BOULDER GOLD MINES LTD.

REPORT ON

SEISMIC REFRACTION INVESTIGATION

PLACER GOLD EXPLORATION

CARIBOO MINING DIVISION

BRITISH COLUMBIA

Wells Area, B.C.

NTS 93 H/4

53° 03.5'N, 121° 40.5'W

OWNER AND OPERATOR

BOULDER GOLD MINES LTD.

#2505 - 1850 Comox Street

VANCOUVER, B.C. V6G 1R3

by

Russell A. Hillman, P. Eng.

January, 1989

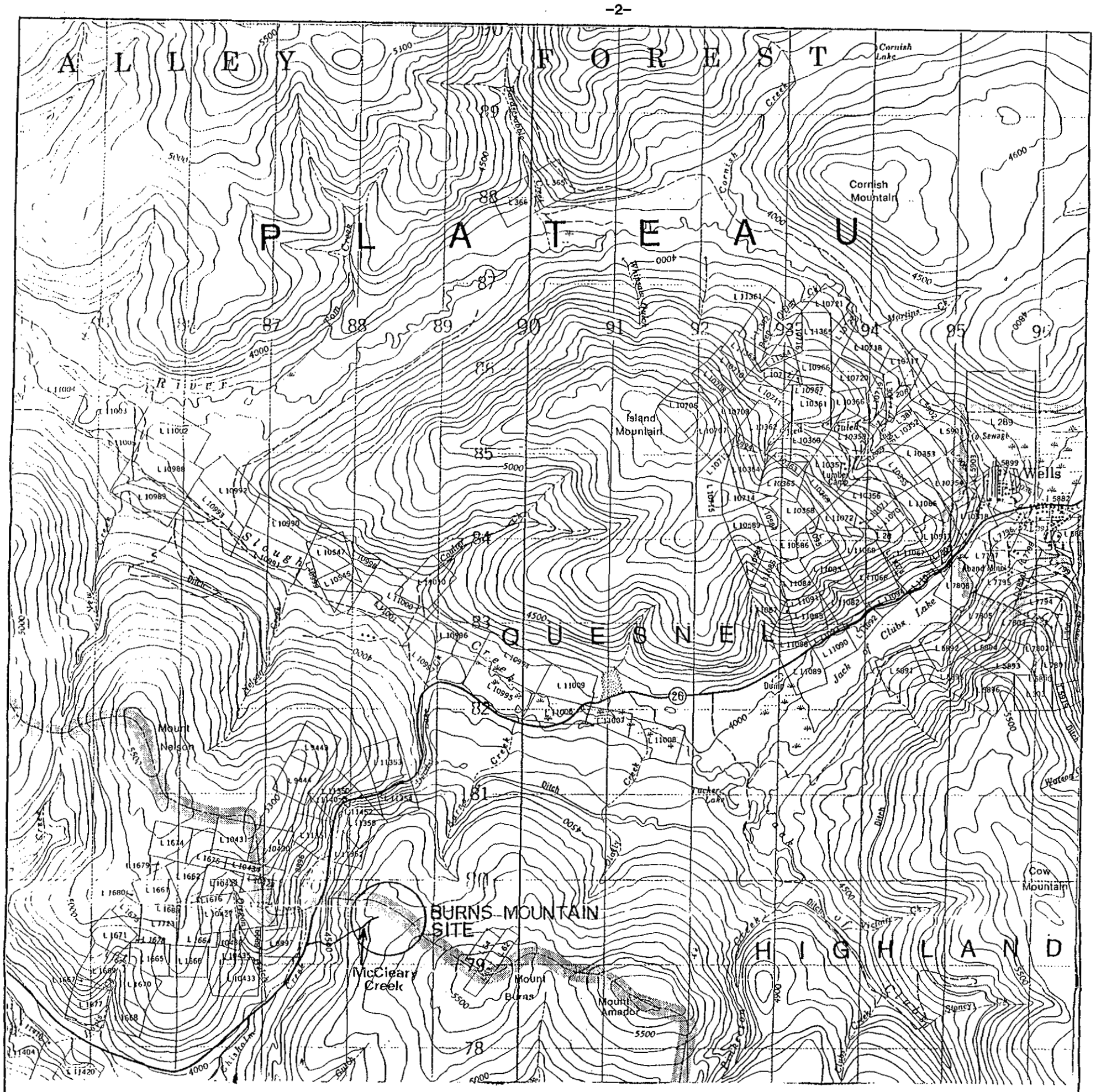
CONTENTS

FIGURES

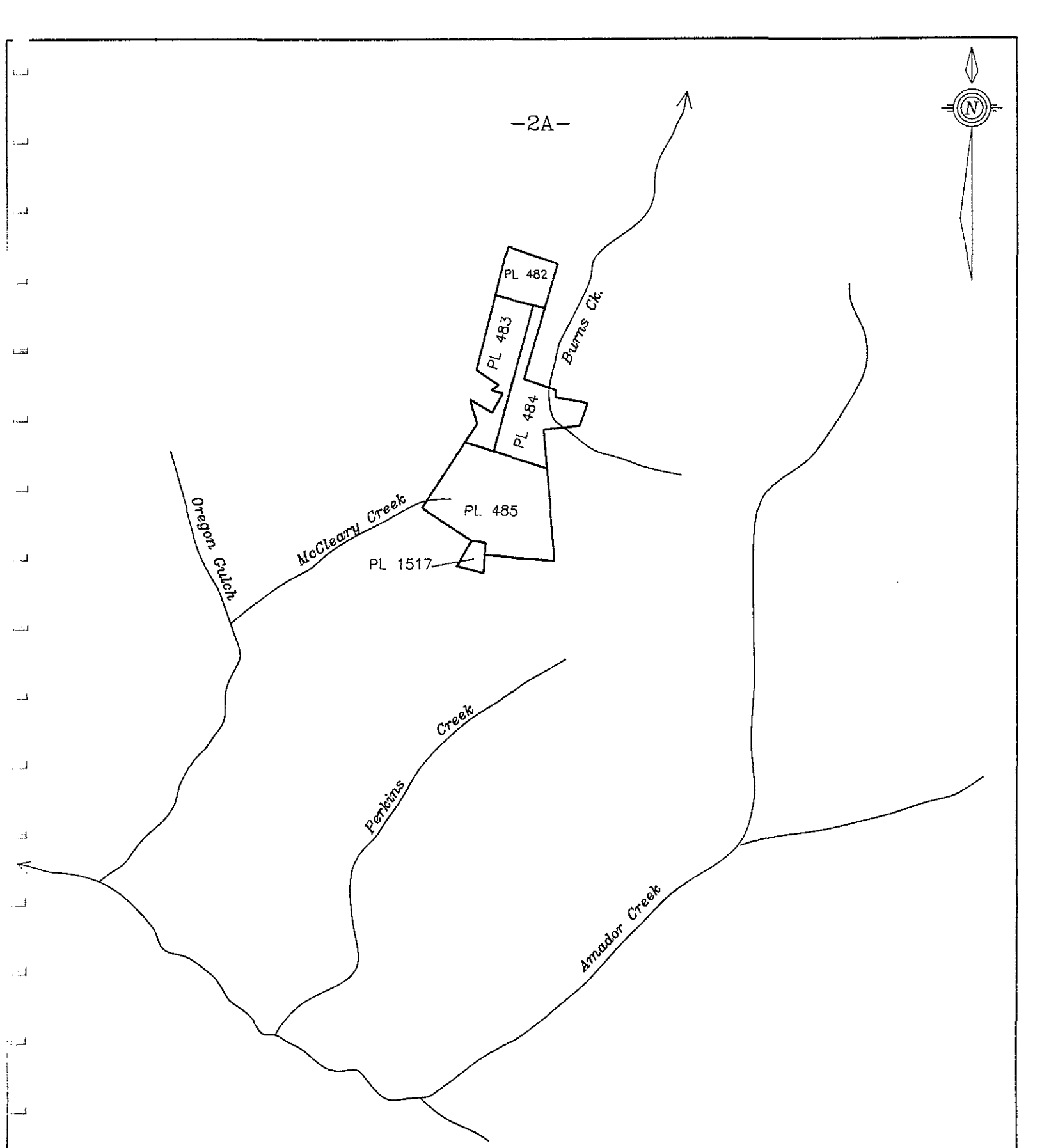
1. INTRODUCTION

In the period August 3, to August 5, 1989, Frontier Geosciences carried out a seismic refraction survey in the Wells area of British Columbia for Boulder Gold Mines Ltd. In all, a total of 1690 m of survey work was carried out on claims 483, 484, 485, and 1517 on Burns Mountain. A survey location plan at 1:50,000 scale is shown in Figure 1 with a claim location plan at 1:31,680 shown in Figure 2. A detailed site plan is presented in Figure 3 at a scale of 1:2860.

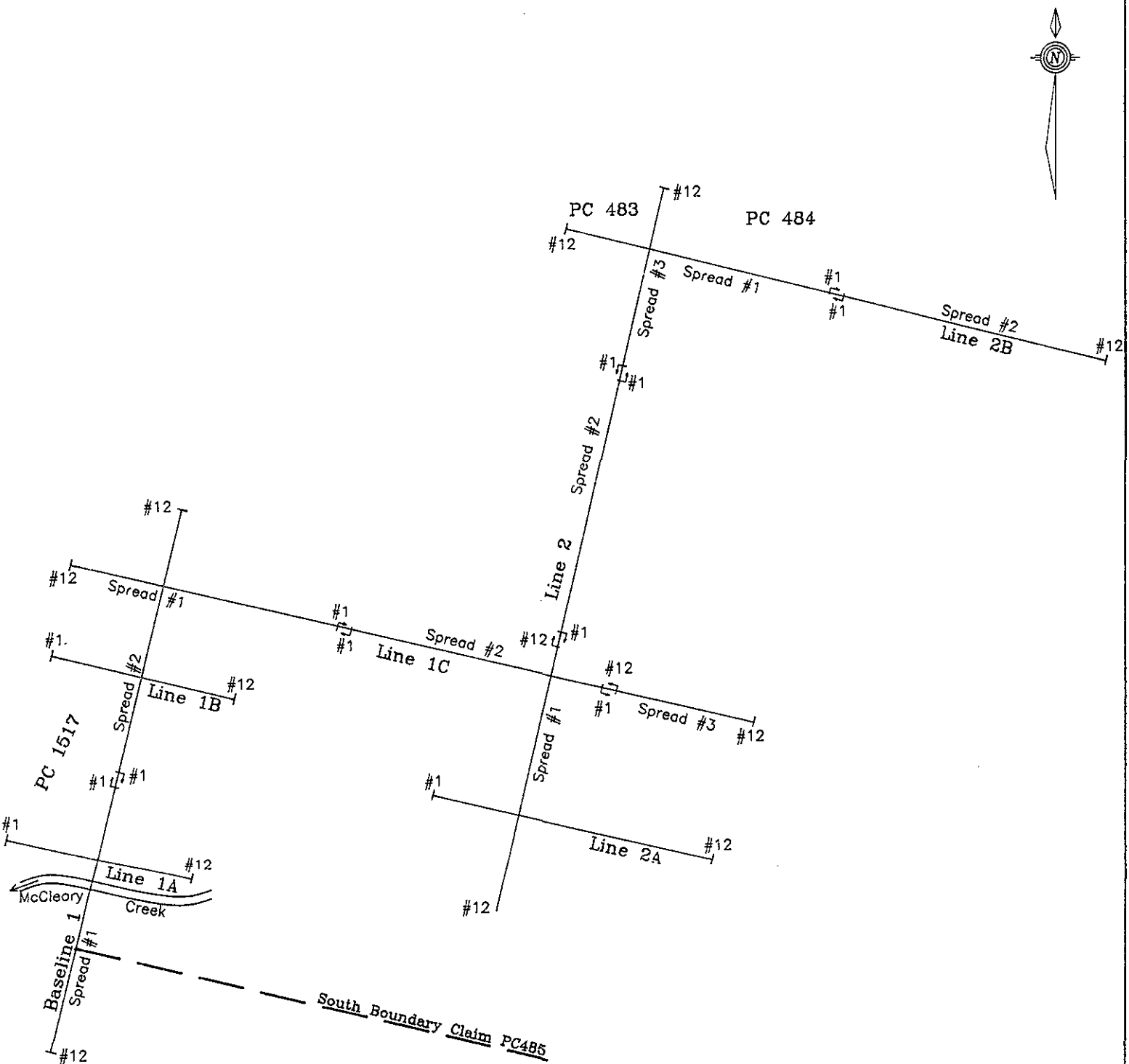
The purpose of the survey was to delineate bedrock depressions infilled with either alluvial sands, gravels, cobbles and boulders or glacial till which may contain anomalously high placer gold values.



BOULDER GOLD MINES LTD. BURNS MOUNTAIN PROJECT	FRONTIER GEOSCIENCES INC.	
SEISMIC REFRACTION SURVEY SURVEY LOCATION PLAN	August 1989 NTS 92H/4	Fig.1



BOULDER GOLD MINES LTD. BURNS MOUNTAIN PROJECT	FRONTIER GEOSCIENCES INC.	
SEISMIC REFRACTION SURVEY CLAIM LOCATION PLAN	August 1989 0 1 km	Fig. 2



BOULDER GOLD MINES LTD. BURNS MOUNTAIN PROJECT	FRONTIER GEOSCIENCES INC.
SEISMIC REFRACTION SURVEY SITE PLAN	August 1989 0 100 metres Fig.3

2. LOCATION AND ACCESS

The survey area lies in close proximity to the town of Wells, B.C. The Burn's Mountain site is on the west flank of Burns Mountain, approximately 6 km west of Wells along Highway 26 and then 3 km south along a 4-wheel drive access road.

3. TOPOGRAHPY AND CLIMATE

The region is characterized by rugged topography with local mountains rising to over 1675 m in elevation. The base of local creek valleys is at approximately 1220 m elevation. The areas surveyed are sub-alpine meadows with a forest cover of balsam and scrub spruce conifers.

Annual temperatures in the area range from -30°C in winter to highs of +25°C in the summer period. Precipitation in the area is high with the moisture falling as rain mainly in the spring and fall periods and snow throughout the winter.

4. HISTORY

The site of substantial placer and limited lode mining since the 1860's. Burns Mountain is famous for the richness of its quartz-hosted mineralization. Numerous historic and currently operating placer mines are located adjoining the B.G.M. Ltd. property, however, no detailed survey work has been carried out to date on this site.

In September 1989, Frontier Geosciences Inc. carried out a reconnaissance dipole-dipole resistivity investigation on the site. Several promising features were identified as favourable targets for further exploration.

Reference: Hillman, R.A., Report on Dipole-Dipole Resistivity Investigation, Golden Opportunity Mining Ltd., November, 1988.

5. GEOLOGY

The Downey Creek Succession composed of metamorphosed slates, phyllites, quartzites, carbonates, metatuffs and clastics is the most significant rock assemblage in the Barkerville/Wells area because of the good correlation between outcrops of these rocks and placer operations. These rocks form a belt trending south-east/northwest through the Cariboo Mining District.

Three types of placer deposits account for the gold production in the area. These deposits are (1) preglacial and inter-glacial gravels reworked from older glacial deposits; (2) lodgement tills containing reworked preglacial gravels deposited at the base of ice sheets and lee side boulder layers formed around bedrock highs, and; (3) modern reconcentrations of gold from older placers.* The areas investigated are largely valleyside benches which may have been favourable environments for deposition of type (1) and (2) deposits.

*Gold placers in Pleistocene glacial deposits; Barkerville, British Columbia N. Eyles and S.P. Kocsis, CIM Bulletin, August 1988.

6. SEISMIC REFRACTION SURVEY METHOD

6.1 EQUIPMENT

The seismic refraction investigation was carried out using a Geometrics Model ES-1225, 12 Channel, signal enhancement seismograph. A 152 metre multicored cable was used for all seismic refraction lines. Geophone spacings along the seismic cable ranged from 3.8 metres to 15.2 metres. Explosive charges were detonated electrically using a Geometrics, HVB-1, high voltage, capacitor-type blaster.

6.2 SURVEY PROCEDURE

For each spread, the seismic cable was stretched out in a straight line and the geophones implanted. Six different shot holes were then excavated: one at either end of the geophone cable, two at intermediate locations along the cable, and one off each end of the cable to ensure adequate coverage of the basal layer. Seventy-five percent Forcite was utilized as an energy source in the survey. Shots consisting generally of one to three sticks of Forcite were detonated individually and arrival times for each geophone were automatically recorded in the seismograph. Hard copy

records were made on electrically sensitive recording film. Data recorded during field surveying was generally of good to excellent quality. Photocopies of the recorded seismic data are shown in Appendix B.

Throughout the survey, notes were recorded regarding seismic line position in relation to topographic and geological features of the area. Elevation surveying was carried out utilizing a chain and inclinometer.

7. DISCUSSION AND RESULTS

7.1 GENERAL

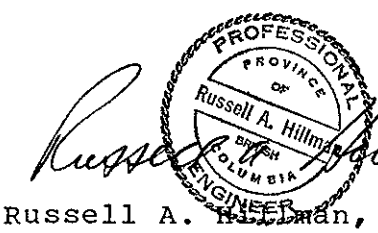
The interpreted seismic sections for the site are presented at a scale of 1:500 in Appendix A (Figure 4). An inspection of the interpreted sections reveals relatively shallow depths to bedrock interpreted thicknesses of overburden vary from a minimum of 1m to a maximum of 10.5 meters. The basal surface in Figure 4 is represented by velocities ranging from 3750 m.p.s. to 4840 m.p.s.

Several Bedrock depressions are present in the sections. An isolated bedrock row is apparent at the north end of Base-line 1. This is consistent with dipole-dipole resistivity results at this location. A more continuous depression is evident trending from the east end of Line 2A to the inter-section of Line 1C and Line 2. The depression centred on Line 2B may be a further extension of this feature to the north.

The generally thin surficial layer varies in velocity from 300 m.p.s. to 900 m.p.s. This layer has been correlated

with weathered glacial till, weathered bedrock, loose alluvium and silty organic material in the bog areas. Underlying this layer, is a thicker intermediate layer ranging in velocity from 1170 m.p.s. to 3000 m.p.s. The lower velocities are probably representative of weathered glacial till or unsaturated alluvium. The intermediate velocities in this layer are likely indicative of glacial till or saturated alluvium. The high velocities are interpreted to be loose weathered rock or coarse gravels, cobbles and boulders.

Frontier Geosciences Inc.



Russell A. Hillman, P.Eng.

8. ITEMIZED STATEMENT OF COST

PERSONNEL		
Senior Geophysicist 15.0 days @ $400.00 per day	$ 6,000.00	
Technician 8.0 days @ $175.00 per day	1,400.00	
Draftsman 8.0 hours @ $30.00 per hour	240.00	
Typist 6.0 hours @ $15.00 per hour	90.00	
Subtotal - Personnel		$ 7,730.00
EXPENSES		
Seismic System Rental 4.0 days @ $175.00 per day	$ 700.00	
Consumables - film, etc.	20.00	
Subtotal - expenses		720.00
TOTAL COST		$ 8,450.00

9. CERTIFICATE

I, RUSSELL ALEXANDER HILLMAN, resident of Vancouver, British Columbia, hereby certify as follows:

1. I am a Consulting Geophysicist with an office at #7 - 84 Lonsdale Avenue in North Vancouver, B.C.

2. I graduated with a degree of Bachelor of Science, Geophysics, from the University of British Columbia.

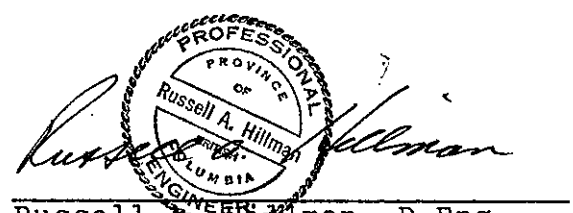
3. I have practised my profession for 19 years. I am a Professional Engineer in the Province of British Columbia.

4. I am a member of good standing with the European Society of Exploration Geophysicists.

5. I have an interest of 40,000 shares in Boulder Gold Mines Ltd.

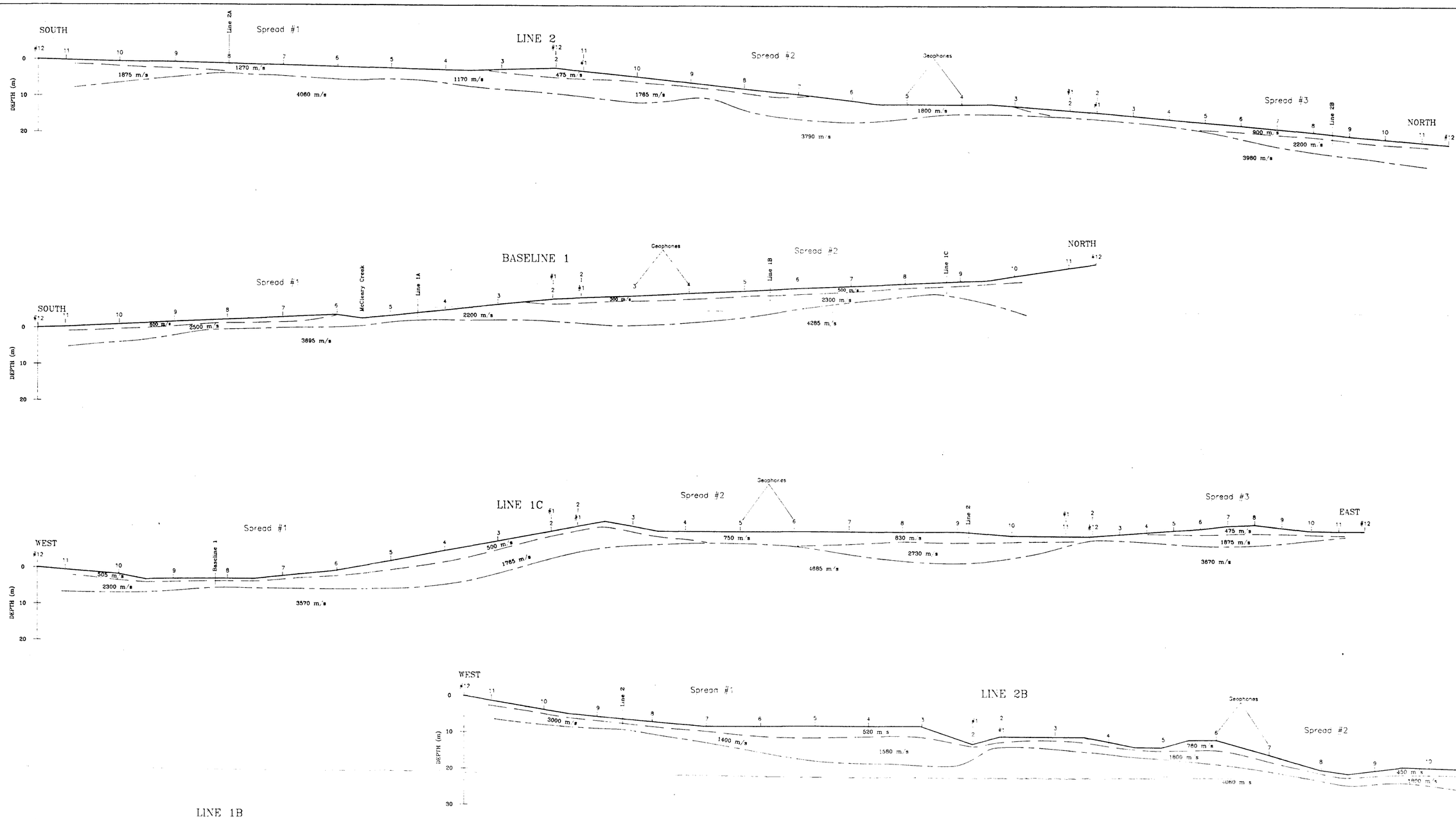
6. I supervised and interpreted the results of a Seismic Refraction Survey carried out on the property of Boulder Gold Mines Ltd. near Wells, B.C. in the period August 3, to August 5, 1989.

Dated at Vancouver, Province of British Columbia, this 29th day of December, 1989.



Russell A. Hillman, P.Eng.

