<i>//</i> ···		
F			ŧ	11//	×11111	1 1 1
- 25N			1	$\mathbb{H}(\langle \langle \rangle)$	p () (4	
- 58N			4	₩\>\\	\ > { † \	
- 751			Š.	$(\mathbf{X})^{\boldsymbol{\mu}}$	$\langle \langle \langle 1 \rangle \rangle$	
- 188N			Ж		'/ N / I	
- 125N			1	$IR/ \leq 1$	A	
- 159N				UR IT		
- 175N - 298N					' N	
225N					IXI	
250H			4		$M \mathcal{M}$	
2751				$A \neq ($	/ / <i>/ /</i> / /	
- 389N					$ \langle \rangle \rangle$	
- 325N					{ ~	\sim
- 358N				<i>ĕY >((</i>	$\langle \langle \langle \langle \rangle \rangle \rangle$	\$
- 375N						$\langle \rangle$
- 488N			6	X / `		\backslash \backslash
425N				2/	+ 1	$)$ χ
L 459N						A

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



SURFACE PEM

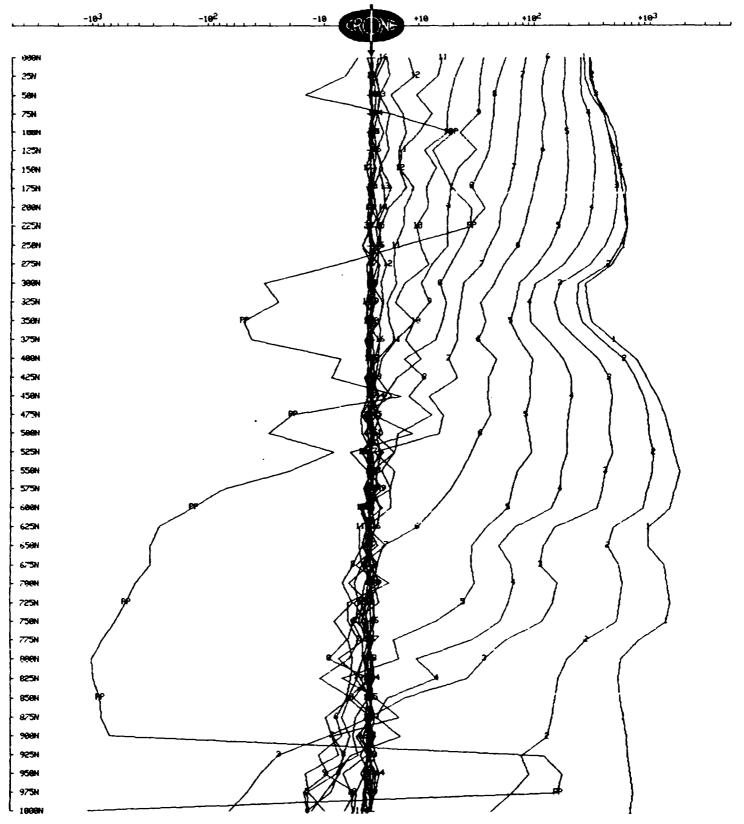
Grid : Date : Time Base : Ramp Time : # Channels: Sync Type : Loop Size :	1.00 ms	2 95 STER)	S LTD.	Tx Loo File 1 # Read Stn Un Coil A Polar: Receiv	name dings nits Area ity ver	: 4ES 5: 82 : Met : 4000 : + : Dig:	l L1.PEM	
1. 100m.	nates (X,Y, 1050m, Om 2000m, Om	Ζ)	2. 4.	1200m, 100m, 2				
Channel Tim	nes (usec)							
Ch Start E	Ind Center	Ch Start	End	Center	Ch	Start	End (Center
PP -198		1 76			2	104		
	171 151	4 171				225		
6 292			490		8	490	639	
9 639	828 733	10 828			11	1075	1395	
	.809 1602	13 1809			14	2348	3046	
	951 3498	16 3951			17	5121	6646	
18 6646 8	617 7632	19 8617	11170	9894	20	11170	14490	12830

•

SURFACE PEM

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

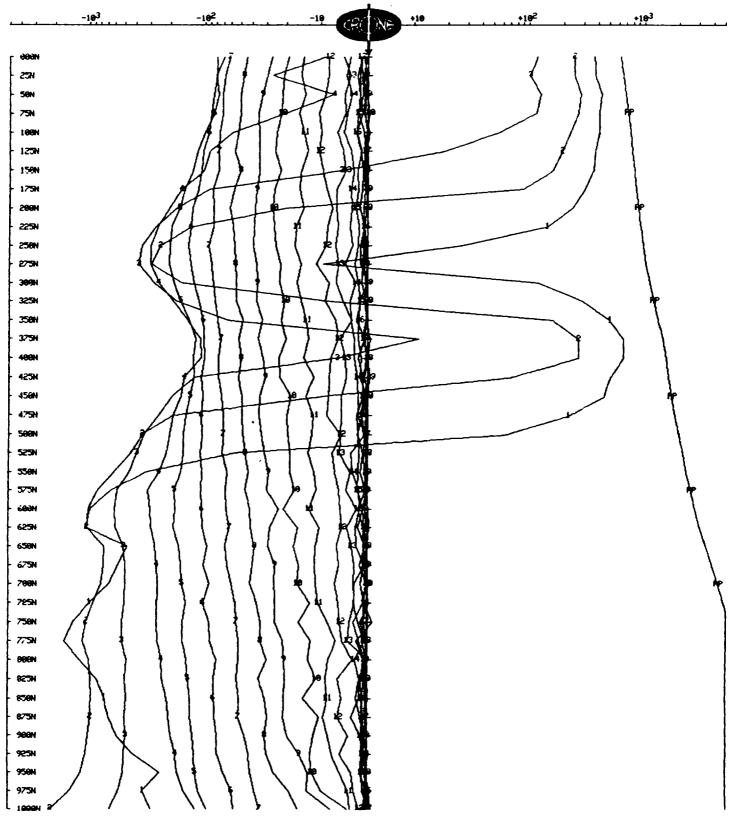
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000



