COMMONWEALTH OF AUSTRALIA.

MINISTRY OF NATIONAL DEVELOPMENT.

BERANDAMENTI KORXSTAPRIAYX AND ASET MERING.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

REPORT No.

RECORDS : 1950. No. 22

PLANS : N60 - 3B - 1 N60 - 3B - 2

> N60 - 3B - 24 N60 - 3B - 3

NON-LENDING COPY

NOT TO BE REMOVED FROM LIBRARY

MINERAL DEPOSITS

OF

THE FINGAL-CUDGEN AREA

NORTHERN NEW SOUTH WALES.

D. E. Gardner.

J. Ward

Geologists.

T.D. Dimmick

L.M. Edhouse

Geophysicist:

L.R. Lee

Laboratory Assistant.

BUREAU OF MINERAL RESOURCES. GEOLOGY AND GEOPHYSICS.

RECORDS.	195	0.	No.	22	
PLANS.	N60	tive	3B	due	1
	N60	ENA	3B	No.	2
	N60	serie	3B	- 646	2A
	M60	NEW .	3B	600	3

MINERAL DEPOSITS

OF

THE FINGAL - CUDGEN AREA.

NORTHERN NEW SOUTH WALES.

D. E. Gardner.	
J. Ward	Geologists.
T.D. Dimmick.	
L.M. Edhouse	Geophysicist.
L.R. Lee	Laboratory Assistant.

MINISTRY OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES.

GEOLOGY AND GEOPHYSICS.

PLANS. N60 - 3B - 1.
N60 - 3B - 2.
N60 - 3B - 2.
N60 - 3B - 2A.
N60 - 3B - 3.

MINERAL DEPOSITS OF THE

FINGAL-CUDGEN AREA

MORTHERN NEW SOUTH WALES.

	CONTENTS	PAGE
SU	MARY.	
A	INTRODUCTION: 1. General purpose of the investigation. 2. Situation 3. Access 4. Mining tenements 5. Responsibility for sections of this report	4 4 4 4 5
B.	TOPOGRAPHY:	5
C.	GEOLOGY:	6
	1. General 2. The Coastal Dunes 3. Deposits of Heavy Minerals	678
D.	METHOD OF TESTING: 1. Mapping 2. Boring 3. Sampling 4. Laboaratory work (a) Estimation of quantities of heavy minerals (b) Determination of compositions of concentrates (c) Variation in composition of heavy mineral concentrates and in thoria content of monazite (i) Zircon, rutile and ilmenite (ii) Monazite (iii) Thoria content of monazite.	8888889
E.	RESULTS OF THE INVESTIGATION:	
	1. Distribution of the Mineral Deposits (a) Extent (b) Shape and attitude (c) The levels at which the deposits occur	10
	2. Origin of the Deposits.	12
	Reserves (a) Total Reserves	13 13

4. Distributio (a) The (b) Sugg (i) (ii)	tities now available for mining n of the Minerals throughout the area. observed distribution. ested causes of the observed distribution. General East-West variation.) South-North variation.	Page 13 13 13 15 15 15
5. Thoria Cont	ent of the Monazite.	16
ACKNOWLED GWENTS		
REFERENCES.		
TABLES.		
Table A. Table B. Table C. Table.1.(a)	The Westerly Dune Ridge. The Central Dune Mass Sandy Scarp at southern end of Area. Preparation of composite samples to	5679
Table 1.(b)	examine distribution of heavy minerals Preparation of composite samples to examine possible variation in thoria content of monazite.	
Table. 2. Table. D.	Levels of deposits. Position of foredune developed at end of period of heavy deposition	11
Table 3. Table.4.(a)	of siliceous sands. Summary of quantities. Variation in mineral composition	14
Table4 (b)	of concentrates. Distribution of heavy minerals from south to north in the Intermediate and Western deposits.	_16
Table 5.	Thoria content of monazite. Detailed statement of quantities between bore lines.	17
Table 7.	Heavy mineral and overburden in bores.	
ILLUSTRATIONS.	: At end of report.	
Fig. 3. Plan	ity map. of area bored (1" = 500 ft), showing oles, leases, and deposits. showing general geology of area. as of bore lines from line 00 to line	

10500S.
Plate 2A. Sections of bore lines, from line 11250S to line 20390S.

Plate 3.
Fig. 1. Blan of Deposits.
Fig. 2. Graphical representation of distribution of minerals.

MINERAL DEPOSITS OF THE FINGAL-CUDGEN AREA. NORTHERN HEW SOUTH WALES.

SUMMARY.

The deposits of heavy minerals along the East Coast of Australia are being investigated primarily to determine their content of monazite. The principal deposit in the Fingal-Cudgen area occurs beneath the dunes adjacent to the beach, from Fingal Point to the northern end of the Camping and Recreation Reserve at Kingscliffe, approximately 4 miles south of Fingal Point. The Two smaller deposits occur over the southern mile or so of the ares, parallel to the main deposit and up to 300 feet west of it. The deposits contain 63,600 tons of zircon-rutile-ilmenite-monazite concentrates, of which an estimated 330 tons is monazite. The average grade is 502 lbs. of heavy mineral concentrate per cubic yard of sand. The width of the deposits ranges from 40 feet to 220 feet and averages 114 feet.

The average thickness of the deposits is 2.25 feet, and the thickness of overburden is 7.3 feet. With the exception of the southernmost 500 feet, in the vicinity of the camping ground, the deposits are available for mining. In the northern portion of the main deposit, from Fingal Point to bore line 60008 (6000 feet south of Fingal Point), and in the southern portion from 169755 to 19890S, the heaviest of the heavy minerals, viz., monazite and zircon, are present in substantially constant proportions. In the middle portion of the main deposit, between 6000S and 16975S, the quantities of monazite and zircon are notably reduced. In the smaller deposits the proportions of monazite and zircon decrease steadily from south to north.

