Report No. NT/ 34/42 /94.

REPORT

ON

GRAVITY SURVEYS IN OIL PERMITS 34 & 42, NORTHERN TERRITORY.

By :

J.E.BURBURY.

Submitted to : Flamingo Petroleum Pty. Ltd.,
128 Queen Street,
Melbourne.

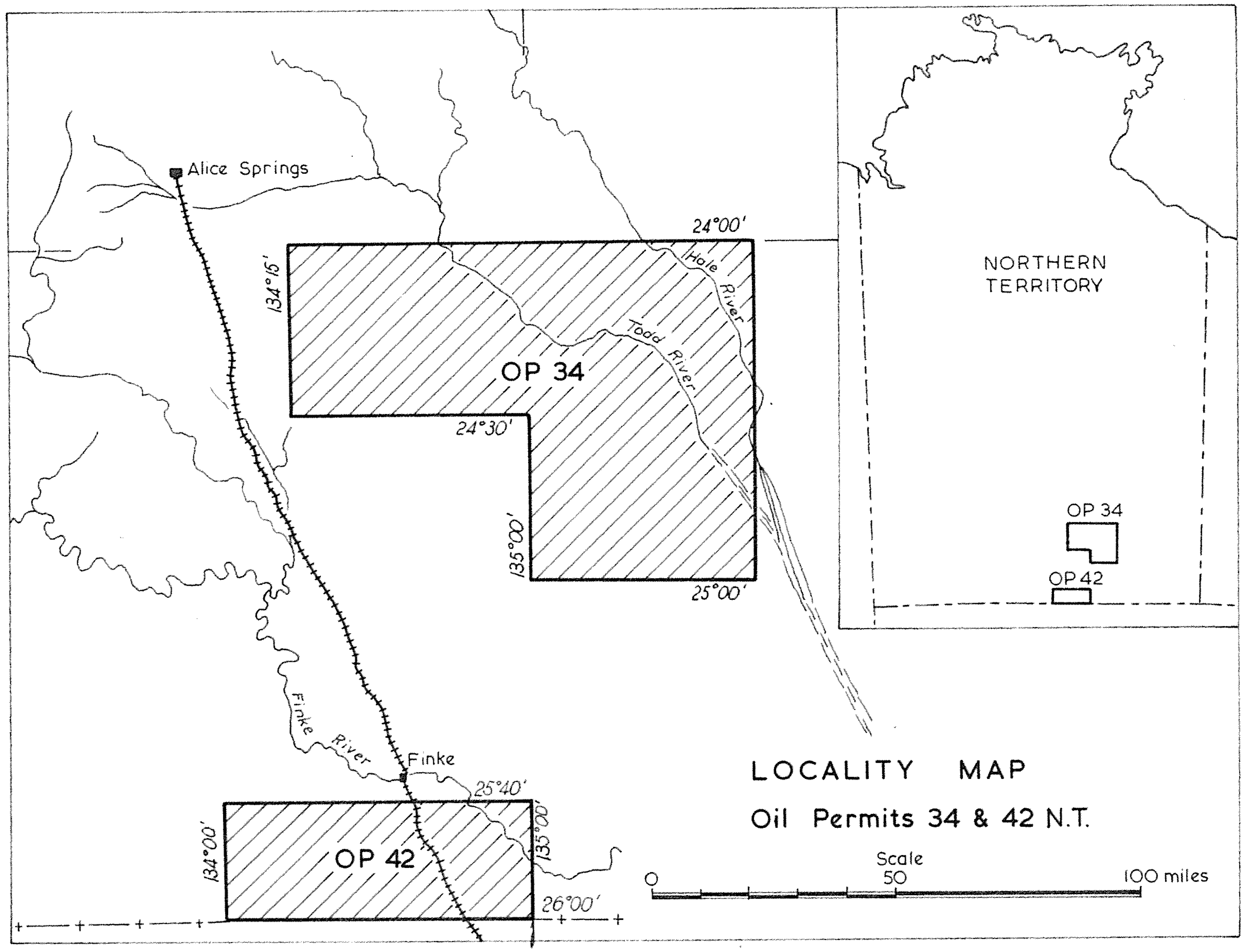
by : Mines Administration Pty. Limited,
31 Charlotte Street,
Brisbane.

December, 1960.

C O N T E N T S.

A P P E N D I C E S.

I L L U S T R A T I O N S.



Alice Springs
24°00'
134°15'
Hale River
Todd River
OP 34
24°30'
135°00'
25°00'
NORTHERN
TERRITORY
OP 34
OP 42
Finke
Finke River
25°40'
134°00'
OP 42
135°00'
26°00'
LOCALITY MAP
Oil Permits 34 & 42 N.T.
Scale
0
50
100 miles

FIGURE 1.

1. INTRODUCTION :

Semi-detailed gravity surveys were carried out over Oil Permit 34, Northern Territory and Oil Permit 42, Northern Territory by Mines Administration Pty. Limited for Flamingo Petroleum Pty. Ltd. during July and August, 1960. The gravity surveys were conducted in conjunction with geological surveys of these areas by Mines Administration Pty. Limited, in order to delineate structure at depth below mapped geological structures in the outcropping areas of the Permits and to estimate thickness of section and to delineate any structural features below the geologically featureless desert areas of the Permits.

Helicopter transport, provided by Trans Australia Airlines, was used successfully and expeditiously throughout the surveys, resulting in the establishment of 501 gravity stations over a total area of approximately 6000 square miles during a period of 21 working days.

2. LOCATION :

Detailed locations of O.P.34, N.T. and O.P.42, N.T. are shown on the Locality Map (frontispiece). These Permits, situated in the Amadeus Basin of Central Australia, cover areas of 4878 and 1865 square miles respectively.

O.P.34, N.T. lies approximately 100 miles south-east of Alice Springs in the Northern Territory and is situated on the western margin of the Simpson Desert. North of latitude 24° 30'S Cambrian and Proterozoic rocks outcrop, forming prominent strike ridges and rough hilly terrain up to 300 feet above the level of the sand-filled flats that separate the outcrops. South of latitude 24° 30'S the area is flat and covered with seif type sand dunes that trend north-north-west. A few isolated flat-topped hills occur in this desert part of the Permit.

O.P.42, N.T. is approximately 160 miles south-south-east of Alice Springs and approximately 6 miles south of the small town of Finke on the Alice Springs - Port Augusta railway. The area is flat, with sand dunes developed in the northern half and low flat-topped ranges and gibber plains in the southern half.

3. FIELD WORK :

Surveying over O.P.34, N.T. was carried out during the period 4th to 26th July, 1960 and over O.P.42, N.T. during the period 4th to 7th August, 1960. J.E. Burbury (geophysicist) was in charge of the survey and was assisted by K. McDermott, L.C. Miller and A.M.B. Brown, (field assistants).

Approximately 500 gravity stations were established over the two Permits; 372 stations over O.P.34, N.T. and 129 stations over O.P.42, N.T. Stations were positioned at 2 to 3 mile intervals along traverses approximately 4 miles apart. Both areas were surveyed by a series of rectangular loops averaging 14 miles long and 4 miles wide. This method minimised the flight time for the helicopter and produced numerous closed loops in the survey, which afforded a constant check on any errors in readings.