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



SURFACE PEM

•

•1

Client Grid Date Time Base Ramp Time # Channels Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 : 20 : Cry : 900	66 ms 0 ms stal(Ma m X 5	e 995 Aster		5 LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	: Metr : 4000 : + : Dig:	3 L3.PEM ric	
Loop Coordinates (X,Y,Z)2.500m, 500m, 0m1. 1000m, 500m, 0m2.500m, 500m, 0m3. 500m, -400m, 0m4.1000m, -400m, 0m										
Channel Ti	imes (usec)								
Ch Start	End C	enter	Ch	Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198	-99	-149	1	76	104	90	2	104	131	117
3 131			4			198		225		259
6 292			7		490			490		565
9 639		733	10	828		952	11		1395	
12 1395	1809	1602	13	1809		-	14			
15 3046		3498			5121		17	5121	6646	
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

.

:

SURFACE PEM

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

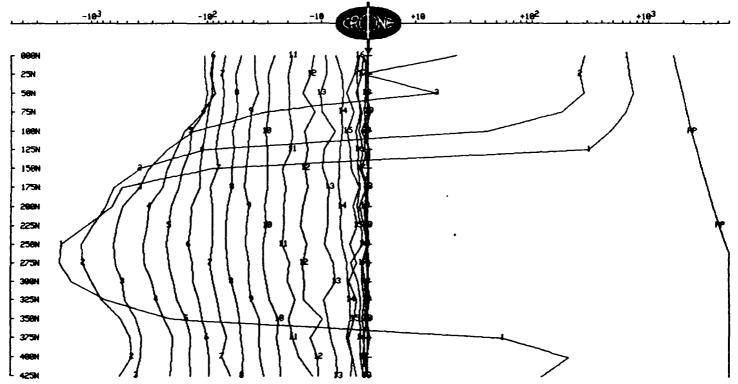
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

-18 ³	-10 ²	-19 CRU NB +10	+192	+1 0 ³
- 600N		1 13	// 1//	1 11
- 25N			1 () ((
- 58N			• \	$\langle \langle \rangle \rangle$
- 75N			////	1 1 1
- 1 88N		¥ * ×	$\left(\left(\right) \right)$	
- 1250			\bigtriangledown \square	
- 156N		\mathbf{T}	$\wedge \mid \mid \mid$	\uparrow \downarrow \downarrow \downarrow \downarrow
- 175N			/ 17 / 1	
- 298N			$\langle \langle \vee \rangle$	/
- 225N		STK ().	アナハノ ノ	
- 250N		تغريك الكل	$\left(\left \right\rangle \right) / \left \right\rangle$	~ / /
- 275N				
- 300N			YK	
· 325N			$\langle \rangle \rightarrow \nabla$, (
- 358N		\mathbf{x}	KL	
- 3 75 N		₩({ > \	KT Y	\setminus \setminus
- 489N			14-	$\langle \rangle$
· 425N	FP		\$ \ }	

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



SURFACE PEM

Client Grid Date Time Ba Ramp Ti # Chann Sync Ty Loop Si Current	se : me : els: pe : ze :	SLA: Feb 16.0 1.00 20 Cry: 110	66 ms 0 ms stal(M/	g 95 Astei	र)	S LTD.	Tx Lc File # Rea Stn U Coil Polar Recei	oop name dings Inits Area ity .ver	: + : Dig:	1 L1.PEM	
Loop Coordinates (X,Y,Z)1. 100m, 1050m, 0m3. 1200m, 2000m, 0m4. 100m, 2000m, 0m											
Channel	Time	s (1	usec)								
Ch Star	t En	d Ce	enter	Ch	Start	End	Center	Ch	Start	End (Center
PP -19	8 –	99	-149	1	76	104	90	2	104	131	117
	1 1	71	151	4	171	225	198		225	292	25 9
	23	78	335	7	378	490	-434	8	490	639	565
9 63	98	28	733	10	828	1075	952		1075	1395	1235
12 139	5 18	09	1602	13	1809	2348	2078	14	2348	3046	2697
15 304	6 39	51	3498	16	3951	5121	4536	17	5121	6646	5884
18 664	6 86	17	7632	19	8617	11170	9894	20	11170	14490	12830

SURFACE PEM

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

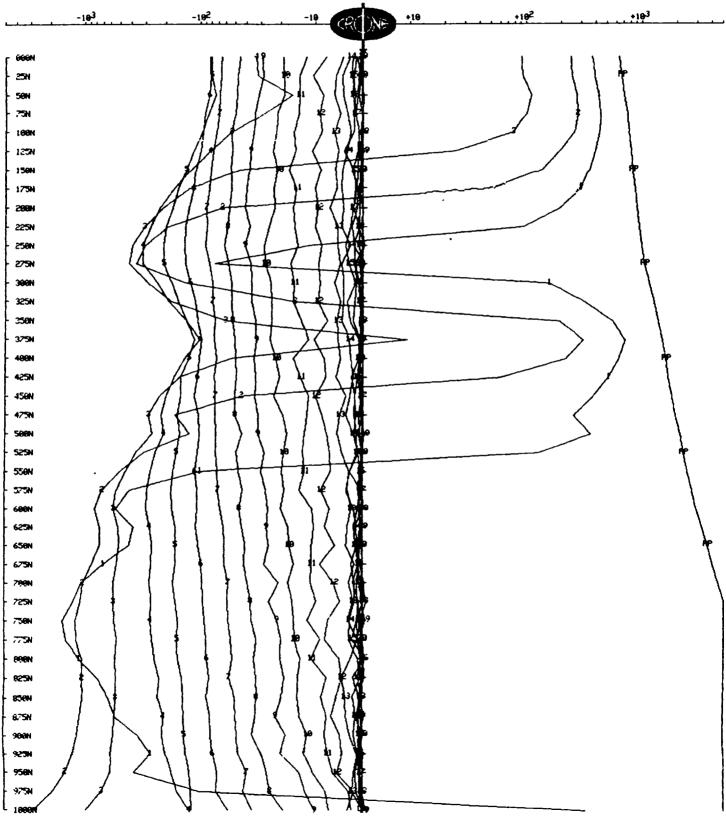
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

