Open File Envelope No. 8752

PEL 39

OTWAY BASIN

1994 EAST AVENUE SEISMIC SURVEY

REPORTS FOR THE PERIOD FEBRUARY TO SEPTEMBER 1994

Submitted by

GFE Resources Ltd
1994

Enquiries: Customer Services
Ground Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

PRIMARY INDUSTRIES AND RESOURCES SA

ENVELOPE 8752

TENEMENT: PEL 39; Otway Basin

TENEMENT HOLDER: GFE Resources Ltd (operator), TMOC Exploration Pty Ltd, Basin Oil NL and Cultus Petroleum (Australia) NL

CONTENTS

END OF CONTENTS

NOTE: See Env 9013 for the licensees' joint interpretation report on both this survey and the subsequent 1996 East Avenue Detail Seismic Survey.

****

GFE Resources Ltd

2 February, 1994

Department of Mines and Energy
191 Greenhill Road
PARKSIDE SA 5063

ATTENTION: Director, Oil and Gas Division

Dear Sir,

Application for Consent to Carry Out the East Avenue Seismic Survey in Petroleum Exploration Licence 39

In accordance with the Petroleum Act (1940 - 1989) GFE Resources Ltd (GFE), as Operator of PEL 39, hereby applies for approval to conduct a seismic survey of approximately 60 km within the Permit area.

SURVEY DETAILS

Name	:	East Avenue Seismic Survey
Proposed Date of Commencement	:	1st March, 1994
Length of Survey	:	6 days
Contractor	:	Geco-Prakla
Energy Source	:	Vibroseis
Technique	:	Multifold with upholes at line intersections and line ends
Instruments	:	I/O System One
Permitting	:	Simplex Pty. Ltd. (Jim Payne)
Crew Size	:	34 persons

11th Floor, 151 Flinders Street, Melbourne, 3000 Telephone: (03) 652 5722 Facsimile: (03) 652 5245

Address all mail to Box 1841Q, G.P.O. Melbourne, 3001 A.C.N. 005 469 581

Estimated Cost	:	$360,000
Person in Charge of Acquisition Contractor	:	Dennis Sweeney

Sam Coniglio (Akermann & Associates) will be bird-dogging the survey on behalf of GFE.

GFE will adopt the Code of Environmental Practice "The Environmental Management of Seismic Exploration Operations in the South East of South Australia, September 1990 (3rd Edition)" to ensure that environmental impact is minimised.

The following preliminary maps are enclosed:

(1) Aerial photo mosaic with proposed lines indicated.

(2) The relevant section of the 1:50,000 Kennion (6923 - II) topographic map incorporating cadastral information.

(3) 1:50,000 shot point map showing lines previously recorded and current interpretation of the Base Eumeralla Unconformity.

All general line locations have been checked in the field and have been sited to minimise any environmental impact. Checking will continue as detailed final locations are surveyed to avoid any unexpected environmental impact.

The Department of Mines and Energy will be consulted if any alteration to the positioning of lines occur that necessitates variations of line preparation techniques.

Yours sincerely,
GFE Resources Ltd

J.D. FOSTER
OPERATIONS CO-ORDINATOR

Attachments
JDF/ac:c2270

EA94-01

EA94-02

EA94-04

EA94-06

EA94-08

EA94-10

EA94-12

7.6 Kms

8.5 Kms

8.0 Kms

8.3 Kms

9.0 Kms

9.0 Kms

10.2 Kms

Mount Burr Forest Reserve

MOUNT BURR FOREST RESERVE

FURNER

SCALE 1:50 000

METRES 1000 0 1 2 3 4 5 KILOMETRES

CLEARED SECTION OF LINE EA94-04

EDITION	
DATE	No.
28 - 10 - 93	1
22 - 11 - 93	2
17 - 2 - 94	3

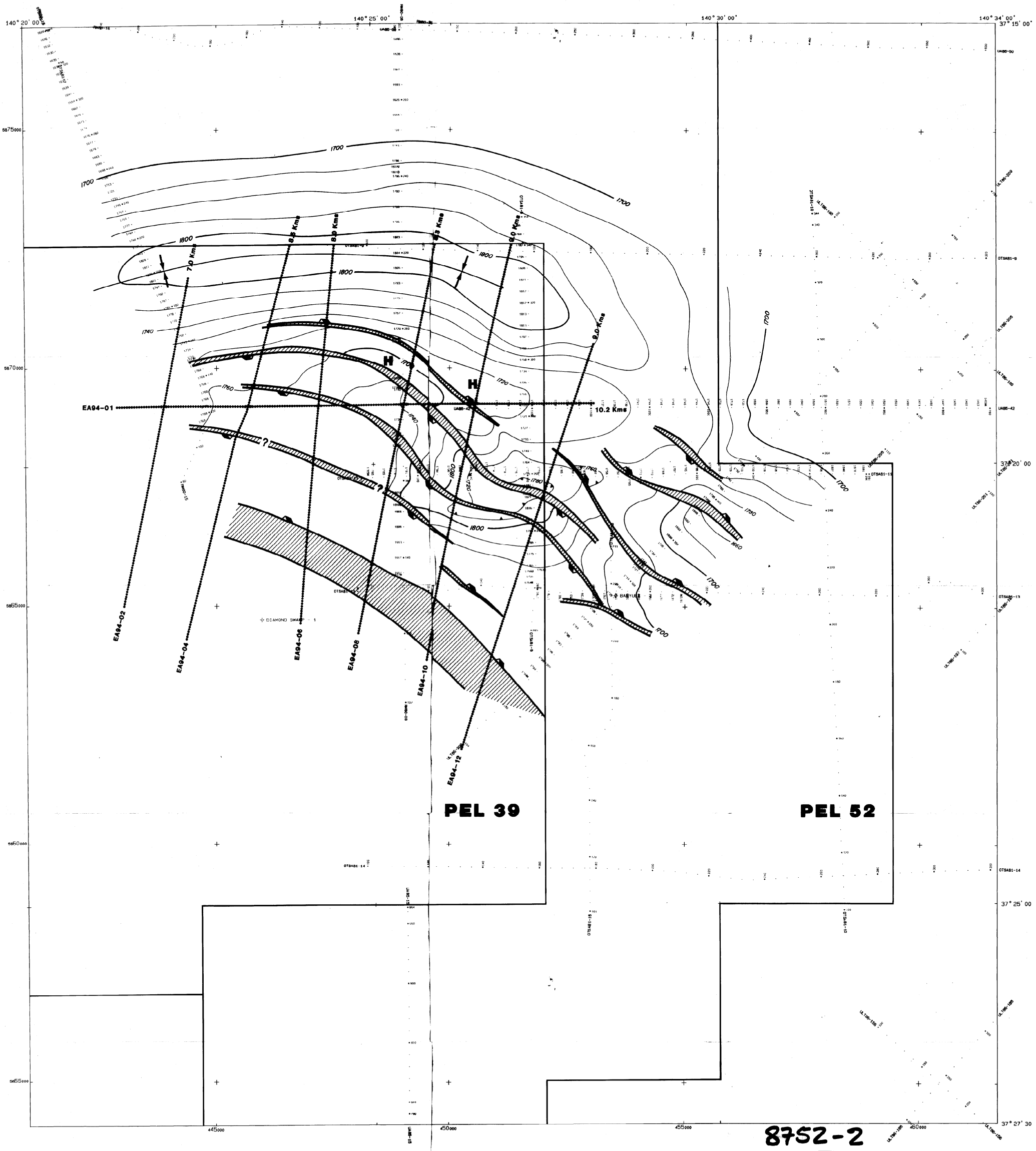
8752-1

GFE Resources Ltd

PEL 39 - OTWAY BASIN

PROPOSED 1994 EAST AVENUE SEISMIC SURVEY ON CADASTRAL

AUTHOR :	J.FOSTER	APPROVED :	S.YU
DATE :	FEBRUARY, 1994	ENCLOSURE No.	
SCALE :	1 : 50,000		
DRAWN BY :	K.URQUHART	DRG No.	



8752-2

SCALE 1 : 25,000

0 0.5 1.0 1.5 2.0 2.5

KILOMETRES

EDITION	
DATE	No.
28 - 10 - 93	1
22 - 11 - 93	2

GAS AND FUEL EXPLORATION N.L.

PEL 39 - OTWAY BASIN

TOP PRETTY HILL

TWO-WAY TIME STRUCTURE MAP

PROPOSED EAST AVENUE SEISMIC SURVEY

TOTAL : 60 Kilometres

AUTHOR : S.YU	APPROVED :
DATE : October, 93'	ENCLOSURE No.
SCALE : 1 : 25,000	
DRAWN : S.Clark	DRG NO. : OT.4653

Velocity Data Pty Ltd - Uphole Report

Report generated Sat 27-Apr-93 6:45 pm

HOLE : N#01 EA-01 VP268 X EA-02 VP429

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01
Observer : R.COOK UNIT N# 6

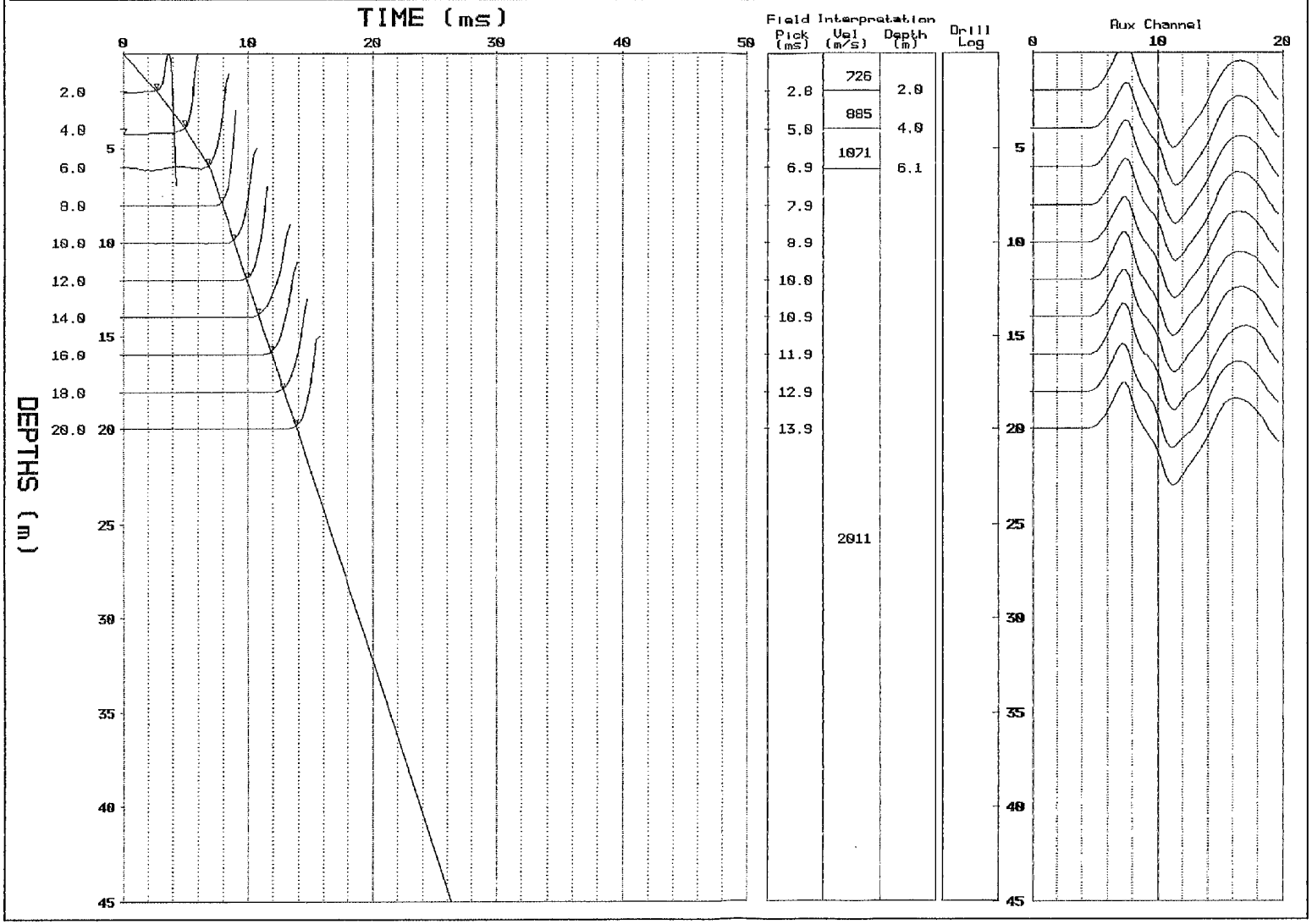
Date : Sat 27-Apr-94
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 3.0
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	20.0	?	50.2	70.6	13.9	1	.0	726.9
2	18.0	?	53.9	77.7	12.9	2	2.0	885.6
3	16.0	?	53.1	61.8	11.9	3	4.0	1071.4
4	14.0	?	28.8	66.4	10.9	4	6.1	2011.4
5	12.0	?	28.2	69.7	10.0			
6	10.0	?	14.3	70.4	8.9			
7	8.0	?	14.3	71.7	7.9			
8	6.0	?	6.5	70.9	6.9			
9	4.0	?	6.5	74.7	5.0			
10	2.0	?	28.8	70.9	2.8			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURHER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 3.0

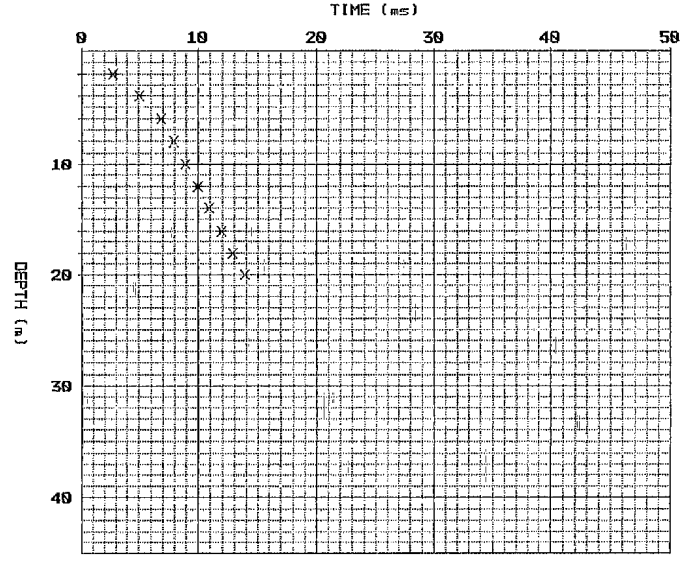
Hole : N#01 EA-01 VP268 X EA-02 VP429



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 3.0

Hole : N#01 EA-01 VP268 X EA-02 VP429



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
2.0	2.8	726	2.0
4.0	5.0	885	4.0
6.0	6.9	1071	6.1
8.0	7.9		
10.0	8.9		
12.0	10.0		
14.0	10.9		
16.0	11.9		
18.0	12.9		
20.0	13.9		
		2011	

Velocity Data Pty Ltd - Uphole Report

Report generated Sat 27-Apr-93 6:45 pm

HOLE : H#02 EA94-01 VP353 X EA94-04

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01
Observer : R.COOK UNIT N# 6

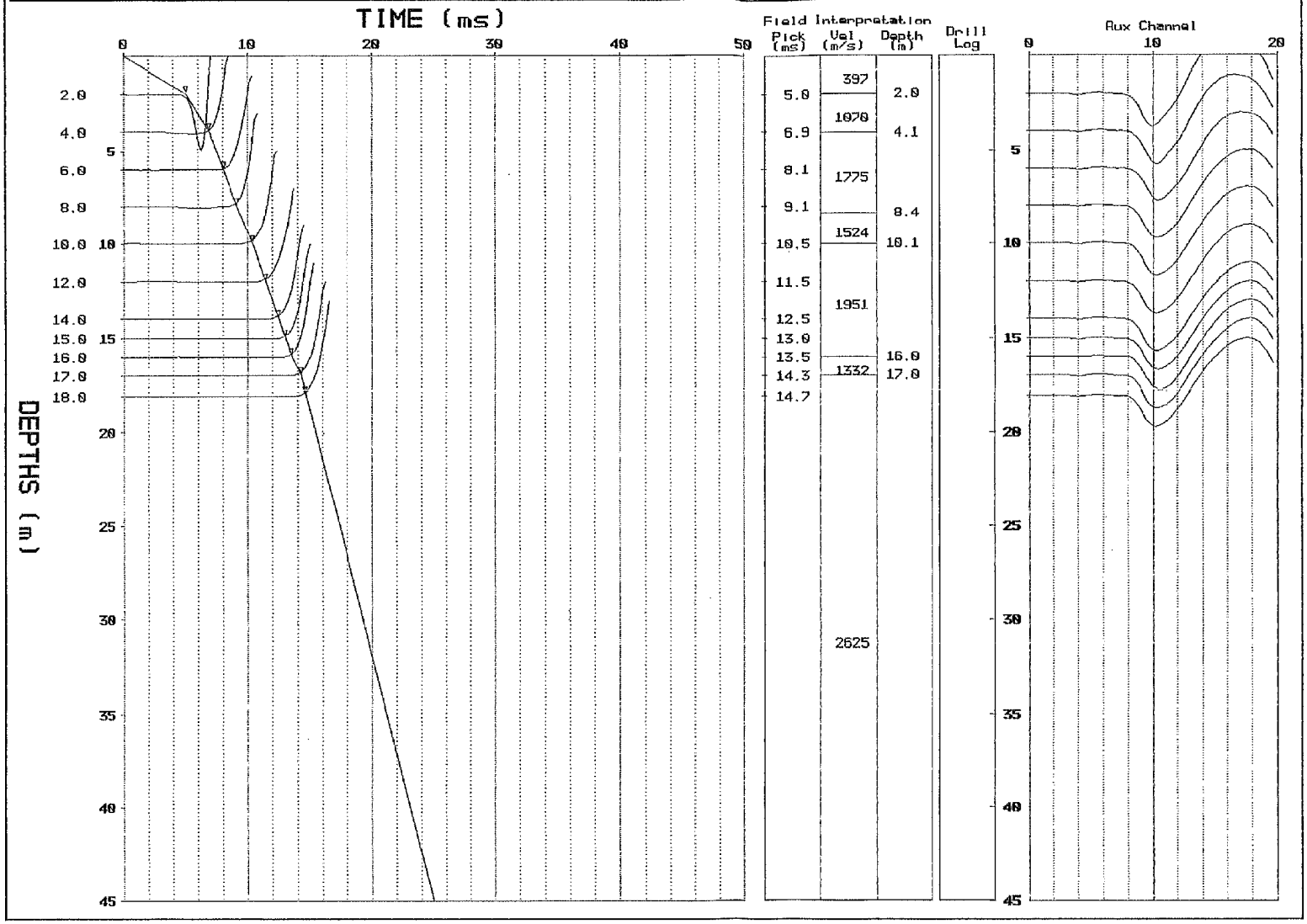
Date : Sat 27-Apr-94
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 2.0
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	18.0	?	100.0	58.2	14.7	1	.0	397.3
2	17.0	?	100.0	59.5	14.3	2	2.0	1070.4
3	16.0	?	52.7	59.7	13.5	3	4.1	1775.4
4	15.0	?	53.1	59.9	13.0	4	8.4	1524.8
5	14.0	?	53.6	60.9	12.5	5	10.1	1951.6
6	12.0	?	55.7	60.4	11.5	6	16.0	1332.5
7	10.0	?	54.4	55.9	10.5	7	17.0	2625.5
8	8.0	?	28.9	58.2	9.1			
9	6.0	?	14.8	44.8	8.1			
10	4.0	?	15.6	37.9	6.9			
11	2.0	?	6.8	39.6	5.0			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 2.0

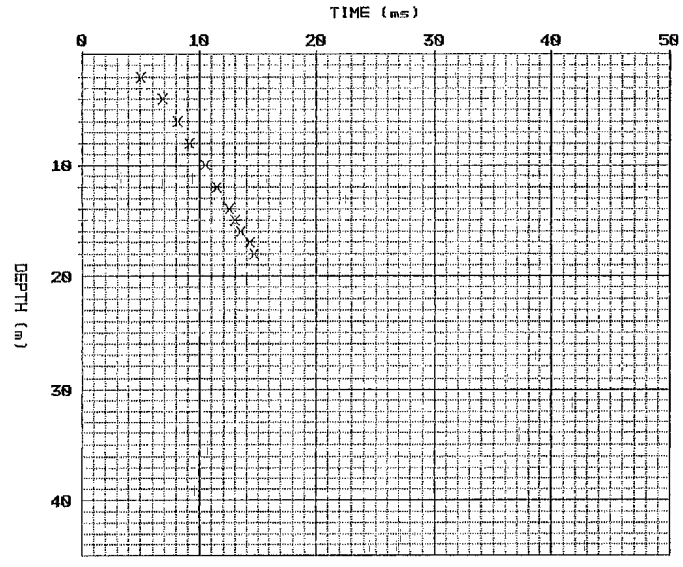
Hole : H#02 EA94-01 VP353 X EA94-04



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 2.0

Hole : H#02 EA94-01 VP353 X EA94-04



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
2.0	5.0	392	2.0
4.0	6.9	1070	4.1
6.0	8.1	1775	
8.0	9.1		8.4
10.0	10.5	1524	10.1
12.0	11.5		
14.0	12.5	1951	
16.0	13.5		16.0
17.0	14.3	1332	17.0
18.0	14.7		
		2625	

Velocity Data Pty Ltd - Uphole Report

Report generated Sat 27-Apr-93 6:45 pm

HOLE : H#03 EA94-01 VP-428 X EA94-06

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01
Observer : R.COOK UNIT N# 6

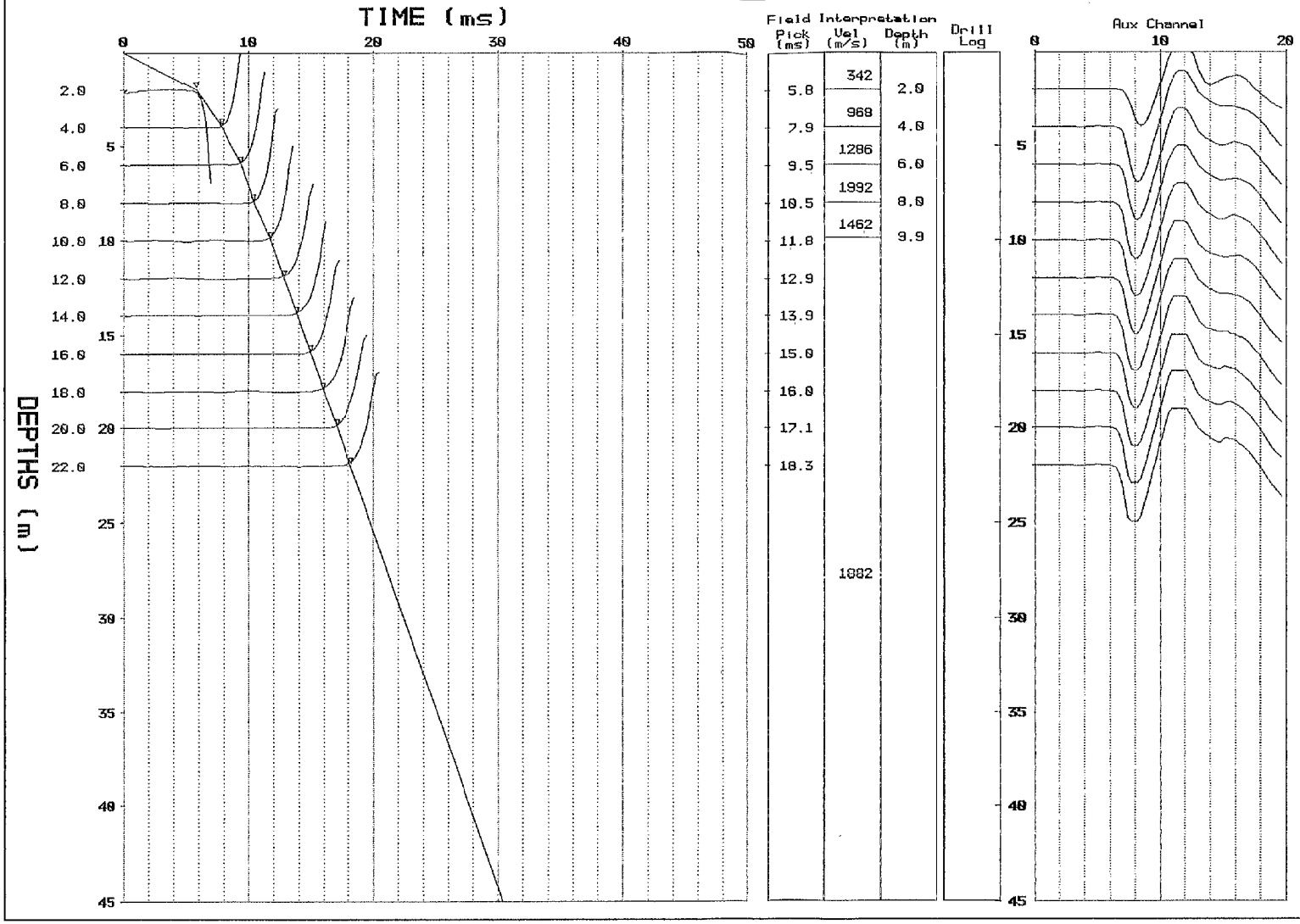
Date : Sat 27-Apr-94
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 2.4
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	22.0	?	94.7	100.0	18.3	1	.0	342.5
2	20.0	?	99.5	100.0	17.1	2	2.0	968.9
3	18.0	?	100.0	100.0	16.0	3	4.0	1286.3
4	16.0	?	53.7	100.0	15.0	4	6.0	1992.5
5	14.0	?	54.7	100.0	13.9	5	8.0	1462.1
6	12.0	?	54.8	100.0	12.9	6	9.9	1882.9
7	10.0	?	54.7	100.0	11.8			
8	8.0	?	29.5	100.0	10.5			
9	6.0	?	31.3	100.0	9.5			
10	4.0	?	15.4	100.0	7.9			
11	2.0	?	6.4	96.2	5.8			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 2.4

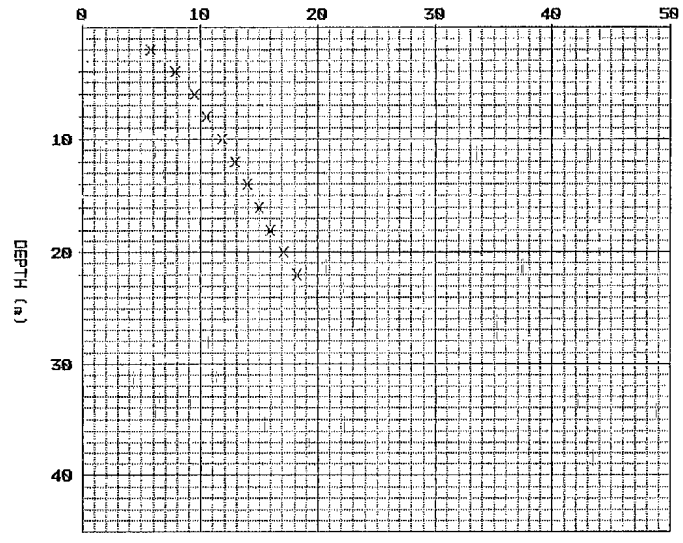
Hole : H#03 EA94-01 VP-428 X EA94-06



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01
A.T.P. : PEL39
DATE : Sat 27-Apr-94
SOURCE OFFSET : 2.4

Hole : H#03 EA94-01 VP-428 X EA94-06



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
2.0	5.8	342	2.0
4.0	7.9	968	4.0
6.0	9.5	1286	6.0
8.0	10.5	1992	8.0
10.0	11.8	1462	9.9
12.0	12.9		
14.0	13.9		
16.0	15.0		
18.0	16.0		
20.0	17.1		
22.0	18.3		
		1882	

Velocity Data Pty Ltd - Uphole Report

Report generated Sun 28-Apr-94 7:39 pm

HOLE : HOLE N# 04 EA94-04 VP230

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-04
Observer : R.COOK UNIT N# 6

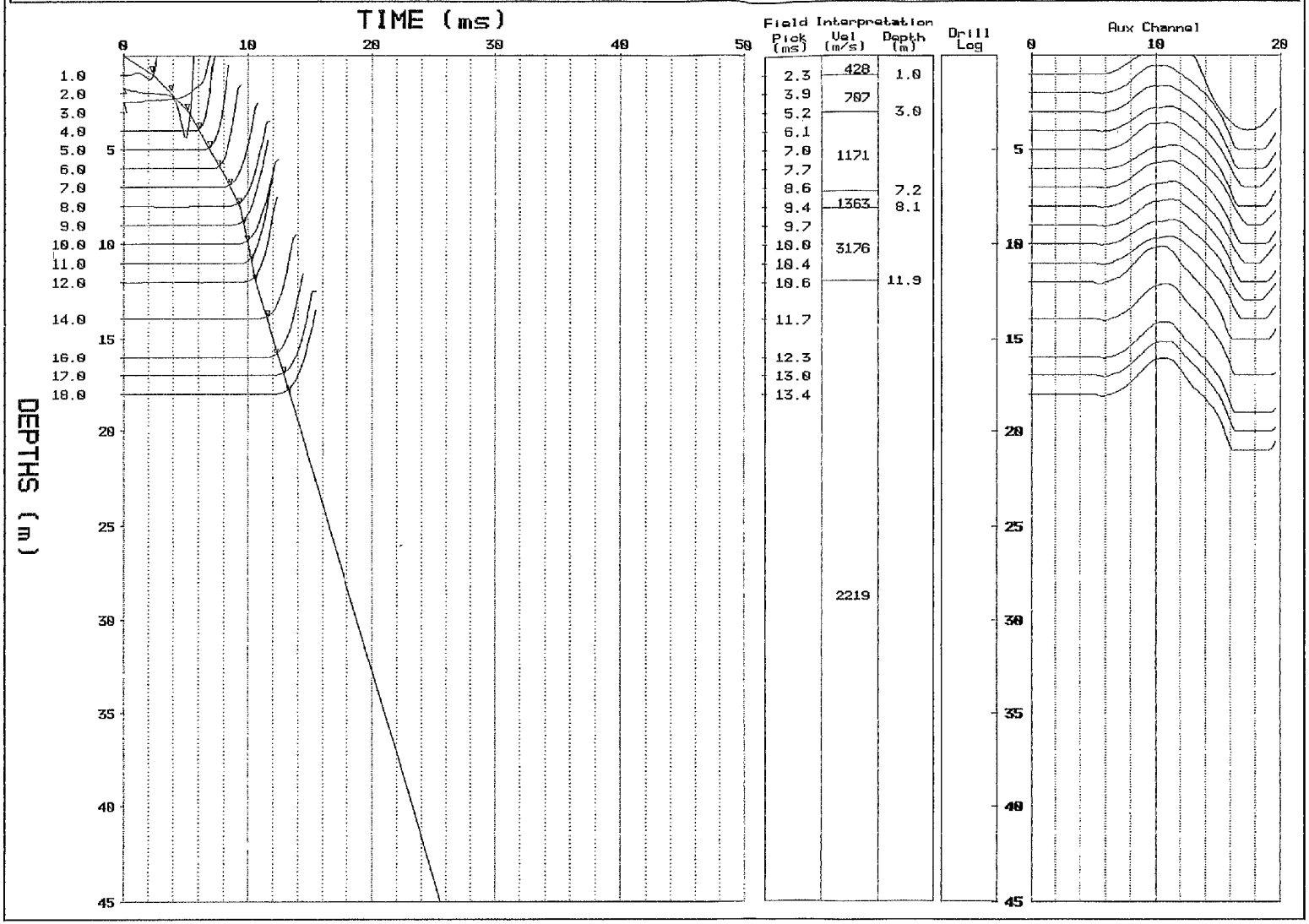
Date : Sun 28-Apr-94
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 2.8
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	18.0	11.2	100.0	100.0	13.4	1	.0	428.2
2	17.0	10.9	100.0	100.0	13.0	2	1.0	707.4
3	16.0	10.9	100.0	100.0	12.3	3	3.0	1172.0
4	14.0	10.9	100.0	100.0	11.7	4	7.2	1363.7
5	12.0	10.7	100.0	100.0	10.6	5	8.1	3176.8
6	11.0	10.7	100.0	100.0	10.4	6	11.9	2219.7
7	10.0	10.7	100.0	100.0	10.0			
8	9.0	10.9	100.0	100.0	9.7			
9	8.0	10.7	54.3	100.0	9.4			
10	7.0	10.9	54.6	100.0	8.6			
11	6.0	10.9	54.5	100.0	7.7			
12	5.0	10.7	56.1	100.0	7.0			
13	4.0	10.7	29.8	100.0	6.1			
14	3.0	10.7	16.1	100.0	5.2			
15	2.0	10.7	15.2	100.0	3.9			
16	1.0	10.7	6.4	32.0	2.3			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-04
A.T.P. : PEL39
DATE : Sun 28-Apr-94
SOURCE OFFSET : 2.8