APPENDIX A



GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,538

KEY

1800 m/s = 1800 metres/second

SCALE 1:500

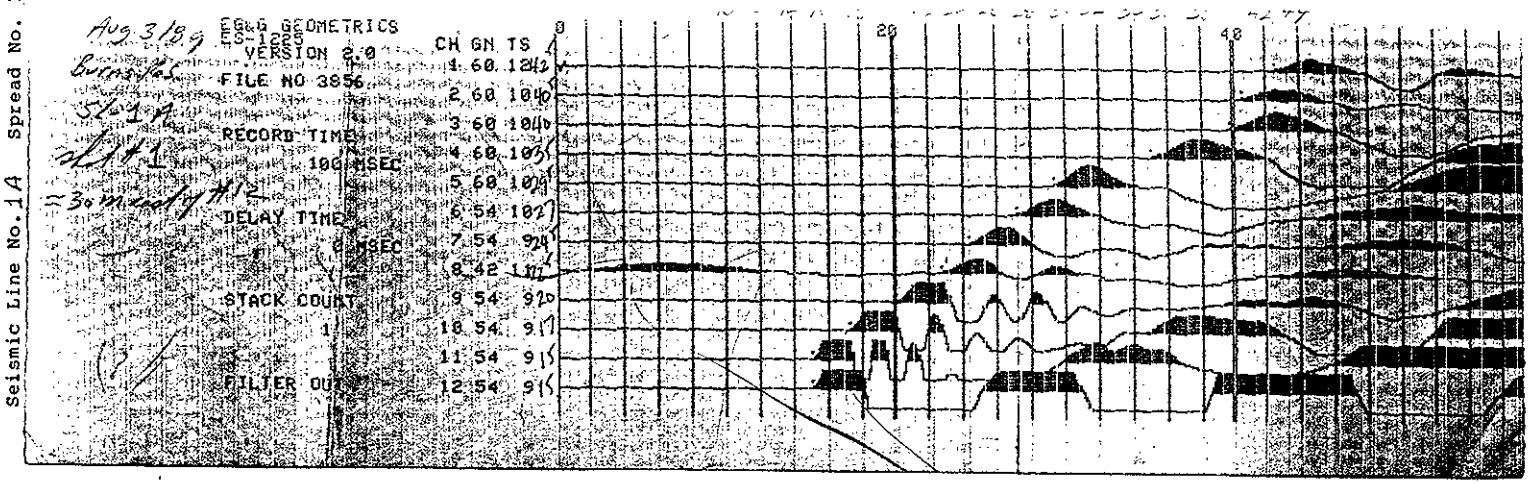
0 50

metres

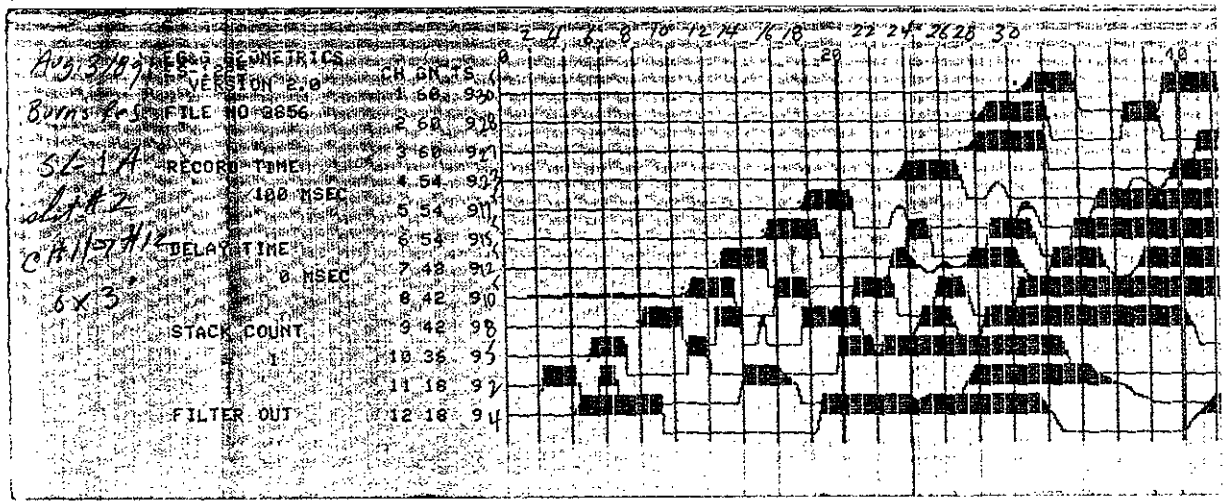
BOULDER GOLD MINES LTD. BURNS MOUNTAIN PROJECT	FRONTIER GEOSCIENCES INC.
SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTIONS	August 1989
	Fig. 4

APPENDIX B

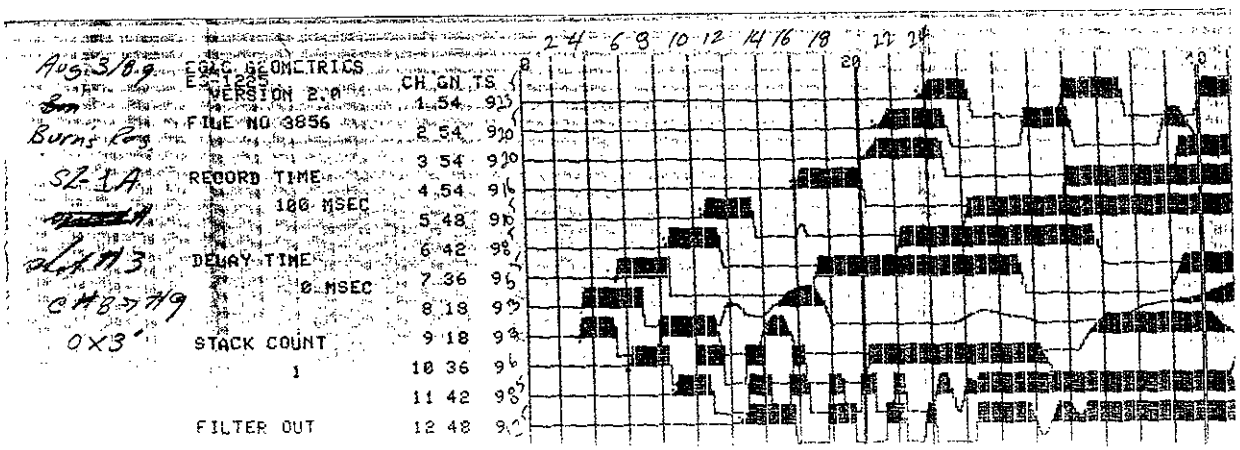
APPENDIX B
Seismic Line No. 1A Spread No. 1



APPENDIX B
Seismic Line No. 1A Spread No. 1



APPENDIX B
Seismic Line No. 1A Spread No. 1



APPENDIX B
Seismic Line No. 1A Spread No. 1

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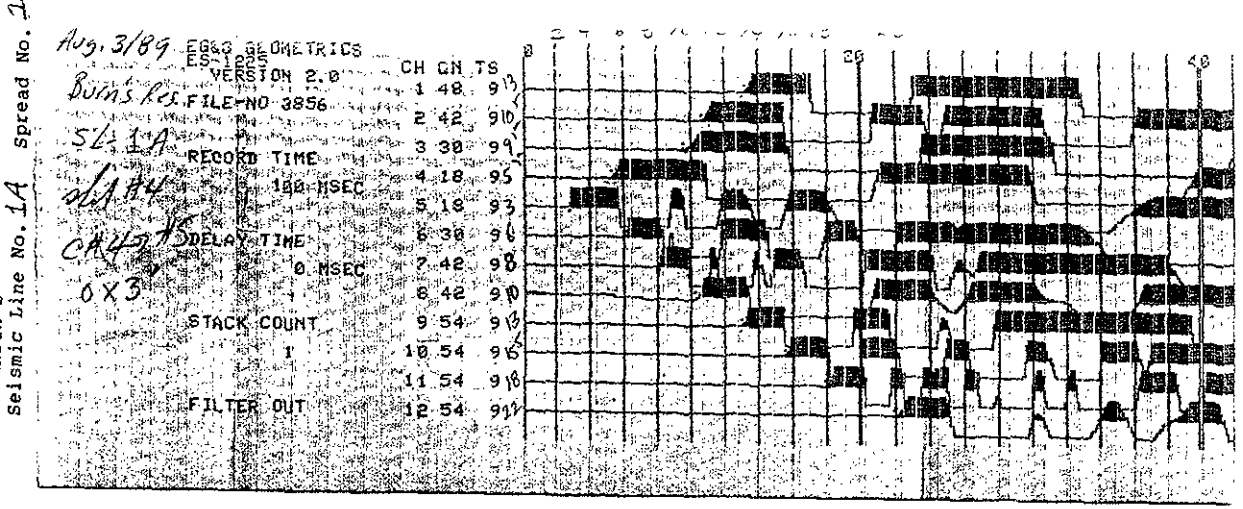
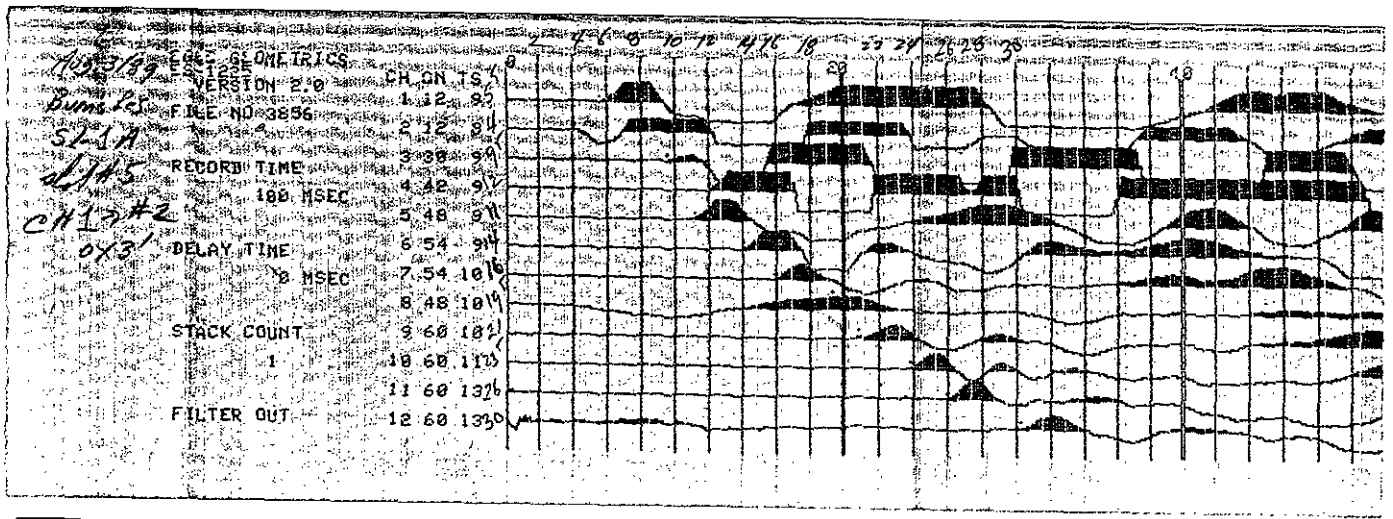
Seismic Line No. 1A Spread No. 1



APPENDIX B
Seismic Line No. 1A Spread No. 1



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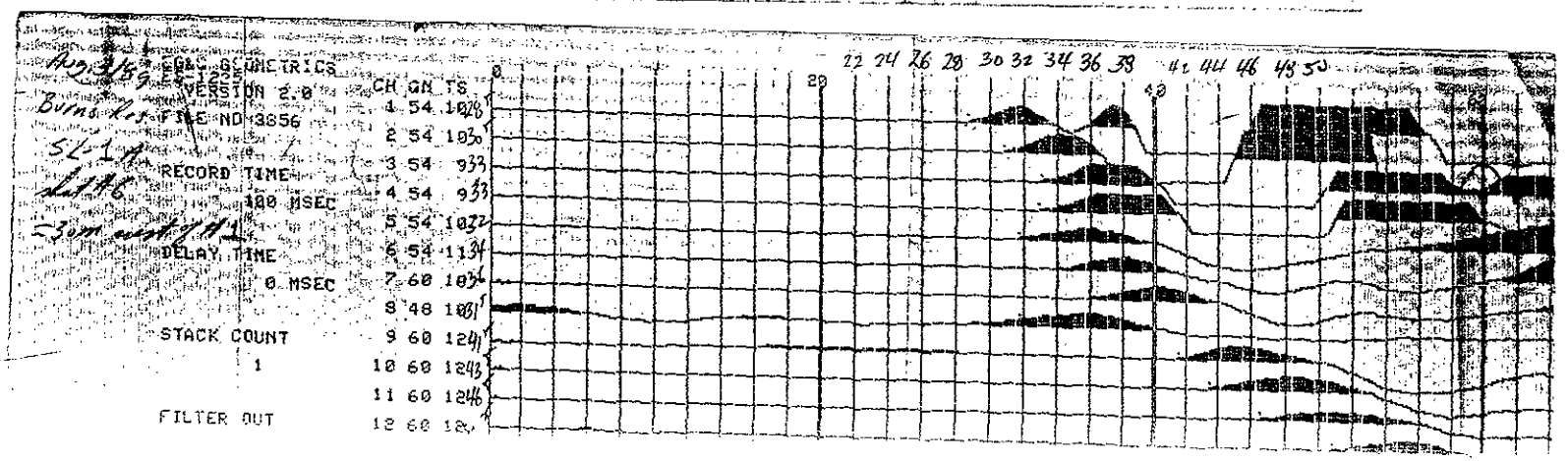
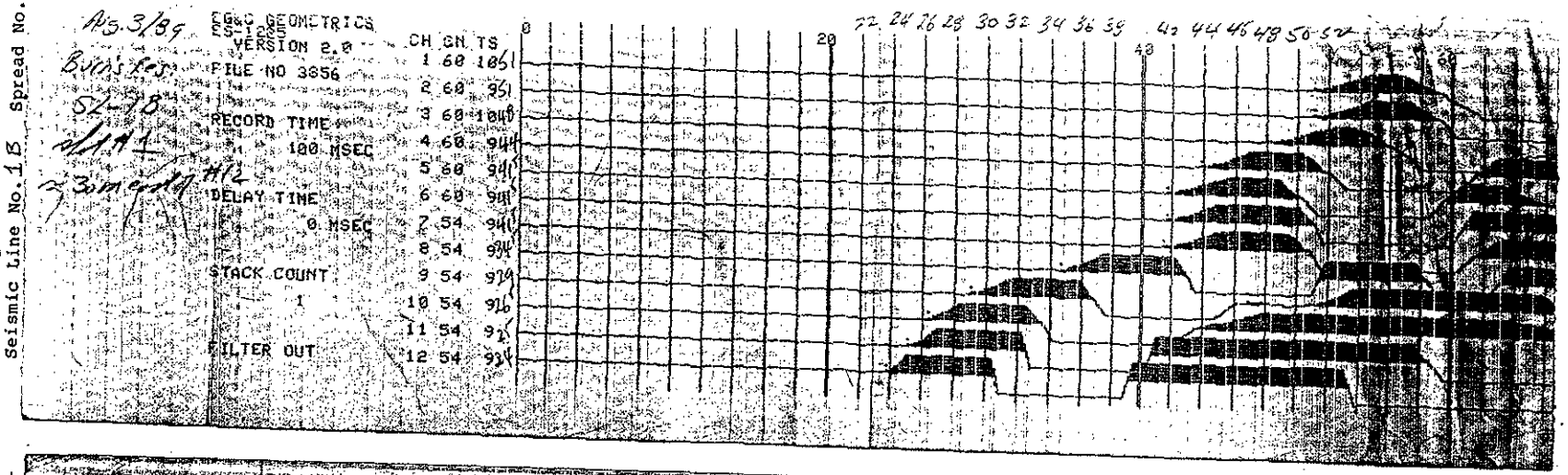
Seismic Line No. 1A Spread No. 1



APPENDIX B
Seismic Line No. 18 Spread No. 1



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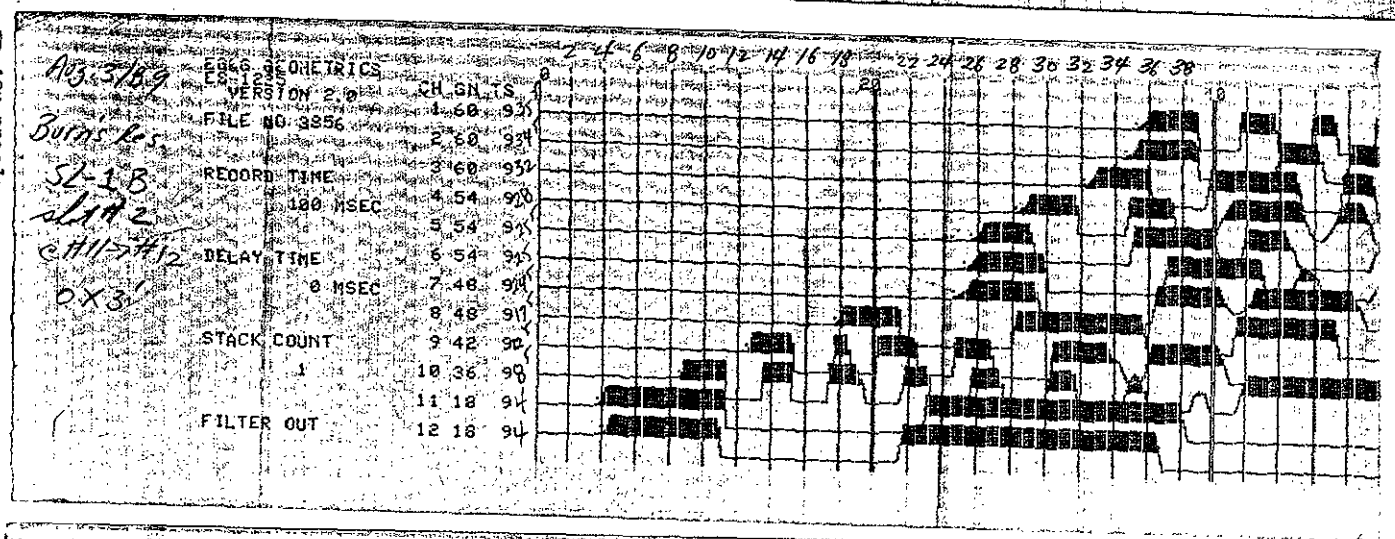

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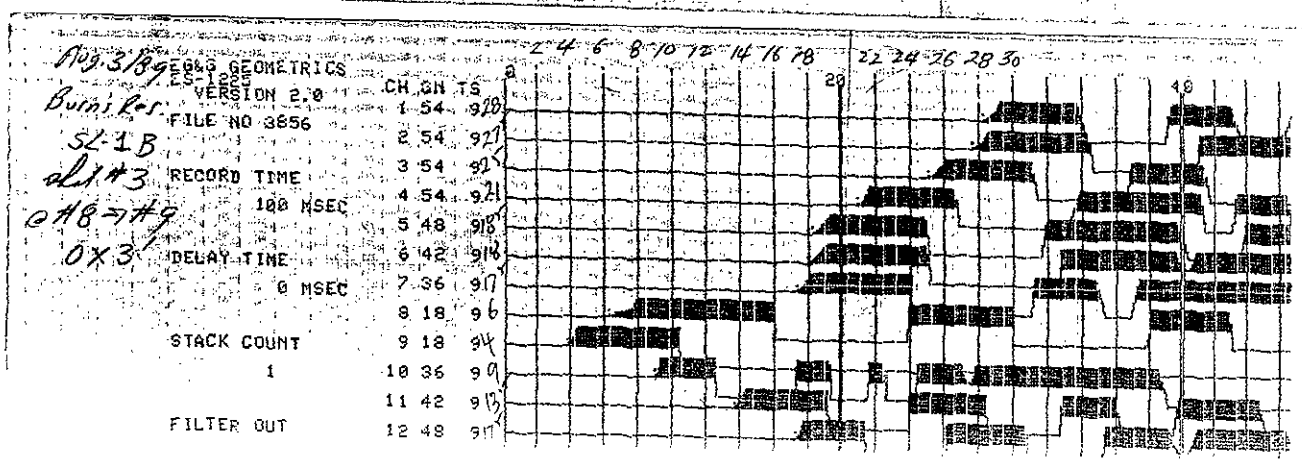

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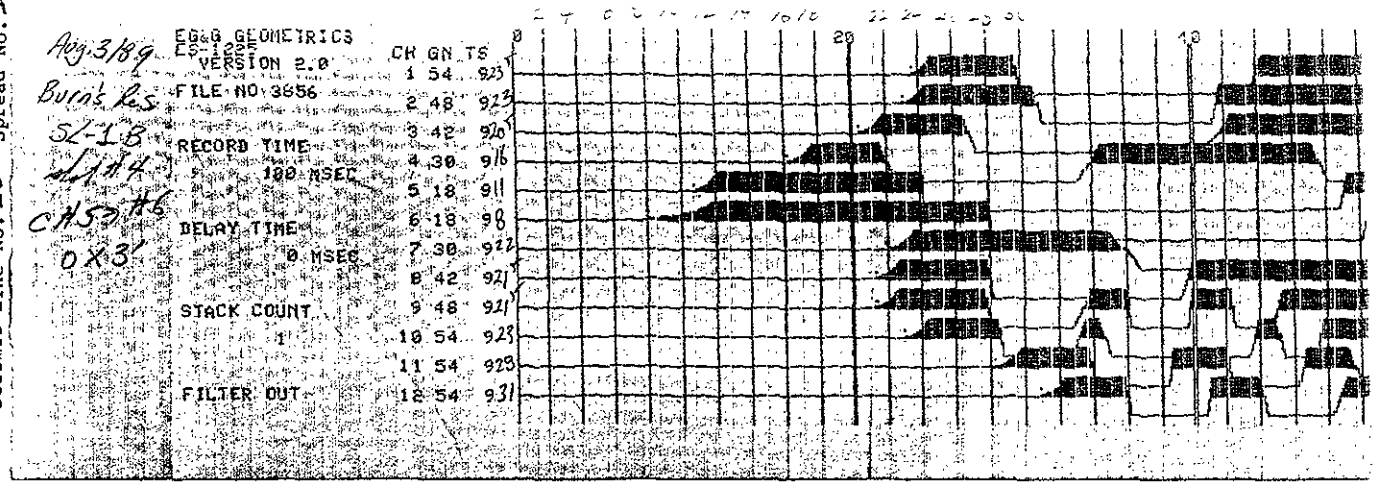

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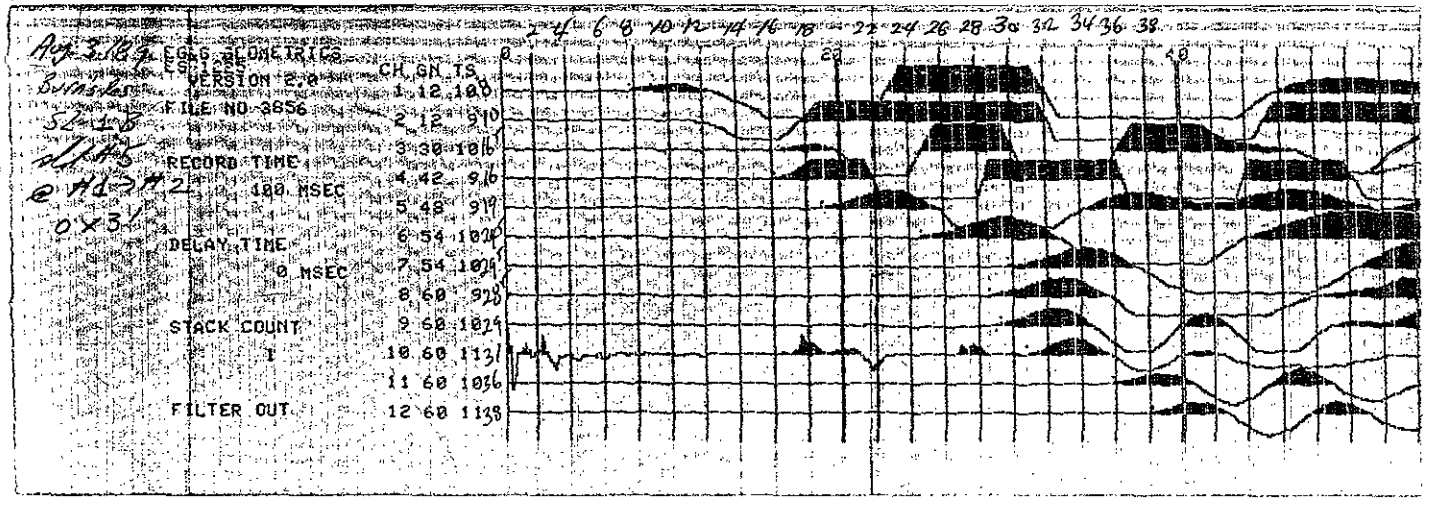