A. INTRODUCTION.

1. General Purpose of the Investigation. The primary aim of the "Beach Sands Investigation" is to determine the reserves and the distribution of monagite in the deposits of heavy mineral sands along the East Coast of Australia. These deposits contain very large reserves of zircon and rutile (Fisher 1949 (a) and (b)) for which they are being exploited at various localitities, mainly from North Stradbroke Island in Queensland to Ballina in New South Wales. The monazite forms little more than 0.5 per cent of the mixed concentrates, but can be recovered as a by-product during the separation of the other minerals. Monazite, a phosphate of cerium lenthenum preaseodymium and other pore earths. With

the separation of the other minerals. Monazite, a phosphate of cerium, lanthanum, praeseodymium and other rare earths, with thorium silicate, is utilised commercially as a source of cerium and of thorium. In this investigation, the thorium content of the monazite is being determined on the basis of its radioactivity.

2. Situation. The Fingal-Cudgen Area comprises a beach and associated dunes extending approximately 4 miles from Cudgen Point to Fingal Point, and the low lying coastal plain between the dunes and the Tweed River. Fingal Point, at the northern end of the area, is 22 miles south of Point Danger, which is crossed by the Queensland-New South Wales State Boundary. Plans of the area, and a locality map, are included in Plate 1 at the end of this report.

1. Access. The Pacific Highway crosses the Tweed River at

3. Access. The Pacific Highway crosses the Tweed River at about the middle of the western margin of the area and continues southwards along the eastern bank of the river. A main road from the Highway Bridge follows the eastern bank of the river northwards to Fingal Point. A second main road, Chinderah Road, runs easterly from the Highway approximately 22 miles south of Fingal Point, and at the coast, meets Marine Parade, which runs southwards adjacent to the beach as far as Cudgen Point. The nearest railhead is the terminus of the Brisbane-Tweed Heads railway at the Town of Tweed Heads, 42 miles north by the Pacific Highway from Chinderah Road. The nearest railhead of the New South Wales railways is at Murwillumbah 132 miles southwards along the Pacific Highway.

4. Mining Tenements. At the time of the investigation, leases or applications for leases were held as follows:-

M.L.1 A.J. Knowles, Erisbane. P.M.D. 3 A.J. Knowles, Erisbane. M.L. 4 J.P. Murphy, Tweed Heads.

M.L. 2 A.J. Knowles, Brisbane G.L.2. J.Cooley, Tweed Heads.

Special Lease Applications:

No.148. J.P. Murphy, Tweed Heads. No.159. J.P. Murphy, Tweed Heads. No.157. J.P. Murphy, Tweed Heads. No.158. J.P. Murphy, Tweed Heads.

Sections of this report were compiled by those who were most directly responsible for the conduct of the respective portions of the work. In general, however, each member of the staff assisted in several phases of the investigation. T.D. Dimmick, now an officer of the Queensland Geological Survey, carried out the preliminary field work in the area. J.Ward, assisted by L.R.Lee was responsible for Laboratory work, including the separation and examination of minerals. Miss L.M. Edhouse conducted radiometric determinations of quantities of menazite, and investigations of the thoria content of the menazite. D.E. Gardner supervised the work.

B. TOPOGRAPHY.

The beach and the adjacent dume belt sweeps northwards from Cudgen Point in a broad curve concave towards the ocean, and terminates against the solid rock at Fingal Point. The crests of the dumes rise to a height of more than 30 feet above mean low water in the northern half of the area, but in the southern half the crest heights are mostly below 30 feet. The width of the dume belt varies from 132 feet to 660 feet, and averages 466 feet. Between bore lines 15008 and 90008, adjacent to the lagoons shown on Plate 1, Fig. 2, the width is, for the most part, less than 300 feet. Plate 1, Fig. 2 shows that lagoons appear west of the dumes between lines 15008 and 52508, and between lines 60008 and 90008. The western boundary of the sandy area crosses the 105008 and 90008 bore lines at 2200W and 357W respectively. The occurrence of the lagoons and of this boundary suggests that the Tweed River may at one time have flowed some distance east of its present course, and have eroded the western portions of the dume area between bore lines 90005 and 15008, thus resulting in the observed narrowing of the dume strip between these lines. Confirmation of this supposed erosion of the dume by the river is obtained from the profiles of Plates 2 and 2A. Thus in the southern half of the area, a prominent dume ridge, which may be termed the Westerly Dume Ridge, occurs some distance west of the beach dumes. This ridge appears in the sections of the bore lines es shown in Table A.

TABLE A. The Westerly Dune Ridge.

Bore Line	Co-ordinate of Crest of Westerly
	Dune Ridge.
105008	1060W
120008	1400W
139758	1270W
154758	985W
169758	900W
18575S	640W

The sections of Plate 2A show that the dune, which has an elevation of 29 feet at the 10500S boreline terminates between the 10000S and 9000S lines. Again examining the area between this westerly ridge and the beach, it can be seen on the section of line 16975S that a massive dune ridge, which may be called the Central Dune Mass, occurs between the 705W and the 165W coordinates, and the "Beach Dunes" occur from 165W to 35E. The Central Dune Mass can be traced from the 19890S bore line northwards as in Table B.

Coordinates between which the
Central Dune Mass Occurs.
880W to 335W
720W to 250W
705W to 255W
610W to 240W
61.5W to 35W (2)
445W to 30W
495W to 175W
The Dune from 913W to 630W extends for
only a short distance from north to south.
357W to 157W

The Central Dune Mass is very narrow on the 9000S line, and does not occur on 7500S line. Presumably, the erosion which removed the Westerly Dune Ridge between the 10500S and 9000S lines partly removed the Central Dune Mass at the 9000S line and terminated it at a point between the 9000S and 7500S lines.

The supposed former channel of the Tweed River can similarly be traced in the northern portion of the area, where it follows approximately the eastern boundary of the northern lagoon. The sections of Plate 2 show that, from lines 7500S to 4500S inclusive, only the Beach Dunes occur. Dune masses on lines 6000S and 4500S, which appear to be the Central Dune Mass, are actually north-westerly trending active dunes, formed in recent years. The outline of this dune on line 4500S can be seen in Plate 1. Fig. 2 The Central Dune Mass does appear on line 3000S from the edge of the lagoon to 237W, and on line 1500S from 427W to 230W. In the latter line, the Western Dune Ridge also appears, its crest being at 640W. The erosion of the dunes outlined above indicates that the eastern bank of the Tweed River in former times encroached as far easterly as the foot of the Beach Dunes between bore lines 9000S and 3000S. It is quite possible that the river formed an outlet to the sca a few hundred feet south of the 6000S bore line. There the crests of the dunes are at a lower elevation than those theyersed by the 6000S line. It will be noted too that on the latter bore line the crests rise to about 21 feet, where as on the 7500S and 4500S lines the crests rise to 38 and 36 feet respectively.