<u></u>	-193	-19 ²	-10 (A(NE -10		
F 000N					1 / 1 1	H3
- 25N				$\mathcal{H} \to I$	+ (₩
- 58N			4		/ / / / /	
- 75N					$\langle \langle \langle \langle \langle \langle \langle \rangle \rangle \rangle \rangle \rangle$	$\langle N \rangle$
100N			đ.		$\langle \rangle$	N N
- 125N			焼	₽Ħ\/ !	$\cap \neq I \cup I$	} N∖
- 158N			(4	₩< }()	• V / /	
- 1758				<u></u>		
- 200N				\mathbb{Y}	入/ 1 /	
- 225N				K / L	PIII	/ / 1
- 258N			Ĭ	VFT /	•////	
- 275N				K/21	{ []] /	1
- 300N		PĘ		UT / /	/] 7 { {	{ [
3251				ביו ו / ו	\uparrow \uparrow \downarrow \downarrow	11
- 358N - 375H		\langle	1			
				$\mathbf{X} \setminus \mathbf{I}$		
- 488N - 425H			X			
420H						
475H				V	T /	
- 500N						
- 5254					}	
- 556N		SP -				
- 575N						
- 666N						
- 625N		/	kii;	\mathbf{I}		\neq ((
658N)	le la	x >	$\left(\right)$	$/ $ \backslash
675N	7				()	
- 700N			LAT		$\left \right\rangle $	
- 725N			~~ F.	ſ		<i>¥</i>
758N						
775N	(r		$\langle \langle \rangle$
- 888N	r t e		\mathbf{X}			()
825N				1 T		((
57.6N			r×jų s	A J		} \
- 875N						
- 908N			ACT I			
- 925N			T A	>		R
- 958N		• /	AT X			
97 0 N		1	ATX Y			
L 1000N		1 /	~/ K⁄ W 🛲			· · · · ·

SURFACE PEM

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L500B
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



SURFACE PEM

Grid : Date : Time Base : Ramp Time : # Channels: Sync Type : Loop Size :	1.00 ms	STER)	S LTD.	Line Tx Loo File n # Read Stn Un Coil A Polari Receiv Operat	ame lings hits lrea ty ver	: 6ES 3: 80 : Met : 4000 : + : Dig:	L1.PEM ric D sq m ital #1	
1. 100m,	inates (X,Y, 1050m, Om 2000m, Om	Z)		1200m, 100m, 2		-		
Channel Tim	nes (usec)							
Ch Start E	End Center	Ch Start	End	Center	Ch	Start	End (Center
PP -198		1 76			2	104		
	171 151	4 171				225		259
6 292		7 378		434	8		639	
9 639	828 733	10 828	1075	952	11	1075	1395	1235
12 1395 1	1602	13 1809	2348	2078	14	2348	3046	2697
15 3046 3	3951 3498	16 3951	5121	4536	17	5121	6646	5884
18 6646 8	8617 7632	19 8617	11170	9894	20	11170	14490	12830

.

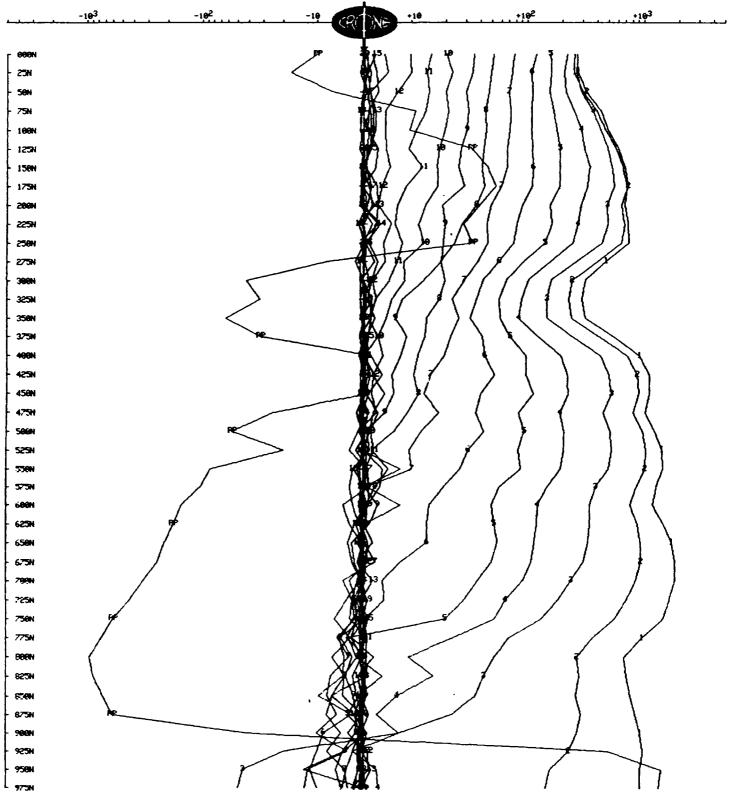
F.

SURFACE PEM

.