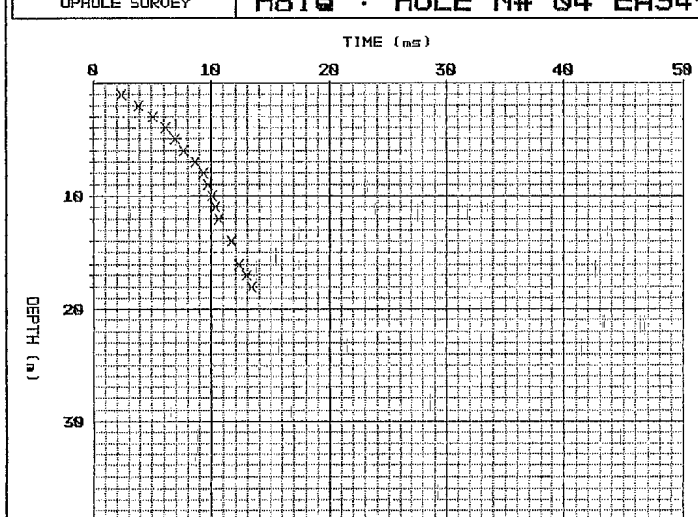
Hole : HOLE N# 04 EA94-04 VP230



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-04
A.T.P. : PEL39
DATE : Sun 28-Apr-94
SOURCE OFFSET : 2.8

Hole : HOLE N# 04 EA94-04 UP230



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
1.0	2.3	428	1.8
2.0	4.8	787	3.9
3.0	6.1		
4.0	7.2		
5.0	8.0	1171	
6.0	8.6		7.2
7.0	9.4	1363	8.1
8.0	9.7		
10.0	10.0	3176	
11.0	10.4		
12.0	10.6		11.9
14.0	11.7		
16.0	12.3		
17.0	12.9		
18.0	13.4		
		2219	

Velocity Data Pty Ltd - Uphole Report

Report generated Mon 29-Apr-94 5:05 pm

HOLE : HOLE N#05 EA94-08 VP-246

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-08
Observer : R.COOK UNIT N# 6

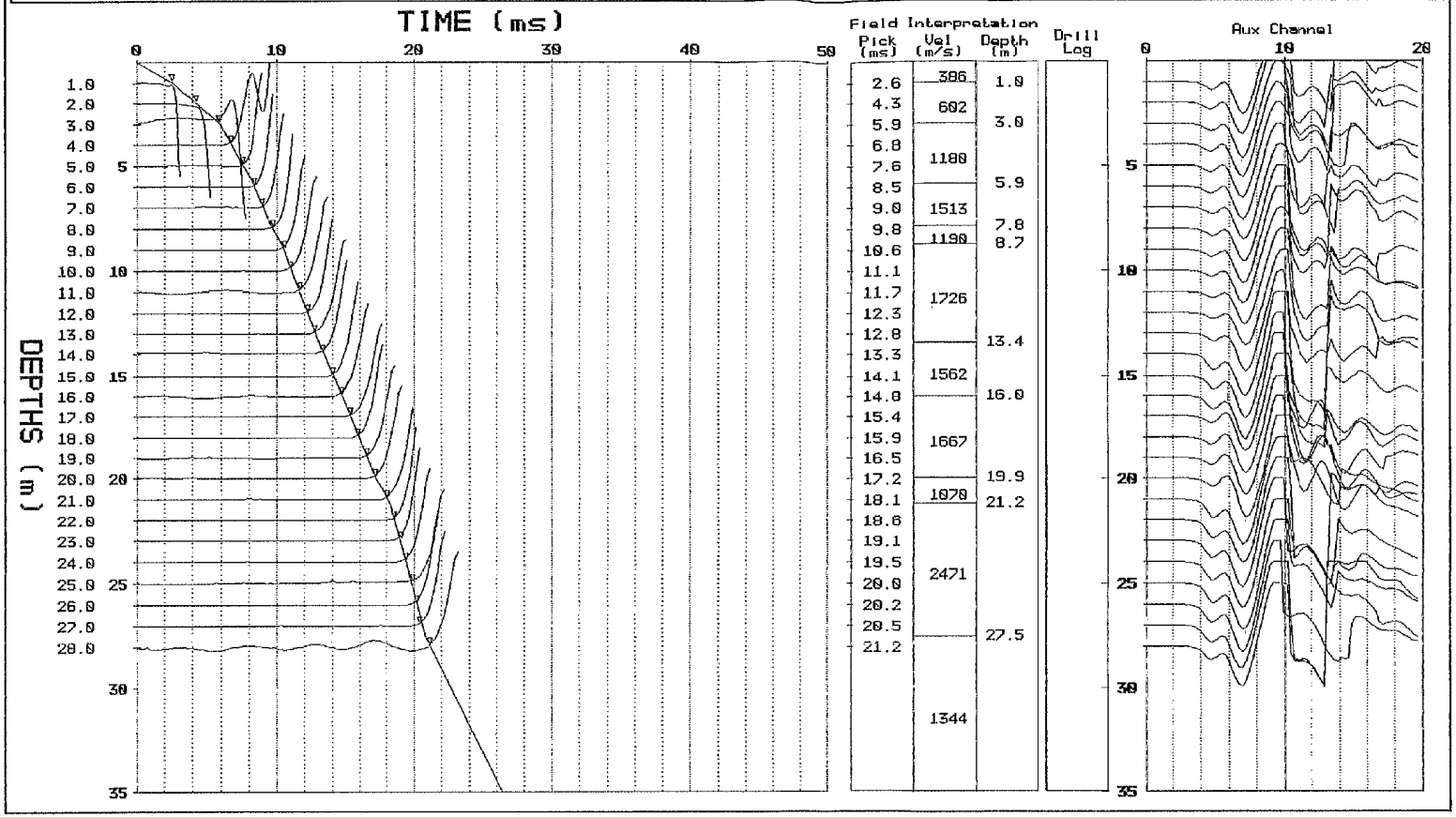
Date : Mon 29-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 3.0
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	20.0	10.9	100.0	100.0	17.2	1	.0	386.1
2	19.0	10.9	100.0	100.0	16.5	2	1.0	602.4
3	18.0	10.7	100.0	100.0	15.9	3	3.0	1180.3
4	17.0	10.9	99.3	100.0	15.4	4	5.9	1513.8
5	16.0	11.2	100.0	100.0	14.8	5	7.8	1190.5
6	15.0	10.9	100.0	100.0	14.1	6	8.7	1727.0
7	14.0	10.9	100.0	100.0	13.3	7	13.4	1562.5
8	13.0	10.7	100.0	100.0	12.8	8	16.0	1667.3
9	12.0	10.9	53.7	100.0	12.3	9	19.9	1070.7
10	11.0	10.9	53.9	100.0	11.7	10	21.2	2471.1
11	10.0	10.9	53.4	100.0	11.1	11	27.5	1344.2
12	9.0	10.9	52.8	100.0	10.6			
13	8.0	10.9	53.4	100.0	9.8			
14	7.0	11.2	28.5	100.0	9.0			
15	6.0	10.9	28.4	100.0	8.5			
16	5.0	10.9	14.6	100.0	7.6			
17	4.0	10.9	15.5	100.0	6.8			
18	3.0	10.9	15.3	100.0	5.9			
19	2.0	10.9	14.6	98.7	4.3			
20	1.0	11.2	14.5	98.7	2.6			
21	28.0	10.9	100.0	100.0	21.2			
22	27.0	10.9	100.0	100.0	20.5			
23	26.0	11.2	100.0	100.0	20.2			
24	25.0	11.2	100.0	100.0	20.0			
25	24.0	10.9	88.0	100.0	19.5			
26	23.0	10.9	99.9	100.0	19.1			
27	22.0	10.9	99.7	100.0	18.6			
28	21.0	10.9	100.0	100.0	18.1			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-08
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 3.0

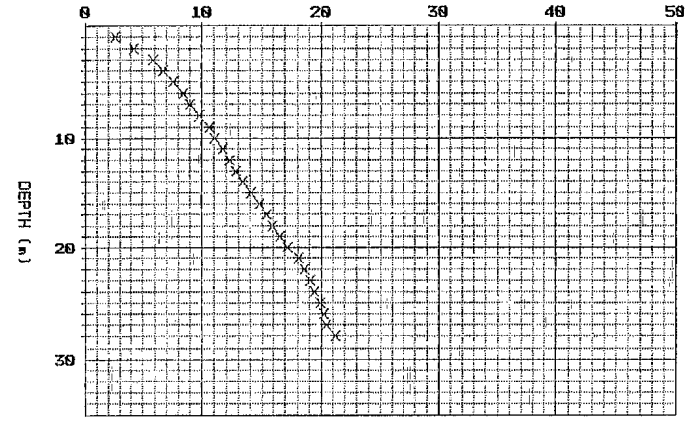
Hole : HOLE N#05 EA94-08 UP-246



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-08
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 3.0

Hole : HOLE N#05 EA94-08 UP-246



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
1.0	2.6	386	1.0
2.0	4.3	602	3.0
3.0	5.8		
4.0	6.6	1180	5.9
5.0	8.0		
6.0	8.9	1513	7.8
7.0	9.8	1190	8.7
8.0	10.6		
9.0	11.2	1726	
10.0	11.8		
11.0	12.5		13.4
12.0	13.3	1562	
13.0	14.1		16.0
14.0	14.8		
15.0	15.4	1667	
16.0	15.7		19.9
17.0	16.1	1070	21.2
18.0	16.6		
19.0	16.9		
20.0	17.5	2471	
21.0	18.5		
22.0	19.2		27.5
23.0	20.2		
24.0	21.2		
25.0		1344	

Velocity Data Pty Ltd - Uphole Report

Report generated Mon 29-Apr-94 8:08 pm

HOLE : HOLE N#06 EA94-12 VP-271

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-12
Observer : R.COOK UNIT N# 6

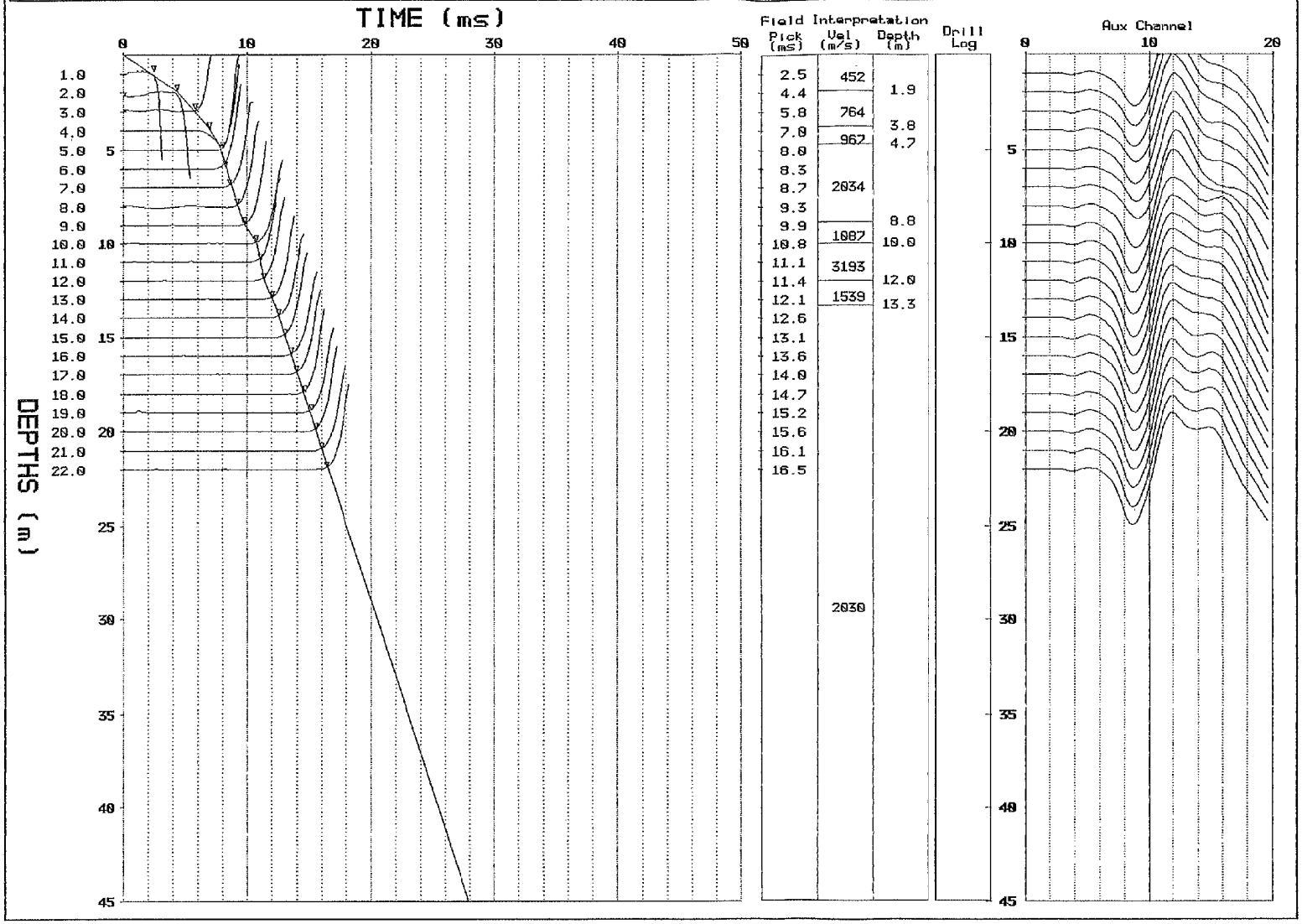
Date : Sun 28-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 3.0
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	22.0	11.2	100.0	38.7	16.5	1	.0	452.6
2	21.0	11.2	100.0	39.3	16.1	2	1.9	764.5
3	20.0	11.2	100.0	39.7	15.6	3	3.8	967.0
4	19.0	11.2	100.0	39.4	15.2	4	4.7	2034.6
5	18.0	11.2	100.0	38.8	14.7	5	8.8	1088.0
6	17.0	11.2	99.8	38.1	14.0	6	10.0	3193.3
7	16.0	11.2	100.0	37.6	13.6	7	12.0	1539.7
8	15.0	11.2	100.0	36.4	13.1	8	13.3	2030.1
9	14.0	11.2	51.4	36.1	12.6			
10	13.0	11.2	53.0	37.2	12.1			
11	12.0	11.2	53.2	35.2	11.4			
12	11.0	11.2	54.6	37.4	11.1			
13	10.0	11.2	29.0	38.8	10.8			
14	9.0	11.2	29.4	39.2	9.9			
15	8.0	10.9	29.0	33.4	9.3			
16	7.0	11.4	28.5	33.5	8.7			
17	6.0	11.2	28.2	33.2	8.3			
18	5.0	11.2	30.1	33.4	8.0			
19	4.0	11.4	15.0	33.2	7.0			
20	3.0	10.9	15.0	33.8	5.8			
21	2.0	11.2	14.7	32.7	4.4			
22	1.0	10.9	6.5	33.0	2.5			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-12
A.T.P. : PEL39
DATE : Sun 28-Apr-93
SOURCE OFFSET : 3.0

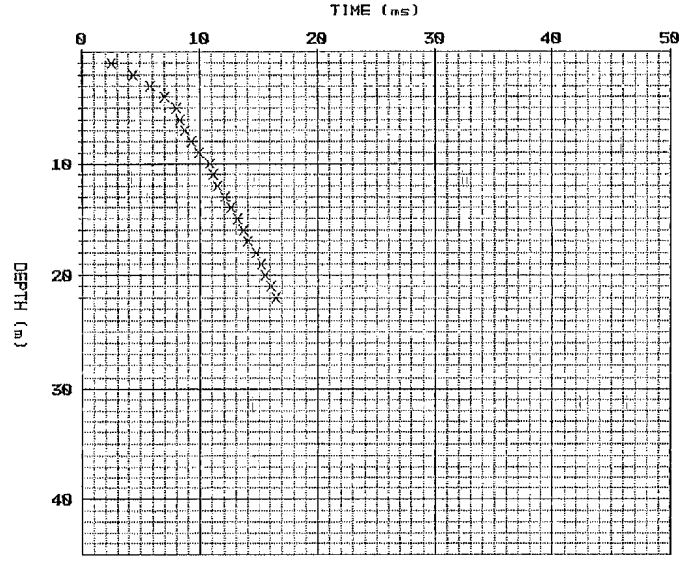
Hole : HOLE N#06 EA94-12 UP-271



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-12
A.T.P. : PEL39
DATE : Sun 28-Apr-93
SOURCE OFFSET : 3.0

Hole : HOLE N#06 EA94-12 VP-271



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
1.0	2.5		
2.0	4.4	452	1.9
3.0	5.8	764	3.8
4.0	6.9	967	4.7
5.0	8.2	2034	
6.0	8.8		8.8
10.0	10.0	1987	10.0
11.0	11.1	3193	12.0
12.0	11.4	1539	13.3
13.0	12.1		
14.0	12.6		
15.0	13.1		
16.0	13.6		
17.0	14.0		
18.0	14.7		
19.0	15.2		
20.0	15.6		
21.0	16.1		
22.0	16.5		
		2030	

Velocity Data Pty Ltd - Uphole Report

Report generated Sun 28-Apr-94 7:39 pm

HOLE : N#07 EA94-~~10~~ 01 VP523 X EA94-08

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01 X EA94-
Observer : R.COOK UNIT N# 6

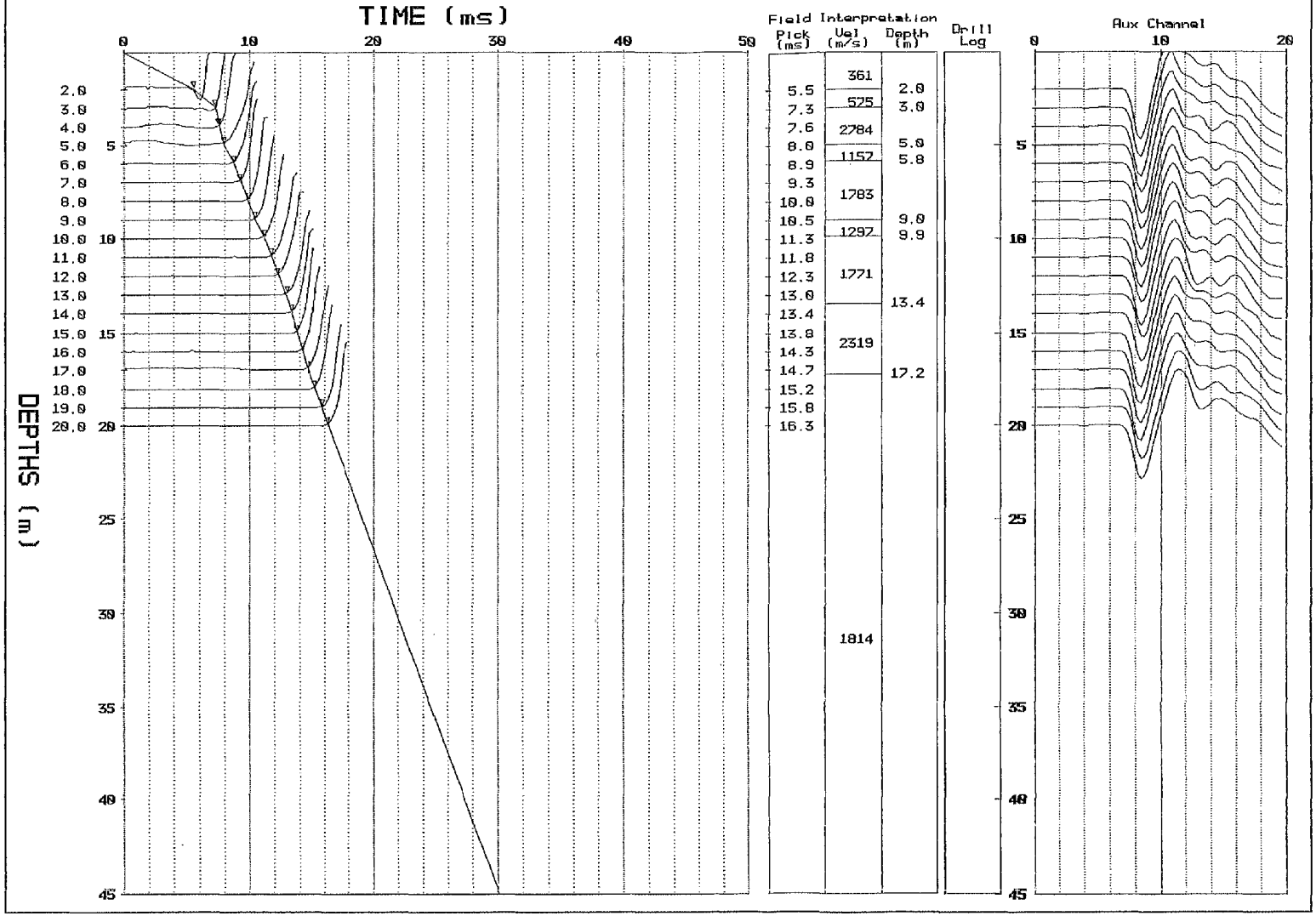
Date : Sun 28-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 1.7
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	20.0	10.9	100.0	93.5	16.3	1	.0	361.1
2	19.0	11.2	100.0	91.2	15.8	2	2.0	575.5
3	18.0	10.9	100.0	93.1	15.2	3	3.0	2784.7
4	17.0	11.2	100.0	90.9	14.7	4	5.0	1157.3
5	16.0	11.2	100.0	92.4	14.3	5	5.8	1783.8
6	15.0	10.9	100.0	88.5	13.8	6	9.0	1297.6
7	14.0	11.2	100.0	83.2	13.4	7	9.9	1771.8
8	13.0	11.2	100.0	74.9	13.0	8	13.4	2319.8
9	12.0	11.2	52.7	82.0	12.3	9	17.2	1814.3
10	11.0	11.2	50.2	76.0	11.8			
11	10.0	11.2	53.7	79.8	11.3			
12	9.0	11.2	53.3	76.5	10.5			
13	8.0	11.2	28.4	77.6	10.0			
14	7.0	11.2	28.6	74.8	9.3			
15	6.0	11.4	14.6	77.7	8.9			
16	5.0	11.4	14.8	75.8	8.0			
17	4.0	11.2	14.6	76.4	7.6			
18	3.0	11.2	6.5	76.3	7.3			
19	2.0	10.9	6.7	76.9	5.5			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Sun 28-Apr-93
SOURCE OFFSET : 1.7

Hole : N#07 EA94-~~10~~ 01 VP523 X EA94-08

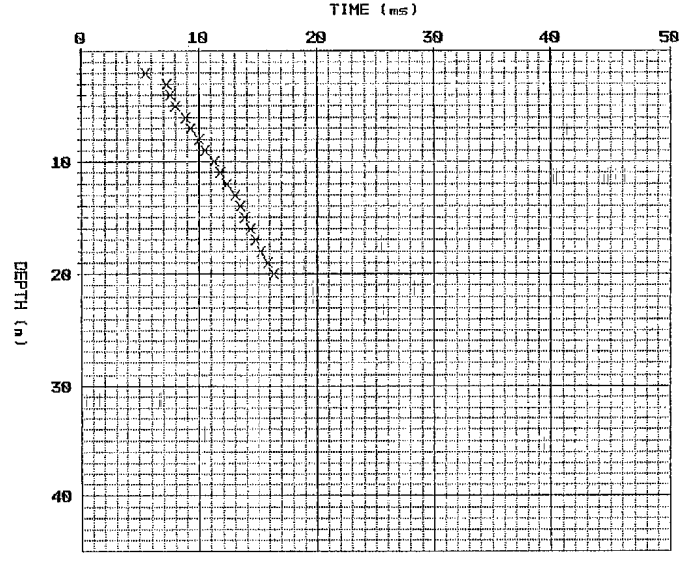


VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Sun 28-Apr-93
SOURCE OFFSET : 1.7

01

Hole : N#07 EA94-10 VP523 X EA94-08



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
2.0	5.5	361	2.0
3.0	7.3	575	3.0
4.0	8.8	2284	5.0
5.0	9.0	1157	5.8
6.0	10.0	1783	
8.0	10.9	1297	9.0
10.0	11.8		9.9
12.0	12.8	1771	
13.0	13.0		13.4
14.0	13.4	2319	
15.0	14.2		17.2
16.0	15.2		
20.0	15.9		
28.0	16.3		
		1814	

Velocity Data Pty Ltd - Uphole Report

Report generated Mon 29-Apr-94 5:04 pm

HOLE : N#08 EA94-01 VP-600 X EA94-10

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01 X EA94-
Observer : R.COOK UNIT N# 6

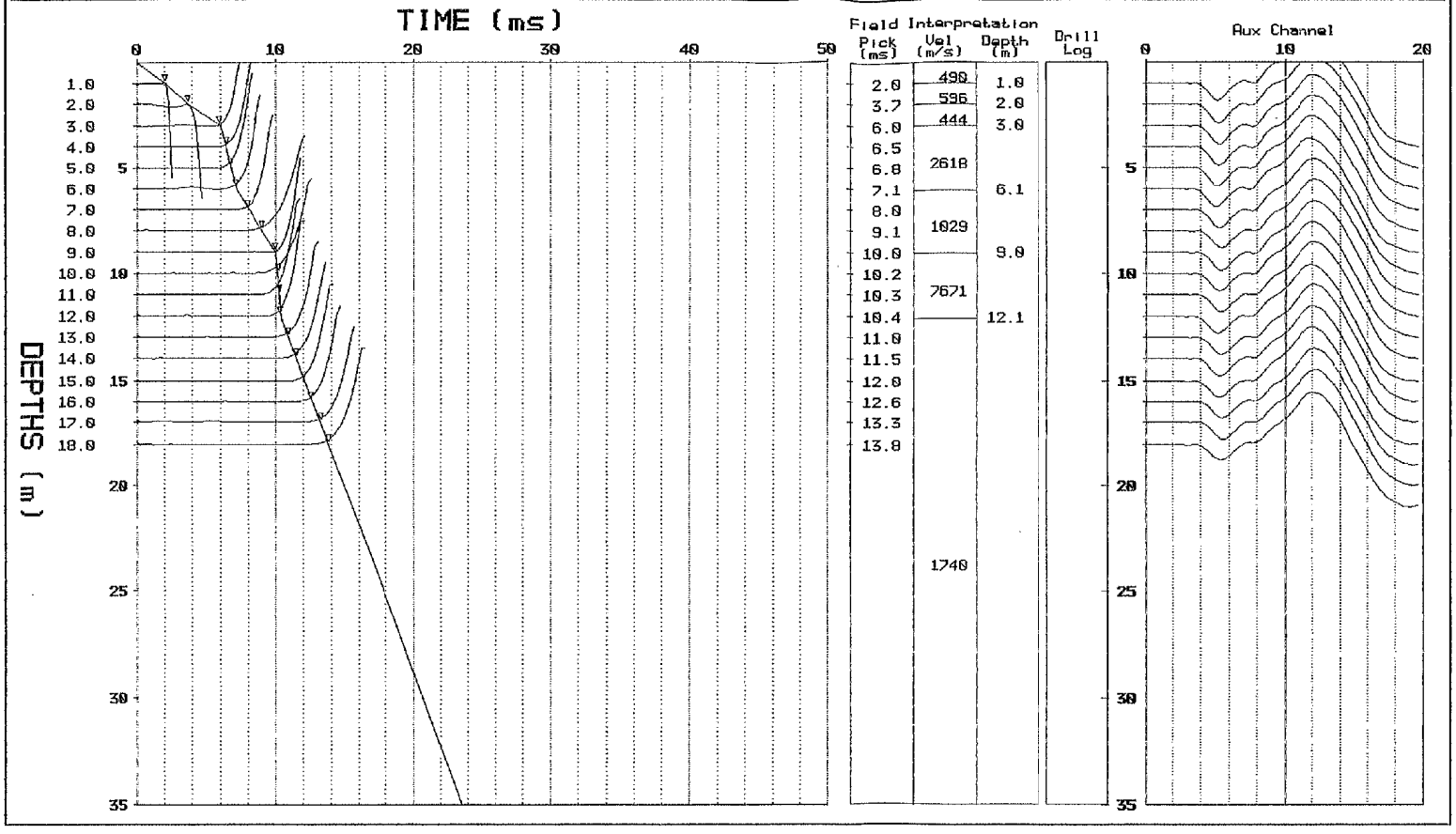
Date : Mon 29-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 3.0
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	18.0	10.7	100.0	73.9	13.8	1	.0	490.4
2	17.0	10.7	100.0	71.5	13.3	2	1.0	596.9
3	16.0	10.7	100.0	72.3	12.6	3	2.0	444.8
4	15.0	10.4	100.0	71.6	12.0	4	3.0	2618.9
5	14.0	10.4	100.0	71.2	11.5	5	6.1	1029.6
6	13.0	10.7	100.0	71.3	11.0	6	9.0	7671.9
7	12.0	10.4	100.0	72.6	10.4	7	12.1	1740.7
8	11.0	10.7	100.0	68.5	10.3			
9	10.0	10.4	100.0	72.2	10.2			
10	9.0	10.7	100.0	73.2	10.0			
11	8.0	10.7	100.0	68.1	9.1			
12	7.0	10.7	100.0	72.1	8.0			
13	6.0	10.4	55.6	67.6	7.1			
14	5.0	10.7	55.8	71.1	6.8			
15	4.0	10.7	55.4	70.0	6.5			
16	3.0	10.7	29.4	67.7	6.0			
17	2.0	10.7	29.6	72.5	3.7			
18	1.0	10.7	14.5	60.8	2.0			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 3.0