A low lying sandy area which included the lagoons shown in Plate 1. with smaller somewhat swampy patches, extends westwards from the coastal dune belt to the Tweed River. The Twampy patches become more extensive in the western portion of the area between Chinderah Road and the lagoon a mile to the north, and in the southern portion of the area, at the foot of the higher country which runs approximately west-southwest from the village of Kingscliffe.

The sand which forms the seaward side of the foredune is fixed mainly by Spinifex, with blady grass in places, coastal couch, goatsfoot convolvulus and pigface. The tops of the foredune, subject to severe wind action, are covered in many places by dense clumps of a native heath. The western or landward side of the foredune supports a mixed dune scrub, including trees such as Banksia, Lillipilli, Cupania and Cupaniopsis, with vines, heath, bracken, grasses and rush-like sedges.

The low lying country between the dune belt and the river has mostly been cleared for cultivation and for grasing. Stunted

The low lying country between the dune belt and the river has mostly been cleared for cultivation and for grazing. Stunted swamp sheeak surrounds the lagoons and is seen, with paper bark tea tree, in the swamps at the southern edge of the area.

C. GEOLOGY.

1. General. The coastal dunes and the low-lying sandy flat between the dunes and the river are composed of recent unconsolidated quartz sand. Near the present beach, the dunes contain small quantities of heavy minerals. The higher country 22 miles west of

Fingal Point is made up of steeply dipping lower Palaeoscic sediments, capped by Pliocene basalt, which occurs mainly above the 150 foot contour. A mass of Pliocene basalt outcropping approximately a mile to two miles to the south-east, where it is crossed by the Pacific Highway, persists downwards below river level. A short distance west of Chinderah Bay, Pliocene basalt again caps lower Palaeozoic sediments, mainly above the 150 foot contour. The higher country at the southern end of the Fingal-Cudgen area consists of Pliocene basalt, which continues below sea level in the vicinity of Cudgen Point, and probably for about two miles in a west-southwesterly direction from Cudgen Point.

2. The Coastal Dunes. During prolonged periods of calm weather the prevailing ocean winds blow sand from the beach into a low dune ridge or foredune at the top of the beach. At the time of the investigation sea erosion during stormy weather had caused the top of the beach to advance landwards, e.g. on bore line 30005 and 7500S to the foot of the high dune appearing on these lines at 93W, and 115W respectively. This high dune apparently represents a former foredune built up when the top of the beach maintained a constant position for a considerable period.

The prominent dune described in section B "Toposgraphy", as the Westerly Dune Ridge apparently marks the position of a former beach which curved around from south of 185758/640W through 139758/1270W to 15008/640W and northwards to the basalt of Fingal Point.

The Central Dune Mass of section B "Topography" appears to be made up of two or three old foredunes, which developed in succession in quiet period of only slight changes in conditions of sea level or of supply of sand. Undoubtedly the Central Dune Mass, prior to the erosion which removed it between lines 9000S and 3000S, swept unbroken from Cudgen Headland to Fingal Point. The sections of the bore lines on the southern part of the area show a steep sandy scarp in the position given in Table C.

TABLE C. Sandy Scare at Southern End of Area.

Bore Line	Coordinate of Scarp.
203908	430W
1989 08	355W
191258	230W
185758	224W
169758	195W

It is probable that, at a comparatively recent date, the beach top advanced westerly to the position of this scarp. Possibly the erosion which formed this scarp was contemporaneous with the erosion which removed the middle portions of the Western Dune Ridge and the Central Dune Mass. Investigations of the mineral deposits of the Palm Beach Area, Queensland, and the Tweed-Fingal Area, Northern New South Wales, gave evidence of erosion of dunes, similar to that noted above in the Fingal-Cudgen Area. In the Palm Beach Area, towards the southern end, an abrupt sandy scarp occurs, comparable with that seen in the Fingal-Cudgen Area. In the Tweed-Fingal Area a truncated westerly dune ridge appears at the southern end, similar to the Westerly Dune Ridge of the Fingal-Cudgen Area.

No westerly dune ridge appears at the north of the Tweed-Fingal

No westerly dune ridge appears at the north of the Tweed-Fingal Area. The latter area is a sandpit terminating at its northern end at the mouth of the Tweed River, and probably the whole spit, excepting the small portion of the western dune at the southern end, was inundated. It is possible that further investigations along the coast may permit correlation of the evidences of erosion in some of the beaches.

3. Deposits of Heavy Minerals.

During stormy weather heavy minerals may be deposited on the upper part of the beach. A deposit appears as a "seam" which may have an unbroken length of several thousand feet, and a maximum width near the northern end, of the order of 50 feet. The "seam" is thickest near the top of the beach, and tapers off wedge-shaped down the beach. The waves and surf sweep onto the beach from a direction somewhat to the south of east, and tend to transport the heavy minerals northwards along the beach. As a result, the heaviest deposits appear on the northern portion of the beach, southwards from the headland. The sections of plates 2 and 2A do not show any newly formed deposit on the present beach, but seams appear beneath the dunes adjacent to the beach, in the positions of former beaches a little to the west of the present beach.

D. METHOD OF TESTING.

1. Mapping. The positions of the bore lines from 00 to
3000S were related by chaining to the residential allotments in the area, and to the eastern training wall of the Tweed River. Bore lines 4500S and 7500S were similarly related to the training wall. Lines 5250S and 6000S were mapped along with the north western peg of G.L. 2 and the north-western corner of allotment 455 in a theodolite survey of this portion of the area. Line 12000S was related in a plane table survey, to the application peg at the south-eastern corner of ML4 and to the nearby allotments, Nos. 349 to 363. Bore lines 13975S to 20890S inclusive were mapped by chaining to the surveyed allotments in the Village of Kingscliffe. A plan showing the bores in the Fingal-Cudgen Area, on a scale of 500 feet to the inch, is given in Plate 1. This plan was based on Military Maps, 1 mile series, Zone 8, Nos. 213A and 224 and on the New South Wales Lands Department plan of the Parish of Terranora, (Scale, 1 inch equals 40 chains) and plan of the Village of Kingscliffe, Parish of Cudgen (Scale, 1 inch equals 4 chains). The geological boundaries were sketched on to the Military Maps mentioned above, and are approximate only. peg of G.L. 2 and the north-western corner of allotment 455 in a mentioned above, and are approximate only.