Gravity readings were made with Worden Gravity Meter No. 216 with a scale constant of 0.09019 milligals per scale division. This scale constant was determined by gravity meter checks in Brisbane before and after the survey over the Bureau of Mineral Resources calibration range, established in January, 1960.

The relative heights of stations were determined with two Paulin micro-altimeters Nos. KK 1422N and KK 1394N, the scales of which are calibrated to 1 foot. One of the micro-altimeters was read at base stations at 12 minute intervals, while the other was read at successive gravity stations in conjunction with the gravity readings.

Positions of stations were identified and marked on R.A.A.F. 1 : 48,000 airphotos and then plotted onto Department of Interior photomosaics. Controlled Department of Interior photo-centre plot photomosaics at photo scale were available for the area west of longitude 135°E in O.P.34, N.T. Station positions in this area were marked onto these mosaics, which were later reduced to 2 miles to the inch for plotting and contouring of gravity values. Uncontrolled Department of Interior airphoto mosaics at 4 miles to the inch were used for the east part of O.P.34, N.T. and the whole of O.P.42, N.T. These mosaics were enlarged and the scales adjusted to 2 miles to the inch for plotting and contouring of values. The final maps were compiled at 2 miles to the inch and then photographically reduced to 4 miles to the inch.

Permanently marked stations were established in both areas at all bores, dams, railway sidings and homesteads and in some cases where traverses crossed roads. Metal tags stamped with station number and year of survey were attached to existing markers, such as a corner post of a windmill, or if no such marker existed a steel fence post was driven into the ground and a metal tag attached. A description of these permanent stations is given in Appendix "A" and all are shown on the accompanying Bouguer Gravity Map as shown in the legends.

4. CORRECTIONS :

Gravity meter readings were corrected for drift by repeat readings at base stations within two to three hours. Gravity meter drift was variable, but did not exceed 3.5 scale divisions per hour. The maximum misclosure in observed gravity around the survey loops was 0.13 milligals and the average of all loop misclosures was 0.06 milligals. These small misclosures indicate that, although the meter drift was high at times, the drift was linear.

A gravity connection was made between Station 282 in the north-west corner of O.P.34, N.T. to the Bureau of Mineral Resources pendulum station in Alice Springs. The observed gravity value of 978.65360 gals. for this pendulum station was used as datum for both surveys. Connections were made along the Alice Springs - Port Augusta railway in order to connect the survey over O.P.42, N.T. to the pendulum station in Alice Springs. The observed gravity values are estimated to be accurate to 0.06 milligals.

The theoretical gravity for each station was determined from tables based upon the international ellipsoid formula. This was then subtracted from the observed gravity, after correction for loop misclosure, and corrected for elevation using a combined Bouguer and Free-air correction factor of 0.06471 milligals/foot, to give Bouguer gravity values.

The Bouguer correction factor of 0.06471 corresponds to a density of 2.3 gms./cc., which is the average of the near surface densities shown on Table 1, page 6, determined from samples collected during the survey. Small errors are introduced by the use of a constant correction factor over an area of changing surface rock densities. However, it is considered that the errors are small enough to be neglected in semi-detailed surveys of this nature.

Micro-altimeter readings were corrected for temperature (instruments calibrated at 50°F) and barometric diurnal variations. On some traverses corrections were made for differences in drift between the two altimeters. The maximum misclosure in elevation around the survey loop was 10 feet and the average of all loop misclosures was 5 feet. These misclosure errors were distributed around the loops.

In O.P.34, N.T. connections were made between Station 32 in the west of the Permit to a railway bench mark at Rodinga siding, and from Station 169 in the far south of the Permit to a railway bench mark at Bundooma siding. The misclosure in elevation around the loop formed by these connections was 3 feet.

In O.P.42, N.T. connections were made to railway levels at Finke siding, the rail bridge over Goyder Creek, Duffield siding and Wall Creek siding. The railway level at Finke siding was used as datum for the survey. The elevation misclosures at the other connections were 5 feet, 1 foot and 4 feet respectively. These errors were adjusted. All elevations are relative to mean sea level Port Augusta and are estimated accurate to 5 feet.

5. ACCURACY :

The accuracy of the survey can be estimated by considering the respective accuracies of the gravity observations, the latitude corrections and the elevation corrections. These are estimated to be 0.06, 0.12 and 0.32 milligals respectively.

These give a standard error of -

$$\left((0.06)^2 + (0.12)^2 + (0.32)^2 \right)^{1/2} = 0.35 \text{ milligals.}$$

6. GEOLOGY :

The following geological summaries and the two geological maps included are after T.J. Madden, 1960.

(a) O.P.34, N.T.

Sheet 3 is the Geological Map of O.P.34, N.T. at a scale of 4 miles to the inch. Rocks of Precambrian, Cambrian, Permo-Carboniferous, Jurassic, Cretaceous and Tertiary age outcrop in the area.

The Upper Proterozoic and Lower Palaeozoic sediments occurring in O.P.34, N.T. were deposited in the Amadeus Basin, a relatively narrow, continually subsiding trough, in which over 15,000 feet of sediment accumulated between the Upper Proterozoic and Middle Ordovician. The basin has an approximate latitudinal trend and is bounded on the north and south by basement metamorphics. In the north these outcrop approximately along an east-west line through Alice Springs and in the south along the South Australian border, latitude 26°. In the east the basin is obscured below the sands of the Simpson Desert and in the west it extends towards the West Australian border.

The geological section occurring in O.P.34, N.T. is summarised in the following table :-

(SEE OVERLEAF).

Table 1. Stratigraphic Table.

			FORMATION	THICKNESS
QUATERNARY			Alluvium and sand	
TERTIARY			Freshwater limestone, conglomerates and sandstone.	± 200 ft.
MESOZOIC	Cretaceous		D i s c o n f o r m i t y.	
			Rumbalara Shale	50 ft.+
	Jurassic		De Sousa Sandstone	50 ft.+
PALAEOZOIC	Upper Palaeozoic Undifferentiated.		U n c o n f o r m i t y.	
			Pertnajara Formation	± 500 ft.
	Cambrian		U n c o n f o r m i t y.	
		U.	Pulya Pulya Sandstone	2075 ft.+
		M.	Phillipson Limestone	1570 ft.
		L.	Hugh River Shale	320 ft.
			? D i s c o n f o r m i t y ?	
			Arumbera Greywacke	1895 ft.
PRECAMBRIAN	Proterozoic	U.	Pertatataka Formation	Approx. 3000 ft.
			D i s c o n f o r m i t y.	
			Bitter Springs Limestone	?
			Heavitree Quartzite	?
			U n c o n f o r m i t y.	
	Archeozoic		Basement Metamorphics.	

Sedimentation from the Upper Proterozoic to the Upper Cambrian was essentially continuous and unconformities are absent from the section.

