# 1984 SIMPSON DESERT SEISMIC SURVEY

O.P. 184

NORTHERN TERRITORY, AUSTRALIA

FOR

BEACH PETROLEUM N.L.

BY

SEISCOM DELTA UNITED (AUSTRALIA) PTY. LTD.

NOVEMBER 1984

## TABLE OF CONTENTS



## APPENDICES



## ENCLOSURES

# LIST OF FIGURES

# STATEMENT OF QUALITY

The survey reported herein has been conducted according to the standards specified in the contract governing the work. In the absence of such contractual standards, the survey has been conducted according to the current Technical Operating Standards of Seiscom Delta United (Australia) Pty. Ltd.

To the best of our knowledge and belief the survey included no deviations from the set standards, either of letter or spirit, which are not specifically reported or justified in the following pages.

SIGNED

AREA MANAGER , A.J. ATKINS

E. Allwood.

PARTY MANAGER , E. ALLWOOD

## 1. INTRODUCTION

In November 1984, Seiscom Delta United (Australia) Pty. Ltd.'s Party 4903 was contracted by Beach Petroleum N.L. to conduct a short seismic survey in O.P. 184, Northern Territory, using the Vibroseis* technique.

The proposed survey, named the 1984 Simpson Desert Seismic Survey, consisted of ten lines (an approximate 160 kilometre programme), radiating from 50 kilometres to 100 kilometres west and north of Poeppel Corner, in the Simpson Desert. Poeppel Corner is the monument established at the intersection of the states of Queensland, South Australia and the Northern Territory (latitude 26° south, longtitude 138° east).

Line clearing began in mid-October 1984 with a survey advance party and the bulldozing crew plus equipment present in Birdsville (15th October). A Satellite Positioning unit was arranged by Beach to back up the field survey interpretation.

The first production profile was obtained on the 13th November, 84, instrument tests, hardwire similarities and experimental sweeps being recorded the day before. The last vibrator point was recorded on the 28th November, 1984.

An uphole programme of fifteen 50 to 60 metre deep holes was also proposed and a drilling crew mobilised from Brisbane to arrive in camp on the 11th November, 1984. Due to complicated field problems, this unit was not able to achieve the programme and another drilling crew was mobilised in early December, together with a set of DFS V instruments for the uphole recording.

The seismic recording acquisition was based on a kilometerage fee basis, and the line clearance was the responsibility of Beach Petroleum N.L.

(* Trademark)

## 2. LOGISTICS AND WEATHER

The area of operations lies in the Northern Territory, close to "Poeppel Corner", a survey monument established at the intersection of three states, approximately 134 kilometres west of Birdsville, Queensland. (Refer to figure 1).

Seiscom Delta United operated here in July - September 1979, but extending further west and using the "Geoflex" technique (refer to the relevant final report submitted).

The survey is located in the Simpson Desert itself and five of the ten assigned lines are located through the inter-dunes corridors. The other lines bisected the 30 metre high sand dunes, and only 4 or 6 wheel drive vehicles could move on the lines, where the soft sand required strong traction with or without sandtyres. As the "avalanche" side of the dunes faces east it is easier to travel from west to east, than east to west (the dunes are oriented NNW). The vehicles frequently became bogged to the axles, especially in the northern lines where the soft dunes were higher and wider (to 300m). The 4x4 water trucks suffered regular breakdowns, including snapped tail-shafts, but the 20 ton 6x6 wheel drive vibrators did extremely well. When travelling, a four wheel drive Toyota would average 25 kilometres per hour only, and other heavy trucks 15 to 20 kilometres per hour.

One major track, a rig road recently opened to connect Poeppel Corner's # 1 well onto the Birdsville track was the only main access to civilisation. This road, starting 65 miles south of Birdsville, more or less outskirted the dunes network and was in a very bad condition. The Caterpillar grader was employed for some days in its restoration, thus allowing the main recording trailers and crew vehicles to reach the only main camp location available; this was the well camp site (refer to figure 2), or to make the 14 hour round trip to Birdsville, some 380 kilometres.

Another possible access was Delhi QAA seismic line, a 1979 line ending near the prospect location, straight to Birdsville (168 kilometres), but cutting across the dunes network, with slow progress.

It was impossible to set up camp other than at the well site, and the first fly camp was established 54 kilometres north of the main camp. The access to the northern lines was by old 1964 C.G.G. Line K1, which was also restored by the line clearing crew. The second fly camp was situated approximately 35 kilometres west, and was served by A.U.G. 1979-16 Geoflex line, but also difficult to drive on after restoration.

The drinking water was obtained from Birdsville using one of the single axle drill water tankers. This water had a strange colour and taste.

Other water for bath and drilling purposes was fetched from a filled stagnant depression found near the rig road, a 280 kilometres return trip requiring up to 10 hours driving. However, few trucks were initiated during the prospect for private use, the water being allocated for drilling firstly.

Normally, a truckload of food and other supplies was ferried from Brisbane to Birdsville at the beginning of the job.

Fuel was obtained in drums from the Mobil agent in Quilpie, Queensland, and the line clearing crew low-loader was used twice to pick it up from Windorah. The line clearing crew organised their own fuel.

Urgent parts deliveries were flown in by plane - Beechcraft Barons, from Coddair airline, using the good landing strip close to the main camp site. Three flights were chartered during this short job.

The recording crew mobilised on the 6th November, 1984 from another contract near Rolleston, Queensland. Appendix A lists the equipment.

The days were hot, up to 45°C outside, but readings of 50°C (maximum range of the camp thermometer) were recorded inside the vans during day time. Surprisingly enough the weather cooled off on the 22nd November with a gale force wind bringing rain clouds. A shower fell during the night (approximately 4mms) and a lower temperature of 10°C was read in the early morning of the 23rd November. However, after this change, hot weather soon built up again and was constant to the end of the survey. Strong winds & blowing sand occurred regularly during the survey, and the heat was very uncomfortable.

## 3. FIELD OPERATIONS

### 3.1. General

A survey team departed from Brisbane to arrive in Birdsville on 11th October, 1984. A few days were spent at Birdsville awaiting the line clearing equipment, which had to come from Millmerran (near Toowoomba, Queensland). The line clearing contractors, E.R. & C.B. Sweedman used their own low-loader twice for the transportation of the 2 Fiat-Allis 14C bulldozers, and hired a spare truck for the transport of the 4-wheel drive Caterpillar grader. Due to the very poor roads, cracking was caused to tanks and 2500 litres of fuel were lost on the way to Birdsville.

This crew arrived at Poeppel Corner's # 1 well site on 17th October, to find that line 1964 C.G.G. K1, the only access to the northern part of the prospect was in an untrafficable state. It took 4 days to restore the 54 kilometre access to line SD 84-39, and line clearing finally began on 24th October, 1984. The cutting progress was slow, line SD 84-39 bissecting the sand dunes orientation (refer to figure 2), and production on this line then stopped for a couple of days at the end of October, as the crew ran out of water in the very hot climate. Normally an A.C.E. drill water truck was sent in advance to assist this crew, but it broke down on its way up on this occasion and was later transported on a hired carrier to the camp site for repair.

Production started again on the 2nd November and the two machines had great difficulty in cutting the lines. As production remained slow accross the dunes, longer working days were initiated and the line clearing programme was achieved without major problems on the 24th November for the second dozer. The lead dozer had finished up on the 20th November.

The grader was only used over a few days for works on the rig road, when it became deeply bogged on the first sand dune off the camp, and remained there until the line clearing crew demobilised. A 6-wheel drive grader is recommended for future work in the area.

The line clearing production breakdown is approximately as follows :

| | |
|---|---|
| Grader hours (rig road) | 44.75 hours |
| 1st bulldozer | 283.50 hours |
| 2nd bulldozer | 307.00 hours |
| Total bulldozer | 590.50 hours |
| cutting time (approximately) | 447.00 hours |
| walking, towing, unbogging trucks | 143.50 hours |

From the approximate figures above-mentioned, many hours were spent in walking through the prospect due to the programme itself, as well as in opening accesses. Some hours were devoted to towing the seismic trucks accross difficult sand dunes. A D6 or equivalent crawler on duty for such a task should be envisaged for future work as the 1979 report also mentions, as well as a suitable tractor for towing duties in such treacherous sands.

## 3.2. Surveying

Survey works were carried out using WILD T-16 theodolites coupled with RED 1-A Sokkisha Electronic Distance Measuring apparatus (EDM). The surveyor set out the line by using solar observations corrected into grid bearing.

The chaining crew established the stations using a 60 metre long chain made from plastic coated multi-strand steel wire cables. This chain was regularly checked against a fibreglass tape measure for accuracy.

All V.P. locations were identified by white numbered pegs, the odd stations being marked with flagging. Low peg numbers started a line at any south or western ends.

