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FIELD AREA REPORT

ON

A VIBROSEIS* REFLECTION SURVEY

FOR

INTERNATIONAL OIL PTY. LTD.

BY

SEISMOGRAPH SERVICE LIMITED

PARTY 179

CONDUCTED IN NEWHAVEN AND MOUNT ALLAN AREAS

OF OP-165

IN NORTHERN TERRITORY AUSTRALIA

BETWEEN

20TH OCTOBER AND 16TH DECEMBER 1981

*Trademark of Continental Oil Company

CONTENTS

SYNOPSIS

Magellan Petroleum Corporation assigned Seismograph Service Limited to International Oil Proprietary to undertake for International a seismic reflection survey in Licence Block OP-165 of Northern Territory, Australia. The survey was in two separate areas.

The Newhaven programme was to help define a structure which had been partially revealed by earlier surveys. The Mount Allan programme was purely speculative, based only on results of an aerial gravity survey.

Recording started on 22nd October and was completed on 16th December, 1981. The correlated field monitor records gave generally good quality data and often indicated steeply dipping horizons.

INTRODUCTION

Seismograph Service Limited Party 179 was contracted to Magellan Petroleum Corporation to undertake five months of seismic surveys in the Northern Territory. On the completion of a survey in OP-189 south east of Alice Springs, the Client assigned S.S.L. to work for their partners and operator in OP-165, International Oil Proprietary Limited.

OP-165 is to the north west of Alice Springs and covers most of the Ngalia Basin. The geology was thought to be similar to that of the Amadeus Basin further south and it was hoped that successful hydrocarbon discoveries in the Amadeus Basin would be repeated in Ngalia Basin. Some seismic work had been done in the area between 1964 and 1971.

The programme was in two parts. The Newhaven area, about 45 kilometres south west of Yuendumu and 20 kilometres north east of Newhaven Station, was a detail survey to further define a possible fault structure shown by an interpretation of old seismic lines in the area. The fault was surmised to be running east west, passing through the junction of Lines N1081-17 and 10.

The Mount Allan programme, between Mount Allan and Mount Wedge Stations, was designed to follow up a gravity high ridge that ran in a generally east west direction. The old seismic lines in the area gave a deterioration of data in the vicinity of this ridge, which was thought to be an upthrust and a possible trap.

Mr. J. Earl represented the Client on the crew for the duration of the survey. Mr. E.M. Denton, the consultant geophysicist, was present for the start of the work and the crew was visited by Mr. J. Malready of International Oil Proprietary.

TERRAIN AND LOGISTICS

Both areas were approached from Alice Springs via the road to Yuendumu. The Mount Allan prospect was immediately to the south of the road, 35 kilometres before reaching Yuendumu. To reach the Newhaven prospect, one left the main road when within sight of Yuendumu and turned south for about 18 kilometres to a good track that headed due west. The programme was just to the south of the track after about 30 kilometres.

Newhaven was recorded first and camps for the survey and recording sections were established close to the east west track mentioned above. There was good access to the lines via a system of tracks that had once been seismic lines. The area was very flat, with a ground cover of spinifex and areas of mulga.

The survey camp for Mount Allan was alongside Smith's Gift Bore and the main camp 3 kilometres further west along a minor track. Some of the seismic lines were old tracks, which gave good access to other parts of the prospect. The area was more heavily wooded than Newhaven, with only a few open areas of spinifex.

Chlorinated water was drawn from the Yuendumu town supply for the Newhaven camps. Mount Allan station allowed good water to be taken from the Smith's Gift Bore, provided the tank was topped up each time by starting the pump engine.

Food was brought from Alice Springs in an S.S.L. Bedford 4 x 4 truck. Fuel was delivered by Northern Fuels of Alice Springs. Both food and fuel were available in Yuendumu, but not in suitable quantities or at sensible prices. There was also a general store at Mount Allan Station. All spares and supplies came from Alice Springs.

Explosives were obtained from Centralian Industries and delivered to the crew by Mr. C. Freer of Alice Springs.

The crew's Administrator worked out of an office in Magellan Petroleum's premises in Alice Springs. A warehouse was rented for storage of infrequently used spares and equipment and for bulky supplies.

Labour were recruited in Alice Springs, although a few travelled from the Party's previous contract near Perth. They had a week's break after three week's work or two week's break after six week's work. Transport was usually by aircraft chartered from Chartair in Alice Springs. They flew twice per day on Tuesdays and Fridays to Yuendumu airstrip. When rain closed the strip, the Party Chief's Toyota was used for leave change transport. The aircraft and Toyota were used also for carriage of mail, small spares and supplies and fresh bread.

Staff worked for 3 weeks before taking a week off. They also travelled to Alice Springs and usually flew on to Adelaide by scheduled flights.

PERMITTING AND DAMAGES

Permitting was undertaken by the Client in advance of the crew's arrival. The Newhaven, Mount Allan and Mount Wedge stations were contacted by the Surveyors to announce the start of the survey.

One Surveyor was sent ahead of the crew to indicate the proposed positions of the lines to the Central Lands Council anthropological field party. They approved the lines and ensured that the sites of significance to the aboriginal community were not affected.

The Mount Allan prospect had two east west fence lines. The most northerly was part of the tuberculosis eradication programme on Mount Allan Station; proper hinged gates were installed where lines crossed this fence. The more southerly fence separated Mount Allan and Mount Wedge Stations; "cocky" gates were installed on this fence with a view to the fence being properly sealed at the close of the survey. Gates were erected by the Yuendumu Mining Company.

EARTHMOVING

By arrangement between the Client and Mr. Frank Baader of the Yuendumu Mining Company, a Caterpillar D6 bulldozer and a Cat 12 grader were supplied for line clearance. They made surprisingly good progress and left the lines very straight and smooth. In areas of thick mulga, the lines were too narrow to enable vehicles to pass each other without risk of damage to tyres.

At Mount Allan, the D6 broke down for the first time, with about 100 kilometres of dozer lead ahead of recording. A Caterpillar D9H was moved in for three day's work. This was arranged by the Client's resident representative.

It was supplied by Mr. D. Parks of Alice Springs. The D6 took only a day to repair and so both machines were at work for a while. They cut the thicker mulga sections on Lines N1080-2A and 3.

A number of lines were following existing tracks and only grading was required, sometimes before the recording and sometimes after it to remove traces of the vibrator pad marks.

SURVEY

White topped 0.6 metre wooden pegs were chained into position every 50 metres alongside the bulldozed track and marked with the line number and station number in felt tipped pen.

Permanent markers were set at line intersections, ends of lines and every 5 kilometres. They consisted of steel star picket fencing posts driven into the ground. They were marked with aluminium tags bolted to the tops of the markers. The tags were dye stamped with the line and station numbers. A list of permanent markers with their elevations and co-ordinates is given in Appendix A.