Outcrop of the basement metamorphics is restricted to the north-east corner of O.P.34, N.T., and consists of a complex mass of igneous and high grade metamorphic rocks.

Upper Proterozoic beds are exposed along the Allambi Thrust Zone and adjacent to the metamorphic basement outcrops in the north-east of the Permit. Nowhere in the Permit is a complete Upper Proterozoic succession exposed. That part exposed consists of dolomites, shales. sandstones and limestones.

The Cambrian sediments occurring in O.P.34, N.T. have been divided into four formations as shown on the Stratigraphic Table. The maximum measured thickness is 5840 feet.

Unconformably overlying the Cambrian section is the Permo-Carboniferous Pertnajara Formation, which occurs at two localities in the Permit; near Pulya Pulya Creek where 250 feet of limestone conglomerates rest with marked angular unconformity on Cambrian and Upper Proterozoic rocks and south-east of the eastern end of the Bindi Anticline, where course quartzite conglomerates and calcareous sandstones outcrop.

Mesozoic sediments occur as isolated low flat-topped hills in the southern part of the Permit. The total thickness, consisting of sandstones and shales would not exceed 500 feet.

Tertiary deposits are of two types - (i) Freshwater limestones, with a maximum thickness of 200 feet, that occur in the Phillipson Pound, (ii) Sandstones and pebble conglomerates of a fluviatile nature, not exceeding 100 feet in thickness, that occur in the southern part of the Permit.

The structure in the Upper Proterozoic and Lower Palaeozoic sediments in the northern part O.P.34, N.T. is complex, with numerous low and high angle thrust faults and vertical to overturned anticlines.

The dominating structural feature is the Allambi Thrust Zone, passing east-north-east through Allambi Station. Thrusting from the north has caused major structural disturbance along this zone and in some places Upper Proterozoic sediments have been overthrust onto Cambrian sediments.

North of the Allambi Thrust Zone is the Phillipson Pound; a structural and topographic basin with dips around the rim rarely exceeding 20° and approaching horizontal in the centre of the basin.

The southernmost exposures of Lower Palaeozoic sediments consist of a series of tightly folded anticlines, with east to north-east trends, which are formed in the Pulya Pulya Sandstones. The Bindi Anticline is the most prominent, being some 10 miles long and up to 2 miles wide, with crumpled and faulted Phillipson Limestone exposed in the core.

Dips on the southern flank are up to vertical and overturned.

The area between the Allambi Thrust Zone and the anticlines to the south has been mapped as a wide north-east trending syncline with flank dips of 7 - 9 degrees.

No structural patterns exist in the southern desert area of the Permit.

(b) O.P.42, N.T.

Within O.P.42, N.T. only flat-lying Mesozoic sediments outcrop, these being the Jurassic De Sousa Sandstone and the Cretaceous Rumbalara Shale. Twelve miles north of the Permit glacial beds of probable Permian age outcrop and these beds are possibly present in the north-west corner of the Permit.

Granitic rocks of Precambrian age outcrop 6 miles west of the Permit and represent the most easterly exposure of a strong east-west trending basement high which extends west as far as the West Australian border. Within the Permit a water bore drilled recently 8 miles south-east of Lilla Creek Homestead bottomed in granite at 500 feet.

No concrete geological evidence exists to indicate that Lower Palaeozoic sediments occur beneath the Mesozoic in O.P.42, N.T, and no structural trends are apparent either in outcrop or on airphotos.

7. RESULTS AND INTERPRETATIONS :

The results of the surveys are presented as Bouguer Gravity Maps, Sheets 1 and 2, at a scale of 4 miles to 1 inch and contoured at an interval of 1 milligal. Geological Maps of the two Permits, Sheets 3 and 4 are included for reference in connection with the interpretation of the gravity anomalies.

The following table shows rock densities determined from specimens collected during the surveys :-

AGE	TYPE	LOCATION	DENSITY
Mesozoic	De Sousa Sandstone	N.W. corner O.P.42, N.T.	2.0
U.Cambrian	Pulya Pulya Sandstone	Stn.11, O.P.34, N.T.	2.1
M.Cambrian	Phillipson Limestone	Stn.21, limestone.	2.65
	Interbeds limestone and shale.	O.P.34, N.T. shale.	2.4
L.Cambrian	Hugh River Shale		2.3

Table (contd.)

AGE	TYPE	LOCATION		DENSITY
L.Cambrian	Arumbera Greywacke	Phillipson Pound		2.2
Upper Proterozoic	Pertatataka Formation	Phillipson Pound	average	2.4
"	Bitter Springs Limestone	Phillipson Pound		
Precambrian	Granites			2.6 - 2.7
	Schists and gneiss			2.8 - 3.0

From this table, it is apparent that only one major density contrast exists in the section - at the base of the Upper Proterozoic. Both the Upper Proterozoic sediments and the total sedimentary section above this horizon have an average density of 2.4 gms./cc., while the Precambrian basement rocks below have an average density of approximately 2.8 gms./cc., resulting in a density contrast of approximately 0.4 gms./cc. From this, it is inferred that a decrease in Bouguer gravity values should indicate an increase in the thickness of the sedimentary section. Also, from the table of densities, it is apparent that the highest Bouguer gravity values would occur over areas of outcropping Precambrian schist and gneiss, the density of which ranges from 2.8 to 3.0 gms./cc.

Some gravity variation must be expected throughout the areas as a result of the non-uniformity of the basement type.

(i) O.P.34, N.T.

Sheet 1 is the Bouguer Gravity Map of O.P.34, N.T. at a scale of 4 miles to 1 inch and contoured at an interval of 1 milligal.

Bouguer gravity values vary over a large range throughout the Permit area; the maximum and minimum values being approximately +5 milligals in the north-east corner of the Permit and approximately -95 milligals in the north-west corner of the Permit. Along the southern boundary of the Permit, Bouguer values are approximately -25 to -30 milligals.

In the western part of the Permit the Bouguer gravity contours show a general east-north-east trend that swings abruptly a little east of longitude 135° to a south-south-east to south trend in the eastern part of the Permit. The surface geological trends are similar to those displayed by the gravity contours. The only major discordance in trends occurs in the area of the Bindi Anticline, where the geological trend is east-north-east and the gravity trend is south-south-east.

The most outstanding feature of the gravity map is the elongate gravity low running through Stations 26, 5, 17 and 54 approximately. The minimum value observed in this low is -88.2 milligals at Station 17. South-west, south-east and east from this low the gravity rises continuously throughout the Permit. To the south-east the rise extends to the southern border of the Permit where the maximum observed value is -24.4 milligals at Station 138. To the east the gravity rise is continuous to Station 117 in the north-east corner of the Permit, Bouguer value +4.4 milligals, about which the contours indicate a prominent gravity high feature.

North of the gravity low the values rise to form a closed gravity high about Stations 249 and 370 and then fall to a minimum value of -95.0 milligals at Station 290 in the north-west corner of the Permit.