Mud maps describing the features of the lines were drawn up and despatched to all sections of the crew.

All pegs were left in the ground.

The lines were permanently marked using steel pickets. An aluminium tag, dye stamped with all pertinent information was bolted on. (Refer to figure 6 and appendix E, and enclosure 1). The permanent markers were planted at a minimum of 5 or 3 kilometre intervals.

Levelling of line 84 SD 39 was done at every station (30m intervals) plus any intermediate change of grades, as the line cuts the dunes at right angles. All other lines were levelled at the V.P. locations plus any other changes of grader (tops and bottoms of sand dunes). The majority of these lines run in the dune corridors.

Procedure

Trigonometric levelling was done using :

one face left reading of the 2 metre high prism
one face left reading of the 5 metre high staff

one face right reading of the 2 metre high prism
one face right reading of the 5 metre high staff

These four readings were systematically done at the backsights, foresights and control points. Single face left face readings were obtained for the intermediate stations.

EDM measurements were used for backsights, foresights and control points with chainage accepted for intermediates.

Solar observations were taken at the beginning and the end of all lines, and many other check points along the survey. These solar observations were not restricted to a set number, as many more sun shots were taken as part of Seiscom's survey standards.

All computations were done using a Northstar Advantage 64k computer, and Hewlett Packard calculators. A first set of provisional values was obtained, the final being calculated on receipt of the Doppler station value.

Normally a first processing run was done by entering the 2 metres heights readings, then a second run was processed with the 5 metres ones. The comparison of both results ascertained the accuracy of the levelling and a set of provisional values was edited.

A report summing up the production of the entire survey section was submitted on a daily basis.

Primary Control

A Beach satellite positioning unit was to arrive at the early stage of the prospect. The technician, busy on another commitment, was not able to arrive until the 22nd November. The base station was set up at Poeppel Corner and 2 translocations were set up before the base station Magnavox MX 1502 Geoceiver broke down. The technician withdrew from the crew on the 27th November. The final computations were achieved using these 2 values only.

A tie between south of 84 SD 44, going through the eastern end of SD 79 23 and connecting north of 84 SD 101 was achieved.

Loop Closures

Lines SD 84 39, 38, 40, 42, 44, 101, 41, 43 and 45 are based on Doppler station # 2. A tie to old permanent marker I/S 72.5 and 79/16 gives a misclose of -55.98, -24.21 and + 5.77 and a check tie to the old P.M. I/S 79.17 and 72.5 gives a misclose of - 80.32, - 36.81 + 5.80.

Line SD 84-46 is based on Doppler station # 1 and tie to old P.M. I/S K1 and 79/21 gives a misclose of - 33.39, -45.26 and + 5.96.

From these results it seems that the height datum for the 1979 survey is in error by approximately 5.86 mt. The co-ordinate tie is reasonable as the 1979 survey was run by stadia and no scale factor applied; so one would expect the misclose to increase as the distance from Poeppel Corner increased.

Differences in double runs only are shown on the two loop closure maps for the sake of clarity. If further information is required see the work sheets in the relevant files.

The double runs all close well and the connection to old P.M.s are of a constant nature.

## 3.3. Reflection Recording

The parameters used were obtained after a short series of experiments carried out on the 12th November, and are as follows :

| | | |
|---|---|---|
| Number of traces | : | 96 |
| Coverage | : | 1200% |
| Geophone group interval | : | 30m |
| Geophone type | : | GSC 20D, 10Hz, 70% dumping<br>Coil resistance 395 ohms |
| Spread | : | 1500-90-0-90-1500 m |
| Geophone array | : | 12 phones equally spaced and centred on peg |
| Geophone spacing | : | 2.5m |
| Geophone array length | : | 27.5m |
| Source (refer to figure 3) | : | 4 vibs. in line |
| Number of sweeps | : | 6 for 84 SD 39,<br>8 for all other lines |
| Sweep frequency | : | from 16 Hz. to 96 Hz. |
| Sweep length | : | 6 sec. |
| Listen time | : | 4 sec. total 10 seconds |
| Mode | : | Logarithmic |
| Distance between pads | : | 10m in line |
| Pad move up | : | 5m for 84 SD 39<br>4m for all other lines |
| Vibrator array length | : | 55m for 84 SD 39<br>58m for all other lines |
| V.P. interval | : | 120m |
| Filters - low | : | out |
| - high | : | 128 Hz. |
| - notch | : | out |
| Gain constant | : | 48 db. |
| Sampling rate | : | 2 ms |
| Tape format | : | SEG B, 1600 BPI, uncorrelated<br>SEG Y, 1600 BPI, correlated with zero phase filter |

| | | |
|---|---|---|
| Auxillary channels | : | 1 timing word<br>2 unfiltered pilot sweep<br>3 unfiltered pilot sweep<br>4 radio similarity<br>5 time break |

Note : The zero phase filter is built up after each initialisation of the entire system.

The first line was vibrated with 6 sweeps. It was then decided to switch to 8 sweeps as a safeguard for a shallow refractor.

Daily tests, including hardwire similarities were carried out at the start of each day. Monthly tests were also produced for further assessment to our office in Singapore at the commencement and end of the job.

The hardwire similarities were considered as good when all the vibrators were in phase within 700 milliseconds.

Normally the recording truck would set off the line, using 1000 feet long jumper cables to connect onto the spread. This was not always possible because of the sand dunes.

Reflection recording began on the 13th November, line 84 SD 39, western end. The first fly camp was set up near the intersection with 1964 Kl. The northern part of the prospect was recorded on the 21st November, and the second fly camp was established along line 84 SD 101 that day.

Recording production went smoothly, in spite of the difficult sand dunes to operate, ie. 18 kilometres were recorded on the 23rd November, this including a change of line and extremely hot weather.

A Vigilant system operated throughout the prospect. Readings of the SEG Y (demultiplexed) tapes were done, and crude velocity analysis were also processed to obtain a 1200% raw stack (no static correction). Good results were obtained, and interesting events emerged. The rather low velocity functions applied needed constant monitoring in this basin, and re-run stacks showed better organised reflectors by only using finer functions.

## 3.4. Drilling

An A.C.E. Drilling crew mobilised from Brisbane on the 6th November, 1984 to reach camp on the 11th November.

A Midway all hydraulic rig was assisted by 2 Toyota 7 tonnes water trucks.

A series of unfortunate events prevented this crew from performing as expected, ie : the drilling rig broke a compressor air intake at the start of the job and the Seiscom Delta United 4x4 water truck was allocated to this crew to replace the Toyota truck, but continually snapped tail shafts when operating on dunes, thus restricting the drilling water supply. Casing was almost impossible to achieve and 2 x 200 feet holes were lost. However, the drilling crew tried extremely hard to drill and perform. They left the prospect on the 26th November.

To remedy the drilling problem, Seiscom Delta United mobilised one of its own drilling crews which had been operating in the Cooper Basin.

Two Mayhew 1000 and supporting water trucks arrived at the camp site on the 2nd December and started drilling at uphole no. 2 on the 3rd December. Vast quantities of water were used (mud bit drilling or lost circulation) and the last hole was achieved on the 7th December. The drillers reported a fair drilling production in the top layer of loose sand followed by clay (constant lithology in every hole sand-clay).

## 3.5. Uphole recording

Uphole recording began on the 3rd December to end on the 7th December. Harnesses fabricated to the depths requirements were primed with "A" or "D" boosters at 5 metre intervals. The top charge (3m) was one detonator only. A DFS V instrumentation with standard I/O encoder-decoder was used.

| Uphole No. | Location | Drilled | Loaded | Elevation | Remarks |
|---|---|---|---|---|---|
| 1 | INT SD 38/SD39 | 48m | 45m | 56.65 | Corridor |
| 2 | INT SD 39/SD40 | 66m | 60m | 57.21 | Dune slope |
| 3 | INT SD 39/SD42 | 54m | 50m | 56.41 | Nearly flat |
| 3A | SD 39 VP 396 | 66m | 60m | 68.56 | Top of dune |
| 4 | INT SD 39/SD44 | 54m | 50m | 61.44 | Dune slope |
| 5 | SD 38 VP 168 | 54m | 50m | 47.53 | Flat area |
| 6 | SD 40 VP 188 | 54m | 50m | 51.48 | Flat/top dune |
| 7 | SD 42 VP 192 | 54m | 50m | 50.05 | Dune slope |
| 8 | SD 44 VP 620 | 54m | 50m | 46.04 | Flat area |
| 9 | SD 44 VP 132 | 54m | 50m | 42.53 | Flat area |
| 10 | SD 41 VP 224 | 54m | 50m | 47.01 | Top of dune |
| 11 | INT SD 101/SD 43 | 54m | 50m | 60.30 | Top of dune |
| 12 | INT SD 101/SD 45 | 66m | 60m | 41.82 | Dune slope |
| 13 | INT SD 46/SD 21 | 66m | 60m | 35.90 | Dune slope |
| 14 | SD 46 VP 168 | 66m | 60m | 40.33 | Dune slope |

(Uphole 3A, close to 3 was added, and specially located on top of a sand dune for investigation).