2. Boring Boring to ground water was by means of a post hole digger or auger, lengthened as required with 5 foot lengths of piping, coupled by screw joints. Below ground water level, or below the depth to which sampling of loose sand could conveniently be done with a post hole digger, about 20 feet, the bore hole was cased with light 3-inch boiler tubing, and a sand pump used. Before boring was started, the bore sites were levelled, using a telescopic alidade set up on a plane table. The datum for levels was high water mark, which was assumed to have the level given in the Tide Table of the Queensland Department of Harbours and in the Tide Table of the Queensland Department of Harbours and Marine, plus one to two feet added for the wash of the surf. The levels of the bores were determined to within about 3 inches, and checked by back levelling.

Preliminary boring of the beach and adjacent dunes was carried out during August and September 1948, when bores were put down to ground level. Additional boring to ground water level was undertaken in July 1949, to define the boundaries of the deposits. In November 1949 some of the earlier bores were deepened and sampled below water level, and some scout boring was done in the low lying country between the coastal dunes and the Tweed River.

3. Sampling. During the preliminary boring, samples were taken of any sand which appeared to contain appreciable quantities of heavy minerals, and a single sample was made up from the overburden. During the later boring, the bores were sampled in sections from top to bottom, whether mineral appeared to be present or not. The reason for this complete sampling is that concentrates with a comparatively high zircon content tend to be grey rather than black, and are liable to left unsampled. Samples taken from the bore holes were reduced by quartering to a convenient size, about 700 to 1000 cubic centimetres, and bagged for despatch to the field laboratory. the field laboratory.

4. Laboratory Work. (a) Estimation of Quantities of Heavy Minerals, The bore samples were dried. and 700 ccs. of each sample was weighed.

Page 9. The heavy mineral concentrates were then separated from the 700 ccs. of rne neavy mineral concentrates were then separated from the 700 ccs. of sample by means of a laboratory Wilfley Table, and the weights and volumes of the dry concentrates were measured. The quantities of heavy minerals in the samples were then expressed as weight per cent, and "lbs/per cu.yd" (pounds weight of heavy mineral concentrate per cubic yard of sand) and are given in Table 7 at the end of this report.

(b) Determination of Compositions of Concentrates. The average percentage composition of the heavy mineral concentrates in the area was obtained from a composite sample from each hore line. The com-

was obtained from a composite sample from each bore line. The composite sample was divided into two portions - one portion for the

determination of the percentage zircon, rutile and ilmenite, the other portion for the determination of percentage monazite.

(i) ZirconkRutile and Ilmenite. The sample was separated magnetically on a Frantz Isodynamic Separator giving a magnetic fraction made up mostly of ilmenite with a little monazite, garnet and tourmaline, and a non-magnetic fraction of zircon and rutile. The zircon and rutile concentrates were separated electrostatically. The magnetic fraction The magnetic fraction concentrates were separated electrostatically. and the zircon and rutile concentrates were weighed; the composition of the magnetic fraction was determined by grain counting.

(ii) Monazite. The percentage monazite in concentrates was determined by means of Geiger-Muller gamma-ray counting equipment. A quentity of high grade monazite was prepared from concentrates of the The counting rate given on the Geiger-Muller equipment by the monazite was recorded, and the number of counts per gram per minute due to this monazite was calculated. Similarly, the second portion of the composite sample of the area which had been set apart for the radiometric determination of monazite was tested. Allowance was made for the radioactivity of the zircon, rutile and ilmenite, and the number of counts per gram per minute due to the monazite in the sample was calculated. From comparison of the counts/gram/minute of the high grade monazite, and the monazite in the composite sample, the percentage monazite in this sample was calculated.

(c) Variation in the Composition of the Feavy Mineral Concentrates. and in the Thoria Content of the Monagite.

(1) Composition of Concentrates. In order to detect any variation which might occur in the composition of the heavy mineral concentrates across the deposits from east to west, portions of concentrates obtained from bores along the bore lines 19890S and 15475S were grouped into composite samples C1-C6. To detect any variation along the deposits, portions of concentrates obtained from Block 1 (shown in Plate3) were grouped into composite samples C7-C12. To avoid possible wasking of grouped into composite samples C7-C12. To avoid possible masking of south-north variation by east-west variation, concentrates from the more easterly bores only of Block 1 were used in making up the composite samples C7-C12. The bores from which concentrates were taken to make up the composite samples are shown in Table 1.(a). Table 1.(a) Fingal-Cudgen Area. Preparation of composite samples to examine distribution of Heavy Minerals.

LINES ALONG WHICH DIRECTION IN WHICH COMPOSITE HORES FROM WHICH CON-SAMPLE GENTRATES MAKING UP BORES ARE POSCIBLE VARIATION SITUATED. OMPOSITE WERE TAKEN INVESTIGATED 20**E** 37W 70₩ 295₩ C2 19,8908 C3 C4 203W MAST-WEST. 130E **60E** C5 **W08** 15,4758 00 C6 195W 4017 80W 20.3908 19.8908 70W 30W C7 C8 20E 35E 16,9758 15,4758 14,7258 13,9758 30E 45W C9 4017 140E 90E 11,250S 10,500S 00 30W SOUTH-HORTH C10 30E 30W 3.5E 9,0008 3211 30E 35E 6,0008 4,5008 60N C11 35W GOT. 40W 5008 C12 250E 50E 00

As in the case of the composite sample of the area discussed in the preceding paragraph, each composite sample was divided into two protions. The composition of each composite sample was

determined by the method outlined in paragraph (b).