A comparison of the geological and gravity maps indicates that the prominent gravity high in the north-east corner of the Permit is associated with the outcropping Precambrian basement rocks in that area. All Bouguer gravity values in this area above approximately -30 milligals occur over the outcropping basement rocks. The contours indicate that the basement complex occurs as a south-south-east trending ridge that extends south-east below the cover of the desert sand. West from the gravity high the Bouguer values fall rapidly with a gradient between Stations 112 and 93 of approximately 4.5 milligals per mile. This very steep gradient is considered to be an expression of major faulting along the edge of the basement ridge. An inferred fault, separating basement and Upper Proterozoic rocks and trending in a similar direction to the gravity contours is indicated on the Geological Map. The line of maximum gravity gradient approximately follows the -25 milligal contour which would be an approximate trace of the fault at the surface. The steep gradient diminishes to the south, indicating a decrease in the magnitude of the fault in this direction. The total gravity decrease over the steep gradient between Stations 112 and 93 is approximately 35 milligals. Assuming a density contrast of 0.4 gms./cc. between the basement and Upper Proterozoic sediments, the vertical displacement of the fault in this area would be approximately 6700 feet and the thickness of Upper Proterozoic sediments, with possibly some Palaeozoic sediments, below Station 93 would be similar.

West from Station 93 the gravity values continue to fall towards the large gravity low feature through Stations 26 to 54. This gravity low is considered to indicate an area of maximum sedimentary thickness within the Permit. The total gravity decrease from Station 93 to the minimum value of -88.2 milligals at Station 17 is approximately 48 milligals. Using a density contrast of 0.4 gms./cc. this decrease in gravity would represent an increase in thickness of the sedimentary section of approximately 9200 feet, indicating a maximum total thickness of sediments of approximately 15,900 feet in the area of the gravity low.

The gravity low terminates abruptly to the west, where the Bouguer values rise appreciably over an area of outcropping Cambrian limestone. A possible south-west continuation of the gravity low extends through Station 30, indicating a possible extension of the deep sedimentary trough in this direction. To the east of the gravity low the contours indicate a gradual thinning of the sedimentary section out of the deep trough with a narrow extension of the deep trough to the north-east through Stations 312 and 323, indicated by a sharp trend in the contours in this direction.

A steep gravity gradient of up to 5 milligals per mile occurs along the northern flank of the gravity low. Faults, downthrown to the south and south-east have been mapped geologically between Stations 238, 264 and 52 and coincide, in that area, with the steep gravity gradients. Major faulting downthrown to the south and associated with the Allambi Thrust Zone is inferred along the length of this steep gradient. The vertical displacement of the fault between Stations 5 and 370 would be approximately 3000 feet. The abrupt change in the strike of the fault near Station 264 is borne out by the complex faulting shown on the Geological Map in that area.

North of the fault the gravity high centred about Stations 249 and 370 indicates the area of greatest uplift in the Allambi Thrust Zone.

North-west of the Allambi Thrust Zone the gravity contours reflect the structural basin of the Phillipson Pound and the Bouguer values fall to the minimum value observed in the Permit of -95.0 milligals at Station 290. This indicates another area of maximum sedimentary thickness within the Permit.

South and south-east of the major gravity low the Bouguer values rise continuously to the southern border of the Permit where the maximum value is -24.4 milligals at Station 138. This gravity rise indicates a complete reduction of the sedimentary section towards the southern boundary of the Permit and that Precambrian basement rocks should occur at, or very close, to the surface. However, Marshall and Narain, 1954, from a regional gravity survey along the Alice Springs - Port Augusta railway, concluded that a south-east regional gradient of approximately 0.5 milligals per mile between Finke and Alice Springs is due to major crustal fracture as a result of compression in the curst and not due to the Amadeus sedimentary basin alone. This hypothesis of crustal fracturing proposed by Marshall and Narain appears sound, but the author considers that part of the observed south-east regional gradient must be due to the Amadeus sedimentary trough, and that this would account for at least half of the observed gradient.

In Sheet 5, which shows the geological section and Bouguer gravity profile drawn from Station 291, in the north-west corner of the Permit, south-east through Stations 360 and 245 to Station 169 near the southern border of the Permit, an estimated south-east regional gradient of 1 milligal per 4 miles has been subtracted from the observed Bouguer profile. The corrected gravity profile should approximate the gravity variation due to variations in the sedimentary thickness or depth to basement in the direction of the profile. It can be seen that after correction for the estimated regional gradient the gravity still shows an appreciable continuous increase towards the southern boundary of the Permit, indicating a decrease in thickness of the sedimentary section in this direction. Assuming that the estimated regional gradient is approximately correct the gravity increase would represent a decrease in the sedimentary thickness of approximately 9000 feet south-east from the deep trough through Station 5, indicating a sedimentary thickness of approximately 6000 feet near the southern boundary of the Permit. A similar thickness is obtained by considering the gravity decrease south from the high over the Precambrian outcrop in the north-east of the Permit.

A narrow gravity low feature through Stations 183 and 169 in the south of the Permit is considered to indicate a stringer of thicker Mesozoic sedimentation. Mesozoic sediments outcrop in this part of the Permit.

The Bindi Anticline and associated structures to the south-west have little or no expression in the gravity contours. The Bindi Anticline itself extends across a steep east-west gravity gradient which apparently masks any gravity expression that might be expected over such a structure. A greater density of gravity stations around the structure could reveal its effect on the gravity pattern. The anticlines to the south-west and north-west of Bindi Anticline coincide with areas of reduced gravity gradient. Residual gravity maps would indicate small gravity closures that would correspond approximately with the structures in this area. The sedimentary thickness below these structures would be approximately 12,000 feet.

(ii) O.P.42, N.T.

Sheet 2 is the Bouguer Gravity Map of O.P.42, N.T. at a scale of 4 miles per inch and contoured at an interval of 1 milligal.

The Bouguer contours show a general east-west trend with an area of relatively low gravity values developed through the centre of the Permit. To the north and south of this low gravity feature the Bouguer values rise approximately 15 milligals to values of approximately -25 to -30 milligals. The Bouguer value at Finke railway siding is -26.5 and north-north-west from Finke along the railway the Bouguer values fall rapidly. The values at Rumbalara, Engoordina and Bundooma, 18, 35 and 53 miles north of Finke, are -28.2, -53.1 and -60.9 milligals respectively.

A regional gravity profile along the railway from Wall Creek in the south of O.P.42, N.T, through Finke and north towards Alice Springs indicates that O.P.42, N.T. is outside the limits of the Amadeus Trough, as indicated by the large gravity low discussed in the results of the survey over O.P.34, N.T. The existence of granitic basement outcrop approximately 6 miles west of O.P.42, N.T., which is the easternmost exposure of an east-west trending basement ridge that extends as far west as the W.A. border, confirms the gravity indications that O.P.42, N.T. lies outside the limits of the Amadeus Trough and in an area where Mesozoic sediments lie directly on Precambrian basement rocks.