Client	:	CUMBERLAND RESOURCES LTD.	Line	:	L600K
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



SURFACE PEM

Client	CUMBERLAND RESOURCE	S 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

SURFACE PEM

Grid : Date : Time Base : Ramp Time : # Channels: Sync Type : Loop Size :	1.00 ms 20 Crystal(MA	e 95 Aster	•	5 LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	name dings nits Area ity ver	: 7ES] =: 80 : Metr : 4000 : + : Dig:	1 L1.PEM	
	nates (X,Y, 1050m, Om 2000m, Om	,Z)			1200m, 100m,				
Channel Tim	nes (usec)								
Ch Start E	Ind Center	\mathbf{Ch}	Start	End	Center	Ch	Start	End (Center
PP -198	-99 -149	1	76	104		2	104		
3 131	171 151	4	171				225		
6 292		7	378			8	490	639	
	828 733	10	828	1075		11		1395	
	809 1602	13	1809	2348		14	2348	3046	
	951 3498	16	3951	5121	4536	17	5121	6646	5884
18 6646 8	617 7632	19	8617	11170	9894	20	11170	14490	12830

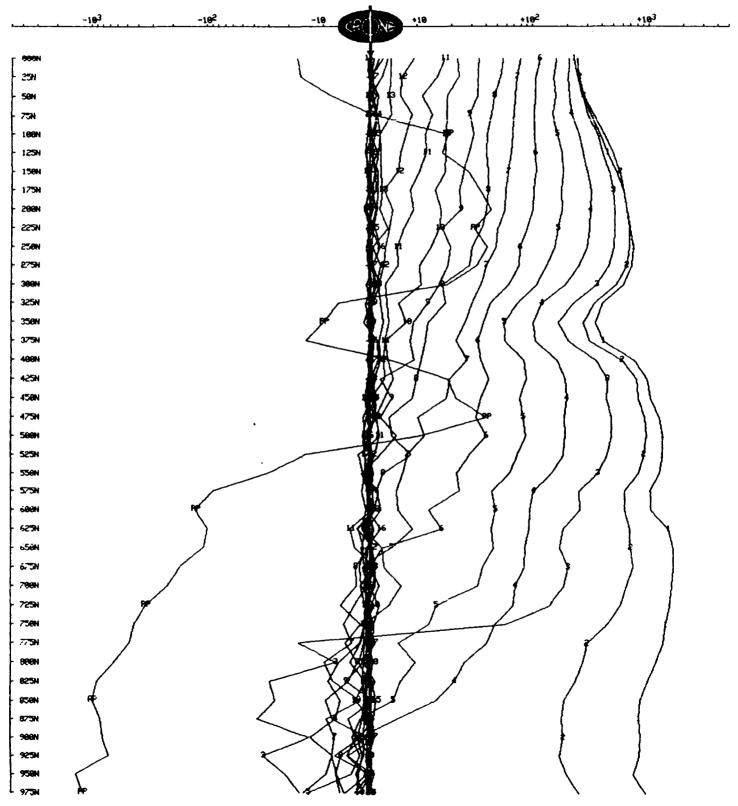
•

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line	:	L700K
Grid	: SLATE LAKE	Tx Loop	:	SL-1
Date	: Feb 2, 1995	File name	:	7ESL1.PEM

• •

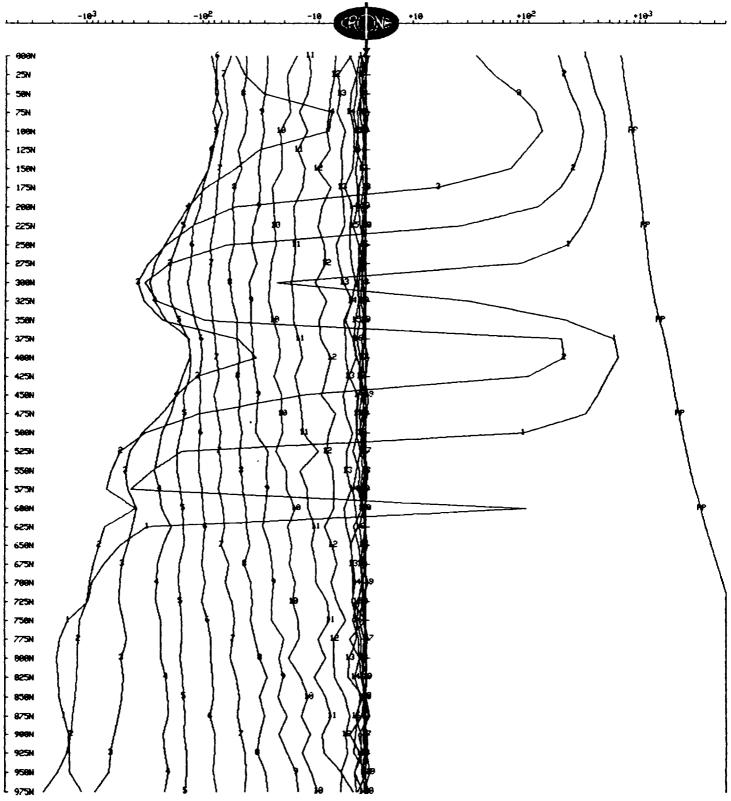
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000



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



SURFACE PEM

Client Grid Date Time Base Ramp Time # Channels Sync Type Loop Size Current	: SLA : Feb : 16. : 1.0 : 20 : Cry : 110	0 ms stal(MA 0m X	ō	२)	S LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	oop name dings lnits Area ity .ver	: 8ES 5: 80 : Met : 4000	1 L1.PEM ric D sq m ital #:	
Loop Coord 1. 100m, 3. 1200m	1050	m, Om	Ζ)			1200m, 100m,				
Channel Ti	mes (usec)								
Ch Start	End C	enter	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			198	5	225	292	259
	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

