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THE 1982 COCRUST EXPERIMENT
ACQUISITION AND INTERPRETATION OF CRUSTAL REFRACTION PROFILES ACROSS
THE OTTAWA VALLEY GRABEN, THE CENTRAL METASEDIMENTARY BELT AND THE
GENVILLE FRONT, ONTARIO AND QUEBEC

by

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BELT AND THE GRENVILLE FRONT, ONTARIO AND QUEBEC

DSS CONTRACT NUMBER 20SU.23235-2-0542

FINAL REPORT

BY

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September, 1983

⋮

OBJECTIVE

To explore the nature of the crust beneath the Ottawa-Bonnechère Graben, the Central Metasedimentary Belt and the Grenville Front, Ontario and Québec, by conducting a seismic refraction experiment.

ABSTRACT

During the summer of 1982 the COCRUST* Consortium conducted a major long-range seismic refraction experiment across the Canadian Shield of Eastern Canada. Major participants of this experiment came from the Earth Physics Branch DEMR, Ottawa, the Department of Geophysics, University of Western Ontario, the Department of Mining and Metallurgical Engineering, McGill University, the Department of Geology, University of Montréal, the Department of Mineral Engineering, Ecole Polytechnique, the Department of Earth Sciences, Université du Québec à Chicoutimi, the Department of Geophysics and Astronomy, University of British Columbia and the Department of Physics, University of Toronto.

Seismic lines, approximately 300 km in length were located along the Ottawa-Bonnechère Graben from North Bay to Arnprior, Ontario and perpendicular to the Ottawa-Bonnechère Graben and Grenville Front along a line from Marmora, Ontario to Mont Laurier, Québec to Val d'Or, Québec. This line was then linked to the Val d'Or to Matagami line of the Abitibi Greenstone Belt experiment. Both in-line and fan-type profiles for both 2-dimensional and 3-dimensional subsurface analysis were obtained from a series of twelve shots which were fired at North Bay, Marmora, Bristol Mines, Mont Laurier, and Val d'Or. An additional four shots which were fired near Matachewan, Matagami, Chibougamau and Val d'Or were recorded along a line from Val d'Or to Matagami in the adjoining Abitibi Greenstone Belt experiment. Seismic sections and a discussion of the preliminary results are presented in this paper.

* Consortium for Crustal Reconnaissance using Seismic Techniques

OBJECTIF

Explorer par sismique réfraction les caractéristiques de la croûte sous le graben d'Ottawa-Bonnechère, la zone métasédimentaire centrale et le front du Grenville en Ontario et au Québec.

RÉSUMÉ

Au cours de l'été 1982 le groupe COCRUST* a mené une expérience importante de sismique réfraction à tirs lointains dans le Bouclier canadien de l'est du Canada. Les principaux participants venaient de la Direction de la physique du globe (Énergie, Mines et Ressources Canada), du département de géophysique de l'université Western Ontario, du département du génie minier et métallurgique de l'université McGill, du département de géologie de l'Université de Montréal, du département de génie minéral de l'École Polytechnique, du département des sciences de la terre de l'Université du Québec à Chicoutimi, du département de géophysique et d'astronomie de l'Université de la Colombie-Britannique et du département de physique de l'Université de Toronto.

Des lignes sismiques d'une longueur d'environ 300 km chacune furent choisies le long du graben d'Ottawa-Bonnechère de North Bay à Arnprior, perpendiculairement au même graben de Marmora (Ontario) à Mont-Laurier (Québec) et perpendiculairement au front du Grenville de Mont-Laurier à Val-d'Or. Cette dernière ligne fût ensuite reliée à la ligne Val-d'Or-Matagami de l'expérience sur la ceinture volcanique d'Abitibi. Des profils de tir en ligne et en éventail, aux fins d'analyses bidimensionnelles et tridimensionnelles de la subsurface, ont été obtenus d'une série de 12 tirs effectués à North Bay, Marmora, Bristol Mines, Mont-Laurier et Val-d'Or. Quatre tirs additionnels à proximité de Matatchewan, Matagami, Chibougamau et Val-d'Or ont été enregistrés le long de la ligne Val-d'Or-Matagami dans le cadre de l'expérience portant sur la ceinture volcanique d'Abitibi. Le présent rapport comprend les profils sismiques ainsi qu'une discussion des résultats préliminaires.

* COCRUST = Consortium for Crustal Reconnaissance using Seismic Techniques

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INTRODUCTION

In August 1982, two long range seismic refraction experiments were conducted in Eastern Canada by the Canadian COCRUST group with the primary objective of determining if some of the significant geological and geophysical features on the surface of the Canadian Shield have an expression at depth. The first experiment was across the Ottawa-Bonnechere Graben and Grenville Front and was supported by this DSS contract. The second experiment was across the Abitibi Greenstone Belt north of the Grenville Front and was supported by an NSERC Strategic grant obtained by the University of Montreal, Ecole Polytechnique, McGill University and the Universite du Quebec a Chicoutimi. For logistic reasons the two experiments were combined into one large field program involving the same personnel. This report is primarily concerned with the first experiment but includes some of the results of the Abitibi experiment for the sake of continuity.

REGIONAL TECTONICS

Geological summaries of the areas under investigation were given by Wynne-Edwards et al (1966), Wynne-Edwards (1969, 1972), Goodwin and Ridler (1970), and Baer (1976). A complete review of both the geology and geophysics of the region and its relation to the active seismic zone was presented by Forsyth (1981). See Figure 1. The main tectonic features of interest are the Central Metasedimentary Belt, the Ottawa-Bonnechere graben, the Ontario and Quebec Gneiss region, The Grenville Front, the Abitibi Greenstone belt, and the active earthquake zone in the area to the east.

The Central Metasedimentary Belt is characterized by the supracrustal Grenville Supergroup assemblage with north-south and north-east structural trends. This is an assemblage of predominantly amphibolite grade marbles, paragneisses, quartzites and metavolcanics. The Ontario and Quebec gneiss zones are mainly quartzofelspathic gneisses with structural trends in Ontario and Quebec being northeasterly and northwesterly respectively. The Ottawa-Bonnechere graben is a northwesterly trending structurally depressed zone running roughly parallel to the Ottawa river and separates the Metasedimentary Belt from the Gneiss zones. It is approximately 60 km wide and is bounded on the north-east by the Laurentian Highlands and on the south-west by the Madawaska Highlands both of which have a maximum relief of about 400 meters. The zone is marked by numerous block faults and is the source of many economic minerals. The geology of the graben was described by Kay (1942). Kumarapelli and Saull (1966) postulated that the graben and the St. Lawrence river valley form part of an ancient rift system which runs from Newfoundland to Lake Superior.

The Grenville Front is one of the major features of the Canadian Shield. It is approximately 1900 km in length extending from the northern shore of Lake Huron across Ontario and Quebec to Labrador. Over most of its length it marks the orogenic boundary between the Superior Structural Province (age 2500 my) and the much younger Grenville Province (age 950 my). The Front truncates the

easterly trending formations of the Superior Province. Previous seismic studies across the boundary in central Quebec showed that there is a distinct zone of crustal thickening along the boundary indicating that the structure is deep seated. (Berry and Fuchs 1973 , Mereu and Jobidon 1972). Baer (1976) reviewed the evidence which indicated that the Front is the result of a continental collision process which may have a suture zone under the Appalachians. The frontal zone as well as the Abitibi Greenstone belt to the north is well known for its source of numerous economic minerals. Goodwin and Ridler (1970) describe this belt as being the largest greenstone belt in the Canadian Shield.

The seismic activity shown in Figure 1 is confined to a rather well defined zone which does not correlate with the geological features. The causes of interplate earthquakes is not understood very well. Some correlations have been observed between the structural trends, the magnetic and gravity anomalies and the epicentral locations. (see for example Basham et al 1977).

REFRACTION EXPERIMENT

Participants

This experiment was a cooperative experiment involving personnel from the Earth Physics Branch (EPB) of the Department of Energy Mines and Resources and seven universities. A list of the organizers and field participants is given in Table 1.

Shot-points

Figure 2 shows the location of the shot-points and refraction lines. During the six-month period prior to the start of the experiment , the task of searching for suitable shot points was shared as given in Table 2. Quarry lakes were found for sites B, O, C, E, and F. Abandoned mine shafts were found at D and G. At North Bay (shot point A) it was necessary to have a line of nine holes drilled to a depth of 35m in the granite rock. The hole separation was 15m. In cases where quarry lakes were used , the shots were loaded into large plastic barrels and lowered to the bottom of the lakes from small boats. Primachord was used to connect the shots to electrical detonators. Further details on the shot locations are listed in Table 4. Five possible time windows were selected in advance for each shooting day. Because of limitations of some of the recording instruments no more than five windows could be used. On days where 3 shots were fired there were thus two alternate times available to take care of technical difficulties at the shot point. Alternate times were successively used on two occasions.

Stations

During the months of June and July 1982 the station siting job was shared amongst the various institutions as shown in Table 3. A set of maps showing the detailed site locations is given in Figure 3. A total of 37 sites were located along each of the line segments OA,OB,OC,CD, and DE shown in Figure 2 and 3. Bedrock outcrops were found at most of the sites. Exceptions are listed in Table 5. It should be noted that the recordings made along line DE from shot-points D,E,F,and G belong to the Abitibi Experiment.

Instrumentation

Information on the characteristics of the various types of recording instruments which was used is given in Table 6. Four different systems were deployed. The Earth Physics Branch and University of Western Ontario had their own instruments. The instruments used by McGill university were borrowed from the University of British Columbia whereas the ones used by the University of Montreal and Ecole Polytechnique were borrowed from the University of Toronto. The original plan was to record each of the shots at the 37 pre-selected sites. This number was reduced a bit in practice due to a few technical difficulties with some of the recording instrument sets. In addition to the mobile recording units the permanent stations of the Earth Physics Branch ECTN telemetry stations were also used. The data from these stations are included on the data tapes with the other data.

Field program

The experiment was carried out during the time period (August 3 to August 15,1982). Reversed profiles were obtained along lines OA, OB, OC, BC, CD, and DE. Fan profiles were obtained along OA from shot point B, BC from shot-point A and DE from shot-points F and G. Shots were fired on the mornings of Aug 5,7,9,11,13,and 16. The instruments were moved from one set of sites on a line segment to the next set on the next segment during the days preceding each of the shot days. Fortunately there were no delays due to bad weather. All the recording was done by four recording teams from the following institutions:

- (i) The Earth Physics Branch
- (ii)The University of Western Ont.
- (iii)McGill and University of British Columbia
- (iv) Ecole Polytechnique and University of Montreal

Compilation of the data

After the field portion of the experiment was completed, each of the participating institutions was responsible for compiling, digitizing and organizing their own data sets. When this job was completed each of the data sets were sent to the University of Western Ontario where the complete edited data set was prepared. The FORMATS used in writing the HEADER and DATA files is given in Table 7. A detailed list of all the information required for each seismic trace is given in Table 8. The information contained in this

table is the same as that in the HEADER file. The listing is grouped according to the shot sequence used and the order of the information is given according to the station number. Both the DATA tapes and the HEADER tapes contain their respective information in the same sequence as that listed in Table 8. Altogether 16 DATA files were made with the records of each shot belonging to a file. The headings used in Table 8 are clarified as follows:

- SECBGN -- Time of first digital data point. In those cases where timing was uncertain, the time of onset was set to 99.0.
- Gain -- The gain factors used for each trace were not always the same for each research group. To convert all the trace data values to micro-volts one should divide the data with the numbers listed under the GAIN column.
- COMP -- The numbers listed under this column are used to indicate which component was used. The convention adopted is that of the EPB in that "1" represents the vertical component and "6" represents the radial horizontal component.

Observations and discussions

Plots of the raw record sections are given in Figures 4 and 5. In most cases each section shows the records for one shot with a reducing velocity of 6.5 km/s. A reducing velocity of 8.0 km/s was also used for some of the fan shots. The record sections for the in-line profiles for line BC show traces from two shots. The numbers under the columns describing each trace are defined as follows:

SHOT --- shot
 STN --- station
 DIST --- distance in km
 AZM --- azimuth from shot to station
 NORM --- normalizing factor used on each trace

The following comments may be made from a visual examination of the record sections:

- (i) The signals generated by the shots fired in the North Bay drill holes and the Val d'Or and Chibougamau mine shafts were much weaker and of higher frequency than from those fired in the quarry lakes.
- (ii) The data from the fan shot across the Ottawa Graben from shot-point A to line BC shows a trend of early arrivals for both Pn and PmP over the region of the Graben. This indicates that the crust is thinner under the Graben which in turn supports the theory that the Graben may be an ancient rift.
- (iii) The retrograde PmP branch appears very well defined for the CD profiles compared to the BC reversed profiles. This suggests that the MOHO may be a much sharper discontinuity under the Quebec and Ontario Gneiss areas than under the Central Metasedimentary belt area and Ottawa graben.

- (iv) There is a significant variation in the seismic velocities of the upper portion of the crustal rocks. Velocities in the 6.0 to 6.2 km/s range were observed near shot-point A,C,D, whereas the velocities near shot-points O and B were in the 6.25- 6.50 km/s range.
- (v) Moho depths as computed from a preliminary interpretation were in the 35 to 40 km range.
- (vi) The termination of the first arrival branch along line DE suggests a complex structure is present which may involve a low velocity zone.
- (vii) Unexplained double source function pulses approximately 3 sec apart were generated at shot-point C.

ACKNOWLEDGEMENTS

The author expresses his sincere thanks to the following:

- (1) The other organizers and field participants of this experiment listed in Table 1 for their cooperation and assistance in making this experiment a success.
- (ii) The numerous technicians, students, advisors etc from various institutions who were not in the field but whose behind the scenes work was absolutely essential.
- (iii) R.Clowes and R.Ellis of the University of British Columbia and G.West of the University of Toronto for lending us their recording instruments.
- (iv) Other non-participating members of the COCRUST consortium for their advice during the initial stages of the planning of the experiment.

On behalf of the COCRUST group we would also like to acknowledge the help from the following industries for allowing us to use their properties for the various shot-points:

- (i) Marmara-- Arnbro Material and Construction Limited
- (ii) Bristol-- LaMarsh McGuinty Incorp.
- (iii) Mont Laurier -- Poisson Granite Transport
- (iv) Val D'or -- Dennison Mines
- (v) Matagami -- Noranda Mines
- (vi) Matachewan -- Young and Davidson Mines
- (vii) Chibougamau --

We would also like to acknowledge the assistance given to us by N.Newton of A.J.N.Drilling Callendar Ont. with respect to the North Bay drill hole site. Permission to use the Crown lands for this site was given to us by the Ontario Ministry Natural Resources.

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Table 1 Participants

Organizers	Field Participants
M.J.Berry, A.G.Green, D.Forsyth Earth Physics Branch	F.Anderson, G.Buchbinder R.Haddon, D.Hoy, C.Michaud P.Morel, L.Parenteau
C.Brooks University of Montreal	C.Gagner
E.Schwartz Ecole Polytechnique	E.Poterlot
D.Crossley McGill University	C.Parker, C.Tsingas W.Wang
R.Clowes University of British Columbia	R.Meldrum
R.Duburger, J.Villeneuve Universite du Quebec a Chicoutimi	
G.West University of Toronto	
R.Mereu University of Western Ontario	J.Baerg, M.Jeffered O.Kuhn, S.Pamidi

Table 2 Shot-point Location Search

Location of shot points	Institution
A North Bay	UWO
B Marmora	UWO and EPB
O Bristol	EPB
C Mont Laurier	Montreal and EPB
D Val D'OR	Montreal
E Matagami	Montreal
F Timmins	Montreal
G Chibougamau	Montreal

Table 3 Station-siting (37 stations per line)

Line	Institution
OA	UWO
OB	UWO
OC	EPB
CD	McGill
DE	McGill

Table 4 1982 COCRUST SHOT DATA

SHOT	LATITUDE	LONGITUDE	ELEV (M)	DEPTH (M)	DAY	MONTH	HOUR	MIN	SEC	LOCATION	SIZE (KG)	SITE	SHOOTER
1	46.2729	-79.3338	192	15	5	8	10	5	.031	A NORTH BAY	1200	2 Holes	Green
2	44.4784	-77.6584	-15	43	5	8	10	25	.210	B MARMORA	1500	Quarry	Buchbinder
3	45.5030	-76.3390	-62	69	5	8	11	35	.200	O BRISTOL	1500	Quarry	Forsyth
4	45.5052	-76.3440	-46	46	7	8	10	15	.091	O BRISTOL	800	Quarry	Forsyth
5	44.4784	-77.6584	-15	43	7	8	10	25	.210	B MARMORA	800	Quarry	Buchbinder
6	46.5574	-75.2373	314	23	7	8	11	25	.980	C MT.LAURIER	1500	Quarry	Duburger,Villineuve
7	46.2712	-79.3348	192	15	9	8	10	5	.031	A NORTH BAY	2400	7 holes	Green
8	45.5052	-76.3440	-46	46	11	8	10	15	.159	O BRISTOL	800	Quarry	Forsyth
9	44.4784	-77.6584	-15	43	11	8	10	25	.210	B MARMORA	1500	Quarry	Buchbinder
10	46.5574	-75.2373	314	23	11	8	10	35	.310	C MT.LAURIER	800	Quarry	Duburger,Villineuve
11	46.5574	-75.2373	314	23	13	8	10	5	.012	C MT.LAURIER	1500	Quarry	Duburger,Villineuve
12	48.0597	-77.5228	283	31	13	8	10	15	.230	D VAL D'OR	1400	Mine shaft	Forsyth
13	49.6903	-77.6947	265	25	15	8	10	5	.044	E MATAGAMI	1500	Quarry	Buchbinder
14	48.0597	-77.5228	283	31	15	8	10	15	.120	D VAL D'OR	1400	Mine shaft	Forsyth
15	47.9477	-80.6839	296	37	15	8	10	25	.049	F Matachewan	1800	Quarry	Green
16	49.9880	-73.9712	410	62	15	8	10	35	.240	G CHIBOUGAMAU	1800	Mine shaft	Duburger,Villineuve

Table 5 Non-bedrock stations

Line	Non-bedrock stations
OA	103,104,115,118
OB	203
OC	303,304,305,306,308,309,310,311 312,313,315,316,317,318,319,320 320,321,325,326,329, 332,333,334,335,336
CD	414,426,431,434
DE	501,511,513,514,515,516,517,518 519,520,521,522,524,525,526,527 528,529

Note: All other stations were located on rock outcrops.

Table 6 Recording Instrumentation Characteristics

Characteristics	Institution			
	EPB	UWO	McGill-UBC	Ecole Pol.-UT
Recorder	EPB	UWO	Geotech	Toronto
Recorder mode	digital	FM	digital	digital
No. of units	12	9	9	7
Geophone	All used the Mark Products L4C (1 HZ natural frequency)			
Components	V and Radial	V	V	V

Table 7 TAPE FORMATS

Number of data tapes --- 3

Files on data tape number 1

File 1 header file for shots 1 to 12
File 2 data for shot 1
File 3 data for shot 2
File 4 data for shot 3
File 5 data for shot 4
File 6 data for shot 5
File 7 data for shot 6

Files on data tape number 2

File 1 data for shot 7
File 2 data for shot 8
File 3 data for shot 9
File 4 data for shot 10
File 5 data for shot 11
File 6 data for shot 12

Files on data tape number 3

File 1 header data for shots 13 to 16
File 2 data for shot 13
File 3 data for shot 14
File 4 data for shot 15
File 5 data for shot 16

DATA TAPE FORMATS

IBM floating point format
no label
logical record length 80 bytes
block size 4800 bytes
1600 B.P.I.

Number of samples per trace = 7200

Sampling rate = 60

First sample point = receiver number

Second sample point = shot number

Third sample point = orientation number

Fourth to 7200 point = data values

Trace format = 5E16.6

Data may be read with the following READ statement

READ (1,10) (A(I),I=1,7200)

FORMAT (5E16.6)

HEADER INFORMATION

Record Header Format ---- 10 card images/header
card no.

1. Title of experiment
2. Line,date,shot time,shot size
3. shot location,shot number,shot latitude and longitude
4. shot elevation,shot depth,receiver elevation
5. receiver number,receiver latitude and longitude
6. seismometer type,nat frequency,orientation
7. recorder type, sampling frequency, gain
8. coded receiver,shot and orientation
9. additional comments
10. time of first data sample