The bearing of a line was established by observation of the sun for azimuth at each end of the line and by measurement of the included angles along its length, using a Wild T1-A theodolite.

The theodolite and metric levelling staff were used for levelling the lines by tacheometry. Top of staff readings were taken as a check on the chaining distances.

With the succession of very hot days at Mount Allan, survey progress was limited by the number of daylight hours available before the shimmer became too bad for reliable use of a theodolite. Some traversing was done at night, using a single vehicle headlamp as an objective - this proved very speedy but was tiring for the Surveyors, being impossible to sleep during the day because of the heat.

Both co-ordinates and elevations were checked and adjusted within the survey loops and were well within tolerance, as can be seen by the horizontal and vertical loop enclosure diagrams of Enclosures 1 and 2 for Newhaven and 3 and 4 for Mount Allan.

At Newhaven, there were no trig points or bench marks near the lines, so the survey was tied into control point NP-1 of an earlier survey, with a view to this point being tied in to distant national control points at a later date if required.

The elevation of NP-1 was given as 2051.0 feet above sea level by Austral United, who were also using 1900 feet above sea level as their seismic datum. The Client wished to use 580 metres above sea level for the datum of this survey. 1900 feet converted to 579.12 metres. Thus the difference of 0.88 metres was added to the metric conversion of the elevation of NP-1.

The position of NP-1 was given in latitude and longitude, which was converted to co-ordinates in AMG using the Australian Map Grid Technical Manual. A tie was made to an aerial survey control marker which was installed by Agip during a minerals survey. Co-ordinates were not available for this marker during the Newhaven/Mount Allan survey.

At Mount Allan there was good elevation control from bench marks along the Yuendumu road. The nearest reliable horizontal controls were the trig points of West Bluff and Uldirra Hill just outside the permit boundary to the south and north respectively. The crew was not equipped to carry these co-ordinates reliably into the prospect area. Co-ordinates have been quoted relative to the old permanent marker at station 93 on Line GAI NH, on the western end of Line N1081-4.

Vibrator Point Location Maps to a scale of 1:100,000 were prepared for the two areas and are included as Enclosures 5 and 6 for Newhaven and Mount Allan respectively.

RECORDING

The main camp moved from Camel Flats in OP-189 to Newhaven in OP-165 over 20th and 21st October, 1981. Experiments were conducted over 22nd to 24th October to help determine suitable recording parameters. Production started in the afternoon of 24th October.

On 22nd October, instrument tests were carried out in the morning, followed by an unsuccessful attempt to establish parameters. Unfortunately, the stretch of Line N1081-0 chosen for the tests was found to give poor quality reflections. The Client specified a geophone pattern 1111112222221111111 with a 7 metre spacing between points, giving a total pattern length of 119 metres. This was laid on the north west end of Line N1081-8. Absolutely no reflections were apparent and it was decided to record a noise spread.

Bunched geophones were laid at 24 pegs spaced 4.3 metres apart between the production pegs 1042 and 1044. One vibrator vibrated one 16 second sweep of 50-10 Hz at every other production peg from 1044 to 1070. The correlated 24 trace monitor records were glued together to make a conventional noise spread display. The main noise events were noted as:

(a) 130 metres wavelength at 20 Hz, 2600 metres per second

(b) 74.5 metres wavelength 25 Hz, 1863 metres per second

(c) 51.6 metres wavelength 25 Hz, 1290 metres per second

It was decided that (a) and (c) would be cancelled by an in-line unweighted array with 7½ metre geophones intervals. (b) would be helped by a vibrator pattern with three vibrators

spaced 25 metres apart. A total vibrator pattern length of substantially greater than 91 metres was arbitarily chosen as 150 metres.

The weighted array had already been laid from station 1000 to 1030 and the revised, unweighted array was laid from 1031 to the end of the line.

While keeping the vibrator pattern length constant, the vibrator spacings and move-ups were altered and the results compared. The sweep frequencies were also altered. These experiments were done at VP 1029 so that the two sets of geophone patterns could be compared. The in-line geophone patterns yielded strong reflections, even if they were of rather low frequency. However, the near traces were still obscured by noise. Increasing the offset to 550 metres and vibrating end on appeared to give better records.

It was pointed out later that some of the apparently good but shallow horizons were most probably composed of refracted energy and would be edited out in the processing. A return was therefore made to split straddle spread configuration.

The geophone pattern was also reduced in length, in an effort to reduce the attenuation of the higher frequency signals.

The parameters at Mount Allan were the same as at Newhaven and seemed to work well, no further experimentation was done.

The parameters used on each section of line are tabulated in Appendix C.

A steady rate of production was soon achieved once the production recording started. The Client requested a higher daily coverage. This was only possible by working longer hours. Geophones were moved by three Toyota pick-ups, manned by a total of 9 workers and a further 3 men were engaged to move cables with a Bedford truck. Only on rare occasions, such as leave change days, were there delays awaiting geophones ahead of the vibrators.

For all lines, the data from the geophones was amplified and digitised by the Sercel 338 HR, summed in the Addit III and then dumped at the end of each VP back into the Sercel for formatting and recording onto $\frac{1}{2}$" tapes in SEG B phase encoded mode. A tape format diagram is enclosed (Enclosure 7).

Equipment performance was checked by recording a set of instrument tests and checking the phase relationship between the vibrator base plate displacements and the recording truck reference sweep before production each day. The summing and noise reject functions were continuously monitored on a trace sequential oscilloscope display and correlated monitor records were produced for 24 trace of every VP recorded.

Although it was generally very hot and dry, there were periods of rain, one of them near the end of the survey losing a whole day while the line dried out.

WEATHERING CONTROL

The weathering control was provided by means of continuous coverage refraction recording. Eight 12 trace cables were supplied. Each had six takeouts spaced 50 metres apart. They were intended to be laid along the line with one takeout per station and a dynamite shot fired at every 6th station into a straddle spread of 24 stations. Each station had one SM4 10 Hz geophone planted a few inches under the surface.

To successfully use the summation method and deduce accurate statics for each station from shots fired within the weathered layer, it is necessary to have reciprocal ray paths. This was only possible by overlapping the cables at each point i.e. having one shot every five stations with two takeouts and geophones laid there (one from each of the two cables which met at the shot point).

The technique was further modified by shooting end on into the 24 trace spread to ensure that the deeper refractors were being detected. Two holes were drilled and loaded every 10th station, one to be shot into the forward spread and one into the back spread.

The records were made on dry write paper by a 24 trace OYO TR7 seismic amplifier and Fieldgraph-32 oscillograph.

Holes were air drilled to 3 metres by a Scott 250 rig supplied by Gorey and Cole of Alice Springs. They were preloaded with 2 kilogrammes of ICI Anzite Blue explosive. Difficulty was often experienced in obtaining enough explosive from the usual supplier in Alice Springs, and alternatives were sometimes bought from mines in Northern Territory. Consequently AN-60 and Molanite were sometimes used. The Molanite was very difficult to use and the AN-60 lost its efficiency if rain water gathered in the hole.