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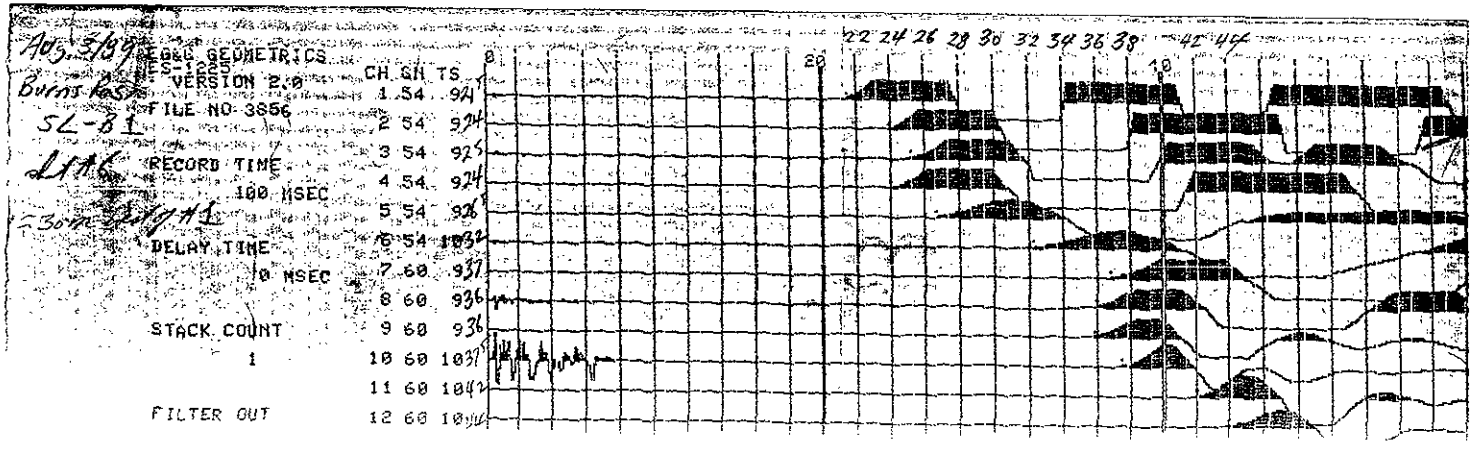

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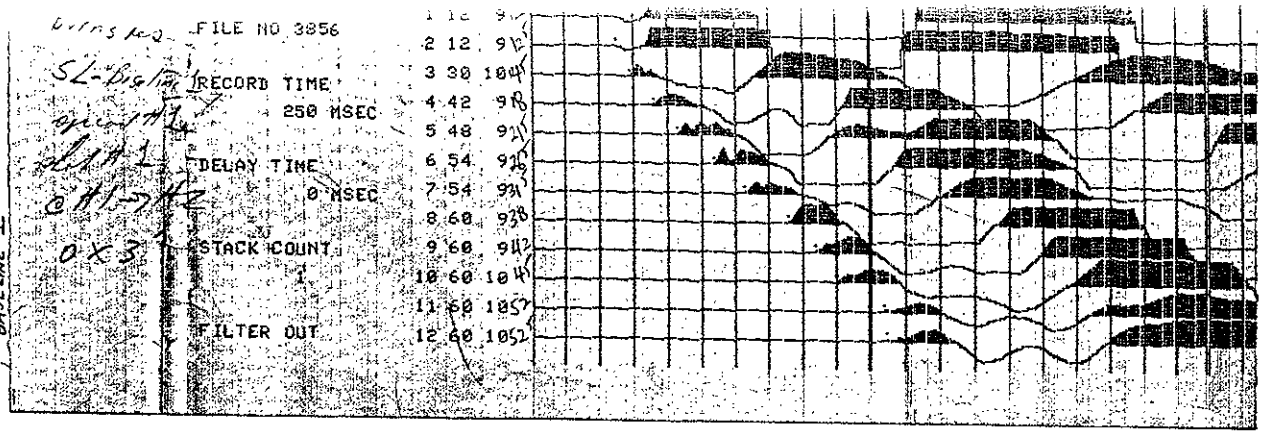
Spread No. 1



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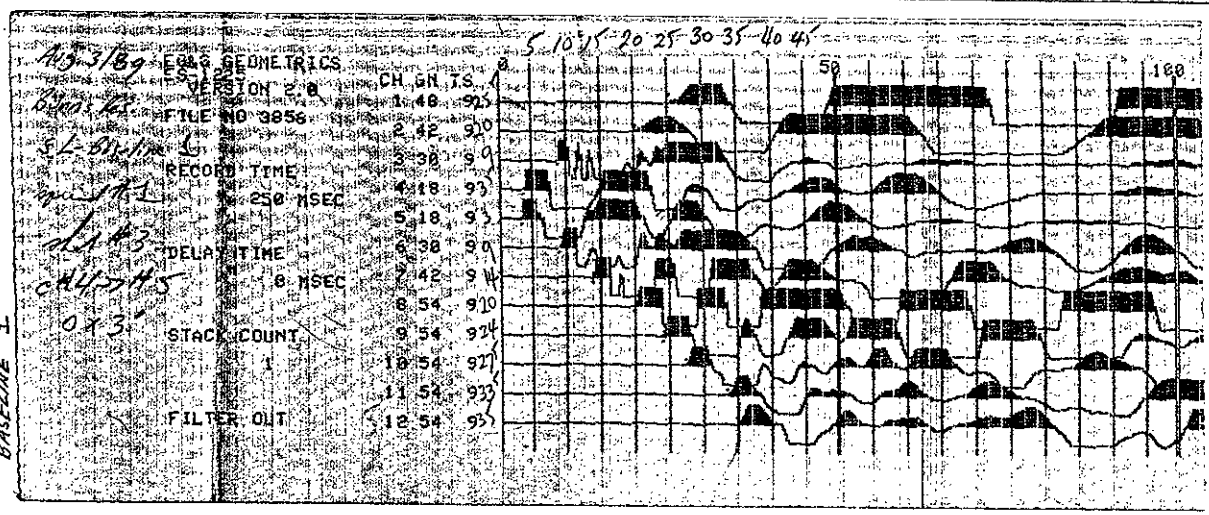
Spread No. 1



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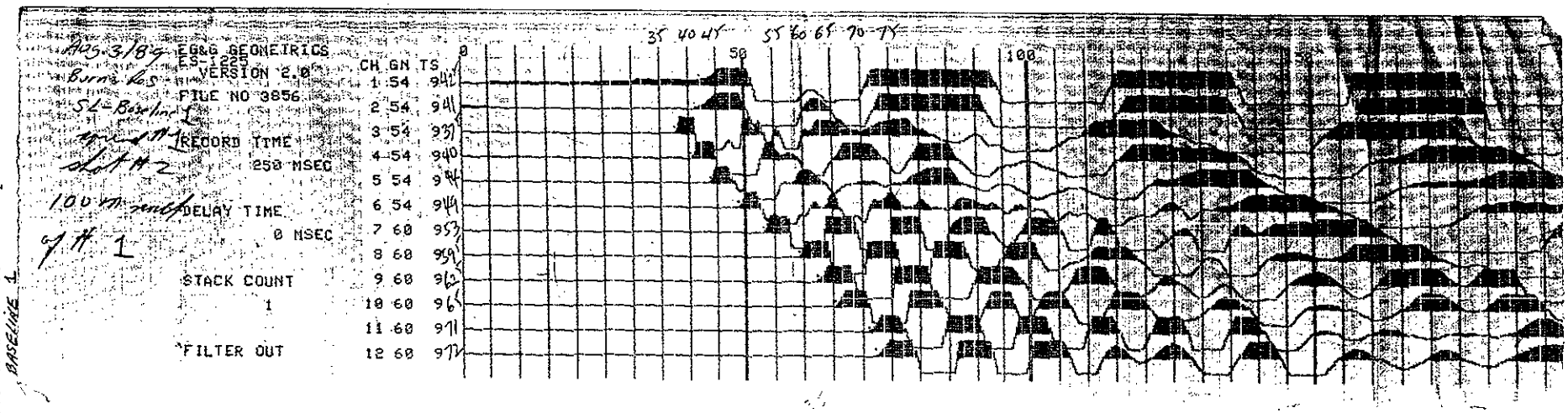
Spread No. 1



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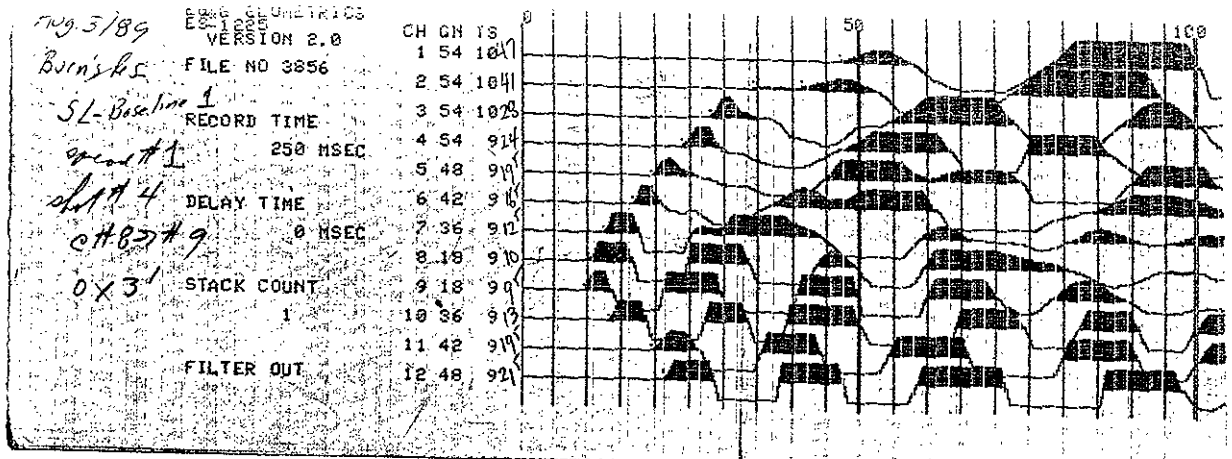

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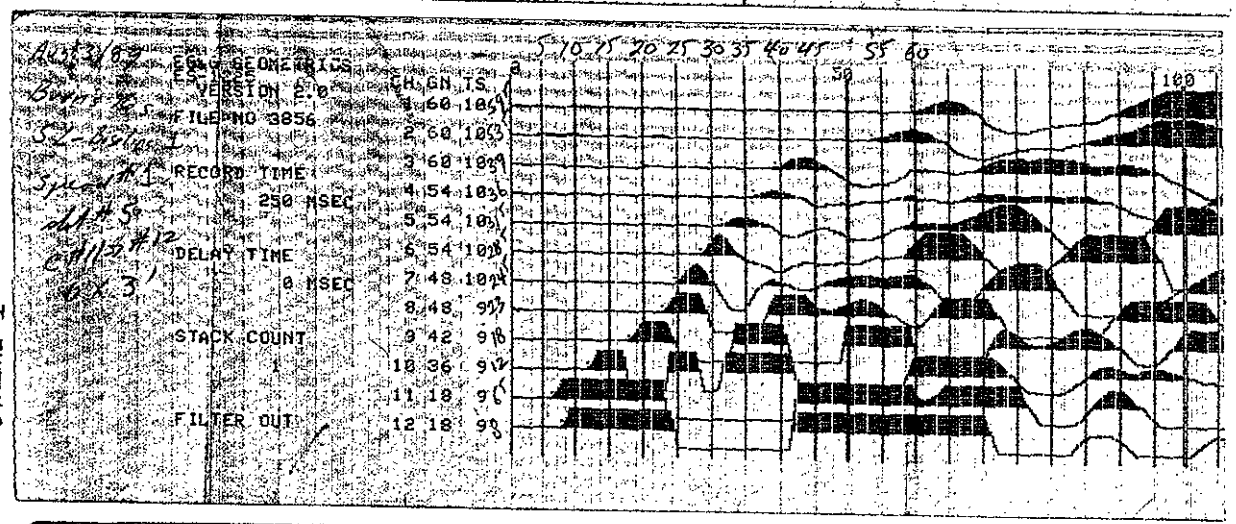

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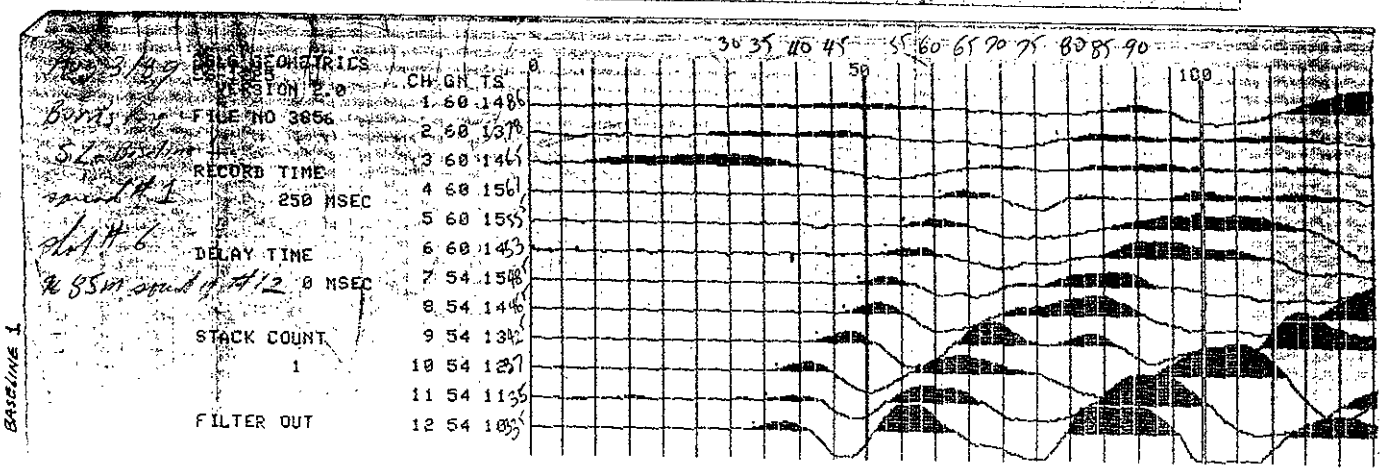
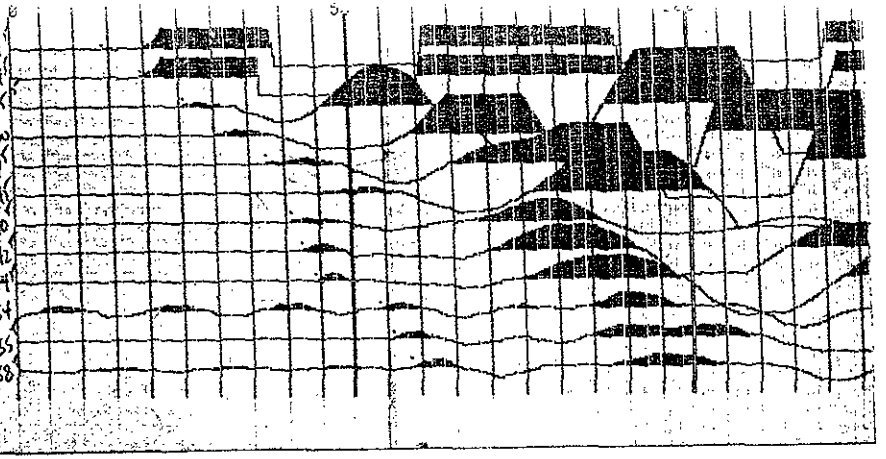


APPENDIX B
Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89
Burns #2
SL-Baseline 1
spread #2
24 ch #2
CH 1 → #2
0 x 3'

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	12	9M
2	12	9M
3	30	121
4	42	113
5	48	133
6	54	114
7	54	1040
8	60	1042
9	60	1144
10	60	1154
11	60	1155
12	60	1158

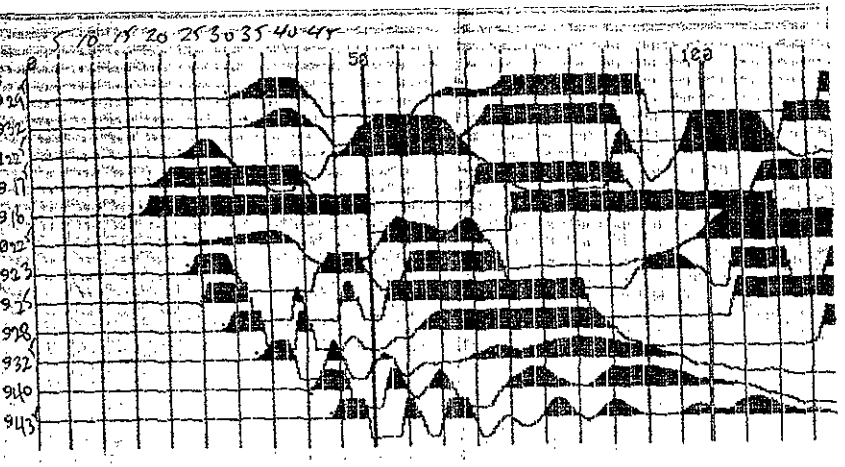


APPENDIX B
Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89
Burns #2
SL-Baseline 1
spread #2
24 ch #3
10' from #5 → #4
1x excavator / spread

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	48	914
2	42	932
3	30	1122
4	18	911
5	18	916
6	30	1012
7	42	923
8	54	935
9	54	938
10	54	932
11	54	940
12	54	943



APPENDIX B
Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89
Res. Burns
SL-Baseline 4
spread #2
24 ch #1
100m south of #1

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
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3	54	1041
4	54	1049
5	54	1156
6	54	1161
7	60	1059
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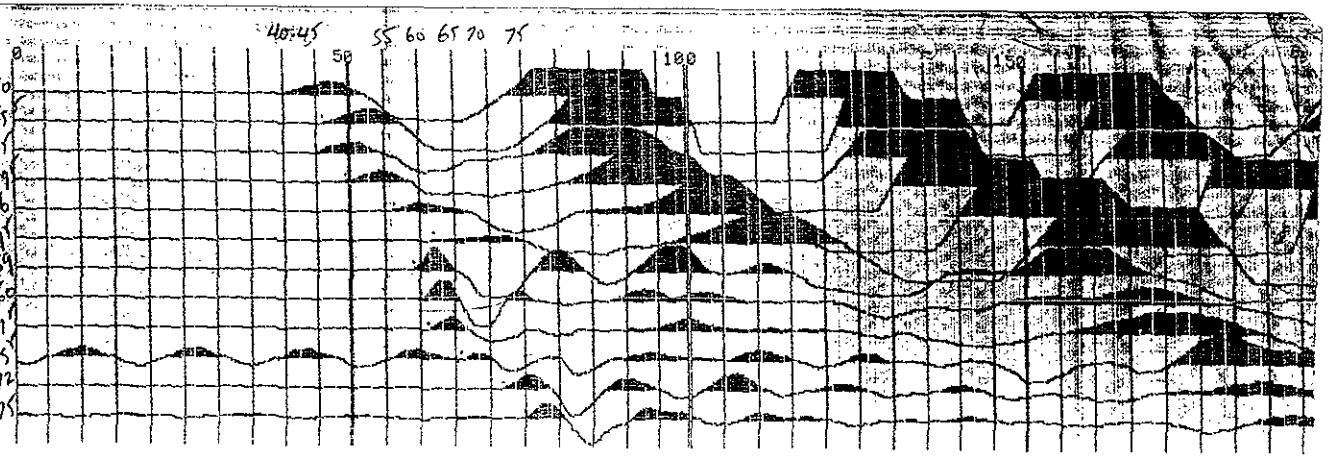
12	60	1071



APPENDIX B
Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
Burnside FILE NO 3856
Baseline 1
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	54	940
2	54	942
3	54	934
4	54	929
5	48	927
6	48	923
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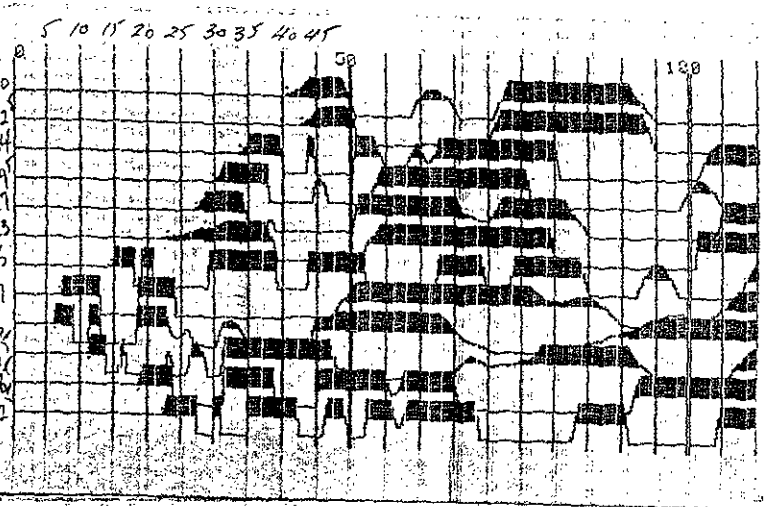
10	36	94
11	42	916
12	48	922



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Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
Burnside FILE NO 3856
Baseline 1
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	60	1064
2	60	1058
3	60	904
4	54	1047
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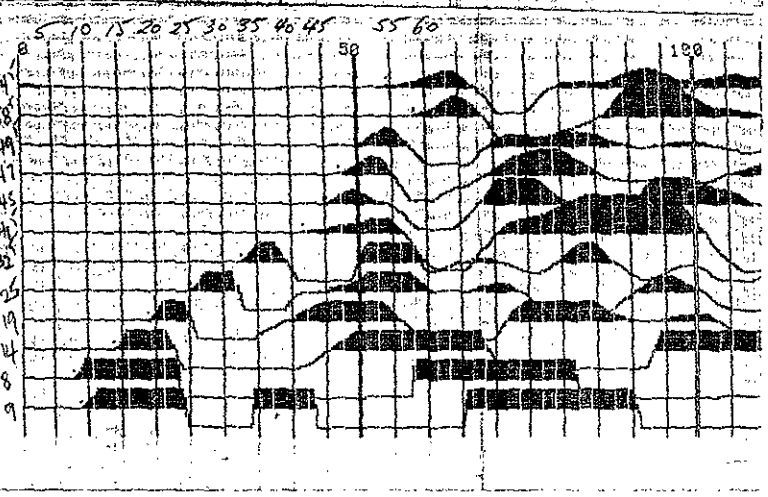
7	48	992
8	48	965
9	42	919
10	36	944
11	18	998
12	18	999