Header computer format statements

```
800  FORMAT(' TITLE - OTTAWA GRABEN - GRENVILLE FRONT - 1982 COCRUST
1 - EXPT')
801  FORMAT(' LINE-',A4,' DAY-',I3,' MONTH-',I2,' YR-',I2,
1 ' LT SHOT-',I2,'HR ',I2,'MIN ',F6.3,'S SIZE - ',I4,'KG')
802  FORMAT(' SHOT LOCATION - ',A4,' SHOT NUMB - ',I2,' LAT - ',
1 F8.4,'DEG LONG - ',F8.4,'DEG')
803  FORMAT(' SHOT ELEVATION - ',I4,'M SHOT DEPTH - ',I3,
1 'M RECEIVER ELEVATION - ',I4,'M')
804  FORMAT(' RECEIVER LOCATION - NUMB ',I3,' LAT - ',F8.4,'DEG ',
1 'LONG - ',F8.4,'DEG')
805  FORMAT(' SEISMOMETER TYPE - ',5A4,' FREQUENCY - ',I2,
1 'HZ ORIENT - ',A4)
806  FORMAT(' RECORDER TYPE - ',5A4,'SAMPLING FREQ.',
1 ' - 60HZ GAIN',F8.0)
807  FORMAT(2X,I3,I2,I1)
808  FORMAT(' MULTIPLY DIGITAL VAL BY 10 TO GIVE NANOMETERS/S')
809  FORMAT(' TIME OF FIRST DATA SAMPLE ',I2,'HR ',I2,'MIN ',
1F6.3,'S')
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SAMPLE HEADER

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TITLE - OTTAWA GRABEN - GRENVILLE FRONT - 1982 COCRUST - EXPT
LINE- OA DAY- 5 MONTH- 8 YR-82 LT SHOT-10HR 5MIN .031S SIZE - 1200KG
SHOT LOCATION - A SHOT NUMB - 1 LAT - 46.2729DEG LONG - -79.3338DEG
SHOT ELEVATION - 192M SHOT DEPTH - 15M RECEIVER ELEVATION - 97M
RECEIVER LOCATION - NUMB 101 LAT - 45.4378DEG LONG - -76.1741DEG
SEISMOMETER TYPE - MARK PRODUCTS L4C FREQUENCY - 1HZ ORIENT - VERT
RECORDER TYPE - EMR DIGITAL MARK 2 SAMPLING FREQ. - 60HZ GAIN 1.
101 11
MULTIPLY DIGITAL VAL BY 10 TO GIVE NANOMETERS/S
TIME OF FIRST DATA SAMPLE 10HR 4MIN 52.410S
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Table 8 Seismic trace - station data

SHOT NUMBER	1	LINE OA		LOCATION A								
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT	
101	45.4378	-76.1741	97	262.35	109.58	6	4	52.41	1.00	1	EPB	
101	45.4378	-76.1741	97	262.35	109.58	6	4	52.41	1.00	6	EPB	
102	45.5326	-76.4056	92	241.65	108.85	6	4	52.38	1.00	1	EPB	
102	45.5326	-76.4056	92	241.65	108.85	6	4	52.38	1.00	6	EPB	
102	45.5326	-76.4056	92	241.65	108.85	6	4	52.38	1.00	6	EPB	
103	45.5597	-76.4827	140	234.96	108.69	6	4	52.40	1.00	1	EPB	
103	45.5597	-76.4827	140	234.96	108.69	6	4	52.40	1.00	6	EPB	
106	45.6593	-76.7334	108	212.78	107.76	6	5	6.30	1.00	1	UWO	
107	45.6863	-76.7896	154	207.65	107.38	6	4	52.39	1.00	1	EPB	
107	45.6863	-76.7896	154	207.65	107.38	6	4	52.39	1.00	6	EPB	
108	45.7117	-76.8845	169	199.74	107.32	6	5	12.19	1.00	1	UWO	
109	45.7397	-76.9462	146	194.19	106.91	6	4	52.37	1.00	1	EPB	
109	45.7397	-76.9462	146	194.19	106.91	6	4	52.37	1.00	6	EPB	
111	45.7675	-77.0931	146	182.37	107.13	6	4	52.39	1.00	1	EPB	
111	45.7675	-77.0931	146	182.37	107.13	6	4	52.39	1.00	6	EPB	
112	45.8145	-77.1814	154	174.22	106.23	6	5	13.59	1.00	1	UWO	
114	45.8776	-77.3135	154	162.35	104.98	6	5	11.41	1.00	1	UWO	
115	45.9538	-77.4030	166	153.42	102.67	6	4	52.39	1.00	1	EPB	
115	45.9538	-77.4030	166	153.42	102.67	6	4	52.39	1.00	6	EPB	
118	46.1239	-77.5585	197	138.03	96.25	6	5	1.85	1.00	1	UWO	
120	46.1633	-77.6984	200	126.77	94.93	6	4	44.15	3.98	1	MCG-UBC	
122	46.1964	-77.8456	154	115.11	93.70	6	4	44.19	3.98	1	MCG-UBC	
123	46.2159	-77.8964	154	111.04	92.75	6	4	50.67	20.00	1	ECOLE-UT	
124	46.2120	-78.0466	205	99.51	93.44	6	4	44.21	3.98	1	MCG-UBC	
126	46.2532	-78.2024	283	87.26	91.03	6	4	44.17	3.98	1	MCG-UBC	
127	46.2431	-78.3096	200	79.04	92.03	6	4	44.11	3.98	1	MCG-UBC	
128	46.2817	-78.3964	200	72.26	88.89	6	4	44.19	3.98	1	MCG-UBC	
129	46.2787	-78.4980	200	64.43	89.13	6	4	44.15	3.98	1	MCG-UBC	
130	46.2845	-78.5732	246	58.64	88.47	6	4	44.17	3.98	1	MCG-UBC	
133	46.2677	-78.8185	231	39.73	90.65	6	0	99.00	20.00	1	ECOLE-UT	
135	46.2791	-79.0326	246	23.23	88.19	6	4	52.39	1.00	1	EPB	
135	46.2791	-79.0326	246	23.23	88.19	6	4	52.39	1.00	6	EPB	
136	46.2568	-79.0879	254	19.04	95.30	6	4	52.39	1.00	1	EPB	
136	46.2568	-79.0879	254	19.04	95.30	6	4	52.39	1.00	6	EPB	
137	46.2574	-79.1846	280	11.63	98.47	6	4	52.41	1.00	1	EPB	
137	46.2574	-79.1846	280	11.63	98.47	6	4	52.41	1.00	6	EPB	
601	45.3942	-75.7167	77	297.49	107.86	6	5	2.93	1.00	1	OTTSPZ	
603	46.3628	-72.3722	10	536.11	86.42	6	5	2.93	1.00	1	GNTSPZ	
604	45.3783	-71.9264	265	583.92	97.14	6	5	2.93	1.00	1	SBQSPZ	
606	44.0186	-78.3744	149	261.65	162.90	6	5	2.93	1.00	1	WEOSPZ	
607	45.7033	-75.4783	62	305.34	100.58	6	5	7.20	1.00	1	GACSPZ	
608	48.2300	-77.9717	305	240.77	24.86	6	5	2.93	1.00	1	VDQSPZ	

SHOT NUMBER	2	LINE OA	LOCATION B								
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
101	45.4378	-76.1741	97	158.38	47.17	6	24	52.39	1.00	1	EPB
101	45.4378	-76.1741	97	158.38	47.17	6	24	52.39	1.00	6	EPB
102	45.5326	-76.4056	92	153.23	39.69	6	24	55.03	1.00	1	EPB
102	45.5326	-76.4056	92	153.23	39.69	6	24	55.03	1.00	6	EPB
103	45.5597	-76.4827	140	151.75	37.23	6	24	55.05	1.00	1	EPB
103	45.5597	-76.4827	140	151.75	37.23	6	24	55.05	1.00	6	EPB
106	45.6593	-76.7334	108	150.10	28.71	6	25	5.90	1.00	1	UWO
107	45.6863	-76.7896	154	150.66	26.70	6	24	52.40	1.00	1	EPB
107	45.6863	-76.7896	154	150.66	26.70	6	24	52.40	1.00	6	EPB
108	45.7117	-76.8845	169	149.99	23.69	6	25	7.03	1.00	1	UWO
109	45.7397	-76.9462	146	150.97	21.54	6	24	52.38	1.00	1	EPB
109	45.7397	-76.9462	146	150.97	21.54	6	24	52.38	1.00	6	EPB
111	45.7675	-77.0931	146	150.01	17.05	6	24	55.04	1.00	1	EPB
111	45.7675	-77.0931	146	150.01	17.05	6	24	55.04	1.00	6	EPB
112	45.8145	-77.1814	154	153.16	14.01	6	25	9.16	1.00	1	UWO
114	45.8776	-77.3135	154	157.85	9.77	6	25	4.39	1.00	1	UWO
115	45.9538	-77.4030	166	165.20	6.89	6	24	52.37	1.00	1	EPB
115	45.9538	-77.4030	166	165.20	6.89	6	24	52.37	1.00	6	EPB
118	46.1239	-77.5585	197	183.05	2.42	6	24	56.45	1.00	1	UWO
120	46.1633	-77.6984	200	187.29	359.05	6	24	44.15	3.98	1	MCG-UBC
122	46.1964	-77.8456	154	191.50	355.67	6	24	44.19	3.98	1	MCG-UBC
123	46.2159	-77.8964	154	194.01	354.57	6	24	50.91	20.00	1	ECOLE-UT
124	46.2120	-78.0466	205	195.06	351.16	6	24	44.21	3.98	1	MCG-UBC
125	46.2414	-78.1333	323	199.44	349.42	6	24	51.44	20.00	1	ECOLE-UT
126	46.2532	-78.2024	283	201.81	348.00	6	24	44.17	3.98	1	MCG-UBC
127	46.2431	-78.3096	200	202.66	345.65	6	24	33.31	3.98	1	MCG-UBC
128	46.2817	-78.3964	200	208.59	344.17	6	24	44.19	31.62	1	MCG-UBC
129	46.2787	-78.4980	200	210.62	342.10	6	24	44.15	3.98	1	MCG-UBC
130	46.2845	-78.5732	246	213.13	340.68	6	24	44.16	3.98	1	MCG-UBC
133	46.2677	-78.8185	231	218.64	335.85	6	0	99.00	20.00	1	ECOLE-UT
134	46.2720	-78.9125	185	222.23	334.21	6	24	47.48	40.00	1	ECOLE-UT
135	46.2791	-79.0326	246	227.23	332.21	6	24	52.38	1.00	1	EPB
135	46.2791	-79.0326	246	227.23	332.21	6	24	52.38	1.00	6	EPB
136	46.2568	-79.0879	254	227.17	330.97	6	24	52.40	1.00	1	EPB
136	46.2568	-79.0879	254	227.17	330.97	6	24	52.40	1.00	6	EPB
137	46.2574	-79.1846	280	231.05	329.38	6	24	52.39	1.00	1	EPB
137	46.2574	-79.1846	280	231.05	329.38	6	24	52.39	1.00	6	EPB
601	45.3942	-75.7167	77	183.98	55.73	6	25	.27	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	337.93	68.91	6	25	.27	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	463.61	61.29	6	25	.27	1.00	1	GNTSPZ
606	44.0186	-78.3744	149	76.69	228.47	6	25	.27	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	219.05	50.81	6	25	.27	1.00	1	GACSPZ
608	48.2300	-77.9717	305	417.73	356.80	6	25	.27	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	197.48	72.09	6	25	.27	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	310.91	50.35	6	25	.27	1.00	1	TRQSPZ

SHOT NUMBER	3	LINE OA	LOCATION	0							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
101	45.4378	-76.1741	97	14.79	119.28	7	34	52.40	1.00	1	EPB
101	45.4378	-76.1741	97	14.79	119.28	7	34	52.40	1.00	6	EPB
102	45.5326	-76.4056	92	6.16	302.32	7	34	52.37	1.00	1	EPB
102	45.5326	-76.4056	92	6.16	302.32	7	34	52.37	1.00	6	EPB
103	45.5597	-76.4827	140	12.87	299.36	7	34	49.72	1.00	1	EPB
103	45.5597	-76.4827	140	12.87	299.36	7	34	49.72	1.00	6	EPB
106	45.6593	-76.7334	108	35.35	299.58	7	34	36.82	1.00	1	UWO
107	45.6863	-76.7896	154	40.64	300.25	7	34	52.38	1.00	1	EPB
107	45.6863	-76.7896	154	40.64	300.25	7	34	52.38	1.00	6	EPB
108	45.7117	-76.8845	169	48.47	298.79	7	34	42.41	1.00	1	UWO
109	45.7397	-76.9462	146	54.17	299.27	7	34	52.38	1.00	1	EPB
109	45.7397	-76.9462	146	54.17	299.27	7	34	52.38	1.00	6	EPB
111	45.7675	-77.0931	146	65.74	296.83	7	34	52.38	1.00	1	EPB
111	45.7675	-77.0931	146	65.74	296.83	7	34	52.38	1.00	6	EPB
112	45.8145	-77.1814	154	74.23	298.10	7	34	54.76	1.00	1	UWO
114	45.8776	-77.3135	154	86.58	299.09	7	34	56.74	1.00	1	UWO
115	45.9538	-77.4030	166	96.80	301.55	7	34	52.38	1.00	1	EPB
115	45.9538	-77.4030	166	96.80	301.55	7	34	52.38	1.00	6	EPB
118	46.1239	-77.5585	197	117.25	306.49	7	35	3.32	1.00	1	UWO
120	46.1633	-77.6984	200	128.62	305.28	7	34	44.15	3.98	1	MCG-UBC
122	46.1964	-77.8456	154	140.12	303.91	7	34	44.18	3.98	1	MCG-UBC
124	46.2120	-78.0466	205	154.26	301.33	7	34	44.22	3.98	1	MCG-UBC
126	46.2532	-78.2024	283	166.97	300.62	7	34	44.17	3.98	1	MCG-UBC
127	46.2431	-78.3096	200	173.71	298.97	7	34	44.10	3.98	1	MCG-UBC
128	46.2817	-78.3964	200	181.63	299.19	7	34	44.18	15.85	1	MCG-UBC
129	46.2787	-78.4980	200	188.45	298.00	7	34	44.15	3.98	1	MCG-UBC
130	46.2845	-78.5732	246	193.94	297.40	7	34	44.16	3.98	1	MCG-UBC
135	46.2791	-79.0326	246	226.15	293.38	7	34	52.38	1.00	1	EPB
135	46.2791	-79.0326	246	226.15	293.38	7	34	52.38	1.00	6	EPB
136	46.2568	-79.0879	254	229.25	292.42	7	34	52.40	1.00	1	EPB
136	46.2568	-79.0879	254	229.25	292.42	7	34	52.40	1.00	6	EPB
137	46.2574	-79.1846	280	236.27	291.80	7	34	52.39	1.00	1	EPB
137	46.2574	-79.1846	280	236.27	291.80	7	34	52.39	1.00	6	EPB
601	45.3942	-75.7167	77	50.16	103.73	7	35	2.27	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	212.26	89.05	7	35	2.27	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	322.12	71.33	7	35	2.27	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	345.49	90.73	7	35	2.27	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	230.60	225.05	7	35	2.27	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	70.74	71.35	7	35	2.27	1.00	1	GACSPZ