Two days were spent getting the newly delivered equipment into commission and the field technique established.

COMPUTING

No computing was done on the crew. The paper records from the weathering control unit were anotated and filed by line number before despatch to Seismic Data Processors in Sydney.

It was understood that they were to forward them to statics computing specialists in Canada. There was also the possibility of using the vibroseis records for further statics information.

CONCLUSIONS AND RECOMMENDATIONS

The record quality was generally good, with indications of steeply dipping reflectors. There were reflections down to $2\frac{1}{2}$ seconds, with very occasional reflections appearing as deep as 4 seconds. The deepest reflector usually seen was thought to be the base of the Mount Doreen or the top of the Vaughan Springs series. Earlier surveys have also detected the occasional deeper reflections which were then surmised to be within the Vaughan Springs and of little interest. The area is well known for large velocity variations. Provided that reliable static corrections can be generated, good sections should be obtainable.

The equipment performed reliably during the contract and was well suited to the terrain.

If any further work is anticipated in OP-165, it is recommended that survey control be extended into the programme area by contract surveyors who are equipped for this task. Meanwhile, it would be dangerous to base a future survey on the lines recently completed as there may well be block adjustments necessary to correct the co-ordinates or, in the case of Newhaven, the elevations. The survey is good within itself, with very small misclosures.

The weathering control unit was large and cumbersome, involving 7 people and four vehicles at any time. It would be interesting to see the results of the statics corrections computations and decide if the effort has been worthwhile.

In areas of thick mulga, it would have been better if the bulldozer had made double width lines to allow vehicles to pass each other without detouring into the bush.

There were many punctures, many of them writing off new tyres. The areas of burnt mulga were the worst, as the wood became harder.

R.K. Abbott
Party Chief

K.A. Potts
Supervisor Australia

M.5209
6th May, 1982.
MWC/JH

DISTRIBUTION

International Oil Proprietary	5 Copies
Magellan Petroleum Corporation	5 Copies
Seismograph Service Limited, Holwood	1 Copy
Seismograph Service Limited, Adelaide	1 Copy

LIST OF APPENDICES AND ENCLOSURES

PERMANENT MARKERS (Newhaven)

Line	Stn. No.	Elevation	Easting	Northing
N1081-06				
S.O.L.	996	628.76	744 403	7 515 597
	1000	628.40	744 591	7 515 527
Int. 6/17	1016	625.98	745 341	7 515 249
	1100	618.03	749 282	7 513 792
Int. 6 & 19	1176 + 28 m	612.12	752 874	7 512 473
E.O.L.	1197	609.26	753 833	7 512 120
N1081-08				
S.O.L.	1000	622.69	733 864	7 515 282
Int. 8 & 13	1016	623.36	734 611	7 514 997
	1059	623.48	736 620	7 514 321
	1100	623.61	738 536	7 513 500
Int. 8 & 15	1120 + 14 m	622.81	739 484	7 513 139
	1200	618.76	743 210	7 511 720
Int. 8 & 17	1216 + 23 m	617.78	743 979	7 511 427
	1300	610.16	747 881	7 509 938
Int. 8 & 19	1377 + 33 m	606.51	751 507	7 508 553
E.O.L.	1398	606.53	752 456	7 508 189
N1081-10				
S.O.L.	996	611.45	732 012	7 511 433
	1000	611.45	732 485	7 511 271
Int. 10/13	1016	612.59	733 242	7 511 012
	1087	612.37	736 601	7 509 860
	1100	612.07	737 214	7 509 644
Int. 10/15	1119 + 7 m	611.74	738 116	7 509 323
	1200	608.92	741 924	7 507 966
Int. 10/17	1215 + 24 m	608.26	742 653	7 507 706
	1300	602.05	746 633	7 506 284
Int. 10/19	1377 + 2 m	600.85	750 258	7 504 977
	1394	600.88	-	-
E.O.L.	1398	599.67	751 243	7 504 619
N1081-12				
S.O.L.	1000	591.08	736 748	7 500 886
Int. 12/17A	1020	592.78	736 140	7 501 680
Int. 12/15A	1077 + 40 m	597.35	734 388	7 503 968
	1100	598.94	733 709	7 504 853
Int. 13/12	1158 + 28 m	602.37	731 925	7 507 176
E.O.L.	1179	603.56	731 303	7 507 987

Line	Stn. No.	Elevation	Easting	Northing
N1081-13				
S.O.L.	996	599.86	731 600	7 506 230
Int. 13/12	1016	602.37	731 925	7 507 176
Int. 13/10	1098 + 44 m	612.59	733 242	7 511 012
	1100	612.90	733 289	7 511 148
Int. 13/8	1181 + 20 m	623.36	734 611	7 514 997
E.O.L.	1202	625.89	734 946	7 515 971
N1081-14				
S.O.L.	1000	586.34	734 256	7 499 028
Int. 14/17A	1020	588.06	733 655	7 499 827
Int. 14/15A	1078 + 21 m	591.86	731 899	7 502 160
	1100	592.74	731 252	7 503 024
	1200	597.02	728 255	7 507 026
E.O.L.	1220	598.13	727 655	7 507 826
N1081-15				
S.O.L.	1000	599.86	736 500	7 504 804
Int. 15/15A/16	1020	602.37	736 836	7 505 746
Int. 15/10	1096	611.74	738 116	7 509 323
	1100	612.01	738 183	7 509 511
Int. 15/8	1177 + 4 m	622.81	739 484	7 513 139
E.O.L.	1197	625.65	739 752	7 513 888
N1081-16				
S.O.L.	974	592.86	739 906	7 501 625
	1000	595.40	739 130	7 502 668
Int. 16/17A	1020	597.21	738 533	7 503 470
Int. 16/15A/15	1076 + 37 m	602.37	736 836	7 505 746
	1100	604.77	736 141	7 506 678
E.O.L.	1105	605.25	735 991	7 506 879
N1081-17				
S.O.L.	996	601.78	741 756	7 505 177
Int. 17/17A	1016	604.09	742 090	7 506 120
Int. 17/10	1049 + 33 m	608.26	742 653	7 507 706
	1100	614.39	743 498	7 510 077
Int. 17/8	1128 + 33 m	617.78	743 979	7 511 427
	1200	625.00	745 177	7 514 787
Int. 17/6	1209 + 40 m	625.98	745 341	7 515 249
E.O.L.	1230	627.53	745 680	7 516 200
N1081-17A				
S.O.L.	1003	587.05	732 973	7 499 319
Int. 17A/14	1020	588.06	733 655	7 499 827
Int.17A/12	1082	592.78	736 140	7 501 680
	1100	594.36	736 861	7 502 220