•

SURFACE PEM

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

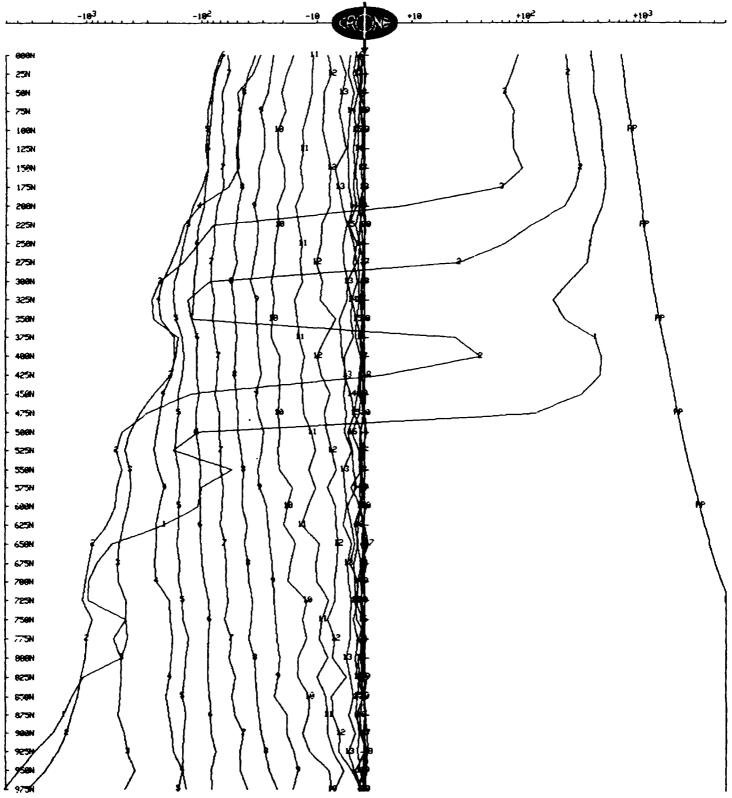
IN-LINK HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

<mark>⊾_d</mark> _d	-18 ³	-182	-19 (Pi	NE +10	+182	+183
г 99 0 м	:					
- 251]	
- 58N						
- 75N				() () ()		W
- 100N				Ale She /) / / 4 \	N
- 125N					$() \downarrow ()$	N
- 150N			¥	$N \neq \{ \zeta \}$) / ())	
- 175N			Į.		\$ { } {	
- 298N				(() 入(' }	
- 225N			R	▶ } ≠ / }	• / } •) } \
- 259N			₿.	ひ) ヤ (く ((< f <	(())
- 275H			6	* * \ \ 	717) } #
- 309N			1	VIL	(11
- 325N			1			/ //
- 358N - 375N				$\left[\left[\left[\right] \right] \right] \right]$	'\	
400N				AHI I	$I \setminus I$	
4250			l l	$\pi \vee \rightarrow$		}]/
458N						
- 475N						
500N		·				
- 525N				$\mathcal{V} / \mathcal{I} $		/ / /
- 558N		5			$\left(\right)$	₹ ((
- 5275N		\rangle		M > /		$\langle \langle \langle \rangle$
688N		^{₽‡}		V / \langle	• >	$\rangle \rangle \rangle \langle \rangle$
- 625N		\langle	, second s	KK		
650N						1
- 67"31 - 2001			Se i			
1	R		y i			
- 725N - 758N			j) j		$\langle \rangle$	
- 775N					τ	' \
- 9981	ł		X	8)	\rangle
- 625N	J	1	~~~ () /		/ (· /
- 858N	B	J			1	(
875N			- Shite)	
900N			\checkmark	e /	f f	l l
9254		₹	$\langle \gamma \rangle$			>
9594			XXX			(
975N		1		•		1

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



SURFACE PEM

Client Grid Date Time Base Ramp Time # Channe Sync Type Loop Size Current	: SLA : Feb = : 16. = : 1.0 = : 1.0 ls: 20 = : Cry = : 110	66 ms 0 ms stal(MA	8 1995 ASTER	٤)	5 LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	oop name idings Jnits Area `ity .ver	: 9ES] s: 80 : Metu : 4000 : + : Dig:	L1.PEM	
		m, Om	,Z)			1200m, 100m,		•		
Channel !	Fimes (usec)								
Ch Start	End C	enter	Ch	Start	End	Center	Ch	Start	End (Center
		-149		76	104		2	104		
		151		171				225	2 92	259
	378	335	7		490		8	490	639	
9 639	828	733	10	828		952	11	1075	1395	1235
12 1395		1602	13	1809	2348	• -	14			
15 3046		3498			5121		17			
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD.	Line : L900K	in the second
Grid	: SLATE LAKE	Tx Loop : SL-1	4 4 T 2 - 1 - 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

-10	3	-1 6 ²	-10 (P(1))	+10	+182	+10 ³	
689N			× #	$J^{3}///$]	1 1 1	
- 25N					1////	/ T.	
- 58N			r y	9/\.#	{ / }]	' A	
- 751			IN	$V \downarrow \uparrow I /$	' [7]		
100N			1.	IT / I	1111	1 Y1	
- 125N					$I / \{$		
- 159N - 175N			V		/ / / 4		
- 200N			K		$1 \land 1 \land$		
- 225%				$\Delta I / \Lambda$			
- 258N				F//			
275N				$\{\}\}$			
- 300N			¥.j			/ / \	
- 325N			<u>a</u>	$\beta < \beta$			
- 358N				€/ `} / <	$\mathcal{F}(\mathcal{L})$	((*	
- 375N				S) / { <i>f</i> / <i>f</i>	\mathbf{S}		
- 499N			ŧy	$X X \{$		} } \\	
425N					7 1	$\langle \langle \langle \rangle \rangle$	
- 45 0 N				$\mathcal{H}(\mathcal{I})$	4		
475N					PI	/ / #}	
- 500N						1	
525N				\checkmark (\checkmark)	{ {	$\langle \langle \langle \rangle$	
- 558N						\rightarrow	
- 575N					^		
- 688N - 625N			X				
658N			TH.	\mathcal{A}			
- 675N	,	2				/ / /	
- 799N		•		\sim			
- 725N	1			$\langle \rangle \langle \rangle$) /	£ (
- 758N			X)	$\langle \rangle \langle \rangle$			
- 775N		\rightarrow	4		\rangle	$\langle \rangle$	
BEEN		po				$\langle \rangle$	
825N		/		<	5		
- 858N		-		\rightarrow			
875N			THE	55			
- 900N				1			>
925N EF	-	\mathbf{i}					
958N)				$\{$	
475N		/				2 1	