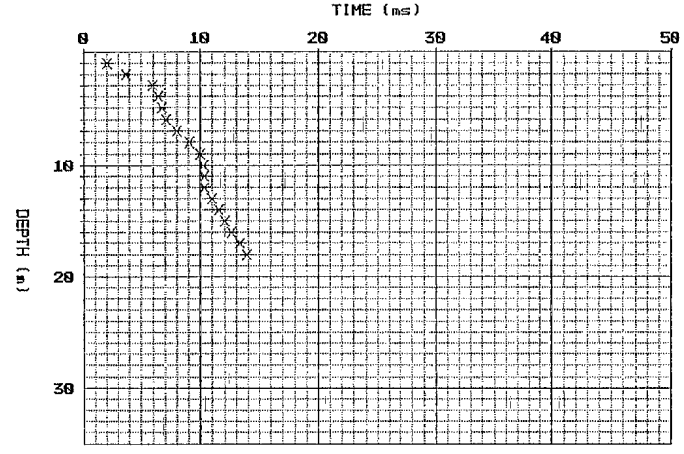
Hole : N#08 EA94-01 UP-600 X EA94-10



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 3.0

Hole : N#08 EA94-01 UP-600 X EA94-10



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
1.0	2.9	490	1.8
2.0	3.7	556	2.8
3.0	6.8	444	3.0
4.0	5.8	2618	6.1
5.0	5.8		
6.0	7.1		
7.0	8.0	1829	9.0
8.0	8.1		
9.0	10.0		
10.0	10.2		
11.0	10.3	7671	12.1
12.0	10.4		
13.0	11.0		
14.0	11.5		
15.0	12.6		
16.0	12.7		
17.0	13.2		
18.0	13.8		
		1740	

Velocity Data Pty Ltd - Uphole Report

Report generated Mon 29-Apr-94 5:04 pm

HOLE : N#09 EA94-01 VP-698 X EA94-12

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-01 X EA94-
Observer : R.COOK UNIT N# 6

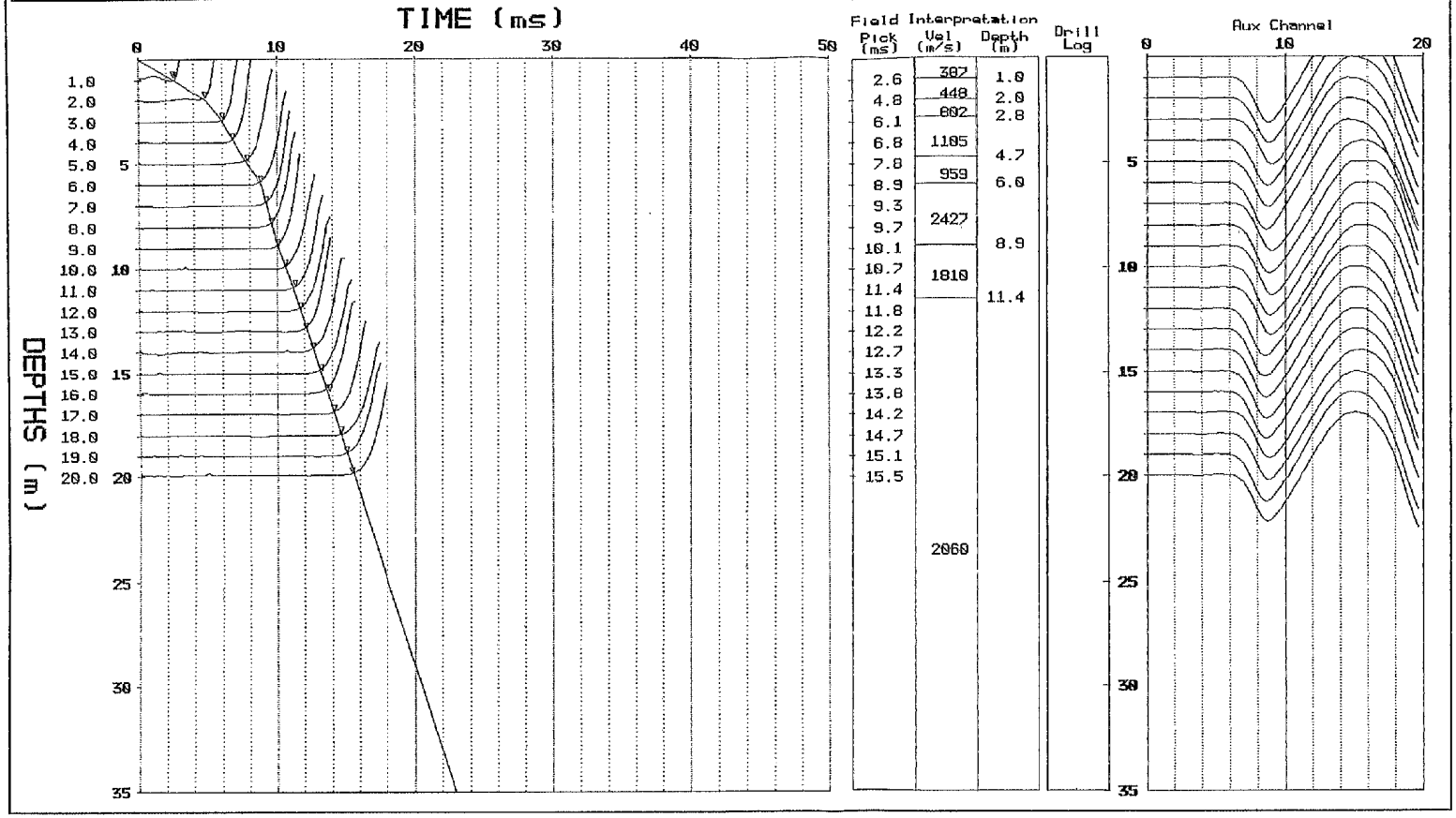
Date : Mon 29-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 2.6
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	20.0	10.4	100.0	89.0	15.5	1	.0	387.3
2	19.0	10.4	100.0	90.2	15.1	2	1.0	448.5
3	18.0	10.7	100.0	94.6	14.7	3	2.0	802.4
4	17.0	10.7	100.0	99.0	14.2	4	2.8	1105.4
5	16.0	10.4	100.0	100.0	13.8	5	4.7	959.7
6	15.0	10.4	100.0	100.0	13.3	6	6.0	2427.3
7	14.0	10.4	100.0	100.0	12.7	7	8.9	1810.7
8	13.0	10.4	100.0	100.0	12.2	8	11.4	2060.8
9	12.0	10.4	100.0	100.0	11.8			
10	11.0	10.7	100.0	100.0	11.4			
11	10.0	10.9	100.0	100.0	10.7			
12	9.0	10.9	100.0	100.0	10.1			
13	8.0	10.7	100.0	100.0	9.7			
14	7.0	10.9	100.0	93.8	9.3			
16	6.0	10.4	100.0	78.7	8.9			
17	5.0	10.7	100.0	79.6	7.8			
18	4.0	10.7	56.0	80.1	6.8			
19	3.0	10.9	55.9	77.7	6.1			
20	2.0	10.7	56.3	79.4	4.8			
21	1.0	10.7	57.9	81.2	2.6			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 2.6

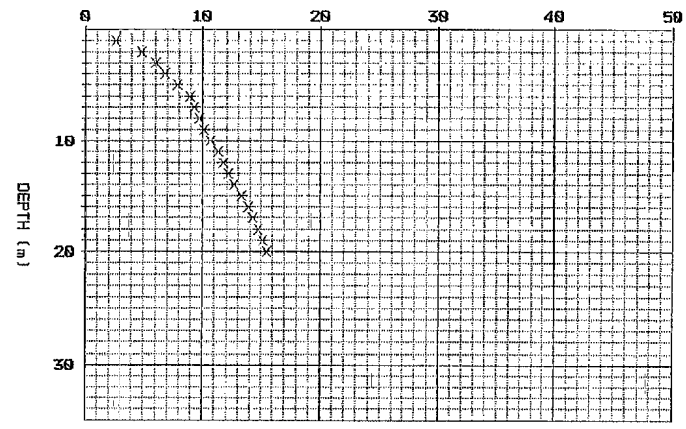
Hole : N#09 EA94-01 VP-698 X EA94-12



VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-01 X EA94-
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 2.6

Hole : N#09 EA94-01 VP-698 X EA94-12



Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
1.0	2.6	387	1.0
2.0	4.6	440	2.0
3.0	6.1	682	2.8
4.0	5.8	1185	4.7
5.0	7.8	959	6.9
6.0	8.9		
7.0	8.5	2427	8.9
8.0	9.7		
9.0	10.1		
10.0	10.2	1810	11.4
11.0	11.4		
12.0	11.8		
13.0	12.2		
14.0	12.5		
15.0	12.2		
16.0	12.8		
17.0	13.2		
18.0	14.2		
19.0	14.5		
20.0	15.1		
	15.5		
		2860	

Velocity Data Pty Ltd - Uphole Report

Report generated Mon 29-Apr-94 8:10 pm

HOLE : HOLE N# 010 EA94-06 VP-581

Client : GFE RESOURCES
A.T.P. : PEL39
Area : FURNER
Line : EA94-06
Observer : R.COOK UNIT N# 6

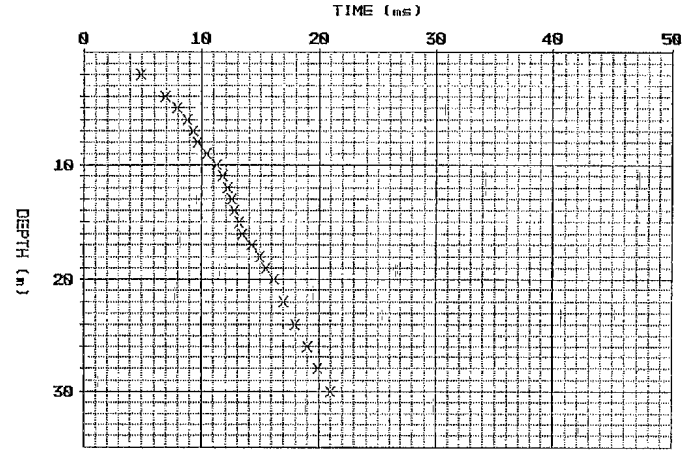
Date : Mon 29-Apr-93
Energy source : 100 KG WEIGHT
Sample Rate : 248 (usec)
Survey units : METRES
Source offset : 2.8
Aux. channel offset : 1.0

Record no.	Geophone depth	Time ref	Downhole channel Max.ampl.	Surface channel Max. ampl.	Pick (msec)	Field Interpretation Layer	Depth(M)	Velocity(M/S)
1	30.0	10.9	100.0	100.0	21.0	1	.0	406.4
2	28.0	10.7	100.0	100.0	19.9	2	2.0	999.7
3	26.0	10.9	100.0	100.0	19.0	3	4.9	1144.0
4	24.0	10.9	100.0	100.0	18.0	4	6.0	2410.1
5	22.0	10.9	100.0	100.0	17.0	5	8.1	1220.2
6	20.0	10.9	100.0	100.0	16.2	6	9.0	1245.5
7	19.0	11.2	100.0	100.0	15.5	7	10.3	2776.1
8	18.0	11.2	100.0	100.0	14.9	8	16.2	1321.8
9	17.0	11.2	100.0	100.0	14.2	9	17.2	1516.5
11	16.0	10.4	100.0	100.0	13.4	10	19.5	2081.3
12	15.0	10.9	100.0	100.0	13.2			
13	14.0	10.9	100.0	100.0	12.8			
14	13.0	10.9	54.2	100.0	12.5			
15	12.0	10.9	54.3	100.0	12.2			
16	11.0	10.9	53.9	100.0	11.8			
17	10.0	11.2	53.7	100.0	11.2			
18	9.0	11.2	55.7	100.0	10.4			
19	8.0	11.2	56.4	100.0	9.6			
21	7.0	11.2	29.4	100.0	9.3			
22	6.0	11.2	29.2	100.0	8.8			
23	5.0	11.2	29.2	100.0	7.9			
24	4.0	11.2	29.1	100.0	6.9			
26	2.0	11.2	6.4	100.0	4.9			

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-06
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 2.8

Hole : HOLE N# 010 EA94-06 VP-581



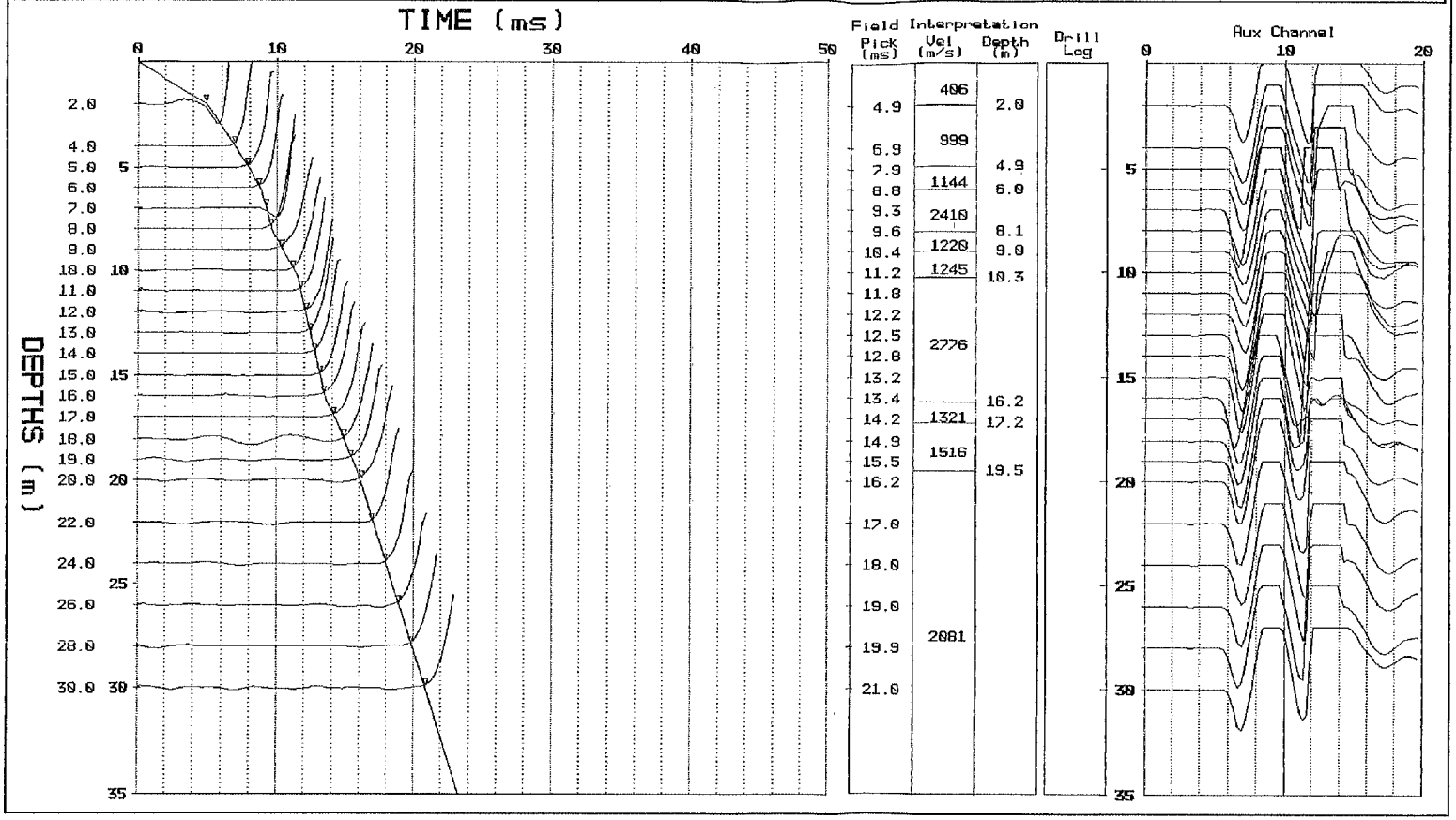
Field Interpretation

Level (m)	Pick (ms)	Vel (m/s)	Depth (m)
2.0	4.9	406	2.0
4.0	6.9	999	
5.0	7.8		4.9
6.0	8.8	1144	6.0
7.0	9.2	2410	
8.0	9.6		8.1
9.0	10.4	1229	9.0
10.0	11.2	1245	10.3
11.0	11.8		
12.0	12.2		
13.0	12.5		
14.0	12.8	2776	
15.0	13.2		
16.0	13.4		16.2
17.0	14.2	1521	17.2
18.0	14.9		
19.0	15.5	1516	19.5
20.0	16.2		
22.0	17.0		
24.0	18.0		
26.0	19.0		
28.0	19.9	2081	
30.0	21.0		

VELOCITY DATA PTY LTD
UPHOLE SURVEY

CLIENT : GFE RESOURCES
AREA : FURNER
LINE : EA94-06
A.T.P. : PEL39
DATE : Mon 29-Apr-93
SOURCE OFFSET : 2.8

Hole : HOLE N# 010 EA94-06 UP-581



PEL 39 1994 EAST AVENUE SEISMIC SURVEY
UPHOLE LOCATIONS

Uphole No.	Line	VP	Elevation (m)	Drilled Depth (m)	Lowest Geophone (m)	Comments
1	01	268	33.96	24	20	Intscn EA94-02
2	01	353	35.26	20	18	Intscn EA94-04
3	01	428	35.37	23	22	Intscn EA94-06
4	04	230	34.44	20	18	
5	08	246	34.19	30	28	
6	12	271	35.76	22	22	
7	08	446	36.42	22	20	Intscn EA94-01
8	01	600	38.44	20	18	Intscn EA94-10
9	01	698	40.06	22	20	Intscn EA94-12
10	06	581	36.84	32	30	

	E	N
1	443982	5869094
2	445715	5869096
3	447177	5869101
4	444598	5864876
5	449583	5864528
6	450696	5863252
7	449069	5869137
8	450614	5869148
9	452574	5869158
10	447425	5872186

Datum = M.S.L.

KL/ac:c2669 (906.6.2)

G.F.E. RESOURCES LTD.
ONSHORE OTWAY BASIN, SOUTH AUSTRALIA
PEL 39

FINAL REPORT :
1994 EAST AVENUE 2D SEISMIC SURVEY

Geco-Prakla (AUSTRALIA) PTY LTD
a SCHLUMBERGER Company

CONTENTS

LIST OF APPENDICES

1 INTRODUCTION

Geco-Prakla (Australia) Pty Ltd (Geco-Prakla) was contracted by GFE Resources Ltd (GFE) to conduct the 60.94km 1994 East Avenue Seismic Survey in PEL-39, in the Onshore Otway Basin, South Australia.

Permitting duties were performed by Mr Chris Annear who was contracted directly to GFE.

Line clearance was arranged and controlled by GFE.

Geco-Prakla sub-contracted Dynamic Satellite Surveys (DSS) of Adelaide to provide topographical surveying services.

Russell Johnston of Mt Gambier, South Australia was contracted by GFE to install temporary fencing and drop down gates.

An electric fencing crew was provided by Geco-Prakla to fence off vulnerable recording spread, in order to minimise damage by cattle chewage.

Line pointing commenced on April 7, chaining commenced on April 8 and topographical surveying commenced on April 20. Seismic recording began on April 21 and was completed on April 25.

The client representative was Sam Coniglio of Akerman and Associates of Perth.

2 LOCATION

The East Avenue Seismic Survey was located in South Australia between latitudes 37° 17' 00° and 37° 23' 30° south and longitudes 140° 22' 30° and 140° 29' 00° east.

The survey consisted of seven lines and was carried out in a manner approved by the local shire and the State of South Australia.

Geologically the survey area is located in the Onshore Otway Basin and within PEL-39.

Refer to Appendix 9 to this report for a copy of the prospect map.

3 FIELD LOGISTICS

3.1 ACCESS

The principal access within the survey areas was by way of shire roads and farm tracks.

The Robe to Penola Road crossed the survey area cutting through the southern sections of lines EA94-02, EA94-04, EA94-06, EA94-08 and EA94-10 and the middle of EA94-12. Leggs Road ran sub parallel to EA94-02 and provided access to both EA94-02 and EA94-04. The southern end of EA94-04 was reached from Catalpa Lane, while Rountree and Batemans Roads provided access to the southern ends of EA94-10 and EA94-12. Most of EA94-08 and EA94-10 was accessible from Cluain Lane and private tracks off Callendale Road led to the northern ends of EA94-10 and EA94-12.

In most places the access was good although there were some long detours ie at the southern ends of EA94-04 and EA94-12. Refer to the chaining line traces in section 11 of Appendix 7 to this report.

3.2 CAMPS

The recording survey crew camp was set up on private land near the junction of the Robe to Penola Road and Leggs Lane.

The topographical survey crew (DSS) was accommodated in the Somerset Motel in Millicent.

3.3 WATER

Water to supply the camp was obtained from a bore on the property and was stored in Geco-Prakla's water truck (capacity of 9000 litres).

3.4 LOGISTICS

3.4.1 Food Supplies:

Supplies were purchased from vendors in Heywood and transported with the crew.

3.4.2 Fuel Supplies:

Diesel fuel to supply the camp and run the line vehicles was purchased from the Shell Agent at the Penola Roadhouse and stored in a 6500 litre fuel cell on the back of a MAN truck. The service vehicle that supplied the vibrators with fuel was filled from the camp storage facility.

3.4.3 Spare Parts:

Parts were drawn from the crew inventory or supplied from the Brisbane office.

3.5 COMMUNICATIONS

The survey was within the mobile telephone service area enabling the crew to communicate directly with Geco-Prakla's Brisbane base by telephone and facsimile machine.

Effective communication between camp and field operations was accomplished using Icom V200 VHF radios. The crew used three separate VHF frequencies

#1	152.5250 Khz	Line Crew
#3	154.5250 Khz	Vibrators
#2	151.6250 Khz	Spare

3.6 CREW ROTATION

Crew rotation is based on a basis of six weeks on followed by two weeks off.

Refer to Appendix 1 to this report for the Personnel Listing.

4. TERRAIN AND WEATHER

4.1 TERRAIN

The terrain is generally flat to mildly undulating in the area of the East Avenue Seismic Survey.

The prospect is bounded to the north-west by the East Avenue Range and to the east by the Wattle Range. The West Avenue Range is to the west of the prospect area.

The prospect becomes more significantly undulating at the northern end of EA94-02, the eastern end of EA94-01 and the southern end of EA94012 as the lines approach the boundary ranges.

The land between the Wattle and West Avenue Ranges is effectively old swampland that has been drained by the network of ditches that covers this part of South Australia. The resultant pastureland is very rich in nutrients and is intensely farmed. In some places the soil is very sandy and to the south-east of the prospect, at the southern end of EA94-12, the Diamond Swamp remains undrained.

On EA94-06 and EA94-12 some patchy areas of sword grass and uncleared bracken and scrub remain.

The predominant land use is sheep and cattle grazing and as such much of the land is in pasture with an occasional isolated stand of timber. The region supports cattle and horse studs and deer farms.

The landholdings are of small to medium size with numerous fences and gates.

4.2 WEATHER

Light rain fell on the morning of April 4, clearing in the afternoon. The skies were clear throughout the rest of the East Avenue Survey with fog in the mornings of April 22 and 23.

5. PERMITTING, FENCING AND BRIDGING

The survey was conducted across privately owned land. GFE Resources contracted Mr Chris Annear for the permitting of affected properties.

The installation of gates and temporary fencing was carried out by Russell Johnston. Geco-Prakla controlled the electric fencing of vulnerable recording spread so as to reduce damage due to chewage by cattle. GFE provided the equipment for the electric fencing and Geco-Prakla supplied the labour and a vehicle. Minimal spread damage was sustained.

Permitting details do not form part of this report.

6. LINE CLEARING

The line clearing was carried by Peter C. Roberts of Millicent S.A. using a Hydro-ax and was performed under the control of GFE within the guidelines enforced by the Department of Forestry and Natural Resources.

Line clearing details do not form part of this report.

7. SURVEYING

7.1 OVERVIEW

The East Avenue Seismic Survey conducted by Geco-Prakla for GFE, consisted of seven lines totalling 60.94kilometres.

The breakdown of individual line lengths is as follows:

LINE	GROUP INT.	SOL	EOL	Km
EA94-01	20m	200.5	724.5	10.48
EA94-02	20m	200.5	573.5	8.54
EA94-04	20m	200.5	633.5	8.66
EA94-06	20m	200.5	603.5	8.06
EA94-08	20m	200.5	624.5	8.48
EA94-10	20m	200.5	660.5	9.20
EA94-12	20m	200.5	627.5	8.54
			TOTAL	60.94 Km

7.2 SUB-CONTRACTOR

The ranging, chaining and coordination of the seismic lines was sub-contracted by Geco-Prakla to Dynamic Satellite Surveys (DSS). A full survey report from DSS is enclosed in Appendix 7 to this report.

Timing and Productivity

	Start	Finish	Days	Km/Day
Ranging	7/04/94	20/04/94	8	7.62
Chaining	8/04/94	23/04/94	12	5.08
GPS Surveying	20/04/94	25/04/94	6	10.16

Between April 11-15 the topographical survey crew was released to honour other work commitments in Victoria.

7.3 SURVEY PARAMETERS AND SURVEY CONTROL

7.3.1 GEODETIC REFERENCE SYSTEM:

Survey Datum	:	A.G.D. 1966
Spheroid	:	A.G.D. 1966
Semi- Major Axis	:	6378160 metres
Flattening	:	298.255
Unit of Measurement	:	International Metre

7.3.2 MAP PROJECTION PARAMETERS:

Projection	:	Universal Transverse Mercator
Zone	:	54 East
Latitude of Origin	:	0° 00'"
Longitude of Origin	:	141° 00' east
False Easting	:	500,000.00
False Northing	:	10,000,000.00
Scale Factor @ c.m.	:	0.9996
Unit of Measure	:	metre

7.3.3 SURVEY CONTROL:

The trig stations and bench marks used to control the coordination of the lines are fully detailed in Appendix 7.

7.4. SURVEY EQUIPMENT AND OPERATING PROCEDURES

The combination of GPS positioning and REM heighting used for the line coordination is detailed fully in Appendix 7, section 12.

8. PRODUCTION RECORDING

8.1 EQUIPMENT

Geco-Prakla supplied an Input / Output (I/O) System One digital telemetry recording system to record seismic data from sound waves generated by Mertz M26 60000lb peak force seismic vibrators. The low system noise and wide dynamic range characteristics of the I/O System One in conjunction with the broad band power of the M26 vibrators facilitated the acquisition of quality seismic data.

The I/O System One was used in conjunction with Pelton Advance II vibrator control electronics. Two tape transport modules were used to facilitate fast recording and minimise tape change time. The receivers were made up of twelve SM-4 geophones (six in series by two parallel) planted continuously and centered on the peg, while the source comprised three Mertz M26 vibrators in line centered on the half station.

A full list of Geco-Prakla equipment used can be found in Appendix 2 to this report.

Source and receiver array diagrams are included in Appendix 3 to this report.

8.2 QUALITY CONTROL

8.2.1 START-UP (MONTHLY) TESTS

Start up tests were performed on March 12 at the commencement of the Gellibrand Seismic Survey performed in PEP 100 as part of GFE's 1994 Otway Basin Program.

On April 21, as part of the daily tests, Hard Wire Similarity and Point Source Similarity Tests (Remote Nest Tests) were carried out.

On March 30 a complete set of Look Ahead Tests (LATs) were carried out on the Remote Signal Conditioners (RSCs) as per Geco-Prakla standards and selected tests were written to tape:

Harmonic Distortion
Signal Level Harmonic Distortion Test
Dynamic Range Determination
Gain Step Accuracy Test
Pulse Test (filtered): the same as a SEG standard pulse test with a broader spectrum
A/D Linearity
Common Mode Rejection (CMR)
Crossfeed Isolation
HPE Performance (High Line Pick-Up Eliminator)
Long Equivalent Noise Test

The following tests were written to tape and made available to the client for further evaluation at an independent processing house :

Signal Level Harmonic Distortion
Dynamic Range Determination
Gain Step Accuracy
Pulse Test (SEG)
Equivalent Input Noise
Harmonic Distortion - 5uV sine wave
- 1.31072V sine wave

The source of the input signal is the test oscillator in each RSC, (which is tested during calibration).

In order to maintain the highest quality of the RSCs, a full set of in-house developed tests were also performed. These tests involve running LATS on a large range of different filter settings which test all the analogue components in the RSCs and is approved by I/O's test department.

(See Appendix 4 for a full description of the Look Ahead Tests.)

Wireline Similarities were run with the following auxiliaries :

Auxiliary 1	- True Reference
Auxiliary 2	- Wireline Reference
Data Channel 1	- Vibrator Similarity (Ground Force)

The following signals may also be put into seismic channels for comparison if required :
Wireline Reference
Vibrator Reference (from the vibrator electronics)

The above checked that the Aux. channels behaved the same as the seismic channels, and that the phase relationship between them all was correct. The zero (start) time was checked by comparing True Reference and Vibrator Reference.

8.2.2 DAILY INSTRUMENT TESTS

All RSCs are put through a set of LATs when 'woken up' each day, prior to being put into production. First the RSCs are calibrated using the automatic calibration function on the system, then the following LATs are run:

1. Total Harmonic Distortion (1.31072V Sine Wave)
2. SEG Standard Filtered Pulse Test
3. Seismic Line Ohm Test (geophone resistance check)
4. Short Equivalent Input Noise Test (For all preamp gains)

These tests were analysed internally by the I/O System One and the results inspected by the observers. RSCs with faulty channels, and geophone strings out of specification were all replaced before production could start for the day. When satisfactory results of the above tests were achieved they were dumped to tape and a printed summary was supplied to the client representative.

In order to assist the data processors, an additional file was recorded each day containing only an uncorrelated True Reference sweep on Auxiliary Channel One.