Line	Stn. No.	Elevation	Easting	Northing
Int. 17A/16	1141 + 39 m	597.22	738 533	7 503 470
	1200	601.45	740 867	7 505 209
Int. 17A/17	1230 + 26 m	604.09	742 090	7 506 120
E.O.L.	1250	605.15	742 871	7 506 703
N1081-19				
S.O.L.	980	596.88	749 578	7 503 018
	1000	600.17	749 906	7 503 962
Int. 19/10	1021 + 24 m	600.85	750 258	7 504 977
Int. 19/8	1097 + 12 m	606.51	751 507	7 508 553
	1100	605.83	751 552	7 508 683
Int. 19/6	1180 + 13 m	612.12	752 875	7 512 473
	1195	614.23	-	-
E.O.L.	1202	614.76	753 233	7 513 499
PERMANENT MARK (Mount Allan)				
N1081-1				
S.O.L.	1000	605.90	180 644	7 508 684
Int 1 & 2A	1020	614.40	180 645	7 509 684
	1100	633.98	180 694	7 513 683
	1200	622.80	180 879	7 518 679
E.O.L.	1258	629.67	180 987	7 521 577
NI081-2				
S.O.L.	1000	588.59	210 885	7 499 058
Int 2 & 9	1020	588.86	211 888	7 499 070
Int 2 & 2A	1036	589.12	212 687	7 499 079
	1100	587.54	215 882	7 499 121
Int 2 & 11	1185 + 46	586.62	220 175	7 499 188
E.O.L.	1206	585.37	221 180	7 499 203
NI081-3				
S.O.L.	1009	577.78	190 514	7 488 752
Int 3 & 4A	1108	585.21	190 412	7 494 151
	1200	591.61	190 323	7 498 753
	1300	600.46	190 226	7 503 756
Int 3 & 2A	1355 + 3	604.61	190 177	7 506 510
	1400	608.01	190 136	7 508 757
	1500	615.16	190 044	7 513 756
E.O.L.	1574	626.92	189 975	7 517 455
NI081-2A				
E.O.L.	1000	617.91	179 698	7 510 004
Int 1 & 2A	1020	614.14	180 645	7 509 684
	1100	608.50	184 438	7 508 413
	1200	605.19	189 183	7 506 839

Line	Stn. No.	Elevation	Easting	Northing
Int 2A & 3	1220 + 43	604.60	190 173	7 506 510
	1300	602.87	193 926	7 505 268
Int 2A & 5	1321 + 17	602.09	194 939	7 504 933
	1400	604.16	198 671	7 503 704
Int 2A & 7	1460 + 13	594.90	201 529	7 502 758
	1500	593.49	203 416	7 502 134
	1600	591.07	208 164	7 500 566
Int 2A & 9	1678 + 17	589.58	211 884	7 499 338
Int 2A & 2	1694 + 47	589.12	212 687	7 499 079
E.O.L.	1715	588.02	213 877	7 498 686
NI081-4				
S.O.L.	1000	576.29	198 810	7 490 292
Int 4 & 4A	1020 + 3 m	576.72	199 813	7 490 312
Int 4 & 7	1058 + 15	574.41	201 726	7 490 351
	1100	572.30	203 810	7 490 388
	1200	571.42	208 809	7 490 477
Int 4 & 9	1263 + 15	570.74	211 974	7 490 527
	1300	571.19	213 810	7 490 556
Int 4 & 11	1420 + 2	568.96	219 814	7 490 640
E.O.L.	1440	569.11	220 812	7 490 650
NI081-4A				
S.O.L.	1000	586.85	181 714	7 497 724
	1100	586.94	186 340	7 495 826
	1200	584.64	190 965	7 493 927
Int 4A & 3	1188 + 3	585.22	190 412	7 494 154
Int 4A & 5	1293 + 17	581.41	195 286	7 492 156
	1300	580.94	195 594	7 492 031
Int 4A & 4	1391	576.71	199 813	7 490 312
E.O.L.	1407	575.40	200 554	7 490 010
NI081-5				
S.O.L.	1000	576.21	195 365	7 489 131
Int 4A & 5	1060 +26	581.41	195 286	7 492 156
	1100	583.79	195 233	7 494 130
	1200	593.19	195 096	7 499 130
	1300	601.33	194 961	7 504 129
Int 2A & 5	1316 + 3	602.09	194 939	7 504 933
	1400	608.88	194 836	7 509 129
E.O.L.	1430	611.89	194 800	7 510 628
N1081-7				
S.O.L.	992	572.52	201 742	7 489 306
Int 4 & 7	1012 + 45	574.41	201 727	7 490 350
	1100	580.21	201 664	7 494 704
	1200	588.21	201 584	7 499 704
Int 7 & 2A	1261 + 4	594.80	201 531	7 502 757
E.O.L.	1430	620.04	201 384	7 511 202

Line	Stn. No.	Elevation	Easting	Northing
NI081-9				
S.O.L.	1002	569.57	211 984	7 489 622
Int 9 & 4	1020 + 5	570.74	211 974	7 490 527
	1100	578.44	211 933	7 494 521
Int 9 & 2	1190 + 46	588.86	211 888	7 499 068
Int 9 & 2A	1196 + 15	589.58	211 886	7 499 337
	1200	589.84	211 884	7 499 522
Int 9 & Road	1301 + 2	602.24	211 828	7 504 574
E.O.L.	1360	609.12	211 794	7 507 521
NI081-11				
S.O.L.	1000	567.69	219 772	7 489 637
	1020 + 4	568.96	219 814	7 490 640
	1100	574.66	219 983	7 494 634
Int 11 & Road	1178	584.40	220 149	7 498 534
Int 11 & 2	1191 + 5	586.62	220 177	7 499 188
	1200	586.96	220 196	7 499 633
	1300	598.31	220 405	7 504 629
E.O.L.	1366	604.83	220 543	7 507 926

CO-ORDINATES

Co-ordinates for this prospect are based on the A.M.G.

CO-ORDINATE GRID with CENTRAL MERIDIAN 135°

ZONE 53

The start co-ordinates have been scaled off from Smiths Gift Bore in latitude and longitude and converted to E and N by applying a geographic to grid transformation.

ELEVATIONS

Elevations are based on a tie between 2 Government bench marks BM EQ-33 and EQ-35.

The elevations are in the A.H.D. and all loops close well within the stipulated accuracy of 0.1 K in metres.