The results obtained were good and all documents were despatched to the processing centre for static computation. The rough field plots kept in the field office confirm more or less the 1979 survey refraction data (one or two layers of similar velocities) with the exception that the consolidated layer may not be a flat plane underlying the dunes as thought in 79. Uphole at SD 101, VP 224, located on top of a dune yields only 22m of weathering. Uphole no. 13 at intersection of lines SD 46/SD 21 drilled on the slope of a dune gives only 13m of Dw when the average depth of the weathered layer is of 25m approximately. A more detailed static control program may be necessary for future surveys.

## 4. FIELD OFFICE PROCEDURES

Reports from all sections of the crew were received at the field office and a daily report was transmitted to Seiscom Delta United's Brisbane office, and was also submitted to Beach Petroleum N.L. representative in the field, Mr. D. Gray, for endorsement.

All tapes (SEG Y) were despatched to Seiscom Delta United's processing centre in Melbourne, together with the relevant observer reports.

## 5. CONCLUSIONS

The 1984 Simpson Desert Seismic Survey, using the Vibroseis technique, proved a production success in spite of the difficult terrain operated on, and the very hot climate at this time of the year.

The areas investigated yielded good data quality, but most importantly , in locations of the Pedirka Basin where very little seismic research has been carried out to date. The basic seismic acquisition was achieved according to plan.

Seiscom Delta United is most appreciative of the assistance of Mr. D. Gray, representative of Beach Petroleum N.L.

Respectfully submitted by

R.A. Ashton
Operations Supervisor
SEISCOM DELTA UNITED (AUSTRALIA) PTY. LTD.

# A P P E N D I X  A

## EQUIPMENT

### RECORDING EQUIPMENT

96 channel DFS V system
Texas Instrument TIMAP FT-1 system
Texas Instrument Vibrator Electronics, VC III
SIE ERC 10C 64 channel electrostatic camera
Rollalong switch and other auxillary input equipment
Full spare kit, oscilloscope, geophone tester etc.
300 strings of geophones, 12 geophones per string, GSC 20D, 10Hz.
36 Mark product cables, 104 pair cables, 8 takeout, Terracon heads.
2 x 150m jumper cables
2 x 50m jumper cables
One GMC Sierra 4x4 truck with air conditioned recording cabin
4 Toyota Landcruiser 4x4 geophone/cable trucks
1 Toyota Landcruiser 4x4 personnel carrier
1 International 4x4 cable truck
FM radios
SSB radios (operating frequency 7770 Khz)
1 37.5 KVA generator mounted on recorder truck

### SOURCE EQUIPMENT

5 Mertz model 12 vibrators, mounted on 6x6 International Paystar 5000 trucks (20 ton unit), fitted with Michelin tyres.
Vibrators fitted with MOOG high frequency valves from 5Hz to 250Hz with peak output of 30,000 lbs.
All trucks fitted with power winch, air-conditioned cabin.

OTHER

All supplies and parts, mechanical, survey, camp, recorder and office.
One Vigilant system mounted on a 4x4 Ford, 7 ton, truck with its own 20KVA generator.

SURVEY EQUIPMENT

3 WILD T-16 theodolites
2 Electronic Distance Measuring apparatus
Chaining equipment
1 Northstar Advantage Microcomputer, VDU terminal and line printer
3 Toyota Landcruisers 4x4
SSB Radios, walkie-talkies
Tools, chainsaws, etc.
Survey notes, calculators, etc.

CAMP EQUIPMENT

1 Party manager/assistant office trailer
1 survey office/cable repair shop trailer
1 mechanic workshop, power tools, welder, compressor, parts
1 shower/laundry trailer
5 sleeper trailers (8 man each)
1 kitchen trailer with cold room
1 diner trailer
1 mess trailer
2 50KVA generators

CREW SUPPORT VEHICLES

1 Toyota Landcruiser 4x4 - party manager

1 Toyota Landcruiser 4x4 - vibrator mechanic

1 Toyota Landcruiser 4x4 - camp supply

1 Toyota Landcruiser 4x4 - camp mechanic

1 International 4x4 water truck with water pumps, and high pressure pump

1 Bedford 4x4 vibrator support truck with crane and fuel tank

1 Bedford 4x4 camp support truck

DRILLING EQUIPMENT (A.C.E. Drilling, Brisbane)

1 Midway air-water drilling rig (weight : 20 tons) International truck with sand tyres

2 x 1000 gallon water truck (Toyota 7 tonnes 2 x 4)

1 4x4 Toyota

DRILLING EQUIPMENT (Seiscom Delta United)

2 x Mayhew 1000 air-water drilling rigs (1 for spare)

3 x 850 gallon 4x4 water trucks

1 x self contained field camp

1 4x4 Toyota/Recorder with DFS V instrumentation, encoder-decoder and uphole equipment

# APPENDIX B

## PERSONNEL

| | |
|---|---|
| Party Manager | E. Allwood |
| Clerk | W. Bell |
| Vigilant/Seismologist | R. Vincart |
| Senior Observer | A. Kopij |
| Observer | G. Ziebarth |
| Senior Surveyor | T. Sheppard |
| Surveyor | R. Percy |
| Vibrator Mechanic | A. Smylie, B. Clarke |
| Vibrator Drivers | G. Cowell (Headman)<br>S. Geal<br>D. Columbus<br>J. Blackley |
| Camp Mechanic | J. Healey |
| Head Linesman | D. Smith |
| Linemen | 8 |
| Chainmen | J. Gleeson, T. Harbottle |
| Rodmen | M. Dagg |
| Survey Helpers | 1 (part time) |
| Cook | I. Rodgers |
| Camp Helpers | 2 |
| Uphole Observer | B. Holmes |
| Preloader/Shooter | D. Sulley |
| Sub-Contractor Surveyor & his rodman | M. Williamson<br>M. Schwikowski |
| ACE Drilling, Brisbane - driller | K. Hardwick, plus 2 offsiders |
| Seiscom Delta United Drilling, - Brisbane | M. Johnson, Chief driller, plus 2 drillers, 3 helpers, 1 cook |
| Line clearing crew (E.R. & C.B. Sweedman) | 5 men |
| Satellite Positioning Service | M. Bennet, Manager |

# APPENDIX C.1

## OPERATIONAL STATISTICS

## RECORDING

| | |
|---|---|
| Recording personnel left Rolleston | 5 November, 1984 |
| Arrived Birdsville | 9 November, 1984 |
| Arrived campsite | 11 November, 1984 |
| Fly camp no. 1 established | 13 November, 1984 |
| | |
| First production profile | 13 November, 1984 |
| Last production profile | 26 November, 1984 |
| | |
| Days vibrating | 12 ½ approximately |
| Shifts between lines | 1 ½ approximately |
| Total | 14 days |
| Kilometerage | 157.68 |
| No. of VP's | 1324 |
| | |
| Working time * | 141.99 |
| Travel time * | 29.74 |
| Total time | 171.73 |
| Production (158km ÷ 14) | 11.3 km/day |
| Production (157.68 ÷ 171.73) | 0.92 km/day |
| Production (157.68 ÷ 141.99) | 1.11 km/day |

* Working time includes 2.25 hours of tests
  Travel time includes camp shifts

# A P P E N D I X  C.2

## DRILLING

### A) ACE DRILLING, BRISBANE

| | |
|---|---|
| Left Brisbane | 6 November, 1984 |
| Arrived Birdsville | 10 November, 1984 |
| Rig on uphole site | 12 November, 1984 |
| Standby water truck | 13,14,15 November, 1984 |
| (4 wheel drive) | 17,21,22 November, 1984 |
| Drilling | 16,18,19,20 November |

| | | |
|---|---|---|
| 1st hole | (UH No. 3) | 50 feet caved in |
| 2nd hole | (UH 3A, top of dune) | 20 feet caved in |
| 3rd hole | (UH 3) air and water | 140feet caved in |
| 4th hole | (UH 3) mud pit | 200, lost circulation at 80ft. then PVC casing stuck at 40ft. |
| 5th hole | (UH 3A) mud pit, top of dune | 200 feet, casing stuck at 85ft. |
| 6th hole | (UH 7) mud pit | 200 feet, abandoned, water truck down |

| | | |
|---|---|---|
| Drilling time | (6 holes) | 24 hours |
| Travel time | (6 holes | 29 hours |