(ii) The Thoria Content of Monazite. A monazite consentrate was separated out from a composite sample representing the whole area. The thoria content of the monazite in composite was tested radiometrically by comparison with a standard monazite sample containing 6.6% thoria. The thoria content of the monazite in composite samples representing Block 1 and Block 2 (shown in Plate3) was similarly tested. The bores from which concentrates were taken to make up the composite samples of Block 1 and Block 2 are shown below in Table 1 (b)

TAPLE 1 (b) Fingal-Cudgen Area. Preparation of composite samples to examine possible variation in the thoris content

of monagite.

este e proprieta de la companya de La companya de la co	BORES FROM WHICH	LINES ALONG WHICH
COMPOSITE	CONCENTRATES MAKING	BORES ARE SITUATED.
	UP COMPOSITE WERE TAKEN	
	2508 - 1508	
·	608 - 40W	500
	40)s = 65W	30008
,	35W - 9 0W	45008
	30K - 250V	60008
***	30% - 30%	75008
	158 - 1271	90008
LOCK 1	30E - 70W	105068
-	00 - 110W	112508
·	1408 - 908	1897.18
	40% - 120W	U1743
	1308 - 80W	UAYIS
	30V	169758
	://I = /01	198908
	40)// 30)/	203908
-	LG5W	154758
· · · · · · · · · · · · · · · · · · ·	11.5W = 16.5W	169738
LOCK 2	500M	1857.58
	140W - 220W	191258
	255W - 295W	16)35008
. 984	160W - 240W	203908

E. RESULTS OF THE INVESTIGATION. 1. Distribution of the Mineral Deposits.

(a) Extent. The plans of Plate 1 and the sections of Plates 2 and 2A show that the deposits of heavy minerals occur almost entirely within the coastal dunes adjacent to the beach. viz. the "Beach Dunes" of "Section B: Topography". No deposits are associated with the "Westerly Dune Ridge" nor with the "Central Dune Mass". Appreciable concentrations of heavy minerals were intersected in the 60006 line from 650W to 950W, approximately 700 to 1000 feet west of the present beach, but this deposit must be of very limited extent, since boring on the 5250S and 6750S lines failed to locate any extension of it. Some years ago portions of this area were filled, probably with sand from the nearby Beach Dunes. The heavy mineral deposit in the western part of line 6000S may have originated in this way.

The deposits beneath the Beach Dunes extend from the northern end of the area southwards past the southernmost bore line (line 203908).

The southern extremity of the deposits lies within a built up area and camping ground which extends from the 203908 bore line to the mouth of Cudgen Creek, a distance of approximately 3000 feet. This area was not tested. At the 185758 bore line, and from 120008 to 147258, the deposits are narroy and thin. Over the whole area, the width of the deposits values from 40 feet to 220 feet, and averages 114 feet. The average overall thickness is 2.25 feet.

In the southern end of the area three separate deposits, each approximately parallel to the beach, can be distinguished. The westernmost deposit, which may be termed the "Western Deposit", is associated with the sandy scarp or old beach line discussed earlier in Section C. "General Geology : The Coastal Dunes". The Western Deposit appears on bore lines 198908 and 154758, The Western Deposit appears on bore lines 190908 and 194798, respectively, from 335% to 203% and at 195%, and may be traced to line 147258, at 240%. The eastermost of the three deposits, which may be termed the "Easterly Deposit", appears to be continuous with the main deposit underlying the Beach Dunes in the northern pertion of the area. An "Intermediate Deposit" appearing in the western portion of the Beach Dunes, is seen on bore lines 198908 and 154758 respectively, from 70% to 37% and 80% to 00. This intermediate Deposit cannot be recognised with certainty north of bore line 105008.

(b) Shape and attitude. The Deposits beneath the dunes appear to have the form of narrow seams extending unbroken for some thousands of feet parallel to the beach. In the sections (Plates 2 and 2A) the seaward dip of the seams, mentioned in section 3C "Geology": Deposits of Heavy Minerals", is illustrated in most of the bore lines. The lenticular or wedge shape of the seams is suggested in the sections of line 2000s 4500s 6000s 7500s suggested in the sections of line 30008, 45008, 60008, 75008, 112508, and 147258. The actual shape of a seam is not always well defined by the profiles, because the borcholes are in general too fer apart.

In several of the borelines, e.g., lines 30008 and 45008, deposits of heavy minerals; lower in grade than the beach seams, were intersected at comparatively high levels in the dunes. These deposits, formed from sand blown up from the beach by the wind, are irregular in shape and attitude, and in longitudinal extension. It is probable that many patches of such acolian deposits occur between

the bore lines.

(c) The Levels at which the Deposits Occur. Deposits occur within two distinct ranges of levels, viz. the beach seems and the acclian deposits. The beach seams have upper levels which range up to about 12 feet, the level of the top of the beach during periods of high tides caused by stormy weather. Their lower levels appear to be at or above mean sea level. The wind formed deposits may have upper levels exceeding 30 feet, as on the 30005 bore line. In their lower levels, viz. down dune on the seaward side, the acolian deposits merge into the upper extremities of the beach deposits, from which they were derived. Additional data on the levels of the deposits is given is Table 2.

TABLE 2 Fingal-Cudgen Area, Levels of Deposits.

Giving the maximum and minimum levels in the bore lines.

GRADE MB.PER.GUZD	LEVELS OF DEPOSITS TOP OF DEPOSIT (FT)	HEFERRED TO MEAN LOW WATER. BOTTOM OF DEPOSIT (FT)
Over 300	Average 9.1 Extreme Range 4.2-16.2 Usual range 5 to 11 0	Average 4.3 Extreme range 2.1 to 7.3 Usual range 3 to 5
120 to 300	Average 9.6 Extreme range 4.3 to 32.8 Usual range 6 to 8 #	Average 5.1 Extreme range 2.2 to 16.0 Usual range 3 to 5 f1 15 to 21 X *
Remarks :	# Deposits formed by wave a X Deposits formed in dune in these are acclian deposit into the beach deposits.	by wind action. ts which grade down dune Probably the grade remains one distance of done.

Page 12

2. Origin of the Deposits. In the section C3, "Geology 1

Deposits of Heavy Minerals" It is stated that, during stormy weather deposits of heavy minerals may be deposited on the upper part of the

deposits of heavy minerals may be deposited on the upper part of the beach. The sections of Plates 2 and 2A show that at various past periods, although massive sand dunes existed adjacent to the beach, for considerable intervals no deposits were formed at all.