K = Kilometres of loop

WELLS AND OLD PERMANENT MARKS

Mount Allan Prospect

Line	Number	Elevation	Eastings	Northings
NIO81-2	Well No. 80	589.02	213 392	7 499 089
NIO81-7	Well Midway 0	-	201 451	7 507 301
	PM M5	-	201 460	7 506 798
	PM M10	-	201 469	7 506 294
	Well MRD 20	-	201 468	7 505 718
	Well MRD 4	-	201 519	7 503 418
	PM M45	-	201 531	7 502 760
NIO81-5	Y 180 Rd Well 133 1 GA1 Stn	-	195 178	7 496 185
	PM NH 93	595.38	195 067	7 500 191
NIO81-11	Well		220 243	7 500 742

RECORDING PARAMETERS

Appendix C

OP-165 - Newhaven

Line	VP's	Spread (m)	Fold	Vibrator Pattern	Sweep Hz.	Filters Lo	Filters Hi	Geophone Pattern Geo No.	Geophone Pattern /Spacing	Geophone Pattern /Weight	50Hz Notch
N10 81-08	1001-1027	1400-250-0 -250-1400	12	A	60-10Hz 16 s	8	62.5	24	7m	A*	In
-08	1029-1041	"	"	B	60-16Hz 16 s	"	"	"	"	linear	"
-08	1043 B*	2600-250-0	"	B	"	"	"	"	"	"	"
-08	1045-1065	1400-250-0 -250-1400	"	B	"	"	"	"	"	"	"
-08	1052-1054	2600-250-0	"	B	"	12.5	"	"	"	"	"
-08	1056-1180	2900-550-0	"	B	"	"	"	"	"	"	"
-08	1182-1184	"	"	C	"	"	"	"	"	"	"
-08	1186-1318	"	"	D	"	"	"	"	"	"	"
-08	1320-1328	"	"	C	"	"	"	"	"	"	"
	1328-1363	"	"	B	"	"	"	"	"	"	"
N10 81-06	1174-1102	2900-550-0	12	B	60-16Hz 16 s	12.5	62.5	24	7m	linear	In
	1100-1096	"	"	D	"	"	"	"	"	"	"
	1094- 996	"	"	B	"	"	"	"	"	"	"
N10 81-19	1202-1015	0-550-2900	12	B	60-16Hz 16 s	12.5	62.5	24	7m	linear	In

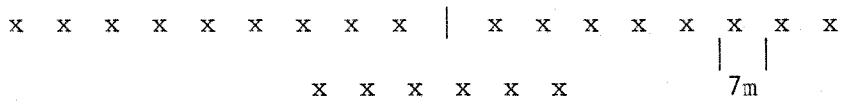
Line	VP's	Spread (m)	Fold	Vibrator Pattern	Sweep Hz.	Filters Lo	Filters Hi	Geophone Pattern Geo No./Spacing/Weight			50Hz Notch
N10 81-10	1374-1300	2900-550-0	12	B	60-16Hz 16 s	12.5	62.5	24	7m	linear	In
-10	1302-1232	2600-250-0	"	B	"	"	"	"	"	"	"
-10	1230-1222	"	"	D	"	"	"	"	"	"	"
-10	1220- 996	"	"	B	"	"	"	"	"	"	"
N10 81-13	1021-1030	0-250-2600	12	B	60-16Hz 16 s	12.5	62.5	24	4m	linear	In
-13	1032-1044	"	"	D	"	"	"	"	"	"	"
-13	1046-1193	"	"	B	"	"	"	"	"	"	"
N10 81-15	1192-1004	1450-300-0 -300-1450	12	B	60-16Hz 16 s	12.5	62.5	24	7 C*	C*	In
N10 81-15A	1004-1158	"	"	B	"	"	"	"	"	"	"
N10 81-14	1215-1003	"	"	B	"	"	"	"	"	"	"
N10 81-12	1174-1004	1450-300-0 -300-1450	12	B	60-16Hz 16 s	12.5	62.5	24	7 C*	C*	In
N10 81-17A	1003-1245	"	"	B	"	"	"	"	"	"	"
N10 81-16	979-1101	"	"	B	"	"	"	"	"	"	"
N10 81-17	1001-1229	"	"	B	"	"	"	"	"	"	"

OP-165 - Mount Allan

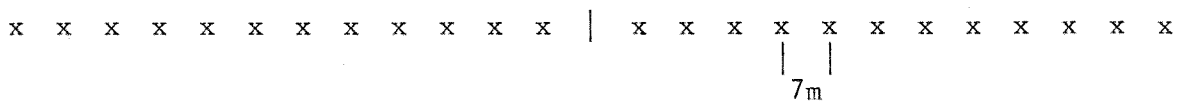
Line	VP's	Spread (m)	Fold	Vibrator Pattern	Sweep Hz.	Filters Lo	Filters Hi	Geophone Pattern Geo No./Spacing/Weight			50Hz Notch
N10 81-07	1429-1001	1450-300-0 -300-1450	12	B	60-16Hz 16 s	12.5	62.5	24	7 m	linear	Out
N10 81-04	1000-1438	"	"	B	"	"	"	1111122332211111	"	"	"
N10 81-11	1000-1366	"	"	B	"	"	"	"	"	"	"
N10 81-02	1206-1000	"	"	B	"	"	"	"	"	"	"
N10 81-02A	1715-1001	"	"	B	"	"	"	"	"	"	"
N10 81-01	1000-1258	"	"	B	"	"	"	"	"	"	"
N10 81-03	1560-1010	"	"	B	"	"	"	"	"	"	"
N10 81-04A	1000-1406	"	"	B	"	"	"	"	"	"	"
N10 81-05	1000-1218	"	"	B	"	"	"	"	"	"	"
N10 81-09	1360-1002	"	"	B	"	"	"	"	"	"	"

NOTES:

A* From peg 1000 to peg 1030 the following pattern was used : Total 119 metres

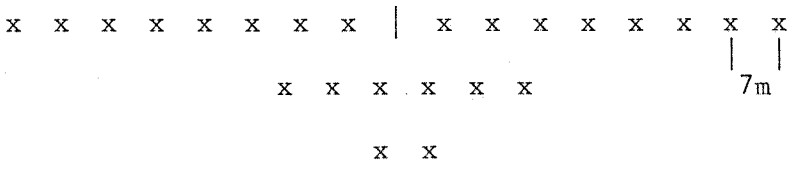


From peg 1031 onwards the following pattern was used : Total 161 metres



B* V.P. 1043 experimental end on shot, as a result of which, 1052 to 1065 was reshot end on.