8.2.3 DAILY VIBRATOR SIMILARITY TESTS

Radio similarity tests (sims) for each vibrator were carried out before production. In the Vib QC computer using Pelton software (SERQC) the uncorrelated Force signal from each vibrator was correlated against the Radio Reference produced by the Encode Sweep Generator (ESG). Each similarity was recorded on disk and a multiplot of the following for each vibrator was produced for the client's perusal.

Cross-Correlation Envelope :	To check the cross correlation amplitude spectrum and hence the presence of any harmonic ghosting.
Phase Plot :	To check vibrator phase difference with the reference.
Force Plot :	To check the amplitude variation with frequency against the reference which is equivalent to 100% force.
Total Harmonic Distortion :	To check for the total amount of spurious harmonics.

8.2.4 VIBRATOR CONTINUOUS MONITORING

During production, the Pelton software package Vibra Sig. gives a constantly updated Quality Control (QC) check of all the vibrators in use. After each sweep a new plot of the correlation wavelet, phase, and amplitude, for each vibrator is sent to screen and to the floppy drive. During this data transmission, Post Sweep Services (PSS) information is also sent to the recording truck. This contains a summary of the maximum and minimum phase and check-sum force, as well as the check-sum of parameters in the vibrator electronics. These results are flagged if they exceed specified limits.

8.2.5 STANDARD FIELD QC PROCEDURES

The first shot of the day is taken with no bad channels on the spread. Any bad channels appearing during the course of the day are troubleshot as soon as possible during recording. Generally, no more than three dead channels are acceptable for recording, while two consecutive bad channels are corrected before continuing.

8.2.6 GEOPHONES

All geophones are leakage tested in a water bath and then tested by a 'Sensor SMT 100' Geophone Analyser before being put on line. A list of the test results can be made available to the client. The SMT tests sensitivity, frequency, DC resistance, damping, distortion and polarity.

8.2.7 ELECTRONIC LOGS

The electronic logs comprise a cover sheet containing general information as well as the line number and any operational information, a parameter sheet containing all the main recording parameters, and the summary sheets for every VP of the day.

The summary sheets are a summary of the essential parameters and is generated from a far more extensive electronic observers log which is recorded on 3.5" disk which is archived for later reference if required. All the essential parameters displayed on the summary are selected by customising the log as required.

8.3 EXPERIMENTATION

A series of tests comparing different sweep lengths and the effect of the Highline Pickup Eliminator (HPE) were performed immediately prior to the commencement of production recording on April 21.

After the brief experimentation program, production began, using :

Sweep Frequency of 6-100Hz over 10secs with a 0.3sec taper.
One sweep per VP.
Lo-Cut Filter A = Out
B = 11.2Hz 12dB/Oct Slope
C = 8.7Hz 24dB/Oct Slope
Hi-Cut Filter 120Hz 72dB/Oct Slope
Highline Pickup Eliminator (HPE) - 50Hz 6% Width.
K-Gain Radius - 12 dB Gain / 2 Channels.
48 dB Gain / 150 Channels.

Refer to Appendix 3 to this report for the full parameter listing.

8.4 RECORDING OPERATIONS

Recording spread was laid out on April 21 and start of contract instrument tests were performed. After 0.90 hours of experimental recording, production commenced at VP 200.5 on EA94-02. Recording began with 152 live channels at VP 576.5, increasing to 304 by the time the vibrators had reached VP 425.5 (Rolling onto the spread).

Shooting Order and Direction

LINE	SHOOTING DIRECTION
EA94-02	N-S
EA94-04	S-N
EA94-06	N-S
EA94-08	S-N
EA94-10	N-S
EA94-12	S-N

The Geco-Prakla electric fencing crew protected vulnerable recording spread thereby minimising the amount of chewage sustained throughout this contract.

The movement of line equipment during production was accomplished using three Mitsubishi Canter 4x4 trucks, each set up to transport 10 RSCs with batteries and cable for 60 channels. Geophones were moved by two HJ75 Toyota utilities with specifically designed geophone holding racks attached to the trays. Each utility carried loads of 100-120 strings.

The movement of spread was accomplished with minimum of difficulty although some rough terrain at the eastern end of EA94-01 slowed the spread retrieval. A total of 2.0 hours was spent waiting on spread over the course of the East Avenue Seismic Survey.

There was a very large amount of detouring due to the small land holdings and numerous gates and boundary fences. The many drains, windmills and irrigation systems within the survey area had to be avoided thereby increasing the detour time. On April 24 one vibrator became bogged in sand while on detour and took 12 minutes to extricate. The total detour time for the survey was 6.3 hours (11.2% of total time).

Power for the RSCs was provided by 'double packed' Dryfit Lead Batteries fitted to each RSC. A Toyota HJ75 utility was set up to carry enough spare batteries to enable a complete battery change for each line RSC every two days.

The Line Supervisor and the Trouble Shooter used I/O Line Checker Modules (LCM) to correct line problems. The total time spent trouble shooting was 1.0 hours.

At all times during the survey the recording spread and line personnel were maintained at or above contract levels. Whilst coping with numerous detours and shorter working days a good level of production was maintained.

Overall production rates were steady with an average of 2.25km per recording hour. Production was completed and the spread was picked up on April 25.

The daily production statistics are recorded in Appendix 6.

8.5 DATA SHIPMENT

The data tapes were sent in a single shipment to Digital Exploration, Piljarra Hills, Qld.

April 26

Field Data Tapes: 1-35
Lines EA94-01, EA94-02, EA94-04, EA94-06, EA94-08, EA94-10 and EA94-12.

Observer logs, Parameter Sheets and Tape Log:
All Lines

Field Monitors:
All Lines

Survey Information:
On paper and disk. All Lines

9. HEALTH SAFETY AND ENVIRONMENT (HSE)

9.1 GENERAL

Geco-Prakla place great importance on the Health and Safety of all personnel involved in, and the local inhabitants affected by their operations. Similarly the company makes an effort to ensure that it minimises the environmental impact associated with seismic operations. To this end, Geco-Prakla employs a full time HS&E Advisor on it's crews.

Strong emphasis is placed on the importance of reporting all potential hazards, near misses and accidents regardless of how minor they may seem. A high emphasis was placed on the Geco-Prakla system of 'STOP for safety' cards during the contract. The system has resulted in many near misses being reported and investigated, and hazardous situations remedied prior to developing into major incidents.

Weekly 'safety' meetings address all health, safety and environmental issues and attendance is compulsory. Daily 'Tool Box' meetings serve to support the HS&E program and addresses new issues as and when they arise.

The safety statistics for the duration of the survey are listed in Appendix 5 to this report.

9.2 ENVIRONMENT

Geco-Prakla has a strong and active commitment to sound environmental practices and demands a positive attitude from the crew.

POLICY : ENVIRONMENT

"Geco-Prakla policy on environmental management implies that all activities of Geco-Prakla shall be performed with due regard to the environment, taking into account the operational goals and physical constraint, by acting to preserve air, land, water, energy, animal and plant life from discharges and noise, which may arise in performing the work."

All operations were carried out in compliance with the Aboriginal Heritage Act, the Department of Forestry and Natural Resources Requirements, the APEA 'Code of Environmental Practice - Onshore' and the South Australian Department of Mines and Energy 'Code of Environmental Practice for Seismic Operations in the south-east of South Australia'.

All permanent employees and many of the casual staff have been involved in ongoing fire fighting training and all vehicles are equipped with extinguishers and rakes or shovels.

In the interests of good environmental practices the marker pegs and pin flags were removed as soon as the recording had been completed on each seismic line. The de-pegging personnel checked for, and removed, flagging on fences, gates and vegetation and any rubbish left behind by the recording crew.

Any damage to private property (eg fences and gates) was reported immediately to the permit officer who arranged for repairs.

9.3 SAFETY

No stop cards were submitted, no near incidents, three incidents and no Lost Time Injuries (LTI) occurred during the contract.

All hazards and accidents were addressed or rectified, and all crew members made aware of them to help prevent recurrence.

Particular attention was given to the special safety considerations arising from the use of motor vehicles as this is the most common cause of incidents. Two of the three reported incidents were vehicle related.

Both of the reported incidents involving vehicles occurred when a line worker fell from the tray of a moving vehicle while pulling in cable. The vehicles were travelling over rough terrain and an unexpected bump caused the workers to lose balance. The vehicles are equipped with cable cages that provide support for the line worker but safe working methods must also be employed to ensure personal safety.

Constant reminders are made to the line crew of the safest operating procedures to follow while a worker is on the tray of a vehicle.

The worker is expected to work in a responsible manner in order to minimise their personal risk.

Communication between the worker and the driver is necessary to establish the most comfortable and the safest manner of operation.

The driver is to travel at speeds and in a manner appropriate to the terrain and to the task being performed, while always conscious of the safety of the worker on the tray.

No personnel are permitted to travel on the back of vehicles during detours or when their task does not require them to do so.

Instruction in safe vehicle operation is an ongoing process as new hands join the crew and experienced personnel are reminded of the risks of working with line vehicles.

9.4 SUMMARY

Geco-Prakla has maintained its excellent safety record with no LTIs and a reporting system that addresses situations before they result in injury.

No adverse environmental impact has resulted to date from the recording operations conducted for the East Avenue Seismic Survey in PEL 39.

10.0 CONCLUSIONS AND RECOMMENDATIONS

The Annya Seismic Survey recording was completed within schedule and without significant difficulty.

The topographical survey information was timely and accurate and was acquired in a professional manner.

East Avenue,

The recording crew performed well and the seismic records were generally of fair to good quality.

Good production levels were maintained throughout the survey with minimum impact on the local environment.

APPENDIX 1: Geco-Prakla Personnel

BRISBANE BASE

Project Manager	D. Sweeney	W. Hess
Expeditor	C. Rowlands	
Administrator	S. Bailey	
Report Editor	J. Ivory	

CREW PERSONNEL

Party Chief	H. Kaeter	
APC/HS&E Advisor	D. Schimanski	
Senior Observer	M. Askey	
Observer	C. Hall	
Instrument Engineer	L. Ngoti	
Vibrator Technician	F. Bletterman	B. Anderson
Camp Mechanic	L. Womersley	
Geophone Repair	R. Adams	
Supply Driver	G. Dunstan	
Lead Vibrator Driver	E. Olsen	
Vibrator Driver	C. Maunder	
Vibrator Driver	R. Rissman	
Vibrator Driver	M. Ayers	
Vibrator Driver	D. Olsen	
Line Supervisor/QC	R. Wilson	
Front Crew Boss	S. Hardstaff	
Back Crew Boss	N. McCabe	
Line Crew	B. Warren	J. Johnson
	A. Hoy	S. King
	A. Grady	P. Garner
	C. Pearce	R. Hope
	A. White	D. Randall
	J. Howard	L. Johnston
	S. Bobrowski	H. Tate
	W. Thomas	K. Russell
	G. Le Gros	T. Metcalfe
Camp Cook	B. Habel	
Cook's Assistant	E. Jackson	
Camp Attendant	K. Lange	
Electric Fence Crew	A. Wallis	
Electric Fence Crew	P. Ward	

APPENDIX 2: Geco-Prakla EQUIPMENT LIST

RECORDING INSTRUMENTS:

1	Compaq 386 (Unix Software - Operator Console Module (OCM))
1	Compaq 386 (Vibra*SIG QC Package)
1	Back Up Unix OCM Software
1	I/O System One Controller Module (SCM)
1	I/O System One Line Interface Module (LIM)
1	I/O System One Interface Module (SIM)
1	Correlation Stacker Module (CSM)
2	Tape Transport Modules (TTM)
1	OYO DFM 250 Camera
1	Tectronic 2236 Oscilloscope
1	Epson LQ-850 Printer
1	Pelton Advance II ESG
5	Pelton Advance II Vibrator Electronics

RECORDING LINE EQUIPMENT:

110	Remote Signal Conditioners
124	Tescorp Telemetry Cables
	115 x RSC-RSC Distributed Cable
	4 x RSC Telemetric Cables 10ft
	4 x RSC Telemetric Cables 425m
2	Line Tap Boxes
2	Line Tap To Truck Cables
	1 x 425m
	1 x 200m
4	Line Tap Cables
660	Sensor SM-4 Geophone Strings
330	RSC Batteries
3	Battery Chargers (36 Battery capacity each)
2	Random Test Terminal
2	HHT Line Test Terminals

LINE VEHICLES:

1	Recording Truck, M.A.N 6 x 6
3	Line Truck, Mitsubishi Canter 4x4
1	Front Crew Transport, Toyota HJ75 PC
1	Back Crew Transport, Toyota HJ75 PC
1	Line Bosses Vehicle, Toyota HJ75
2	Jug Vehicles, Toyota HJ75
1	Battery Vehicle, Toyota HJ75
4	Mertz M26 Vibrators
1	Vibrator Personnel Toyota HJ75 PC
1	Vibrator Support Vehicle

CAMP SUPPORT VEHICLES:

1	Party Chief Vehicle, HJ80 S/W
1	Mechanics Vehicle, HJ75 Utility
1	Battery Charger Truck, Mitsubishi Canter 4X4
2	Water Tanker, International Paystar 6X6
1	Generator Truck, International Paystar 6X6, Fitted with 1X 85KVA and 1X 50KVA Generators.
1	Mechanics Workshop, MAN 15/168 4X4
1	Crane Truck, HINO GT175 4X4
1	M.A.N Truck with 6500 litre fuel cell

CAMP TRAILERS:

1	Kitchen
1	Mess
1	Shower / Laundry
1	Office / 2 x Two Berth Accommodation
1	RTS Workshop / Geophone Cable Repair Shop
2	2 x Four Berth Accommodation
1	2 x Two Berth Accommodation
2	1 x Two and 1 x Four Berth Accommodation
1	Client Office/Two Berth Accommodation
1	2 x Toilet Trailer
1	Vib Spares Trailer

SURVEY:

1	GPS and Rapid Elevation Meter, Computer and Software
1	Wild TO Line Pointing Instrument (or equivalent)
1	Chaining Tools and Surveying Equipment
3	Toyota HJ75 Utilities (or equivalent) - Survey
1	Toyota HJ75 Utility - Line Clearing
3	Ashtech, Geodetic GPS Receivers
1	Renard L304, 386 Laptop Computer with 387 Co-processor, 3.5" 1.44Mb floppy drive
1	Panasonic KK-1124, 24 Pin Printer

RADIO :

6	Midland VHF Radios (Recording Truck and Vibrators)
8	Kenwood TK230 VHF Hand Held Radio transceivers
20	ICOM V200 25wt VHF Radios (Recording Truck and Line Vehicles)

APPENDIX 3: RECORDING PARAMETERS AND STANDARDS

AREA : PEP-105 PEL 39
SURVEY : East Avenue Seismic Survey

INSTRUMENTATION

Recording Instruments	: I/O System One
Data Channels	: 304
Aux. Channels	: 1) True Reference Sweep
	2) Clock Time Break
	3) 100Hz Reference
Monthly Tests Aux. Channels	: 1) True Reference
	: 2) Wireline Reference
	: 3) Clock Time Reference
	: 4) 100Hz Reference
Tape Format	: SEG D, 2.5 Byte 8015, 6250 b.p.i.
Filters	: Lo-Cut A) Out
	B) 11.2 Hz, 12 dB/Oct
	C) 8.7 Hz, 24 dB/Oct
	Hi-Cut 120 Hz, 72 dB/Oct
Spectral Shaping Filter	: Out
Sample Rate	: 2 ms
Highline Pickup Eliminator	: 50Hz 6.0% Width
K-Gain Radius	: Energy gap - 0 stations
	12 dB - 2 stations
	24 dB - 0 stations
	36 dB - 0 stations
	48 dB - 150 stations
Correlation / Type	: Correlate after stack / Zero phase
Noise Elimination	: Burst and Diversity
Noise Edit Sensitivity	: 18 dB
Record Length	: 5 sec (10 sec sweep + 5 sec listen)

SOURCE DATA

Vibrators	: 3 x Mertz M26 60,000 lb
	mounted on Mertz 8 x 8 Carrier
Electronics	: Pelton Advance II
Sweep Frequency	: 6-100 Hz
Sweep Function	: Linear Upsweep
No. of sweeps/V.P.	: 1
Source Array	: 3 vibrators in line, Pad to Pad 12.0 m
Phase Locking Type	: Ground Force
High Force Out	: 90% - 54,000 lb
Force Control	: Peak and Trough
Cosine Taper	: 0.30 sec

RECEIVER DATA

Manuf./Model/Res. Freq.	: Sensor, SM4, 10 Hz
No./String	: 12
Connection	: 6 x 2, series / parallel

SPREAD PARAMETERS

Receiver Group Interval	: 20m
Receiver Location / Array	: On Peg / Symmetrical
V.P. Interval	: 20m
V.P. Location / Array	: Half Station. / In line
Spread Geometry	: 300 channels split : 3030 - 10 - 0 - 10 - 3030
Gap	: 0 dead stations
Multiplicity	: 152 nominal

G.F.E. Resources Ltd.

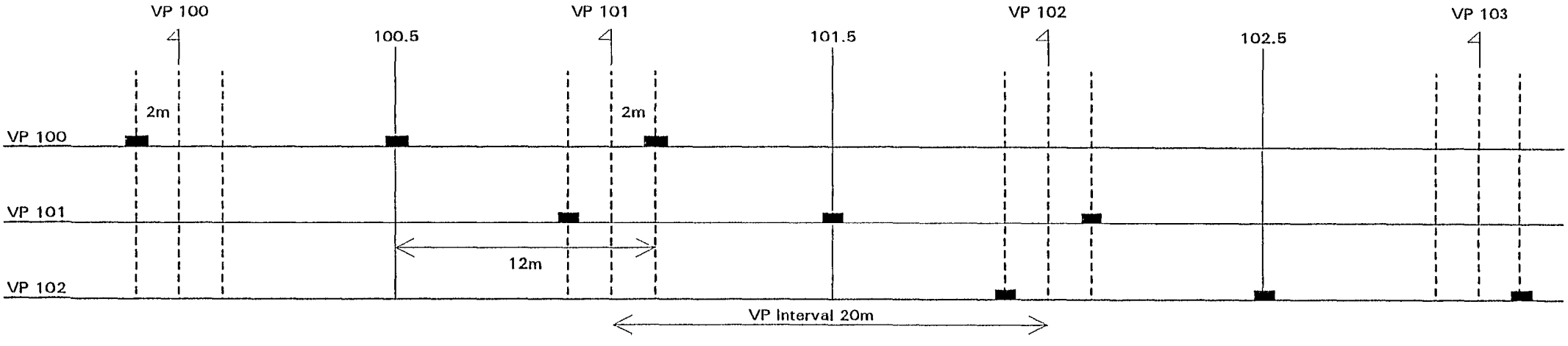
1994 East Avenue 2-D Seismic Survey

Source Design

STATION INTERVAL 20m

12m PAD TO PAD

3 MERTZ M26 VIBRATORS IN LINE



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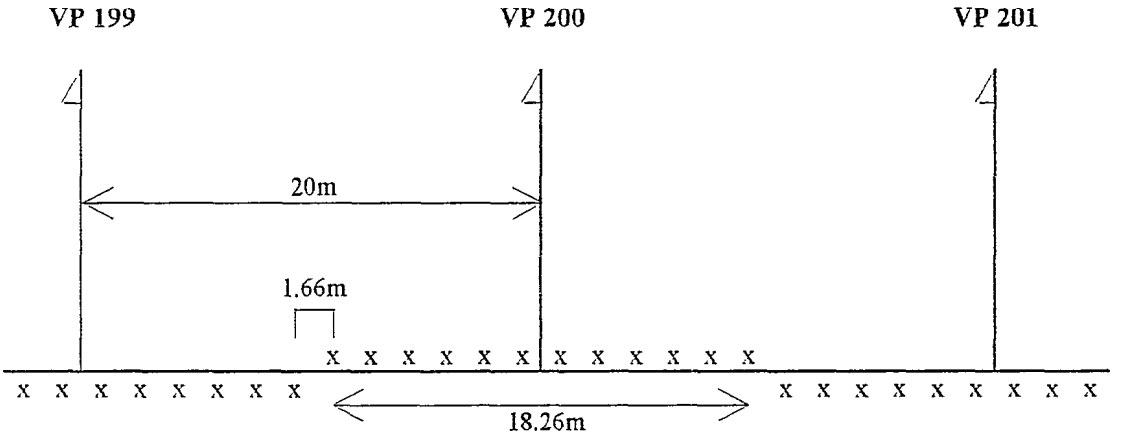
G.F.E. Resources Ltd.
East Avenue Seismic Survey

G.F.E Resources Ltd.

1994 East Avenue 2-D Seismic Survey

Receiver Array



20m Receiver Group Interval

APPENDIX 4: I/O SYSTEM ONE LOOK AHEAD TESTS (LATs)

The LATs are a set of instrument self tests, which are also capable of being written to tape automatically by the system for independent testing if required. When written to tape the system uses its own numbering for the file numbers. This and a detailed description of each LAT test is usually submitted with the start up test tape.

The system performs a self analysis during each test and checks the results against its own pass specifications. The system gives the option of automatically logging all the results of the test analysis or only failures. These logs known as LAT Logs can be viewed by the observer and the faulty unit can be removed. The system can also generate a summary of which RSCs failed which test.
A summary of the function of each LAT test is as follows:

RSC CALIBRATION - Calibration is in four stages

1. Gain Step Calibration - calculates the gain correction multipliers for all the Gain Ranging Amplifier (floating point amplifier) gain steps and all the test oscillator attenuation steps.

2. ADC Calibration - calculates the A/D Converter gain.

3. Oscillator Calibration - tests the RMS amplitude and distortion of the test oscillator.

4. Seismic Channel Calibration - calculates a gain correction multiplier for each K-Gain for each of the six channels in each of the RSCs.

All the gain correction multiplier values for all channels are stored in the Line Interface Module (LIM) memory, and all data acquired after running RSC Calibrate is corrected with these multipliers before being written to tape. Calibration removes the need for any time consuming manual adjustments to the analogue circuits in the RSC and improves the fidelity of the data.

IMPULSE TEST - There are two options
1. SEG standard - half a sample length pulse
2. Filtered pulse - as above but filtered to give a broader flatter frequency spectrum.

HARMONIC DISTORTION - Calculates the total harmonic distortion for a signal with the maximum amplitude that the system can handle at a frequency in the middle of the filter band width.

COMMON MODE REJECTION - Tests the common mode (as compared to the differential mode) rejection characteristics of the Preamp and the balanced input filter circuits. It tests the RSC balanced circuits and the external cabling separately, and for each K-Gain.

OHMING SEISMIC GROUPS - Calculates overall string impedance using an AC oscillator signal.

CROSSFEED - Tests the crossfeed between all analogue pairs in the RSC and in the cable for even channels then odd channels.

HPE PERFORMANCE - Tests how effective the Highline Pickup Eliminator filter is at removing power line frequencies.

DYNAMIC RANGE - Tests the dynamic range of the system with the Gain Ranging Amplifier switched off, i.e. the instantaneous dynamic range.

EQUIVALENT INPUT NOISE - Tests the system instrument noise in the form of an equivalent voltage at the channel inputs, and tests all channels with all K-Gains.
There are two options:

1. Short - 1 x 2 second record is taken
2. Long - 16 x 2 second records are taken

GAIN STEP ACCURACY - Tests the accuracy of each gain step in the Gain Ranging Amplifier, and every attenuation step in the test oscillator.

SIGNAL LEVEL HARMONIC DISTORTION - Effectively this is the total system dynamic range (not including Spectral Shaping Filter) and tests from noise level to maximum system input amplitude.

HPE REFERENCE - Is not an instrument test. It is used when the HPE is in tracking mode, and is used to select the frequency to be eliminated in areas where the highline frequency is not as expected or varies considerably.

APPENDIX 5: SAFETY POLICY AND STATISTICS

Corporate Health, Safety and Environment Policy

Geco-Prakla's Five Year mission statement is: To become the industry leader in all product lines through differentiation in efficiency, technology, HSE and quality.

In pursuing this objective, Geco-Prakla is committed to avoiding injury to and the preservation of, the health and safety of its employees and any other persons who may at any time be affected by its activities and conduct its operations in a manner that provides optimum protection to the environment in which these operations are conducted.

- HSE is a line management responsibility. Line managers are appraised on the basis of HSE performance.
- The HSE policy is applicable to all employees, client representatives and third parties involved in Geco-Prakla Seismic Operations. Compliance with the HSE Policy is a Geco-Prakla condition of employment.
- The Geco-Prakla HSE policy addresses respect for the Health of the individual and respect for the Environment in the execution of safe and efficient seismic operations.
- The Company will provide training to all employees to operate in an HSE conducive manner. Compliance with the HSE policy is the responsibility of the individual.
- The Company HSE policy is built on a "No blame" culture. We are more concerned with recognizing and eliminating risk than we are with looking for someone to blame.
- If witnessing an unsafe act or hazard an individual is expected to rectify the situation, report accordingly or if appropriate STOP the operation.

The President of Geco-Prakla carries the ultimate responsibility for the Company's commitment to Health, Safety and the Environment. Each and every employee is expected to be dedicated to being an integral part of this commitment.

C. Kampmann
Geco-Prakla President

T. Blades
Vice President – HSE

1.1 Responsibilities

■ General

All employees should understand their specific role and responsibilities for HSE which must be clearly defined in their job description. Accountability for unsafe practices and resulting accidents, lies with Line Management from the President to every level of supervisor and down to each individual employee. The concept that HSE is the responsibility of the HSE department or HSE Manager, though still prevalent in the minds of many, is quite wrong. HSE advisors can supply specialized knowledge and support but action is the responsibility of Line Management.

■ Line Managers

Line Managers are responsible for the HSE performance. They must ensure that Geco-Prakla HSE policies are carried out, and that all specific HSE requirements are met, including the legal requirements of the host country. It is the specific responsibility of all managers to inspect, instruct and ensure that HSE objectives are implemented down into their organization according to Geco-Prakla HSE requirements.

Accountability for HSE requires that each manager and supervisor must be able to demonstrate that he has:

- HSE standards as part of his/her standard of performance,
- given explicit HSE instruction to his subordinates,
- taken appropriate implementation actions,
- provided resources (equipment, training, manpower, finance, time),
- checked and followed-up on adherence to HSE instructions.

■ HSE Staff

Each appointed HSE staff member and HSE committee member is responsible for ensuring that the HSE system is in place and operates efficiently. They alert Management to discovered shortcomings in the existing HSE rules and recommend improvements. They make sure that new techniques are safely introduced.

■ Geco-Prakla Employees

It is the obligation of all employees to participate in maintaining a healthy, safe and clean work environment. Geco-Prakla employees are responsible for completing the job safely. If they are unsure of the safe way to proceed, they must ask for assistance from their supervisor, and must report any unsafe situation or action.

SCHLUMBERGER ENVIRONMENTAL PROTECTION POLICY

It is Schlumberger's Policy to conduct its worldwide businesses in a manner which assures optimum protection of the environment. In addition to careful compliance with relevant laws and regulations, efficient use of natural resources and waste reduction are keys to achieving this objective.

This policy commits us to provide regular training to all employees, improve our technology and enlist the cooperation of our suppliers, customers and neighboring communities to build better environmental practices.

This policy is further managed through:

- *Periodic Environmental Assessments of all sites to ensure compliance with and continuous improvement of operating standards,*
- *Environmental Impact Assessment of new products, processes and operations,*
- *Environmental Assessments performed in relation to business and/or real property transactions to avoid exposure to environmental liabilities.*

In each company, it is the responsibility of Line Management, with the support of the HSE and Legal organizations, to implement the Environmental Protection Policy.

23 March 1992

G.F.E. RESOURCES LTD

HEALTH , SAFETY AND ENVIRONMENT SUMMARY

EAST AVENUE SEISMIC SURVEY 1994

Tool Box Meetings	5
Safety Meetings	1
Stop Cards	0
Potential Hazards	0
Near Incidents	0
Incidents	3
LTI	0
Man Hours	2592

The Safety Meeting was held on 21/04/94.

INCIDENTS

DATE	DESCRIPTION
21/04/94	Welding sparks ignited rags in the workshop
21/04/94	Line personnel fell from vehicle while pulling cable in over rough terrain
21/04/94	Line personnel fell from vehicle while pulling cable in over rough terrain

SUMMARY

The survey was of short duration (4 days) and little reporting was done during this time.
No STOP cards were submitted and no near incidents or hazards were reported.
There were no Lost Time Injuries (LTIs) incurred on this survey.

The occurrence of two incidents involving personnel falling from line vehicles on the same day, under the same conditions emphasises the need for careful examination of the task procedures and for appropriate cautionary action.

APPENDIX 6: PRODUCTION STATISTICS

GFE Resources Ltd.

1994 EAST AVENUE SEISMIC SURVEY PEL 39

PRODUCTION STATISTICS

DATE	LINE	LINE MOVE (hrs)	DAILY TESTS (hrs)	PRODUCTION (km)	TT (hrs)	OT (hrs)	STBY (hrs)	WOS (hrs)	DT (hrs)	TS (hrs)	EXP (hrs)	DETOUR (hrs)	TRAV (hrs)	OTHER (hrs)	COMMENT
21/04/94	EA94-02/04	0.70	1.40	8.780	11.60	4.30	2.30				0.80	1.80	0.30		Standby for Camp Move
22/04/94	EA94-04/06	1.00	0.30	15.480	12.00	6.80		0.50	0.70	0.40		1.60	0.70		
23/04/94	EA94-08/10	1.00	0.40	12.760	11.40	5.50		1.10	0.30	0.20		1.60	0.40	0.30	Cable Chewage - Line Fault
24/04/94	EA94-10/12/0	1.10	1.10	13.720	12.00	6.50			1.00	0.10		1.00	0.40	0.20	Vibrator bogged in sand
25/04/94	EA94-01	0.70	0.50	10.220	9.30	3.90	1.20	0.40	0.10	0.30		0.30	0.20	2.90	Picking Up Spread
	TOTAL	**4.50**	**3.70**	**60.960**	**56.30**	**27.00**	**3.50**	**2.00**	**2.10**	**1.00**	**0.80**	**6.30**	**2.00**	**3.40**	

TT Total Time
OT Operational Time
STBY Stand By
WOS Waiting on Spread
DT Down Time
TS Trouble Shooting
EXP Experimentals
TRAV Travel Time
LINE MOVE Includes Recorder Move

GFE Resources Ltd.

1994 EAST AVENUE SEISMIC SURVEY PEL 39

RECORDING OPERATIONS EFFICIENCY

Date	Production	Rec.Time	Total	No.	Km Per Rec.	VPs per Rec.	VP Intervai	Skips
	(km)	(hrs)	(hrs)	VPs	Hour	Hour	(m)	
21/04/94	8.780	4.30	11.60	442	2.042	102.79	20	3
22/04/94	15.480	6.80	12.00	775	2.276	113.97	20	5
23/04/94	12.760	5.50	11.40	640	2.320	116.36	20	4
24/04/94	13.720	6.50	12.00	688	2.111	105.85	20	6
25/04/94	10.220	3.90	9.30	511	2.621	131.03	20	4
TOTAL	**60.960**	**27.00**	**56.30**	**3056**				**22**
AVERAGE	**12.192**	**5.40**	**11.26**	**611.2**	**2.274**	**114.00**		**4.4**

APPENDIX 7: D.S.S. FINAL SURVEY REPORT

1. INTRODUCTION

Dynamic Satellite Survey (DSS) was contracted by Geco-Prakla (Australia) Pty. Ltd. to provide topographical surveying services for the Annya Seismic Survey in Victoria. The survey was conducted in PEP 105 at the request of GFE Resources Ltd.