Consumables

| | |
|---|---|
| Quick trol | 5 bags |
| Quick mud | 4 litres |

1 set of Chevron blades

# A P P E N D I X  C.2

## DRILLING

### B) SEISCOM DELTA UNITED (AUSTRALIA) PTY. LTD.

| | |
|---|---|
| Arrived Birdsville | 1 December, 1984 |
| Left Poeppel Corner | 8 December, 1984 |

| | |
|---|---|
| Number of holes | 15 |
| Meterage | 864 m |
| Average drilling time per hole (mud bit drilling) | 1.50 to 2.00 hours |

Consumables

12 bags mud
5 bags bran
5 bags Quick-trol

Uphole Consumables

| | |
|---|---|
| "A" Boosters | 240 |
| "D" Boosters | 24 |
| 1.8m detonators | 161 |
| Star pickets | 15 + 15 weights |
| Insulating tape | 16 |
| Bailing twine | 5 reels |
| Twin Flex | 14 reels |

# A P P E N D I X  D

## LIST OF RECORDED LINES

| Date | Line No. | VP | to | VP | No. of VPs | Kms |
|---|---|---|---|---|---|---|
| 13,14 Nov | 84 SD 39 | 76 | | 952 | 220 | 26.28 |
| 15,16 Nov | 84 SD 38 | 868 | | 100 | 193 | 23.04 |
| 17 Nov | 84 SD 40 | 600 | | 120 | 121 | 14.40 |
| 18 Nov | 84 SD 42 | 600 | | 124 | 120 | 14.28 |
| 19-21 Nov | 84 SD 44 | 1200 | | 64 | 285 | 34.08 |
| 22-23 Nov | 84 SD 101 | 530 | | 58 | 119 | 14.16 |
| 23 Nov | 84 SD 45 | 104 | | 296 | 49 | 5.76 |
| 24 Nov | 84 SD 43 | 100 | | 332 | 59 | 6.96 |
| 24 Nov | 84 SD 41 | 96 | | 328 | 59 | 6.96 |
| 25 Nov | Move accross to line SD 46 all day | | | | | |
| 26 Nov | 84 SD 46 | 492 | | 100 | 99 | 11.76 |
| | | | | | 1324 | 157.68 kms |

Note : Sweep tests done on 12 November, 1984

Pegging Convention was for low number at any north or west ends.

# APPENDIX E

## LIST OF PERMANENT MARKERS

| LINE/VP | EASTING | NORTHING | ELEVATION | REMARKS |
|---|---|---|---|---|
| Line 84 SD 46 | | | | |
| 492 | 793 526.67 | 7 133 412.88 | 37.21 | E.O.L. |
| 468 (I/S 79.21) Doppler Station # 1 | 793 754.33 | 7 132 727.48 | 35.90 | |
| 352 | 794 849.48 | 7 129 416.24 | 34.66 | |
| 248 (I/S 79.QAF) | 795 834.39 | 7 126 447.49 | 35.20 | |
| 148 | 796 776.60 | 7 123 591.20 | 44.55 | |
| 100 | 797 236.02 | 7 122 222.58 | 47.30 | S.O.L. |
| Existing Permanent Markers | | | | |
| I/S K1 & SD 79.21 (384 120 MW) | 795 814.39 | 7 133 357.26 | 18.34 | |
| SP 690 line 79.QAF | 795 894.47 | 7 126 454.72 | 39.34 | |
| Line 84 SD 45 | | | | |
| 296 | 768 356.48 | 7 136 769.11 | 64.26 | E.O.L. |
| 168 I/S 84 WMZ 740 | 764 563.47 | 7 137 399.08 | 28.97 | |
| Thomas # 1 well | 764 596.85 | 7 137 385.51 | 28.56 | |
| 148 I/S 84 SD 101 | 763 971.03 | 7 137 497.03 | 41.82 | |
| 104 | 762 666.87 | 7 137 710.62 | 38.91 | S.O.L. |
| Existing Permanent Markers | | | | |
| I/S 72.5 & 84 WMZ 740 | 764 600.85 | 7 137 452.63 | 28.90 | |
| B.M. Thomas # 1 | 764 651.19 | 7 137 508.84 | 30.50 | |

| LINE/VP | EASTING | NORTHING | ELEVATION | REMARKS |
|---|---|---|---|---|
| Line 84 SD 43 | | | | |
| 332 | 768 824.40 | 7 141 334.07 | 45.28 | E.O.L. |
| 208 (I/S 101 & 43 | 765 165.23 | 7 142 030.66 | 60.30 | |
| 100 | 761 979.04 | 7 142 633.41 | 30.02 | S.O.L. |
| Existing Permanent Markers | | | | |
| I/S 79.17 & 72.5 | 762 656.68 | 7 142 567.19 | 33.80 | |
| Line 84 SD 41 | | | | |
| 96 | 763 046.91 | 7 149 047.86 | 57.79 | S.O.L. |
| 224 (I/S 101 & 41) | 766 768.73 | 7 148 093.28 | 47.01 | |
| 328 | 769 792.87 | 7 147 313.44 | 39.24 | E.O.L. |
| Line 84 SD 101 | | | | |
| 530 | 767 357.02 | 7 150 327.73 | 53.54 | E.O.L. |
| 453 (I/S 101 & 41) | 766 768.73 | 7 148 093.28 | 47.01 | |
| 292 (I/S 101 & 79/17) | 765 528.76 | 7 143 420.47 | 77.87 | |
| 244 + 4mt. (I/S 101 & 43) | 765 165.23 | 7 142 030.66 | 60.30 | |
| 100 + 20mt. (I/S 101 & 79/16) | 764 068.22 | 7 137 861.34 | 36.23 | |
| 88 + 4 mt. (I/S 101 & 45) | 763 971.03 | 7 137 497.03 | 41.82 | |
| 58 | 763 738.59 | 7 136 621.90 | 34.67 | S.O.L. |
| Existing Permanent Markers | | | | |
| (I/S 72.5 & 79/16) | 764 537.98 | 7 137 994.21 | 28.63 | |

| LINE/VP | EASTINGS | NORTHING | ELEVATION | REMARKS |
|---|---|---|---|---|
| Line 84 SD 44 | | | | |
| 1200 | 762 536.29 | 7 187 586.72 | 58.07 | E.O.L. |
| 1176 & I/S 44 & 39 | 762 785.85 | 7 186 910.90 | 61.44 | |
| 1100 | 763 580.67 | 7 184 769.64 | 53.26 | |
| 1000 | 764 626.73 | 7 181 952.51 | 70.38 | |
| 900 | 765 673.90 | 7 179 134.84 | 61.55 | |
| 800 | 766 718.16 | 7 176 316.23 | 52.25 | |
| 698 | 767 781.41 | 7 173 440.50 | 53.31 | |
| 600 | 768 813.85 | 7 170 680.96 | 45.24 | |
| 500 | 769 870.01 | 7 167 866.63 | 51.79 | |
| 400 | 770 925.02 | 7 165 052.73 | 47.13 | |
| 300 | 771 979.16 | 7 162 237.14 | 52.17 | |
| 200 | 773 033.13 | 7 159 420.70 | 51.98 | |
| 100 | 774 089.94 | 7 156 607.36 | 48.31 | |
| 66 | 774 449.25 | 7 155 650.85 | 48.81 | |
| Line 84 SD 42 | | | | |
| 600 | 770 506.87 | 7 190 758.00 | 58.89 | E.O.L. |
| 576 (I/S 39 & 42) | 770 736.49 | 7 190 074.79 | 56.41 | |
| 424 | 772 180.73 | 7 185 742.50 | 61.69 | |
| 272 | 773 618.65 | 7 181 407.57 | 61.07 | |
| 124 | 775 029.86 | 7 177 190.08 | 48.22 | S.O.L. |
| Line 84 SD 40 | | | | |
| 600 | 780 087.08 | 7 194 552.62 | 55.69 | E.O.L. |
| 576 (I/S 39 & 40) | 780 369.00 | 7 193 889.71 | 57.21 | |
| 412 | 782 407.81 | 7 189 403.06 | 69.73 | |
| 248 | 784 450.16 | 7 184 916.52 | 57.33 | |
| 120 | 786 043.96 | 7 181 415.78 | 46.55 | S.O.L. |

| LINE/VP | EASTING | NORTHING | ELEVATION | REMARKS |
|---|---|---|---|---|
| Line SD 84 38 | | | | |
| 868 | 782 192.90 | 7 204 328.81 | 58.73 | E.O.L. |
| 685 | 784 358.74 | 7 199 274.82 | 67.48 | |
| 568 (I/S 38 & 39) | 785 747.66 | 7 196 045.61 | 56.65 | |
| 404 | 787 685.88 | 7 191 513.51 | 54.52 | |
| 252 | 789 482.70 | 7 187 312.66 | 49.03 | |
| 100 | 791 278.58 | 7 183 110.67 | 50.18 | S.O.L. |
| Line SD 84 39 | | | | |
| 76 | 762 003.69 | 7 186 599.69 | 52.55 | S.O.L. |
| 198 | 765 409.85 | 7 187 953.89 | 73.28 | |
| 299 | 768 231.93 | 7 189 075.96 | 65.94 | |
| 432 | 771 941.74 | 7 190 550.91 | 74.89 | |
| 542 (I/S 39 & K1) | 775 009.09 | 7 191 761.73 | 57.15 | |
| 632 | 777 522.86 | 7 192 758.21 | 73.40 | |
| 734(I/S 39 & 40) | 780 369.00 | 7 193 889.71 | 57.21 | |
| 828 + 16 mt. | 783 001.37 | 7 194 939.29 | 71.17 | |
| 927 + 8.5mt. (I/S 39 & 38) | 785 747.66 | 7 196 045.61 | 56.65 | |
| 952 | 786 437.17 | 7 196 319.83 | 54.48 | E.O.L. |
| 950 Doppler # 2 | 786 381.43 | 7 196 297.49 | 53.72 | |