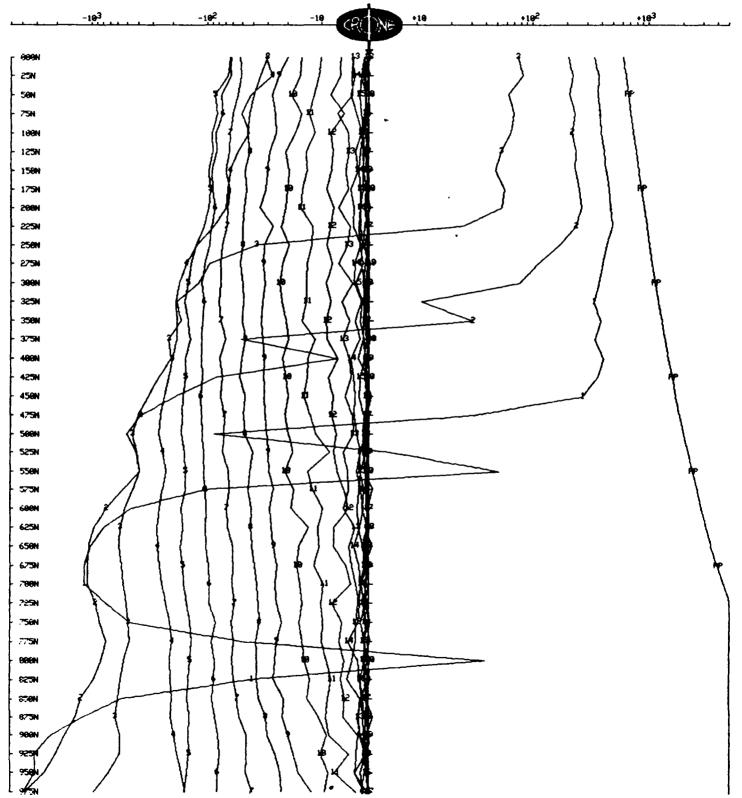
....

•

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



• .

SURFACE PEM

.

Client : CUMBERLAND Grid : SLATE LAKE Date : Feb 3, 199 Time Base : 16.66 ms Ramp Time : 1.00 ms # Channels: 20 Sync Type : Crystal(MA Loop Size : 1100m X Current : 16.5 Amps	STER)	S LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	op name dings nits Area ity ver	s: 80 : Metr : 4000 : + : Dig:	L SL1.PEN ric	109
Loop Coordinates (X,Y, 1. 100m, 1050m, 0m 3. 1200m, 2000m, 0m			1200m, 100m,				
Channel Times (usec)							
Ch Start End Center	Ch Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198 -99 -149		5 104		2	104		
3 131 171 151			198		225		259
6 292 378 335			.434		490		
9 639 828 733	10 828		952	11			
12 1395 1809 1602	13 1809			14			
15 3046 3951 3498		5121					
18 6646 8617 7632	19 8617	11170	9894	20	11170	14490	12830

SURFACE PEM

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

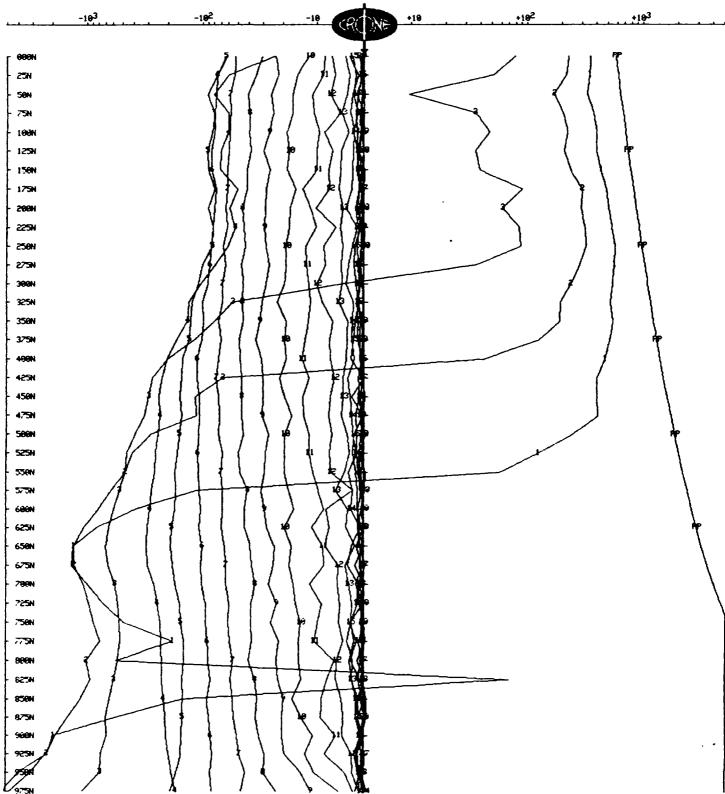
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 20 channels and PP Scale: 1:5000