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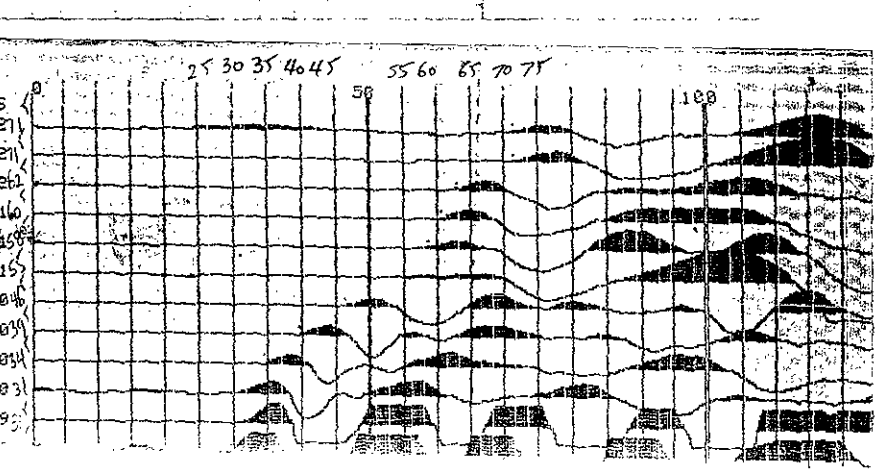
Seismic Line No. BASELINE 1 Spread No. 2

Aug 3/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
Burnside FILE NO 3856
Baseline 1
RECORD TIME
250 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1

CH	GN	TS
1	60	1271
2	60	1211
3	60	1262
4	60	1160
5	60	1358
6	60	1155
7	54	1046
8	54	1039
9	54	1034
10	54	1031
11	54	93



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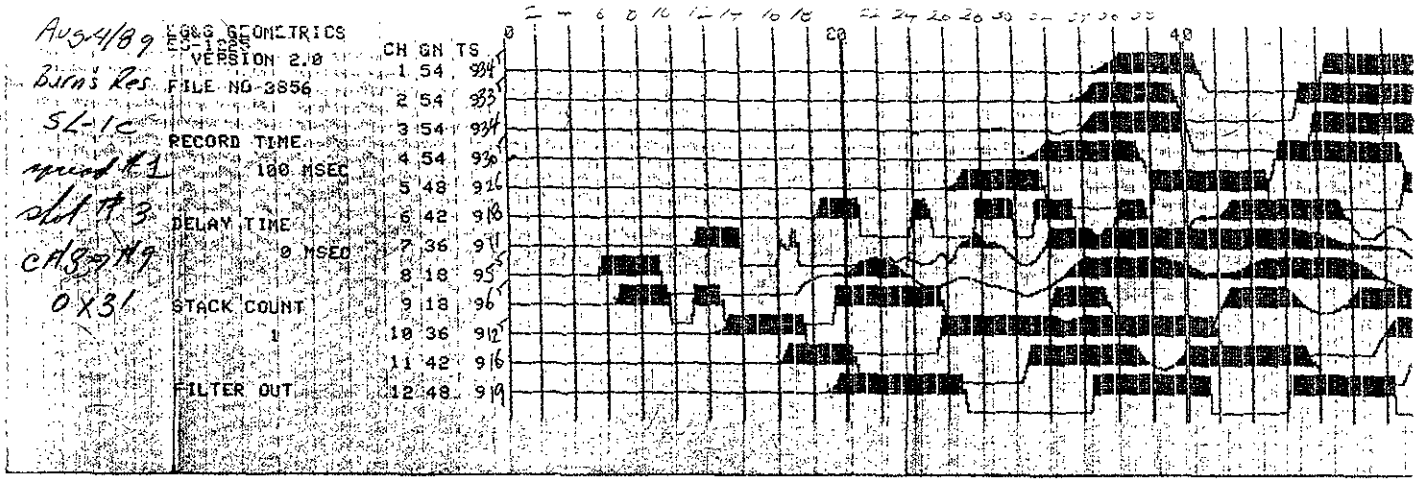
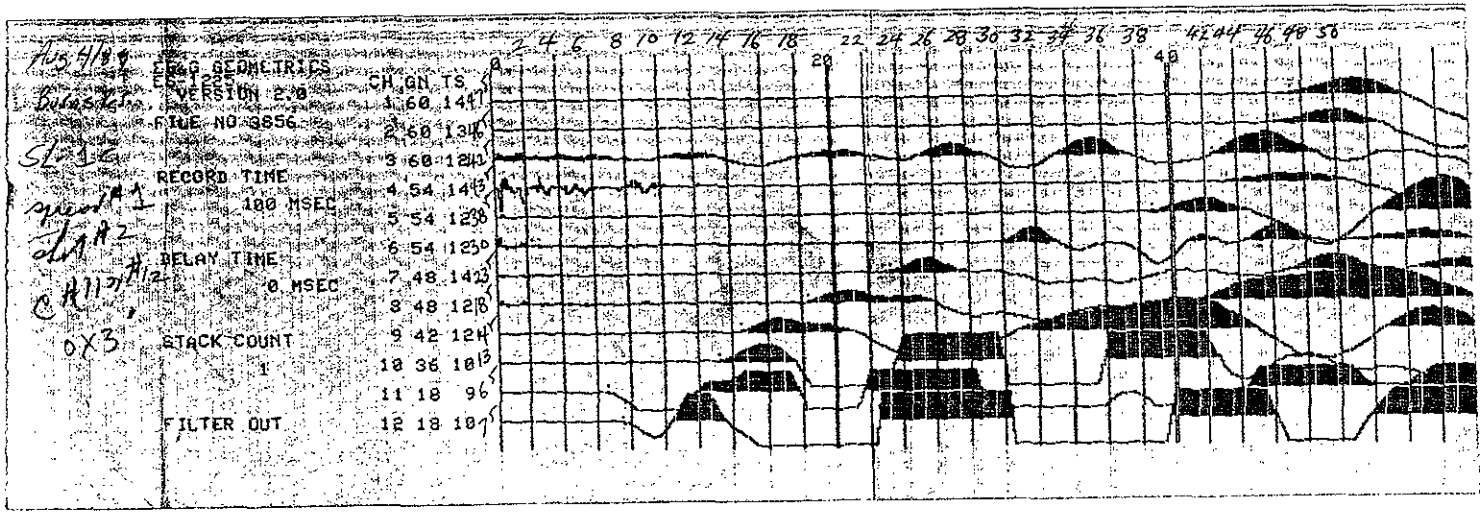
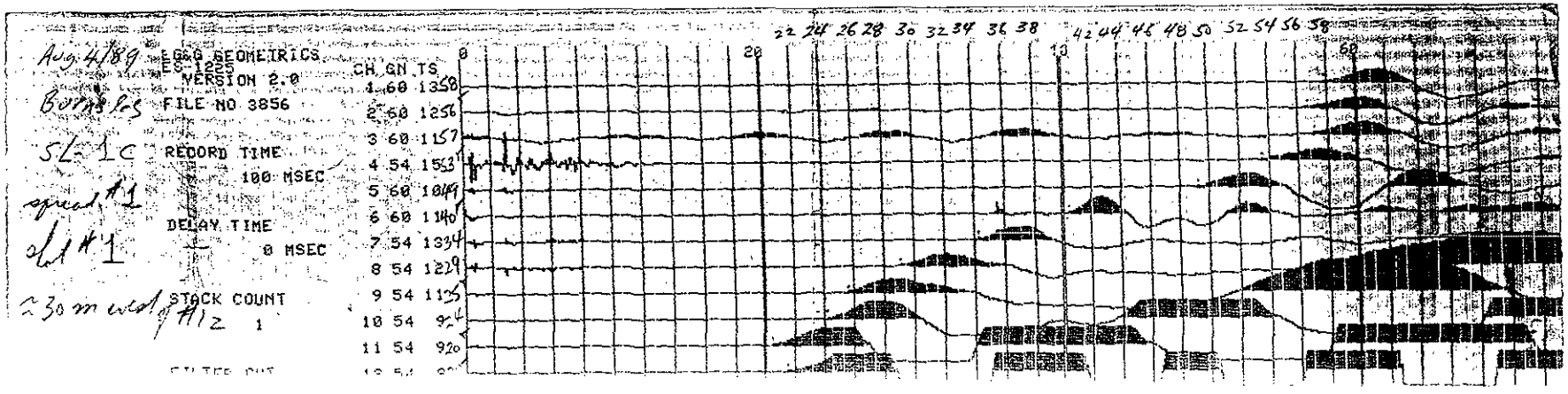


APPENDIX B
Seismic Line No. 1C Spread No. 1



APPENDIX B
Seismic Line No. 1C Spread No. 1

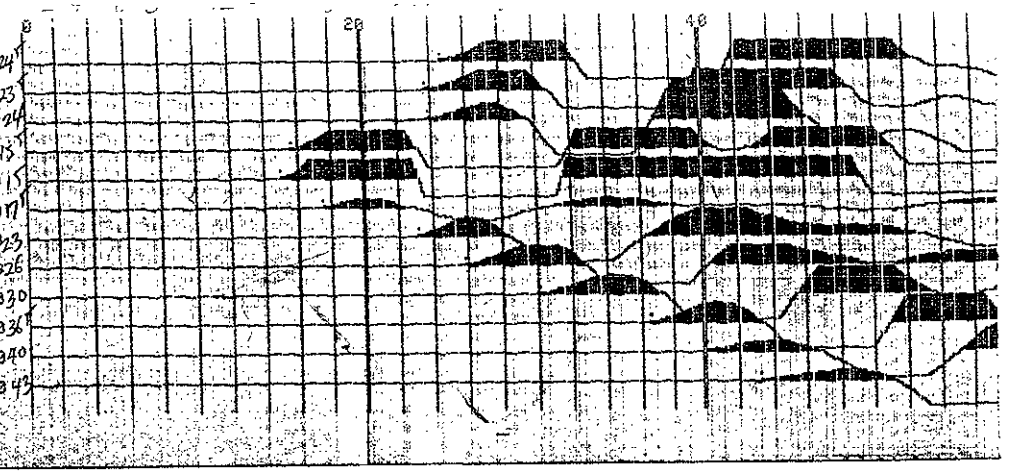


APPENDIX B
Seismic Line No. 1C Spread No. 1

Aug 4/89
Burnaby Res.
SL-1C
spread #1
Line #4
@ #4 → #5
0 X 3'

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	48	924
2	42	923
3	30	1124
4	18	915
5	18	915
6	30	1017
7	42	1023
8	54	926
9	54	1030
10	54	1036
11	54	1040
12	54	1043

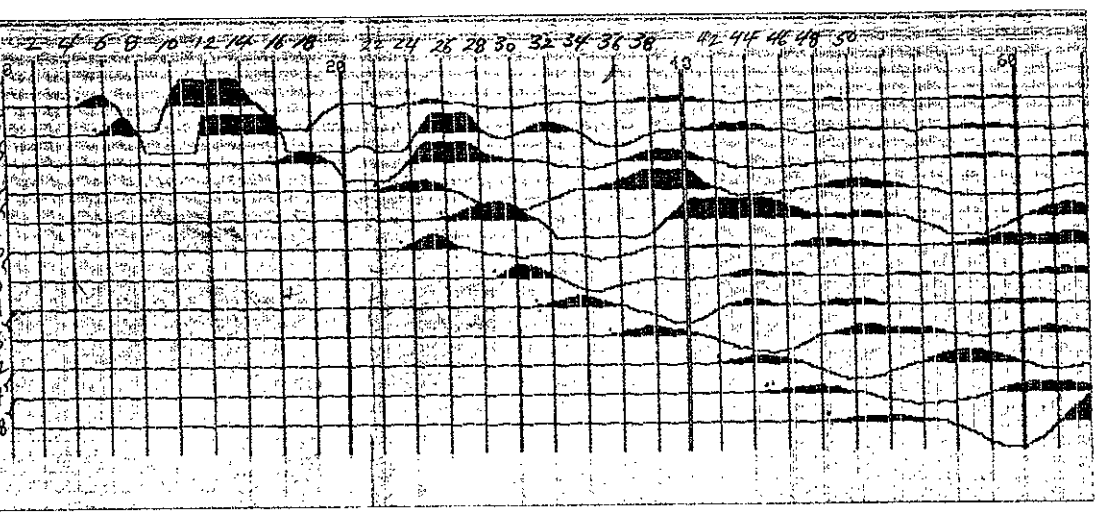


APPENDIX B
Seismic Line No. 1C Spread No. 1

Aug 4/89
Burnaby Res.
SL-1C
spread #1
Line #3
@ #1 → #2
0 X 3'

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	12	104
2	12	95
3	30	915
4	42	921
5	48	925
6	54	1025
7	54	1028
8	60	1031
9	60	1135
10	60	1042
11	60	1144
12	60	1148

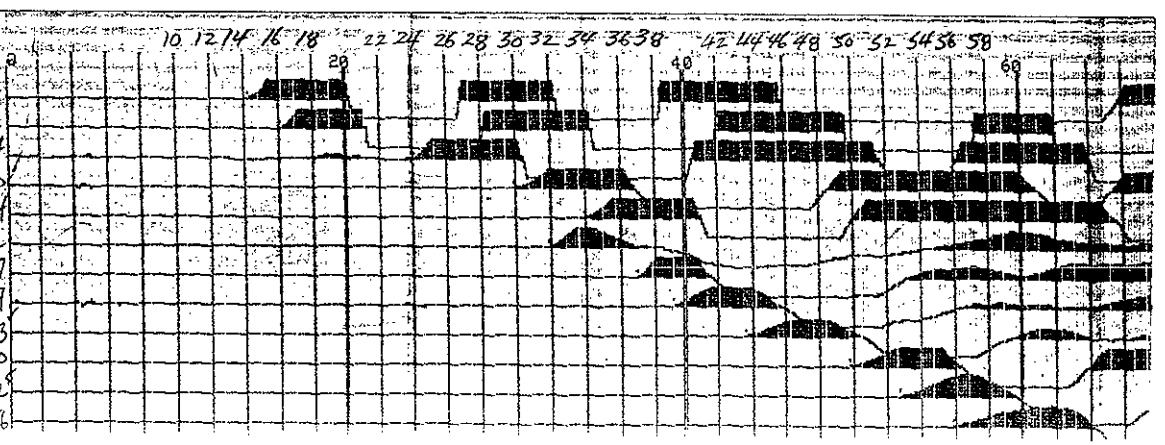


APPENDIX B
Seismic Line No. 1C Spread No. 1

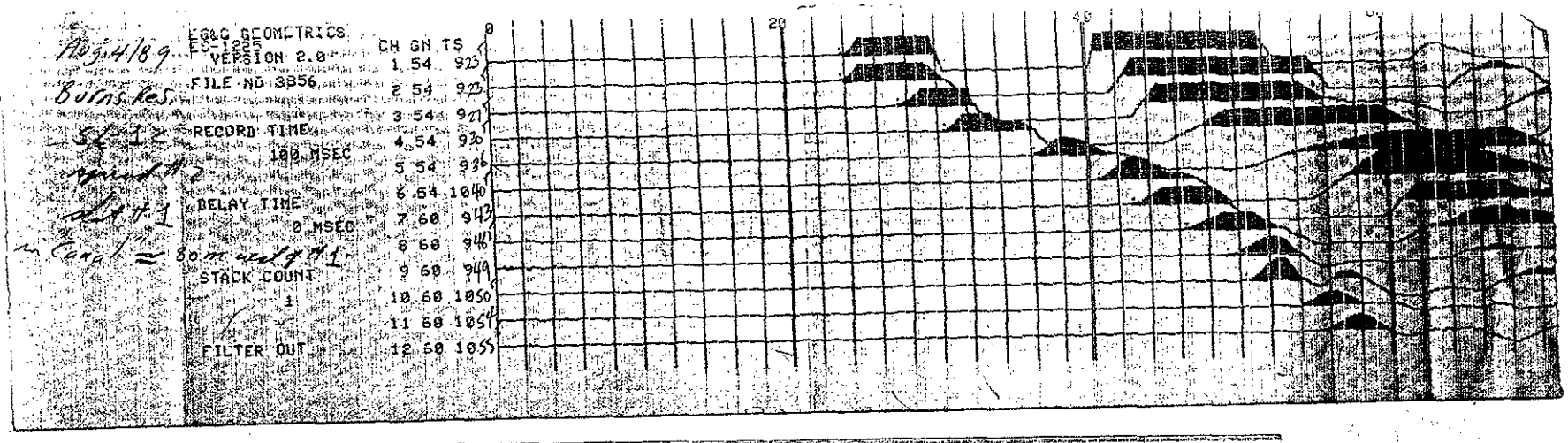
Aug 4/89
Burnaby Res.
SL-1C
spread #1
Line #6
~30m west of #1

EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

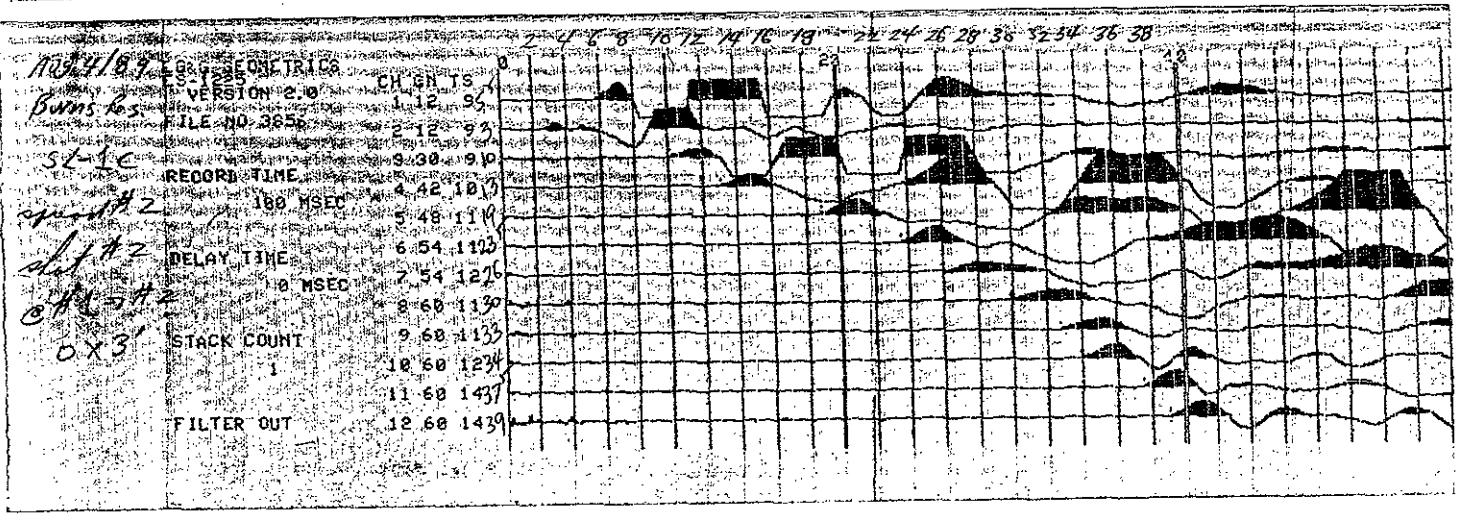
CH	GN	TS
1	54	911
2	54	916
3	54	924
4	54	930
5	54	934
6	54	932
7	60	937
8	60	939
9	60	943
10	60	950
11	60	1052
12	60	1046



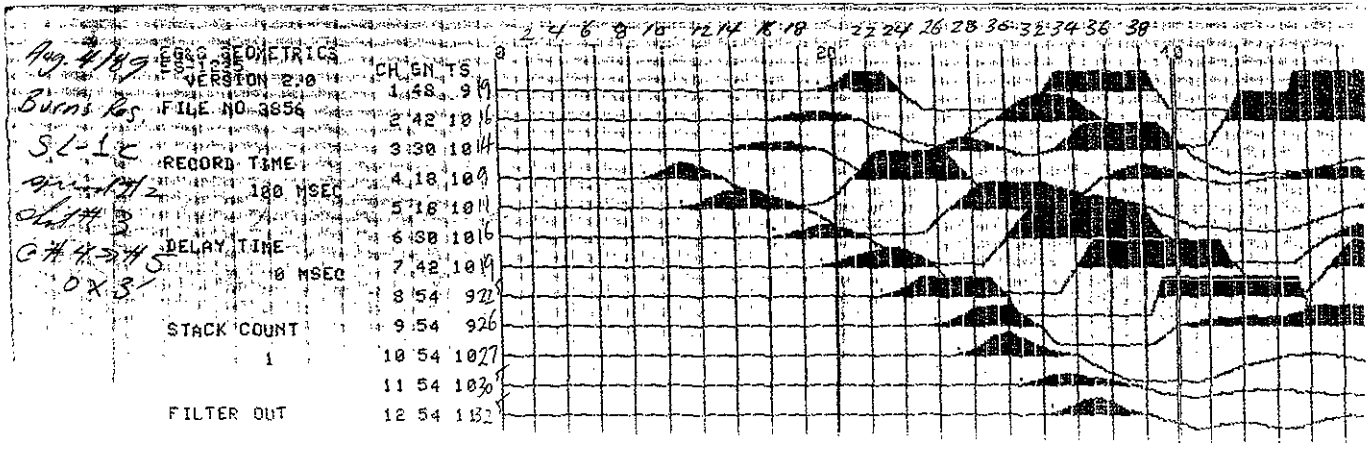
APPENDIX B
Seismic Line No. 1C Spread No. 2



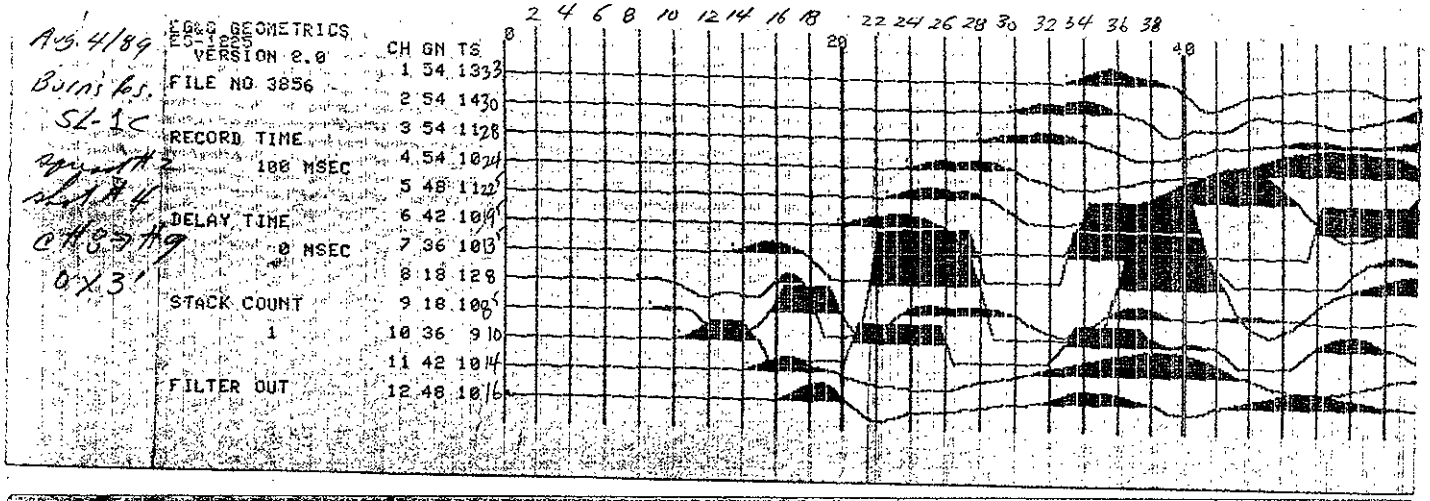
APPENDIX B
Seismic Line No. 1C Spread No. 2