DSS provided line pointing, chaining and Global Positioning Survey (GPS) services. The line pointing commenced on April 7 finishing on April 20. Chaining began on April 8 and finished on April 23. Topographical survey by Global Positioning System (GPS) and Rapid Elevation Meter (REM) commenced on April 20 and was completed on April 24.

2. INSTRUMENTATION

Conventional survey traversing equipment was used for line set-out operations.

Two Ashtech LXII Dual Frequency GPS Receivers and three Single Frequency Receivers were used for peg positioning, with post processing performed on a Sharp 386 portable colour computer.

A Rapid Elevation Meter (REM) was used for profiling where required on the seismic lines.

3. METHOD OF SURVEY

The survey process for each line, consisted of four stages. Line set-out, chaining, GPS surveying and elevation observations.

3.1 LINE SET-OUT

Lines were set out from colour aerial photographs (approximate scale 1:40,800) and a 1:50,000 topographic map. Line direction was determined using compasses and was checked against natural features on the ground and on the aerial photographs.

All lines were placed in their planned locations. The accuracy of the aerial photographs was sufficient for the lines to be placed such that there was minimal obstruction by either natural or man made features.

3.2 CHAINING

All Lines were chained with a 20m group interval. Pegs were placed at every station, alternating red and white. The pegs were numbered at even increments on the white pegs.

The chaining operation commenced in early April. No work was done between April 11 and 15 as the survey crew was released to honour other work commitments in Victoria.

Line traces showing natural and man made features, detours and monumentation details were prepared each night and are included in section 11 of this survey report.

3.3 GPS SURVEYING

Kinematic GPS methods were predominantly employed for the survey. Static methods were restricted to acquisition and verification of control and for providing control on sections of line in scrub areas. On these lines with vegetative cover the Rapid Elevation Meter (REM) was used.

Coordination of permanent markers and key stations on bends was often accomplished by an indirect method of observation (line level method). Eccentric stations, usually within a 10m separation, were occupied by the GPS receiver. A connection to the permanent marker was provided by a compass and tape measure enabling coordinates to be calculated. Elevations of the permanent mark were accomplished by line level. The line level method is faster and more accurate than using the REM over short distances.

Eccentric stations were utilised when the permanent marker was located directly beneath, or adjacent to a large tree.

Compass traversing was performed through small sections of scrub where the line followed existing tracks. The tracks caused the lines to bend more than in cleared sections of line and traverses were between GPS controlled points provided accurate co-ordinates of the VPs in these areas. Misclosures and adjustments ensured accurate results.

3.4 GPS PROCESSING

All GPS data is recorded internally within each receiver, and downloaded onto the office computer each evening. The data is then differenced, and transformed to the AMG AGD'66 datum using software developed by Dynamic Satellite Surveys and Ashtech. As height values are required relative to Australian Height Datum (AHD), the OSU89A geoid spheroid software package is used to reduce the GPS elevations.

Various quality control checks were then undertaken including chaining checks and GPS solution analysis.

3.5 ELEVATION OBSERVATIONS & REDUCTIONS

Sections of line profiling were accomplished using the REM. GPS control stations with an average interval of one kilometre were used to control the REM elevation interpolations. Lines were run in two directions, to ensure data integrity and as a further check on the order of placement of intermediate pinflags and pegs.

Elevation observations were reduced in the field, and measurements outside a +/-0.33m tolerance, were re-observed.

Similar to GPS operations, data was downloaded onto the office computer and processed each evening.

4.0 MONUMENTATION

Permanent markers consisted of a galvanised steel picket with an iron pin set in concrete at the base. These markers were placed by the chaining crew near most intersections, bends, tracks and major roads, and at or near the start and end of each line. Holding to the standard set in 1993, permanent markers were not placed in the open, more visible areas, but were placed either on fence lines or adjacent to large, healthy trees. Such placement of the markers does not endanger livestock or restrict cultivation.

An aluminium tag was fixed to each steel picket indicating the line name, shot point number, and other details where applicable. Where old permanent markers were found near the line, GPS ties were performed and new tags attached indicating the position and shot point number of the new line.

5.0 DATA OUTPUT

Data is supplied in both hard copy and digital formats.

5.1 Hard Copy Data

All co-ordinates are based on AMG AGD'66 and AHD.

A line file is produced for each line containing:

Permanent Marker List
Co-ordinate and Elevation Data List (not interpolated)
Horizontal Plot
Profile Plot (single sheet)
Line Trace (prepared by the chaining crew)

5.2 Digital Data

Digital data in UKOOA and SEGP1 formats are supplied for the co-ordinate and elevation data list and the permanent marker list for each line.

6. SURVEY CONTROL

The Horizontal Control for the East Avenue Survey was established from two first order government trig stations. One station was situated to the north of the prospect (Callendale) and to the south of the prospect (Buffon Hill).

Vertical Control was based on the Department of Lands Third Order Benchmark #6923 878 located near the western side of the prospect.

6.1 Datum

STATION	EASTING	NORTHING	ELEVATION
Callendale	453843.122	5880133.008	
Buffon Hill	452298.862	5863426.087	
BM 6923 878			30.623

Ties were done to three Permanent Marks established in the 1990 survey and the misclosures were as follows:

PM	E	dN	dE
SC90-04 ST560+03	0.1	-0.7	+0.6
SC90-05 ST241+11	0.6	+0.2	+1.2
SC90-01 ST550	0.2	+0.1	+1.0

6.2 Accuracies

GPS utilises US Navy NAVSTAR satellites to provide real time three dimensional positioning. When the phase data received from the satellites is post processed, a significant increase in the accuracy of the position is gained. Accuracies of one part per million of measured length (1ppm) are possible with the Ashtech LXII dual frequency units used for this survey.

The accuracy of the static and kinematic GPS observations is a minimum of +/- 0.05m. Connections from eccentric GPS stations to permanent markers beneath trees however, reduces the final coordinate accuracy.

Compasses were individually calibrated for a magnetic to grid correction of + 10° in this area. With the assumption that a standard error reading of the compass was +/- 30', over an average 10m, a variation of +/-O.09m in bearing would be observed. Cloth tape connections to the permanent marks are accurate to +/-0.01m. Error ellipses would therefore be +/-0.01m on the semi-minor axis and +/-0.09m on the semi-major axis, thereby exceeding the minimum accuracy requirements.

Elevations to permanent marks by way of the line level, were tested in the field to +/- 0.025m, for distances less than 25m. Elevations of intermediate stations are quoted, and have been proven to +/-0.33m.

7.0 PERSONNEL

Topographical survey operations were centred at the temporary office at the Pinewood Caravan Park in Heywood whilst working on the Annya Seismic Survey in PEP 105.

Personnel Listing:

Line Set-Out	Chris Mead
	Rod Field
Chaining	Scott Bacchus
	Ryan Balkwil
	Damian Hedditch
	Colin French
GPS Surveying & Processing	Peter Cox
	Peter Harwood
	Chris Mead
	Ken MacAulay
	Marc Blundell
Elevations & Processing	Marc Blundell
	Ken MacAulay
Processing & Reporting	Ken MacAulay
	Chris Mead
Survey Supervision	Ken MacAulay

7. SAFETY

No incidents of personal injury or property damage were reported throughout the duration of the survey in PEL 39.

8. OPERATIONAL ASPECTS

No breakdowns of the GPS receivers of REM occurred during the survey, and as such, no time was lost due to instrument down time. The weather did not pose any difficulties.

9. CONCLUSION & RECOMMENDATIONS

The surveying related operations proceeded well, all aspects of the topographical survey operation were completed in a timely fashion.

The survey crew had some difficulty keeping up with the pace of the recording crew. This was due in part to the streamlining of the recording acquisition. A lead-in time of one week for survey over recording is recommended.

10. PERMANENT MARKER LISTINGS

Dynamic Satellite
Surveys Pty. Ltd.

Exploration
& Mining
Satellite Control

PERMANENT MARKERS

GFE | **EAST AVENUE** | **APRIL 1994**
AMG AGD 66 | **UTM projection** | **AMG ZONE 54 CM=141**
BEACHPORT | | **DYNAMIC SATELLITE SURVEYS**
20 | **DSS**

LINE NAME	STN	EASTING	NORTHING	ELEV.	COMMENTS
EA94-01	P200	442624.3	5869090.6	33.3	PM200+5mS
EA94-01	P310	444836.0	5869097.7	34.5	PM310+15
EA94-01	P354	445708.8	5869091.7	35.0	PM354+10
EA94-01	P600	450628.1	5869146.0	38.4	PM600+15
EA94-01	P698	452589.7	5869158.6	40.1	PM698+17
EA94-02	P238	443173.6	5865357.3	33.6	PM238
EA94-02	P383	443804.5	5868193.4	34.2	PM383+06
EA94-02	P428	443977.8	5869079.8	33.9	PM428+11
EA94-02	P518	444269.5	5870847.3	34.2	PM518+04
EA94-04	P200	444473.5	5864289.4	33.5	PM200
EA94-04	P250	444743.5	5865270.7	34.2	PM250+18
EA94-04	P392	445381.2	5868013.0	34.2	PM392+03
EA94-04	P448	445708.8	5869091.7	35.0	PM448+15
EA94-04	P503	446007.0	5870144.4	35.5	PM503+11
EA94-04	P634	446703.3	5872670.9	36.5	PM634+11
EA94-06	P427	447188.5	5869121.9	35.7	PM427+07
EA94-06	P517	447326.5	5870911.6	36.7	PM517+04
EA94-06	P603	447460.2	5872627.3	37.0	PM603+07
EA94-06	PM38	446884.2	5865352.6	34.2	PM238+05
EA94-08	P616	449741.7	5872471.4	38.4	PM616+7
EA94-08	P249	448230.2	5865302.0	34.4	PM249+10
EA94-08	P417	448954.1	5868569.7	35.7	PM417
EA94-10	P286	449755.5	5865316.9	34.6	PM286+08
EA94-10	P378	450165.8	5867112.1	35.6	PM378+11
EA94-10	P482	450628.1	5869146.0	38.4	PM482+19
EA94-10	P653	451386.9	5872468.7	39.0	PM653+11
EA94-12	P200	450264.7	5861897.0	35.3	PM200 EOL
EA94-12	P385	451388.1	5865432.5	37.5	PM385+15
EA94-12	P435	451695.3	5866386.6	38.5	PM435+19
EA94-12	P581	452589.7	5869158.6	40.1	PM581+15
EA94-12	P619	452827.9	5869884.1	45.9	PM619+19

11. CHAINING LINE TRACES

The following pages consist of the chaining line traces for lines EA94-01, EA94-02, EA94-04, EA94-06, EA94-08, EA94-10 and EA94-12.

LINE ...EA94-01..... TRACE DIAGRAM PAGE 1.... OF 2....

DYNAMIC SATELLITE SURVEYS

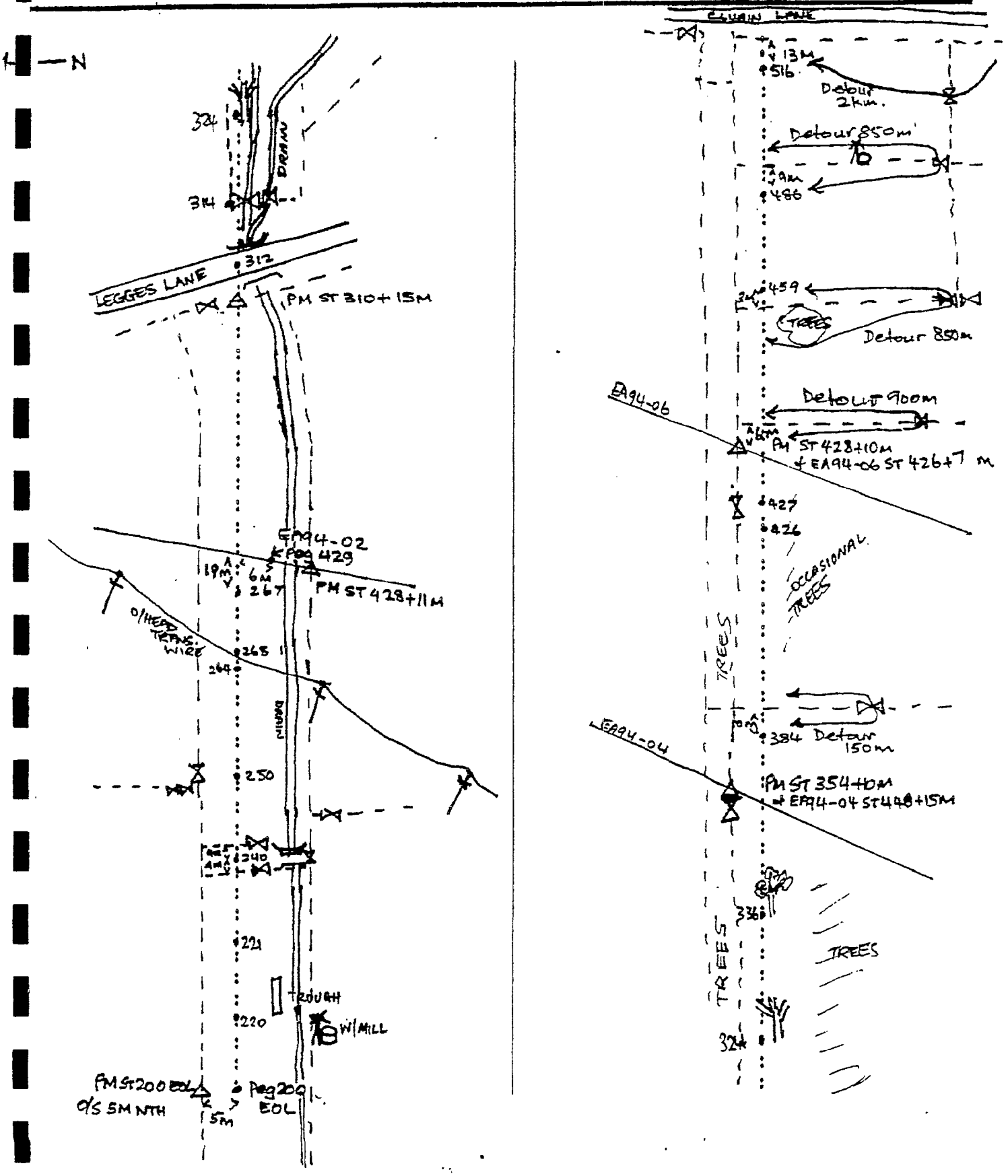
O Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT:...GAS & FUEL.....

JOB No.:.....

AREA :.EAST AVENUE....

From ~~200EOL~~ To ..... Shooting Direction ..... Brg ..... 20.0M INTERNAL



LINE EA 94-01 TRACE DIAGRAM PAGE 2 OF 2

DYNAMIC SATELLITE SURVEYS

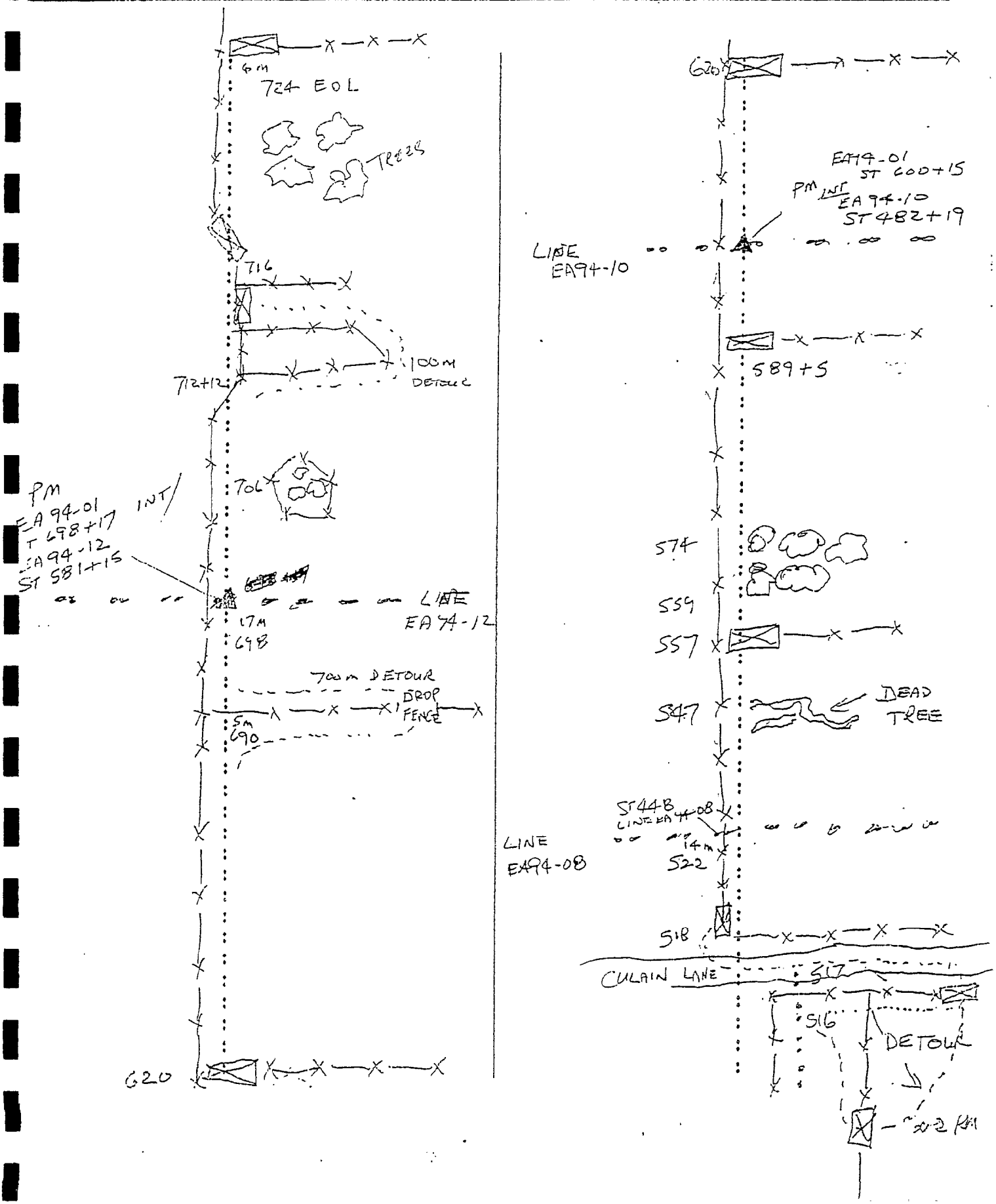
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax: 079 392867

CLIENT: GAS + FUEL

JOB No.:

AREA : EAST AUBIGNE

From 516 To 724 EOL Shooting Direction E - W Brg 20.0 m.



EA94-

LINE ~~EA~~ - 02 ..... TRACE DIAGRAM PAGE 1 ..... OF 2 .....

DYNAMIC SATELLITE SURVEYS

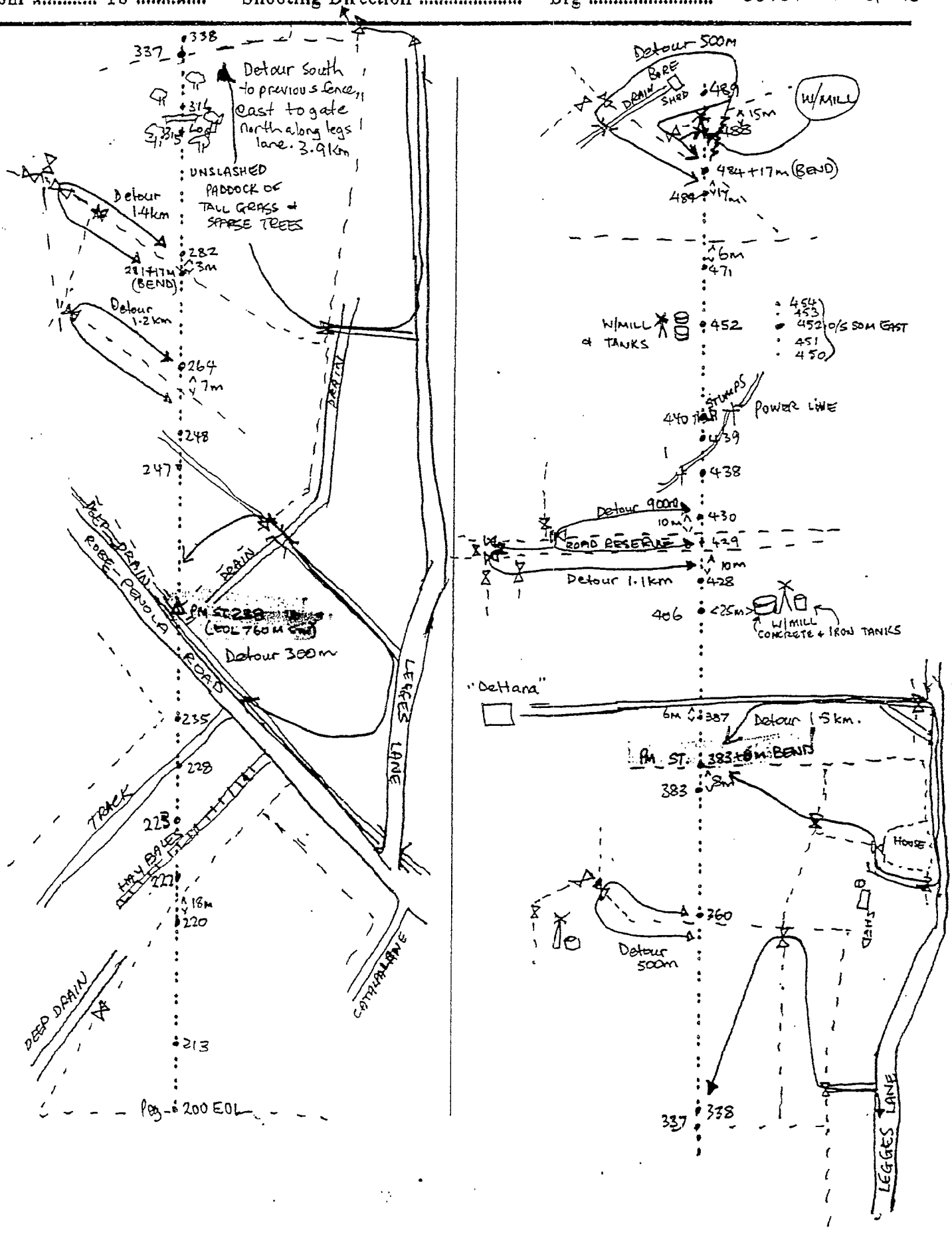
Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: GAS + FUEL

JOB No.: .....

AREA : "EAST AVENUE"

From 200 EOL To 489 Shooting Direction NTH - STH Brg ..... 20+0M INTERVAL



LINE EA94-02 ..... TRACE DIAGRAM PAGE 2 OF 2

DYNAMIC SATELLITE SURVEYS

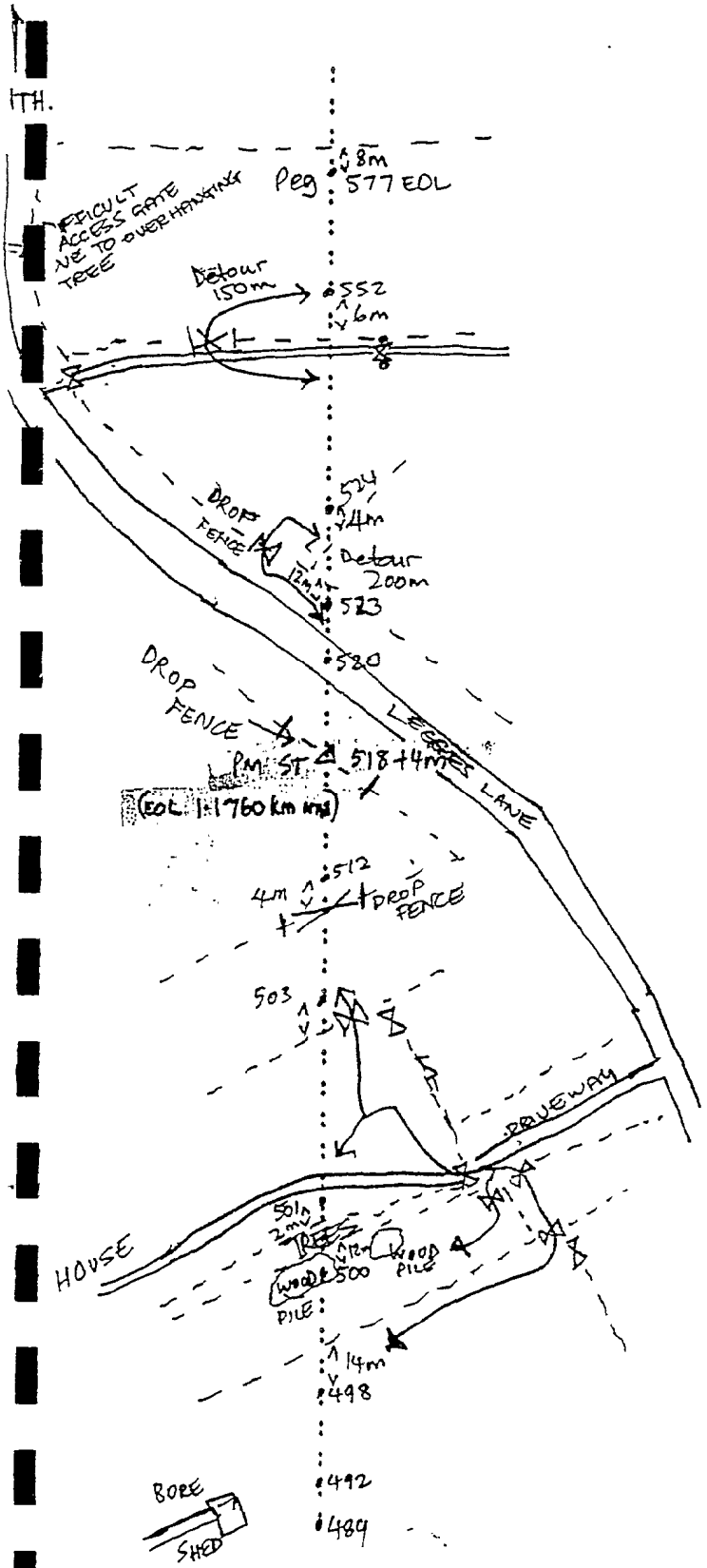
Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax: 079 392867

CLIENT: GAS + FUEL

JOB No.: .....

AREA : EAST AVENUE

From 489 To 577 (EOL) Shooting Direction NTH - STH Brg ..... 20.0M INTERVAL



LINE ..EA94-04..... **TRACE DIAGRAM** PAGE 1.... OF 2

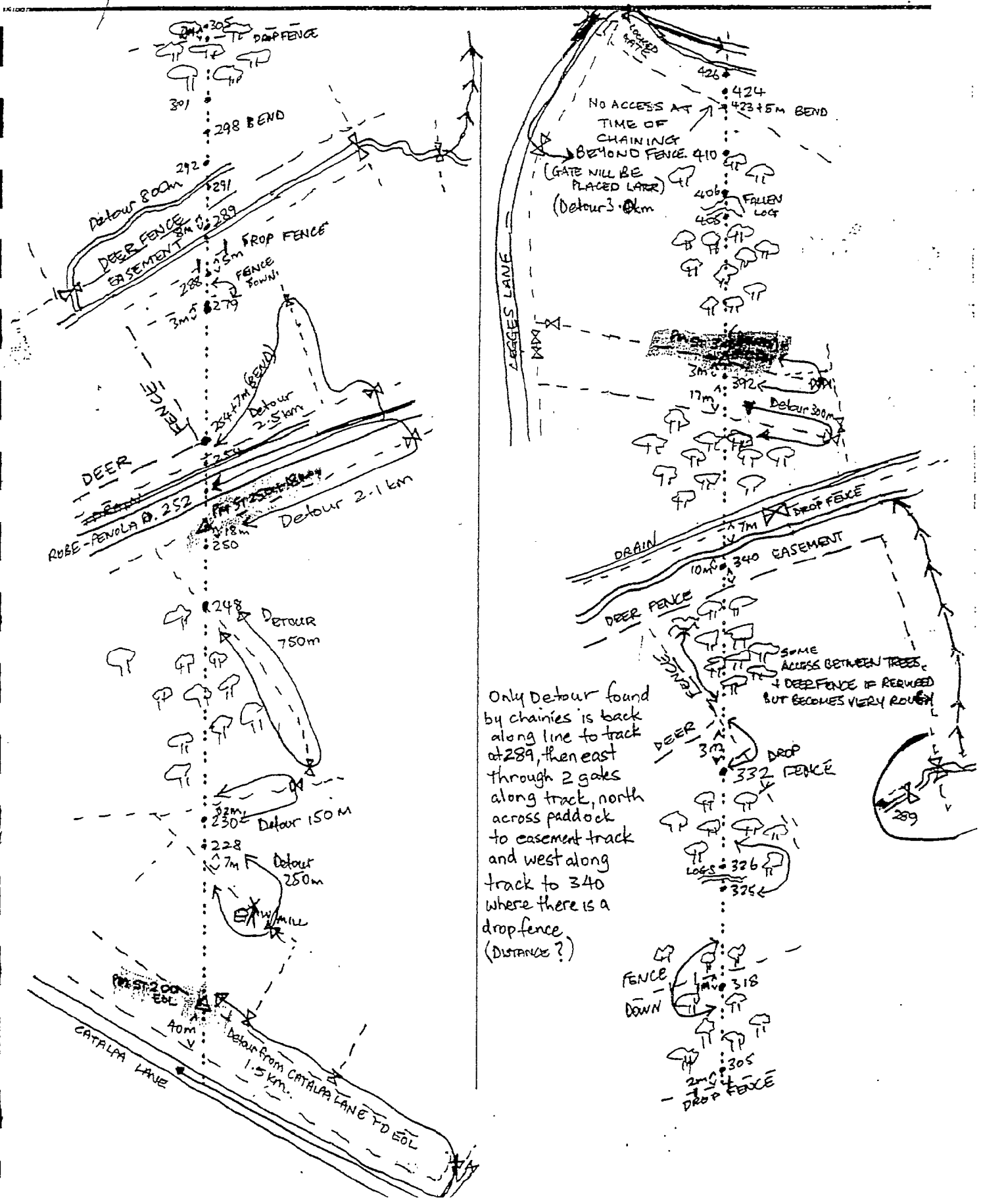
DYNAMIC SATELLITE SURVEYS
O Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: GAS + FUEL

JOB No.:.....