	-1 9 ³	-102	-10 (R())	NE +10	+102	+10 ³
L 000M			PP D	15 / / 19	1/1/3	\ ! \\
- 25N))(+ /	$\{(), \{\}, \{\}\}$	¥ }
- 58N				\$/ ₽(/ { / } /	/4
- 75N			\sim		' \$ {	({
100N						·/ [}
125N			PR	ふく > ル /	()	
- 158N						<pre>{</pre>
175N				(A)		
- 298N			兼	$\langle \rangle \langle \rangle \langle \rangle \langle \rangle$	4 1 1 1	
22511			1		$\{ \} \{ \}$	
- 258N				27 \ 10 (10)	2 + 1 + 1) \\\
- 275N			ť	$X \rightarrow ($		1 111
- 399N			, ti	$\langle / / \rangle$) { {	
- 325N			붋	1/ 1/1		
- 358N					(1)	1 \ \
375N				R. T /) /		} } }
- 400N			X	[]]]]		
425N			7	$\mathbf{N} \mathbf{V} \{ \mathbf{f} \}$		
450N					k / /	7 {}
4751			ľ	$M \left\{ \right\}$		
- 500N						
525N						
- 558N - 575N			<u>A</u>			
- 6 88 N				$X \setminus$		
- 625N			113	\sim /		
- 658N					$A \mid$	
- 675N		_		17		
- 788N						$\langle \langle \rangle$
· 725N			V.S.	1-t-	+-+	}
750N				$V \rightarrow t$		
- 775N						\rightarrow \rightarrow
- BREN			· /	> //		\checkmark
- 825N						
858N					\checkmark	
875N		D		le S	J	
- 900N			130			
925N				' {{		<i>i f</i> (
- 958N		$\boldsymbol{\prec}$		لرل ه		
- 975N						

SURFACE PEM

Client	: CUMBERLAND RESOURCES LTD	D. 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



.

SURFACE PEM

× · .

Client Grid Date Time Base Ramp Time # Channel Sync Type Loop Size Current	: SLAT : Feb : 16.6 : 1.00 s: 20 : Crys : 1100) ms stal(MAS)m X 1	5 STEF	8)	S LTD.	Tx Lo File # Rea Stn U Coil Polar Recei	oop name dings Jnits Area ity .ver	s: 78 : Metu : 4000 : + : Dig:	l SL1.PEN ric	109
Loop Coor 1. 100m 3. 1200	, 1050m	n, Om	2)			1200m, 100m,				
Channel T	imes (u	usec)								
Ch Start	End Ce	enter	Ch	Start	End	Center	\mathbf{Ch}	Start	End (Center
PP -198	-99	-149	1	76	104		2		131	
	171		4			198				
		335	7			434			639	
		733	10	828		952	11		1395	
12 1395		1602	13	1809	2348		14	2348	3046	2697
15 3046	3951		16	3951	5121	4536	17	5121		
18 6646	8617	7632	19	8617	11170	9894	20	11170	14490	12830

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

	-19 ³	-10 ² -1	*	+182	+103
- 889N			散发 /	11111	1/ 8
- 25N				/ / / / / / /	
58N					7
· 75H					λ
100N				1	
1250				T \] T	W
158N				X//////	11
1750				/ / /	11
200N				$N \Lambda$	
225N				$\Lambda \mid I \mid I$	/{\
258N 275N					111
- 2/5H - 389N					
325N					1/1
358N					
375N					
400N					
425N			₩ 1<	+ X + +	\ \
458N				$\left(\right) \left(\right) \left(\right) $	> >
475N			$\langle \mathbf{x} \rangle \mathbf{X}$) (/ +	
Seen			ر 🔨 🖌 🏹	/] = = = [(((
525N				\rightarrow	
550N			$\blacksquare \land \land$	$\langle \rangle$	} }
575N				$\left(\right) \left(\right) \left(\right)$	<i>}</i> }}
688N				\mathcal{Y}	/ //
625N					
650N			< ALX	$\{\langle \langle \langle \rangle \rangle \}$	$\langle \langle$
475N				$\nabla \langle \rangle \rangle$)) Y
FRON				$\langle \rangle \rangle$	
725N				>11	/ { \
750N				94 X	
775N				\langle / \rangle	
eeen				X	۴ /
8250				1/ 1	
ETEN	ſ	~		11 /	
8.75N	JBR			♥	
900N			XXXX {	- Y .	<u>}</u>
925N 958N				·/ ·	/ · · /
7,300				,	/ /

. .

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

<u></u>	-1 9 3	-182	-10 CR(1)N	+10	+192	+183
F 898N		د د هور	9 , , , , , , , , , , , , , , , , , , ,		<i></i>	ι.
2591		ALT		_		PP
- 58N		(K ()		<	Ļ	
- 75N		VIII	- Lelle		~~ \	
- 1 99N						1
125N		XII 1				ł
- 15 0 N		altt	+///		< (h
- 175N		$\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$	\¥ }(#0)			}
- 298N			} } ¥ ¥ M		k 1	l l
225N		11-1	ノ\(州傳			
- 258N		THT I		<	ζ	l l
- 275N			* / \ (#		$\gamma \gamma$	AP .
- 300N						
- 325N					7	}
- 358N						
- 375N				\leq	,	
- 488N - 425N			$(\)./)$			
- 450N		11121				
475N	4		1/1		1	
- 586N	I				\	
5258	}					
- 558N		H			×	
- 575N	F	₹ \ \				
- 6 89 N	A					l l
625N	(\{	. →	FT TRUE			\
659N	U Y	\ \ \ \ \ \	* { { } }			A.
675N	'n	$\langle \rangle \rangle \langle \rangle \rangle$	· > + \((+		7	
- 798N	J.) () }) (, /
725N	1	() ())				
- 7 58N						\
- 775N	11 -	H	. ₹ <u>/</u> X T			*
- 886N	IIT) \ * 191			
625N	1 / \					
858N						
8.75N	+					
- 900N - 930N		$V \downarrow V$				
ASSON 1	/	XIYI				

•

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.

STATEMENT OF QUALIFICATIONS

APPENDIX 2

.

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: <u>Rat Leuns</u> M.P. Lewis

Date: _____

6	
19	2
Ľ	
On	tario

Ministry of Northern Development and Mines

Report of Work Conducted After Recording Claim

Transaction Number **A**() . 00083

PI

<u>S</u>S8

36,

Mining Act

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.