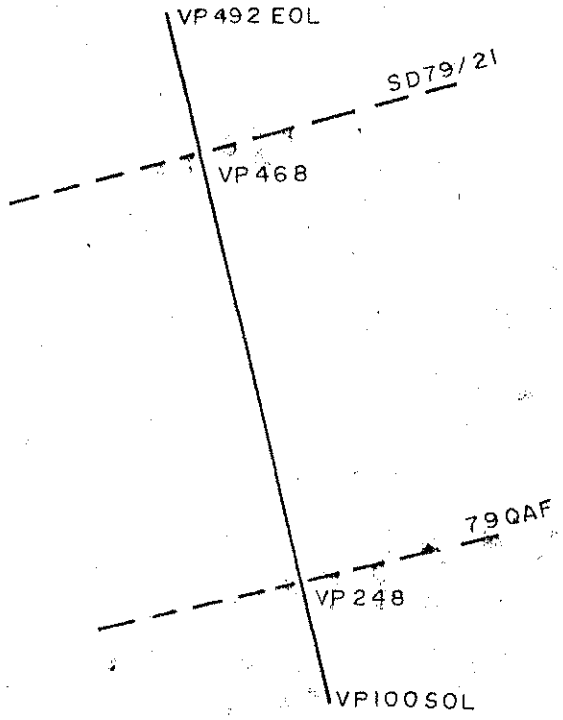
# A P P E N D I X  F

## INTERSECTION DIAGRAMS

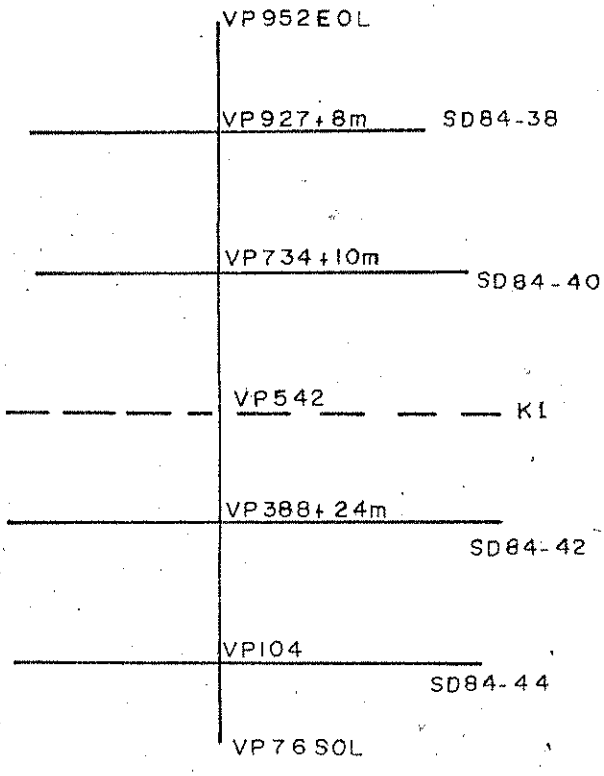
APPENDIX F

# INTERSECTION DIAGRAMS

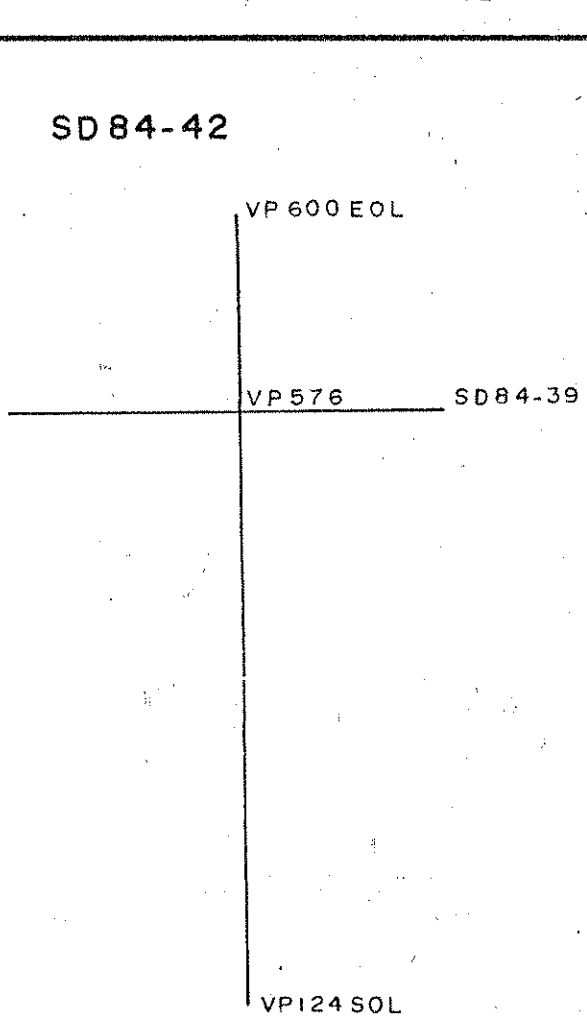
## SD84-46



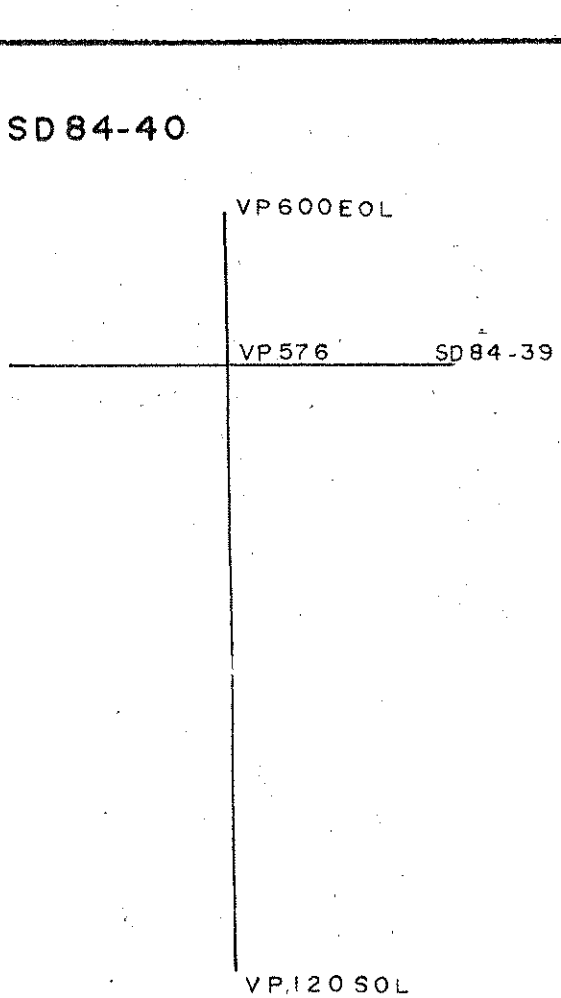

## SD84-39




## SD84-42



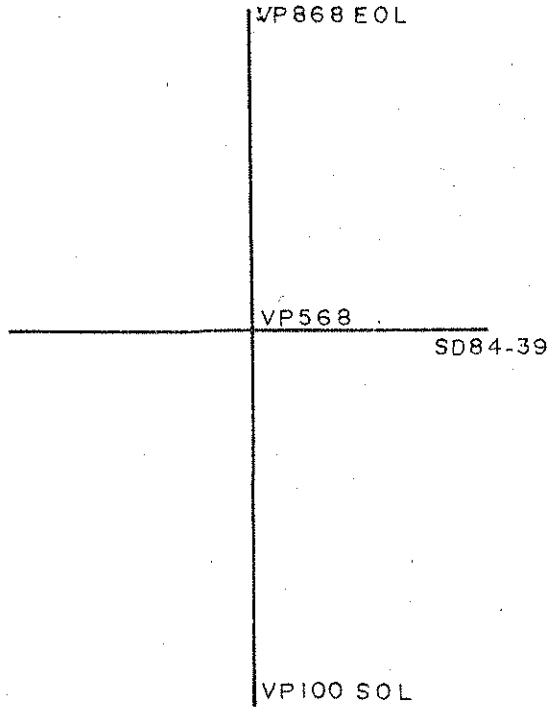