608	48.2300	-77.9717	305	327.71	338.27	7	35	2.27	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	100.49	123.40	7	35	2.27	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	159.90	59.37	7	35	2.27	1.00	1	TRQSPZ
612	47.3408	-70.0094	126	527.53	64.96	7	35	2.27	1.00	1	LPQSPZ
614	49.1917	-68.3939	123	726.47	52.79	7	35	2.27	1.00	1	HTQSPZ

SHOT NUMBER	4	LINE OB			LOCATION O						
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZINUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
201	45.4378	-76.1741	97	15.25	119.36	6	14	52.37	1.00	1	EPB
201	45.4378	-76.1741	97	15.25	119.36	6	14	52.37	1.00	6	EPB
202	45.4450	-76.3712	89	7.02	197.64	6	14	42.73	1.00	1	UWO
203	45.4115	-76.3989	108	11.26	202.43	6	14	52.40	1.00	1	EPB
203	45.4115	-76.3989	108	11.26	202.43	6	14	52.40	1.00	6	EPB
204	45.3809	-76.4074	123	14.68	199.77	6	14	47.51	1.00	1	UWO
205	45.3450	-76.4348	146	19.17	201.79	6	14	52.38	1.00	1	EPB
205	45.3450	-76.4348	146	19.17	201.79	6	14	52.38	1.00	6	EPB
206	45.3054	-76.4554	185	23.86	201.48	6	14	48.32	1.00	1	UWO
207	45.2818	-76.4731	177	26.81	202.20	6	14	52.37	1.00	1	EPB
207	45.2818	-76.4731	177	26.81	202.20	6	14	52.37	1.00	6	EPB
208	45.2378	-76.4738	192	31.41	198.93	6	14	37.17	1.00	1	UWO
209	45.1875	-76.4842	200	36.98	197.34	6	14	52.37	1.00	1	EPB
209	45.1875	-76.4842	200	36.98	197.34	6	14	52.37	1.00	6	EPB
210	45.1724	-76.5430	262	40.14	202.94	6	14	53.32	1.00	1	UWO
211	45.1435	-76.5751	231	44.09	204.34	6	14	52.37	1.00	1	EPB
211	45.1435	-76.5751	231	44.09	204.34	6	14	52.37	1.00	6	EPB
212	45.1000	-76.6019	308	49.37	204.28	6	14	51.25	1.00	1	UWO
213	45.0676	-76.6388	302	53.85	205.54	6	14	52.39	1.00	1	EPB
213	45.0676	-76.6388	302	53.85	205.54	6	14	52.39	1.00	6	EPB
214	45.0501	-76.6790	277	57.00	207.58	6	14	57.35	1.00	1	UWO
215	45.0393	-76.7199	292	59.59	209.80	6	14	52.39	1.00	1	EPB
215	45.0393	-76.7199	292	59.59	209.80	6	14	52.39	1.00	6	EPB
216	45.0216	-76.7705	323	63.32	212.07	6	14	36.05	1.00	1	UWO
217	44.9778	-76.8131	277	69.23	212.31	6	14	52.38	1.00	1	EPB
217	44.9778	-76.8131	277	69.23	212.31	6	14	52.38	1.00	6	EPB
218	44.9643	-76.8526	246	72.17	213.78	6	14	46.72	1.00	1	UWO
220	44.9168	-76.9545	285	81.10	216.47	6	14	44.17	7.94	1	MCG-UBC
221	44.8888	-77.0194	308	86.66	218.00	6	14	52.45	10.00	1	ECOLE-UT
222	44.8722	-77.0556	292	89.87	218.73	6	14	44.19	7.94	1	MCG-UBC
223	44.8548	-77.0928	300	93.21	219.42	6	14	49.04	40.00	1	ECOLE-UT
224	44.8327	-77.1420	277	97.58	220.29	6	14	44.19	7.94	1	MCG-UBC
226	44.7556	-77.2129	277	107.76	219.68	6	14	44.20	7.94	1	MCG-UBC
228	44.6884	-77.2542	262	115.64	218.61	6	14	44.20	7.94	1	MCG-UBC
229	44.6689	-77.2710	246	118.17	218.47	6	14	25.85	10.00	1	ECOLE-UT
230	44.6351	-77.3704	231	126.03	220.26	6	14	44.19	7.94	1	MCG-UBC
232	44.5914	-77.4579	231	134.22	221.23	6	14	44.18	7.94	1	MCG-UBC
234	44.5441	-77.5273	231	141.79	221.54	6	14	51.59	7.94	1	MCG-UBC
235	44.5123	-77.5600	231	146.17	221.41	6	14	52.40	1.00	1	EPB
235	44.5123	-77.5600	231	146.17	221.41	6	14	52.40	1.00	6	EPB
236	44.5007	-77.6113	197	149.82	222.28	6	14	52.41	1.00	1	EPB
236	44.5007	-77.6113	197	149.82	222.28	6	14	52.41	1.00	6	EPB
237	44.4819	-77.6223	192	151.97	222.01	6	14	55.07	1.00	1	EPB
237	44.4819	-77.6223	192	151.97	222.01	6	14	55.07	1.00	6	EPB
601	45.3942	-75.7167	77	50.60	103.89	6	15	.53	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	212.65	89.11	6	15	.53	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	322.41	71.39	6	15	.53	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	345.88	90.77	6	15	.53	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	230.50	224.93	6	15	.53	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	71.04	71.64	6	15	4.80	1.00	1	GACSPZ
608	48.2300	-77.9717	305	327.34	338.31	6	15	.53	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	100.95	123.39	6	15	.53	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	160.12	59.51	6	15	.53	1.00	1	TRQSPZ
612	47.3408	-70.0094	126	527.78	65.00	6	15	.53	1.00	1	LPQSPZ
614	49.1917	-68.3939	123	726.63	52.82	6	15	.53	1.00	1	HTQSPZ

SHOT NUMBER	5	LINE OB	LOCATION	B							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
201	45.4378	-76.1741	97	158.38	47.17	6	24	52.37	1.00	1	EPB
201	45.4378	-76.1741	97	158.38	47.17	6	24	52.37	1.00	6	EPB
202	45.4450	-76.3712	89	147.83	42.94	6	25	5.45	1.00	1	UWO
203	45.4115	-76.3989	108	143.65	43.35	6	24	52.39	1.00	1	EPB
203	45.4115	-76.3989	108	143.65	43.35	6	24	52.39	1.00	6	EPB
204	45.3809	-76.4074	123	140.76	44.12	6	25	4.48	1.00	1	UWO
205	45.3450	-76.4348	146	136.42	44.67	6	24	55.04	1.00	1	EPB
205	45.3450	-76.4348	146	136.42	44.67	6	24	55.04	1.00	6	EPB
206	45.3054	-76.4554	185	132.20	45.54	6	25	7.90	1.00	1	UWO
207	45.2818	-76.4731	177	129.39	45.95	6	24	55.03	1.00	1	EPB
207	45.2818	-76.4731	177	129.39	45.95	6	24	55.03	1.00	6	EPB
208	45.2378	-76.4738	192	126.05	47.56	6	25	-.02	1.00	1	UWO
209	45.1875	-76.4842	200	121.78	49.27	6	24	52.37	1.00	1	EPB
209	45.1875	-76.4842	200	121.78	49.27	6	24	52.37	1.00	6	EPB
210	45.1724	-76.5430	262	117.17	48.45	6	24	53.97	1.00	1	UWO
211	45.1435	-76.5751	231	113.17	48.84	6	24	52.37	1.00	1	EPB
211	45.1435	-76.5751	231	113.17	48.84	6	24	52.37	1.00	6	EPB
212	45.1000	-76.6019	308	108.45	50.07	6	24	57.50	1.00	1	UWO
213	45.0676	-76.6388	302	103.93	50.59	6	24	52.38	1.00	1	EPB
213	45.0676	-76.6388	302	103.93	50.59	6	24	52.38	1.00	6	EPB
214	45.0501	-76.6790	277	100.24	50.33	6	24	51.04	1.00	1	UWO
215	45.0393	-76.7199	292	96.99	49.68	6	24	52.38	1.00	1	EPB
215	45.0393	-76.7199	292	96.99	49.68	6	24	52.38	1.00	6	EPB
216	45.0216	-76.7705	323	92.67	49.04	6	24	58.83	1.00	1	UWO
217	44.9778	-76.8131	277	86.97	50.05	6	24	52.38	1.00	1	EPB
217	44.9778	-76.8131	277	86.97	50.05	6	24	52.38	1.00	6	EPB
218	44.9643	-76.8526	246	83.62	49.49	6	24	58.36	1.00	1	UWO
219	44.9382	-76.8840	308	79.86	49.95	6	24	49.32	40.00	1	ECOLE-UT
220	44.9168	-76.9545	285	74.07	48.63	6	24	44.17	7.94	1	MCG-UBC
221	44.8888	-77.0194	308	68.17	47.78	6	0	99.00	10.00	1	ECOLE-UT
222	44.8722	-77.0556	292	64.81	47.31	6	24	44.19	7.94	1	MCG-UBC
223	44.8548	-77.0928	300	61.33	46.80	6	24	49.60	10.00	1	ECOLE-UT
224	44.8327	-77.1420	277	56.82	45.95	6	24	44.19	7.94	1	MCG-UBC
226	44.7556	-77.2129	277	46.90	48.78	6	24	44.20	7.94	1	MCG-UBC
228	44.6884	-77.2542	262	39.69	53.84	6	24	44.20	7.94	1	MCG-UBC
230	44.6351	-77.3704	231	28.76	52.63	6	24	44.19	7.94	1	MCG-UBC
232	44.5914	-77.4579	231	20.29	51.69	6	24	44.18	7.94	1	MCG-UBC
234	44.5441	-77.5273	231	12.73	54.95	6	24	51.59	1.00	1	MCG-UBC
235	44.5123	-77.5600	231	8.69	64.26	6	24	52.41	1.00	1	EPB
235	44.5123	-77.5600	231	8.69	64.26	6	24	52.41	1.00	6	EPB
236	44.5007	-77.6113	197	4.49	56.50	6	24	55.06	1.00	1	EPB
236	44.5007	-77.6113	197	4.49	56.50	6	24	55.06	1.00	6	EPB
237	44.4819	-77.6223	192	2.90	82.28	6	24	52.40	1.00	1	EPB
237	44.4819	-77.6223	192	2.90	82.28	6	24	52.40	1.00	6	EPB
601	45.3942	-75.7167	77	183.98	55.73	6	25	.27	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	337.93	68.91	6	25	.27	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	463.61	61.29	6	25	.27	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	463.34	75.53	6	25	.27	1.00	1	SBQSPZ
607	45.7033	-75.4783	62	219.05	50.81	6	25	.27	1.00	1	GACSPZ
608	48.2300	-77.9717	305	417.73	356.80	6	25	.27	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	197.48	72.09	6	25	.27	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	310.91	50.35	6	25	.27	1.00	1	TRQSPZ

SHOT NUMBER	6	LINE OB	LOCATION C								
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
201	45.4378	-76.1741	97	144.06	210.59	7	24	52.38	1.00	1	EPB
201	45.4378	-76.1741	97	144.06	210.59	7	24	52.38	1.00	6	EPB
202	45.4450	-76.3712	89	151.67	215.80	7	25	6.39	1.00	1	UWO
203	45.4115	-76.3989	108	155.96	215.67	7	24	52.40	1.00	1	EPB
203	45.4115	-76.3989	108	155.96	215.67	7	24	52.40	1.00	6	EPB
204	45.3809	-76.4074	123	159.14	215.16	7	25	6.28	1.00	1	UWO
205	45.3450	-76.4348	146	163.65	215.00	7	24	55.05	1.00	1	EPB
205	45.3450	-76.4348	146	163.65	215.00	7	24	55.05	1.00	6	EPB
206	45.3054	-76.4554	185	168.20	214.61	7	25	8.52	1.00	1	UWO
207	45.2818	-76.4731	177	171.15	214.51	7	24	52.37	1.00	1	EPB
207	45.2818	-76.4731	177	171.15	214.51	7	24	52.37	1.00	6	EPB
208	45.2378	-76.4738	192	175.27	213.64	7	25	8.06	1.00	1	UWO
209	45.1875	-76.4842	200	180.43	212.90	7	24	52.35	1.00	1	EPB
209	45.1875	-76.4842	200	180.43	212.90	7	24	52.35	1.00	6	EPB
210	45.1724	-76.5430	262	184.33	213.84	7	25	10.15	1.00	1	UWO
211	45.1435	-76.5751	231	188.40	213.95	7	24	52.38	1.00	1	EPB
211	45.1435	-76.5751	231	188.40	213.95	7	24	52.38	1.00	6	EPB
212	45.1000	-76.6019	308	193.60	213.70	7	25	2.05	1.00	1	UWO
213	45.0676	-76.6388	302	198.20	213.84	7	24	55.06	1.00	1	EPB
213	45.0676	-76.6388	302	198.20	213.84	7	24	55.06	1.00	6	EPB
214	45.0501	-76.6790	277	201.56	214.30	7	25	9.70	1.00	1	UWO
215	45.0393	-76.7199	292	204.34	214.87	7	24	52.36	1.00	1	EPB
215	45.0393	-76.7199	292	204.34	214.87	7	24	52.36	1.00	6	EPB
216	45.0216	-76.7705	323	208.21	215.48	7	25	7.14	1.00	1	UWO
217	44.9778	-76.8131	277	214.12	215.49	7	24	52.39	1.00	1	EPB
217	44.9778	-76.8131	277	214.12	215.49	7	24	52.39	1.00	6	EPB
218	44.9643	-76.8526	246	217.12	215.94	7	25	18.16	1.00	1	UWO
219	44.9382	-76.8840	308	220.92	216.04	7	24	50.67	20.00	1	ECOLE-UT
220	44.9168	-76.9545	285	226.07	216.86	7	24	44.16	7.94	1	MCG-UBC
221	44.8888	-77.0194	308	231.60	217.44	7	24	49.85	10.00	1	ECOLE-UT
222	44.8722	-77.0556	292	234.78	217.74	7	24	44.19	7.94	1	MCG-UBC
223	44.8548	-77.0928	300	238.08	218.03	7	24	49.39	20.00	1	ECOLE-UT
224	44.8327	-77.1420	277	242.38	218.42	7	24	44.19	7.94	1	MCG-UBC
226	44.7556	-77.2129	277	252.60	218.27	7	24	44.20	7.94	1	MCG-UBC
228	44.6884	-77.2542	262	260.55	217.86	7	24	44.20	7.94	1	MCG-UBC