16340Instructions: - 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 900 Becorded Holder(s) UMBERLAND RESOURCES LTD. 12 2924 WINNIPEG AVE, THUNDER BAY, ONT 807-344-6598 SLATE G. 1884 L. To: From: JAN 28, 1995 EB Work Performed (Check One Work Group Only) Work Group Type PULSE GEOPHYSICS Geotechnical Survey Em 4 LINE CUTTING Physical Work, Including Drilling RECEIVED Rehabilitation Other Authorized Work JAN 1 0 1996 Assavs MINING LANDS BRANCH

Total Assessment Work Claimed on the Attached Statement of Costs \$

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
	BNT. PTG 1A2

(attach a schedule if necessary)

Assignment from

Reserve

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

I certify that at the time the work was performed, the claims covered in this work	Recorded Holder or Agent (Signature)
	· · · · · · · · · · · · · · · · · · ·

Certification of Work Report

	-	
I certify that I have a pers its completion and annexe	onal knowledge of the facts set forth in this Work report, having performed t ad report is true.	he work or witnessed same during and/or after
Name and Address of Person	Certifying	
PAT LE	WIS 269 CHERCOVER DRI	
_		
807-767-0	259 DEC 13/95 Nat	Lellus
For Office Use Only	1a	
Total Value Cr. Recorded	Date Recorded Mining Recorder	Received Statip
00	December 22/95 Carbon Thom	
. 19.	Deemed Approval Date / Date Approved /	
\$ 551.	m 1 relat	2 1995
21	march 21/96	AH PM
·40 >	Date Notice for Amendments Sent	7[0]9[2]12[1]2[1]0]8[4:5]6
	1	

0241 (03/91)

Assessment Work Distribution, f	ile#2.16340
---------------------------------	-------------

Claim number	Units	value of	assessment work	valu	e applied to	value	assigned from	Reserve:	
		done on	this claim	this	claim	this c	aim	Work to be calimed at a fu	ture date
483668	1	\$	2,970.00	T		\$	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		\$	1,994.00		
KRL1144369	4	\$	6,057.00	\$	3,200.00	\$	2,857.00	**************************************	
KRL1144370	2	\$	191.00	\$	1,600.00	1		••••••••••••••••••••••••••••••••••••••	
KRL1144371	1	\$	3,325.00	\$	800.00	\$	2,525.00		
KRL1144372	6	\$	3,703.00	\$	4,800.00	1			······································
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	1			
KRL1209261	3	\$	•	\$	2,400.00				
TOTALS	49	\$	36,559.00	\$	35,200.00	\$	20,957.63	\$	1,359.00

.

Total Assigned From
N N
es es
+
w.
N N
S
2
6.
NCH R R
Value Assigned from this Cialm

3. Credits are to be cut back as priorized on the attached appendix.

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 789101112112341516

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

ULU 22 1995

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 patente	Signature	Date
or leased land at the time the work was performed.	Not Lyuns	DEC 13/95
	VILL CLAWY	- UKC ATS



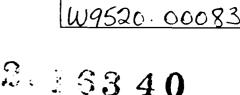
Ministry of Northern Development and Mines

Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation





Transaction No./Nº de transaction

Mining Act/Loi sur les mines

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, 4^e étage, Sudbu (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Туре	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre	2462	2462
	Field Supervision Supervision sur le terrain		2,462
Contractor's and Consultant's Fees	GEOPHVSICS	20,294	
Droits de l'entrepreneur	LINECUTTING	20,294 8,000	
et de l'expert- conseil			28,294
Supplies Used Fournitures utilisées	MISC	73 09	
			G
Equipment Rental Location de matériei	Туре /		73.09
	Total Die Total des coû	rect Costs	30,829

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.

Filing Discounts

- Work filed within two years of completion is claimed at 100% of 1. 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 =	

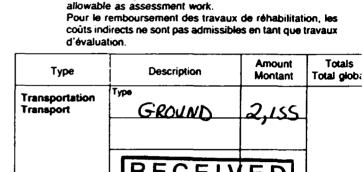
Certification Verifying Statement of Costs

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.



to make this certification



** Note: When claiming Rehabilitation work Indirect costs are not

2. Indirect Costs/Coûts indirects

1996 10 AINING LANDS BRANCH Food and Lodging Nourriture et MEALS 3575 hébergement Mobilization and Demobilization Mobilisation et démobilisatio Sub Total of Indirect Costs Total partiel des coûts indirects Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs **Total Value of Assessment Credit** Valeur totale du crédit (Total of Direct and Allowabl indirect costs) d'évaluation (Total des couts d

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dan 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 toou une partie des travaux d'évaluation présentés.

Remises pour dépôt

- 1. Les travaux déposés paris 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 du cinq ans après leur achèvemer sont remboursés à 50 40 de la valeur totale du crédit d'évaluatio susmentionné. Voir les calculs di dependes Valeur totale du crédit d'évaluation Valeur totale du crédit d'évaluation Évaluation totale demandée

× 0,50 =

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 _____ je suis autoris (titulaire enregistré, représentant, poste occupé dans la compegnie)

à faire cette attestation.

Date ignature Tal

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

APR22'96(MON) 09:13 MININ	G-RECORDERRL	TEL:807 727 3553	P. 002
MAR 7,2' 96 (FR1) 10:26 MINING	LANDS SECTION	TEL: 705 670 5863	P. 001
The orthogonal of the orthogon	rio		
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 Norther Ontario governmen 227 Howey Street Box 324 Red lake, Ontario	n Development and Mines	• . •	
POV 2M0 Dear Mr. Rivett:		. Pestere	
	of Assessment Work Cre in the Slate lake Area	dits om Mining Claims	

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 question; regarding this correspondence, please contact Blair Kite at (705) 670-5855.

Yours Sincerely, ORIGINAL SIGNED BY:

Ron Clarke

Ron Gashinski Senior Manager, Mining Lands Section Mining and Land management Branch Mines and Minesola 1944-

RECEIVED RED LAKE MINING DIV.

MAR 2 2 1996 AN PN 318193101111213141516