It does not seem possible that the period required to build the Dunes between the Western, Intermediate and Easterly Deposits could have passed without seasonal storms. The inference is that the Fingal-Cudgen Beach received three separate accessions of heavy minerals. In Section C, "General Geology: The Coastal Dunes", it is suggested that the erosion which formed the sandy scarp at the southern end of the area may have been contemporaneous with the erosion of the dunes between bore lines 10500S and 1500S, and possibly, with erosion in the Palm Beach Tweed-Fingal Areas. Extending this supposition, it may be that similar erosion took place contemporaneously further south along the coast, and that deposits of heavy minerals further south were exposed, and transported northwards. A (southern) relatively small quantity of these heavy minerals a rrived at the southern and of the Fingal-Cudgen beach forming the Western Deposit. One may suppose that large volumes of common beach sand, silica, dislodged by the general erosion, then covered the source of supply of the heavy minerals and the same common beach sand also covered the newly-formed Western deposit before juch of the mineral had been transported north of the 14725S line. Similarly, a fresh supply of heavy minerals formed the Intermediate Deposit. Siliceous sand was deposited in large quantities for a further period, after which the beach became stabilized, and a foredune developed, with its crest at the positions shown in Table P.

TABLE D. Position of Foredune developed at end of PERIOD OF HEAVY DEPOSITION OF SILICEOUS SAND.

Bore Line	Coordinate of Crest of For
203908	00
198908	The (Approx.)
169758	65y (Approx.)
154758	308
139758	Removed by erosion (?)
112508	//OY
90008	Between 97W and 30W
75008	DVV (P)
60008	Does not occur (Broded?)
45008	90W (?)
30008	93W
15008	May be 150W

The stabilization of the beach apparently took place when the bulk of the siliceous sand made available by the erosion had been transported and distributed.

Supplies of heavy minerals, then becoming exposed south of the Fingal-Cudgen Area, were transported and deposited, still with considerable volumes of siliceous sand, on the Fingal-Cudgen beach. Concentration of the heavy minerals was effected during stormy weather, and possibly during a period of renewed erosion of the beach, resulting in a deposit of comparatively uniform composition from the southern side to the northern end of the beach. This deposit is represented by the main deposit, the Easterly Deposit, of the present day!

After cessation of active dune building. The Tweed River cut through the Beach Dunes a short distance south of the 60005 bore line. The southern portion of the Beach Dunes then terminated as a spit at the river mouth. The period during which the river mouth occupied this position could not have been long; otherwise considerable erosion of the dunes north of the break through would have taken place.

At the time the river mouth had been barred, presumably by the development of a sand spit across it, the beach for some distance south of the 60008 line must have been embayed. Heavy minerals were transported northwards from about the southern end of the embayment, which was presumably some distance north of the 148258 line, and were arrested near the northern end of the embayment, near the 60008 line. This may explain the samil size of the deposits from 112508 to 147258.

3. Reserves.

(a) Total Reserves. A summary of the total reserves of heavy mineral and quantities of overburden is given in Table 3, while a statement of the reserves between each pair of bore lines appears in Table 6. Details of bores and samples are given in Table 7. When computing the reserves it was necessary to decide, somewhat arbitrarily, the minimum grade of sand which should be included, and the minimum thickness of sand of a given grade. The minimum grade has been fixed at 120 lbs. weight of heavy mineral concentrate per cubic yard of sand. This is a little greater than 4 per cent by weight (Footnote). The minimum quantity of mineral was decided on the basis that the product of thickness of seam in feet times pounds of heavy mineral per cubic yard should be at least 300. Thus a seam which has a grade of 600 lbs of concentrate per cu.yd must be at least 6 inches thick, and seam of minimum grade, 120 lbs. per cu.yd., must have a thickness of at least 2 ft. 6 inches. Actually, the Fingal-Cudgen deposits are predominatly much higher in grade than the minimum grade given above. The overall grade, as stated in Table 3, is 502 lbs per cubic yard, and it can be seen in Tables 6 and 7 that a comparatively high grade is maintained et each bore line.

(b) <u>Quantities now Available for Mining</u>. Plate 1 shows that the deposits occur almost entirely within the boundaries of leases or applications for leases. It is believed that substantially all of the reserves given in Table 3 will be available for mining.

4. Distribution of the Minerals Throughout the Area.

(a) The Observed Distribution. The percentages of zircon, rutile, ilmenite and monazite in the composite samples of Table 1, are given in Table 4 (a)

COMPOSITE SAMPLE	PERCENTAGE COMPOSITION (NEGLECTING THE PERCENTAGE OF GARNET AND "OTHER MINERALS."					
	ZIRCON	RIVINE	TANGAN TO S	MONAZIRE		
C1	48.7	30.6	19.8	0,66	•	
C2	36.3	31.3	21.6	0.78		
	48.0	31.2	20.2	0.59	HAST-WEST.	
C4	46.3	30.2	22.5	0.99	•	
C5	40.3	36.3	22.6	0.76	•	
C 6	36.9	39.7	22.9	0.48		
C7 198905-263905	The second se	31.2	20.0	0.64	- P	
C8 14 9755	47.0	32.4	20.9	0.65		
C9 154755 - 139755		34.7	23.0	0.76	SOUTH-NORTH	
C10112505-9000S		35.1	22,2	0.57	100	
CI 60005 - 46005	49.1	29.2	21.0	0.63	•	
C12 15005-00	49.3	28.9	21.0	0.71		

The composition of the composite samples C1 to C3 from line 198908 and C4 to C6 from line 154758 suggests that the percentages of monagite and of zircon in the concentrates tend to decrease from east to west, across the deposits, while the percentages of rutile and of ilmenite tend to increase.

The variations in the composition of the concentrates from south to north, along the deposits, are illustrated graphically in Plate 3, Fig. 2. In the southern portion of the area i.e. from line 20390S to line 9000S (C7-G10) the percentage zircon tends to decrease while the percentages of rutile and ilmenite increase. However in the northern portion of the area, line 6000S to line 00 (C11-C12), there is an abrupt rise in the percentage of zircon

*FOOTWOTE: Figures for weight per cent and pounds per cubic yard may be interchanged on the tasis that 1 per cent by weight equals 30 lb. per cu. yd (approximately). This relationship holds reasonably well up to about 30 per cent, but as the percentage by weight continues to rise above 30. the number of nounds weight of mineral commondation to each 1 per cent becomes increasingly larger.

FINGAL-CUDGEN AREA : SUMMARY OF QUANTITIES.