A bore approximately 2 miles east of Station 101 is reported to have encountered granite at approximately 500 feet, while the Charlotte Wqters Bore penetrated 1474 feet of Mesozoic sediments without reaching basement. The gravity values at these locations are similar, whereas a minimum difference of 5 milligals should be expected to account for the increased thickness of Mesozoic sediments at Charlotte Waters. This indicates that the gravity pattern is not directly related to the thickness of the Mesozoic but is related to variations in the basement complex. The complex nature and the variation in rock type of the basement rocks mapped to the west (M.F. Glaessner, et al 1958), would account for the magnitude of the gravity variation over O.P.42, N.T. if the basement rocks lay close to the surface. The relatively sharp rise in gravity in the southern part of the Permit could be due to the occurrence of ultra-basic rocks to the south of O.P.42, N.T. Ultra-basic rocks have been mapped along the southern side of the basement trend west-south-west of O.P.42, N.T. (M.F. Glaessner, et al 1958).

8. CONCLUSIONS :

The gravity surveys over Oil Permits 34 and 42, N.T. have produced valuable information on the structural relationship of these Permits to the Amadeus Basin and on the structural configuration of the rock units within the two Permits.

In O.P.34, N.T., two areas of maximum sedimentary thickness, estimated at approximately 16,000 feet, have been delineated and it has been shown that the sedimentary sequence is decreasing in thickness towards the southern boundary of the Permit. No important structural features are indicated over the southern desert part of the Permit. Some structural features are indicated by the gravity pattern south-west of Bindi Anticline and appear to be related to geological structures mapped in that area.

The faulted nature of the Precambrian basement rocks and the post-Precambrian sedimentary rocks in the north-east of the Permit has been indicated.

A major fault, downthrown to the south, has been mapped along the southern edge of the Allambi Thrust Zone which is itself clearly expressed in the gravity pattern.

In O.P.42, N.T., it has been suggested that Precambrian basement rocks lie close to the surface and that it is unlikely that Upper Proterozoic or Lower Palaeozoic sediments of the Amadeus Basin would occur below the Mesozoic sediments. It has been shown that the gravity pattern is not reliable for estimating the thickness of Mesozoic sediments above the basement and that the major gravity variations observed over the Permit are probably due to structural and physical variations within the basement complex.

9. REFERENCES :

GLAESSNER, M.F. and PARKIN, L.W., 1957 - "The geology of South Australia". G.S.A. Journal, Vol. 5, Part 2, 1957.

MADDEN, T.J., 1960 - "Final report on geology of O.P.34, Northern Territory." Mines Administration Pty. Limited report No. NT/34/92.

MADDEN, T.J., 1960 - "Final report on geology of O.P.42, Northern Territory." Mines Administration Pty. Limited report No. NT/42/93.

MARSHALL, C.E. and NARAIN, H., 1954 - "Regional gravity investigations in the eastern and central Commonwealth". Uni. of Sydney, Dept. Geology & Geophysics Memoir 1954/2.

APPENDIX "A".

PRINCIPLE FACTS.

O.P. 34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
1	24° 31.4	1046	978.80227	- 66.83
2	28.9	1019	.79895	- 69.08
3	26.3	1026	.79086	- 73.78
4	23.5	1046	.78140	- 78.78
5	19.4	1165	.76251	- 85.34
6	22.2	1285	.75924	- 84.01
7	24.3	1148	.77563	- 78.85
8	27.5	1141	.78541	- 73.15
9	30.6	1138	.79520	- 67.05
10	34.2	1128	.80301	- 63.97
11	31.0	1025	.80153	- 68.48
12	28.1	1007	.79546	- 72.44
13	25.9	978	.79376	- 73.53
14	23.4	996	.78673	- 76.57
15	21.1	1027	.77843	- 80.26
16	18.8	1038	.77064	- 84.76
17	16.7	1087	.76167	- 88.20
18	18.8	1016	.77279	- 84.03
19	20.3	1000	.77987	- 79.63
20	22.9	967	.78899	- 75.63
21	25.7	1053	.78967	- 72.54
22	33.5	1314	.78342	- 70.73
23	31.2	1251	.78173	- 73.89
24	27.9	1220	.77641	- 77.48
25	25.3	1229	.76769	- 82.68
26	23.2	1208	.76244	- 86.92
27	25.2	1212	.77941	- 71.95
28	28.0	1283	.78317	- 66.76
29	30.5	1386	.77333	- 72.76
30	32.9	1357	.77607	- 74 62
31	33.6	1402	.77622	- 72.35
32	31.8	1323	.78797	- 63.67
33	29.6	1301	.78945	- 61.12
34	27.4	1273	.78294	- 66.96
35	24.7	1245	.77961	- 69.05
36	22.7	1329	.77093	- 70.03
37	26.0	1369	.77747	- 64.63
38	28.7	1449	.77832	- 61.66
39	30.5	1381	.78476	- 61.66
40	21.7	1183	.76691	- 82.37
41	19.4	1224	.76644	- 77.59

APPENDIX "A" (Contd.)

O.P.34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
42	24° 18.2	1219	978.76428	- 78.74
43	16.3	1252	.76323	- 75.51
44	17.4	1339	.76000	- 74.34
45	20.3	1330	.76586	- 72.34
46	22.2	1382	.76835	- 68.62
47	25.5	919	.80028	- 70.38
48	23.1	972	.79063	- 73.88
49	20.9	968	.78499	- 77.31
50	18.6	980	.77679	- 82.14
51	16.8	1072	.76478	- 86.17
52	14.1	1046	.76601	- 83.58
53	13.2	1024	.77952	- 70.50
54	14.3	1002	.77445	- 78.22
55	16.2	978	.77785	- 78.51
56	18.8	968	.78359	- 76.34
57	21.1	951	.78647	- 77.14
58	24.1	942	.79675	- 70.83
59	27.8	900	.80440	- 70.08
60	29.8	884	.81307	- 64.71
61	32.1	846	.82499	- 57.86
62	34.2	847	.83029	- 54.87
63	36.2	841	.83422	- 53.60
64	38.3	841	.83784	- 52.37
65	41.8	940	.84296	- 44.82
66	39.8	1027	.83139	- 48.48
67	36.8	804	.83654	- 54.35
68	34.0	823	.82773	- 58.75
69	31.3	.834	.82100	- 61.71
70	29.0	852	.81300	- 65.95
71	26.5	869	.80510	- 69.93
72	21.1	939	.79312	- 71.27
73	22.2	892	..80145	- 67.23
74	24.8	868	.80630	- 66.86
75	27.3	850	.81541	- 61.75
76	29.7	837	.82435	- 56.36
77	32.1	815	.83155	- 53.30
78	34.2	846	.83632	- 48.91
79	37.2	792	.85025	- 41.88
80	36.1	766	,86106	- 31.49
81	34.1	802	.85325	- 34.70
82	31.9	782	.84764	- 39.12
83	29.7	784	.83795	- 46.19
84	28.0	808	.82955	- 51.12

APPENDIX "A" (Contd.)

O.P. 34, N.T.