AREA : EAST AVENUE

From 200EQ To ...426... Shooting Direction STH-NTH Brg ..... 20.0M INTERVAL



Only Detour found by chainies is back along line to track at 289, then east through 2 gates along track, north across paddock to easement track and west along track to 340 where there is a drop fence (DISTANCE ?)

LINE EA94-04 **TRACE DIAGRAM** PAGE 2 OF 2

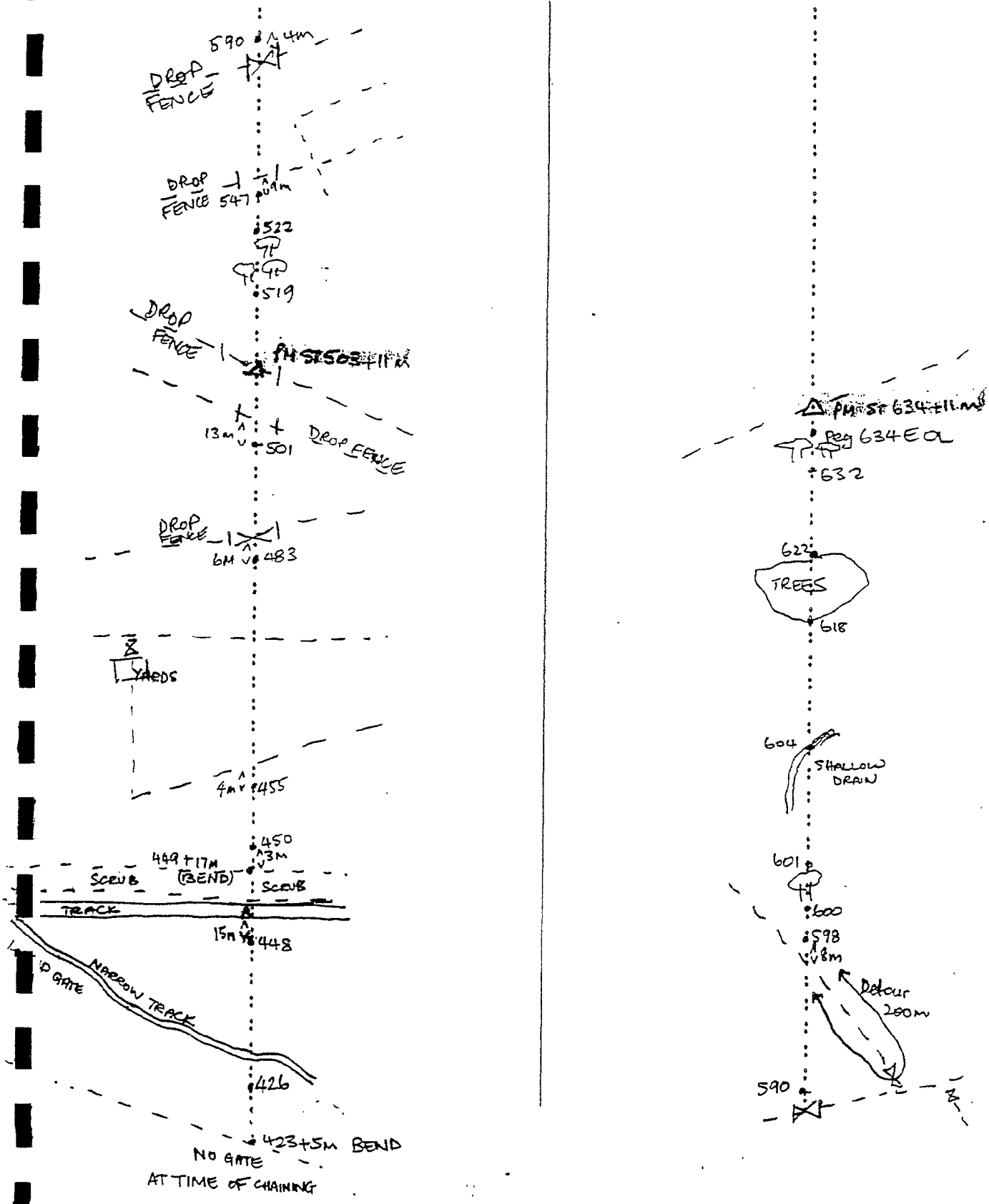
DYNAMIC SATELLITE SURVEYS
O Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: GAS + FUEL

JOB No.:

AREA : EAST AVENUE

From 426 To 634 EOL Shooting Direction STH - NTH Brg 20·0M INTERVAL



LINE EA94-06 ..... TRACE DIAGRAM PAGE 1 OF 2

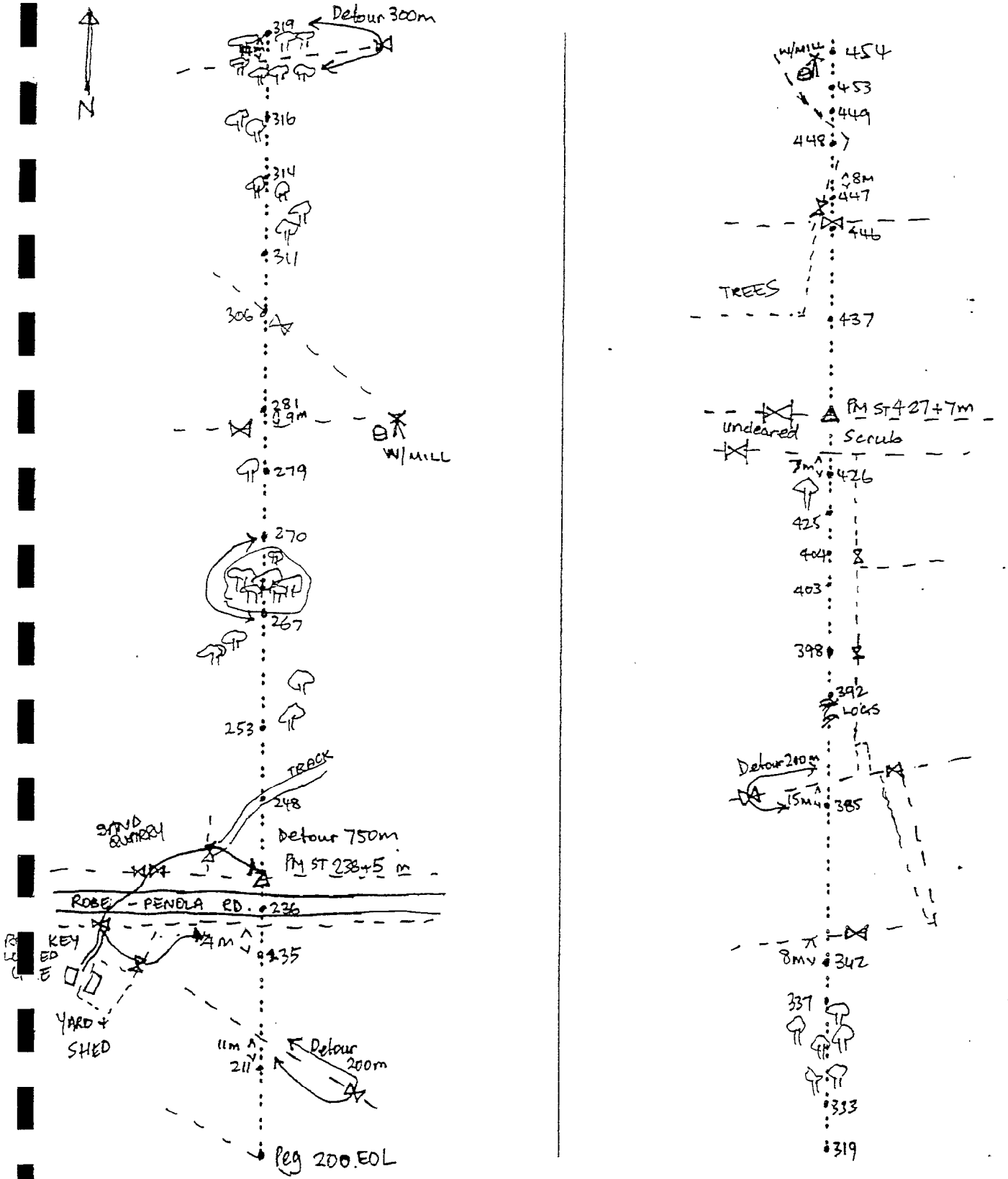
DYNAMIC SATELLITE SURVEYS
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: GAS & FUEL

JOB No.: .....

AREA : EAST AVENUE

From 200EOL To 454 Shooting Direction ..... Brg ..... 20.0m Interval



LINE ..EA94-06..... TRACE DIAGRAM PAGE 2 OF 2

DYNAMIC SATELLITE SURVEYS

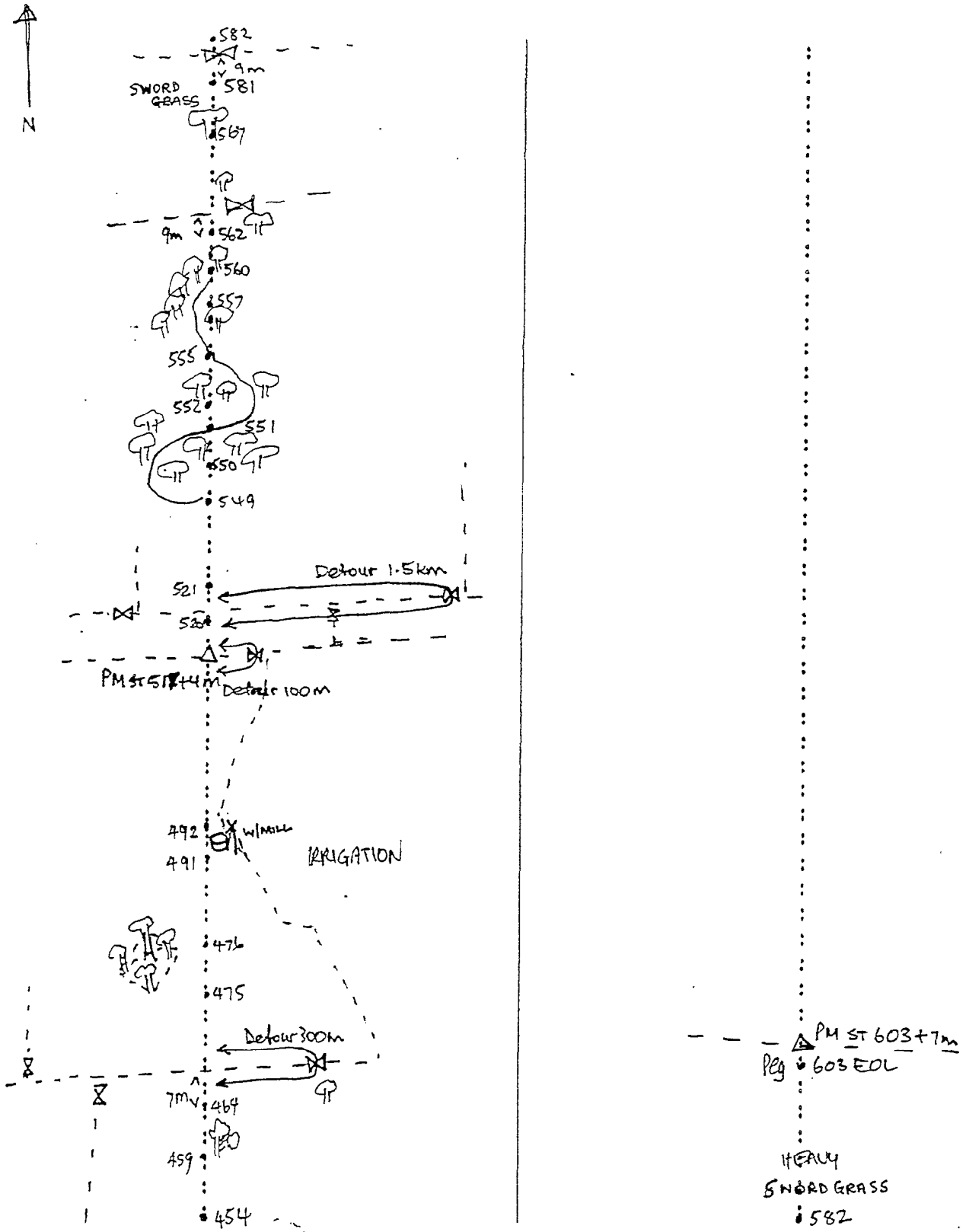
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: Gas & Fuel

JOB No.:.....

AREA : EAST AVENUE

From 454 To 603 EOL Shooting Direction ..... Brg .....



LINE EA94 -08 TRACE DIAGRAM PAGE 1 OF 2

DYNAMIC SATELLITE SURVEYS

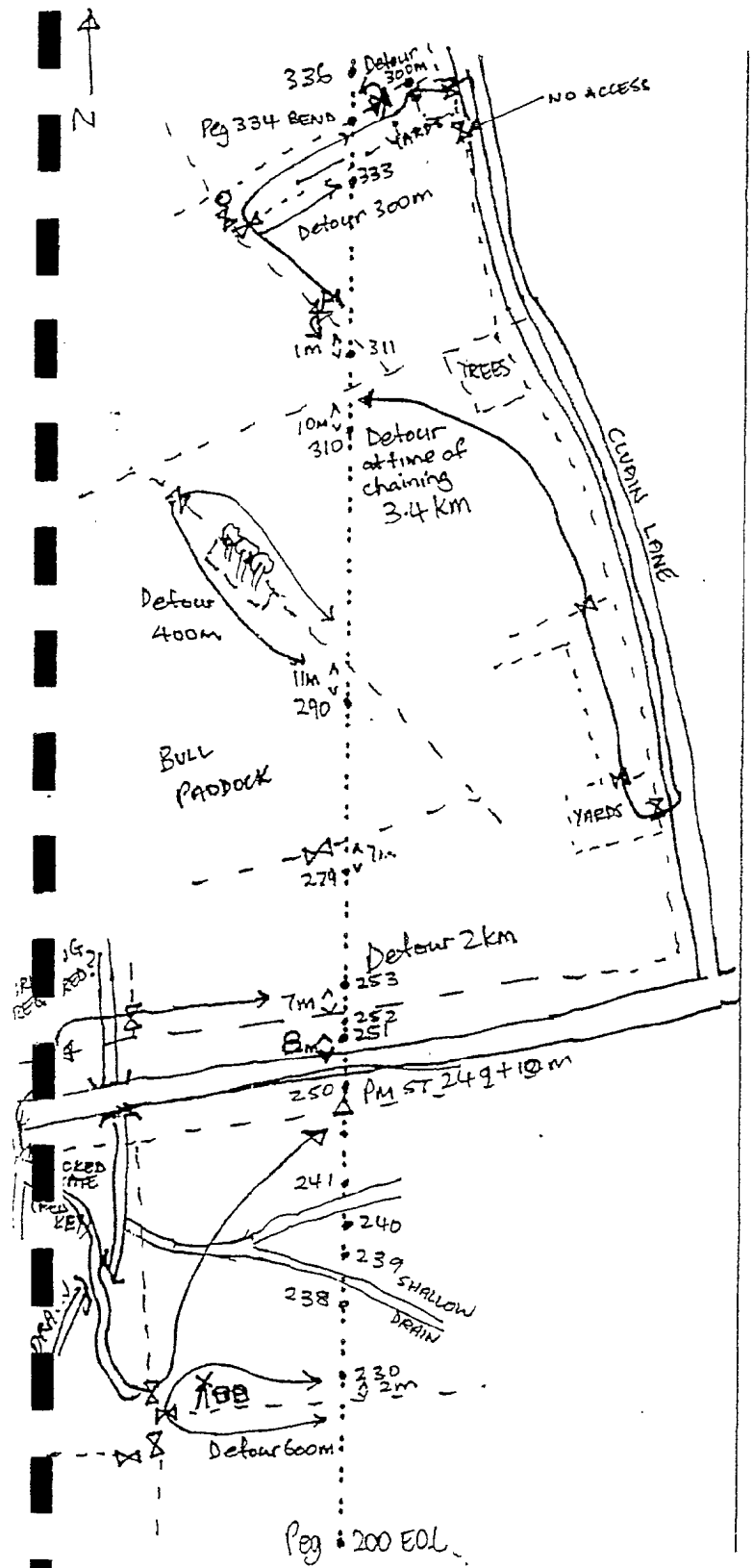
) Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

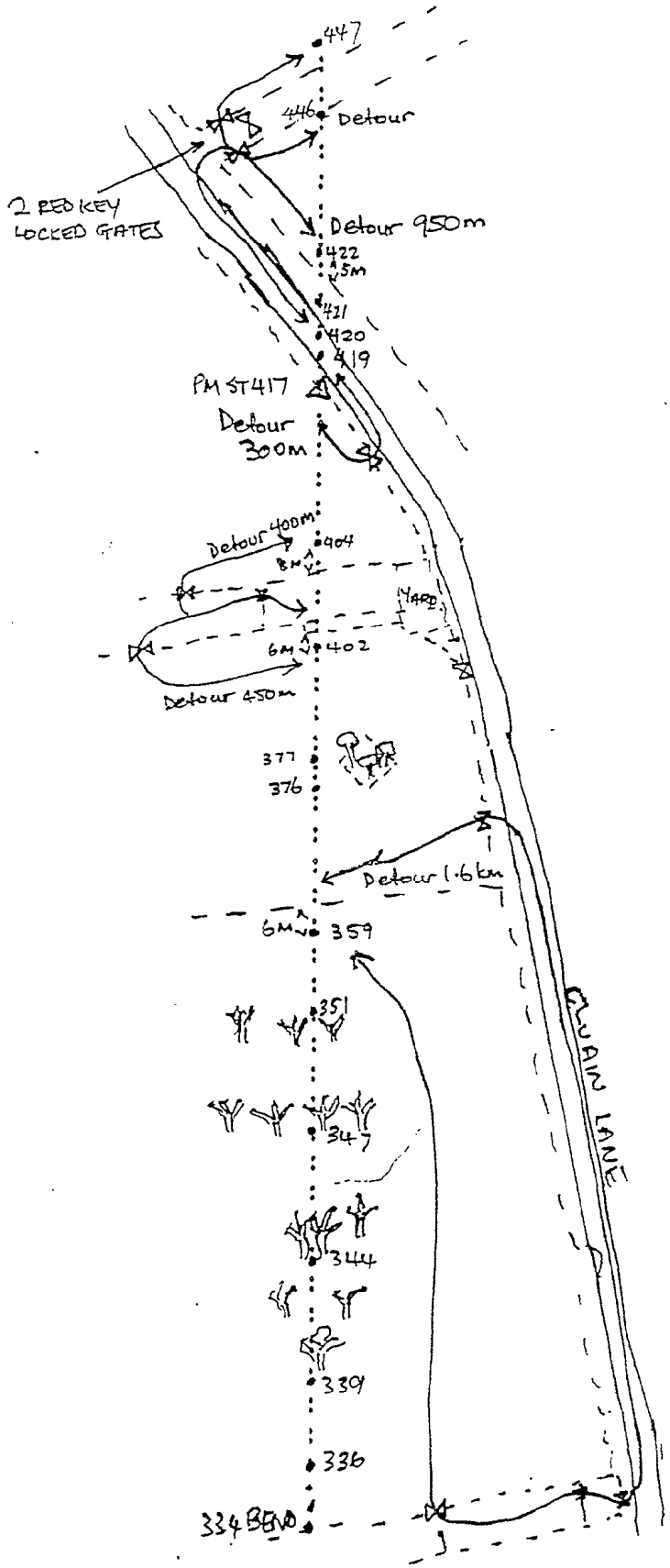
CLIENT: GAS + FUEL

JOB No.:

AREA : EAST AVENUE

rom 200EOL To 447 Shooting Direction Brg 20.0 M INTERVAL





LINE EA94-08 TRACE DIAGRAM PAGE 2 OF 2

DYNAMIC SATELLITE SURVEYS

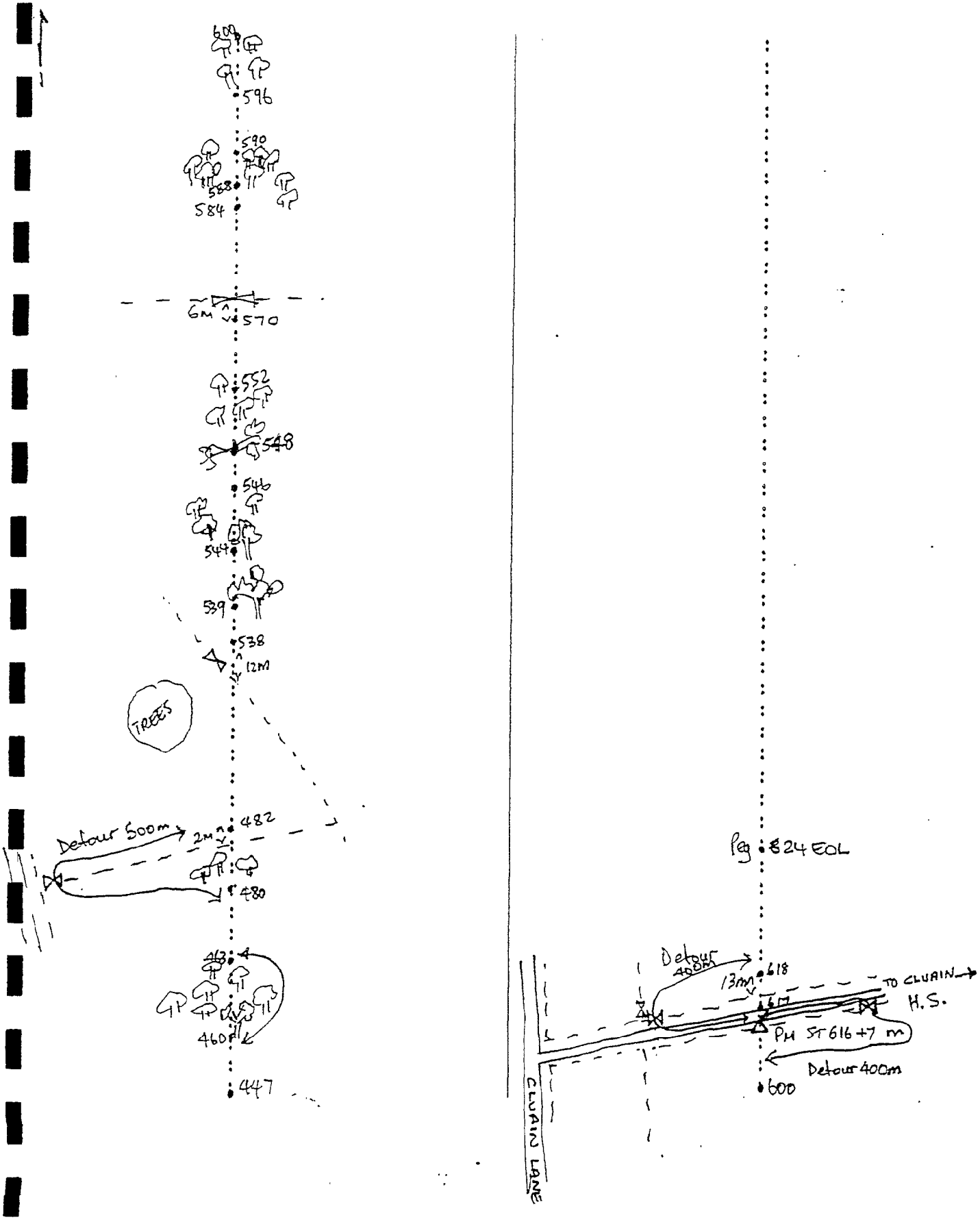
Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT: GAS + FUEL

JOB No.:

AREA : EAST AVENUE

From 447 To 624 EOL Shooting Direction ..... Brg ..... 20.0 M INTERVAL



LINE EA96-10 TRACE DIAGRAM PAGE 1 OF 2

DYNAMIC SATELLITE SURVEYS

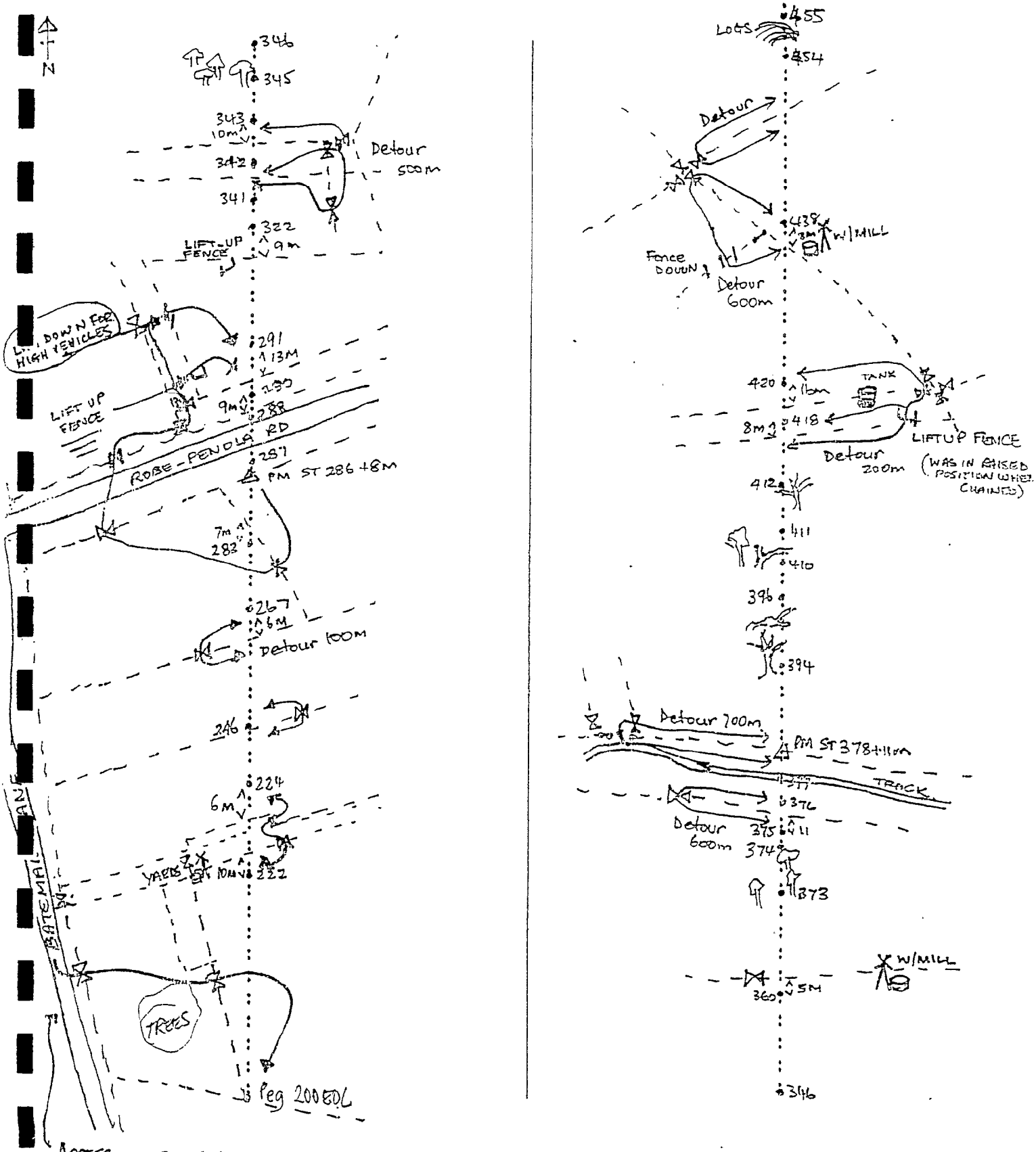
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax: 079 392867

CLIENT: GAS + FUEL

JOB No.:

AREA : EAST AVENUE

From 200 EOL To 355 Shooting Direction S-N Brg 20.0m INTERVAL



ACCESS TO 200 EOL THROUGH GATE APP. 1.250 km South of Pendola-Robe Rd on Batemans Lane

LINE ...EA94-10..... TRACE DIAGRAM PAGE 2 OF 2

DYNAMIC SATELLITE SURVEYS

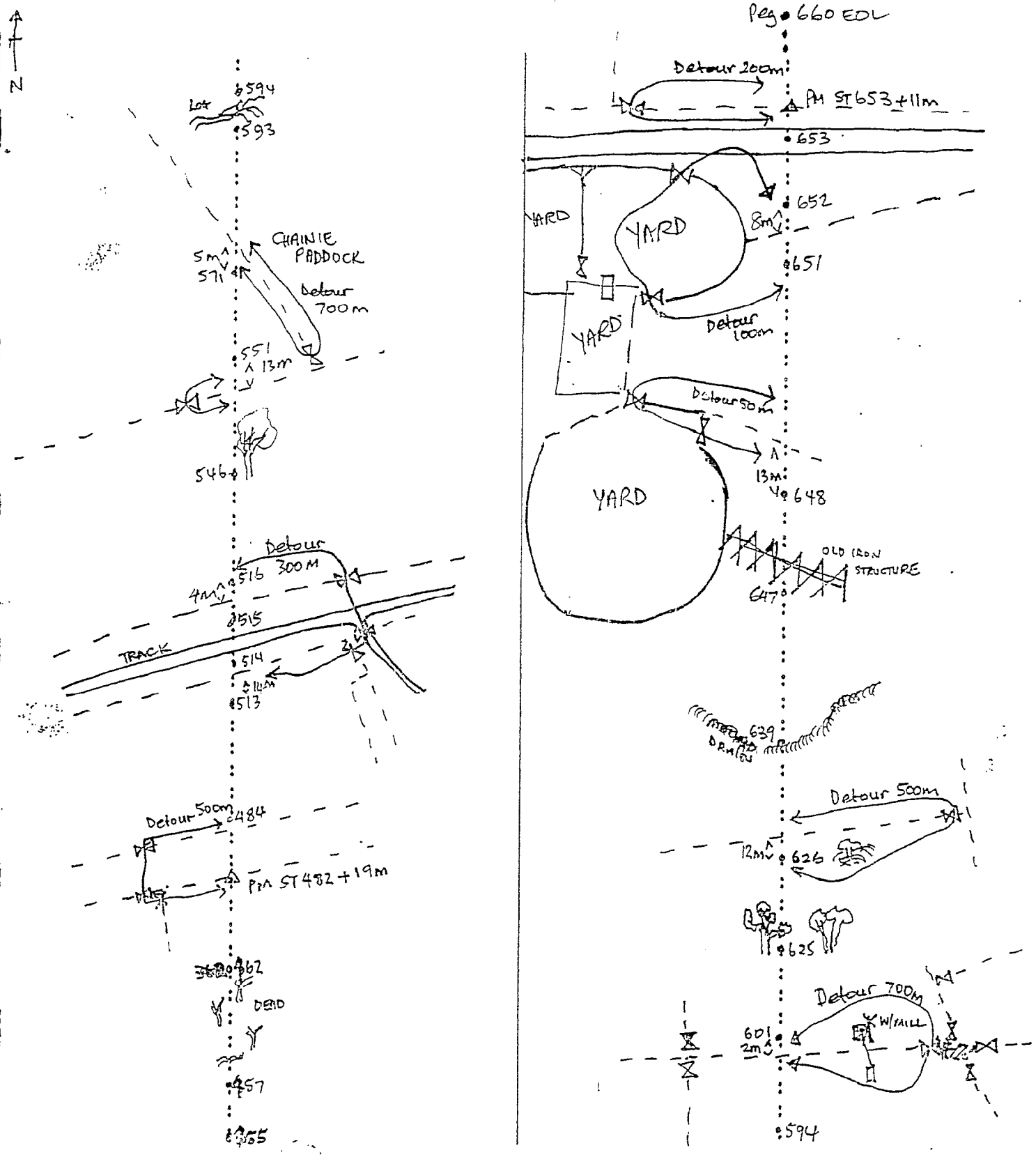
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax: 079 392867

CLIENT:...GAS+FUEL

JOB No.:.....