## SD84-40



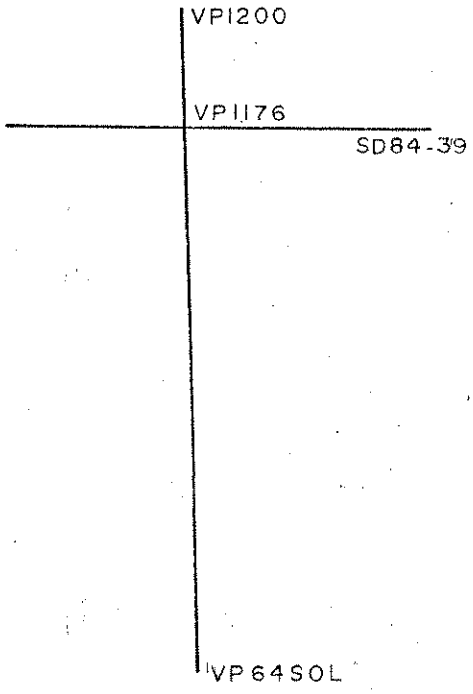
APPENDIX F

# INTERSECTION DIAGRAMS

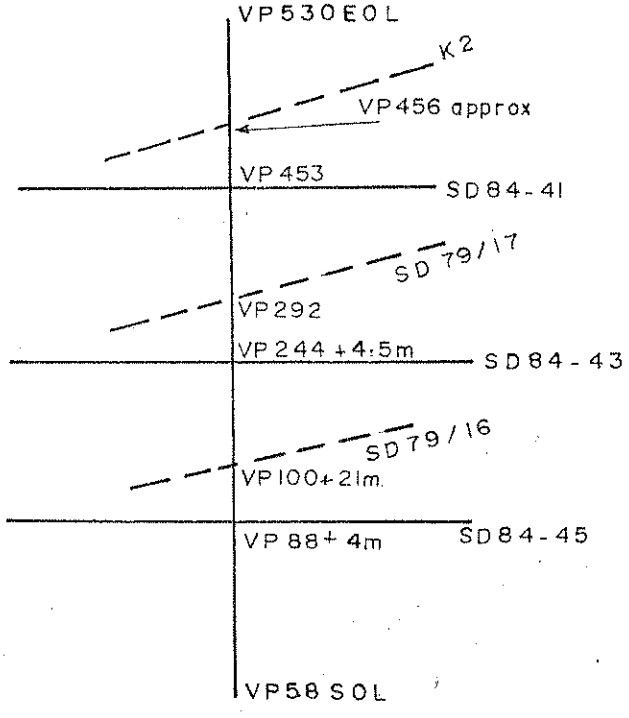
## SD84-38



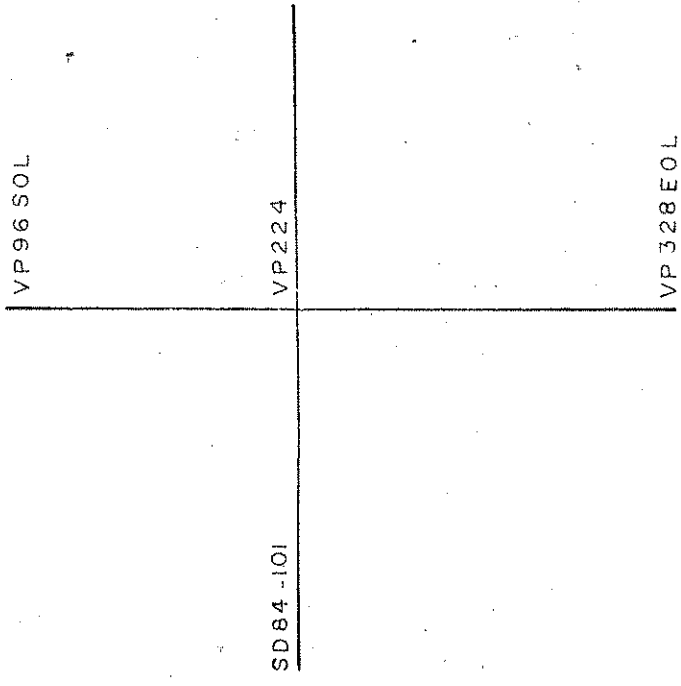

## SD84-44




## SD84-101



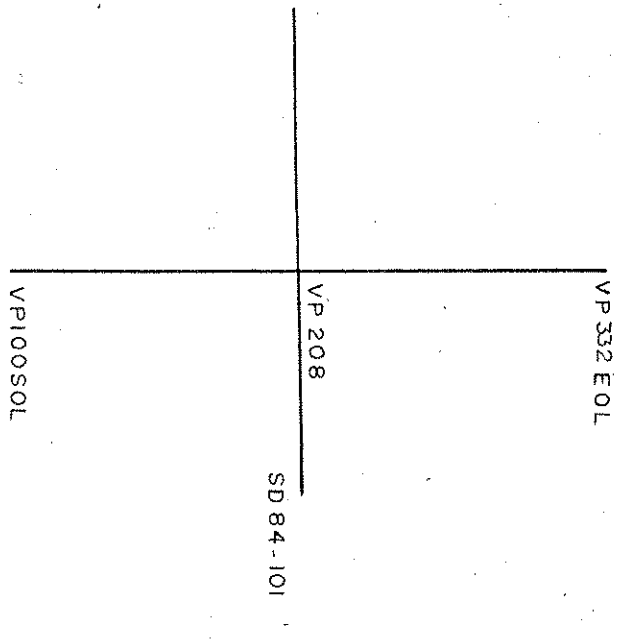

## SD84-41



APPENDIX F

# INTERSECTION DIAGRAMS

SD 84-43