230	44.6351	-77.3704	231	270.81	218.68	7	24	44.19	7.94	1	MCG-UBC
232	44.5914	-77.4579	231	278.89	219.22	7	24	44.17	7.94	1	MCG-UBC
234	44.5441	-77.5273	231	286.42	219.45	7	24	51.59	7.94	1	MCG-UBC
235	44.5123	-77.5600	231	290.80	219.43	7	24	52.40	1.00	1	EPB
235	44.5123	-77.5600	231	290.80	219.43	7	24	52.40	1.00	6	EPB
236	44.5007	-77.6113	197	294.33	219.90	7	24	52.38	1.00	1	EPB
236	44.5007	-77.6113	197	294.33	219.90	7	24	52.38	1.00	6	EPB
237	44.4819	-77.6223	192	296.52	219.79	7	24	52.40	1.00	1	EPB
237	44.4819	-77.6223	192	296.52	219.79	7	24	52.40	1.00	6	EPB
601	45.3942	-75.7167	77	134.53	196.20	7	25	3.53	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	171.37	132.59	7	25	3.53	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	221.15	94.58	7	25	3.53	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	288.13	115.86	7	25	3.53	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	374.35	222.22	7	25	3.53	1.00	1	WBOSPZ
607	45.7033	-75.4783	62	96.75	191.19	7	25	7.80	1.00	1	GACSPZ
608	48.2300	-77.9717	305	277.82	313.01	7	25	3.53	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	173.10	180.98	7	25	3.53	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	64.33	125.15	7	25	3.53	1.00	1	TRQSPZ

SHOT NUMBER	7	LINE BC	LOCATION A								
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
201	45.4378	-76.1741	97	262.36	109.54	6	4	55.04	1.00	1	EPB
201	45.4378	-76.1741	97	262.36	109.54	6	4	55.04	1.00	6	EPB
202	45.4450	-76.3712	89	247.79	110.69	6	5	17.02	1.00	1	UWO
203	45.4115	-76.3989	108	247.27	111.68	6	4	52.37	1.00	1	EPB
203	45.4115	-76.3989	108	247.27	111.68	6	4	52.37	1.00	6	EPB
204	45.3809	-76.4074	123	248.05	112.46	6	5	10.47	1.00	1	UWO
205	45.3450	-76.4348	146	247.80	113.50	6	4	52.36	1.00	1	EPB
205	45.3450	-76.4348	146	247.80	113.50	6	4	52.36	1.00	6	EPB
206	45.3054	-76.4554	185	248.29	114.58	6	5	19.36	1.00	1	UWO
207	45.2818	-76.4731	177	248.24	115.27	6	4	52.38	1.00	1	EPB
207	45.2818	-76.4731	177	248.24	115.27	6	4	52.38	1.00	6	EPB
208	45.2378	-76.4738	192	250.47	116.27	6	5	15.08	1.00	1	UWO
209	45.1875	-76.4842	200	252.46	117.47	6	4	55.02	1.00	1	EPB
209	45.1875	-76.4842	200	252.46	117.47	6	4	55.02	1.00	6	EPB
210	45.1724	-76.5430	262	249.29	118.33	6	5	18.10	1.00	1	UWO
211	45.1435	-76.5751	231	248.77	119.26	6	4	52.38	1.00	1	EPB
211	45.1435	-76.5751	231	248.77	119.26	6	4	52.38	1.00	6	EPB
213	45.0676	-76.6388	302	249.04	121.52	6	5	15.33	1.00	1	UWO
215	45.0393	-76.7199	292	245.52	122.96	6	4	55.04	1.00	1	EPB
215	45.0393	-76.7199	292	245.52	122.96	6	4	55.04	1.00	6	EPB
217	44.9778	-76.8131	277	243.58	125.26	6	5	26.99	1.00	1	UWO
219	44.9382	-76.8840	308	241.87	126.89	6	4	52.37	1.00	1	EPB
219	44.9382	-76.8840	308	241.87	126.89	6	4	52.37	1.00	6	EPB
221	44.8888	-77.0194	308	237.19	129.54	6	5	11.55	1.00	1	UWO
223	44.8548	-77.0928	300	235.40	131.17	6	4	52.37	1.00	1	EPB
223	44.8548	-77.0928	300	235.40	131.17	6	4	52.37	1.00	6	EPB
225	44.7998	-77.1818	282	234.56	133.43	6	5	25.32	1.00	1	UWO
229	44.6689	-77.2710	246	240.32	137.08	6	4	52.41	1.00	1	EPB
229	44.6689	-77.2710	246	240.32	137.08	6	4	52.41	1.00	6	EPB
233	44.5624	-77.4945	223	238.36	142.16	6	4	52.40	1.00	1	EPB
233	44.5624	-77.4945	223	238.36	142.16	6	4	52.40	1.00	6	EPB
237	44.4819	-77.6223	192	239.87	145.39	6	4	52.41	1.00	1	EPB
237	44.4819	-77.6223	192	239.87	145.39	6	4	52.41	1.00	6	EPB
303	45.5546	-76.2830	107	249.80	107.50	6	4	44.20	2.00	1	MCG-UBC
306	45.6484	-76.1893	198	253.46	104.72	6	4	52.79	20.00	1	ECOLE-UT
308	45.6984	-76.1350	183	255.97	103.25	6	4	58.04	10.00	1	ECOLE-UT
319	46.0256	-75.8558	183	270.14	94.55	6	5	5.39	20.00	1	ECOLE-UT
321	46.0972	-75.7880	213	274.50	92.76	6	4	44.18	15.85	1	MCG-UBC
338	45.6344	-76.2195	245	251.67	105.21	6	4	44.23	15.85	1	MCG-UBC
339	45.6771	-76.1594	185	254.79	103.88	6	4	44.20	7.94	1	MCG-UBC
340	45.7177	-76.1212	191	256.44	102.72	6	4	44.15	15.85	1	MCG-UBC
341	45.8394	-75.9745	205	264.42	99.25	6	4	44.20	15.85	1	MCG-UBC
342	45.9524	-75.8661	213	270.47	96.28	6	4	44.20	15.85	1	MCG-UBC
601	45.3942	-75.7167	77	297.51	107.82	6	5	3.47	1.00	1	OTSPZ
603	46.3628	-72.3722	10	536.20	86.40	6	5	3.47	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	583.97	97.12	6	5	3.47	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	261.49	162.87	6	5	3.47	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	305.38	100.54	6	5	7.73	1.00	1	GACSPZ
608	48.2300	-77.9717	305	240.98	24.86	6	5	3.47	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	346.58	112.59	6	5	3.47	1.00	1	WBQSPZ
611	46.2222	-74.5556	853	368.56	89.13	6	5	3.47	1.00	1	TRQSPZ

SHOT NUMBER	8	LINE OC	LOCATION	0							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
301	45.4378	-76.1741	99	15.25	119.36	6	14	52.40	1.00	1	EPB
301	45.4378	-76.1741	99	15.25	119.36	6	14	52.40	1.00	6	EPB
302	45.5321	-76.3202	126	3.52	31.87	6	14	52.41	1.00	1	EPB
302	45.5321	-76.3202	126	3.52	31.87	6	14	52.41	1.00	6	EPB
303	45.5546	-76.2830	107	7.27	40.93	6	14	52.42	1.00	1	EPB
303	45.5546	-76.2830	107	7.27	40.93	6	14	52.42	1.00	6	EPB
305	45.6348	-76.2189	213	17.40	34.09	6	14	55.06	1.00	1	EPB
305	45.6348	-76.2189	213	17.40	34.09	6	14	55.06	1.00	6	EPB
306	45.6484	-76.1893	198	19.98	37.13	6	14	51.23	1.00	1	UWO
307	45.6760	-76.1589	183	23.85	37.20	6	14	52.39	1.00	1	EPB
307	45.6760	-76.1589	183	23.85	37.20	6	14	52.39	1.00	6	EPB
308	45.6984	-76.1350	183	26.96	37.14	6	14	39.62	1.00	1	UWO
309	45.7177	-76.1157	191	29.58	36.94	6	14	52.40	1.00	1	EPB
309	45.7177	-76.1157	191	29.58	36.94	6	14	52.40	1.00	6	EPB
310	45.7481	-76.0414	198	35.86	41.05	6	14	48.67	1.00	1	UWO
311	45.7847	-76.0494	168	38.63	36.37	6	14	52.40	1.00	1	EPB
311	45.7847	-76.0494	168	38.63	36.37	6	14	52.40	1.00	6	EPB
312	45.8103	-76.0167	175	42.44	36.84	6	14	50.27	1.00	1	UWO
313	45.8394	-75.9751	198	46.97	37.60	6	14	52.41	1.00	1	EPB
313	45.8394	-75.9751	198	46.97	37.60	6	14	52.41	1.00	6	EPB
314	45.8691	-75.9547	183	50.55	36.72	6	14	39.46	1.00	1	UWO
315	45.9017	-75.9341	183	54.42	35.77	6	14	55.19	40.00	1	ECOLE-UT
316	45.9243	-75.8880	152	58.57	37.15	6	14	50.65	1.00	1	UWO
317	45.9534	-75.8672	213	62.12	36.52	6	14	54.60	40.00	1	ECOLE-UT
318	45.9964	-75.8563	184	66.49	34.63	6	14	48.99	1.00	1	UWO
320	46.0766	-75.8594	183	73.85	30.51	6	14	54.98	1.00	1	UWO
321	46.0972	-75.7890	213	78.73	33.10	6	14	45.45	40.00	1	ECOLE-UT
322	46.0983	-75.7081	229	82.40	36.64	6	14	44.13	7.94	1	MCG-UBC
324	46.1534	-75.6550	226	89.76	36.37	6	14	44.17	7.94	1	MCG-UBC
325	46.1812	-75.6123	256	94.22	36.85	6	0	99.00	40.00	1	ECOLE-UT
326	46.2444	-75.6759	244	97.17	32.03	6	14	44.17	7.94	1	MCG-UBC
327	46.2481	-75.5557	230	102.78	36.26	6	14	44.17	7.94	1	MCG-UBC
328	46.2786	-75.5488	230	105.83	35.39	6	14	44.18	7.94	1	MCG-UBC
329	46.3016	-75.4924	233	110.47	36.44	6	14	44.13	7.94	1	MCG-UBC
330	46.3295	-75.4802	245	113.51	35.87	6	14	44.21	7.94	1	MCG-UBC
331	46.3595	-75.4439	213	117.86	36.00	6	14	44.18	7.94	1	MCG-UBC
332	46.3810	-75.4097	233	121.35	36.32	6	4	49.45	20.00	1	ECOLF-UT
333	46.4162	-75.3756	244	126.05	36.21	6	14	52.39	1.00	1	EPB
333	46.4162	-75.3756	244	126.05	36.21	6	14	52.39	1.00	6	EPB
335	46.4738	-75.3311	259	133.23	35.73	6	14	49.74	1.00	1	EPB
335	46.4738	-75.3311	259	133.23	35.73	6	14	49.74	1.00	6	EPB
336	46.5042	-75.2958	259	137.56	35.80	6	14	52.40	1.00	1	EPB
336	46.5042	-75.2958	259	137.56	35.80	6	14	52.40	1.00	6	EPB
601	45.3942	-75.7167	77	50.60	103.89	6	15	1.53	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	212.65	89.11	6	15	1.53	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	322.41	71.39	6	15	1.53	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	345.88	90.77	6	15	1.53	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	230.50	224.93	6	15	1.53	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	71.04	71.64	6	15	5.80	1.00	1	GACSPZ
608	48.2300	-77.9717	305	327.34	338.31	6	15	1.53	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	100.95	123.39	6	15	1.53	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	160.12	59.51	6	15	1.53	1.00	1	TRQSPZ
614	49.1917	-68.3939	123	726.63	52.82	6	15	1.53	1.00	1	HTQSPZ

SHOT NUMBER	9	LINE OC	LOCATION	B							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
301	45.4378	-76.1741	99	158.38	47.17	6	24	52.39	1.00	1	EPB
301	45.4378	-76.1741	99	158.38	47.17	6	24	52.39	1.00	6	EPB
302	45.5321	-76.3202	126	157.62	41.55	6	24	55.08	1.00	1	EPB
302	45.5321	-76.3202	126	157.62	41.55	6	24	55.08	1.00	6	EPB
303	45.5546	-76.2830	107	161.42	41.71	6	24	52.41	1.00	1	EPB
303	45.5546	-76.2830	107	161.42	41.71	6	24	52.41	1.00	6	EPB
305	45.6348	-76.2189	213	171.38	40.92	6	24	52.39	1.00	1	EPB
305	45.6348	-76.2189	213	171.38	40.92	6	24	52.39	1.00	6	EPB
306	45.6484	-76.1893	198	174.05	41.15	6	24	59.93	1.00	1	UWO
307	45.6760	-76.1589	183	177.92	41.05	6	24	55.08	1.00	1	EPB
307	45.6760	-76.1589	183	177.92	41.05	6	24	55.08	1.00	6	EPB
308	45.6984	-76.1350	183	181.01	40.96	6	24	58.22	1.00	1	UWO
309	45.7177	-76.1157	191	183.61	40.86	6	24	52.39	1.00	1	EPB
309	45.7177	-76.1157	191	183.61	40.86	6	24	52.39	1.00	6	EPB
310	45.7481	-76.0414	198	190.00	41.47	6	25	12.24	1.00	1	UWO
311	45.7847	-76.0494	168	192.60	40.52	6	24	52.39	1.00	1	EPB
311	45.7847	-76.0494	168	192.60	40.52	6	24	52.39	1.00	6	EPB
312	45.8103	-76.0167	175	196.42	40.52	6	25	3.86	1.00	1	UWO
313	45.8394	-75.9751	198	200.98	40.60	6	24	52.40	1.00	1	EPB
313	45.8394	-75.9751	198	200.98	40.60	6	24	52.40	1.00	6	EPB
314	45.8691	-75.9547	183	204.50	40.31	6	25	14.23	1.00	1	UWO
315	45.9017	-75.9341	183	208.28	39.98	6	24	51.63	40.00	1	ECOLE-UT
316	45.9243	-75.8880	152	212.53	40.26	6	25	14.81	1.00	1	UWO
317	45.9534	-75.8672	213	216.02	40.01	6	24	54.80	40.00	1	ECOLE-UT
318	45.9964	-75.8563	184	220.19	39.35	6	25	5.59	1.00	1	UWO
320	46.0766	-75.8594	183	226.87	37.84	6	24	50.28	1.00	1	UWO
321	46.0972	-75.7880	213	232.15	38.54	6	25	35.17	40.00	1	ECOLE-UT
322	46.0983	-75.7081	229	236.26	39.67	6	24	44.13	7.94	1	MCG-UBC