STN.	LATITUDE	ELEVATION RE - LATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
85	24° 24.8	824	978..82191	- 54.10
86	21.8	838	.81552	- 56.19
87	19.6	836	.81420	- 55.17
88	17.5	915	.80670	- 55.19
89	15.2	867	.81271	- 49.71
90	15.4	864	.81568	- 47.15
91	16.2	847	.81900	- 45.84
92	17.1	827	.82399	- 43.15
93	18.7	825	.83300	- 36.08
94	20.1	796	.84052	- 32.00
95	22.3	782	.84560	- 30.31
96	24.9	768	.85193	- 27.83
97	27.0	760	.85773	- 24.91
98	20.0	951	.81566	- 46.72
99	22.0	815	.82744	- 45.99
100	23.2	779	.83350	- 43.62
101	25.4	770	.83750	- 42.68
102	27.6	757	.84410	- 39.42
103	30.2	774	.84917	- 36.18
104	31.6	760	.85503	- 32.81
105	33.2	746	.86257	- 28.00
106	29.8	738	.86166	- 25.56
107	27.9	733	.87684	- 8.57
108	26.1	747	.87381	- 8.65
109	24.1	763	.86683	- 12.34
110	21.6	775	.86332	- 12.25
111	19.5	796	.85920	- 12.64
112	17.3	802	.86473	- 4.25
113	15.5	814	.86114	- 5.04
114	13.3	858	.85218	- 8.69
115	11.8	890	.83822	- 18.89
116	11.8	917	.85762	+ 2.26
117	13.4	882	.86384	+ 4.41
118	16.3	829	.86816	+ 2.04
119	18.0	820	.87025	+ 1.64
120	20.5	797	.86529	- 7.63
121	22.2	781	.86716	- 8.70
122	23.8	769	.87105	- 7.39
123	25.2	757	.87263	- 8.18
124	23.3	758	.86989	- 8.70
125	21.8	772	.86783	- 8.15
126	20.0	788	.86555	- 7.38

APPENDIX "A" (Contd.)

O.P.34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
127	24° 18.5	799	978.87078	+ 0.25
128	16.5	814	.86905	+ 1.74
129	14.4	825	.86510	+ 0.86
130	11.8	855	.85556	- 3.01
131	42.0	895	.84686	- 44.07
132	43.8	857	.85490	- 39.53
133	45.9	797	.86753	- 34.19
134	47.7	789	.87240	- 31.88
135	50.3	778	.87756	- 30.41
136	53.6	718	.88860	- 27.03
137	55.5	721	.89075	- 26.86
138	57.9	683	.89844	- 24.38
139	58.8	772	.89156	- 26.54
140	57.3	772	.88608	- 30.29
141	54.6	802	.88099	- 30.35
142	51.7	855	.87339	- 31.19
143	49.8	871	.87011	- 31.26
144	47.9	850	.86241	- 38.16
145	45.0	909	.85024	- 43.20
147	44.6	941	.84805	- 42.86
148	47.0	918	.85629	- 38.85
149	48.7	895	.86287	- 35.70
150	50.3	918	.86673	- 32.18
151	53.8	849	.87655	- 30.83
152	56.2	830	.88019	- 31.17
153	58.8	800	.88804	- 28.25
154	25° 00.2	786	.89397	- 24.83
155	00.6	809	.89133	- 26.44
156	24° 58.8	841	.88542	- 28.22
157	57.2	861	.88063	- 29.88
158	55.3	885	.87705	- 29.71
159	53.2	942	.87066	- 30.01
160	49.8	994	.85863	- 34.78
161	47.8	930	.85659	- 38.68
162	38.5	729	.86735	- 30.34
163	40.6	685	.87728	- 25.63
164	42.7	678	.87859	- 27.18
165	44.7	651	.88397	- 25.82
166	47.5	641	.88793	- 25.71
167	50.0	638	.88888	- 27.81
168	58.1	582	.90074	- 28.85
169	57.5	596	.89747	- 30.64

APPENDIX "A" (Contd.)

O.P.34, N.T.

STN.	LATITUDE	ELEVATION RE- LATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
170	24° 54.7	654	978.89199	- 29.04
171	51.0	654	.88708	- 29.71
172	48.5	700	.88128	- 29.67
173	45.3	721	.87514	- 30.81
174	42.3	760	.86374	- 36.26
175	39.9	820	.85485	- 38.53
175a	34.9	726	.86734	- 26.44
176	37.6	711	.87392	- 23.90
177	39.9	686	.87897	- 23.08
178	41.8	677	.88165	- 23.15
179	43.5	663	.88428	- 23.37
180	46.3	641	.89083	- 21.43
181	48.8	630	.89294	- 22.88
182	50.2	618	.89384	- 24.37
183	56.7	684	.89092	- 30.46
194	31.6	716	.86618	- 24.51
195	32.9	710	.87023	- 22.33
196	34.8	699	.87402	- 21.40
197	37.1	695	.87752	- 20.77
198	39.0	683	.88140	- 19.82
199	41.2	671	.88354	- 20.97
200	43.0	662	.88648	- 20.66
201	45.4	653	.89106	- 19.41
202	46.9	639	.89649	- 16.59
203	48.5	633	.89630	- 18.99
204	49.2	629	.89553	- 20.82
205	51.0	720	.88771	- 24.81
206	54.7	717	.88915	- 27.80
207	44.8	633	.89383	- 17.24
208	43.4	648	.89260	- 15.91
209	41.2	660	.89160	- 13.62
210	39.9	666	.89036	- 12.98
211	37.8	683	.88818	- 11.68
212	36.0	684	.88595	- 11.80
213	34.6	689	.88397	- 11.86
214	32.5	704	.87991	- 12.59
215	30.6	719	.87665	- 12.71
216	29.1	728	.87809	- 08.99
217	30.7	717	.88095	- 08.65
218	32.0	707	.88328	- 08.45
219	33.4	694	.88464	- 09.51
220	34.7	690	.88701	- 08.87

APPENDIX "A" (Contd.)

O.P. 34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
221	24° 36.4	685	978.89005	- 08.08
222	38.3	675	.89302	- 07.93
223	40.1	664	.89389	- 09.81
224	41.8	669	.89285	- 12.47
225	30.2		.88376	
226	27.0		.88090	
235	24.6	979	.79597	- 69.79
236	26.1	878	.80279	- 71.20
237	27.6	862	.80735	- 69.37
238	29.2	843	.81330	- 66.46
239	31.4	815	.82413	- 59.92
240	33.0	818	.82789	- 57.79
241	34.6	848	.82975	- 55.80
242	37.8	797	.84148	- 51.01
243	42.1	824	.84717	- 48.46
244	40.0	898	.83547	- 52.98
245	38.2	892	.83219	- 54.61
246	20.7	1176	.76458	- 84.03
247	16.9	1150	.77397	- 74.30
248	18.2	1169	.77344	- 72.81
249	16.5	1258	.76850	- 70.07
250	14.9	1256	.76482	- 72.09
251	12.7	1264	.76040	- 73.52
252	15.6	1278	.75990	- 76.37
253	17.2	1288	.76345	- 73.97
254	19.0	1291	.75819	- 81.06
255	20.7	1357	.76185	- 75.05
256	23.4	1224	.77045	- 78.09
257	17.5	1081	.76751	- 83.64
258	15.9	1095	.77398	- 74.46
259	14.2	1203	.76730	- 72.25
260	12.8	1181	.76296	- 76.44
261	11.5	1222	.76084	- 74.44
262	10.2	1166	.76126	- 76.20
263	12.2	1116	.76588	- 77.05
264	13.5	1098	.76712	- 78.44
265	15.6	1072	.76520	- 84.40
266	17.8	1076	.76414	- 87.67
267	14.6	1172	.75765	- 84.36
268	12.3	1174	.76454	- 74.75
269	09.9	1095	.76883	- 72.87
270	08.9	1155	.76084	- 75.76

APPENDIX "A" (Contd.)