AREA :...EAST AVENUE

From ..355.... To ..660EOL Shooting Direction ..S-N..... Brg ..... 20.0m INTERVAL



LINE ..EA94-1A..... TRACE DIAGRAM PAGE 1.... OF 3....

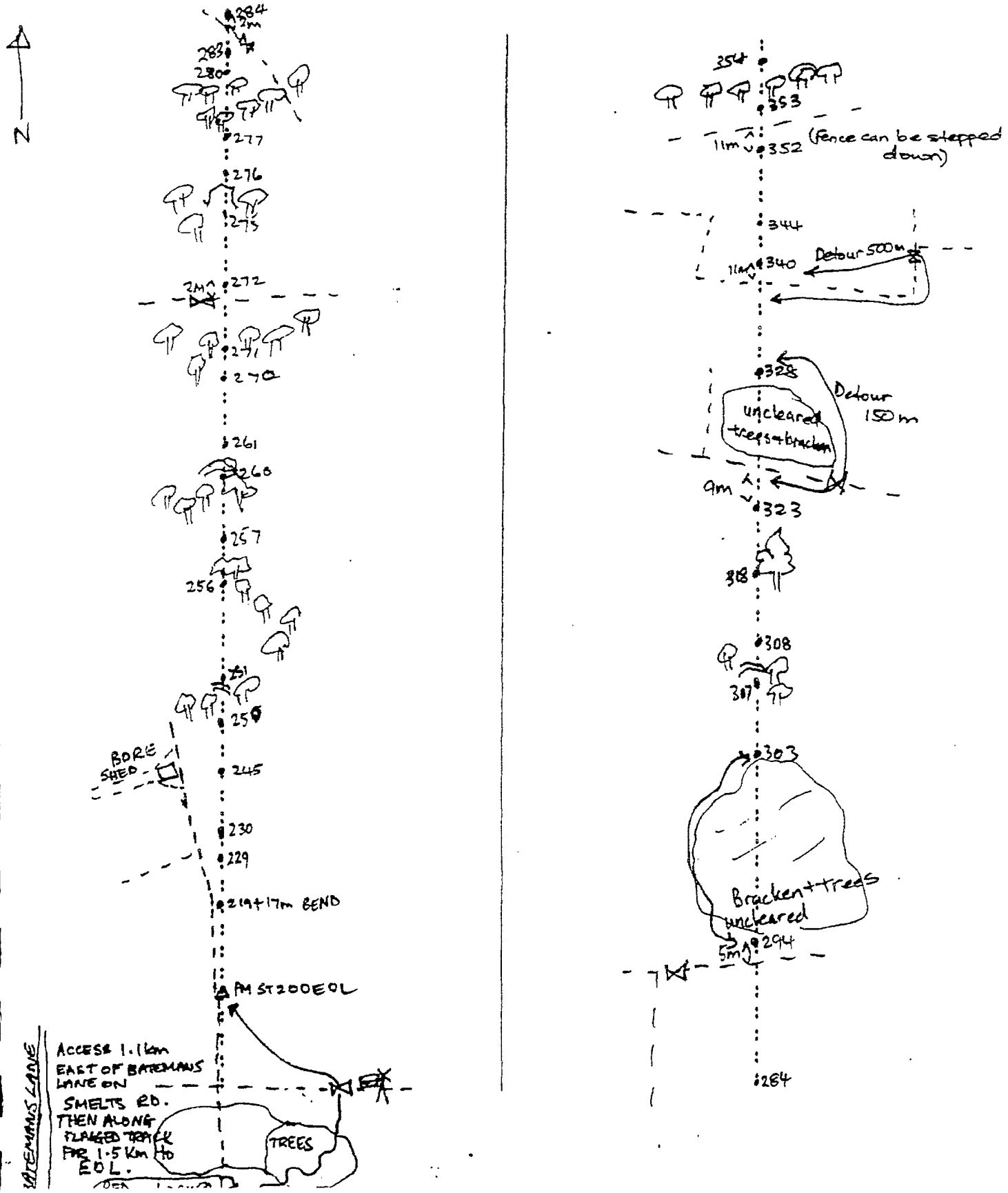
DYNAMIC SATELLITE SURVEYS
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax: 079 392867

CLIENT: GAS + FUEL

JOB No.:.....

AREA :...EAST AVENUE

From 200EOL To 354 Shooting Direction N-S Brg ..... 20.0m INTERVAL



LINE ...EA94-12..... **TRACE DIAGRAM** PAGE ...2... OF ...3...

DYNAMIC SATELLITE SURVEYS

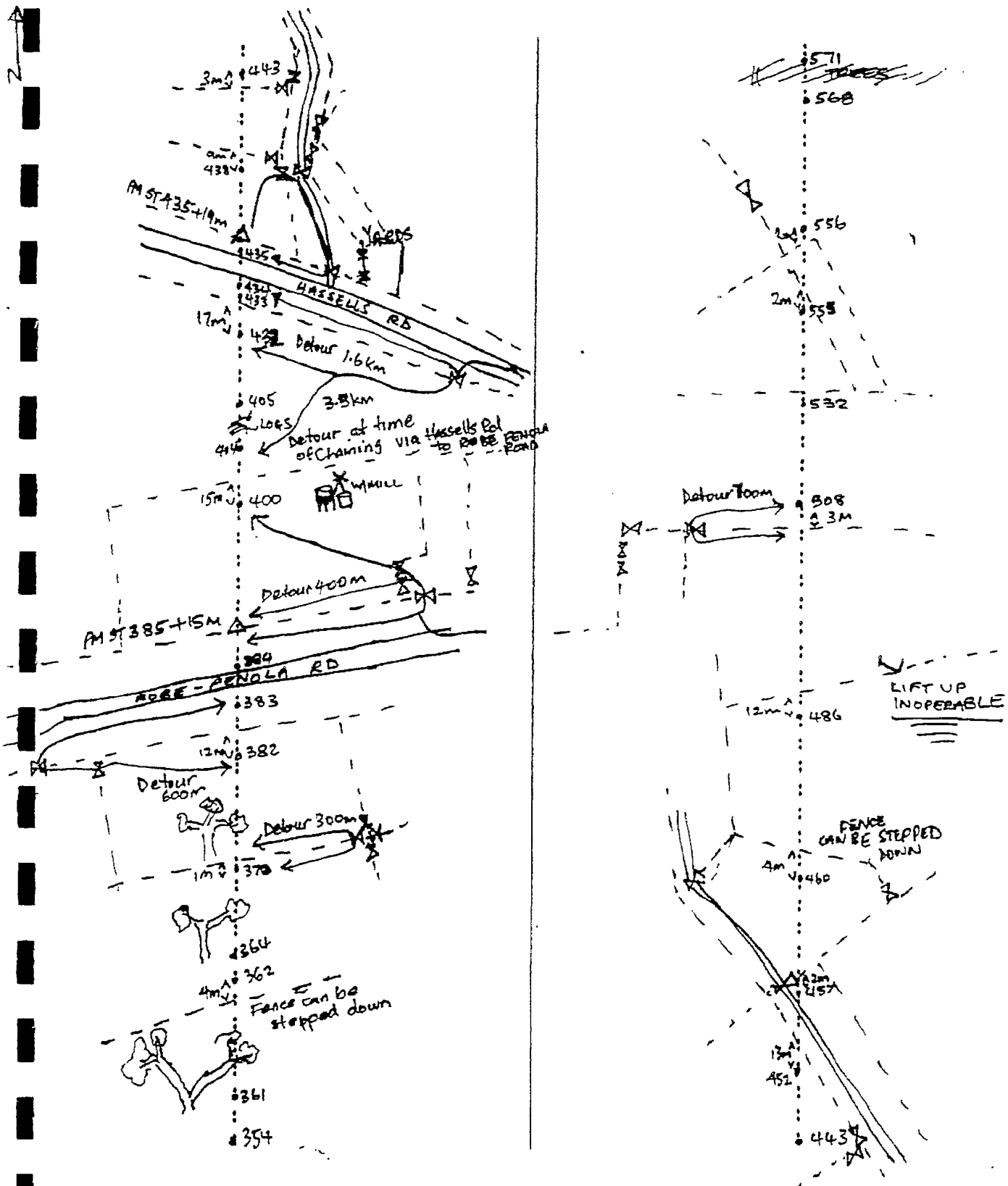
Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT:...GAS + FUEL.....

JOB No.:.....

AREA :...EAST AVENUE.....

From ...354... To ...571... Shooting Direction ...N-S... Brg ..... 20-OH INTERVAL



LINE ....EA94-12..... TRACE DIAGRAM PAGE 3.. OF 3...

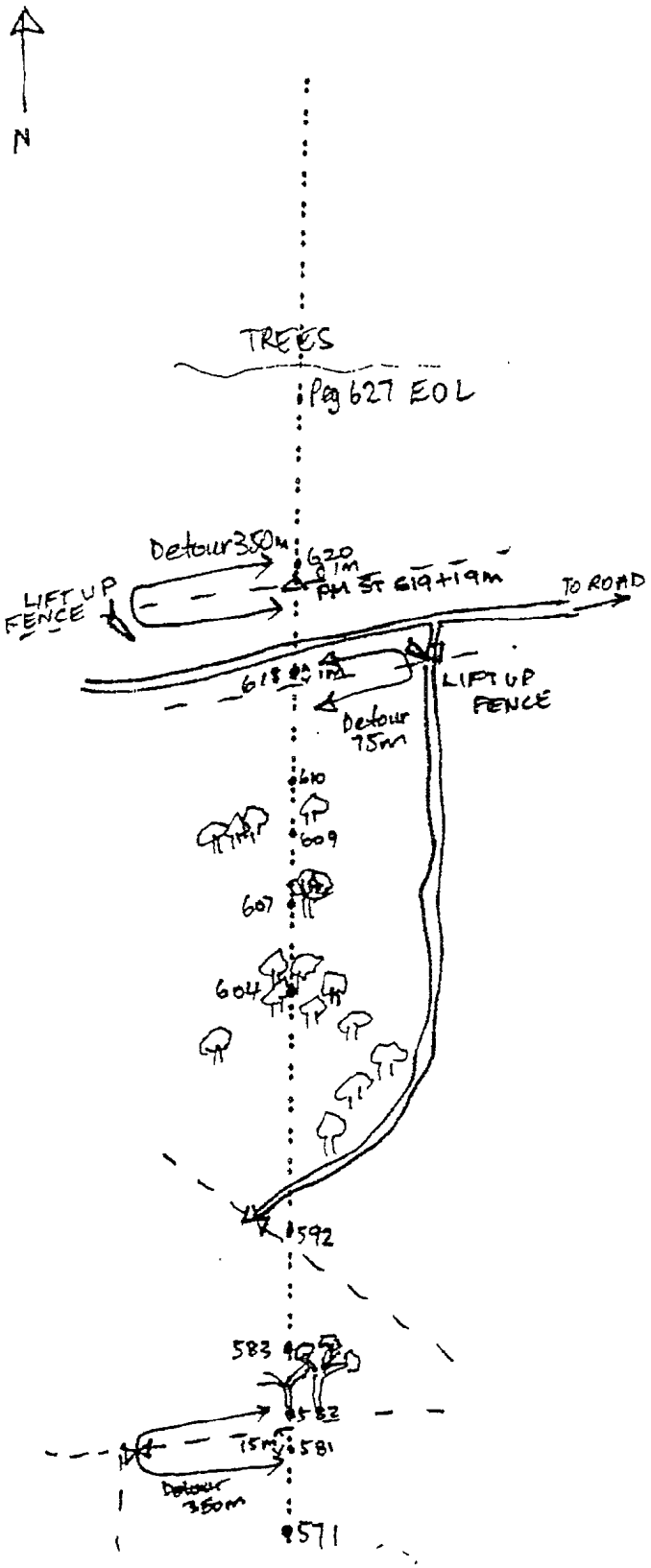
DYNAMIC SATELLITE SURVEYS
PO Box 713, Yeppoon Qld 4703 Tel: 079 392866 Fax 079 392867

CLIENT:....GAS + FUEL.....

JOB No.:.....

AREA :...EAST AVENUE...

From 571..... To 627 EOL Shooting Direction ...N-S..... Brg ..... 20.0 M INTERVAL



12. GPS AND REM SURVEY TECHNIQUES

12.1 GLOBAL POSITIONING SYSTEM (GPS)

The Global Positioning System utilitises US Navy NAVSTAR satellites to provide real time three dimensional positioning. When the phase data received from the satellites is post processed, an accuracy of one part per million of measured length (1 ppm) is possible with dual frequency units, and 3-4 ppm with single frequency units.

The Static Method and the Pseudo Kinematic methods of operation of the GPS equipment are employed to position all permanent markers and other points necessary to control the Rapid Elevation Meter (REM).

The Static Method involves setting a receiver over a point of known position, with a remote receiver over a point of unknown position. Both positions are observed simultaneously. The time taken is dependent upon the level of accuracy required and the geometrical relationship of the satellites.

The Psuedo-Kinematic method of survey requires the remote receiver to occupy the unknown position on two occasions for about 7 minutes, one hour apart. This time separation allows sufficient change in satellite geometry to solve for the ambiguities.

GPS Processing

All GPS data is stored internally within the receivers, and is subsequently transferred to a laptop computer. The base and remote data sets are processed to give values relative to the World Geodetic System 1984 (WGS 84) ellipsoid. Various quality control checks are undertaken, and those points rejected, are either re-processed using different input parameters or re-observed.

Required height values are relative to the geoid and not the ellipsoid so a program to generate the separation between these surfaces is run to reduce the heights.
Co-ordinates are transformed directly to the Australian Map Grid

12.2 THE RAPID ELEVATION METER (REM)

The Rapid Elevation Meter (REM) was developed by Dynamic Satellite Surveys, and consists of a Paro Scientific 1016a quartz crystal barometer, coupled to a Sharp PC 1600 pocket computer. The software enables elevations to be produced to a precision of 0.33m, at a rate of one per seven seconds. Line of sight is not necessary, and the unit is fully portable.

The trend of the barometric pressure must be established daily. The system is set up at the beginning of each day sampling the pressure automatically every second for three minutes, to determine the major trends. The REM is then set over a mark of known height (GPS point), and pressure and temperature observations are taken every second, for 60 seconds. Using this data, the base offset and polynomials for the pressure equation are computed.

To measure the elevation of a position the REM is set up over the point of unknown height. The descriptive pointname is entered and in seven seconds a raw elevation is produced and stored internally. The instrument is moved to the next unknown position.

Observations are taken at all changes of grade, until another GPS control is encountered. At this point, the control station name and elevation are entered.

A data set is recorded for 60 seconds, and the computed elevation displayed. The polynomials for the pressure curve are re-computed to accommodate the misclose observed at this station. All intermediate stations are adjusted using the new polynomials. This is a single run.

To ensure data integrity, all work performed with the REM is run a second time providing a measure of error and reliability. Field software is run to check that all points have been recorded at least twice, and that the elevations agree within the error limits (sigma = 0.33m).

REM Processing

The REM is coupled to the laptop computer, and all data downloaded. The point names are analysed to find matches. Elevations, standard deviations and the number of observations on each point are computed, and printed. This is the elevation data set.

As another quality control check all points are re-examined for accuracy. Any points still outside of the required accuracies are tagged and re-observed in the field.

APPENDIX 8: EVENT LOG

East Avenue Seismic Survey 1994. PEL 39. GFE Resources.

April 7	Line ranging commenced.
April 8	Chaining commenced.
April 20	Topographical survey commenced. Vibrators mobilise from Heywood to Beachport. 180 Traces laid in on EA94-02
April 21	0.8 Hours Experimental Program. Camp staff carry out camp move to a site at the intersection of the Robe to Penola Rd and Leggs Lane. EA94-02 completed and EA94-04 commenced.
April 22	EA94-04 and EA94-06 completed. WOS 0.5hrs.
April 23	EA94-08 Completed and EA94-10 commenced. WOS 1.1hrs. Line crew finished 0.5hr early due to fencing problems.
April 24	EA94-10 and EA94-12 completed and EA94-01commenced. Vibrator bogged in sand.
April 25	EA94-01 completed. Topographical Survey completed. Picking Up Spread 2.9 hours. Prospect completed. Total Line Move time adjusted to 3.0 hours. Additional line move time transferred to standby time. Final Data Tapes sent to Digital Exploration.

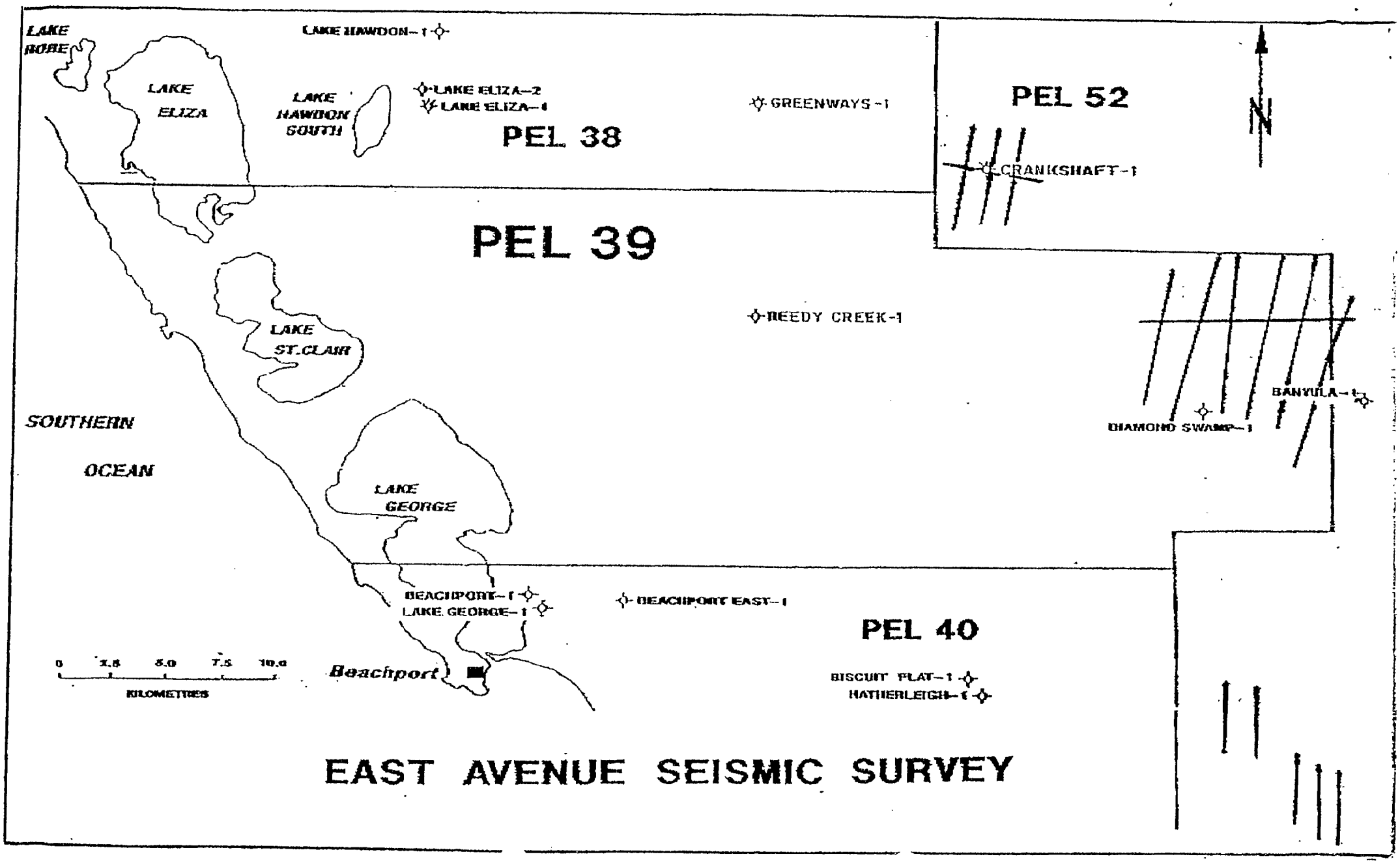
APPENDIX 10:

A: PROSPECT LOCATION MAP

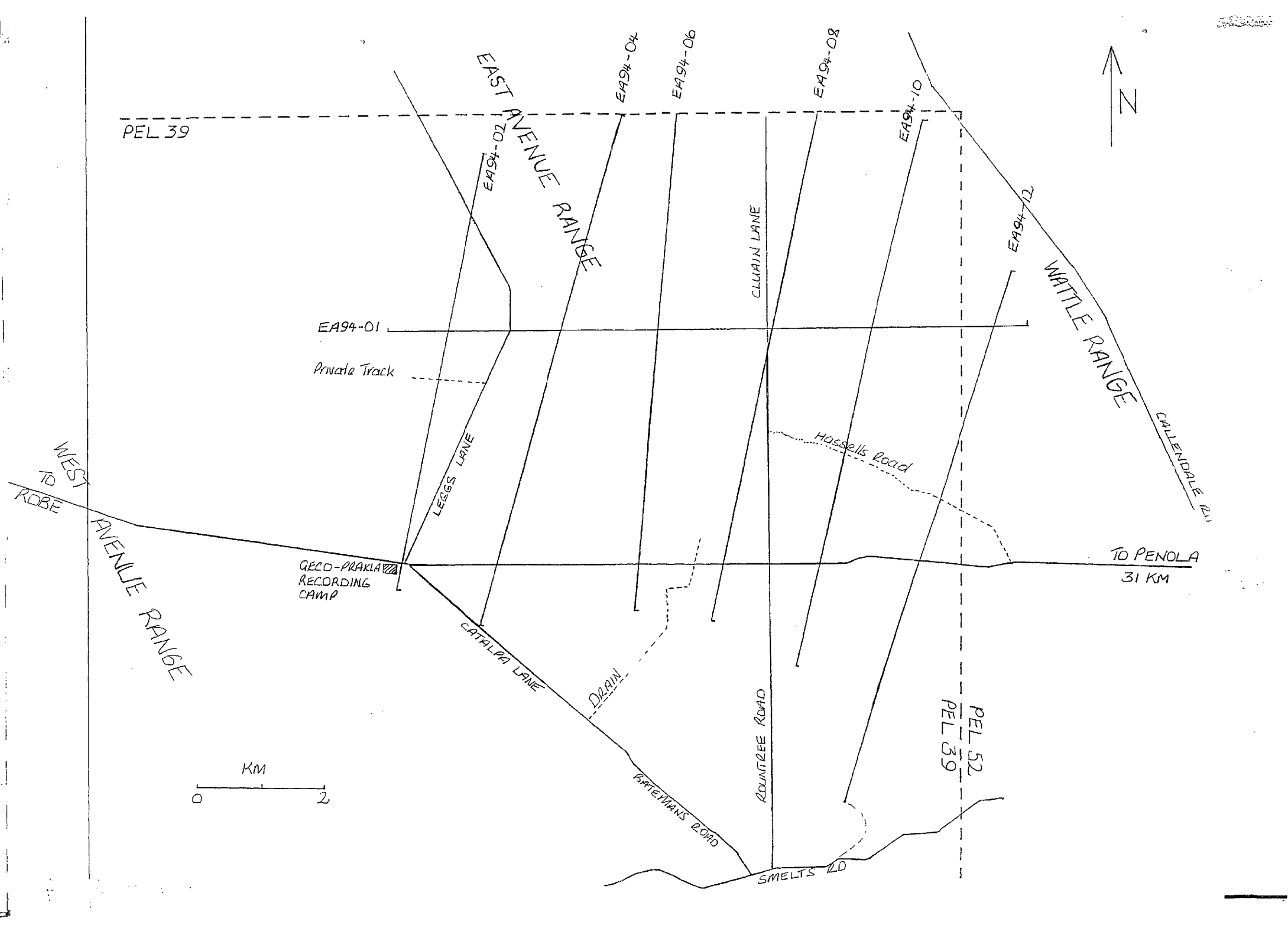
B: PROSPECT MAP

C: INTERSECTION DIAGRAM

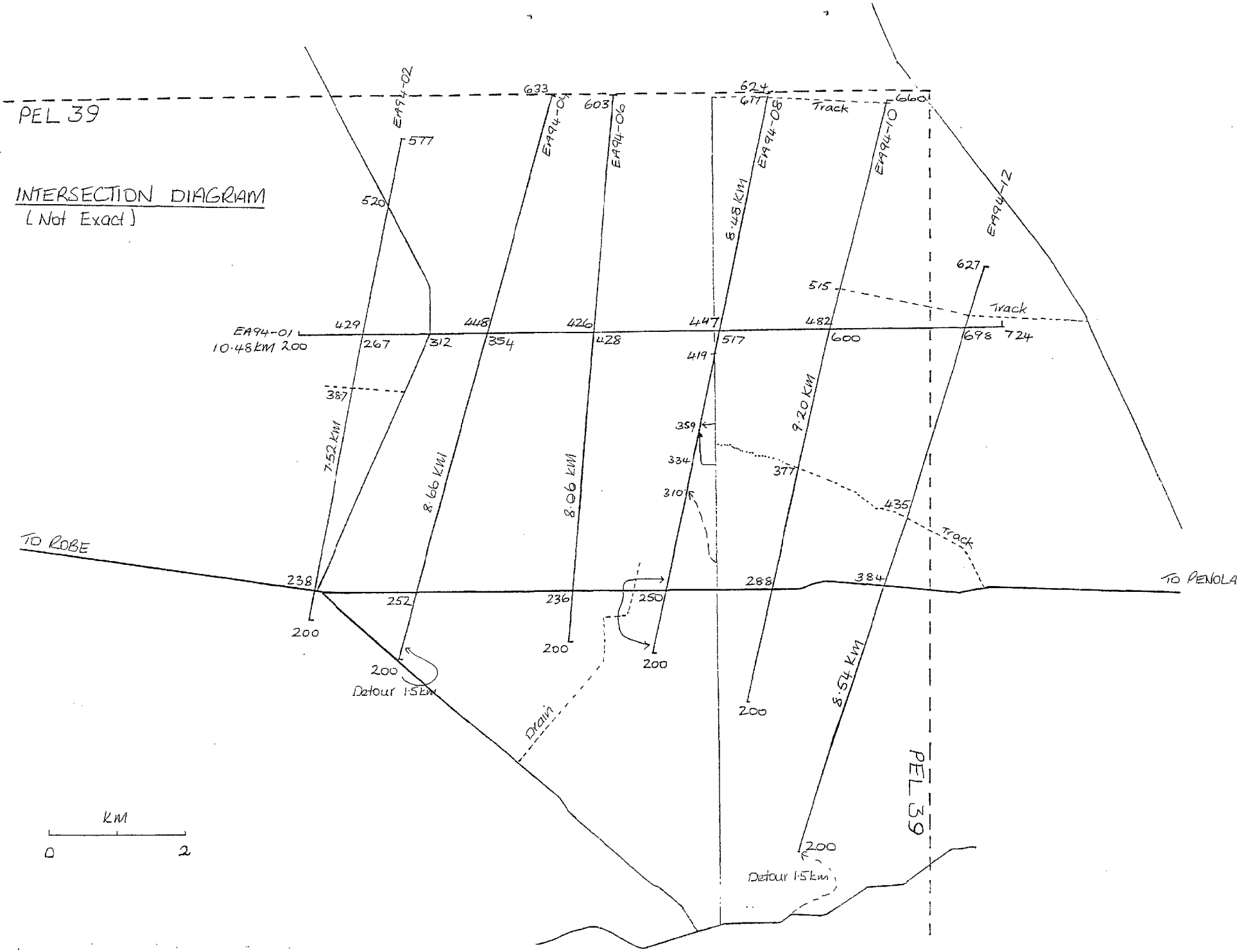
A: PROSPECT LOCATION MAP


LAKE ROBE
LAKE HAWDON-1
LAKE ELIZA
LAKE HAWDON SOUTH
LAKE ELIZA-2
LAKE ELIZA-4
GREENWAYS-1
PEL 38
PEL 52
N
CRANKSHAFT-1
PEL 39
LAKE ST.CLAIR
REEDY CREEK-1
BANYULA-1
DIAMOND SWAMP-1
SOUTHERN
OCEAN
LAKE GEORGE
BEACHPORT-1
LAKE GEORGE-1
BEACHPORT EAST-1
PEL 40
0 2.5 5.0 7.5 10.0
KILOMETRES
Beachport
BISCUIT FLAT-1
HATHERLEIGH-1
EAST AVENUE SEISMIC SURVEY

B: PROSPECT MAP


PEL 39
EA94-02
EA94-04
EA94-06
EA94-08
EA94-10
EA94-12
EAST AVENUE RANGE
CLUAIN LANE
WATTLE RANGE
CALLENDALE RD
EA94-01
Private Track
LEGGS LANE
Hassells Road
WEST TO ROBE
AVENUE RANGE
GECO-PRAKLA RECORDING CAMP
TO PENOLA 31 KM
CATALPA LANE
DRAIN
BATEMANS ROAD
ROUNTREE ROAD
SMELTS RD
PEL 52
PEL 39
KM
0
2
N

C: INTERSECTION DIAGRAM


PEL 39
INTERSECTION DIAGRAM
(Not Exact)
EA94-01
10·48 KM 200
EA94-02
EA94-04
EA94-06
EA94-08
EA94-10
EA94-12
5·48 KM
9·20 KM
8·54 KM
7·52 KM
8·66 KM
8·06 KM
577
520
633
603
624
617
660
627
515
Track
429
267
312
448
354
426
428
447
419
517
482
600
698
724
387
359
334
310
377
435
Track
TO ROBE
TO PENOLA
238
252
236
250
288
384
200
200
200
200
200
200
Detour 1·5 KM
Drain
Detour 1·5 km
PEL 39
KM
0
2

DATA PROCESSING REPORT

GELLIBRAND, ANNYA AND EAST AVENUE SEISMIC SURVEYS

APRIL 1994

OTWAY BASIN

VICTORIA AND SOUTH AUSTRALIA

FOR

GFE RESOURCES LTD

LEVEL 6, 6 RIVERSIDE QUAY

SOUTH MELBOURNE VIC 3205

AUSTRALIA

BY

DIGITAL EXPLORATION LIMITED

(A DIGICON COMPANY)

2643 MOGGILL ROAD

PINJARRA HILLS QLD 4069

PREPARED BY:
A.P SPENCELEY, LAND PROCESSING SUPERVISOR

SEPTEMBER 1994

DPR1073:DS

GENERAL

GFE Resources contracted Digital Exploration Limited to process data from their Gellibrand, Annya and East Avenue 1994 Seismic Surveys. The lines which were acquired and processed were:

Gellibrand Seismic Survey

Line	SP Range	Km
G94 - 01	200 - 817	12.34
G94 - 03	200 - 949	14.98
G94 - 05	254 - 1048	15.88
G94 - 07	200 - 818	12.36
G94 - 09	204 - 1278	16.11
G94 - 11	200 - 1673	22.095
G94 - 13	200 - 1374	17.61

Annya Seismic Survey

Line	SP Range	Km
AN94 - 01	200 - 690	9.80
AN94 - 03	200 - 1047	16.94
AN94 - 05	200 - 715	10.30
AN94 - 07	378 - 1550	23.44
AN94 - 09	200 - 1535	26.70
AN94 - 11	200 - 1325	22.50
AN94 - 13	200 - 800	12.00
AN94 - 15	200 - 1630	28.60
AN94 - 126	200 - 591	7.82

East Avenue Seismic Survey

Line	SP Range	Km
EA94 - 01	200 - 724	10.48
EA94 - 02	200 - 576	7.52
EA94 - 04	200 - 634	8.68
EA94 - 06	200 - 603	8.06
EA94 - 08	200 - 624	8.48
EA94 - 10	200 - 660	9.20
EA94 - 12	200 - 627	8.54

ACQUISITION PARAMETERS

Recording Parameters

Recorded by:	Geco-Prakla
Date:	March/April 1994
Party:	LOZ 161
Instruments:	I/O System One
Tape Format:	SEG-D, 6250 BPI, correlated, multiplexed
Sample Rate:	2 ms
Record Length:	5 s
Gain Mode:	I.F.P.
Recording Filter:	Lo-cut : 8/12 Hz/dB
	Hi-cut : 120/72 Hz/dB

Source Parameters

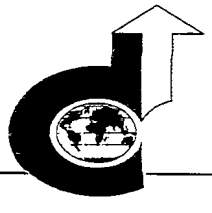
Energy Source:	Vibroseis
Sweep/VP:	1
Sweep Length:	10.0 s
Sweep Frequency:	6 - 100 Hz
Source Array:	10.00 m pad to pad, standing sweeps
Source Interval:	20.0 m
	15.0 m (lines G94-09, 11, 13)

Spread Parameters

Number of groups:	300
	306 (line G94-01)
	304 (East Avenue lines)
Group Interval:	20.0 m
	15.0 m (lines G94-09, 11, 13)
Geophone Array:	12 geophones over 18.3 m (1.67 m spacing)
Spread Pattern:	

For Gellibrand (20 m), Annya	Channel 1	150	VP	151	300	
	-2990.0 m	-10.0 m		10.0 m	2990.0 m	
Gellibrand (15 m group)	Channel 1	150	VP	151	300	
	-2242.5 m	-7.5 m		7.5	2242.5 m	
East Avenue	Channel 1	152	VP	153	304	
	-3030 m	-10.0	VP	10.0 m	3030 m	

Coverage:	15000%	Gellibrand
	15300%	
	15000%	Annya
	15200%	East Avenue



TESTING

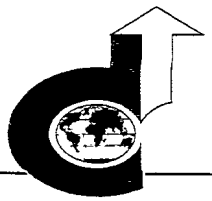
Extensive testing was undertaken in order to optimise the processing parameters.