324	46.1534	-75.6550	226	243.57	39.45	6	24	44.17	7.94	1	MCG-UBC
325	46.1812	-75.6123	256	248.07	39.56	6	0	99.30	40.00	1	ECOLE-UT
326	46.2444	-75.6759	244	250.29	37.66	6	24	44.17	7.94	1	MCG-UBC
327	46.2481	-75.5557	230	256.55	39.21	6	24	44.17	7.94	1	MCG-UBC
328	46.2786	-75.5488	230	259.47	38.81	6	24	44.18	7.94	1	MCG-UBC
329	46.3016	-75.4924	233	264.24	39.17	6	24	44.12	7.94	1	MCG-UBC
330	46.3295	-75.4802	245	267.21	38.89	6	24	44.21	7.94	1	MCG-UBC
331	46.3595	-75.4439	213	271.56	38.88	6	24	44.18	7.94	1	MCG-UBC
332	46.3810	-75.4097	233	275.08	38.97	6	24	49.22	20.00	1	ECOLE-UT
333	46.4162	-75.3756	244	279.76	38.86	6	24	52.40	1.00	1	EPB
333	46.4162	-75.3756	244	279.76	38.86	6	24	52.40	1.00	6	EPB
334	46.4566	-75.3759	229	283.18	38.27	6	24	58.15	20.00	1	ECOLE-UT
335	46.4738	-75.3311	259	286.85	38.55	6	24	52.39	1.00	1	EPB
335	46.4738	-75.3311	259	286.85	38.55	6	24	52.39	1.00	6	EPB
336	46.5042	-75.2958	259	291.19	38.53	6	24	55.06	1.00	1	EPB
336	46.5042	-75.2958	259	291.19	38.53	6	24	55.06	1.00	6	EPB
601	45.3942	-75.7167	77	183.98	55.73	6	25	.27	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	337.93	68.91	6	25	.27	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	463.61	61.29	6	25	.27	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	463.34	75.53	6	25	.27	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	76.69	228.47	6	25	.27	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	219.05	50.81	6	25	.27	1.00	1	GACSPZ
608	48.2300	-77.9717	305	417.73	356.80	6	25	.27	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	197.48	72.09	6	25	.27	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	310.91	50.35	6	25	.27	1.00	1	TRQSPZ
613	47.5400	-68.2410	189	804.17	61.66	6	25	.27	1.00	1	EBNSPZ

SHOT NUMBER	10	LINE OC	LOCATION C									
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT	
301	45.4378	-76.1741	99	144.06	210.59	6	34	52.39	1.00	1	EPB	
301	45.4378	-76.1741	99	144.06	210.59	6	34	52.39	1.00	6	EPB	
302	45.5321	-76.3202	126	141.47	216.72	6	34	57.73	1.00	1	EPB	
302	45.5321	-76.3202	126	141.47	216.72	6	34	57.73	1.00	6	EPB	
303	45.5546	-76.2830	107	137.74	216.36	6	34	52.41	1.00	1	EPB	
303	45.5546	-76.2830	107	137.74	216.36	6	34	52.41	1.00	6	EPB	
305	45.6348	-76.2189	213	127.59	216.86	6	34	52.38	1.00	1	EPB	
305	45.6348	-76.2189	213	127.59	216.86	6	34	52.38	1.00	6	EPB	
306	45.6484	-76.1893	198	125.01	216.42	6	35	9.26	1.00	1	UWO	
307	45.6760	-76.1589	183	121.14	216.36	6	34	52.40	1.00	1	EPB	
307	45.6760	-76.1589	183	121.14	216.36	6	34	52.40	1.00	6	EPB	
308	45.6984	-76.1350	183	118.03	216.33	6	35	3.09	1.00	1	UWO	
309	45.7177	-76.1157	191	115.41	216.34	6	34	52.41	1.00	1	EPB	
309	45.7177	-76.1157	191	115.41	216.34	6	34	52.41	1.00	6	EPB	
310	45.7481	-76.0414	198	109.32	214.92	6	35	8.59	1.00	1	UWO	
311	45.7847	-76.0494	168	106.35	216.43	6	34	52.38	1.00	1	EPB	
311	45.7847	-76.0494	168	106.35	216.43	6	34	52.38	1.00	6	EPB	
312	45.8103	-76.0167	175	102.56	216.21	6	34	56.96	1.00	1	UWO	
313	45.8394	-75.9751	198	98.05	215.78	6	34	52.40	1.00	1	EPB	
313	45.8394	-75.9751	198	98.05	215.78	6	34	52.40	1.00	6	EPB	
314	45.8691	-75.9547	183	94.44	216.15	6	34	57.55	1.00	1	UWO	
316	45.9243	-75.8880	152	86.44	215.73	6	34	48.98	1.00	1	UWO	
317	45.9534	-75.8672	213	82.87	216.11	6	34	54.90	40.00	1	ECOLE-UT	
318	45.9964	-75.8563	184	78.52	217.64	6	35	2.69	1.00	1	UWO	
320	46.0766	-75.8594	183	71.78	222.10	6	34	31.53	1.00	1	UWO	
321	46.0972	-75.7880	213	66.45	219.86	6	34	37.92	40.00	1	ECOLE-UT	
322	46.0983	-75.7081	229	62.60	215.56	6	34	44.13	7.94	1	MCG-UBC	
324	46.1534	-75.6550	226	55.23	215.75	6	34	44.17	7.94	1	MCG-UBC	
326	46.2444	-75.6759	244	48.46	224.27	6	34	44.17	7.94	1	MCG-UBC	
327	46.2481	-75.5557	230	42.21	215.57	6	34	44.17	7.94	1	MCG-UBC	
328	46.2786	-75.5488	230	39.17	217.81	6	34	44.18	7.94	1	MCG-UBC	
329	46.3016	-75.4924	233	34.54	214.68	6	34	44.12	7.94	1	MCG-UBC	
330	46.3295	-75.4802	245	31.47	216.47	6	34	44.21	7.94	1	MCG-UBC	
331	46.3595	-75.4439	213	27.13	215.88	6	34	44.18	7.94	1	MCG-UBC	
333	46.4162	-75.3756	244	18.95	214.13	6	34	52.40	1.00	1	EPB	
333	46.4162	-75.3756	244	18.95	214.13	6	34	52.40	1.00	6	EPB	
335	46.4738	-75.3311	259	11.76	217.79	6	34	55.06	1.00	1	EPB	
335	46.4738	-75.3311	259	11.76	217.79	6	34	55.06	1.00	6	EPB	
336	46.5042	-75.2958	259	7.42	217.22	6	34	52.41	1.00	1	EPB	
336	46.5042	-75.2958	259	7.42	217.22	6	34	52.41	1.00	6	EPB	
601	45.3942	-75.7167	77	134.53	196.20	6	35	3.53	1.00	1	OTTSPZ	
602	45.5025	-73.6230	112	171.37	132.59	6	35	3.53	1.00	1	MNTSPZ	
603	46.3628	-72.3722	10	221.15	94.58	6	35	3.53	1.00	1	GNTSPZ	
604	45.3783	-71.9264	265	288.13	115.86	6	35	3.53	1.00	1	SBQSPZ	
606	44.0186	-78.3744	149	374.35	222.22	6	35	3.53	1.00	1	WEOSPZ	
607	45.7033	-75.4783	62	96.75	191.19	6	35	7.80	1.00	1	GACSPZ	
608	48.2300	-77.9717	305	277.82	313.01	6	35	3.53	1.00	1	VDQSPZ	
609	45.0003	-75.2750	85	173.10	180.98	6	35	3.53	1.00	1	WBOSPZ	
611	46.2222	-74.5556	853	64.33	125.15	6	35	3.53	1.00	1	TRQSPZ	

SHOT NUMBER	11	LINE CD	LOCATION C								
STATION	LAT	LONG	ELEV	DIST	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
			(M)	(KM)							
401	46.5542	-75.3200	252	6.35	266.82	6	4	52.35	1.00	1	EPB
401	46.5542	-75.3200	252	6.35	266.82	6	4	52.35	1.00	6	EPB
402	46.5417	-75.4516	312	16.53	264.02	6	4	52.33	1.00	1	EPB
402	46.5417	-75.4516	312	16.53	264.02	6	4	52.33	1.00	6	EPB
403	46.5725	-75.6083	263	28.50	273.51	6	4	49.68	1.00	1	EPB
403	46.5725	-75.6083	263	28.50	273.51	6	4	49.68	1.00	6	EPB
404	46.5800	-75.7050	331	35.95	274.18	6	4	46.04	1.00	1	UWO
405	46.5742	-75.8133	267	44.20	272.63	6	4	52.33	1.00	1	EPB
405	46.5742	-75.8133	267	44.20	272.63	6	4	52.33	1.00	6	EPB
406	46.6075	-75.9083	191	51.73	276.42	6	4	28.25	1.00	1	UWO
407	46.6600	-75.9583	206	56.40	281.93	6	4	52.34	1.00	1	EPB
407	46.6600	-75.9583	206	56.40	281.93	6	4	52.34	1.00	6	EPB
408	46.7175	-76.0267	213	63.01	286.69	6	4	56.04	1.00	1	UWO
410	46.8008	-76.1950	267	78.11	290.61	6	4	54.84	1.00	1	UWO
411	46.8316	-76.2883	297	85.98	291.15	6	4	55.01	1.00	1	EPB
411	46.8316	-76.2883	297	85.98	291.15	6	4	55.01	1.00	6	EPB
412	46.8625	-76.3367	297	90.65	292.37	6	4	59.21	1.00	1	UWO
413	46.9033	-76.4233	427	98.47	293.41	6	4	52.34	1.00	1	EPB
413	46.9033	-76.4233	427	98.47	293.41	6	4	52.34	1.00	6	EPB
414	46.9850	-76.4767	389	105.93	297.11	6	5	2.63	1.00	1	UWO
415	47.0316	-76.5283	373	111.78	298.61	6	4	52.33	1.00	1	EPB
415	47.0316	-76.5283	373	111.78	298.61	6	4	52.33	1.00	6	EPB
416	47.0858	-76.5333	389	115.03	301.18	6	4	58.80	1.00	1	UWO
417	47.1167	-76.5967	381	120.92	301.44	6	5	3.04	1.00	1	UWO
418	47.1525	-76.6400	381	125.78	302.24	6	4	59.14	1.00	1	UWO
420	47.2592	-76.8283	434	144.15	303.34	6	4	44.16	7.94	1	MCG-UBC
421	47.3350	-76.8583	366	150.67	305.60	6	4	51.13	20.00	1	ECOLE-UT
422	47.3708	-76.9650	351	159.58	305.14	6	4	44.15	7.94	1	MCG-UBC
423	47.4225	-77.0316	354	166.97	305.82	6	4	55.36	20.00	1	ECOLE-UT
424	47.4608	-77.0983	381	173.53	306.04	6	4	44.15	7.94	1	MCG-UBC
425	47.5550	-77.1450	373	182.50	308.12	6	4	54.39	20.00	1	ECOLE-UT
426	47.6217	-77.2216	373	191.57	308.86	6	4	44.18	7.94	1	MCG-UBC
427	47.6542	-77.2800	396	197.25	308.92	6	4	51.14	20.00	1	ECOLE-UT
428	47.7233	-77.2700	347	201.43	310.79	6	4	44.15	7.94	1	MCG-UBC
430	47.8692	-77.3367	335	215.77	313.29	6	4	44.19	31.62	1	MCG-UBC
431	47.9308	-77.3500	335	221.12	314.44	6	4	55.58	20.00	1	ECOLE-UT
432	48.0100	-77.3433	335	226.85	316.15	6	4	44.20	31.62	1	MCG-UBC
433	48.0517	-77.3567	320	230.83	316.80	6	4	50.95	20.00	1	ECOLE-UT
434	48.0683	-77.4233	335	235.65	316.26	6	4	44.12	31.62	1	MCG-UBC
435	48.1325	-77.5400	335	246.85	316.02	6	4	52.43	1.00	1	EPB
435	48.1325	-77.5400	335	246.85	316.02	6	4	52.43	1.00	6	EPB
436	48.1867	-77.5700	335	252.67	316.65	6	4	52.40	1.00	1	EPB
436	48.1867	-77.5700	335	252.67	316.65	6	4	52.40	1.00	6	EPB
437	48.2383	-77.6100	305	258.84	317.08	6	4	57.75	1.00	1	EPB
437	48.2383	-77.6100	305	258.84	317.08	6	4	57.75	1.00	6	EPB
601	45.3942	-75.7167	77	134.53	196.20	6	5	2.00	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	171.37	132.59	6	5	2.00	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	221.15	94.58	6	5	2.00	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	288.13	115.86	6	5	2.00	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	374.35	222.22	6	5	2.00	1.00	1	WEOSPZ
607	45.7033	-75.4783	62	96.75	191.19	6	5	6.27	1.00	1	GACSPZ
608	48.2300	-77.9717	305	277.82	313.01	6	5	2.00	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	173.10	180.98	6	5	2.00	1.00	1	WBOSPZ
610	45.9944	-77.4500	190	181.67	250.65	6	5	2.00	1.00	1	CKOSPZ
611	46.2222	-74.5556	853	64.33	125.15	6	5	2.00	1.00	1	TRQSPZ

SHOT NUMBER	12	LINE CD	LOCATION	D							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
401	46.5542	-75.3200	252	236.13	134.33	6	14	55.01	1.00	1	EPB
401	46.5542	-75.3200	252	236.13	134.33	6	14	55.01	1.00	6	EPB
402	46.5417	-75.4516	312	230.25	136.37	6	14	52.35	1.00	1	EPB
402	46.5417	-75.4516	312	230.25	136.37	6	14	52.35	1.00	6	EPB
403	46.5725	-75.6083	263	219.74	138.09	6	14	57.69	1.00	1	EPB
403	46.5725	-75.6083	263	219.74	138.09	6	14	57.69	1.00	6	EPB
404	46.5800	-75.7050	331	214.35	139.46	6	15	7.26	1.00	1	UWO
405	46.5742	-75.8133	267	209.71	141.32	6	14	52.35	1.00	1	EPB
405	46.5742	-75.8133	267	209.71	141.32	6	14	52.35	1.00	6	EPB
406	46.6075	-75.9083	191	202.37	142.32	6	15	12.48	1.00	1	UWO
407	46.6600	-75.9583	206	195.41	142.21	6	14	52.34	1.00	1	EPB
407	46.6600	-75.9583	206	195.41	142.21	6	14	52.34	1.00	6	EPB
408	46.7175	-76.0267	213	187.15	142.32	6	15	.07	1.00	1	UWO
410	46.8008	-76.1950	267	172.12	143.92	6	15	7.89	1.00	1	UWO
411	46.8316	-76.2883	297	165.26	145.25	6	14	52.34	1.00	1	EPB
411	46.8316	-76.2883	297	165.26	145.25	6	14	52.34	1.00	6	EPB
412	46.8625	-76.3367	297	160.36	145.67	6	14	31.27	1.00	1	UWO
413	46.9033	-76.4233	427	152.96	146.79	6	14	55.00	1.00	1	EPB