O.P. 34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
271	24° 06.2	1125	978.76053	- 75.09
273	09.7	1080	.77028	- 72.17
274	10.7	1082	.77321	- 70.24
275	12.5	1063	.77348	- 73.21
276	14.9	1273	.75995	- 75.85
277	13.1	1293	.75613	- 76.36
278	11.3	1322	.74895	- 79.64
279	09.9	1351	.73927	- 85.87
280	07.9	1479	.73267	- 81.94
281	05.9	1497	.72790	- 83.32
282	04.4	1587	.71850	- 85.23
283	04.8	1536	.72058	- 86.90
284	08.7	1489	.72750	- 87.37
285	11.1	1467	.73585	- 83.13
286	13.2	1337	.75185	- 77.91
287	09.7	1356	.74251	- 82.08
288	07.9	1369	.73251	- 89.22
289	05.4	1401	.72350	- 93.38
290	3.3	1453	.71621	- 94.96
291	01.8	1547	.70945	- 93.96
292	23° 59.1	1605	.70621	- 90.43
293	24° 00.8	1545	.71437	- 88.06
294	02.6	1570	.71615	- 86.67
295	04.6	1578	.71696	- 87.57
296	06.8	1508	.72673	- 84.79
297	07.7	1306	.74715	- 78.44
298	06.1	1389	.73813	- 80.30
299	03.3	1291	.74126	- 80.39
300	01.0	1253	.73903	- 82.51
301	02.6	1199	.74614	- 80.68
302	02.8	1159	.75011	- 79.53
303	05.8	1115	.75741	- 78.43
304	10.8	1043	.78084	- 65.25
305	08.7	1061	.77627	- 66.29
306	06.5	1099	.76829	- 69.35
307	04.9	1115	.76195	- 72.87
308	03.1	1133	.75885	- 72.79
309	23°59.4	1213	.75344	- 68.90
310	24°01.1	1189	.74766	- 78.13
311	03.2	1168	.75266	- 76.83
312	12.8	1008	.77363	- 75.96
313	11.2	1020	.77994	- 68.09

APPENDIX "A" (Contd.)

O.P.34, N.T.

STN.	LATITUDE	ELEVATION RE= LATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
314	24° 09.6	1041	978.78321	- 61.66
315	07.7	1071	.78069	- 60.11
316	05.5	1114	.77823	- 57.33
317	03.3	1145	.77316	- 57.94
318	01.4	1202	.76309	- 62.20
319	02.5	1237	.77441	- 49.84
320	04.1	1178	.78066	- 49.19
321	05.4	1138	.78378	- 50.12
322	06.8	1145	.78277	- 52.24
323	08.3	1033	.78160	- 62.34
324	14.6	972	.78048	- 74.47
325	16.5	955	.78499	- 73.19
326	18.4	942	.78923	- 71.93
327	15.3	895	.80371	- 57.01
328	13.8	894	.79956	- 59.54
329	12.2	904	.79616	- 60.49
330	10.1	967	.78872	- 61.50
331	12.9	873	.80939	- 50.05
332	10.6	877	.80714	- 49.47
333	09.1	934	.80175	- 49.48
334	06.3	1046	.80048	- 40.37
335	04.7	1080	.79939	- 37.47
336	02.9	1137	.79598	- 35.19
337	01.5	1086	.80370	- 29.21
338	00.9	1023	.81547	- 20.84
339	03.3	1111	.82360	- 9.70
340	05.1	1034	.84126	- 9.03
341	07.3	973	.83351	- 13.19
342	09.9	918	.83085	- 22.31
343	09.3	929	.85262	+ 0.83
344	07.7	971	.84874	+ 1.47
345	05.9	956	.84442	- 1.81
346	04.2	1003	.83515	- 6.14
347	02.2	988	.82499	- 15.04
348	01.0	993	.82172	- 16.64
349	00.6	1039	.81829	- 16.66
350	00.3	937	.82624	- 14.98
351	02.2	910	.83214	- 12.94
352	03.9	899	.83730	- 10.38
353	06.1	890	.84382	- 6.90
354	08.3	886	.84713	- 6.32
355	09.8	878	.85120	- 4.45

APPENDIX "A" (Contd.)

O.P.34, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
356	24° 30.2	996	978.80072	- 70.27
357	28.6	972	.79918	- 71.55
358	26.7	977	.79533	- 72.93
359	24.6	988	.78929	- 75.89
360	23.0	996	.78420	- 78.65
361	20.8	1034	.77429	- 83.62
362	21.1	1203	.76246	- 84.84
363	22.9	1200	.76867	- 80.87
364	24.3	1212	.76582	- 84.52
365	26.1	1367	.75861	- 83.73
366	28.1	1225	.77456	- 79.23
367	30.2	1246	.77881	- 76.00
368	18.5	1167	.77283	- 73.88
369	17.2	1132	.77656	- 70.96
370	15.1	1210	.77047	- 69.63
371	13.8	1302	.75929	- 73.41
372	12.2	1303	.75727	- 73.56

APPENDIX "A" (Contd.)

O.P.42, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
1	25° 40.3	1047	978.91340	- 35.05
2	42.1	996	.91616	- 37.71
3	43.2	1018	.91563	- 38.11
4	45.4	1041	.91207	- 42.76
5	47.1	1066	.91322	- 41.98
6	49.6	1101	.91432	- 41.57
7	52.5	1174	.91427	- 40.30
8	54.9	1183	.92070	- 36.11
9	56.9	1112	.93286	- 30.90
10	58.2	1114	.93495	- 30.23
11	58.6	1005	.94473	- 27.98
12	57.1	1029	.93702	- 32.36
13	55.7	1046	.93283	- 33.80
14	53.2	1101	.92097	- 39.16
15	51.3	1164	.91005	- 43.75
16	49.4	1030	.91554	- 44.70
17	47.4	981	.91954	- 41.51
18	45.1	1004	.91883	- 38.04
19	42.5	1002	.92166	- 32.29
20	39.6	975	.91986	- 32.43
21	38.3	880	.93096	- 25.96
22	42.1	1041	.92960	- 21.36
23	43.8	935	.93045	- 29.36
24	45.5	969	.92726	- 32.35
25	48.9	860	.93590	- 34.75
26	50.8	922	.93208	- 36.79
27	51.9	1062	.92363	- 37.48
28	54.9	1025	.92989	- 37.14
29	56.7	961	.93833	- 34.97
30	59.1	946	.94670	- 30.42
31	59.0	898	.94435	- 35.75
32	57.1	859	.94308	- 37.30
33	55.3	935	.93351	- 39.82
34	53.0	927	.93219	- 38.96
35	51.3	854	.93591	- 37.95
36	49.4	814	.93808	- 36.14
37	47.1	823	.93875	- 32.28
38	44.2	872	.93646	- 27.89
39	42.2	888	.93358	- 27.40
40	37.9	819	.93383	- 26.56
41	39.4	765	.93873	- 26.92

APPENDIX "A" (Contd.)