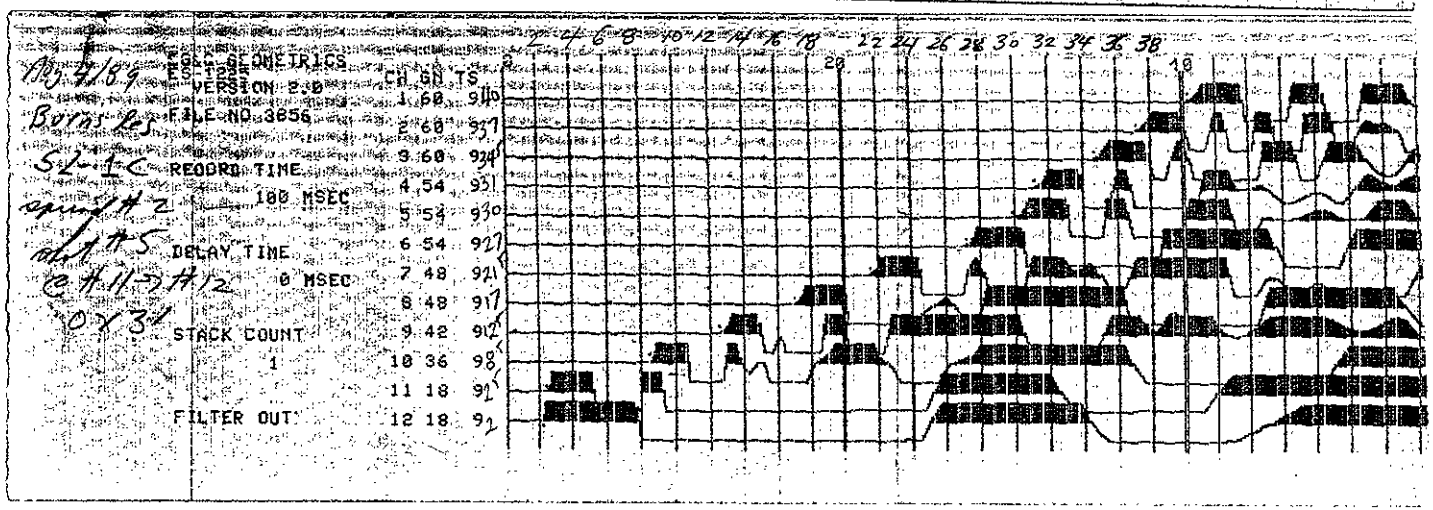
APPENDIX B
Seismic Line No. 1C Spread No. 2



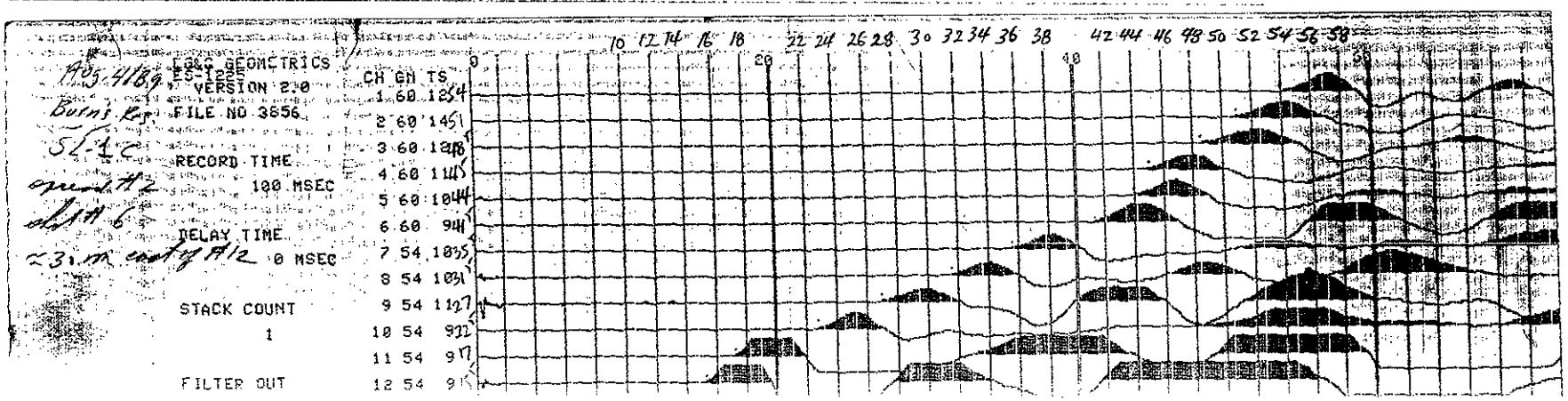
APPENDIX B
Seismic Line No. 1C Spread No. 2



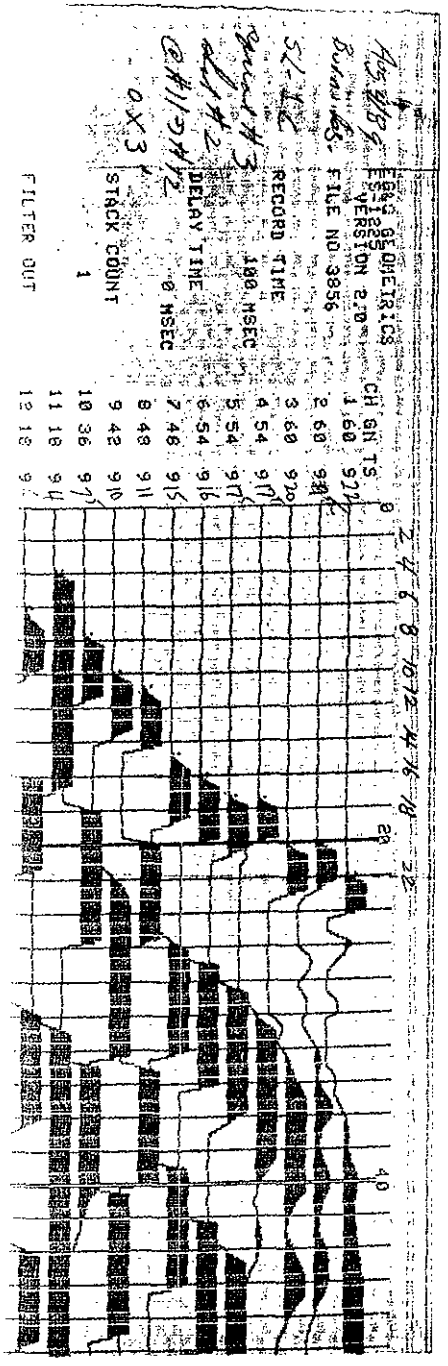
APPENDIX B
Seismic Line No. 1C Spread No. 2



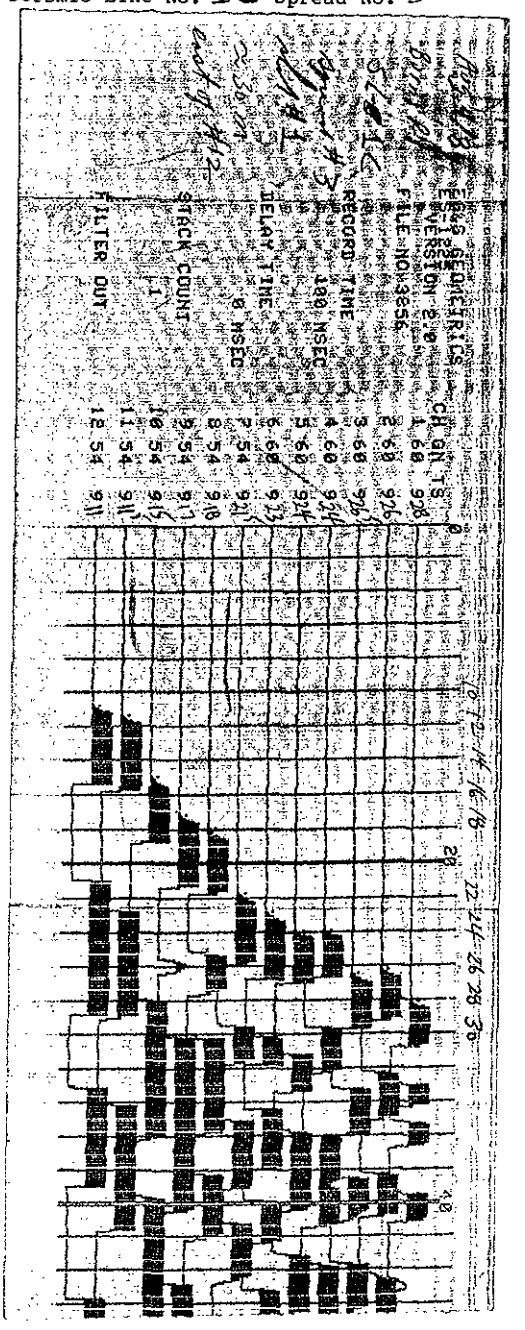
APPENDIX B
Seismic Line No. 1C Spread No. 2



APPENDIX B
Seismic Line No. 1C Spread No. 3

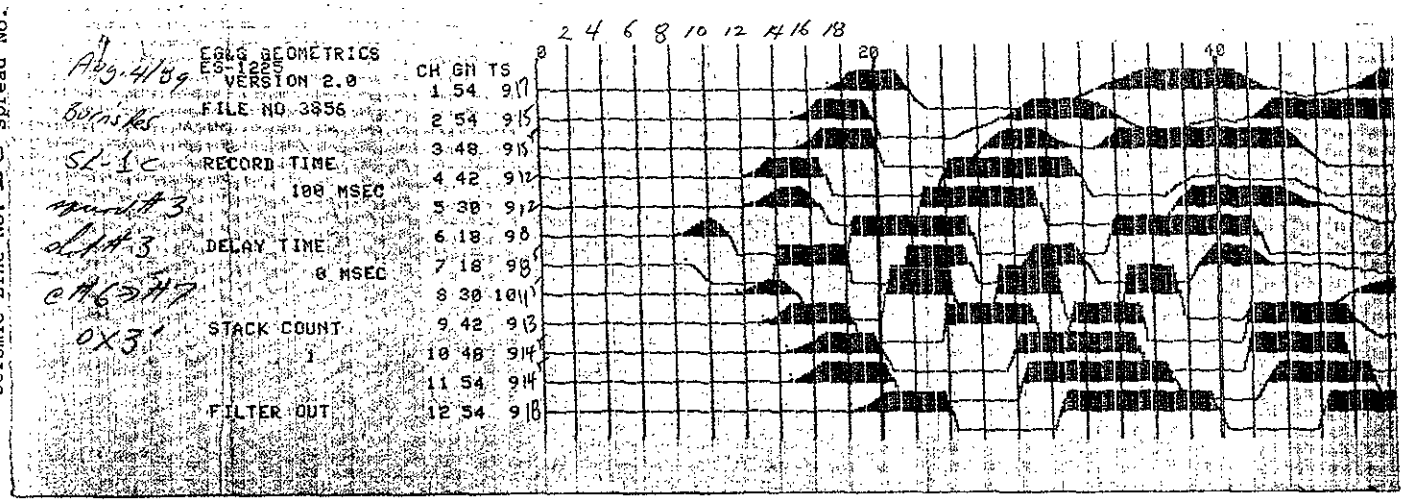


APPENDIX B
Seismic Line No. 1C Spread No. 3

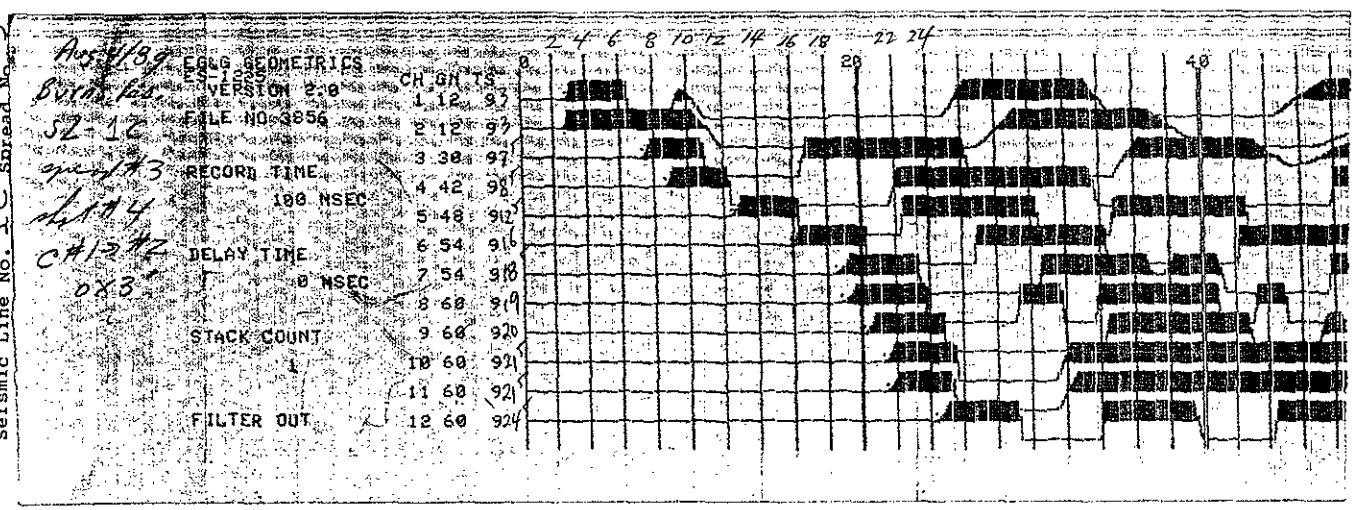


APPENDIX B
Seismic Line No. Spread No. 3

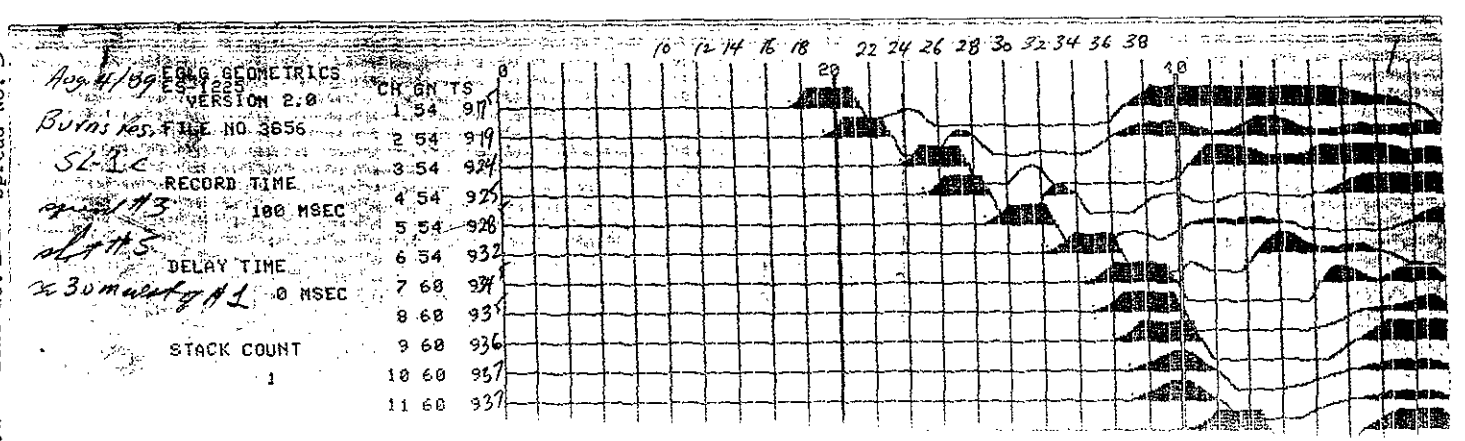
APPENDIX B
Seismic Line No. 1C Spread No. 3



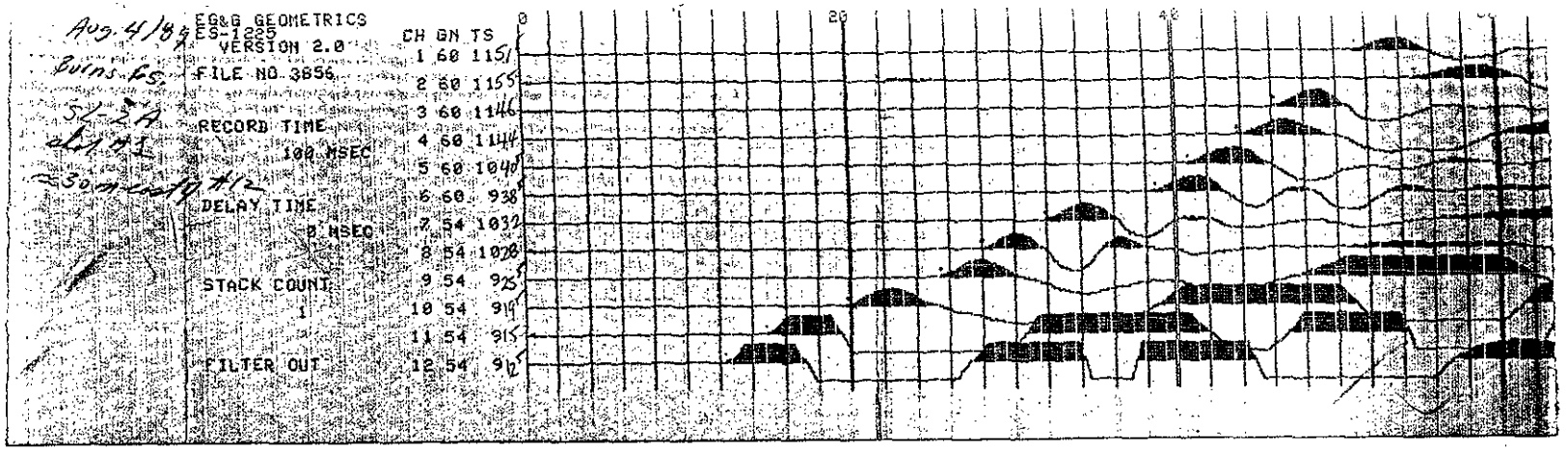
APPENDIX B
Seismic Line No. 1C Spread No. 3



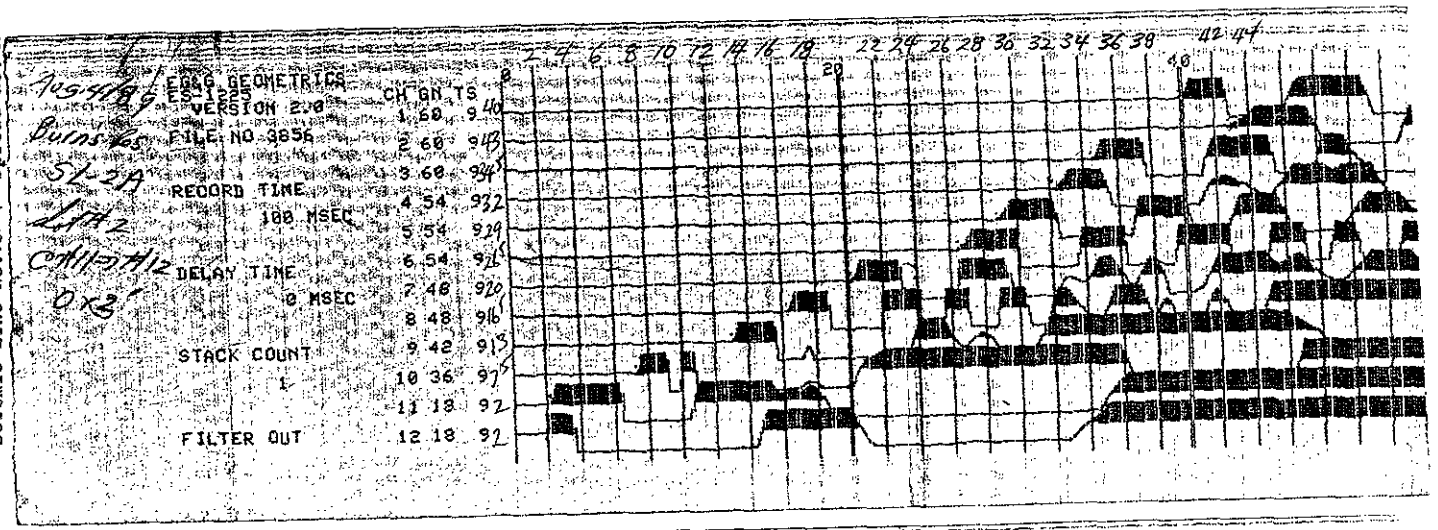
APPENDIX B
Seismic Line No. 1C Spread No. 3



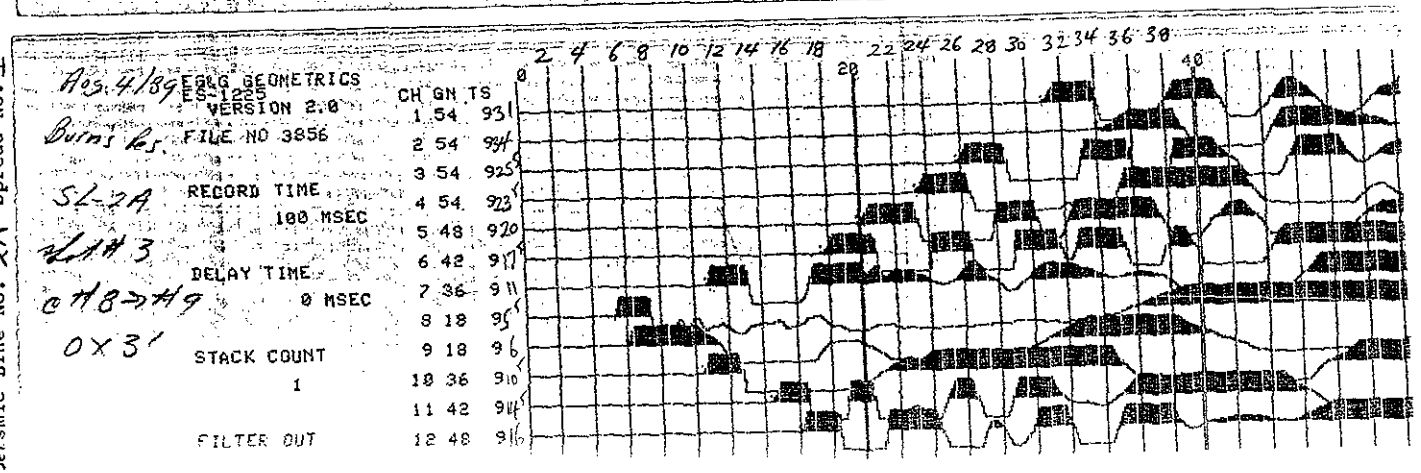
APPENDIX B
Seismic Line No. 2A Spread No. 1



APPENDIX B
Seismic Line No. 2A Spread No. 1



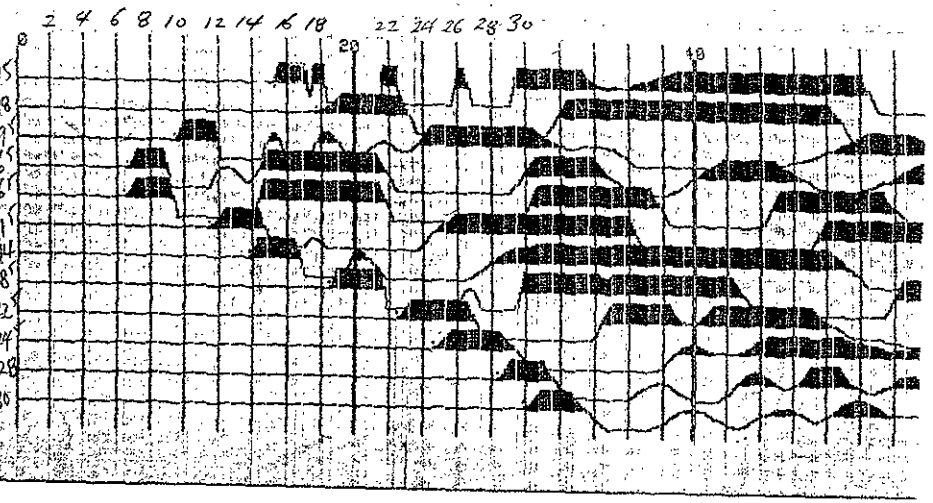
APPENDIX B
Seismic Line No. 2A Spread No. 1