413	46.9033	-76.4233	427	152.96	146.79	6	14	55.00	1.00	6	EPB
414	46.9850	-76.4767	389	143.12	146.22	6	14	51.56	1.00	1	UWO
415	47.0316	-76.5283	373	136.64	146.41	6	14	52.35	1.00	1	EPB
415	47.0316	-76.5283	373	136.64	146.41	6	14	52.35	1.00	6	EPB
416	47.0858	-76.5333	389	131.41	145.12	6	15	6.67	1.00	1	UWO
417	47.1167	-76.5967	381	125.88	146.06	6	15	5.07	1.00	1	UWO
418	47.1525	-76.6400	381	120.75	146.33	6	14	59.57	1.00	1	UWO
420	47.2592	-76.8283	434	103.17	149.37	6	14	44.16	7.94	1	MCG-UBC
421	47.3350	-76.8583	366	94.77	148.00	6	14	52.75	20.00	1	ECOLE-UT
422	47.3708	-76.9650	351	87.29	151.14	6	14	44.15	7.94	1	MCG-UBC
423	47.4225	-77.0316	354	79.85	152.34	6	14	50.93	20.00	1	ECOLE-UT
424	47.4608	-77.0983	381	73.81	154.30	6	14	44.14	7.94	1	MCG-UBC
425	47.5550	-77.1450	373	62.85	153.10	6	14	49.36	20.00	1	ECOLE-UT
426	47.6217	-77.2216	373	53.67	155.05	6	14	44.18	7.94	1	MCG-UBC
427	47.6542	-77.2800	396	48.61	157.96	6	14	51.33	20.00	1	ECOLE-UT
428	47.7233	-77.2700	347	41.91	153.09	6	14	44.15	7.94	1	MCG-UBC
430	47.8692	-77.3367	335	25.33	146.66	6	14	44.19	2.00	1	MCG-UBC
432	48.0100	-77.3433	335	14.48	112.37	6	14	44.20	1.00	1	MCG-UBC
433	48.0517	-77.3567	320	12.41	94.05	6	14	47.15	10.00	1	ECOLE-UT
434	48.0683	-77.4233	335	7.48	82.62	6	14	44.12	1.00	1	MCG-UBC
435	48.1325	-77.5400	335	8.20	351.01	6	14	52.42	1.00	1	EPB
435	48.1325	-77.5400	335	8.20	351.01	6	14	52.42	1.00	6	EPB
436	48.1867	-77.5700	335	14.55	346.04	6	14	52.42	1.00	1	EPB
436	48.1867	-77.5700	335	14.55	346.04	6	14	52.42	1.00	6	EPB
437	48.2383	-77.6100	305	20.89	341.94	6	14	52.41	1.00	1	EPB
437	48.2383	-77.6100	305	20.89	341.94	6	14	52.41	1.00	6	EPB
601	45.3942	-75.7167	77	326.88	154.36	6	15	2.73	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	411.62	132.24	6	15	2.73	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	433.29	113.90	6	15	2.73	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	521.26	122.81	6	15	2.73	1.00	1	SBQSPZ
606	44.0186	-78.3744	149	453.99	188.66	6	15	2.73	1.00	1	WEOSpz
607	45.7033	-75.4783	62	304.79	148.50	6	15	2.73	1.00	1	GACSPZ
608	48.2300	-77.9717	305	38.40	299.71	6	15	2.73	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	381.28	152.29	6	15	2.73	1.00	1	WBOSpz
610	45.9944	-77.4500	190	229.67	178.59	6	15	2.73	1.00	1	CKOSpz
611	46.2222	-74.5556	853	303.93	131.13	6	15	2.73	1.00	1	TRQSPZ
613	47.5400	-68.2410	189	697.33	91.31	6	15	2.73	1.00	1	EBNSpz

SHOT NUMBER	13	LINE DE	LOCATION	E							
STATION	LAT	LONG	ELEV	DIST	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
			(M)	(KM)							
501	48.1325	-77.5400	335	173.61	176.20	6	4	52.34	1.00	1	EPB
501	48.1325	-77.5400	335	173.61	176.20	6	4	52.34	1.00	6	EPB
502	48.1867	-77.5700	335	167.47	176.83	6	4	55.00	1.00	1	EPB
502	48.1867	-77.5700	335	167.47	176.83	6	4	55.00	1.00	6	EPB
503	48.2383	-77.6100	305	161.60	177.77	6	4	52.34	1.00	1	EPB
503	48.2383	-77.6100	305	161.60	177.77	6	4	52.34	1.00	6	EPB
504	48.3000	-77.6300	320	154.69	178.22	6	5	9.39	1.00	1	UWO
505	48.3592	-77.6533	305	148.07	178.81	6	0	99.30	20.00	1	ECOLE-UT
506	48.4366	-77.6416	320	139.48	178.39	6	4	53.42	1.00	1	UWO
507	48.5166	-77.6750	312	130.54	179.36	6	0	99.00	20.00	1	ECOLE-UT
508	48.5867	-77.6633	301	122.76	178.92	6	4	46.56	1.00	1	UWO
509	48.6450	-77.6566	320	116.29	178.62	6	4	50.79	20.00	1	ECOLE-UT
510	48.6750	-77.7550	312	113.00	182.25	6	4	40.25	1.00	1	UWO
511	48.7350	-77.8333	309	106.72	185.48	6	4	50.59	10.00	1	ECOLE-UT
512	48.8150	-77.8883	351	98.36	188.31	6	4	53.27	1.00	1	UWO
514	48.9167	-77.9366	320	87.82	191.65	6	4	44.18	15.85	1	MCG-UBC
515	48.9808	-77.9450	320	80.98	193.08	6	0	99.00	10.00	1	ECOLE-UT
516	49.0475	-77.9600	320	74.04	195.19	6	4	44.20	15.85	1	MCG-UBC
518	49.1917	-77.9533	310	58.54	198.78	6	4	44.18	15.85	1	MCG-UBC
520	49.2817	-78.0083	290	50.81	206.68	6	4	44.19	15.85	1	MCG-UBC
521	49.3300	-78.0767	305	48.70	214.77	6	4	44.24	15.85	1	MCG-UBC
522	49.4058	-78.1100	305	43.64	223.68	6	4	52.42	1.00	1	EPB
522	49.4058	-78.1100	305	43.64	223.68	6	4	52.42	1.00	6	EPB
523	49.4533	-78.1483	290	42.09	231.39	6	4	44.18	15.85	1	MCG-UBC
525	49.5658	-78.1167	320	33.49	245.73	6	4	48.77	1.00	1	UWO
526	49.5908	-78.0250	312	26.30	245.24	6	4	52.42	1.00	1	EPB
526	49.5908	-78.0250	312	26.30	245.24	6	4	52.42	1.00	6	EPB
528	49.5683	-77.7683	282	14.57	201.43	6	4	52.40	1.00	1	EPB
528	49.5683	-77.7683	282	14.57	201.43	6	4	52.40	1.00	6	EPB
529	49.6358	-77.7117	285	6.18	191.45	6	4	55.08	1.00	1	EPB
529	49.6358	-77.7117	285	6.18	191.45	6	4	55.08	1.00	6	EPB
530	49.7758	-77.6183	275	10.99	30.05	6	4	52.41	1.00	1	EPB
530	49.7758	-77.6183	275	10.99	30.05	6	4	52.41	1.00	6	EPB
531	49.7958	-77.5000	300	18.29	50.03	6	4	55.09	1.00	1	EPB
531	49.7958	-77.5000	300	18.29	50.03	6	4	55.09	1.00	6	EPB
532	49.8167	-77.3750	290	26.99	58.49	6	4	52.40	1.00	1	EPB
532	49.8167	-77.3750	290	26.99	58.49	6	4	52.40	1.00	6	EPB
533	49.8667	-77.2583	285	37.05	57.86	6	4	56.61	1.00	1	UWO
534	49.8917	-77.1083	280	47.80	61.83	6	4	52.43	1.00	1	EPB
534	49.8917	-77.1083	280	47.80	61.83	6	4	52.43	1.00	6	EPB
535	49.9833	-77.1333	295	51.90	50.89	6	4	56.15	1.00	1	UWO
536	50.0792	-77.1117	274	60.22	43.86	6	4	33.32	15.85	1	MCG-UBC
537	50.1708	-77.0750	305	69.54	39.54	6	4	44.20	15.85	1	MCG-UBC
601	45.3942	-75.7167	77	500.28	161.95	6	5	1.47	1.00	1	OTSPZ
602	45.5025	-73.6230	112	557.10	145.15	6	5	1.47	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	542.44	130.99	6	5	1.47	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	646.53	135.67	6	5	1.47	1.00	1	SBQSPZ
605	53.8022	-75.7211	366	477.34	15.82	6	5	1.47	1.00	1	JAQSPZ
607	45.7033	-75.4783	62	473.44	158.61	6	5	5.73	1.00	1	GACSPZ
608	48.2300	-77.9717	305	163.66	187.22	6	5	1.47	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	552.49	159.78	6	5	1.47	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	451.21	147.53	6	5	1.47	1.00	1	TRQSPZ

SHOT NUMBER	14	LINE DE	LOCATION	D								
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT	
501	48.1325	-77.5400	335	8.20	351.01	6	14	52.33	1.00	1	EPB	
501	48.1325	-77.5400	335	8.20	351.01	6	14	52.33	1.00	6	EPB	
502	48.1867	-77.5700	335	14.55	346.04	6	14	52.33	1.00	1	EPB	
502	48.1867	-77.5700	335	14.55	346.04	6	14	52.33	1.00	6	EPB	
503	48.2383	-77.6100	305	20.89	341.94	6	14	52.34	1.00	1	EPB	
503	48.2383	-77.6100	305	20.89	341.94	6	14	52.34	1.00	6	EPB	
504	48.3000	-77.6300	320	27.88	343.43	6	14	44.62	1.00	1	UWO	
505	48.3592	-77.6533	305	34.69	343.81	6	14	47.75	10.00	1	ECOLE-UT	
506	48.4366	-77.6416	320	42.83	348.16	6	14	37.75	1.00	1	UWO	
507	48.5166	-77.6750	312	52.05	347.52	6	14	49.53	20.00	1	ECOLE-UT	
508	48.5867	-77.6633	301	59.52	349.97	6	15	-13.02	1.00	1	UWO	
510	48.6750	-77.7550	312	70.55	345.97	6	14	38.18	1.00	1	UWO	
511	48.7350	-77.8333	309	78.54	343.09	6	14	50.74	10.00	1	ECOLE-UT	
512	48.8150	-77.8883	351	88.24	342.29	6	14	42.74	1.00	1	UWO	
514	48.9167	-77.9366	320	100.09	342.36	6	14	44.18	15.85	1	MCG-UBC	
515	48.9808	-77.9450	320	107.07	343.22	6	0	99.00	20.00	1	ECOLE-UT	
516	49.0475	-77.9600	320	114.49	343.79	6	14	44.20	15.85	1	MCG-UBC	
518	49.1917	-77.9533	310	129.82	346.01	6	14	44.18	15.85	1	MCG-UBC	
520	49.2817	-78.0083	290	140.52	345.44	6	14	44.19	15.85	1	MCG-UBC	
521	49.3300	-78.0767	305	147.03	344.11	6	14	44.24	15.85	1	MCG-UBC	
522	49.4058	-78.1100	305	155.80	344.12	6	14	52.44	1.00	1	EPB	
522	49.4058	-78.1100	305	155.80	344.12	6	14	52.44	1.00	6	EPB	
523	49.4533	-78.1483	290	161.66	343.70	6	14	44.18	15.85	1	MCG-UBC	
525	49.5658	-78.1167	320	173.08	345.62	6	15	8.75	1.00	1	UWO	
526	49.5908	-78.0250	312	174.22	347.97	6	14	52.41	1.00	1	EPB	
526	49.5908	-78.0250	312	174.22	347.97	6	14	52.41	1.00	6	EPB	
528	49.5683	-77.7683	282	168.74	353.96	6	14	52.40	1.00	1	EPB	
528	49.5683	-77.7683	282	168.74	353.96	6	14	52.40	1.00	6	EPB	
529	49.6358	-77.7117	285	175.82	355.55	6	14	52.41	1.00	1	EPB	
529	49.6358	-77.7117	285	175.82	355.55	6	14	52.41	1.00	6	EPB	
530	49.7758	-77.6183	275	190.98	357.94	6	14	52.43	1.00	1	EPB	
530	49.7758	-77.6183	275	190.98	357.94	6	14	52.43	1.00	6	EPB	
531	49.7958	-77.5000	300	193.08	.49	6	14	52.41	1.00	1	EPB	
531	49.7958	-77.5000	300	193.08	.49	6	14	52.41	1.00	6	EPB	
532	49.8167	-77.3750	290	195.70	3.12	6	14	52.40	1.00	1	EPB	
532	49.8167	-77.3750	290	195.70	3.12	6	14	52.40	1.00	6	EPB	
533	49.8667	-77.2583	285	201.89	5.41	6	15	.89	1.00	1	UWO	
534	49.8917	-77.1083	280	205.99	8.32	6	14	52.42	1.00	1	EPB	
534	49.8917	-77.1083	280	205.99	8.32	6	14	52.42	1.00	6	EPB	
535	49.9833	-77.1333	295	215.82	7.44	6	15	7.88	1.00	1	UWO	
536	50.0792	-77.1117	274	226.60	7.46	6	14	44.12	15.85	1	MCG-UBC	
537	50.1708	-77.0750	305	237.05	7.76	6	14	44.20	15.85	1	MCG-UBC	
601	45.3942	-75.7167	77	326.88	154.36	6	15	1.80	1.00	1	OTTSPZ	
602	45.5025	-73.6230	112	411.62	132.24	6	15	1.80	1.00	1	MNTSPZ	
603	46.3628	-72.3722	10	433.29	113.90	6	15	1.80	1.00	1	GNTSPZ	
604	45.3783	-71.9264	265	521.26	122.81	6	15	1.80	1.00	1	SBQSPZ	
605	53.8022	-75.7211	366	651.23	10.52	6	15	1.80	1.00	1	JAQSPZ	
607	45.7033	-75.4783	62	304.79	148.50	6	15	1.80	1.00	1	GACSPZ	
608	48.2300	-77.9717	305	38.40	299.71	6	15	1.80	1.00	1	VDQSPZ	
609	45.0003	-75.2750	85	381.28	152.29	6	15	1.80	1.00	1	WBOSPZ	
611	46.2222	-74.5556	853	303.93	131.13	6	15	1.80	1.00	1	TRQSPZ	

SHOT NUMBER	15	LINE DE	LOCATION F								
STATION	LAT	LONG	ELEV	DIST	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
			(M)	(KM)							
501	48.1325	-77.5400	335	235.32	83.83	6	24	52.32	1.00	1	EPB
501	48.1325	-77.5400	335	235.32	83.83	6	24	52.32	1.00	6	EPB
502	48.1867	-77.5700	335	233.58	82.31	6	24	52.34	1.00	1	EPB
502	48.1867	-77.5700	335	233.58	82.31	6	24	52.34	1.00	6	EPB
503	48.2383	-77.6100	305	231.24	80.83	6	24	52.33	1.00	1	EPB
503	48.2383	-77.6100	305	231.24	80.83	6	24	52.33	1.00	6	EPB
504	48.3000	-77.6300	320	230.69	79.09	6	25	13.40	1.00	1	UWO
505	48.3592	-77.6533	305	230.07	77.41	6	24	52.56	20.00	1	ECOLE-UT