C* From peg 1163 (SOL 81-15) the following pattern was used : Total 105 metres



Vibrator Pattern Code:

A = 3 vibs, spaced 25 m pad to pad, 13m moveup, 8 sweeps per VP total pattern 141 metres
B = 3 vibs, spaced 30 m pad to pad, 13m moveup, 8 sweeps per VP total pattern 151 metres
C = 2 vibs, spaced 30 m pad to pad, 13m moveup, 8 sweeps per VP total pattern 121 metres
D = 3 vibs, spaced 30 m pad to pad, 13m moveup, 12 sweeps per VP total pattern 203 metres

EQUIPMENT

4	Failing Y900 Vibrators on International 6 x 6 Paystar 5000s
1	Bedford 4 x 4 Recording Truck
2	Bedford 4 x 4 Workshop Trucks
2	Bedford 4 x 4 Water Trucks
3	Bedford 4 x 4 Load Carriers
2	Toyota 4 x 4 Hard Top Vehicles (1 Additional)
10	Toyota 4 x 4 Pick Ups (2 Additional)
1	Toyota 4 x 4 L.V.L. Recording Truck
1	Car (for Administrator)
1	Stores Trailer
1	Mess Trailer
1	Kitchen Trailer
2	Shower Trailers
2	Office Trailers
2	Toilet Trailers
2	Static Water Tank Trailers
1	Observer's Workshop Trailer
1	Mess/Kitchen Trailer
1	Sercel 338 HR Digital Recording System, 48 trace
1	Input/Output Rotalong Switch
1	SDW 400 Electrostatic Oscillograph, 48 trace
1	Addit III Digital Compositor
1	Quantum Coreelator, 24 trace
1	Pelton Sweep Encoder
5	Pelton Advance 1 Mk IV Vibraator Electronics (1 Additional)
14	VHF Fadios (2 Additional)
25	110 Conductor C.D.P. Cables, 48 trace, 100 metres intervals
2304	Geophones in strings of 12, SM4, 10 Hz
1	OYO Refraction Amplifier/Blaster/Oscillograph System, 24 trace
8	Spread Cables, 12 trace (property of International Oil)
2	Wild T.1A Theodolites
6	S.S.B. Radios (2 Additional)

STATISTICS

Survey Dates	17th October 1981 - 5th December
C.L.C. Dates	4th October - 16th October
Recording Dates	22nd October - 16th December
Days Production Recording	48½
Days Experimental Recording	3
Days Camp Move	4
Days Lost due to Rain	1
Days Instrument Tests	½
Recording Hours	508.05
Travel Hours (including camp moves)	104.05
Total Contractual Hours	612.10
Standby Hours	10.00
Kilometres Vibrated	346.35
V.P.'s Vibrated	3442
Sweeps Vibrated	27652
Sweeps per Recording Hour	54.43
V.P.'s per Production Day	71
Weathering Control Shots (with OYO)	983
Weathering Control Shots (with Sercel)	221

LIST OF PERSONNEL

Technical Staff (includes leave reliefs and replacements)

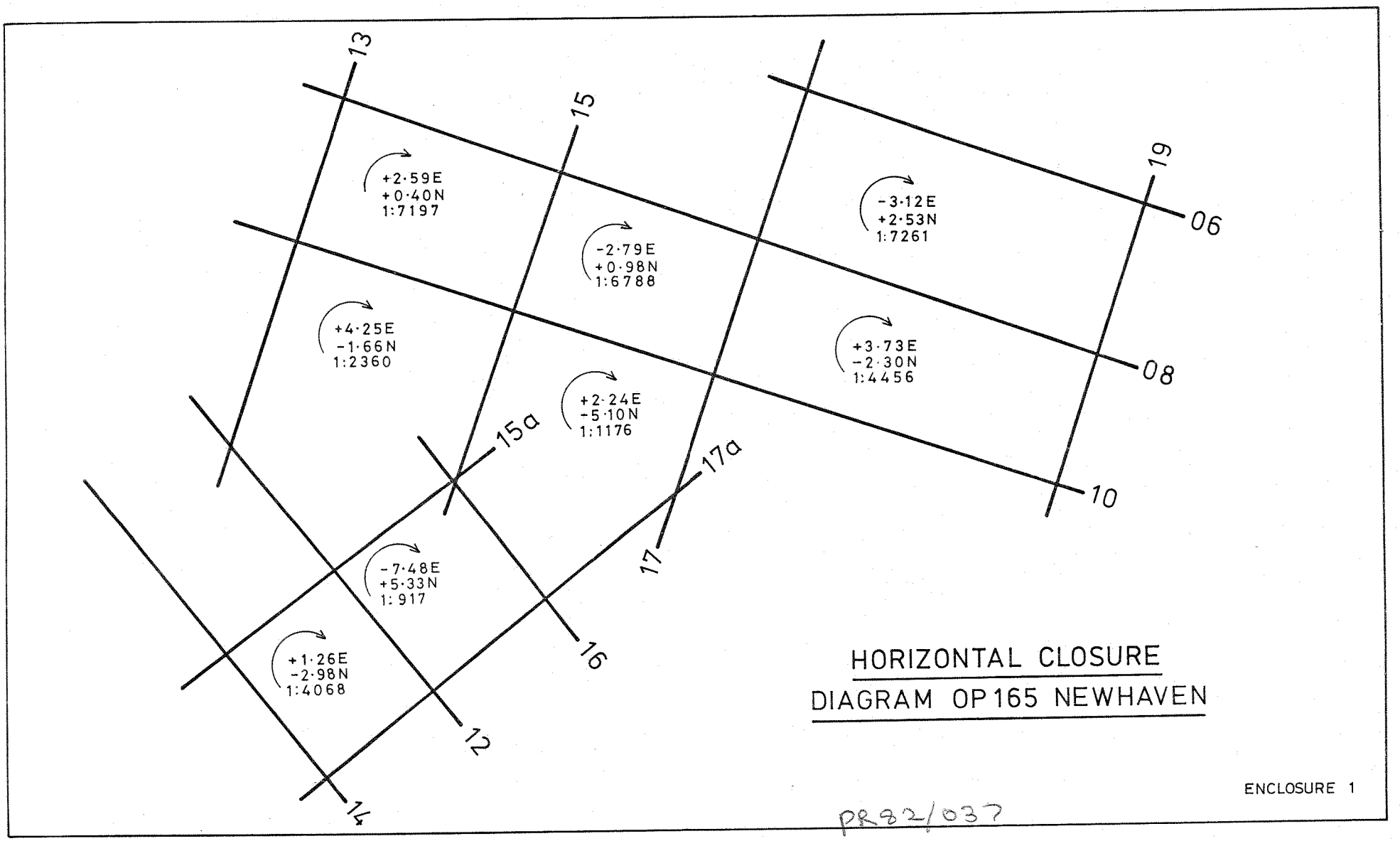
Party Chief	R.K. Abbott
Computer/Deputy Party Chief	S. Wright I. Donnelly
Assistant Computer	A. Oldham T. Perrin
Observers	K.C. Filer M.T. Jenkins
Assistant Observers	P. Spragg A. Colquhoun
Technical Assistants	P.C. Harris M. Small
Mechanics	R. Provis F.B. Vitnell J.C. Timbrell
Surveyors	P.D. Skelton D. Armstrong G.D. Leith
Administrator	A. Bauer

Auxiliary Staff:

Cooks	2
Cook's Assistants	2
Vibrator Operators	5
Drivers	6
Utility Workers	12
Survey Labour	4
Refraction Crew	6
Mechanic's Assistant	1

Additional to Contract and not paid for by Client:

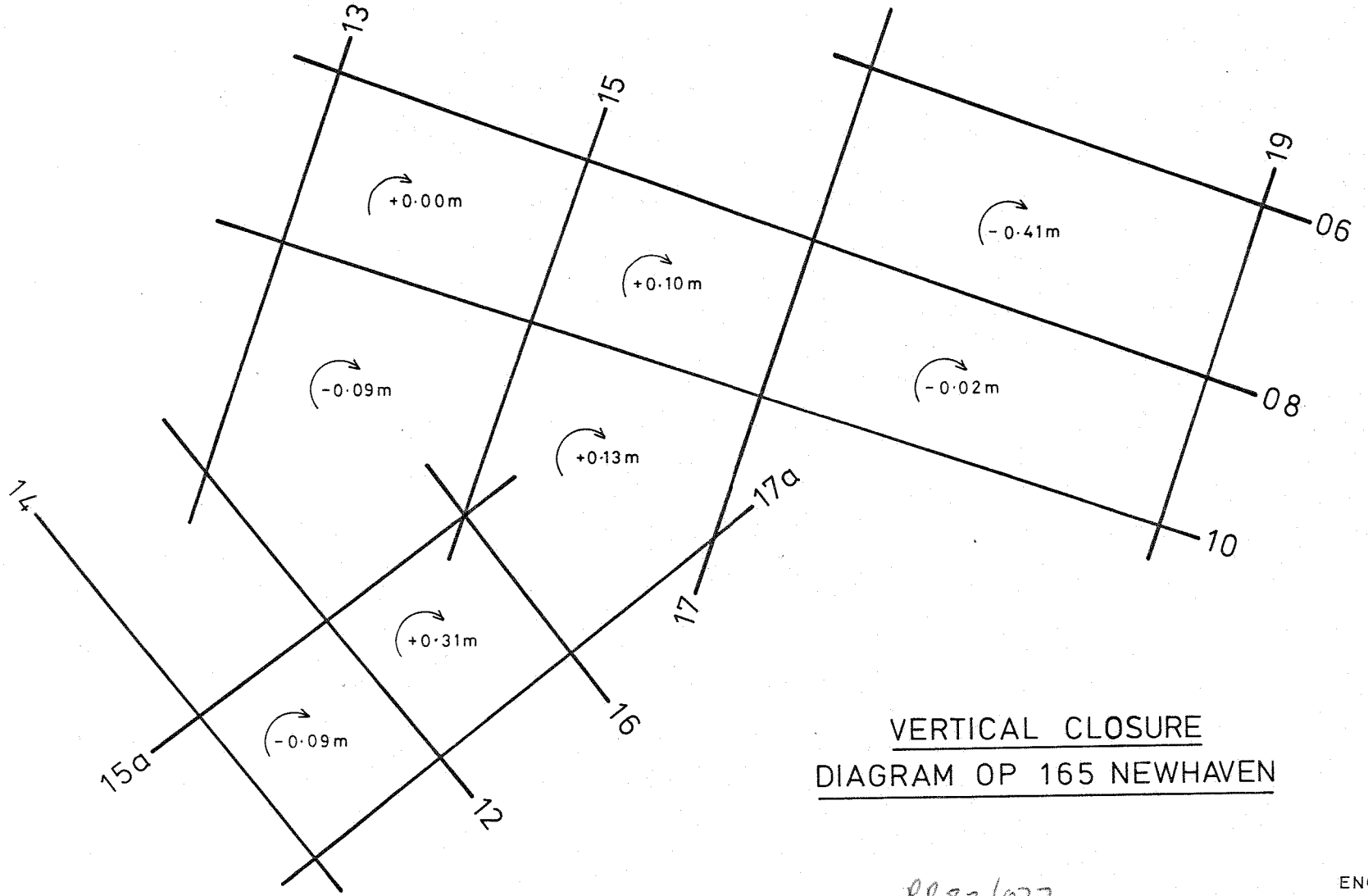
Administrative Assistant	R. Lenehan



HORIZONTAL CLOSURE
DIAGRAM OP165 NEWHAVEN

ENCLOSURE 1

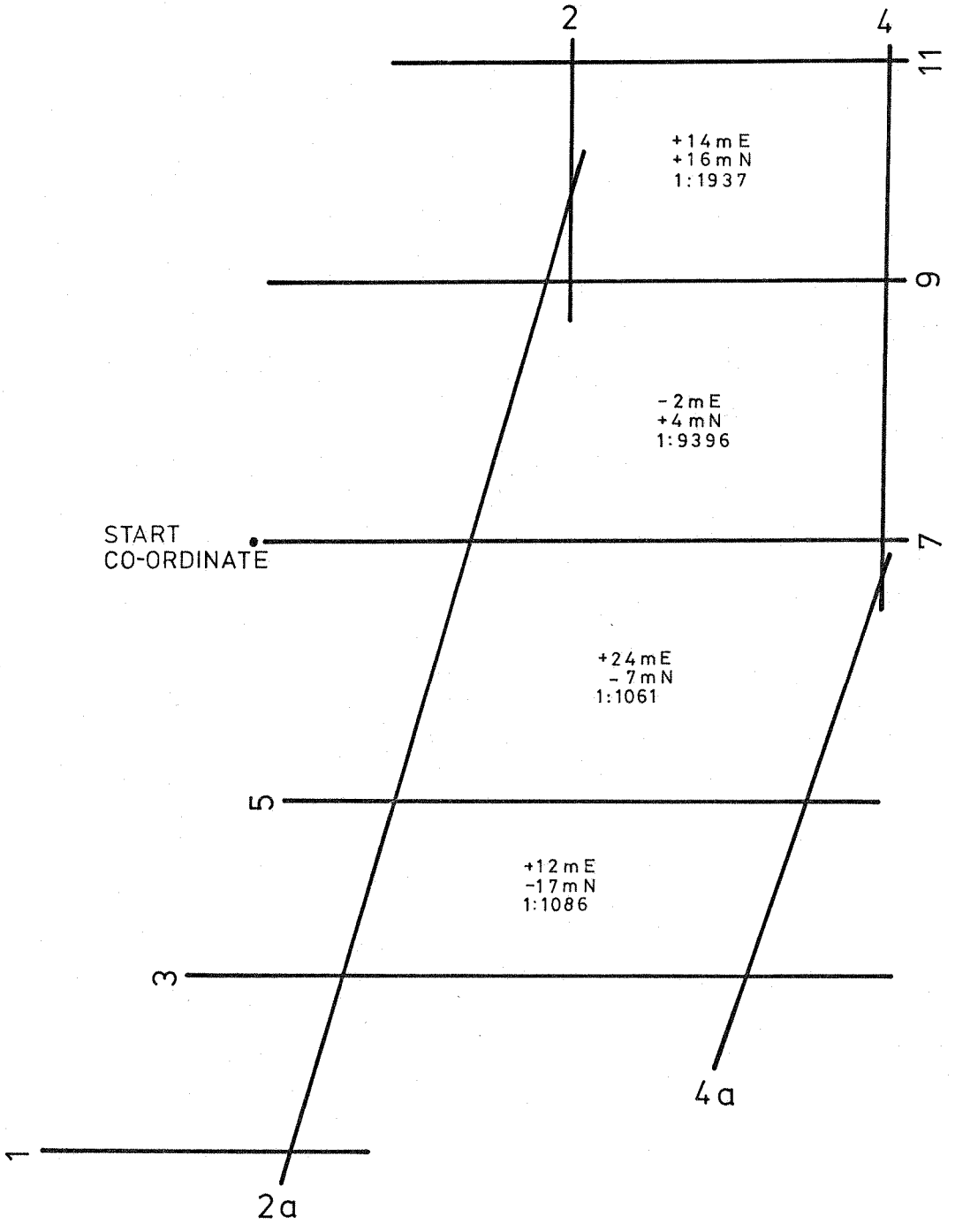
PR82/037



VERTICAL CLOSURE
DIAGRAM OP 165 NEWHAVEN

PR82/037

ENCLOSURE 2



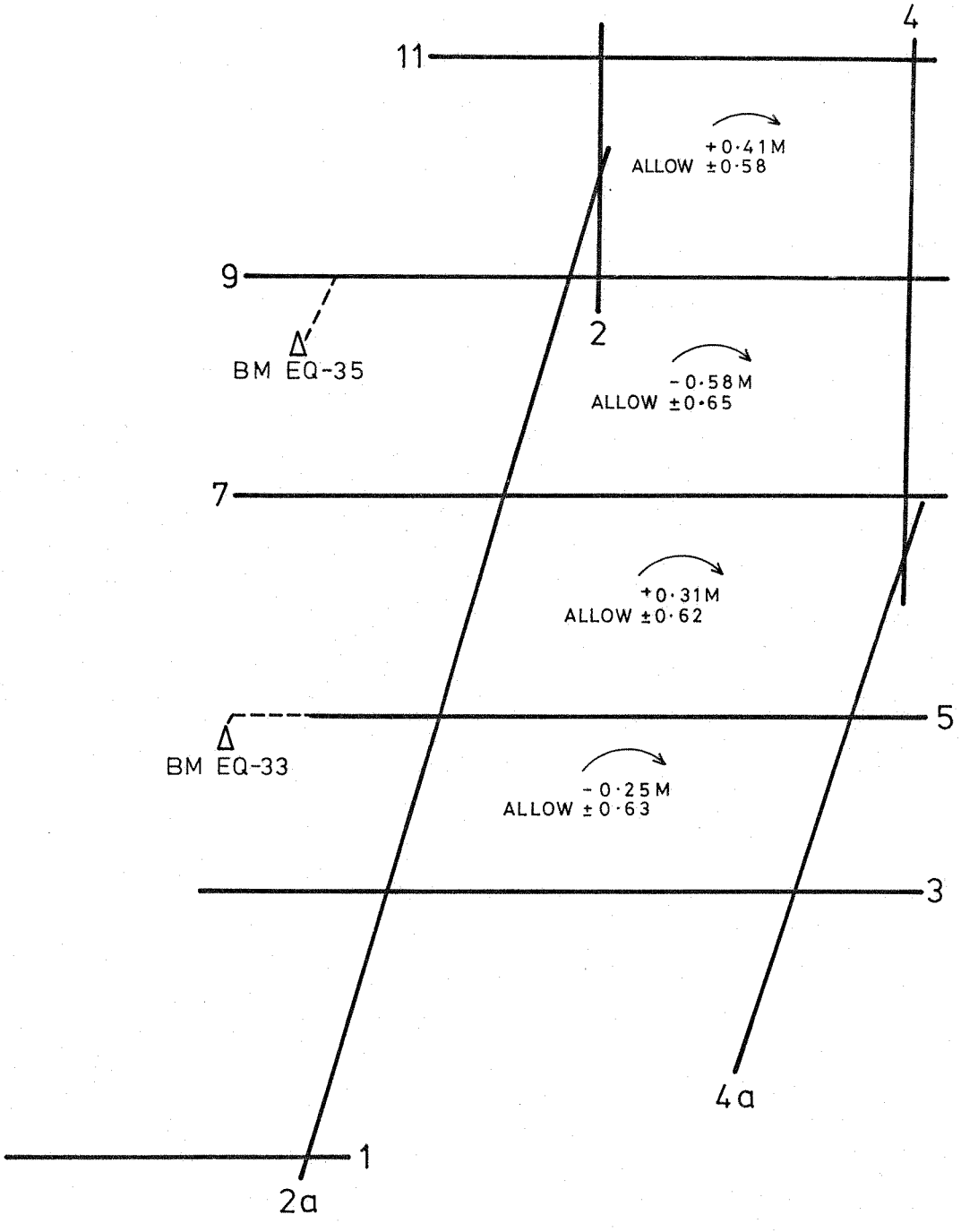
HORIZONTAL CLOSURE MAP

MOUNT ALLEN

A.M.G. MAP GRID
ZONE 53
CM 135°

PR82/037

ENCLOSURE 3



VERTICAL CLOSURE MAP

MOUNT ALLEN

PR82/037

ENCLOSURE 4

MAGELLAN

MAGELLAN PETROLEUM AUSTRALIA LIMITED

ADMINISTRATIVE OFFICE:
8th Floor, National Bank Building,
420 George Street, Brisbane, 4000.

Telephone: 221 7505
Telex: AA40392

Bell

PR82/037

DDB:LIM

D.G.S.

July 13, 1982

The Secretary,
Department of Mines & Energy,
Minerals House,
66 The Esplanade,
DARWIN 5790

Dear Mr Purcell,

Oil Permit No. 165 - Northern Territory
Quarterly Report No. 34
Period ended April 10, 1982

During the period under review, activity has been related to the processing and interpretation of the Newhaven - Mt. Allan seismic survey.

The brute stack sections were completed by the processing centre during March 1982. The final stack sections are currently being processed. I am enclosing the Field Area Report from S.S.L. which relates to the conduct of operations during the survey.

Interpretation of the sections are being carried out by Mr Eric Denton and Mr John Davidson, both of whom are consulting geophysicists to the Operator of the exploration joint venture, International Oil Proprietary.

Copies of the final stack sections and the final report of the seismic survey will be forwarded to the Department when received from the Operator.

Total cost of the seismic surveys will be in excess of $1,000,000.

The permit holder in conjunction with the Operator intends to commence a geological survey in the eastern part of the Basin in the second half of the year. The object of this

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survey will be to attempt to provide stratigraphic control in the Mt. Allan area to assist the geological interpretation of the geophysical data.

The preliminary interpretation of the Newhaven survey suggests that a structural target will be present for the drilling of a test well in the area during the next permit year.

Yours faithfully,

Dennis D. Benbow

Dennis D. Benbow
Operations Manager

Encl.