APPENDIX B
Seismic Line No. 2A Spread No. 1

Aug. 4/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

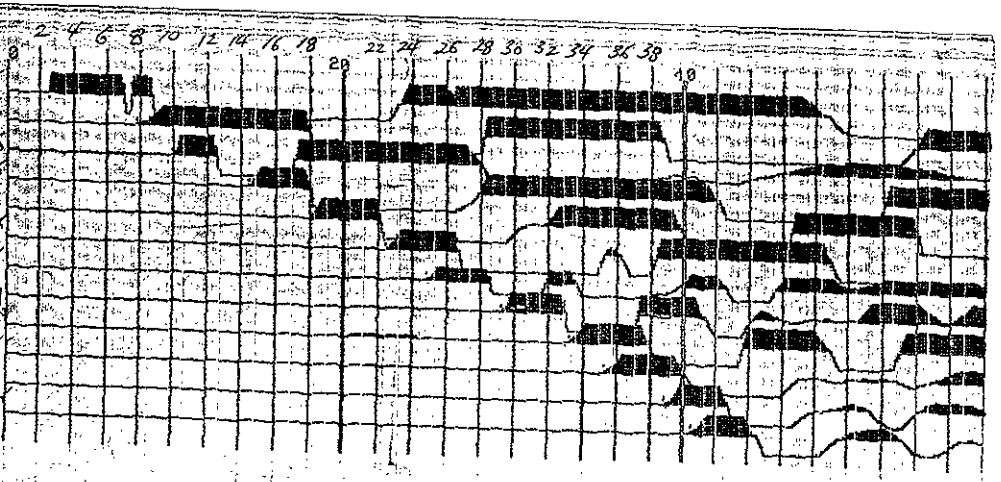
CH	GN	TS
1	48	915
2	42	918
3	30	99
4	18	96
5	18	96
6	30	911
7	42	914
8	54	918
9	54	922
10	54	924
11	54	928
12	54	930



APPENDIX B
Seismic Line No. 2A Spread No. 1

Aug. 4/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

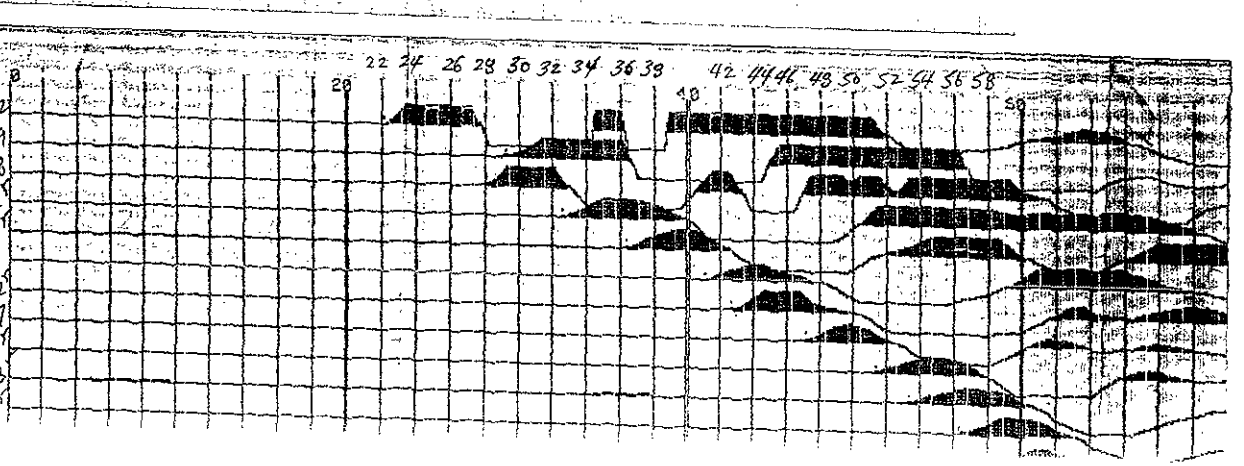
CH	GN	TS
1	12	92
2	12	98
3	30	910
4	48	914
5	48	918
6	54	922
7	54	825
8	60	929
9	60	933
10	60	935
11	60	939
12	60	940



APPENDIX B
Seismic Line No. 2A Spread No. 1

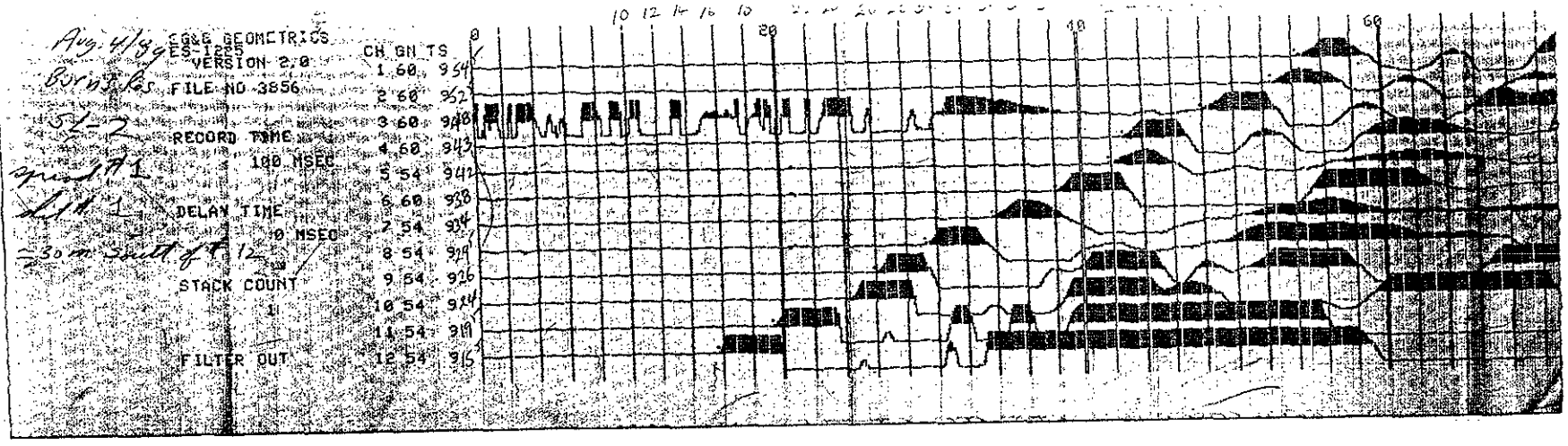
Aug. 4/89 EG&G GEOMETRICS
ES-1225
VERSION 2.0
FILE NO 3856
RECORD TIME
100 MSEC
DELAY TIME
0 MSEC
STACK COUNT
1
FILTER OUT

CH	GN	TS
1	54	922
2	54	929
3	54	928
4	54	932
5	54	936
6	54	941
7	60	942
8	60	947
9	60	951
10	60	1053
11	60	1156

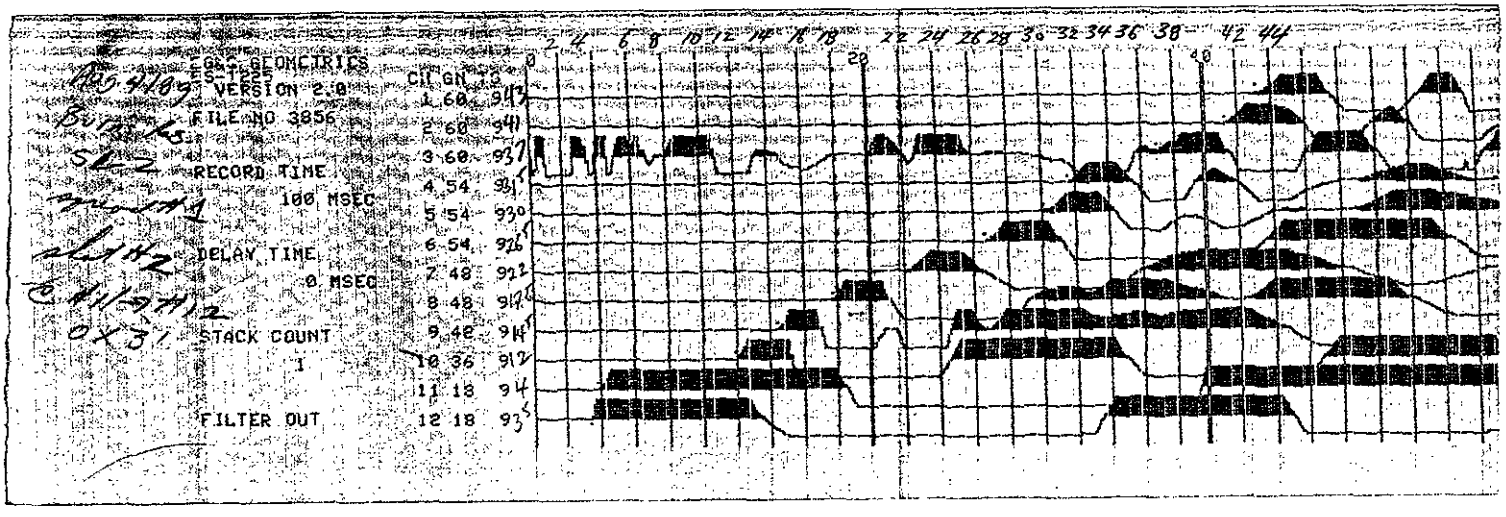


APPENDIX B
Seismic Line No. 2A Spread No. 1

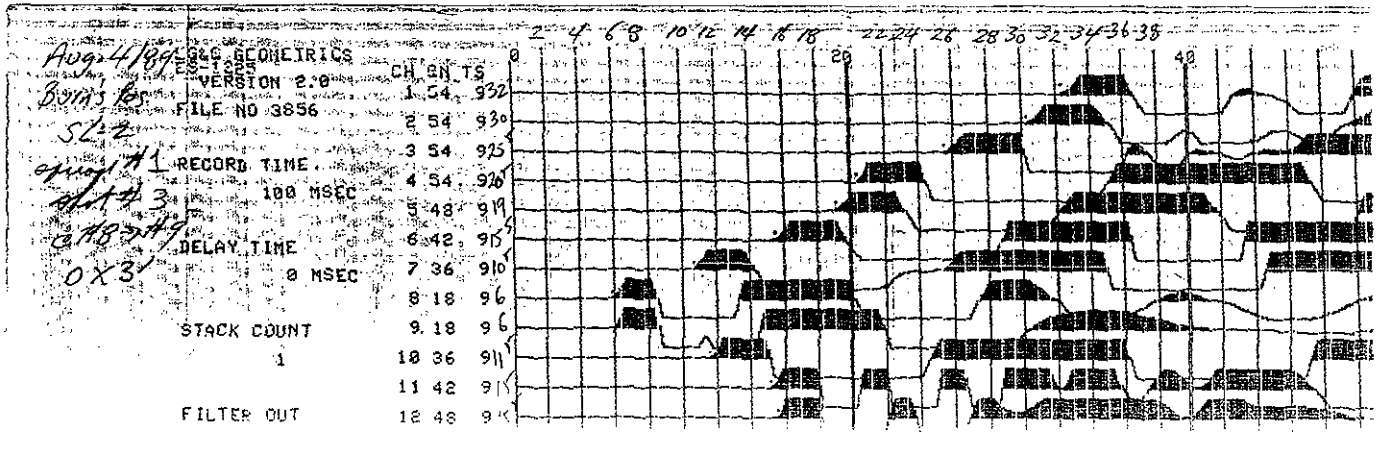
APPENDIX B
Seismic Line No. 2 Spread No. 1



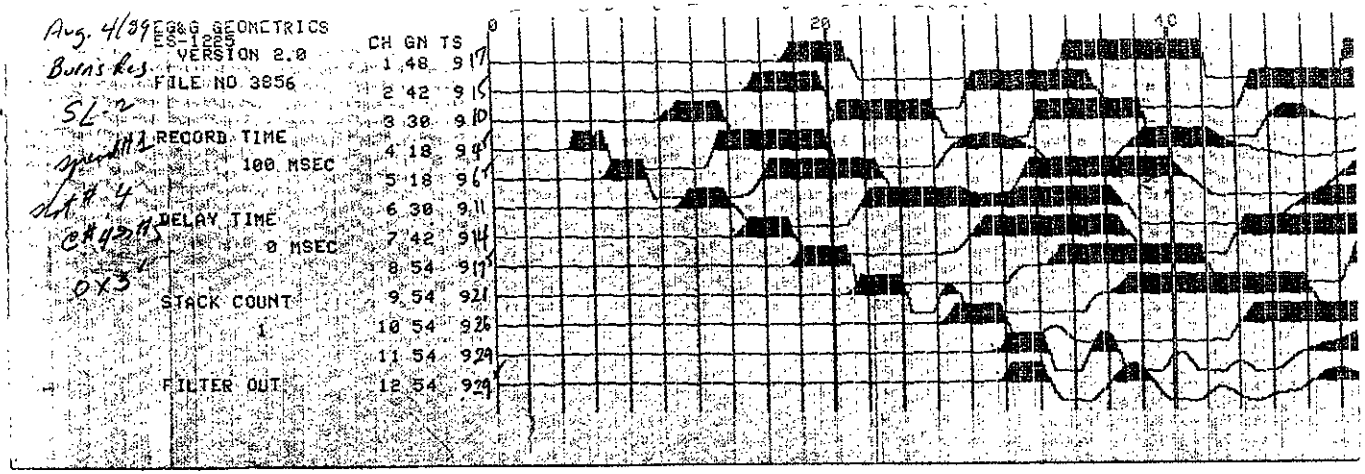
APPENDIX B
Seismic Line No. 2 Spread No. 1



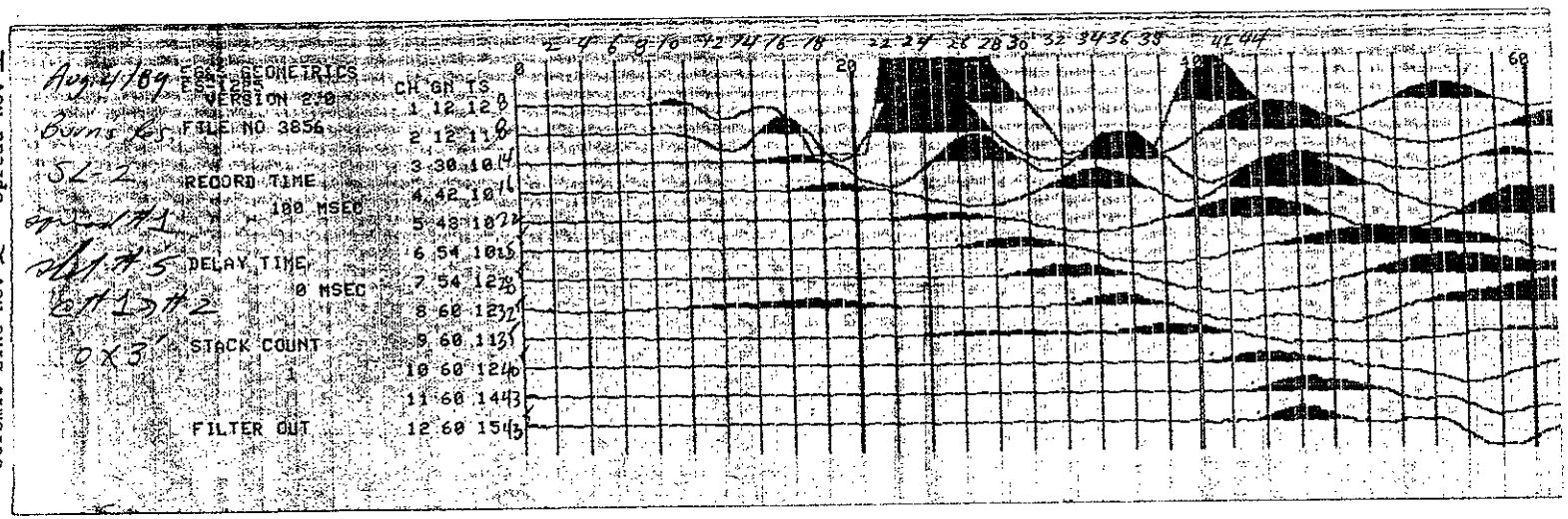
APPENDIX B
Seismic Line No. 2 Spread No. 1



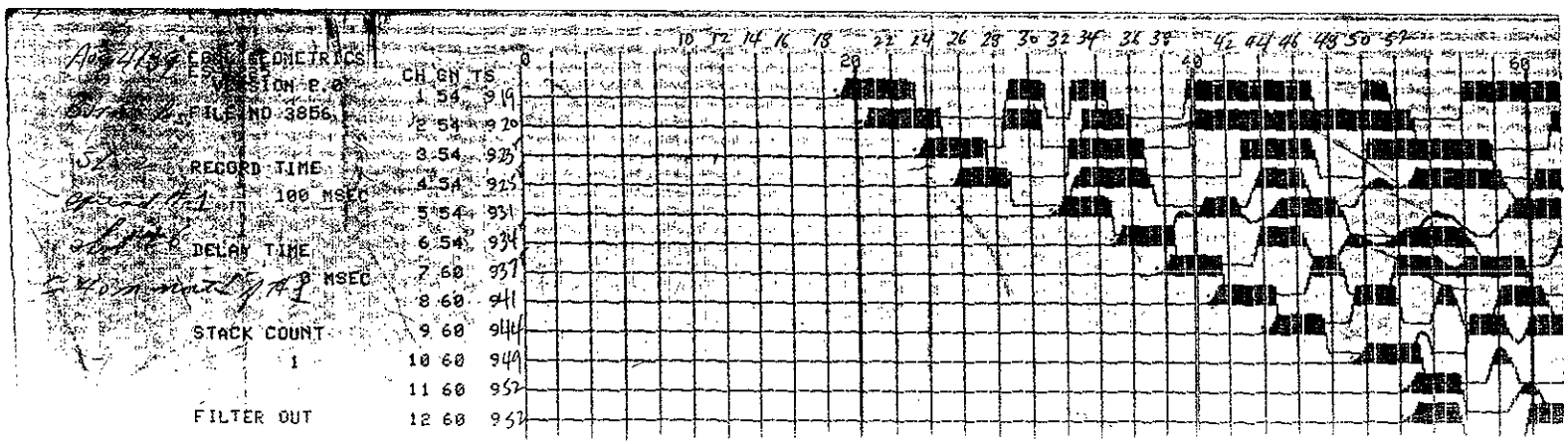
APPENDIX B
Seismic Line No. 2 Spread No. 1



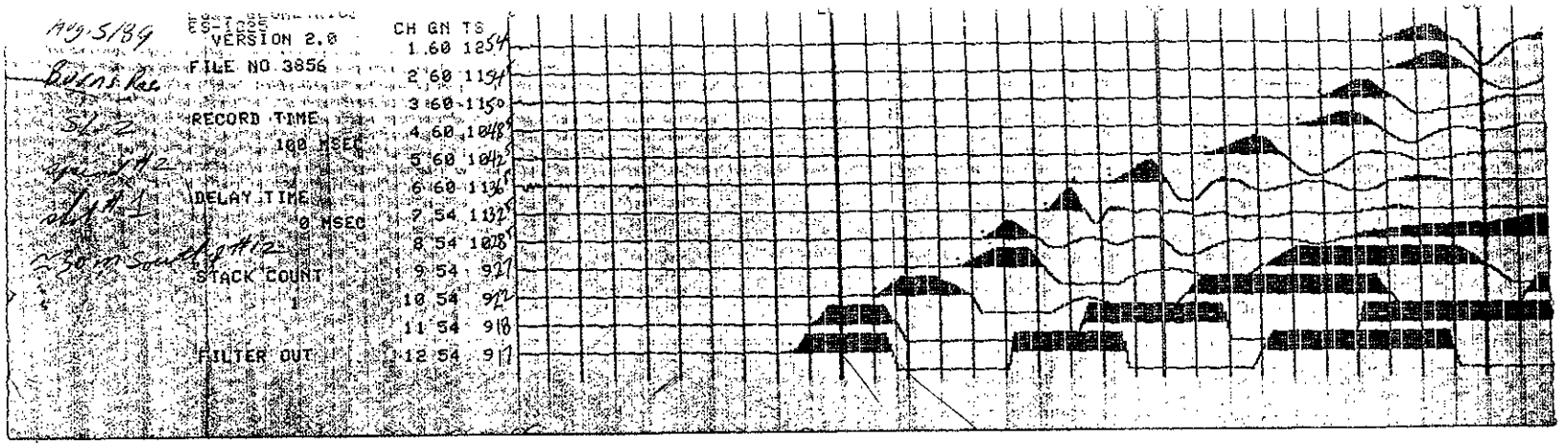
APPENDIX B
Seismic Line No. 2 Spread No. 1



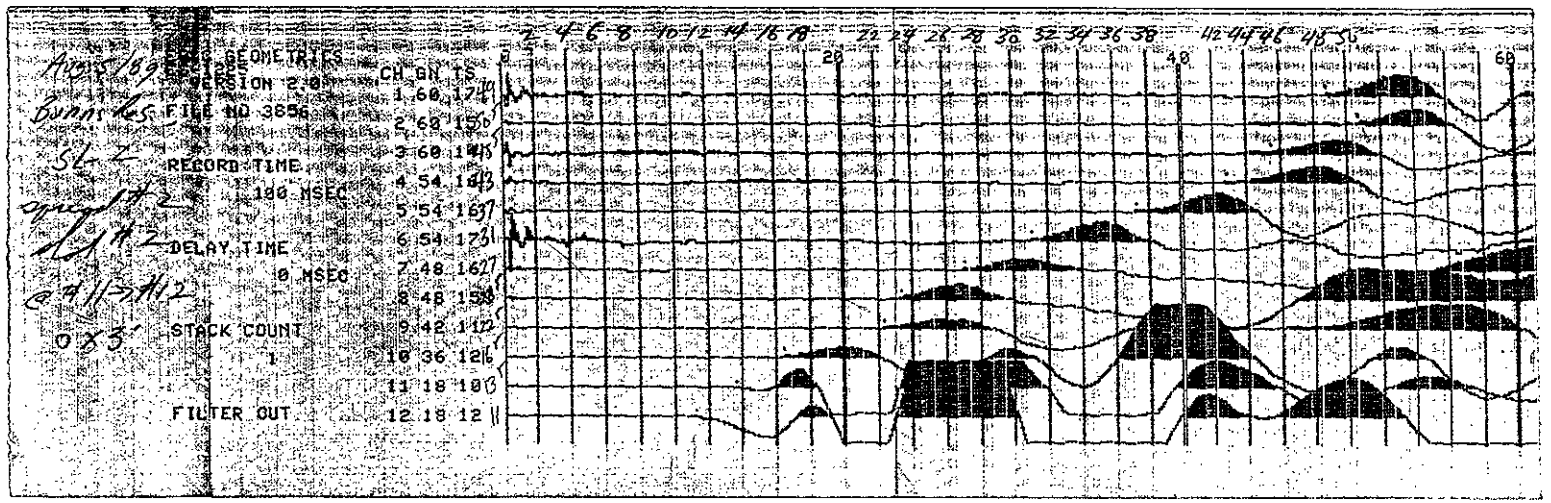
APPENDIX B
Seismic Line No. 2 Spread No. 1



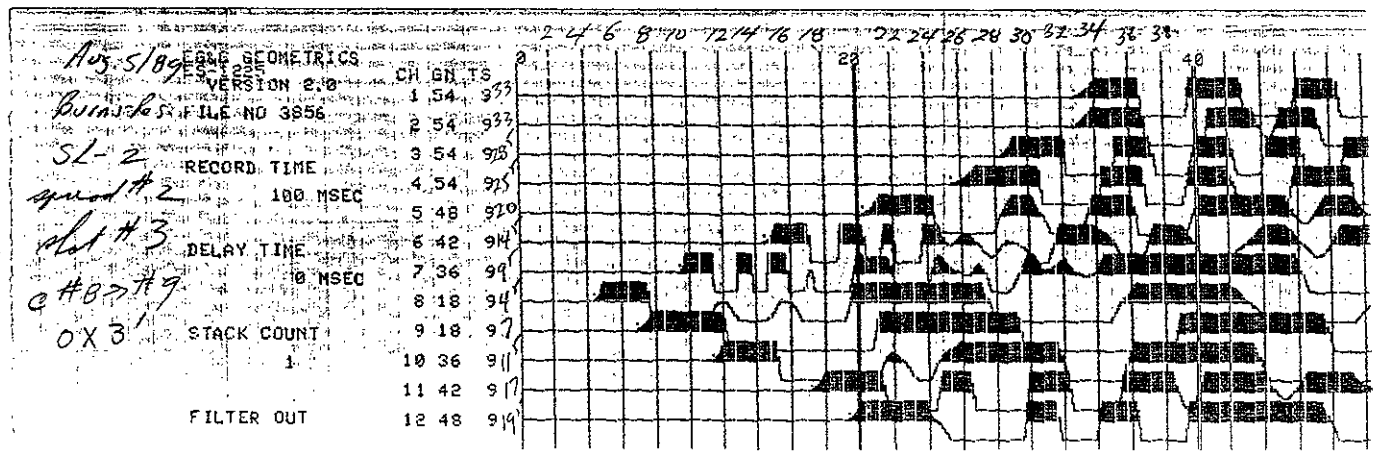
APPENDIX B
Seismic Line No. 2 Spread No. 2