506	48.4366	-77.6416	320	232.62	75.36	6	25	20.29	1.00	1	UWO
508	48.5867	-77.6633	301	235.22	71.30	6	25	18.26	1.00	1	UWO
510	48.6750	-77.7550	312	231.80	68.50	6	25	9.23	1.00	1	UWO
511	48.7350	-77.8333	309	228.72	66.44	6	24	50.83	10.00	1	ECOLE-UT
512	48.8150	-77.8883	351	228.42	63.99	6	25	18.01	1.00	1	UWO
514	48.9167	-77.9366	320	230.08	61.06	6	24	44.18	15.85	1	MCG-UBC
515	48.9808	-77.9450	320	232.85	59.42	6	0	99.00	20.00	1	ECOLE-UT
516	49.0475	-77.9600	320	235.53	57.71	6	24	44.20	15.85	1	MCG-UBC
518	49.1917	-77.9533	310	244.41	54.52	6	24	44.18	15.85	1	MCG-UBC
520	49.2817	-78.0083	290	246.82	52.06	6	24	44.19	15.85	1	MCG-UBC
521	49.3300	-78.0767	305	246.05	50.37	6	24	44.24	15.85	1	MCG-UBC
522	49.4058	-78.1100	305	249.42	48.50	6	24	52.43	1.00	1	EPB
522	49.4058	-78.1100	305	249.42	48.50	6	24	52.43	1.00	6	EPB
523	49.4533	-78.1483	290	250.72	47.16	6	24	44.18	15.85	1	MCG-UBC
525	49.5658	-78.1167	320	260.76	45.41	6	25	22.17	1.00	1	UWO
526	49.5908	-78.0250	312	267.54	45.94	6	24	52.40	1.00	1	EPB
526	49.5908	-78.0250	312	267.54	45.94	6	24	52.40	1.00	6	EPB
528	49.5683	-77.7683	282	280.03	48.86	6	24	52.41	1.00	1	EPB
528	49.5683	-77.7683	282	280.03	48.86	6	24	52.41	1.00	6	EPB
529	49.6358	-77.7117	285	287.95	48.21	6	24	52.43	1.00	1	EPB
529	49.6358	-77.7117	285	287.95	48.21	6	24	52.43	1.00	6	EPB
530	49.7758	-77.6183	275	303.16	46.75	6	24	52.42	1.00	1	EPB
530	49.7758	-77.6183	275	303.16	46.75	6	24	52.42	1.00	6	EPB
531	49.7958	-77.5000	300	311.08	47.47	6	24	49.74	1.00	1	EPB
531	49.7958	-77.5000	300	311.08	47.47	6	24	49.74	1.00	6	EPB
532	49.8167	-77.3750	290	319.48	48.19	6	24	52.42	1.00	1	EPB
532	49.8167	-77.3750	290	319.48	48.19	6	24	52.42	1.00	6	EPB
533	49.8667	-77.2583	285	329.50	48.36	6	25	29.66	1.00	1	UWO
534	49.8917	-77.1083	280	339.66	49.14	6	24	52.41	1.00	1	EPB
534	49.8917	-77.1083	280	339.66	49.14	6	24	52.41	1.00	6	EPB
535	49.9833	-77.1333	295	344.67	47.63	6	25	33.85	1.00	1	UWO
536	50.0792	-77.1117	274	352.75	46.45	6	24	44.12	15.85	1	MCG-UBC
537	50.1708	-77.0750	305	361.45	45.50	6	24	44.20	15.85	1	MCG-UBC
601	45.3942	-75.7167	77	474.25	124.93	6	25	3.20	1.00	1	OTTSPZ
602	45.5025	-75.6230	112	604.05	114.13	6	25	3.20	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	654.13	102.55	6	25	3.20	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	728.04	109.86	6	25	3.20	1.00	1	SBQSPZ
605	53.8022	-75.7211	366	738.64	26.31	6	25	3.20	1.00	1	JAQSPZ
607	45.7033	-75.4783	62	468.93	120.22	6	25	3.20	1.00	1	GACSPZ
608	48.2300	-77.9717	305	204.47	80.16	6	25	3.20	1.00	1	VQSPZ
609	45.0003	-75.2750	85	528.85	126.28	6	25	3.20	1.00	1	WBOSPZ
611	46.2222	-74.5556	853	503.18	110.14	6	25	3.20	1.00	1	TRQSPZ

SHOT NUMBER	16	LINE DE	LOCATION	G							
STATION	LAT	LONG	ELEV (M)	DIST (KM)	AZIMUTH	HOUR	MIN	SECBGN	GAIN	COMP	INSTRUMENT
501	48.1325	-77.5400	335	332.52	233.00	6	34	52.32	1.00	1	EPB
501	48.1325	-77.5400	335	332.52	233.00	6	34	52.32	1.00	6	EPB
502	48.1867	-77.5700	335	330.45	234.06	6	34	52.34	1.00	1	EPB
502	48.1867	-77.5700	335	330.45	234.06	6	34	52.34	1.00	6	EPB
503	48.2383	-77.6100	305	329.24	235.16	6	34	52.34	1.00	1	EPB
503	48.2383	-77.6100	305	329.24	235.16	6	34	52.34	1.00	6	EPB
504	48.3000	-77.6300	320	326.30	236.27	6	35	30.52	1.00	1	UWO
506	48.4366	-77.6416	320	318.21	238.57	6	35	24.04	1.00	1	UWO
507	48.5166	-77.6750	312	315.37	240.16	6	34	50.03	20.00	1	ECOLE-UT
508	48.5867	-77.6633	301	310.50	241.28	6	35	26.96	1.00	1	UWO
509	48.6450	-77.6566	320	306.73	242.27	6	34	49.55	20.00	1	ECOLE-UT
510	48.6750	-77.7550	312	311.35	243.47	6	35	22.36	1.00	1	UWO
511	48.7350	-77.8333	309	313.21	245.06	6	34	50.99	10.00	1	ECOLE-UT
512	48.8150	-77.8883	351	312.77	246.84	6	35	21.64	1.00	1	UWO
514	48.9167	-77.9366	320	311.19	249.00	6	34	44.18	15.85	1	MCG-UBC
515	48.9808	-77.9450	320	308.92	250.26	6	0	99.00	40.00	1	ECOLE-UT
516	49.0475	-77.9600	320	307.15	251.61	6	34	44.20	15.85	1	MCG-UBC
518	49.1917	-77.9533	310	301.20	254.42	6	34	44.18	15.85	1	MCG-UBC
520	49.2817	-78.0083	290	301.99	256.46	6	34	44.19	15.85	1	MCG-UBC
521	49.3300	-78.0767	305	305.29	257.70	6	34	44.24	15.85	1	MCG-UBC
522	49.4058	-78.1100	305	305.50	259.34	6	34	55.09	1.00	1	EPB
522	49.4058	-78.1100	305	305.50	259.34	6	34	55.09	1.00	6	EPB
523	49.4533	-78.1483	290	306.99	260.43	6	34	44.18	15.85	1	MCG-UBC
525	49.5658	-78.1167	320	302.23	262.64	6	35	30.10	1.00	1	UWO
526	49.5908	-78.0250	312	295.20	262.94	6	34	52.42	1.00	1	EPB
526	49.5908	-78.0250	312	295.20	262.94	6	34	52.42	1.00	6	EPB
528	49.5683	-77.7683	282	277.42	261.76	6	34	52.41	1.00	1	EPB
528	49.5683	-77.7683	282	277.42	261.76	6	34	52.41	1.00	6	EPB
529	49.6358	-77.7117	285	272.04	263.15	6	34	52.42	1.00	1	EPB
529	49.6358	-77.7117	285	272.04	263.15	6	34	52.42	1.00	6	EPB
530	49.7758	-77.6183	275	263.16	266.25	6	34	52.41	1.00	1	EPB
530	49.7758	-77.6183	275	263.16	266.25	6	34	52.41	1.00	6	EPB
531	49.7958	-77.5000	300	254.45	266.53	6	34	52.42	1.00	1	EPB
531	49.7958	-77.5000	300	254.45	266.53	6	34	52.42	1.00	6	EPB
532	49.8167	-77.3750	290	245.26	266.84	6	34	52.41	1.00	1	EPB
532	49.8167	-77.3750	290	245.26	266.84	6	34	52.41	1.00	6	EPB
533	49.8667	-77.2583	285	236.40	267.98	6	35	2.84	1.00	1	UWO
534	49.8917	-77.1083	280	225.44	268.47	6	34	52.42	1.00	1	EPB
534	49.8917	-77.1083	280	225.44	268.47	6	34	52.42	1.00	6	EPB
535	49.9833	-77.1333	295	226.77	271.08	6	35	22.28	1.00	1	UWO
536	50.0792	-77.1117	274	225.22	273.78	6	34	44.12	15.85	1	MCG-UBC
537	50.1708	-77.0750	305	223.08	276.42	6	34	44.20	15.85	1	MCG-UBC
601	45.3942	-75.7167	77	527.27	195.04	6	35	7.00	1.00	1	OTTSPZ
602	45.5025	-73.6230	112	499.42	176.87	6	35	7.00	1.00	1	MNTSPZ
603	46.3628	-72.3722	10	420.26	162.97	6	35	7.00	1.00	1	GNTSPZ
604	45.3783	-71.9264	265	534.98	162.56	6	35	7.00	1.00	1	SRQSPZ
605	53.8022	-75.7211	366	441.13	344.84	6	35	7.00	1.00	1	JAQSPZ
607	45.7033	-75.4783	62	489.56	193.88	6	35	7.00	1.00	1	GACSPZ
608	48.2300	-77.9717	305	351.41	237.72	6	35	7.00	1.00	1	VDQSPZ
609	45.0003	-75.2750	85	563.16	190.53	6	35	7.00	1.00	1	WBOSPZ
611	46.2222	-74.5556	653	420.99	186.15	6	35	7.00	1.00	1	TRQSPZ

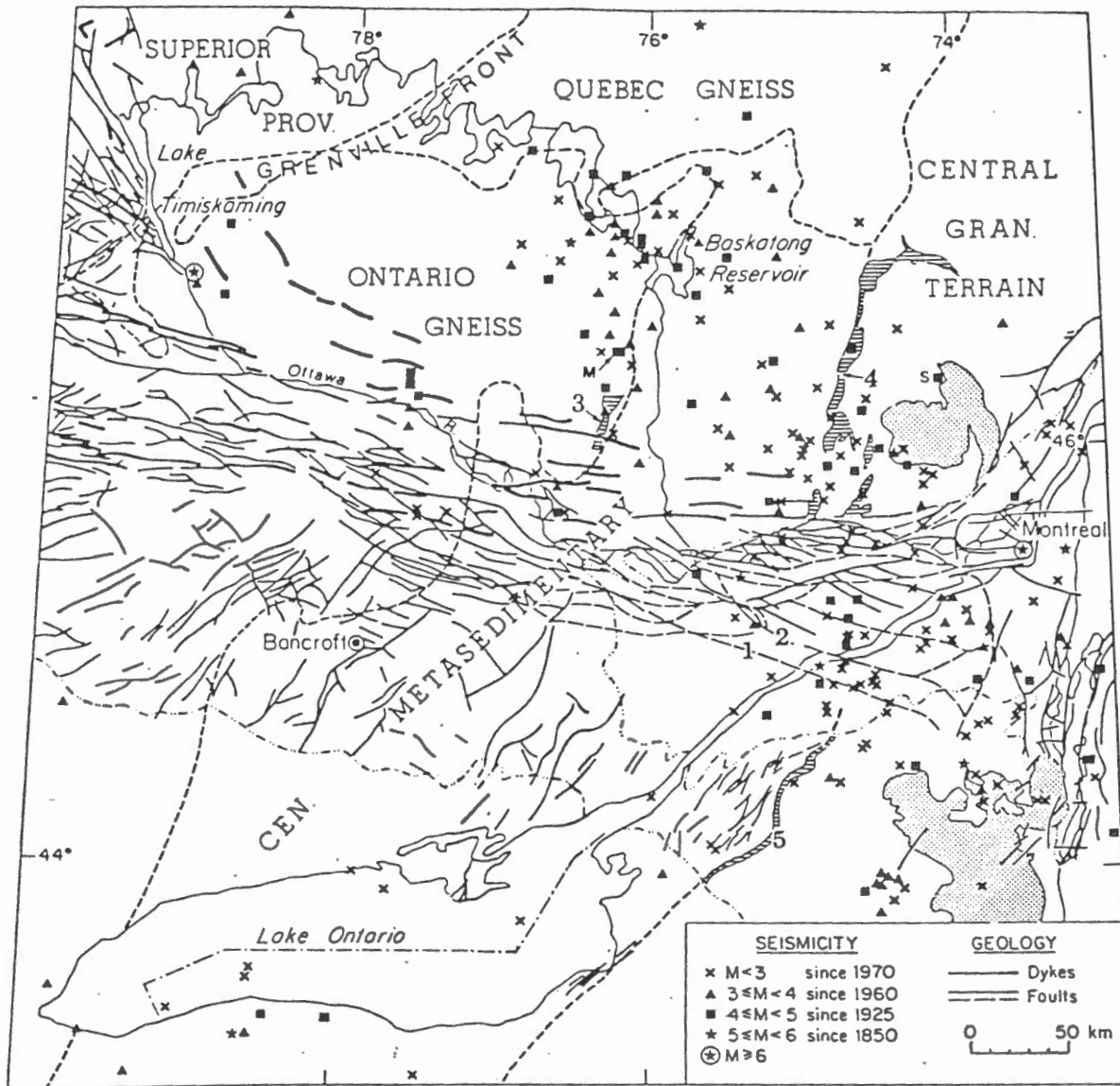


FIG. 1. Seismicity and geological features in and near the western Quebec seismic zone. The stippled areas show anorthosite bodies and lined areas indicate cataclastic/mylonite zones. Numbers are explained in the text. M and S indicate the Maniwaki and St-Donat events, respectively. Dashed-dotted line indicates Palaeozoic cover to the south and southeast. Short dashes indicate geological province subdivisions (suggested near Lake Ontario).

Figure 1 Seismicity and geological features
(from Forsyth 1981)

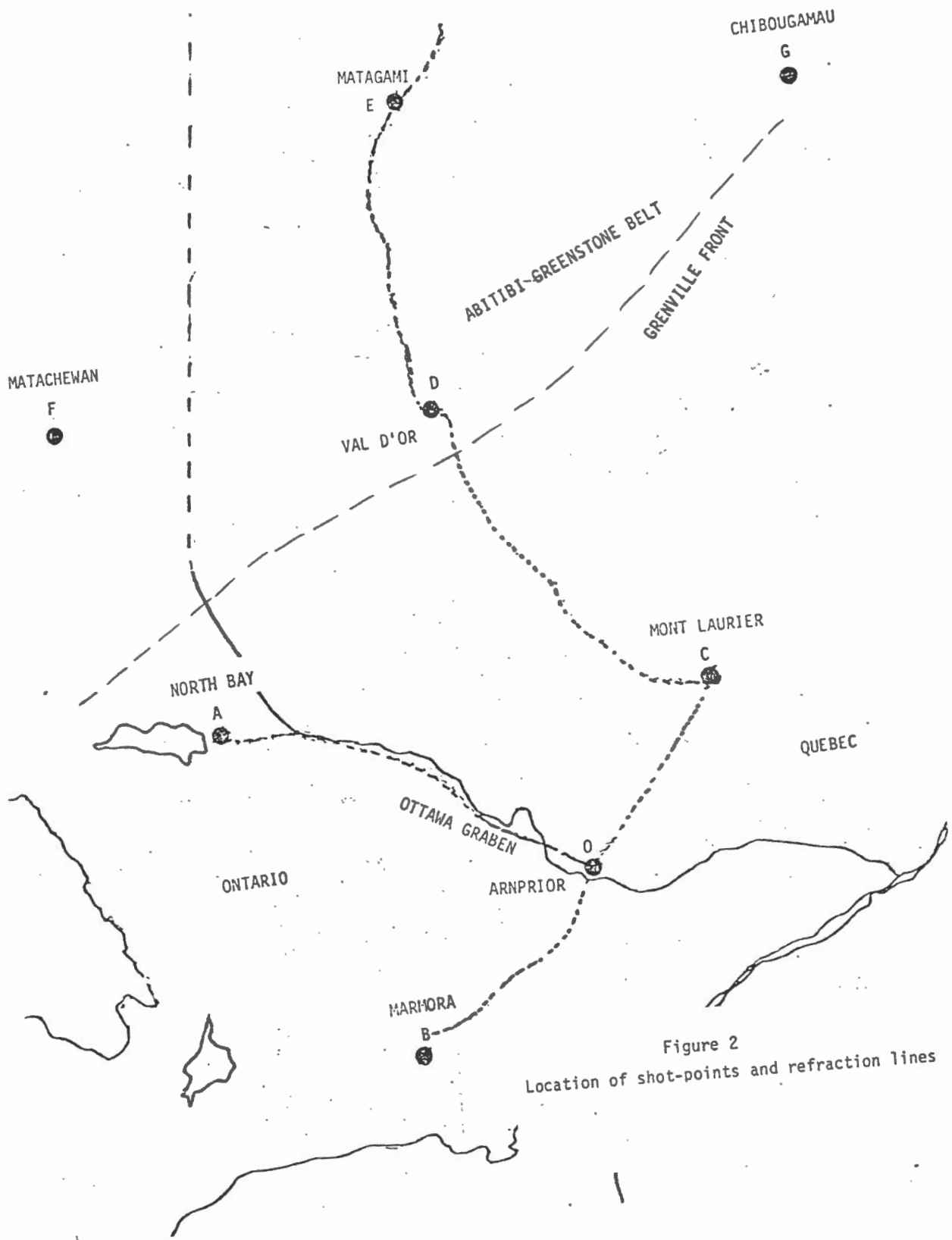
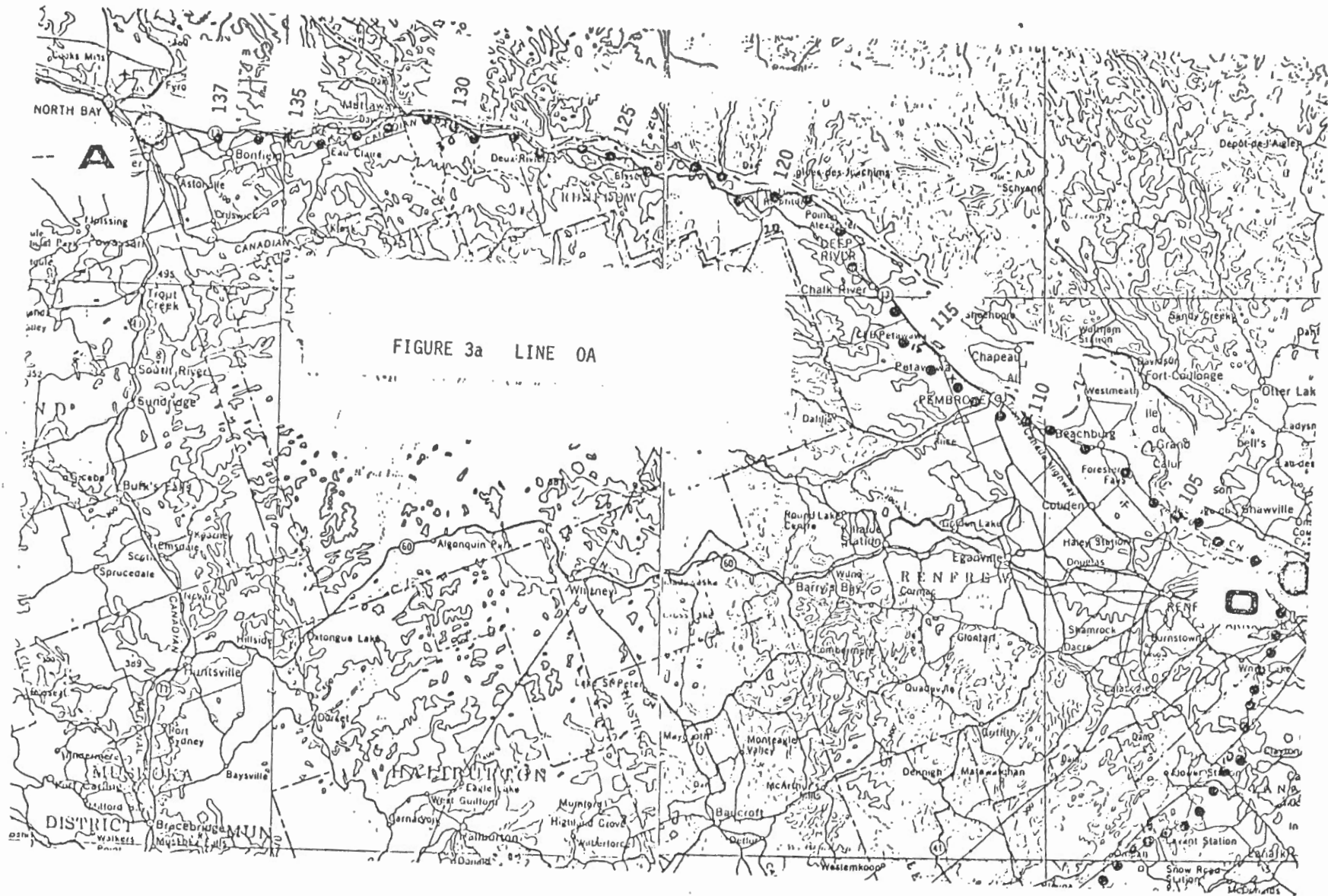


Figure 2
Location of shot-points and refraction lines



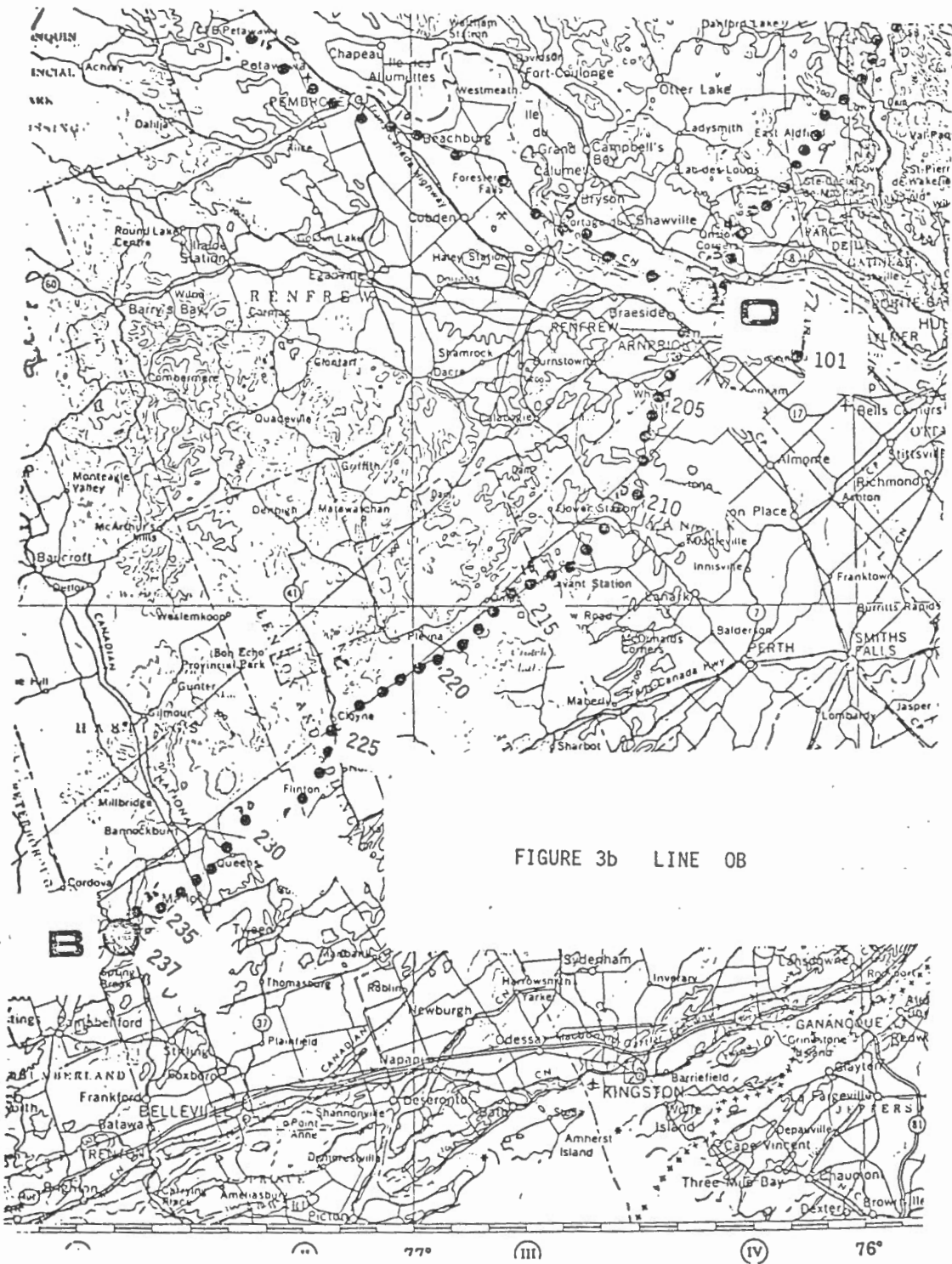


FIGURE 3b LINE OB

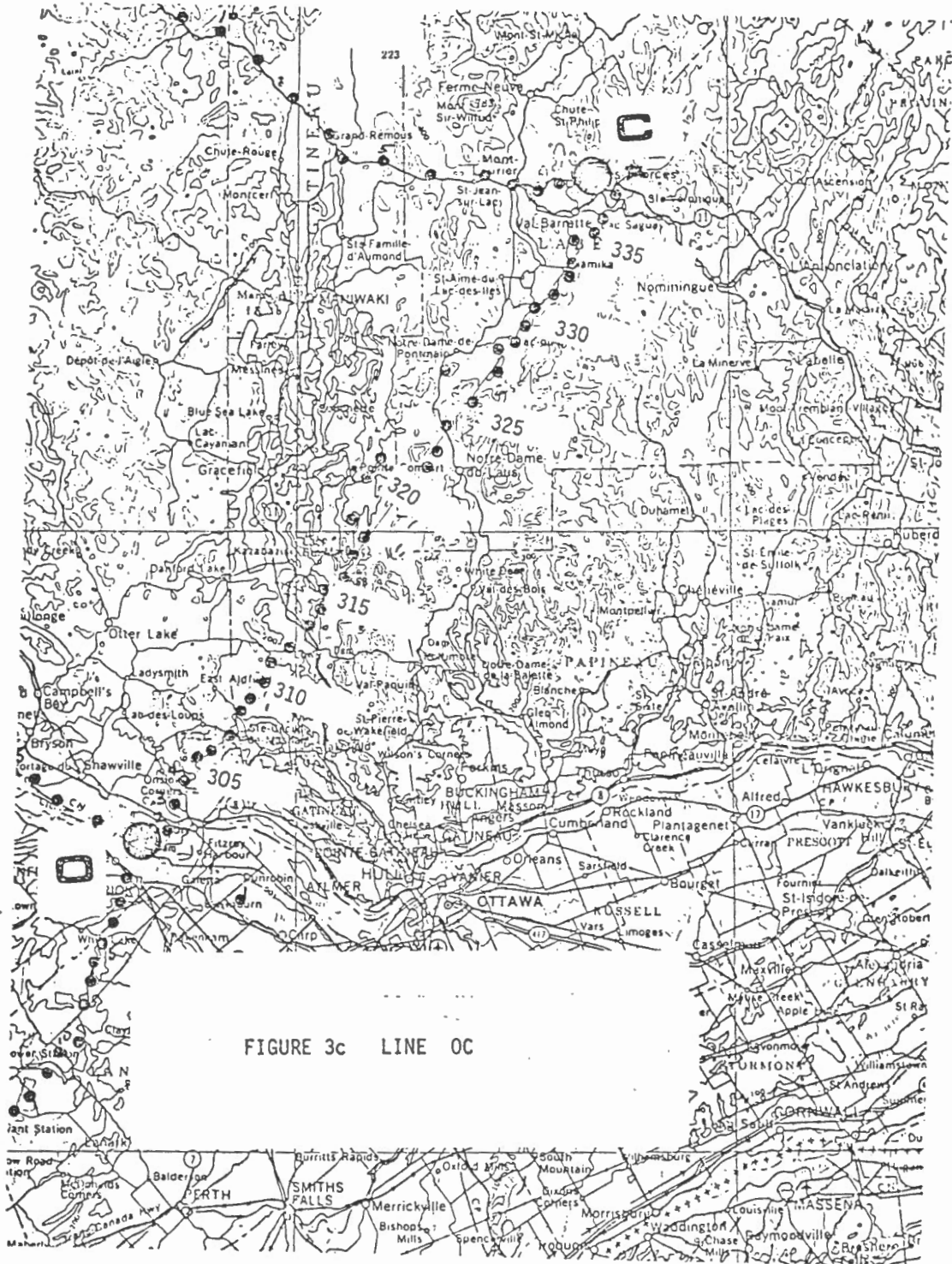


FIGURE 3c LINE OC

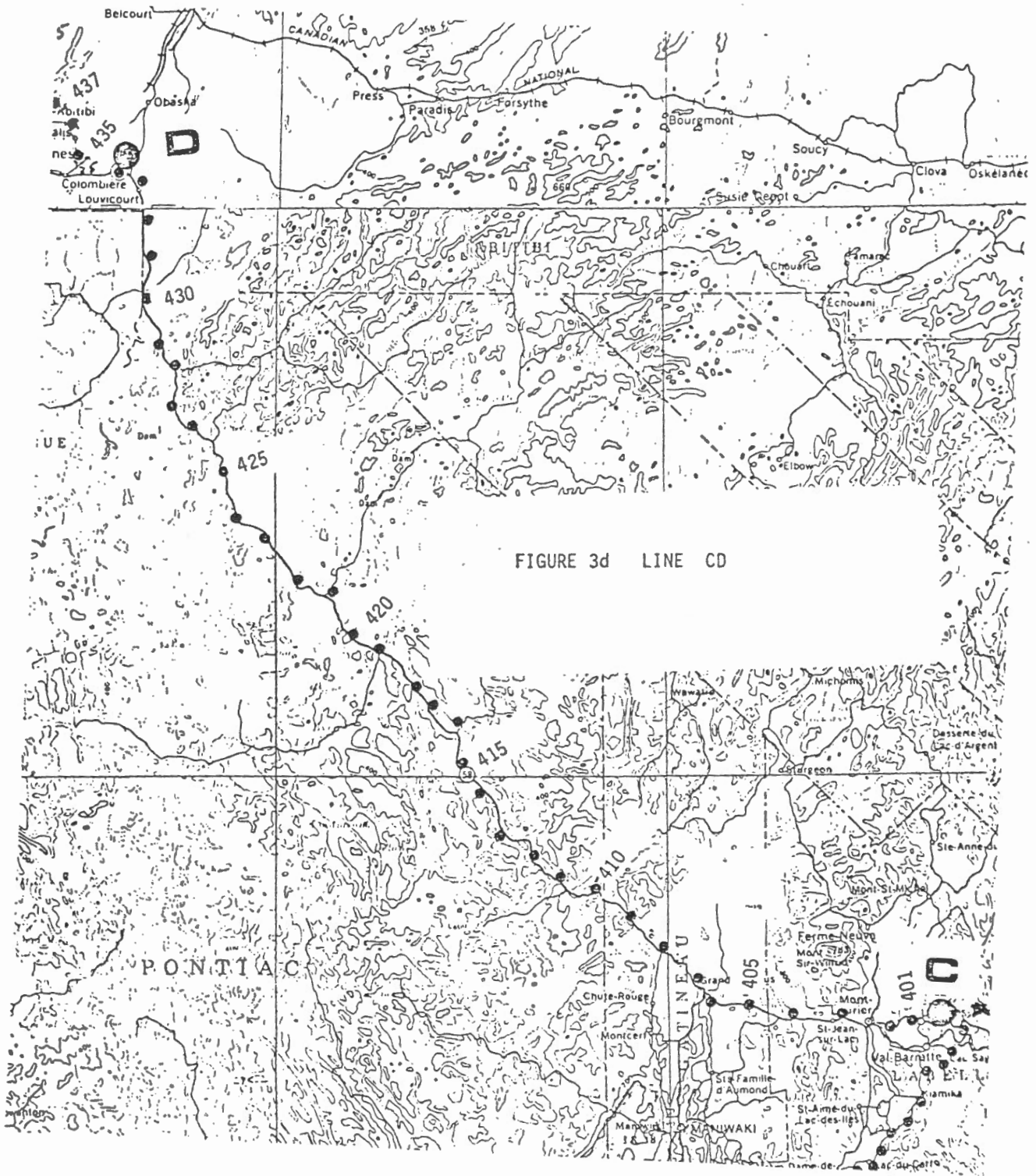


FIGURE 3d LINE CD

TORY

A. B. I. T. B. I.

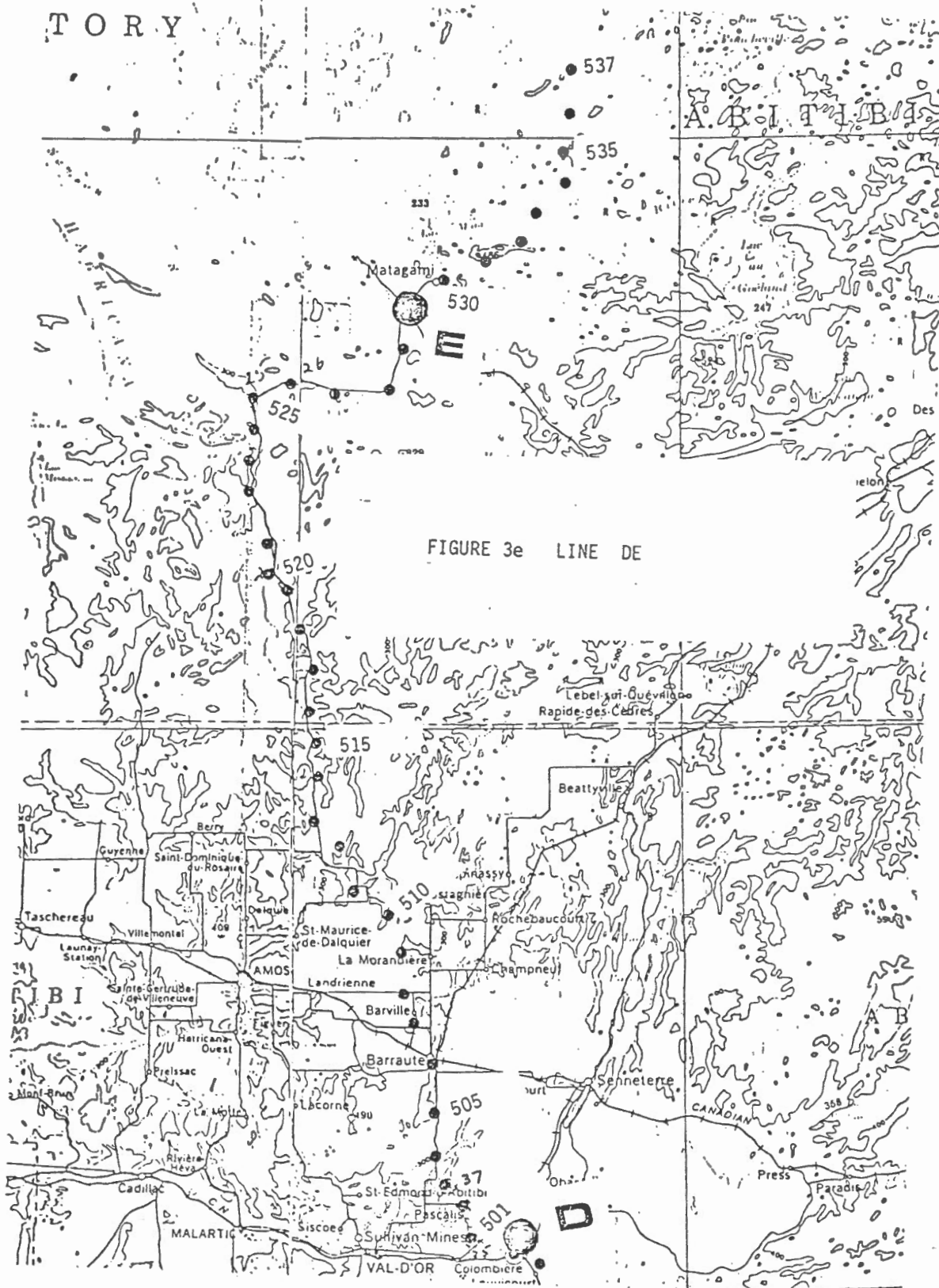


FIGURE 3e LINE DE

R. B. I.

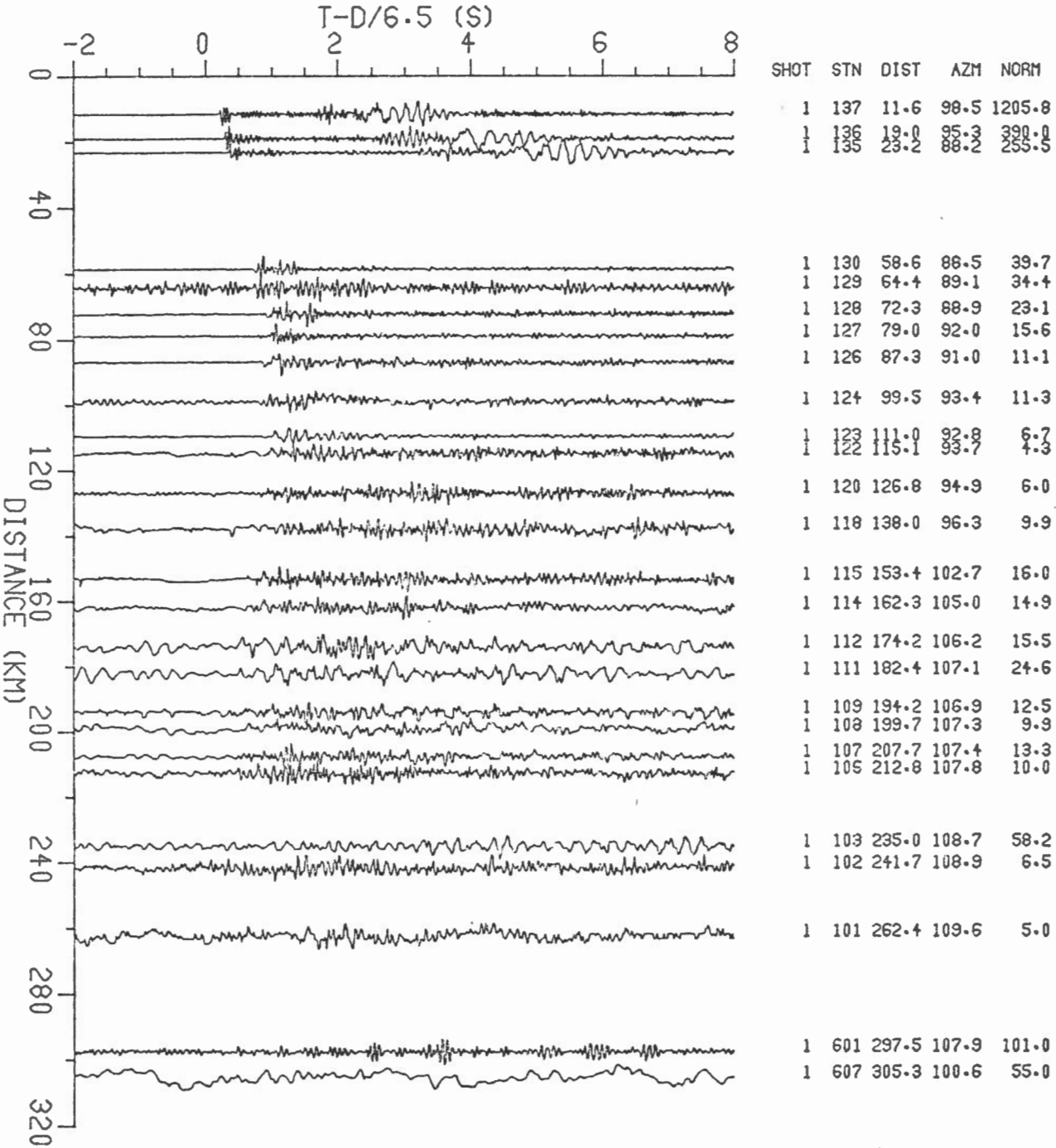
CANADIAN

VAL-D'OR

Figure 4a

1982 OTTAWA GRABEN EXPERIMENT
RAW DATA

LINE 0A SHOT A



1982 OTTAWA GRABEN EXPERIMENT
LINE 0A SHOT A

Figure 4b

1982 OTTAWA GRABEN EXPERIMENT

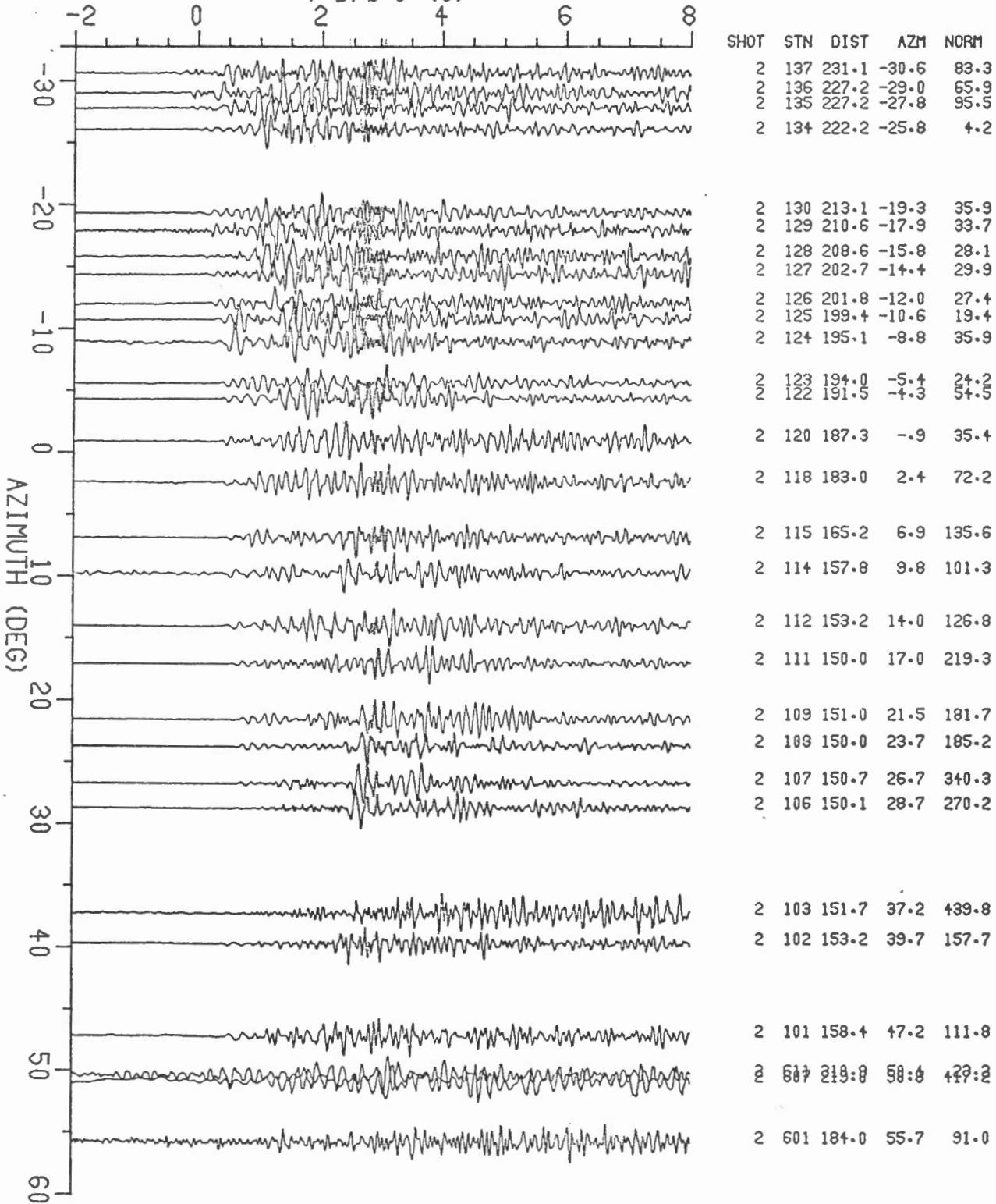
LINE OA

SHOT B

FAN

RAW DATA

T-D/6-5 (S)



1982 OTTAWA GRABEN EXPERIMENT

LINE OA

SHOT B

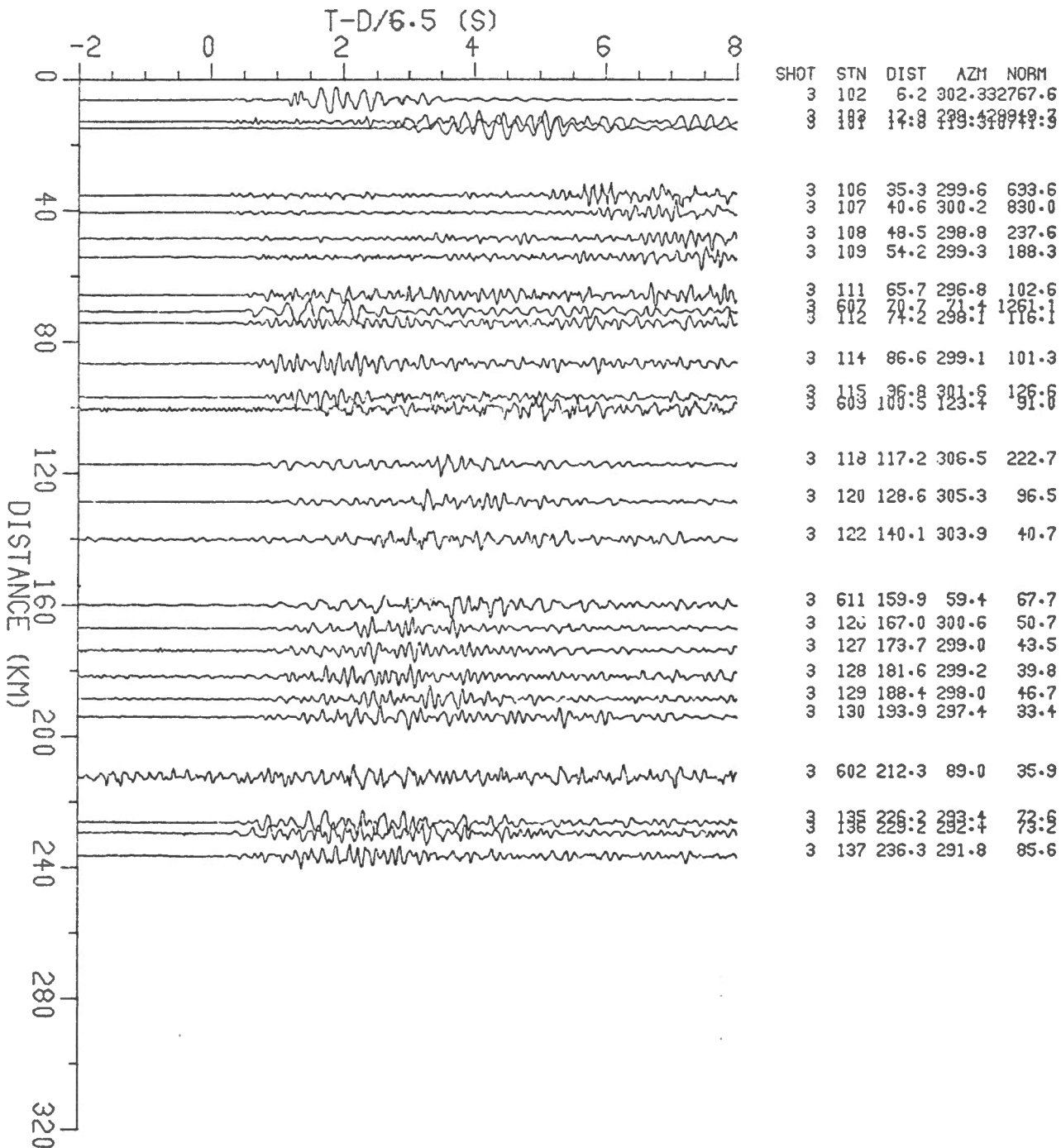
Figure 4c

1982 OTTAWA GRABEN EXPERIMENT

LINE OA

SHOT 0

RAW DATA



1982 OTTAWA GRABEN EXPERIMENT LINE OA SHOT 0

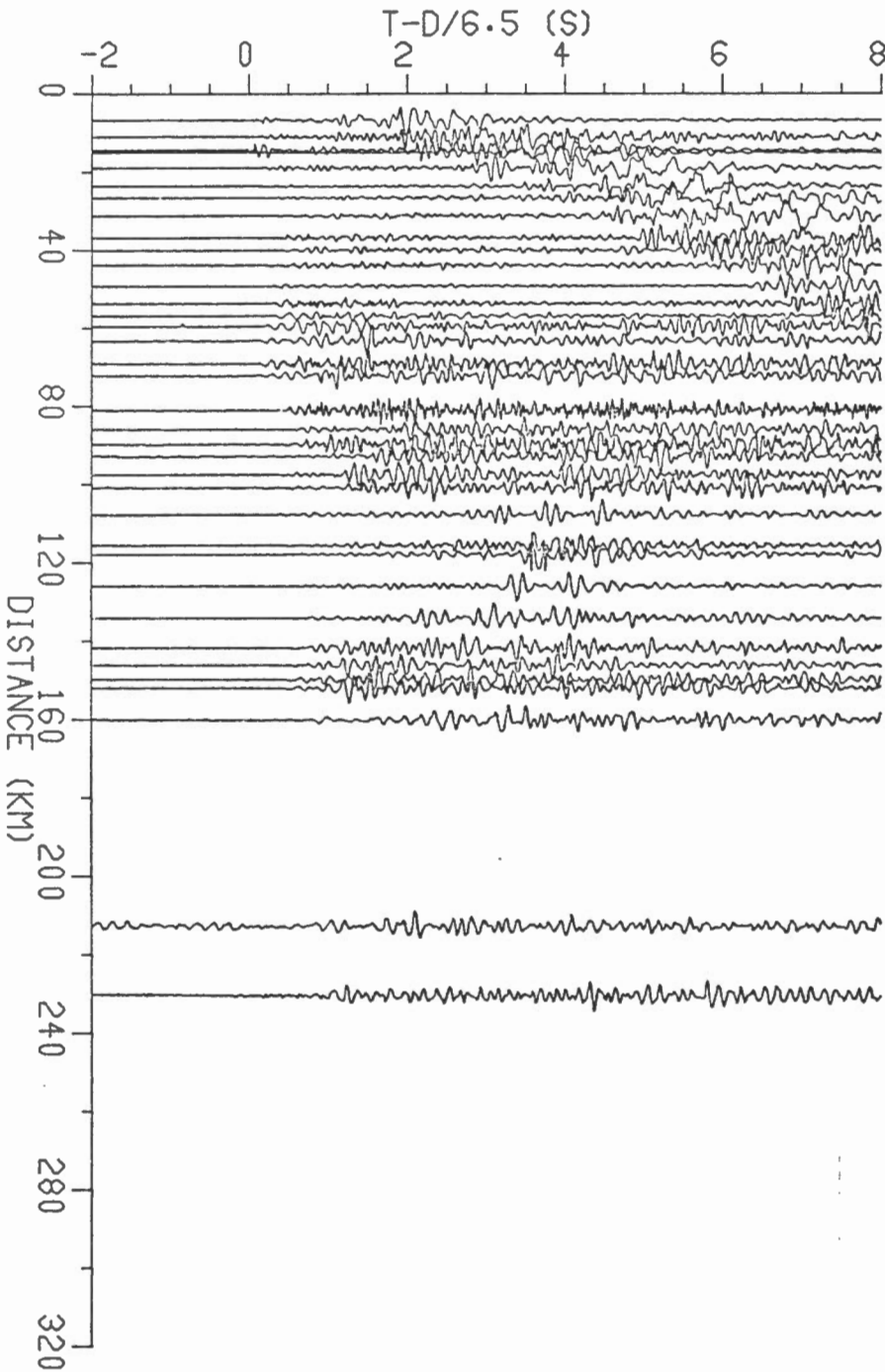
Figure 4d

1982 OTTAWA GRABEN EXPERIMENT

LINE 0B

SHOT 0

RAW DATA

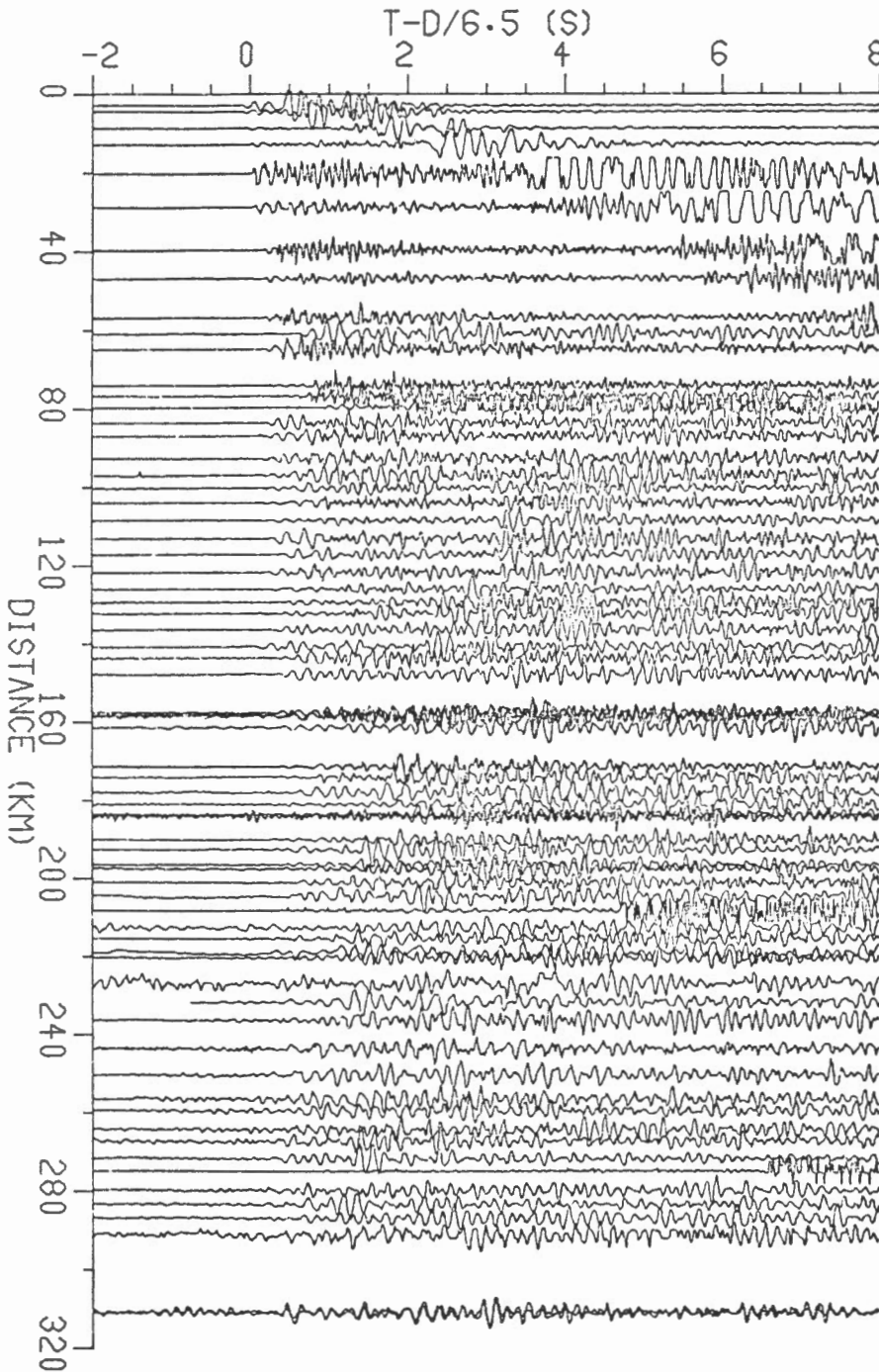


SHOT	STN	DIST	AZM	NORM
+	202	7.0	197.6	919.2
+	203	11.4	200.0	100.0
+	204	15.8	198.0	100.0
+	205	19.2	201.0	101.0
+	206	23.6	199.0	101.0
+	207	28.0	202.0	101.0
+	208	31.4	199.0	101.0
+	209	35.8	197.0	101.0
+	210	40.2	200.0	101.0
+	211	44.6	204.0	101.0
+	212	49.0	204.0	101.0
+	213	53.4	200.0	101.0
+	214	57.8	204.0	101.0
+	215	62.2	212.0	111.7
+	216	66.6	212.0	88.6
+	217	71.0	216.0	88.6
+	218	75.4	216.0	88.6
+	220	81.1	216.5	69.6
+	221	85.5	218.0	11.0
+	222	89.9	218.0	11.0
+	223	94.3	218.0	11.0
+	224	98.7	218.0	11.0
+	225	103.1	218.0	11.0
+	226	107.8	219.7	68.4
+	227	112.2	218.0	81.0
+	228	116.6	218.0	81.0
+	229	121.0	220.3	121.6
+	230	126.0	220.3	121.6
+	232	134.2	221.2	112.7
+	234	141.8	221.5	48.8
+	235	146.2	221.5	198.0
+	236	150.6	222.0	188.0
+	237	155.0	222.0	188.0
+	611	160.1	59.5	47.5

1982 OTTAWA GRABEN EXPERIMENT LINE 0B SHOT 0

Figure 4e

1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT B
RAW DATA



SHOT	STATION	DIST	AZIM	NO	TIME
5	232	20.3	51.7	257.8	
5	230	28.8	52.6	257.8	
5	228	39.7	53.8	257.8	
5	226	46.9	48.8	257.8	
5	224	56.8	46.0	249.4	
5	222	67.0	47.7	241.0	
5	220	78.0	49.2	232.7	
5	218	89.0	50.7	224.4	
5	216	100.0	52.2	216.1	
5	214	111.0	53.7	207.8	
5	212	122.0	55.2	199.5	
5	210	133.0	56.7	191.2	
5	208	144.0	58.2	182.9	
5	206	155.0	59.7	174.6	
5	204	166.0	61.2	166.3	
5	202	177.0	62.7	158.0	
5	200	188.0	64.2	149.7	
5	198	200.0	65.7	141.4	
5	196	211.0	67.2	133.1	
5	194	222.0	68.7	124.8	
5	192	233.0	70.2	116.5	
5	190	244.0	71.7	108.2	
5	188	255.0	73.2	99.9	
5	186	266.0	74.7	91.6	
5	184	277.0	76.2	83.3	
5	182	288.0	77.7	75.0	
5	180	299.0	79.2	66.7	
5	178	310.0	80.7	58.4	
5	176	321.0	82.2	50.1	
5	174	332.0	83.7	41.8	
5	172	343.0	85.2	33.5	
5	170	354.0	86.7	25.2	
5	168	365.0	88.2	16.9	
5	166	376.0	89.7	8.6	
5	164	387.0	91.2	0.3	
5	162	398.0	92.7	-8.0	
5	160	409.0	94.2	-16.3	
5	158	420.0	95.7	-24.6	
5	156	431.0	97.2	-32.9	
5	154	442.0	98.7	-41.2	
5	152	453.0	100.2	-49.5	
5	150	464.0	101.7	-57.8	
5	148	475.0	103.2	-66.1	
5	146	486.0	104.7	-74.4	
5	144	497.0	106.2	-82.7	
5	142	508.0	107.7	-91.0	
5	140	519.0	109.2	-99.3	