BLOCK AS	AREA OF	WEIGHT OF HEAVY	VOLU	OVERBURDEN.		HICKNEGS OVERBURDEN	AVERAGE GRADE OF
SHOWN IN PLATE 1.	DEPOSIT SQ. YDS.	WINERAL CON- CENTRATE TONS.	DEPOSIT CU.YDS	CU.YDS	FT.	FT.	DEPOSIT LBS/CU_YD
BLOCK 1.	308,820	59,784	248,484	760,826	2.5	7.4	518
BLOCK 2.	53,526	3,796	25,498	125,226	1.3	7.0	334
TOTAL	362,346	63,580	283,982	886,052	. 2.25	7•3	502

Average Composition of Concentrate, and Weight of Each Mineral.

	MONAZITE .	ZIRCON	RUTTLE	IZERVITE .	GARNET. X. OT	efer minerals 6
PERCENTAGE	0.52	41.7	35.1	22.2	0.2	0.28
	Min. miller melagifinet musika seller Anabe quoqua errolle des Carrinos generale de que			erkundirallerik ungazekteritakturun hiputerik palektikan estilikkan estilikkan estilikkan estilikkan estilikka		
Weight (Tons)	330.6	26,513	22,317	14,115	127,2	178.0

X. This figure is somewhat low: verying proportions of garnet are lost when the sand is being tabled.

^{##} The "other minerals" are chiefly tourmaline, epidote, spinel, corundum and amphibole.

to a figure somewhat higher than that of zircon in the extreme south of the area, while the percentages of rutile and ilmenite decrease to a figure similar to that of rutile and ilmenite in the southern

portion of the area.

The percentage monazite tends to increase from line 20390S up to line 13975S, decreases abruptly in the section which included lines 11250S to 9000S, and in the northern portion of the area, from line 6000S to line 00, increases again to a percentage of the same order as that which applies in the southern portion of the area.

(b) Suggested Causes of the Observed Distribution of Heavy Minerals

(1) General. It may be expected that, in general, the proportions of the heavier minerals in the concentrates, viz. monazite and zircon, should decrease northwards along a beach. The truth of this assumption seems to be borne out by the present day overall distribution of the minerals along the coast. Thus, Fisher (1948) points out that there is a gradual decrease in the proportions of zircon and an increase in rutile and ilmenite from the mouth of the Clarence River northwards to South Stradbroke Island, Imposed on this general trend of distribution is a minor fluctuation within each beach area. In the Palm Beach Area, Queensland the distirbution of the heavy minerals appears to reflect in a minor way the overall distribution along the coast, viz. a decrease in monazite and zircon in a northward direction. Modifications to this distribution are effected where the concentrates are subjected to erosion or transport other than transport along the beach. For example, at the northern end of Palm Beach, the concentrates are exposed to the tidal currents flowing into and out of Tallebudgera Creek. Here an enrichment in monazite and zircon is observed, and has been brought about presumably, by selective removal of rutile and ilmenite by the tidal currents. In the Tweed-Fingal area, New South Wales, the proportions of monazite and of zircon do not decrease uniformly from south to north. Instead, in the northern half of the deposits, a sharp increase is observed. An attempt has been made to explain this distribution by extending the theory already adopted for the northern tip of the Palm Beach area, viz. enrichment in monazite and zircon because of removal of rutile and ilmenite by tidal currents and in addition, probably removal of rutile and ilmenite by wind action.

In the Fingal-Cudgen area the smiple picture of the distribution of the heavy minerals observed in the Palm Beach area appears in some measure in the southern part of the area, but is not apparent along the beach as a whole. Other factors appear to have overshadowed the tendency towards enrichment in rutile and ilmenite northwards along the area, and will be discussed in the following two paragraphs which deal respectively with the distribution of the heavy minerals across the deposits, viz. from east to west, and along the deposits

viz. from south to north.

(11) <u>East-West Variation</u>. In section F.1. "Distribution of the Mineral Deposits", it is suggested that, towards the end of a period of erosion, the Fingal-Cudgen deposits of heavy mineral were transported northwards from sources south of Cudgen Point. The deposits near the southern end of the area, for example, three separate deposits intersected on bore lines 19890S and 15975S, are separated by siliceous dune sand. Presumably, this sand covered the sources of supply of heavy minerals at intervals, while being transported along the coast. Hence the Fingal-Cudgen while being transported along the coast. Hence the Fingal-Cidgen Area received three separate accessions of heavy minerals, which could be expected to have somewhat differing compositions. If rutile and ilmenite were being transported along the coast at a more rapid rate than monazite and zircon, and if the successive deposits of heavy minerals arriving at the Fingal-Cudgen Area originated from the same locality south of Cudgen Point, it could be expected that the successive deposits from west to east in the southern part of the Fingal-Cudgen Area would become progressively richer in monazite and zircon. The samples taken along the 19890S and the 15975S bore lines do in general show an increase in monazite and zircon from west to east, although the middle sample on the 19890S line viz. Sample C2 fails to conform with this trend. A random variation such as that fails to conform with this trend. A random variation such as that appearing in sample C2 which represents the intermediate deposit, may indicate that the heavy minerals of the deposit concerned were transported from a source a little to the north or to the south of the source of the heavy minerals in the adjacent deposits.

(iii) South-North Variation. It is proposed first to examine.

The distribution from south to north along the Intermediate and the Western deposits of the southern end of the area.

Of these, the Western deposit cannot be traced north of the 147255 bore line, and the Intermediate deposit cannot be traced with certainty north of the 139755 line. Probably then, these deposits represent semil supplies of heavy minerals which arrived at the southern end of the area, and worked northwards for 5000 to 6000 feet, before becoming buried by siliceous dune sand. The data of Table 4 (a) has been rearranged below in Table 4 (b) to show the distribution of heavy minerals in these deposits on bore lines 19890S and 15475S.

TABLE 4 (b) Fingel Cudgen Area. Distribution of Heavy Minerals from South to North in the Intermediate and Western Deposits. RANK DEPOSIT AND COMPOSITE LINE. EALPIP THESPERM C3 ZIRCON RUTTLE ILMENITE MONAZITE 20.2 48.0 31/2 0.59 198908 **G**6 0.48 36.9 39.7 22.9 159758 TRUBERRATE TATEL 46.3 21,6 0.78 198908 02 31.3 05 0.76 40.3 36.3 159758 22.6

monagite and gircon distinctly decrease in a northerly direction.