O.P.42, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
42	25° 41.5	797	978.93997	- 26.07
43	43.5	1019	.92654	- 27.48
44	45.3	799	.94358	- 26.79
45	46.8	757	.94740	- 27.45
46	48.5	771	.94526	- 30.68
47	49.8	773	.94226	- 35.08
48	51.8	765	.93981	- 40.40
49	53.6	814	.93867	- 40.50
50	55.5	844	.94334	- 36.12
51	57.8	791	.95429	- 31.31
52	59.6	808	.95654	- 30.10
53	59.6	769	.96225	- 26.91
54	57.0	741	.95506	- 32.83
55	54.4	716	.94762	- 38.82
56	52.1	702	.94741	- 37.24
57	50.7	727	.94511	- 36.27
58	48.8	746	.94600	- 31.85
59	47.0	720	.94608	- 31.39
60	45.1	730	.94380	- 30.80
61	42.7	800	.93708	- 30.17
62	40.0	736	.93649	- 31.74
63	40.7	727	.93783	- 31.80
64	42.4	718	.94063	- 31.58
65	43.8	704	.94384	- 30.92
66	46.6	677	.94711	- 32.68
67	49.4	671	.94673	- 36.74
68	51.4	662	.94639	- 39.98
69	53.6	669	.95016	- 38.39
70	54.7	681	.95433	- 34.73
71	56.2	696	.95699	- 32.87
72	58.3	709	.95971	- 31.79
73	57.7	665	.95831	- 35.33
74	56.2	647	.95554	- 37.49
75	54.0	637	.95408	- 37.00
76	51.1	645	.94845	- 38.70
77	48.7	651	.94495	- 38.99
78	46.0	664	.94672	- 33.20
79	44.0	673	.94570	- 31.29
80	41.5	687	.94219	- 30.97
81	39.6	1149	.90451	- 36.52
82	41.4	1137	.90622	- 37.70

APPENDIX "A" (Contd.)

O.P.42, N.T.

STN.	LATITUDE	ELEVATION RELATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
83	25° 42.3	1164	978.90768	- 35.55
84	44.2	1137	.91326	- 33.17
85	45.7	1109	.91809	- 32.67
86	47.2	1134	.91542	- 35.50
87	50.0	1159	.91372	- 38.87
88	51.9	1157	.91707	- 37.89
89	54.1	1188	.91985	- 35.70
90	56.3	1166	.92797	- 31.59
91	58.2	1110	.93655	- 28.89
92	57.7	1193	.92478	- 34.69
93	56.0	1250	.91855	- 35.22
94	53.8	1225	.91746	- 35.34
95	52.1	1224	.91363	- 37.24
96	50.2	1290	.90520	- 39.16
97	48.3	1222	.90553	- 40.99
98	46.5	1234	.90592	- 37.71
99	44.5	1227	.90780	- 33.93
100	42.5	1230	.90552	- 33.68
101	40.0	1238	.89208	- 43.66
102	42.5	1260	.89535	- 41.91
103	44.9	1345	.89410	- 40.47
104	47.5	1280	.89861	- 43.21
105	49.9	1332	.90133	- 39.96
106	51.6	1287	.90801	- 38.19
107	53.2	1254	.91259	- 37.64
108	55.1	1281	.91339	- 37.32
110	57.4	1297	.91611	- 36.27
111	45.3	737	.93836	- 36.02
112	47.6	639	.94818	- 35.24
113	50.2	626	.95214	- 35.18
114	52.3	620	.95323	- 36.95
115	54.8	610	.95569	- 38.08
116	56.5	598	.95824	- 38.32
117	58.4	616	.95880	- 38.84
118	59.5	621	.95924	- 39.38
119	56.3	587	.96043	- 36.60
120	54.2	597	.95810	- 35.81
121	50.2	623	.95460	- 32.92
122	47.2	637	.94962	- 33.46
123	44.8	638	.94703	- 33.17
124	42.2	648	.94677	- 29.74
125	40.4	663	.94475	- 28.67

APPENDIX "A" (Contd.)

O.P.42, N.T.

STN.	LATITUDE	ELEVATION RE-LATIVE TO M.S.L.	OBSERVED GRAVITY	BOUGUER GRAVITY
126	25° 34.8	887	978.92584	- 26.53
127	19.8	1048	.89645	- 28.15
128	06.5	1123	.85791	- 53.10
129	24° 53.8	1159	.83332	- 60.86

APPENDIX "A" (Contd.)

Description of Permanently Marked Stations.

O.P. 34, N.T.

STATION	DESCRIPTION
1	North end of water trough "Desert Bore" - ground level.
5	Steel fence peg on west side of road to Desert Bore.
11	Steel fence peg on south side of road 1 miles north-east of Desert Bore.
17	South-east corner of windmill - Camel Flat Bore.
43	North-west corner of fence around Allambi Homestead.
44	North-west corner of windmill on bore.
66	South-east corner on top of low flat-topped hill.
78	Steel fence peg on east side of small claypan.
89	Steel fence peg on east side of road.
127	North-east corner of windmill on bore.
169	Casing head of bore - ground level.
250	North-east corner of windmill on bore.
268	North-east corner of windmill Larrier Bore.
302	North-east corner of windmill Mt. Capitor Bore.
308	North-east corner of windmill Allora Creek Bore.
338	South-east corner of yard - on Hale River.
342	South-east corner of dam - ground level.
348	North-east corner of windmill on bore.
354	North-west corner of windmill on bore.
370	North-west corner of windmill on bore.

APPENDIX "A" (Contd.).

Description of Permanently Marked Stations.

O.P. 42, N.T.

STATION	DESCRIPTION
1	Steel fence peg on north side of road.
3	Steel fence peg on west side of road.
4	North-west corner of windmill on Bloodwood Bore.
20	Steel fence peg on south side of road.
36	Steel fence peg on north side of track.
40	South end of rail bridge over Goyder Creek - rail level.
55	Steel fence peg on north side of track.
57	On railway opposite Duffield sign post - rail level.
63	North-east corner of fence about "New Crown" Homestead.
65	Casing head of bore.
72	On railway opposite Wall Creek sign post - rail level.
87	Steel fence peg on north side of road.
94	North-east corner of windmill - on bore.
107	Steel fence peg on south side of road.
115	North-east corner of windmill on Charlotte Waters Bore.
126	On railway opposite Finke sign post - rail level.
127	On railway opposite Rumbalara sign post - rail level.
128	On railway opposite Engoordina sign post - rail level.
129	On railway opposite Bundooma sign post - rail level.