5	138	530.0	110.7	-107.6	
5	136	541.0	112.2	-115.9	
5	134	552.0	113.7	-124.2	
5	132	563.0	115.2	-132.5	
5	130	574.0	116.7	-140.8	
5	128	585.0	118.2	-149.1	
5	126	596.0	119.7	-157.4	
5	124	607.0	121.2	-165.7	
5	122	618.0	122.7	-174.0	
5	120	629.0	124.2	-182.3	
5	118	640.0	125.7	-190.6	
5	116	651.0	127.2	-198.9	
5	114	662.0	128.7	-207.2	
5	112	673.0	130.2	-215.5	
5	110	684.0	131.7	-223.8	
5	108	695.0	133.2	-232.1	
5	106	706.0	134.7	-240.4	
5	104	717.0	136.2	-248.7	
5	102	728.0	137.7	-257.0	
5	100	739.0	139.2	-265.3	
5	98	750.0	140.7	-273.6	
5	96	761.0	142.2	-281.9	
5	94	772.0	143.7	-290.2	
5	92	783.0	145.2	-298.5	
5	90	794.0	146.7	-306.8	
5	88	805.0	148.2	-315.1	
5	86	816.0	149.7	-323.4	
5	84	827.0	151.2	-331.7	
5	82	838.0	152.7	-340.0	
5	80	849.0	154.2	-348.3	
5	78	860.0	155.7	-356.6	
5	76	871.0	157.2	-364.9	
5	74	882.0	158.7	-373.2	
5	72	893.0	160.2	-381.5	
5	70	904.0	161.7	-389.8	
5	68	915.0	163.2	-398.1	
5	66	926.0	164.7	-406.4	
5	64	937.0	166.2	-414.7	
5	62	948.0	167.7	-423.0	
5	60	959.0	169.2	-431.3	
5	58	970.0	170.7	-439.6	
5	56	981.0	172.2	-447.9	
5	54	992.0	173.7	-456.2	
5	52	1003.0	175.2	-464.5	
5	50	1014.0	176.7	-472.8	
5	48	1025.0	178.2	-481.1	
5	46	1036.0	179.7	-489.4	
5	44	1047.0	181.2	-497.7	
5	42	1058.0	182.7	-506.0	
5	40	1069.0	184.2	-514.3	
5	38	1080.0	185.7	-522.6	
5	36	1091.0	187.2	-530.9	
5	34	1102.0	188.7	-539.2	
5	32	1113.0	190.2	-547.5	
5	30	1124.0	191.7	-555.8	
5	28	1135.0	193.2	-564.1	
5	26	1146.0	194.7	-572.4	
5	24	1157.0	196.2	-580.7	
5	22	1168.0	197.7	-589.0	
5	20	1179.0	199.2	-597.3	
5	18	1190.0	200.7	-605.6	
5	16	1201.0	202.2	-613.9	
5	14	1212.0	203.7	-622.2	
5	12	1223.0	205.2	-630.5	
5	10	1234.0	206.7	-638.8	
5	8	1245.0	208.2	-647.1	
5	6	1256.0	209.7	-655.4	
5	4	1267.0	211.2	-663.7	
5	2	1278.0	212.7	-672.0	
5	0	1289.0	214.2	-680.3	
5	320	611	310.9	50.4	19.9

1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT B

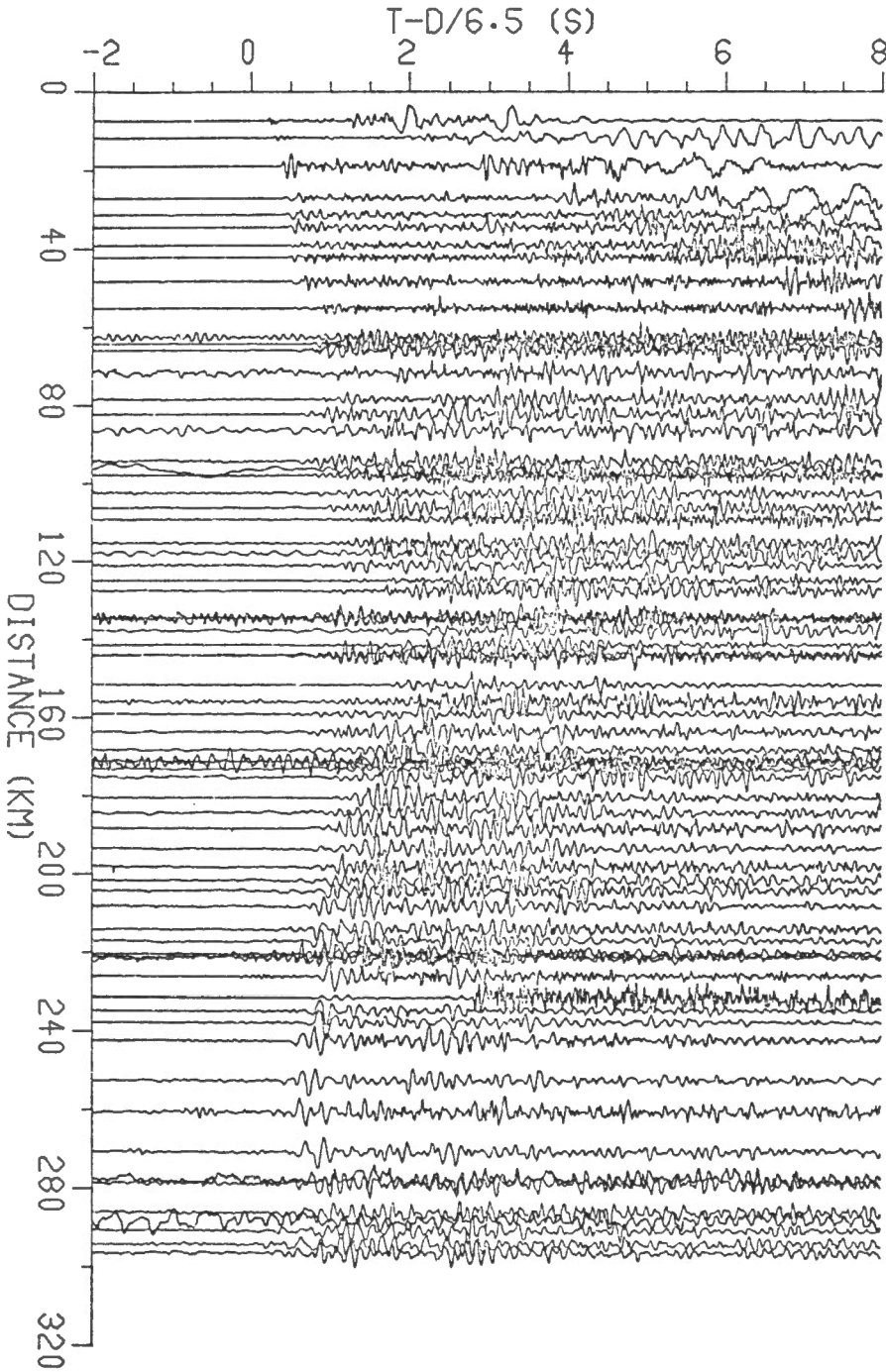
Figure 4f

1982 OTTAWA GRABEN EXPERIMENT

LINE BC

SHOT C

RAW DATA

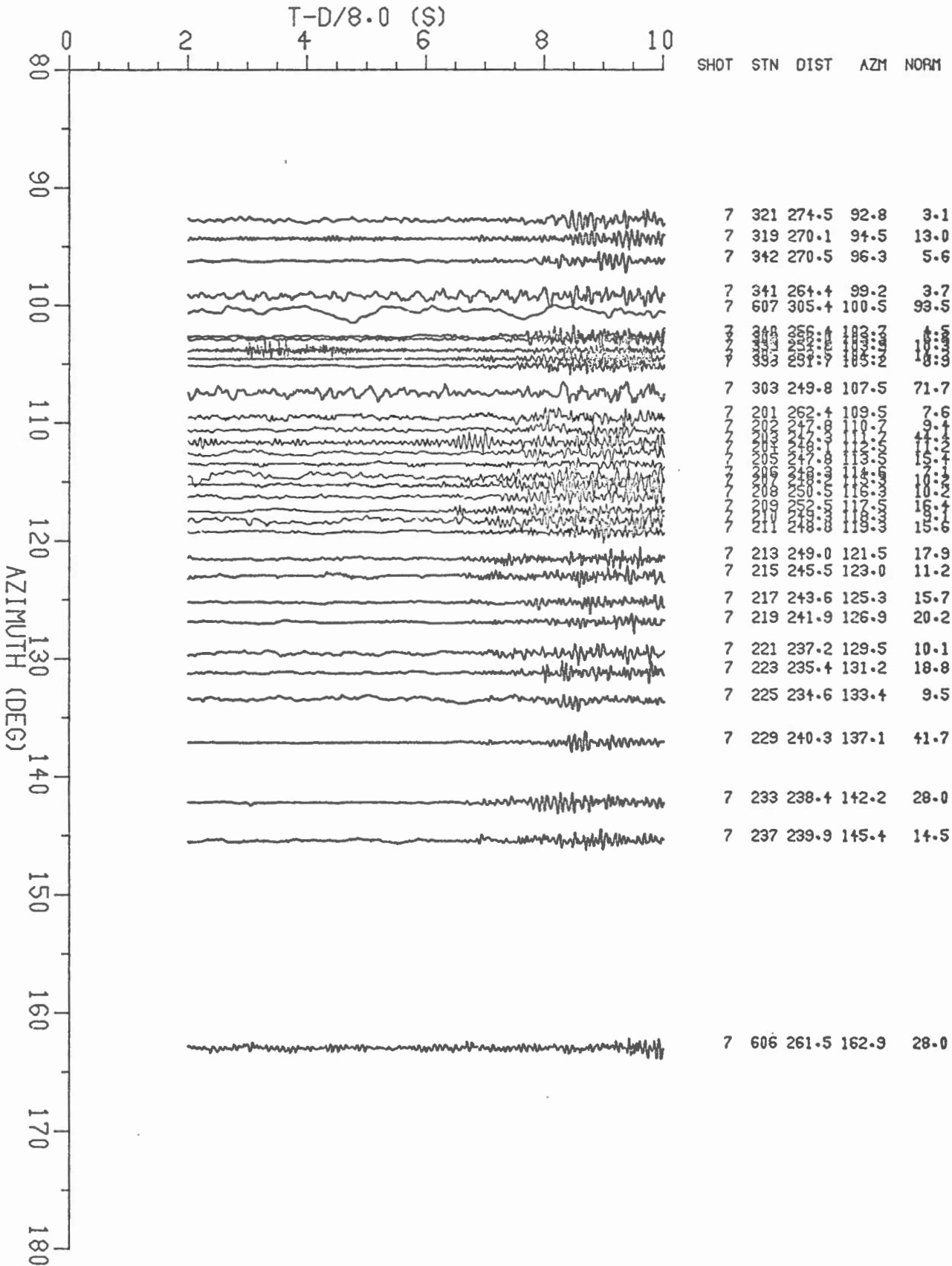


SHOT	STN	DIST	AZM	NORM
10	336	7.4	217.2	5235.5
10	335	11.8	217.8	6978.5
10	333	19.0	214.1	773.2
10	327	27.1	215.7	122.7
10	328	31.2	217.2	104.4
10	329	35.3	218.7	71.4
10	326	48.5	224.3	69.6
10	324	55.2	215.7	88.9
10	322	63.3	215.0	121.2
10	320	71.8	222.1	320.2
10	318	78.5	217.5	149.7
10	316	86.6	217.2	201.8
10	314	94.7	217.2	201.8
10	312	102.8	217.2	201.8
10	310	110.9	217.2	201.8
10	308	119.0	217.2	201.8
10	306	127.1	217.2	201.8
10	304	135.2	217.2	201.8
10	302	143.3	217.2	201.8
10	300	151.4	217.2	201.8
10	298	159.5	217.2	201.8
10	296	167.6	217.2	201.8
10	294	175.7	217.2	201.8
10	292	183.8	217.2	201.8
10	290	191.9	217.2	201.8
10	288	200.0	217.2	201.8
10	286	208.1	217.2	201.8
10	284	216.2	217.2	201.8
10	282	224.3	217.2	201.8
10	280	232.4	217.2	201.8
10	278	240.5	217.2	201.8
10	276	248.6	217.2	201.8
10	274	256.7	217.2	201.8
10	272	264.8	217.2	201.8
10	270	272.9	217.2	201.8
10	268	281.0	217.2	201.8
10	266	289.1	217.2	201.8
10	264	297.2	217.2	201.8
10	262	305.3	217.2	201.8
10	260	313.4	217.2	201.8
10	258	321.5	217.2	201.8
10	256	329.6	217.2	201.8
6	226	252.6	218.3	11.0
6	228	260.5	217.9	9.2
6	230	270.8	218.7	12.0
10	222	226.6	219.2	15.2
10	224	234.5	219.8	15.2
10	226	242.4	220.4	15.2
10	228	250.3	221.0	15.2
10	230	258.2	221.6	15.2
10	232	266.1	222.2	15.2
10	234	274.0	222.8	15.2
10	236	281.9	223.4	15.2
10	238	289.8	224.0	15.2
10	240	297.7	224.6	15.2
10	242	305.6	225.2	15.2
10	244	313.5	225.8	15.2
10	246	321.4	226.4	15.2
10	248	329.3	227.0	15.2
10	250	337.2	227.6	15.2
10	252	345.1	228.2	15.2
10	254	353.0	228.8	15.2
10	256	360.9	229.4	15.2
10	258	368.8	230.0	15.2
10	260	376.7	230.6	15.2
10	262	384.6	231.2	15.2
10	264	392.5	231.8	15.2
10	266	400.4	232.4	15.2
10	268	408.3	233.0	15.2
10	270	416.2	233.6	15.2
10	272	424.1	234.2	15.2
10	274	432.0	234.8	15.2
10	276	439.9	235.4	15.2
10	278	447.8	236.0	15.2
10	280	455.7	236.6	15.2
10	282	463.6	237.2	15.2
10	284	471.5	237.8	15.2
10	286	479.4	238.4	15.2
10	288	487.3	239.0	15.2
10	290	495.2	239.6	15.2
10	292	503.1	240.2	15.2
10	294	511.0	240.8	15.2
10	296	518.9	241.4	15.2
10	298	526.8	242.0	15.2
10	300	534.7	242.6	15.2
10	302	542.6	243.2	15.2
10	304	550.5	243.8	15.2
10	306	558.4	244.4	15.2
10	308	566.3	245.0	15.2
10	310	574.2	245.6	15.2
10	312	582.1	246.2	15.2
10	314	590.0	246.8	15.2
10	316	597.9	247.4	15.2
10	318	605.8	248.0	15.2
10	320	613.7	248.6	15.2
10	322	621.6	249.2	15.2
10	324	629.5	249.8	15.2
10	326	637.4	250.4	15.2
10	328	645.3	251.0	15.2
10	330	653.2	251.6	15.2
10	332	661.1	252.2	15.2
10	334	669.0	252.8	15.2
10	336	676.9	253.4	15.2
10	338	684.8	254.0	15.2
10	340	692.7	254.6	15.2
10	342	700.6	255.2	15.2
10	344	708.5	255.8	15.2
10	346	716.4	256.4	15.2
10	348	724.3	257.0	15.2
10	350	732.2	257.6	15.2
10	352	740.1	258.2	15.2
10	354	748.0	258.8	15.2
10	356	755.9	259.4	15.2
10	358	763.8	260.0	15.2
10	360	771.7	260.6	15.2
10	362	779.6	261.2	15.2
10	364	787.5	261.8	15.2
10	366	795.4	262.4	15.2
10	368	803.3	263.0	15.2
10	370	811.2	263.6	15.2
10	372	819.1	264.2	15.2
10	374	827.0	264.8	15.2
10	376	834.9	265.4	15.2
10	378	842.8	266.0	15.2
10	380	850.7	266.6	15.2
10	382	858.6	267.2	15.2
10	384	866.5	267.8	15.2
10	386	874.4	268.4	15.2
10	388	882.3	269.0	15.2
10	390	890.2	269.6	15.2
10	392	898.1	270.2	15.2
10	394	906.0	270.8	15.2
10	396	913.9	271.4	15.2
10	398	921.8	272.0	15.2
10	400	929.7	272.6	15.2
10	402	937.6	273.2	15.2
10	404	945.5	273.8	15.2
10	406	953.4	274.4	15.2
10	408	961.3	275.0	15.2
10	410	969.2	275.6	15.2
10	412	977.1	276.2	15.2
10	414	985.0	276.8	15.2
10	416	992.9	277.4	15.2
10	418	1000.8	278.0	15.2
10	420	1008.7	278.6	15.2
10	422	1016.6	279.2	15.2
10	424	1024.5	279.8	15.2
10	426	1032.4	280.4	15.2
10	428	1040.3	281.0	15.2
10	430	1048.2	281.6	15.2
10	432	1056.1	282.2	15.2
10	434	1064.0	282.8	15.2
10	436	1071.9	283.4	15.2
10	438	1079.8	284.0	15.2
10	440	1087.7	284.6	15.2
10	442	1095.6	285.2	15.2
10	444	1103.5	285.8	15.2
10	446	1111.4	286.4	15.2
10	448	1119.3	287.0	15.2
10	450	1127.2	287.6	15.2
10	452	1135.1	288.2	15.2
10	454	1143.0	288.8	15.2
10	456	1150.9	289.4	15.2
10	458	1158.8	290.0	15.2
10	460	1166.7	290.6	15.2
10	462	1174.6	291.2	15.2
10	464	1182.5	291.8	15.2
10	466	1190.4	292.4	15.2
10	468	1198.3	293.0	15.2
10	470	1206.2	293.6	15.2
10	472	1214.1	294.2	15.2
10	474	1222.0	294.8	15.2
10	476	1229.9	295.4	15.2
10	478	1237.8	296.0	15.2
10	480	1245.7	296.6	15.2
10	482	1253.6	297.2	15.2
10	484	1261.5	297.8	15.2
10	486	1269.4	298.4	15.2
10	488	1277.3	299.0	15.2
10	490	1285.2	299.6	15.2
10	492	1293.1	300.2	15.2
10	494	1301.0	300.8	15.2
10	496	1308.9	301.4	15.2
10	498	1316.8	302.0	15.2
10	500	1324.7	302.6	15.2

1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT C

Figure 4g

1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT A FAN
 RAW DATA

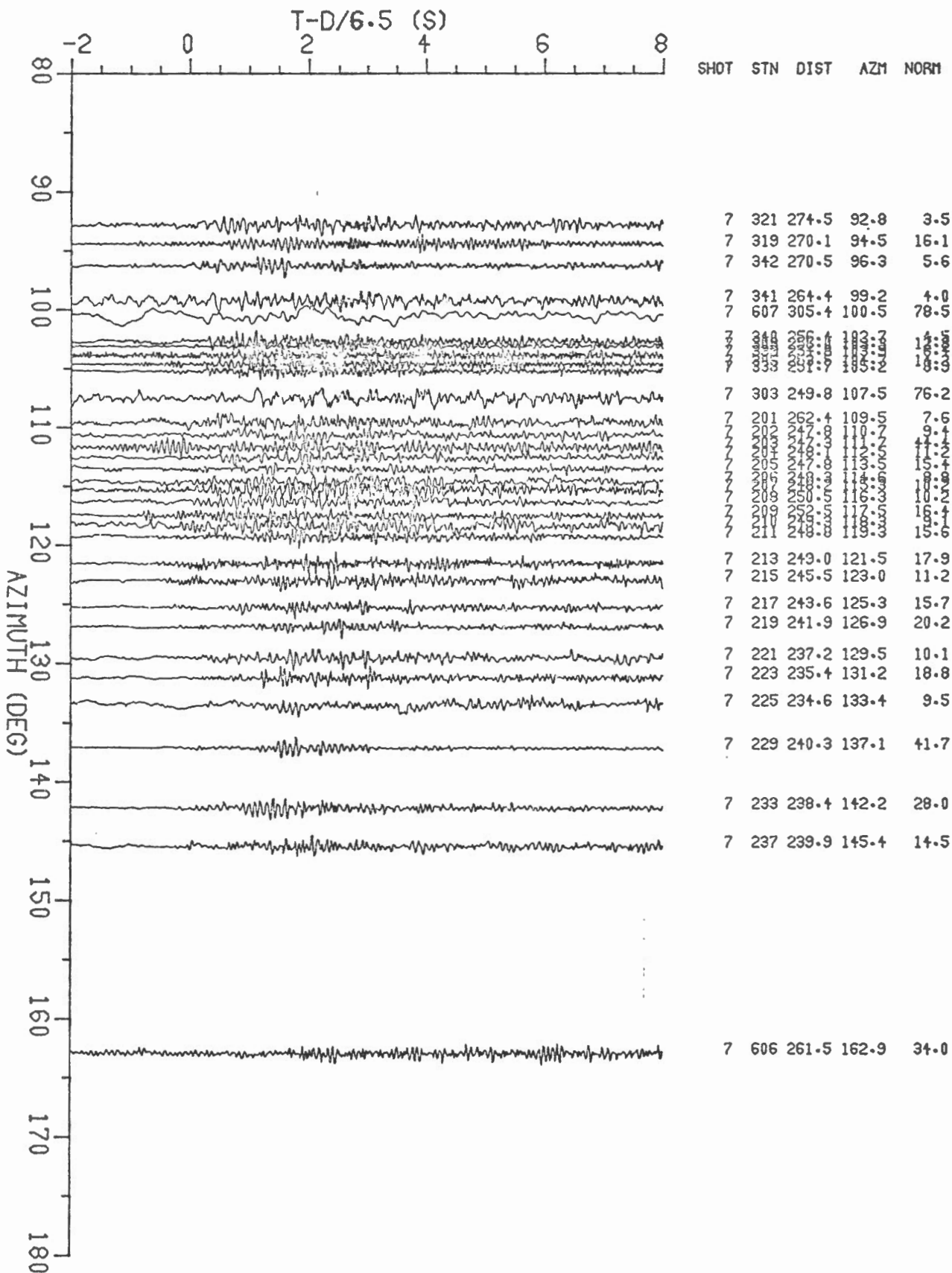


1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT A FAN

Figure 4h

1982 OTTAWA GRABEN EXPERIMENT LINE BC SHOT A FAN

RAW DATA



1982 OTTAWA GRABEN EXPERIMENT

LINE BC

SHOT A FAN

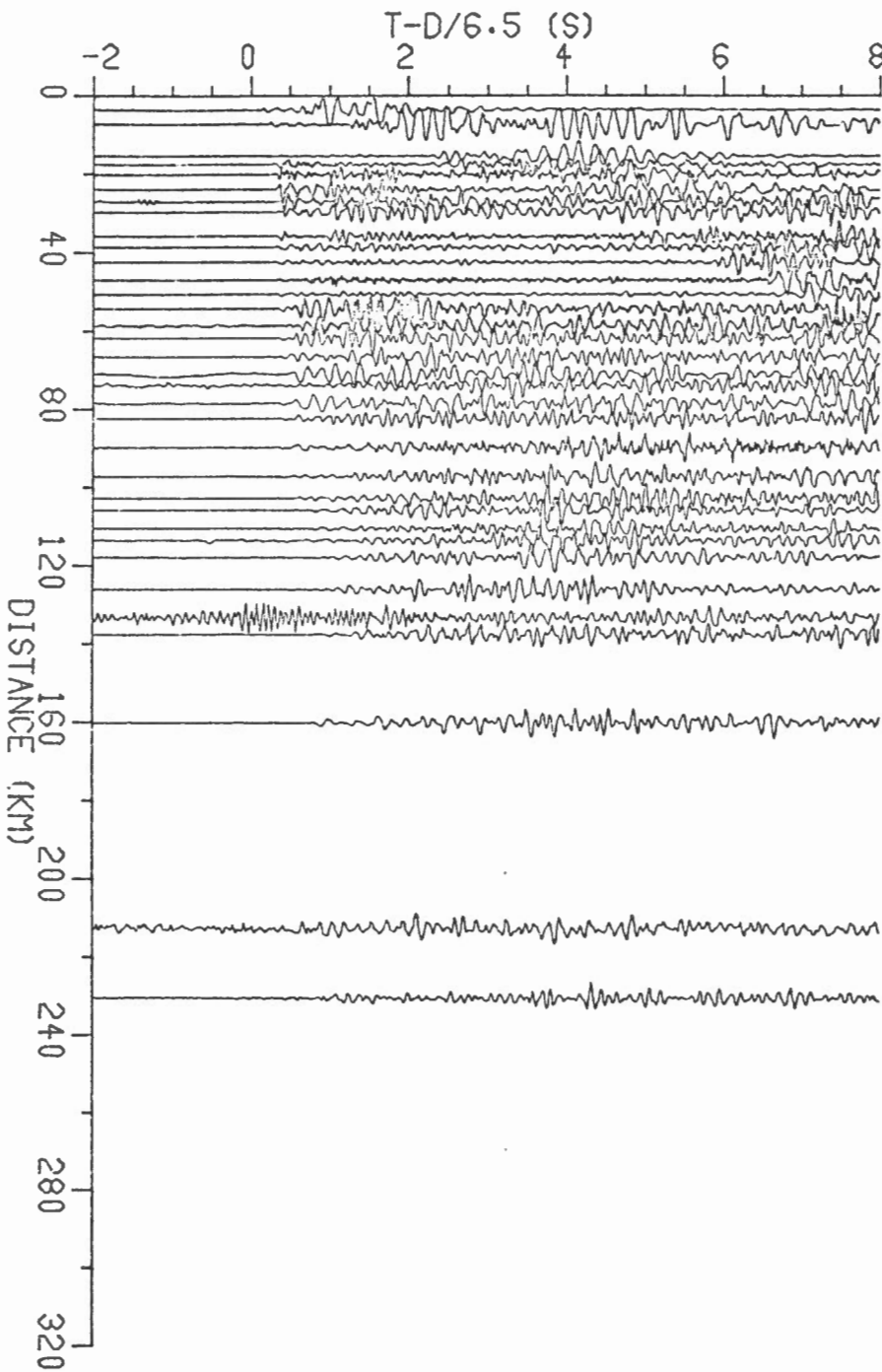
Figure 4i

1982 OTTAWA GRABEN EXPERIMENT

LINE OC

SHOT 0

RAW DATA



SHOT	STATION	DIST	AZ	NORM
8	324	89.8	36.4	41.8
8	326	97.2	32.0	50.2
8	333	126.1	35.2	188.9
8	335	133.2	35.7	957.6
8	336	137.0	35.8	81.4
8	611	160.1	59.5	53.9
8	602	212.7	89.1	48.1
8	606	230.5	224.9	243.2

1982 OTTAWA GRABEN EXPERIMENT

LINE OC

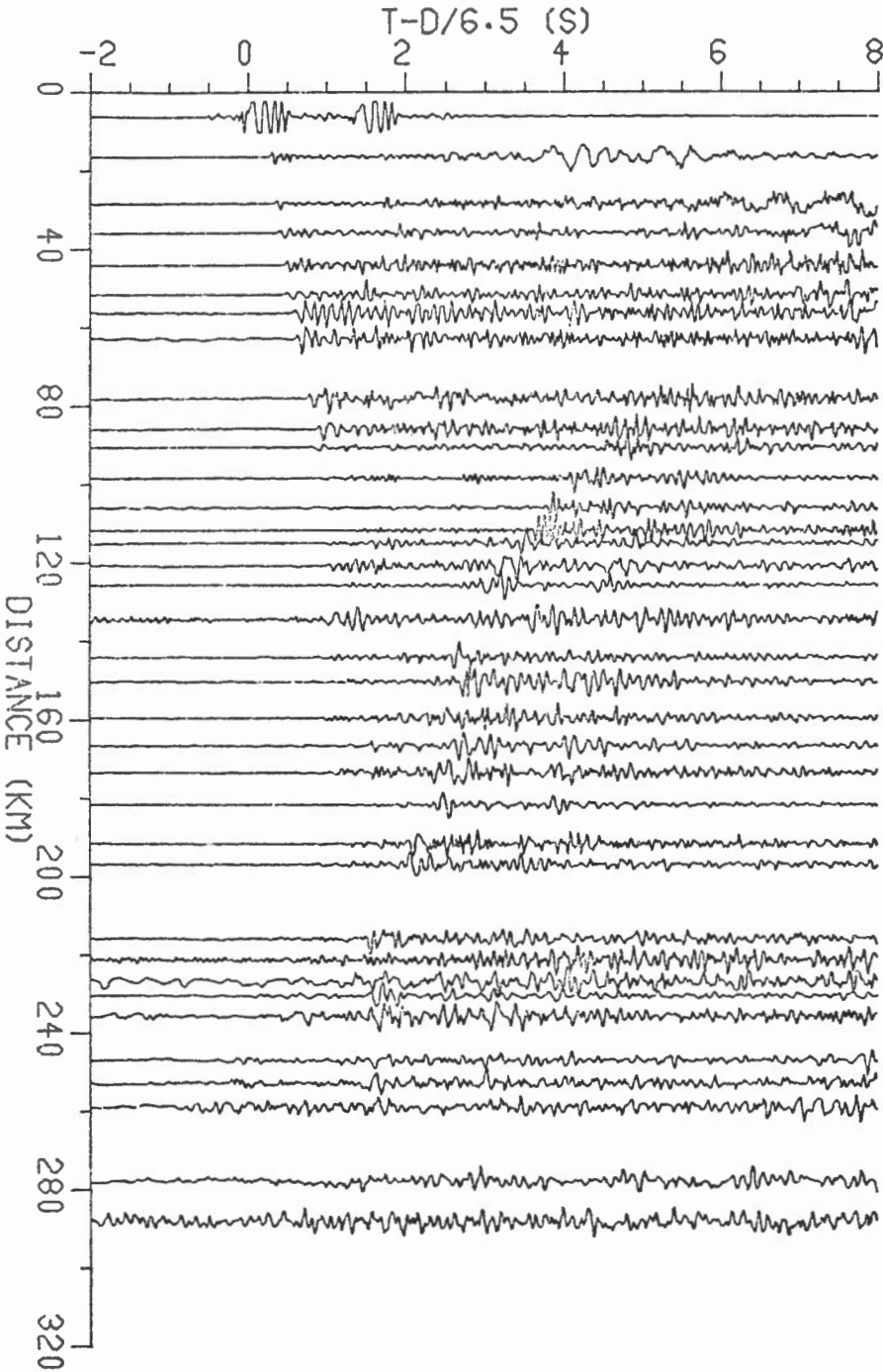
SHOT 0

Figure 4j

1982 OTTAWA GRABEN EXPERIMENT
RAW DATA

LINE CD

SHOT C



SHOT	STN	DIST	AZM	NORM
11	401	6.4	266.832798.5	
11	402	16.5	264.0	1420.0
11	403	28.5	273.5	318.3
11	404	35.9	274.2	180.5
11	405	44.2	272.6	110.0
11	406	51.7	276.4	95.4
11	407	56.4	281.9	79.0
11	408	63.0	286.7	45.3
11	410	78.1	290.6	37.2
11	411	86.0	291.1	53.7
11	412	90.7	292.4	74.7
11	413	98.5	293.4	146.6
11	414	105.9	297.1	663.2
11	415	111.8	299.5	1034.5
11	416	115.8	307.2	84.5
11	417	120.9	301.4	52.1
11	418	125.8	302.2	96.2
11	601	134.5	196.2	95.9
11	420	144.1	303.3	25.4
11	421	150.7	305.6	24.8
11	422	159.6	305.1	21.1
11	423	167.0	305.8	23.1
11	424	173.5	306.0	16.4
11	425	182.5	308.1	6.3
11	426	191.6	308.9	22.8
11	427	197.2	308.9	13.5
11	430	215.8	313.3	8.6
11	431	221.1	314.4	21.2
11	432	226.8	316.2	4.2
11	433	230.8	316.8	17.3
11	434	235.6	316.3	8.7
11	435	246.9	316.0	32.0
11	436	252.7	316.6	14.0
11	437	258.8	317.1	12.5
11	608	277.8	313.0	10.0
11	604	288.1	115.9	16.6

1982 OTTAWA GRABEN EXPERIMENT

LINE CD

SHOT C

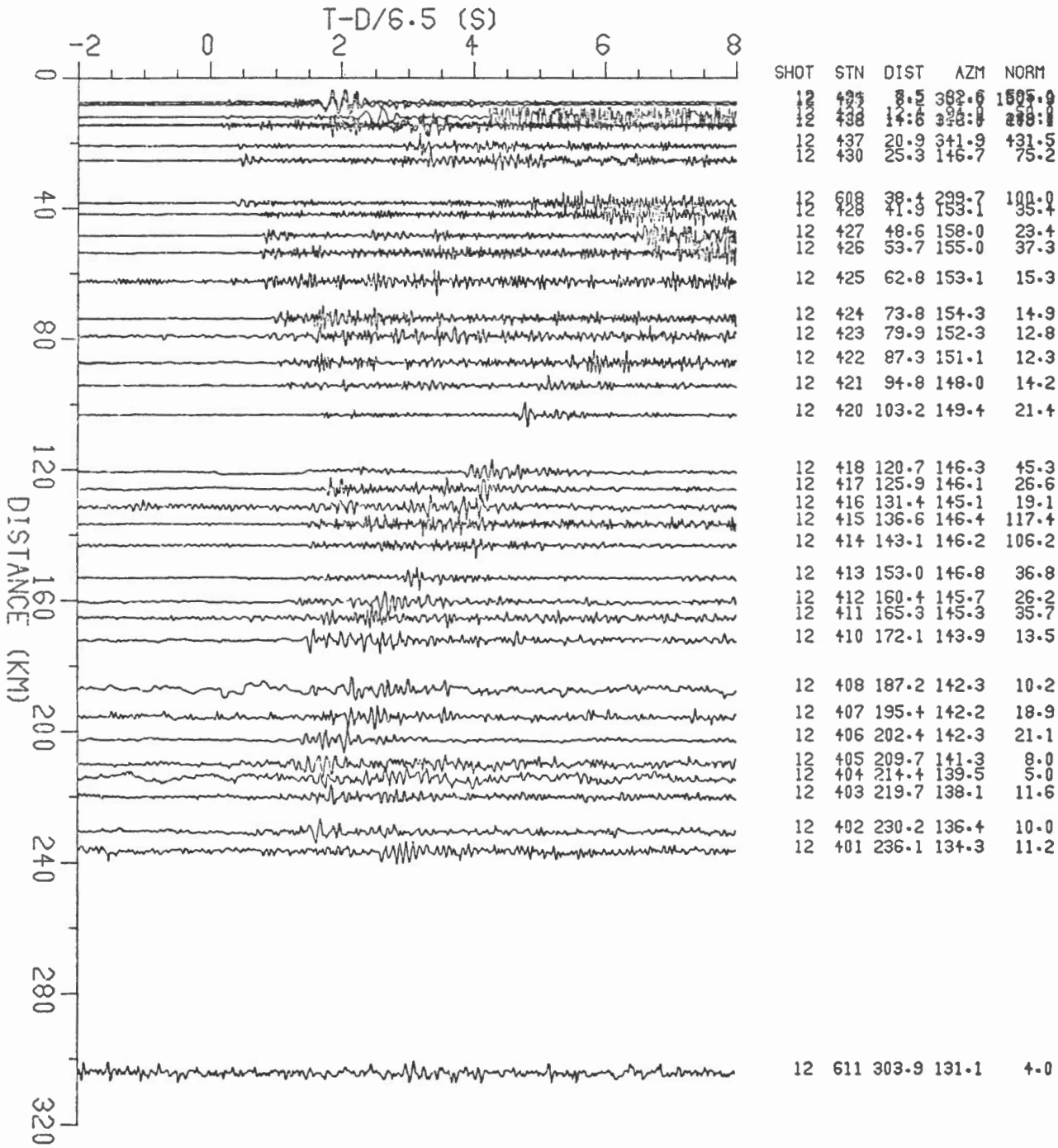
Figure 4k

1982 OTTAWA GRABEN EXPERIMENT

LINE CD

SHOT D

RAW DATA



1982 OTTAWA GRABEN EXPERIMENT

LINE CD

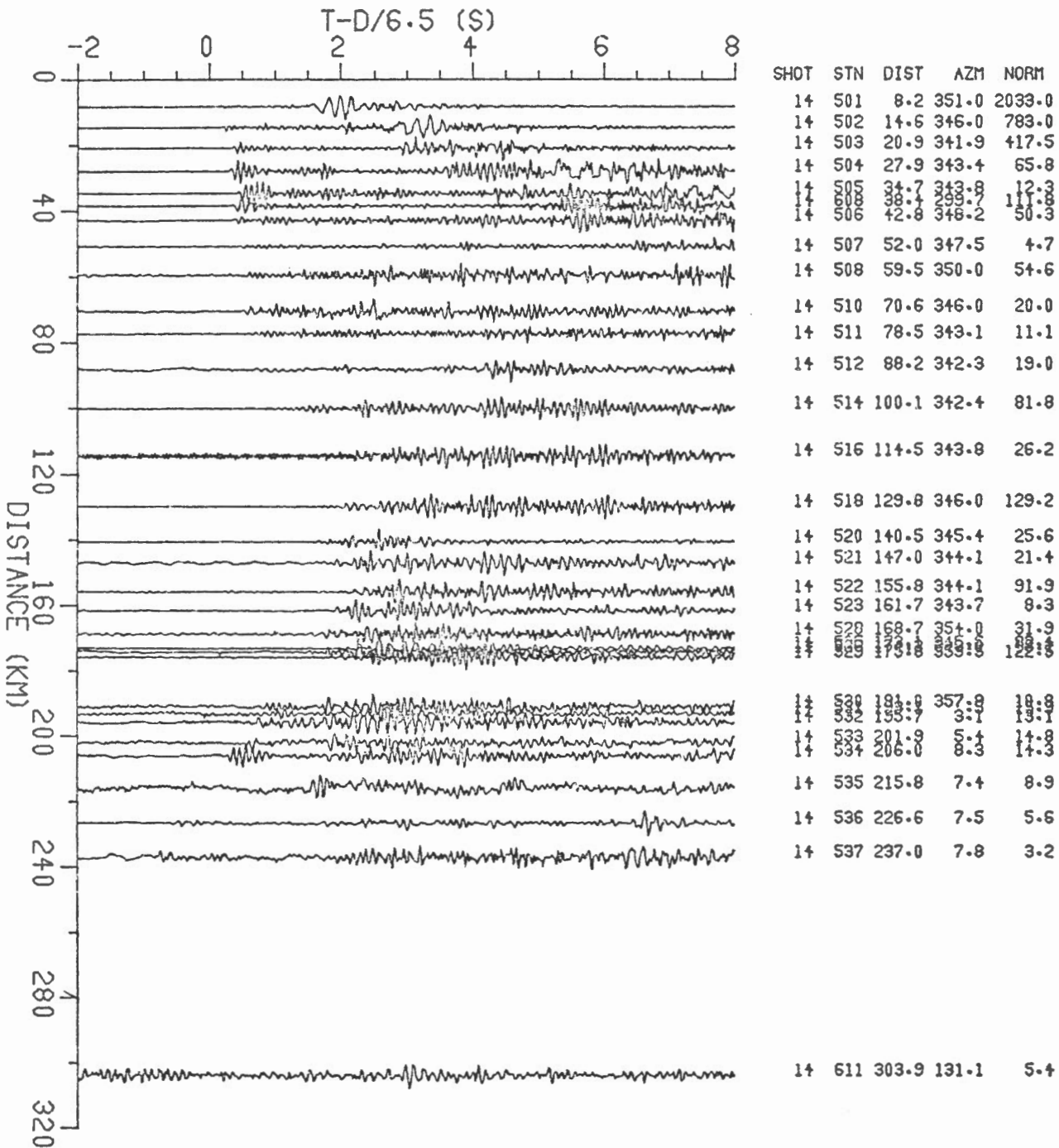
SHOT D

Figure 5a

1982 ABITIBI EXPERIMENT

LINE DE SHOT D

RAW DATA



1982 ABITIBI EXPERIMENT

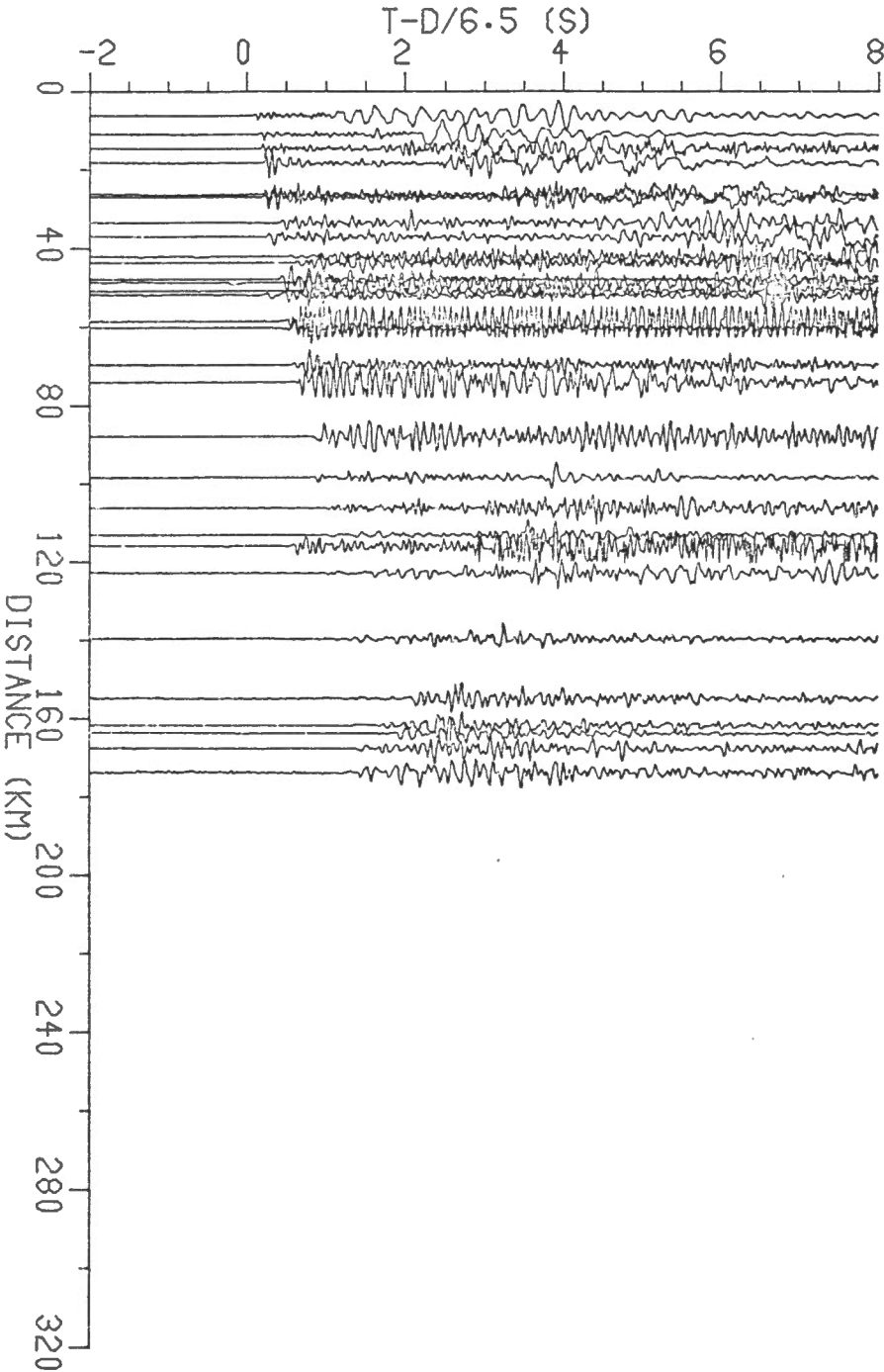
LINE DE SHOT D

Figure 5b

1982 ABITIBI EXPERIMENT

LINE DE SHOT E

RAW DATA



SHOT	STN	DIST	AZM	NORM
13	529	6.2	191.52	8962.1
13	530	11.0	30.0	3019.5
13	528	14.0	201.7	2037.0
13	531	18.3	50.0	811.0
13	532	29.8	255.8	629.0
13	525	33.5	245.7	1026.2
13	533	37.1	57.9	202.5
13	534	43.4	233.7	798.8
13	535	43.4	233.7	898.8
13	536	43.4	233.7	198.8
13	538	68.2	198.8	169.8
13	537	69.5	99.5	59.2
13	516	74.0	195.2	129.2
13	514	87.8	191.6	129.2
13	512	98.4	188.3	125.3
13	511	106.7	185.5	24.6
13	510	118.3	182.3	98.6
13	508	122.8	178.9	169.6
13	506	139.5	178.4	71.0
13	504	154.7	178.2	40.4
13	503	163.6	177.8	175.8
13	502	167.5	176.8	78.1
13	501	173.6	176.2	49.0

1982 ABITIBI EXPERIMENT

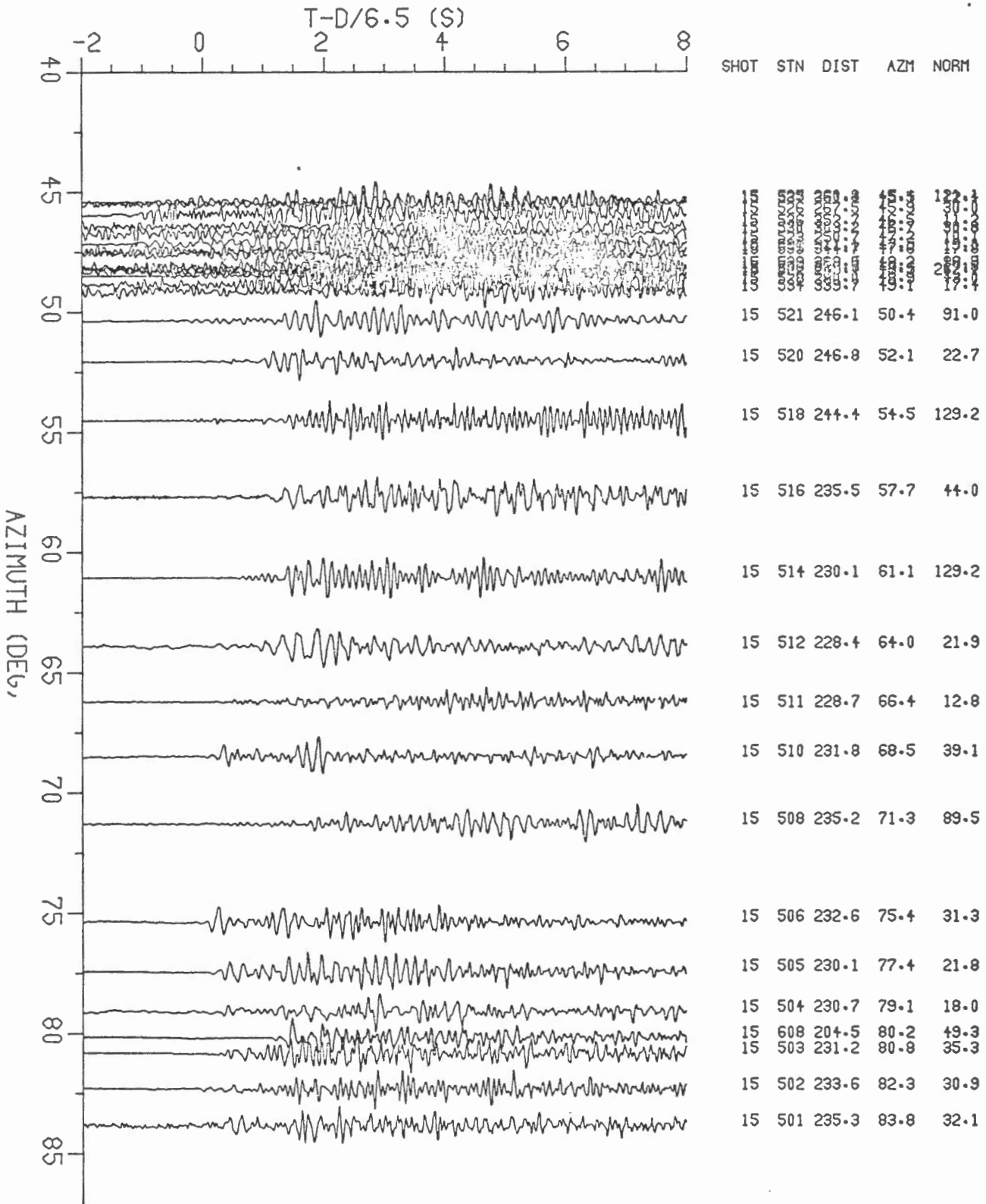
LINE DE SHOT E

Figure 5c

1982 ABITIBI EXPERIMENT

LINE DE SHOT F FAN

RAW DATA



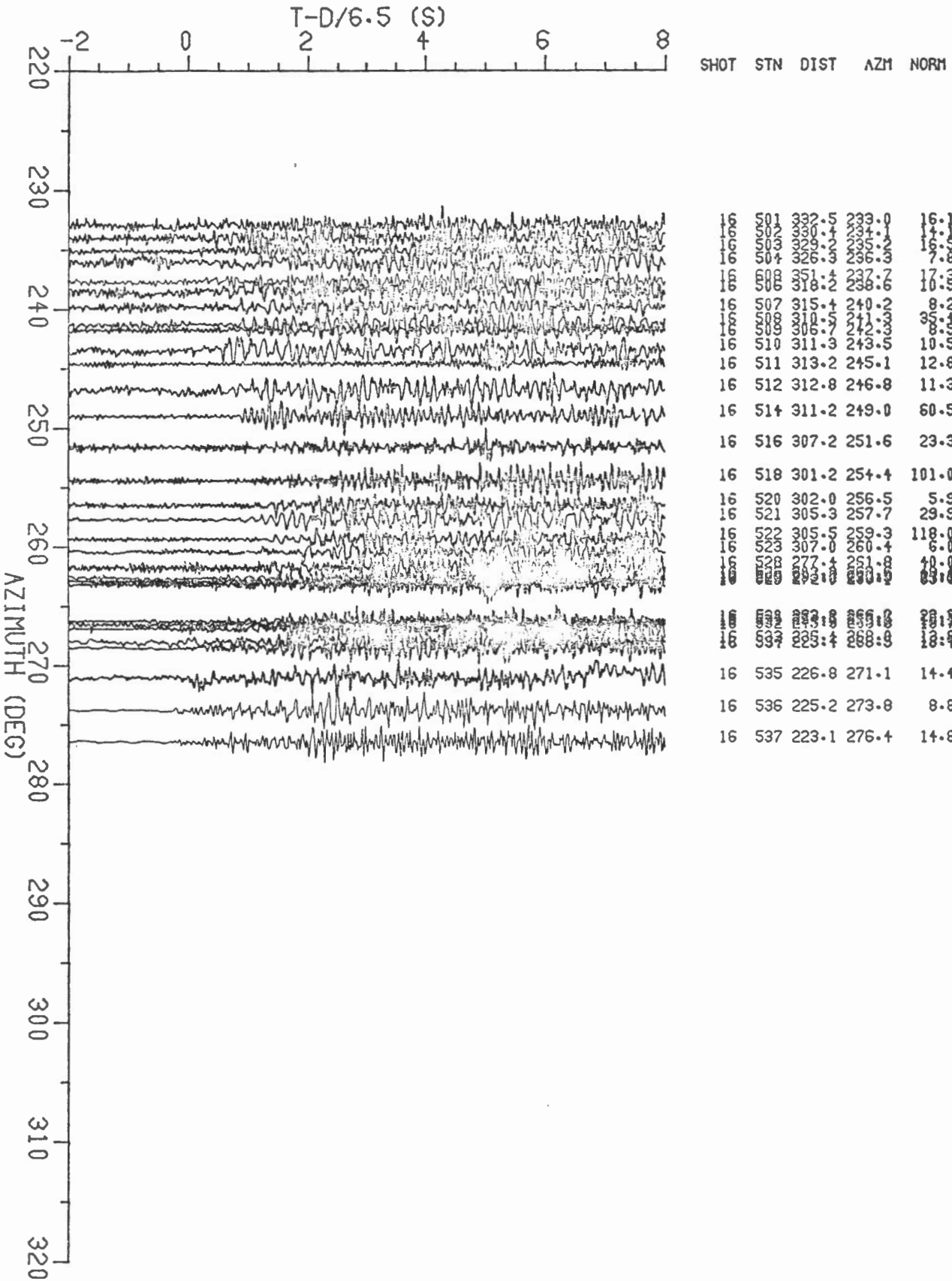
1982 ABITIBI EXPERIMENT

LINE DE SHOT F FAN

Figure 5d

1982 ABITIBI EXPERIMENT
RAW DATA

LINE DE SHOT G FAN



1982 ABITIBI EXPERIMENT

LINE DE SHOT G FAN