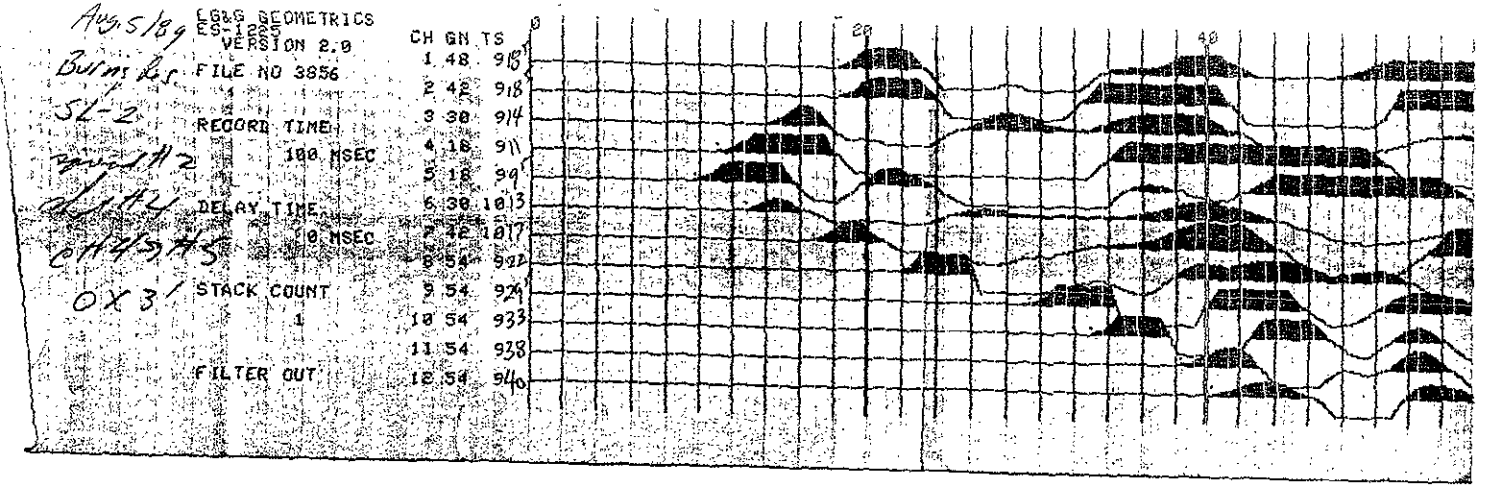
APPENDIX B
Seismic Line No. 2 Spread No. 2



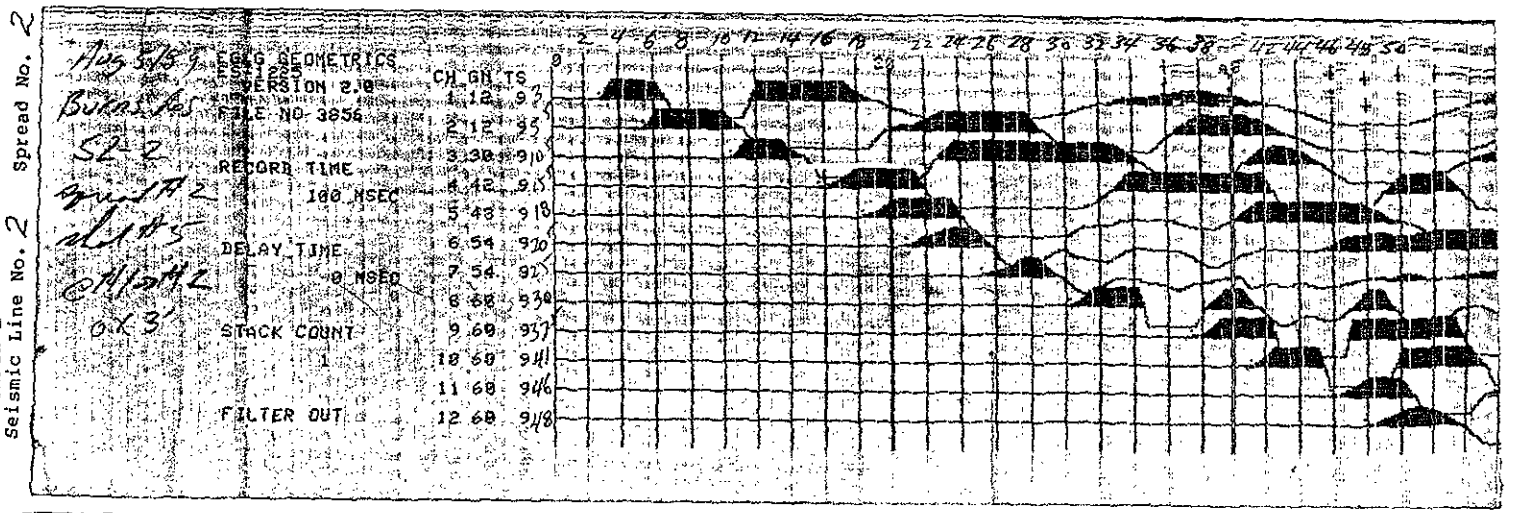
APPENDIX B
Seismic Line No. 2 Spread No. 2



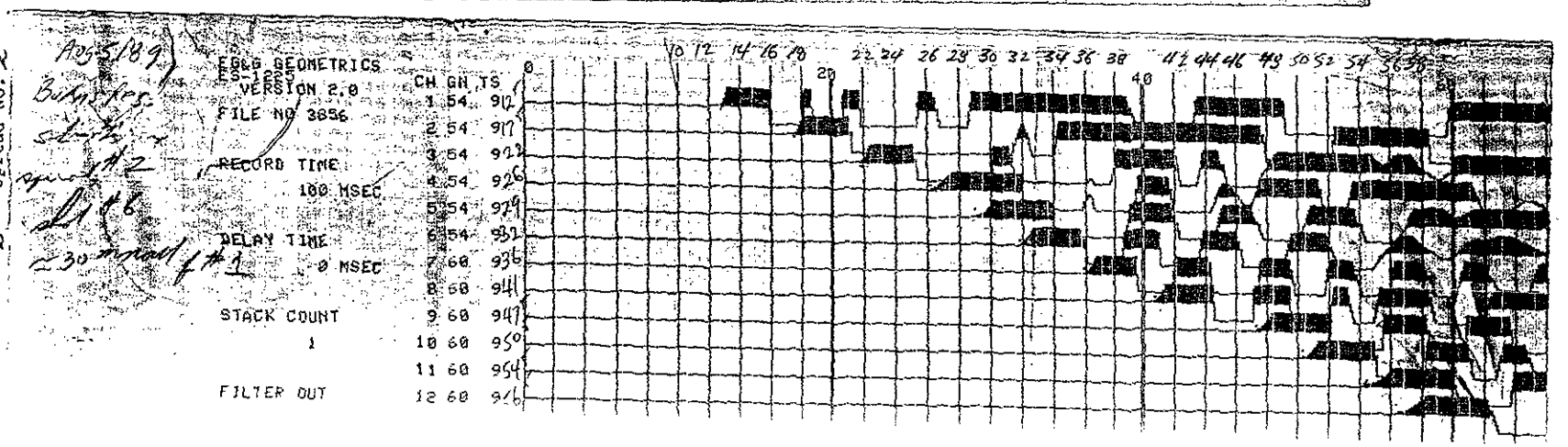
APPENDIX B
Seismic Line No. 2 Spread No. 2



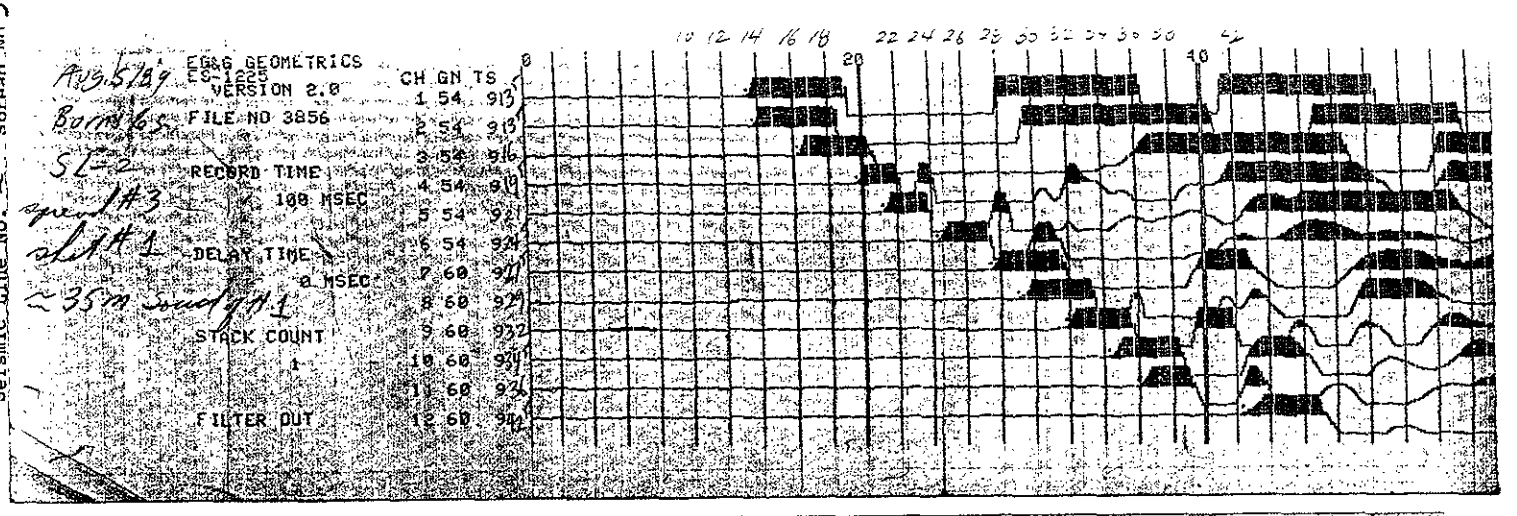
APPENDIX B
Seismic Line No. 2 Spread No. 2



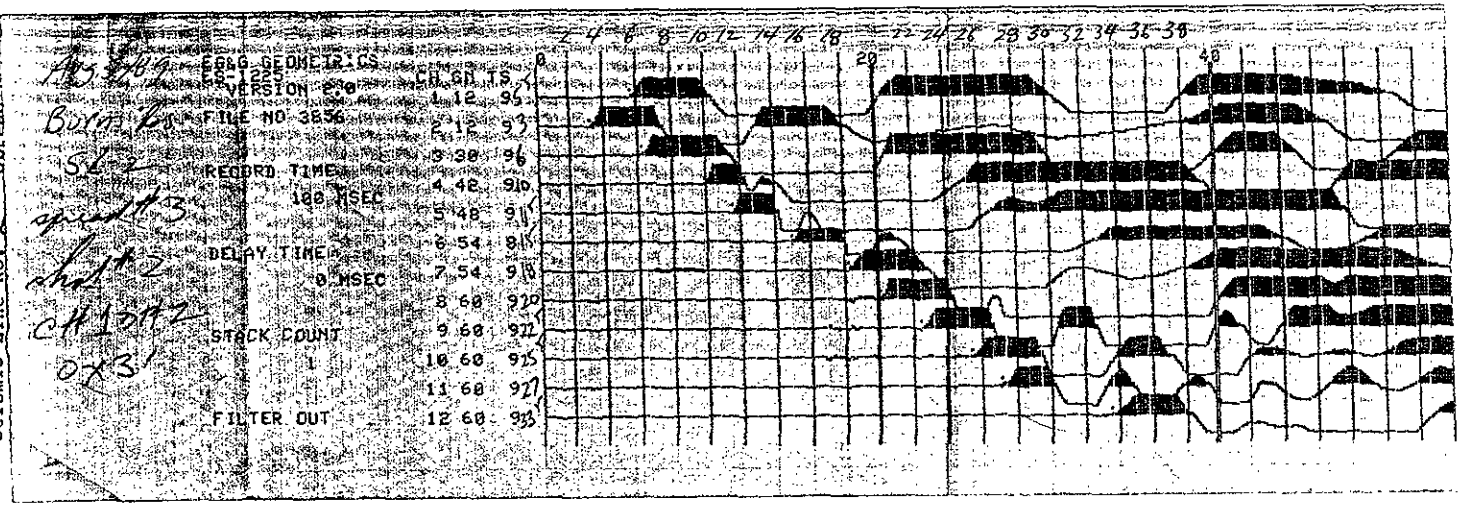
APPENDIX B
Seismic Line No. 2 Spread No. 2



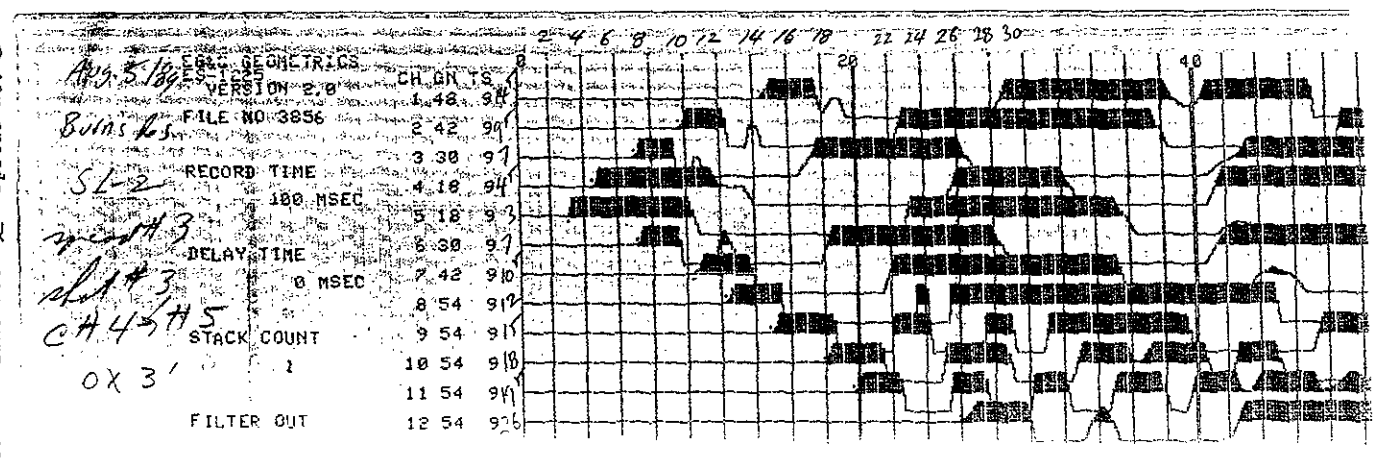
APPENDIX B
Seismic Line No. 2 Spread No. 3



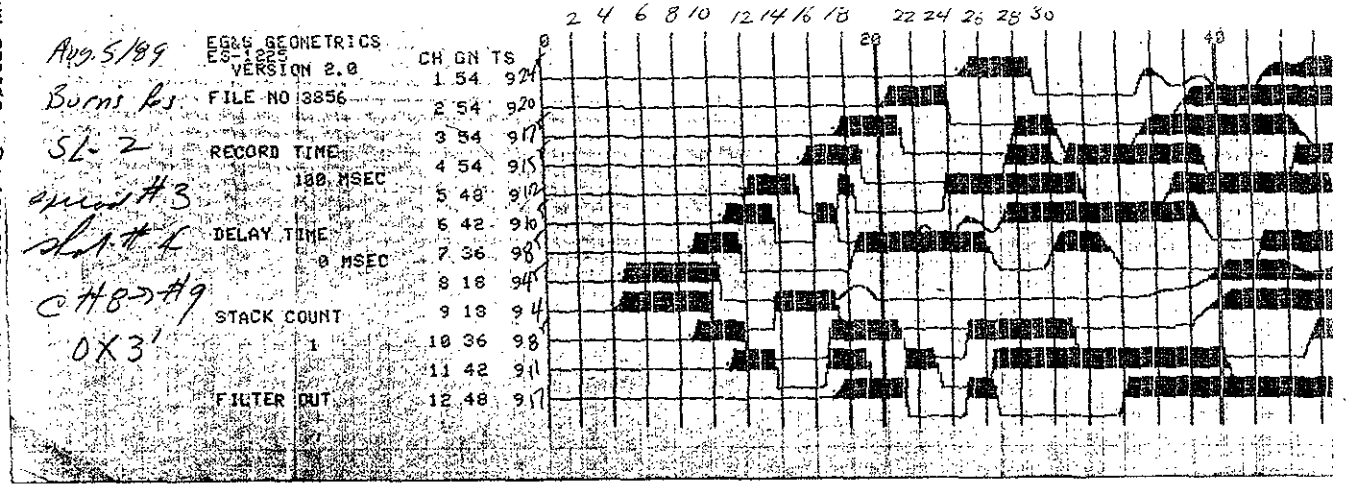
APPENDIX B
Seismic Line No. 2 Spread No. 3



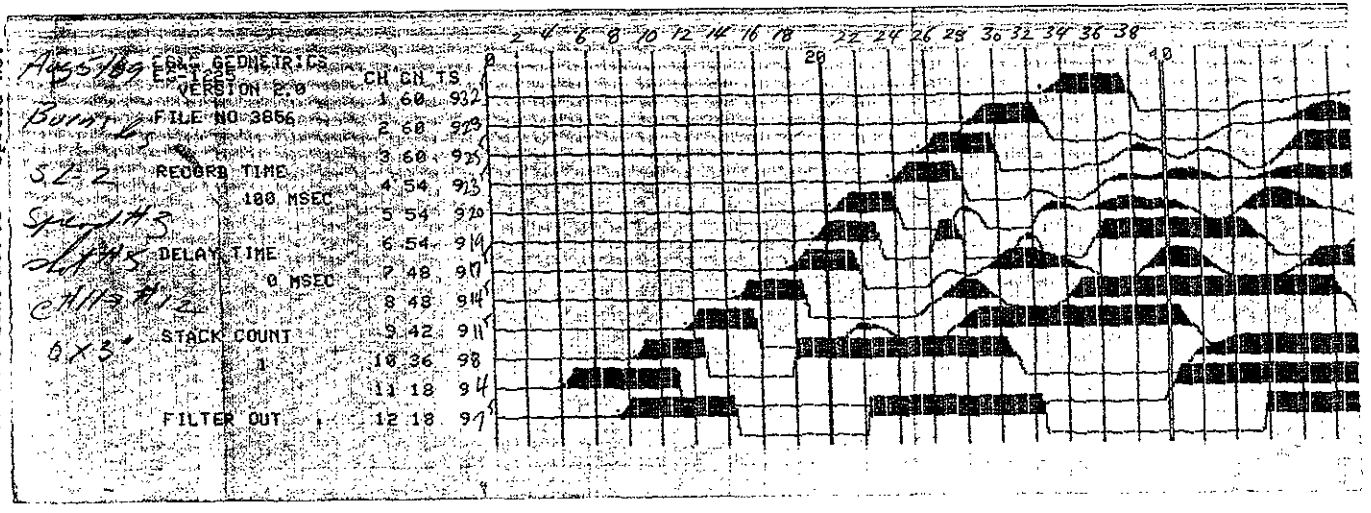
APPENDIX B
Seismic Line No. 2 Spread No. 3



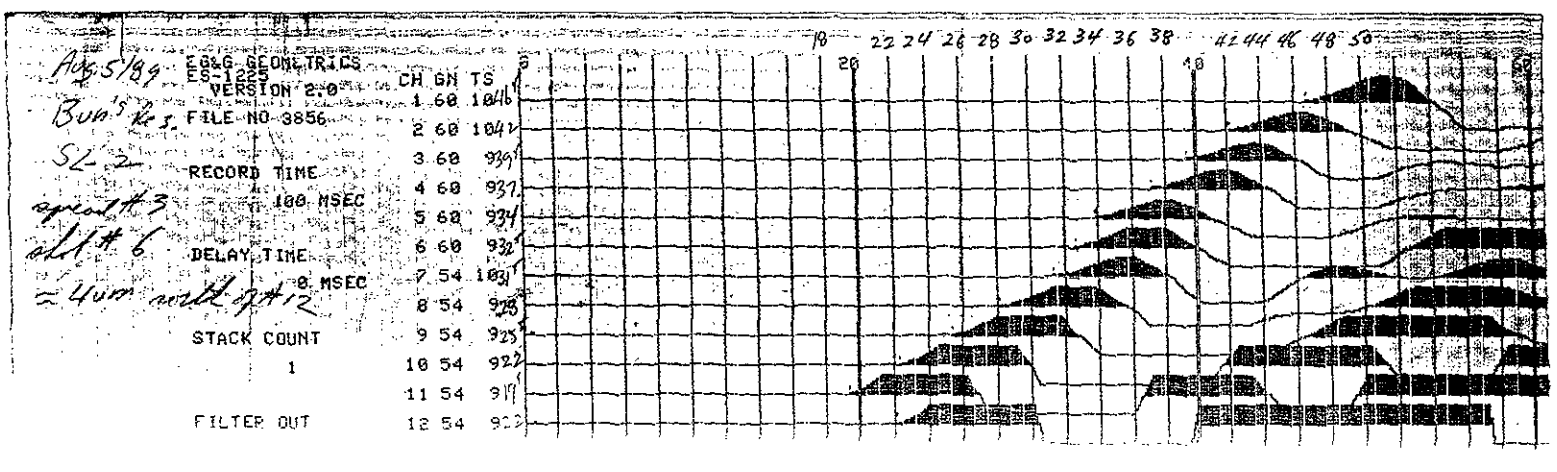
APPENDIX B
Seismic Line No. 2 Spread No. 3



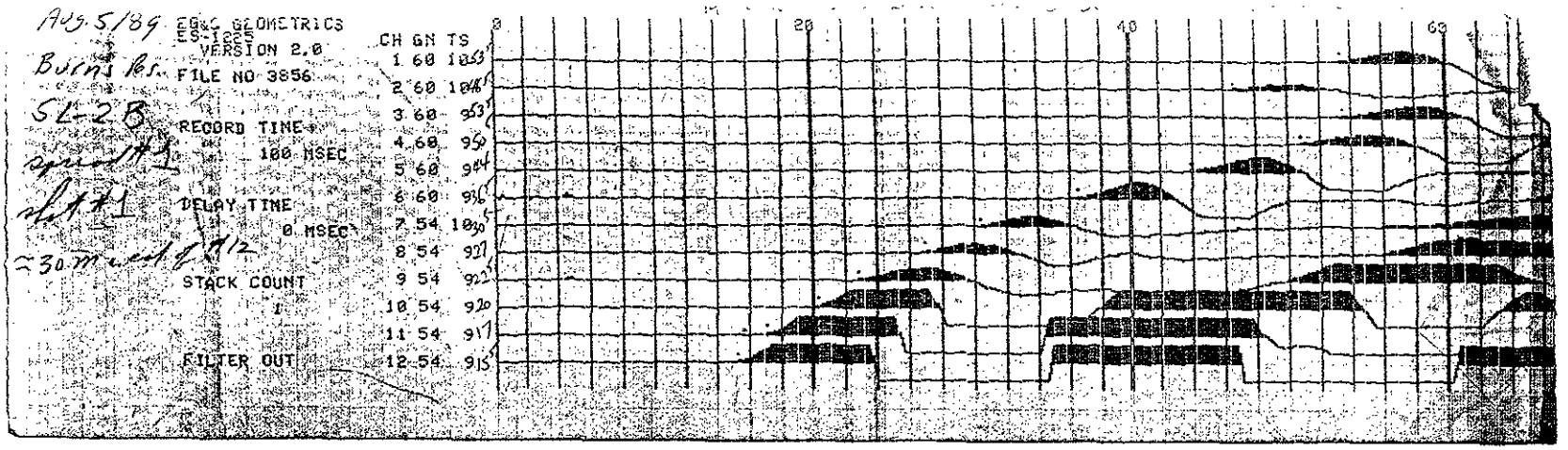
APPENDIX B
Seismic Line No. 2 Spread No. 3