SD84-45

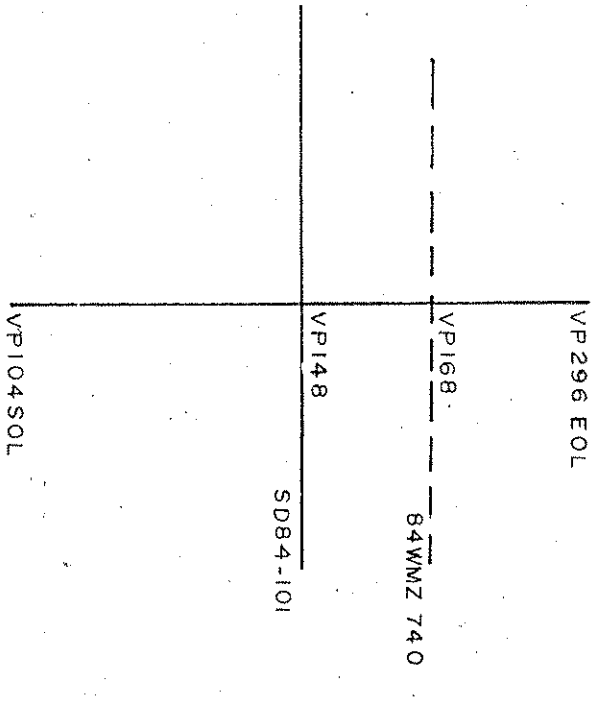


FIG. 1

# SIMPSON DESERT 1984

## LOCATION SKETCH

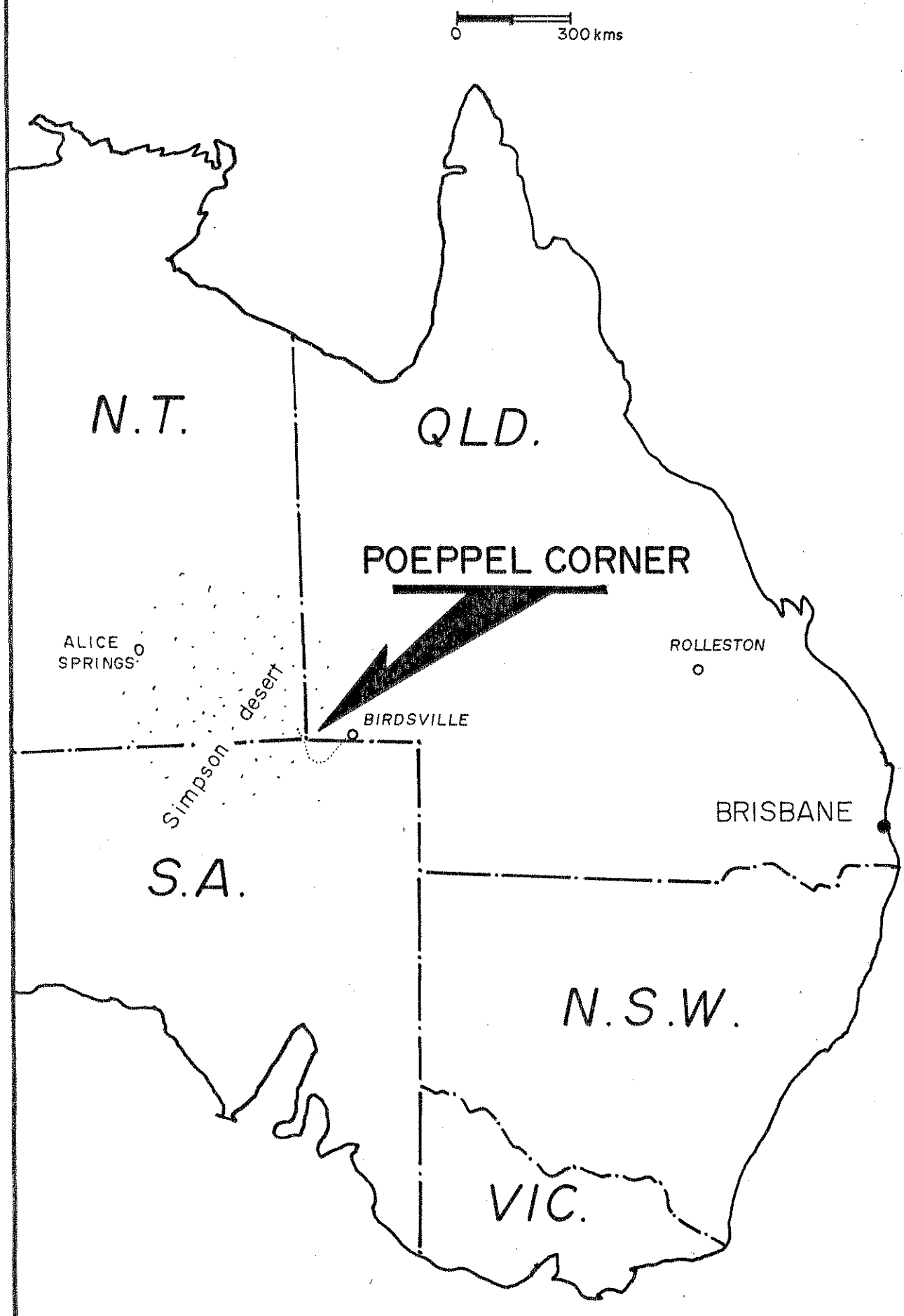


FIG. 2

# SIMPSON DESERT 1984

## SURVEY LOCATION MAP

## (O.P. 184)

1 : 250 000 approx.

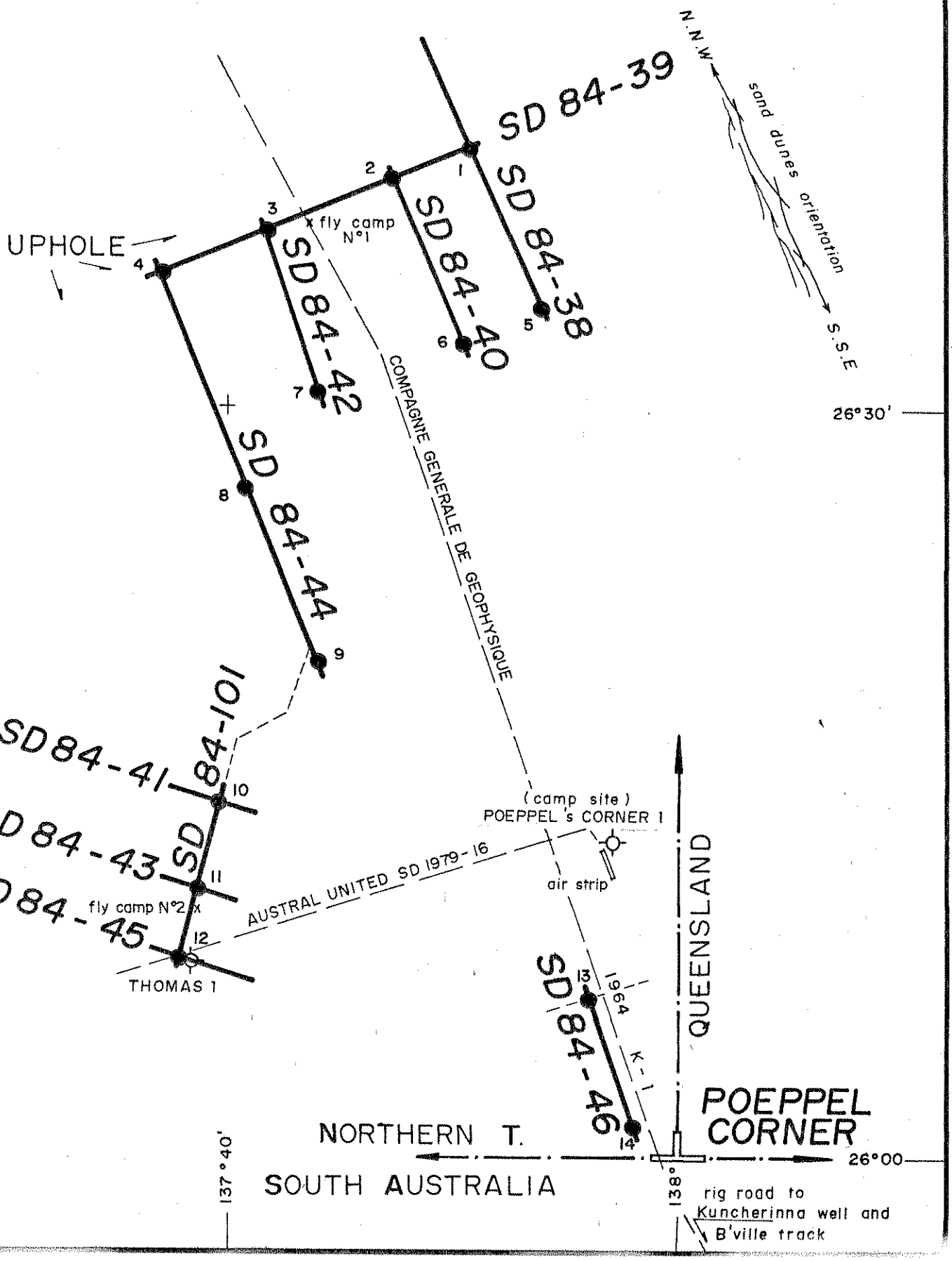
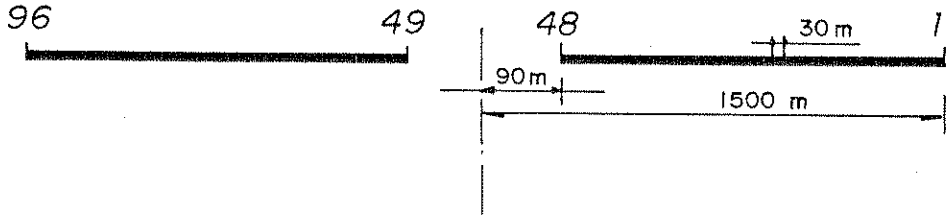