(a) Gain Correction
(b) F-K Velocity Filtering in shot domain
(c) Deconvolution before stack:

spike	120 ms operator length
	160 ms operator length
	200 ms operator length
	240 ms operator length
	160 ms operator length with 2 windows
8 ms gap	160 ms operator length
16 ms gap	160 ms operator length
24 ms gap	160 ms operator length

Gap deconvolution using a modified version of the Weiner - Levinson algorithm (BLIMP), single windows spike 160 ms operator length

(d) Mute Scan
(e) Filter Scan
(f) Pre Stack Spectral Whitening
(g) DMO
(h) Tau-P post stack
(i) F-X Decon post-stack
(j) Finite Difference Migration



PROCESSING

A general description of the processing sequence is given below. The programs used to process the data form part of Digicon's basic "DISCO" seismic processing system developed for use with the Digital Equipment Corporation's VAX Computers. In addition some proprietary programs were used.

1. Reformat

   The SEGD format data from the field tapes were decoded and converted to Digicon's internal 9 track, trace sequential format for subsequent processing.

2. Zero to Minimum Phase

   Resample to 4 ms

3. F-K Filter

   This process applies a zero phase, F-K filter in the F-K domain to shot data. Reflections are separated from interfering noise on the basis of differences in apparent horizontal velocity. Events which are slower than the specified velocity are rejected. Amplitude and phase of the signal within the accept zone are preserved.

   An apparent velocity of 1430 m/s (+/- 14 ms/tr for 20 m groups and +/- 10.5 ms/tr for 15 m groups) was used on these data.

4. Trace Editing

   Selective trace editing was undertaken from shot records to zero noisy or bad traces which would have affected the data once it was stacked.

5. True amplitude recovery

   The true amplitude recovery phase of seismic data processing included the following steps:

   a. Removal of Binary Gain (non-linear) which is applied to the data during recording.

   b. Correction for amplitude loss due to spherical spreading of the wave front as it is propagated downwards through the earth and reflected back to the surface. A removable velocity/time function was applied to each trace prior to applying the correction.

   c. An exponential gain correction was applied to compensate for loss of amplitude due to the inelastic properties of wave propagation through rock.

6. Deconvolution

Deconvolution is the process of designing and applying an inverse filter to remove from the recorded data the effects of the earth's filtering of the source wavelet. The deconvolution is accomplished by the application of one or more whitening or non-whitening filters designed from the auto-correlation of each data trace of the input records.

The filter is designed to whiten or broaden the frequency spectrum within a passband having an allowable signal-to-noise ratio. By whitening the passband, the time transient (i.e. residual shot wavelet) is collapsed into a shorter interval thus providing more precise delineation of the seismic reflection events.

A single window deconvolution operator was applied to the data. Parameters used were spiking deconvolution filter, 160 ms operator length using 1% white noise. The design and application windows were as follows:

design	near offset:	800 - 2200 ms
	far offset :	1600 - 3000 ms
apply	near offset:	Whole Trace
	far offset :	Whole Trace

7. Common Depth Point Gathers

The seismic traces along a line were gathered into data sets on the basis of common reflection points. The offsets, surface and sub-surface numbers and the shot sequence numbers are annotated in the trace headers for use in subsequent processing. The average nominal fold once the data was sorted was 15000%.

8. Datum Statics

Refraction statics were computed by initially digitising first breaks from the production records. Geometry information was drawn from the data base and is used with the elevation data to fully define the profile. Details of shot and receiver offsets, instrument delay correction, weathering velocity (Vw), and selected datum elevation (0 m AHD East Avenue and Annya lines, 150 m AHD Gellibrand lines) were also provided.

An iterative routine is used, progressively updating first break times. These are used to compute a sub-weathering velocity (Vsw) and delay times (Td) at each group location. Both of these are constrained by suitable smoothing filters to inhibit erratic variation.

The group static (Tg) was computed as an elevation correction plus a weathering correction:

$$Tg = - ([E/Vsw] + KTd)$$

where:

$$K = ([Vsw - Vw]/[Vsw + Vw])^{0.5}$$

E = elevation above datum

The shot correction (Ts) is:

$$Ts = Tg$$

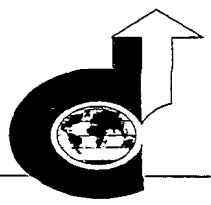
The weathering thickness (Dw) was computed by:

$$Dw = [Td.Vw]/\cos(\text{arc sin } Vw/Vsw)$$

The static values were tied to values at deep upholes shot on line. The static values were then averaged to produce a mean static and a residual or deviation shot and receiver static values. These were usually very small. Subsequent processing was performed on data which had been adjusted by the deviation statics, which effectively produced a solution which was surface consistent.

9. Velocity Analysis (VELFAN)

VELFAN velocity analysis is an automatic production orientated technique designed to obtain RMS velocity information from seismic data in CDP gathered form. It is based on a pre-determined knowledge of the stacking velocities which might be expected to be used in an area. A set of velocity ranges versus two-way reflection time is input to the program together with a number of consecutive CDP gathers, for each location at which a velocity study is required. The number N, usually between 9 and 15, which is the number of velocity functions to be applied to the gathers is input at this stage. The program takes the maximum and minimum functions as specified by the velocity ranges and times and evenly disperses N-2 other functions between them. The functions are applied to the data which is then stacked, filtered and displayed.



The VELFAN display consists of six parts:

a. The uncorrected central gather of the input group.
b. The central gather NMO-corrected by the central velocity function.
c. The stacks formed by NMO-correcting, stacking and filtering the set of CDP gathers using the N functions.
d. A display of velocity versus reflection time showing the fan of N functions and points of high coherence at preselected intervals eg 50 ms
e. A plot of relative coherence amplitude versus time.
f. A listing of velocities versus time for up to three velocities at any time level, based on coherence measurements.

Velocity analyses were performed over 21 depth points in this project applying 15 velocity functions. Analyses were computed at 1 km before and after the generation of residual static values and after conducting DMO on the data.

The optimum stacking velocities were picked from the velocity function displays. The Normal Moveout Correction is a result of the following equation:

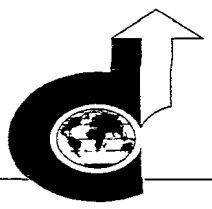
$$T^2(x) = T^2(0) + X^2/V^2_{NMO}$$

A space varying velocity function was utilized and the program computed a new space-varying function for each trace by making floating point cubic interpolation between control points, to produce a high fidelity NMO output.

10. Residual reflection statics - surface consistent

The calculation of residual reflection statics assumes that the static variation from trace-to-trace is caused by variations in the velocity and thickness of the near-surface weathered layers. It further assumes that the initial datum statics applied to the data are not precise and that the refined static corrections. based on statics computed from the reflection data itself, are desirable.

The automated residual statics analysis routine is conducted on NMO corrected gather records by utilizing all possible cross-correlations between traces within and from adjacent mid points.



A dip model, representing the observed structure on one or more events within a specified gate or gates, is input to the program to facilitate dip correction within the set of CDP gathers being operated on. The model is interpreted from the previous stacked section in the processing sequence. For the project data a design gate was used which started at 300 ms and finished at 2000 ms approximately.

The process iterates automatically and makes separate estimations of residual normal moveout and dip, then computes a set of surface consistent residual statics for all shot and receiver locations. The appropriate residual static values are stored in the data-base.

The following correlation processing controls are generally followed while calculating residual statics:

a. Static limits (+/- 20 ms)
b. Dampening factor to prevent matrix instability
c. The number of depth points in the cross-correlations
d. The number of interations
e. Inverse filtering controls for low-frequency static estimation

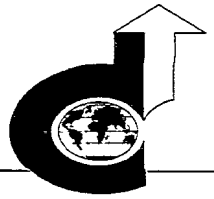
Residual geophone statics were applied relative to receiver surface locations. The residual shot statics were applied relative to the input shot sequence. Both sets of values were stored in the appropriate trace headers.

The parameters used in this project included a +/- 20 ms maximum shift; a 9, 7, 5 trace mix for the model trace and 3 iterations.

11. Residual Reflection Statics - Non-Surface Consistent

This is a similar process to that described above with the exception that the constraint of surface consistency is removed. This results in a non-iterative technique that computes corrections for individual CDP traces rather than source or group locations. Sensible limits need to be adopted when using this program to prevent artificial structures being created. These include:

a. Static Limits
b. Number of depthpoints used in the cross-correlations
c. Large windows within which to perform the analyses



Typical values of +/- 8 ms shift, 5 trace mix and 300 - 2000 ms window was used, centred on the zone of interest.

12. Dip Moveout Correction (DMO)

The data was processed through Digicon's dip moveout/pre-stack time migration routine.

The main benefits of including this in the processing sequence are:

a. Dip-independent stacking velocities

Stacking velocities after DMO are dip-independent, allowing both horizontal and dipping reflectors to be stacked with the same RMS velocity, ie the RMS velocity associated with the horizontal event. As a consequence flat-dip primary reflectors and steep-dip events (such as fault plane reflectors and diffraction limbs) may be optimally stacked at the same time.

b. Removal of reflection point smear

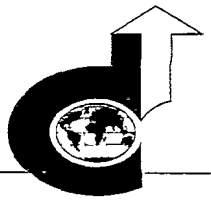
Data recorded at a finite offset is transformed to zero offset thus eliminating reflection point smear. Time varying multi-channel filters applied in the common-offset domain laterally shift the reflection points to their zero-offset position.

13. Pre-stack muting

The function of this process is to mute or scale down the very shallow long offset traces where the signal-to-noise ratio is extremely poor. An apparent lowering of frequency content of the seismic signal, or NMO stretch, occurs when a CDP gather has a stacking velocity function applied to it. This is most apparent at shallow time depths and at far offsets. Parts of traces which exhibit this characteristic have to be excluded from data analyses, otherwise they may significantly degrade the quality of the final product.

The following mute was used on all lines:

Time ms	Distance m
0	75
100	105
200	165
450	600
900	1240
1800	2500



14. Pre-stack scaling

A 500 ms AGC was applied to the data prior to summing.

15. Stack

Once the traces have been adjusted by the final velocities and residual reflection static, they are summed algebraically. Amplitudes at each sample point are summed horizontally within the gather and the resultant amplitude is averaged by the number of live traces.

Stacking of CDP gathers has the effect of enhancing coherent signal and attenuating random noise. The effect is a function of the square root of the number of traces contributing to the stack.

16. Datum Correction

The mean static was applied after stack to correct the data from the surface datum to the seismic datum. It was applied at this stage rather than before so that the underlying assumptions of surface consistency of several data analytical techniques would not be violated. It is also computationally more efficient to apply it at this stage on one trace rather than on each trace within a CDP gather.

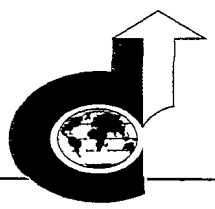
17. Migration

The seismic signal tends to be out of its true spatial position because of several effects: the presence of fault planes and discontinuous reflectors, the dip of reflectors and off the plane noise. Migration is the process used to attempt to correctly position the seismic data in time and space.

A finite difference migration algorithm was used on this data. Migration tests were conducted using 90%, 95%, 100% and 105% smoothed final stacking velocities. The parameters used were 100% smoothed stacking velocities, sub-surface trace interval and a layer thickness of 20 ms. The effect of migration on stacked data is to:

a. Correct the lateral displacement of dipping events.
b. Collapse the diffraction patterns.
c. Provide a more distinct fault resolution.
d. Improve the signal-to-noise ratio.

Migration tests showed that residual high frequency noise was left on the data after migration. This was removed by filtering the data pre-migration. The filter used was the final display filter.



18. TAU-P Dip Filtering

The TAU-P program has non-linear signal estimation options available. These are coherence mask and a dip balancing option. It is also possible to limit the dips passing through the filter. A percentage of the unfiltered input data can be added back to the output to retain some character to the data.

The parameters adpoted were:

dip: +/6 ms/trace
addback: 50% (70% for East Avenue)

19. Filtering

Time variant zero-phase digital filters were used to filter the stacked data. The following display filters were used:

Gellibrand Seismic Survey

Time (ms)	Freq (Hz/dB/Oct)
0	15/18 - 90/72
500	15/18 - 90/72
1000	10/18 - 80/72
2000	10/18 - 75/50
3000	10/18 - 60/50

Annya Seismic Survey

Time (ms)	Freq (Hz/dB/Oct)
0	10/18 - 80/72
500	10/18 - 80/72
1000	10/18 - 70/72
2000	10/18 - 60/50
3000	10/18 - 50/50

East Avenue Seismic Survey

Time (ms)	Freq (Hz/dB/Oct)
0	15/18 - 100/72
300	15/18 - 100/72
800	10/18 - 100/72
1500	10/18 - 80/72
2000	10/18 - 65/48
3000	10/18 - 50/48

20. Post-stack scaling

A 500 ms AGC was applied post-stack.

21. Display

Films of the filtered/scaled final stacks and migrated stacks were produced. For each line two films of the migrated stacks were produced at different scales. The following scales were used for the various areas:

Annya - 15 traces per cm representing 1:15 000, 15 traces per cm after 2:1 trace decimation representing 1:30 000, 9.525 cm per second.

East Avenue- 10 traces per cm representing 1:10 000, 10 traces per cm after 2:1 trace decimation representing 1:20 000, 10 cm per second.

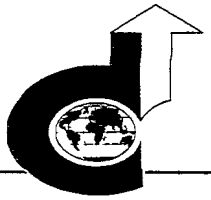
Gellibrand - (G94-01, 03, 05, 07)
10 traces per cm representing 1:10 000, 10 traces per cm after 2:1 trace decimation representing 1:20 000.

(G94-09,11,11,13)
13.3 traces per cm representing 1:10 000, 13.3 traces per cm after 2:1 trace decimation representing 1:20 000

15 cm per second for all Gellibrand lines.

The films were accompanied by a side panel which contained relevant acquisition and processing details and a series of profiles above the section. The profiles display information related to the surface elevation of the data, datum statics, residual statics, velocity functions, well and line intersection locations, station number and fold, RMS velocity tables with their points of application, and uphole locations.

All films were in the wiggle trace - variable area mode, with timing lines every 100 ms.

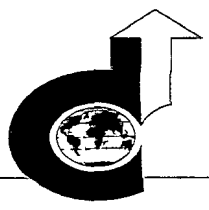


DISCUSSION

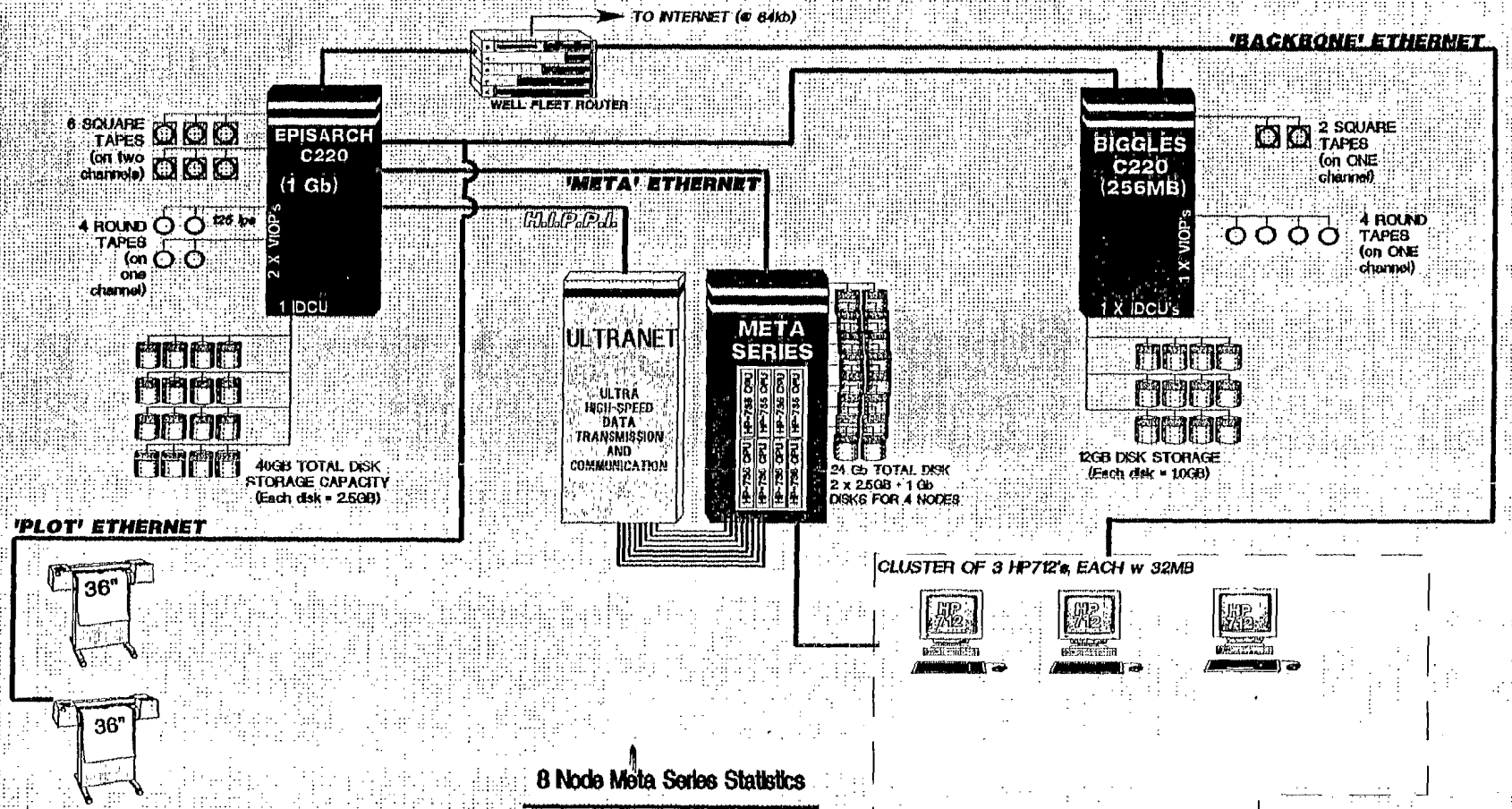
The data as a whole have very good signal noise ratios. The exception were in parts of the Gellibrand area. These areas coincided with changing surface conditions. The sub-surface expression was represented by a lack of continuity in the data. It also coincided with very poor first breaks and hence a reduced confidence in their picks and the destined static solution.

It was expected that, with rocks normally found deep on the section but closer to the surface, that the stacking velocity functions would be faster. This was not found to be the case when stacking up events which aligned themselves. Extra constant velocity scans were produced, faster trends identified and data stacked using these velocity functions. The results were inferior to the original picks; the revised faster trends were picking aliased data.

It is recommended that any future work in this area be accompanied by a more detailed uphole programme which adequately samples the changing surface conditions. This would provide a better foundation for first break picking. This is predicated on the fact that the uplifting and faulting within the problem areas has allowed structures and continuity of reflectors to be preserved and/or maintained at an angle ehich can be recorded with traditional seismic techniques.



SeismicTANGO HARDWARE & NETWORK CONFIGURATION



8 Node Meta Series Statistics

Each Node Consists of:
144 Mb Main Memory
6 Gb Fast/Wide SCSI Disk
200 Megaflops Power

DIGICON BRISBANE

Respectfully submitted,
Digital Exploration Limited

Dr. Anthony P. Spenceley
LAND PROCESSING SUPERVISOR

Mr. Cameron Astill
CENTRE MANAGER

DPR062A:KJF

APPENDIX 1

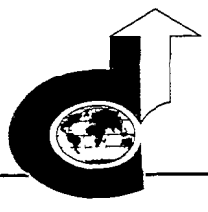
ANNYA ARCHIVE TAPE LISTING

Data : Raw demultiplexed shot records
Format : SEGY, EXB-8200, 5.0 Gbyte
Length : 5 seconds
Sample Rate : 2 milliseconds

Tape	Line	Shots	Sequential Shots
EXA-1824	AN94-01	1-474	1-474
	AN94-03	1-813	475-1287
EXA-1656	AN94-07	1-1143	1-1143
EXA-1657	AN94-09	1-1304	1-1304
EXA-1658	AN94-11	1-1014	1-1014
	AN94-126	1-368	1015-1382
EXA-1825	AN94-05	1-510	1-510
	AN94-13	1-591	511-1101
EXA-1670	AN94-15	1-1291	1-1291
EXA-1671	G94-01	1-549	1-549
	G94-03	1-675	550-1224
EXA-1672	G94-05	1-708	1-708
	G94-07	1-479	709-1187
EXA-1673	G94-09	1-1002	1-1002
EXA-1674	G94-11	1-1422	1-1422
EXA-1675	G94-13	1-1081	1-1081
EXA-1676	EA94-01	1-521	1-521
	EA94-02	1-377	522-898
	EA94-04	1-431	899-1329
EXA-1677	EA94-06	1-401	1-401
	EA94-08	1-422	402-823
	EA94-10	1-457	824-1280
EXA-1678	EA94-12	1-426	1-426

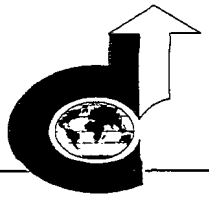
Data : CDP gathers - field statics applied
residual statics applied
NMO corrected using final stacking velocities
Format : SEGY, EXB-8200, 2.5 Gbyte
Length : 4 seconds
Sample Rate : 4 milliseconds

Tape	Line	CDP Range
EXA-1862	G94-09	600-1020
	G94-11	540-1020
EXA-1875	EA94-04	700-1200
	EA94-08	540-1160



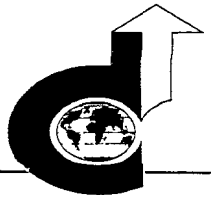
Data : Raw final stacks (Annya, Gellibrand, East Avenue Surveys)
Format : SEGY, EXB-8200, 2.5 Gbyte
Length : 4 seconds
Sample Rate : 4 milliseconds
Tape : EXA-1752

Line	SP Range	CDP Range	Sequential Trace
AN94-01	200-690	400-1680	1-981
AN94-03	200-1047	400-2094	982-2676
AN94-05	200-715	401-1430	2677-3706
AN94-07	378-1550	756-3100	3707-6051
AN94-09	200-1535	409-3070	6052-8713
AN94-11	200-1325	401-2646	8714-10959
AN94-13	200-800	400-1599	10960-12159
AN94-15	200-1630	400-3259	12160-15019
AN94-126	200-591	404-1176	15020-15792
G94-01	200-817	400-1634	15793-17027
G94-03	200-949	400-1898	17028-18526
G94-05	254-1048	508-2095	18527-20114
G94-07	200-818	400-1633	20115-21348
G94-09	204-1278	408-2556	21349-23497
G94-11	200-1325	400-2646	23498-26444
G94-13	200-1374	400-2748	26445-28793
EA94-01	200-724	400-1448	28794-29842
EA94-02	200-576	400-1152	29843-30595
EA94-04	200-634	400-1267	30596-31463
EA94-06	200-603	400-1206	31464-32270
EA94-08	200-624	400-1248	32271-33119
EA94-10	200-660	400-1320	33120-34040
EA94-12	200-627	400-1254	34041-34895



Data : Migrated/filtered/scaled stacks (Annya, Gellibrand, East Avenue Surveys)
Format : SEGY, EXB-8200, 2.5 Gbyte
Length : 4 seconds
Sample Rate : 4 milliseconds
Tape : EXA-1858

Line	SP Range	CDP Range	Sequential Trace
AN94-01	200-690	400-1680	1-981
AN94-03	200-1047	400-2094	982-2676
AN94-05	200-715	401-1430	2677-3706
AN94-07	378-1550	756-3100	3707-6051
AN94-09	200-1535	409-3070	6052-8713
AN94-11	200-1325	401-2646	8714-10959
AN94-13	200-800	400-1599	10960-12159
AN94-15	200-1630	400-3259	12160-15019
AN94-126	200-591	404-1176	15020-15792
G94-01	200-817	400-1634	15793-17027
G94-03	200-949	400-1898	17028-18526
G94-05	254-1048	508-2095	18527-20114
G94-07	200-818	400-1633	20115-21348
G94-09	204-1278	408-2556	21349-23497
G94-11	200-1325	400-2646	23498-26444
G94-13	200-1374	400-2748	26445-28793
EA94-01	200-724	400-1448	28794-29842
EA94-02	200-576	400-1152	29843-30595
EA94-04	200-634	400-1267	30596-31463
EA94-06	200-603	400-1206	31464-32270
EA94-08	200-624	400-1248	32271-33119
EA94-10	200-660	400-1320	33120-34040
EA94-12	200-627	400-1254	34041-34895



Data : Raw final stacks and migrated/filtered/scaled stacks (Annya Survey)
Format : SEGY, EXB-8200, 2.5 Gbyte
Length : 4 seconds
Sample Rate : 4 milliseconds
Tape : EXA-1894

Line	SP Range	CDP Range	Sequential Trace
Final Stacks			
AN94-01	200-690	400-1680	1-981
AN94-03	200-1047	400-2094	982-2676
AN94-05	200-715	401-1430	2677-3706
AN94-07	378-1550	756-3100	3707-6051
AN94-09	200-1535	409-3070	6052-8713
AN94-11	200-1325	401-2646	8714-10959
AN94-13	200-800	400-1599	10960-12159
AN94-15	200-1630	400-3259	12160-15019
AN94-126	200-591	404-1176	15020-15792
Migrated Stacks			
AN94-01	200-690	400-1680	15793-16773
AN94-03	200-1047	400-2094	16774-18468
AN94-05	200-715	401-1430	18469-19498
AN94-07	378-1550	756-3100	19499-21843
AN94-09	200-1535	409-3070	21844-24505
AN94-11	200-1325	401-2646	24506-26751
AN94-13	200-800	400-1599	26752-27951
AN94-15	200-1630	400-3259	27952-30811
AN94-126	200-591	404-1176	30812-31584

Data : Raw final stacks and migrated/filtered/scaled stacks (East Avenue Survey)
Format : SEGY, EXB-8200
Length : 4 seconds
Sample Rate : 4 milliseconds
Tape : EXA-1798 (2.5 Gbyte)
EXA-1799 (5.0 Gbyte)

Line	SP Range	CDP Range	Sequential Trace
Final Stacks			
EA94-01	200-724	400-1448	1-1049
EA94-02	200-576	400-1152	1050-1802
EA94-04	200-634	400-1267	1803-2670
EA94-06	200-603	400-1206	2671-3477
EA94-08	200-624	400-1248	3478-4326
EA94-10	200-660	400-1320	4327-5247
EA94-12	200-627	400-1254	5248-6102
Migrated Stacks			
EA94-01	200-724	400-1448	6103-7151
EA94-02	200-576	400-1152	7152-7904
EA94-04	200-634	400-1267	7905-8772
EA94-06	200-603	400-1206	8773-9579
EA94-08	200-624	400-1248	9580-10428
EA94-10	200-660	400-1320	10429-11349
EA94-12	200-627	400-1254	11350-12204