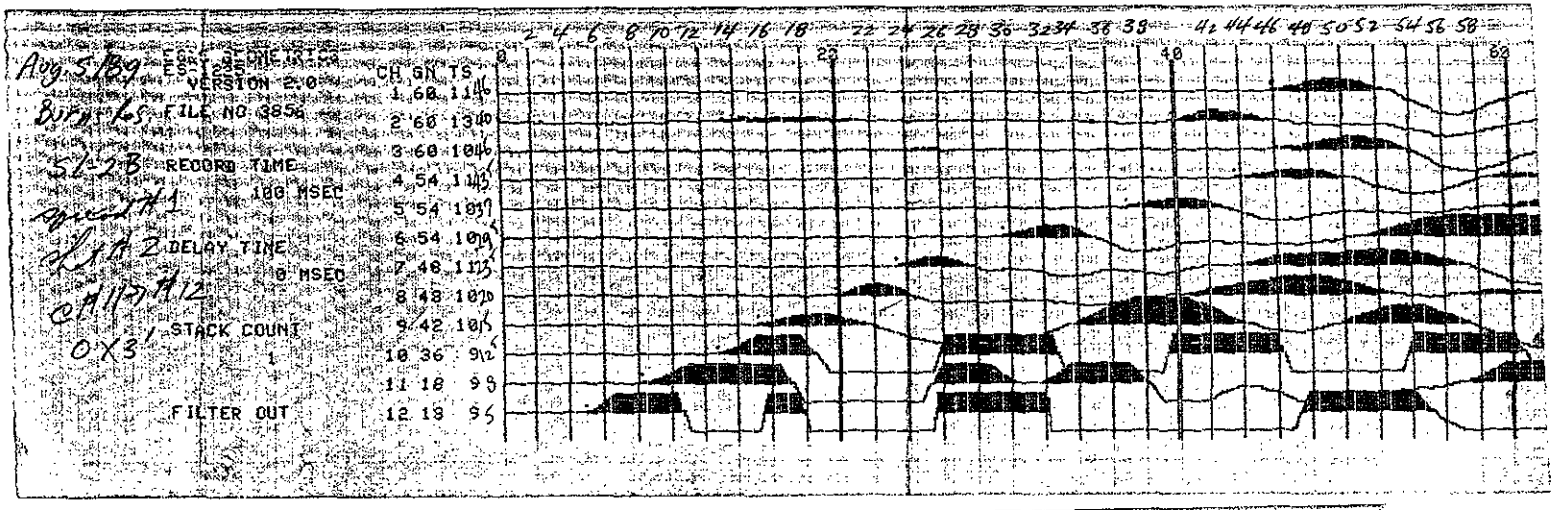
APPENDIX B
Seismic Line No. 2 Spread No. 3



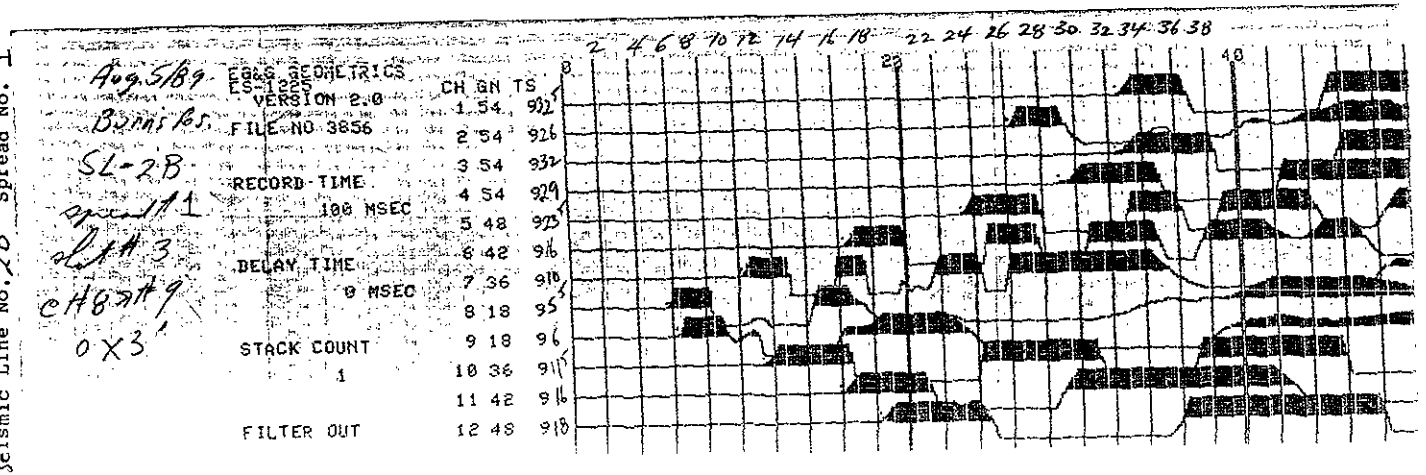
APPENDIX B
Seismic Line No. 28 Spread No. 1



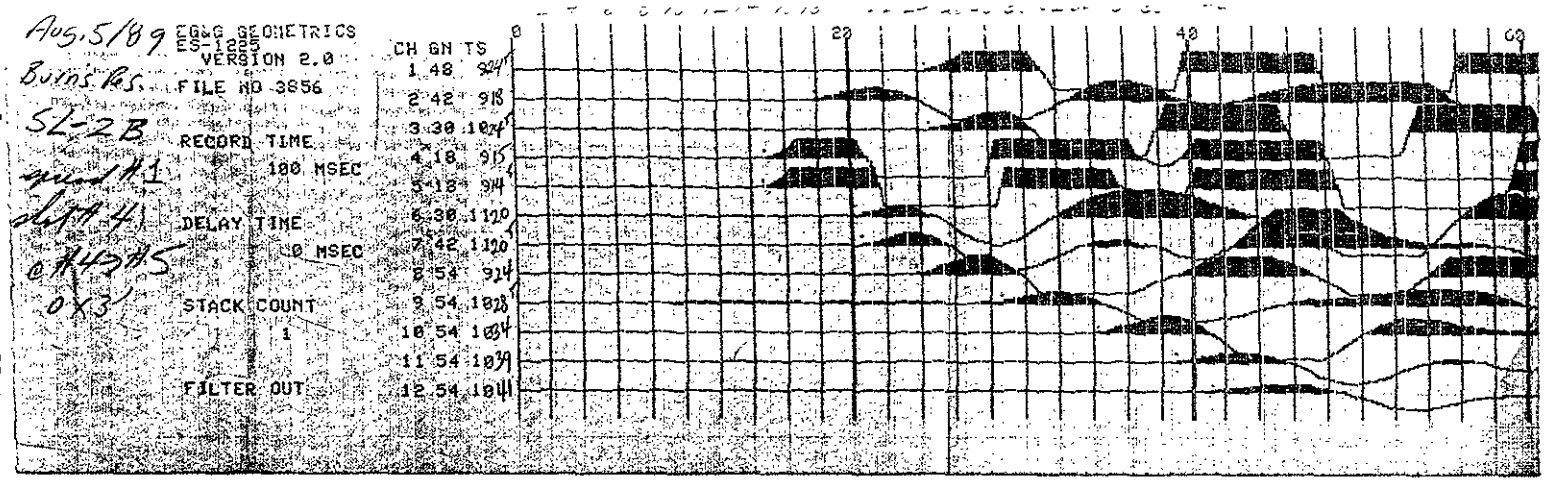
APPENDIX B
Seismic Line No. 28 Spread No. 1



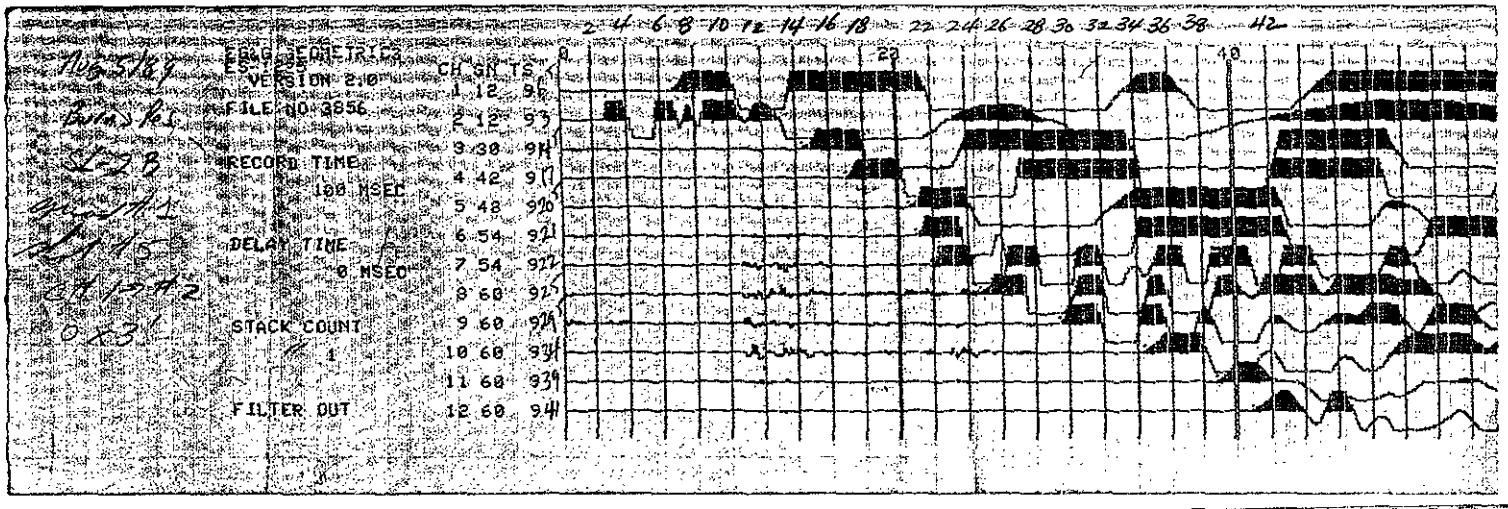
APPENDIX B
Seismic Line No. 28 Spread No. 1



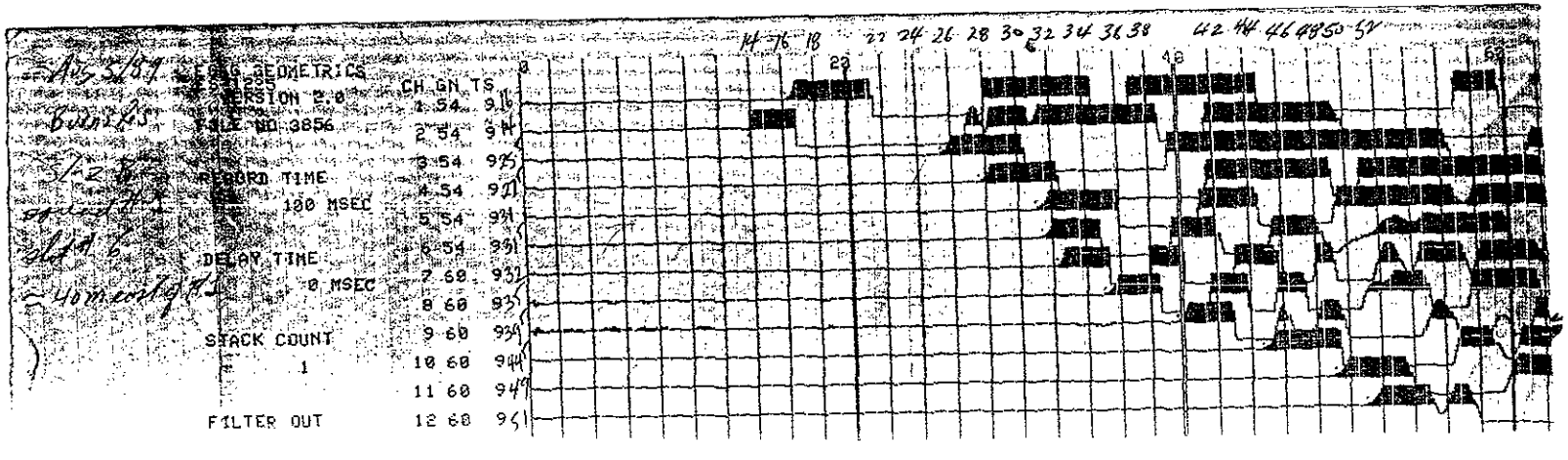
APPENDIX B
Seismic Line No. 28 Spread No. 1



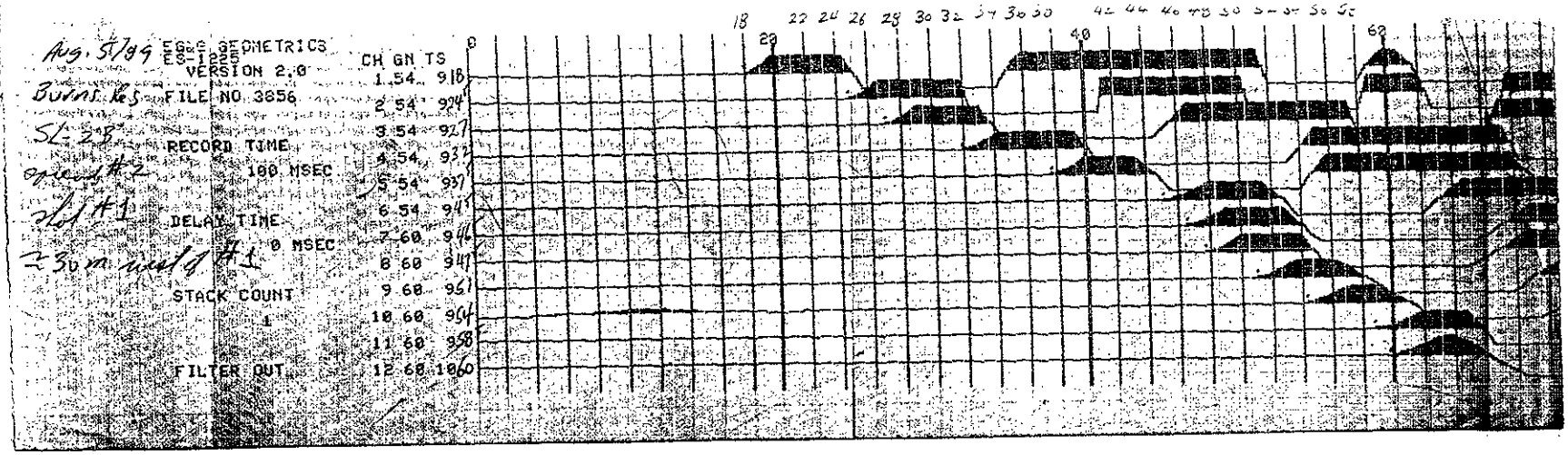
APPENDIX B
Seismic Line No. 28 Spread No. 1



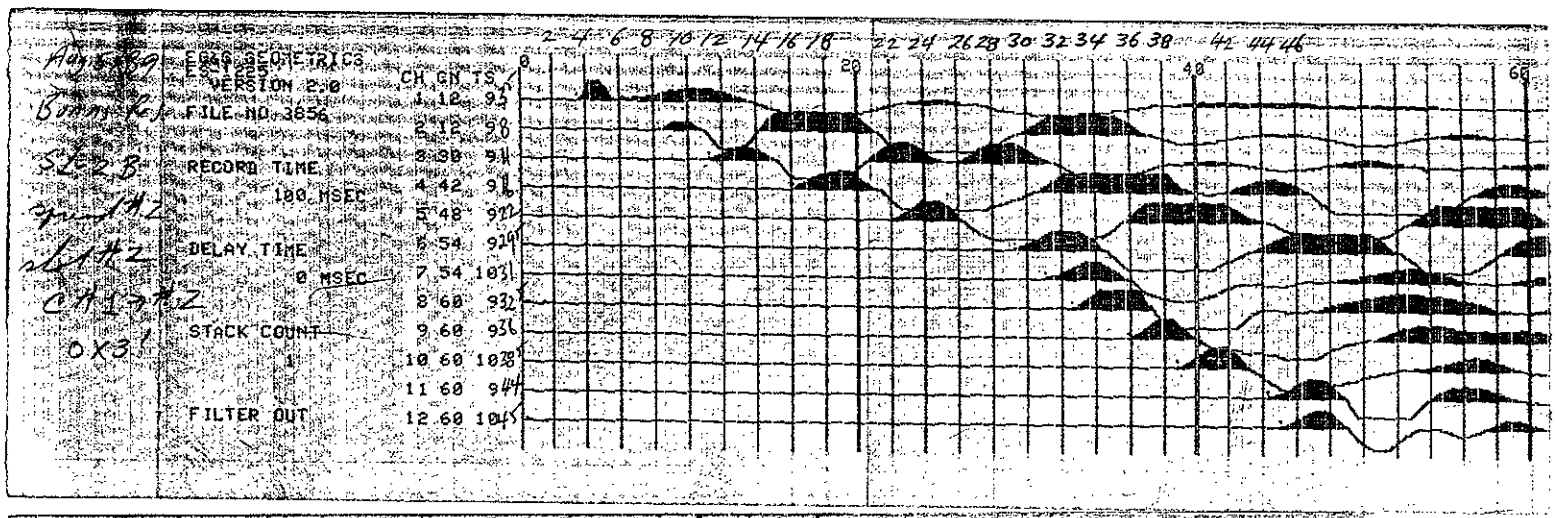
APPENDIX B
Seismic Line No. 28 Spread No. 1



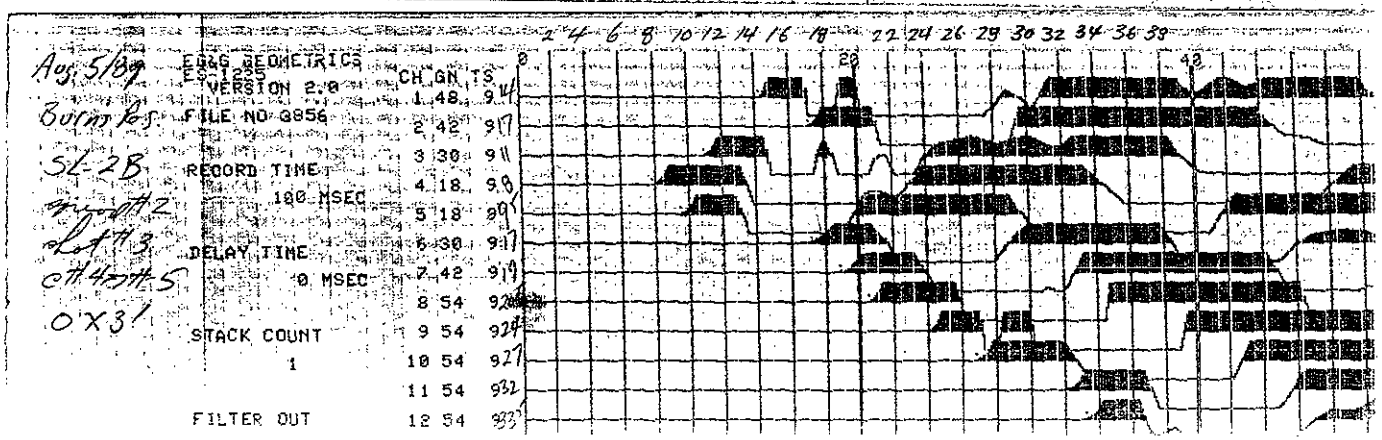
APPENDIX B
Seismic Line No. 28 Spread No. 2



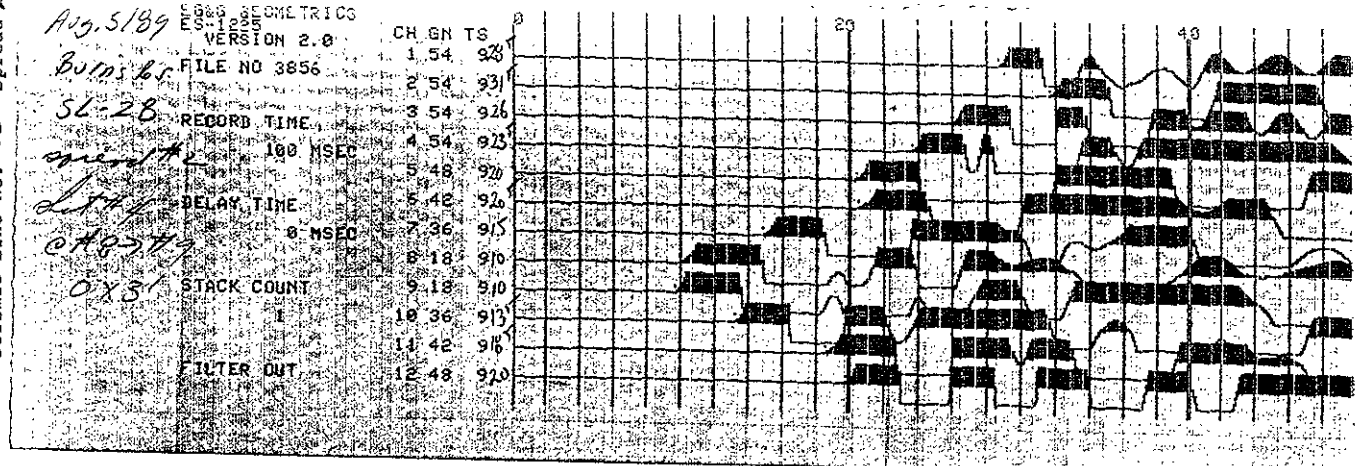
APPENDIX B
Seismic Line No. 28 Spread No. 2



APPENDIX B
Seismic Line No. 28 Spread No. 2



APPENDIX B
Seismic Line No. 28 Spread No. 2



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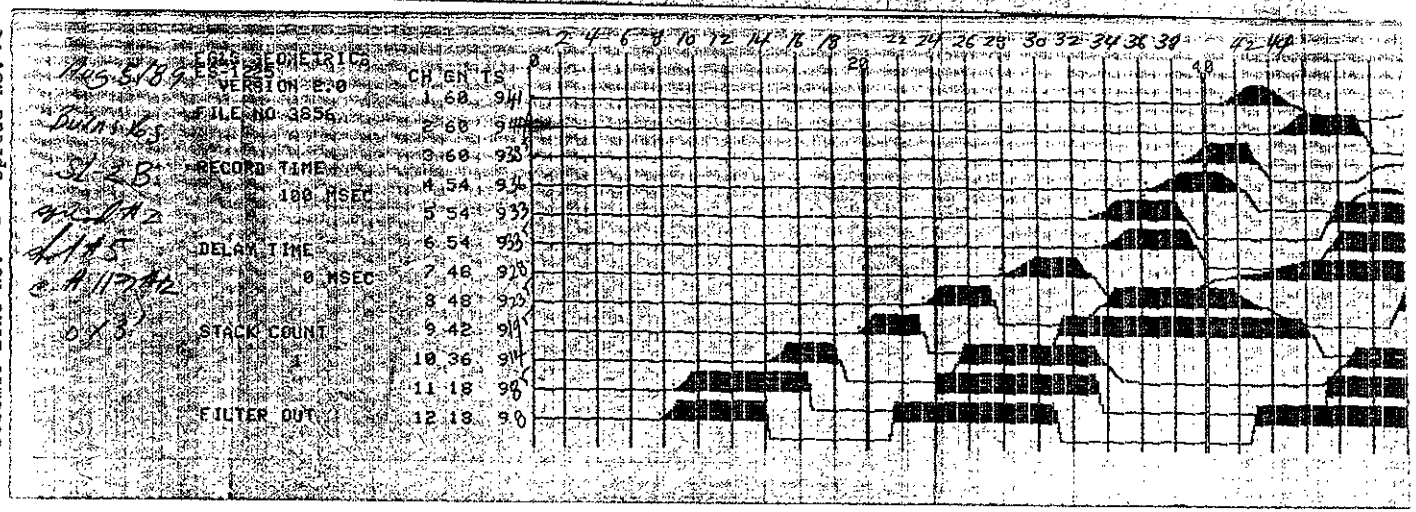
Seismic Line No. 28 Spread No. 2



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Seismic Line No. 28 Spread No. 2