FIG. 3

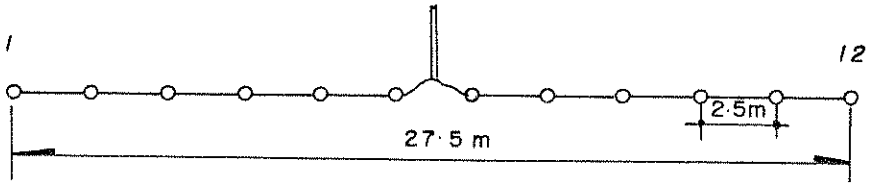
# SIMPSON DESERT 1984

## FIELD PARAMETERS

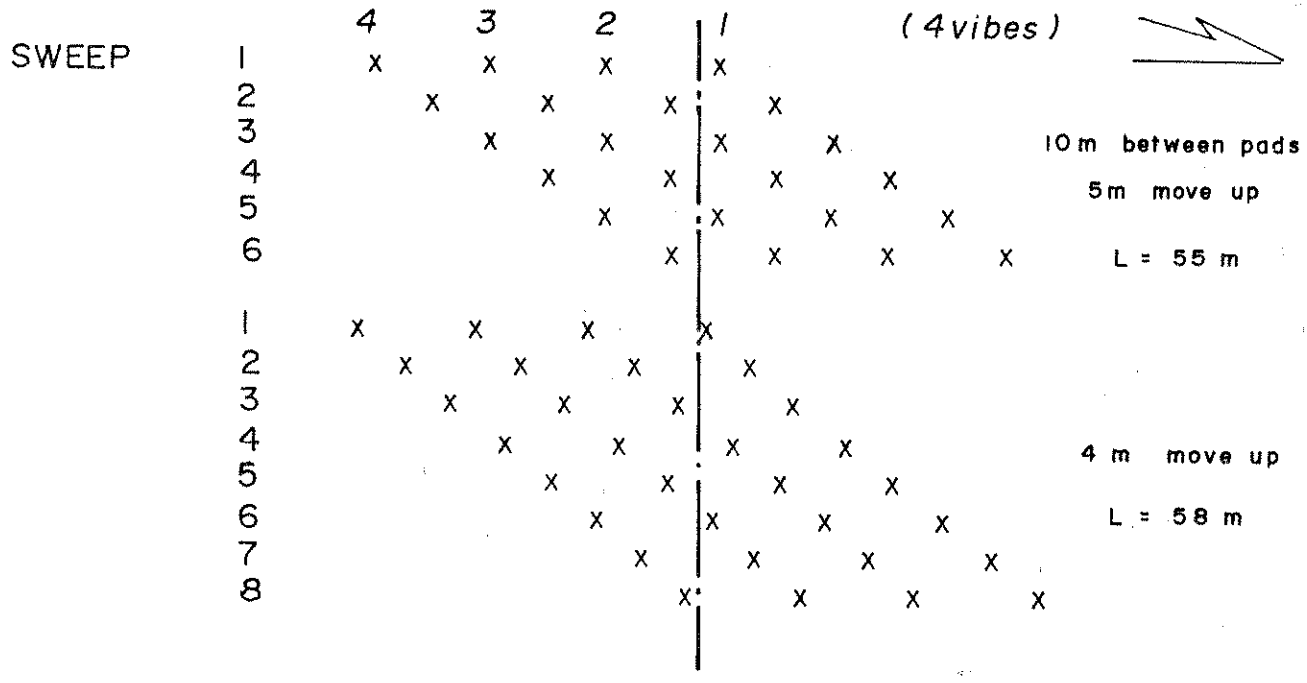
### SPREAD




### GEOPHONE ARRAY




### VIBRATOR ARRAY




arrays centred on V.P. peg

FIG. 4

# SIMPSON DESERT 1984

## UPHOLE PARAMETERS

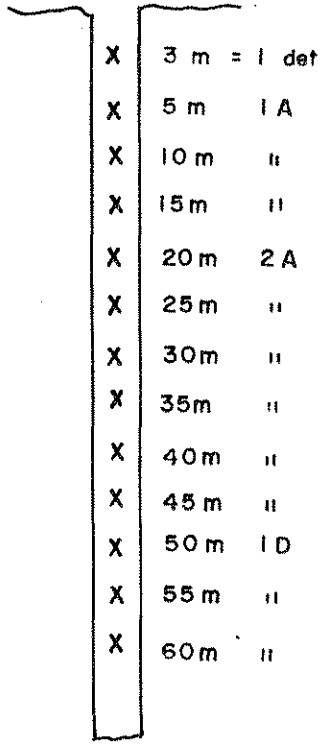
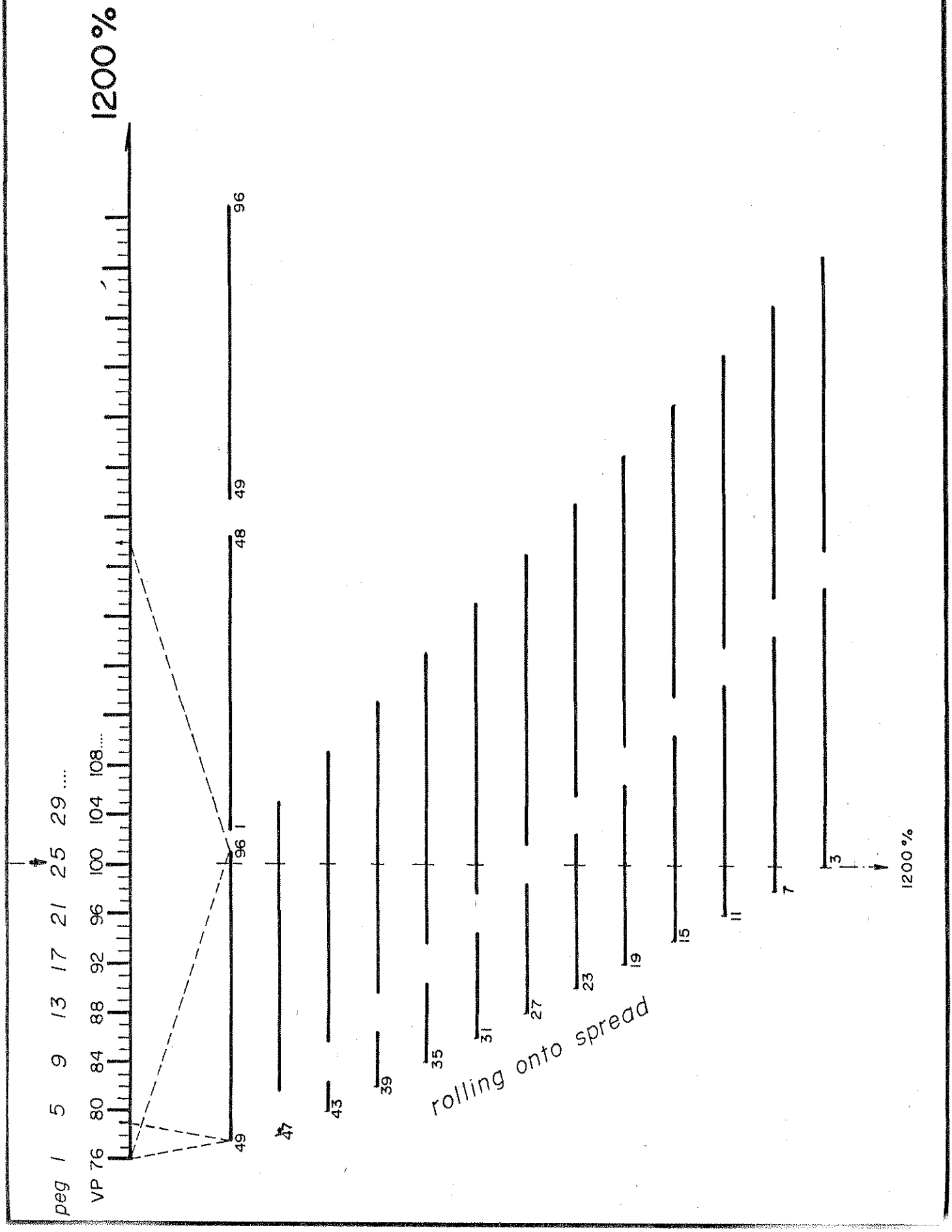


FIG. 5

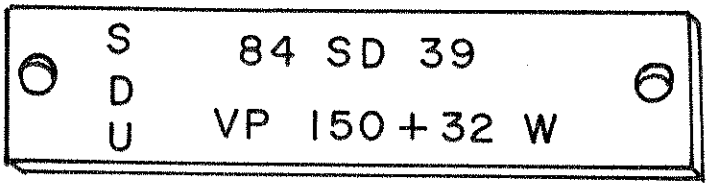
# SIMPSON DESERT 1984

## C.D.P. CHART

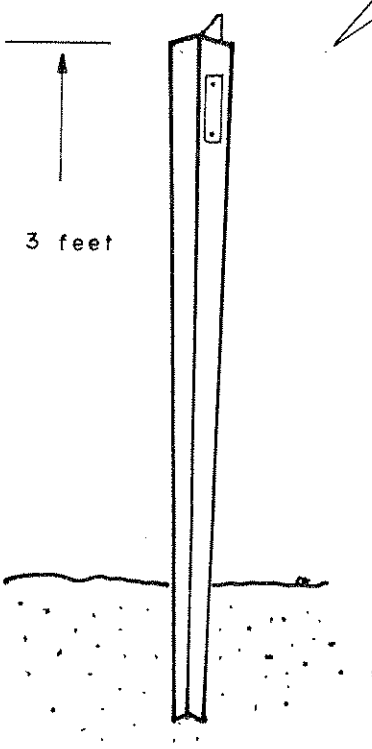


# SIMPSON DESERT 1984

## PERMANENT MARKER




aluminium tag




SDU : SEISCOM DELTA UNITED

84SD 39 : survey line number

E.O.L, S.O.L. end or start of line

I / S : intersection

VP 150 + 32 W : VP number, distance and direction to V.P.