The Easterly Deposit. The Easterly Deposit appears to extend The Easterly Deposit. The Easterly Deposit appears to extend continuously to the northern end of the Fingal-Cudgen Area, although some uncertainty exists from about 139758 to 120008. In Section E.(b) "Origin" (of the deposits) it is suggested that, at a fairly late stage of the northward movement of siliceous sand, and abundant supply of heavy minerals was uncovered south of Gudgen Point, and was carried northwards with siliceous sand and deposited on the Fingal-Cudgen Beach. In this way the beach received a deposit of heavy minerals comparatively low in grade, large in volume and of uniform composition from end to end. Note the similar compositions of the concentrates at the northern end the southern ends, vis. samples Cl. C4. C7. and C8 at the southern end. and samples Cl. C4. C7. and C8 at the southern end. Cl. C4, C7, and C8 at the southern end, and samples C11 and C12 at the northern end.

Later crosion of the beach and dunes resulted in the removal of silica, with concentration of the heavy minerals into higher grade deposits. Apparently during or just efter the period of erosion and concentration, the Tweed River formed an outlet to the sea a few hundred feet south of the 60008 bore line (see Section B, "Topography"). Brosion of the beach south of the river mouth resulted in a partial removal of the deposits from somewhere north of line 16975S, northwards to the river mouth. When the river mouth was subsequently barred, heavy minerals, more particularly rutile and ilmenite, drifted northwards along the embayment of the beach. As a result the proportions of rutile and ilmenite are increased from about 14725S (Note composition of Sample C9. Footnote) to somewhere north of line 90008 (note composition of sample ClO). Lines 154758 (Sample C4) and 169758 (Sample C8) are high in monagite.

The high sircon - monazite content of the northern portion of the area from 60008 to 00 (sample Cll and Cl2) has been explained as an initially high concentration due to "flooding" of the Fingal-Cudgen beach with siliceous sands carrying a comparatively low concentration of heavy minerals, uniform in composition. It is possible too, that small quantities of heavy minerals are transported past Fingal Point. If so, larger proportions of rutile-ilmenite would be removed in this way, resulting in a higher content of zircon-monazite in the deposits for some distance south of the headland.

5. Thoria Content of the Monazite. Figures for the determinations of thoria are given in Table 5. It is seen that the thoria content of the monagite from Block 1, Block 2 and from the entire area is 6.6%,

6.6 per cent and 6.7 percent respectively.

FOOTNOER: Sample C9 has a comparatively high monazite content, but it includes concentrate from line 15475S which is extraordinarily high in monazite.

MONAZITE CONCENTRATE FINGAL-CUDGEN MONAZITE CONCENTRATE (FC) SEPARATED FROM THE MIXED HEAVY CONCENTRATES OF THE PLOCK.	BLOCK 1. Monazite (ml) = 99.4 Zirdon = 0.1 Ilmenite = 0.2 Other Minerals= 0.2 100.0	BLOCK 2. Monazite (m2) = 99.3 Zircon = 0.1 Ilmenite = 0.3 Other Minerals = 0.3 100.0	Monazite (m2+m1) = 99.6 Ilmenite = 0.3 Other Minerals = 0.1
STANDARD MONAZITE CONCENTRATE (SG) MADE UP OF THE STANDARD MONAZITE (ms) AND ZIRCON ETC.	Monazite (ms) = 99.6 Zircon = 0.2 Other Minerals= 0.2 100.0	Monazite (ms) = 99.6 Zircon = 0.2 Other Minerals= 0.2 100.0	Monazite (ms) = 99.6 Zircon = 0.2 Other Minerals = 0.2
MASS (IN GRAMS) OF FINGAL - CUDGEN MONAZITE CONCENTRATE (FC)	11.120	11.088	10.518
MASS (IN GRAMS) OF MONAZITE (M1, M2 AND M1+M2) IN FINGAL-CUDGEN MONAZITE CONCENTRATE (FC)	11.053	11.010	10.476
MASS (IN GRAMS) OF STANDARD MONAZITE CONCENTRATE (SC)	11,132	11.132	11.132
MASS (IN GRAMS) OF STANDARD MONAZITE (MS)IN STANDARD MONAZITE CONCENTRATE (SC)	11.087	11.087	11.087
EXCESS OVER BACKGROUND (COUNTS PER MINUTE) DUE TO STANDARD MONAZITE CONCENTRATE (SC)	638	638	638
EXCESS OVER BACKGROUND (COUNTS PER MINUTE) DUE TO FINGAL-CUDGEN MONAZITE CONCENTRATE (FC)	639	633	615
COUNTS/GRAM/MINUTE OF FINGAL-CUDGEN MONAZITE (m1, m2 and m1 + m2)	639 11.053 = 57.8 (Counts due to zircon negligible)	11.010 = 57.5 (Counts due to zircon negligible)	615 = 58.7 10.476 (Counts due to zircon negligible.)
COUNTS/GRAMS/MINUTE OF STANDARD MONAZITE. (ms)	638 11.087 = 57.5	57.5	57.5
PERCENTAGE THORIA - IN MONAZITE m1, m2 and m1 + m2)	(57.8 x 6.6%) = 6.6%	67.5 x 6.6% = 6.6%	$(\frac{58.7}{57.5} \times 6.6\%) = 6.7\%$

x. Calculated on the basis of the thoria content of the standard monazite which chemical analysis gives as 6.6%

The experimental error due to the equipment is (\$\frac{1}{2}\$ 0.3 percent). Hence, it may be concluded that the thoria content of monazite from Block 1, Block 2 and from the entire area is the same, within experimental limits, as the thoria content of the standard monazite, viz. 6.6 percent.

ACTRICULATION DESCRIPTIONS.

The Beach Sands Investigation along the New South Wales Coast has received assistance from the New South Wales Mines and Lands Departments in the provision of lease plans and parish plans, and from operating companies and individuals who hold leases in the areas investigated. Information regarding leases in the Fingal-Cudgen area has been provided by Nr. J. Cooley of Tweed Heads; Cudgen Rutile-Zircon (Cudgen R-Z) of Kingscliffe; and Tweed-Rutile Syndicate of Tweed Heads, Notes on the vegetation of the area have been compiled from information supplied by Mr. S. T. Blake of the Queensland Department of Agriculture and Stock. In the administrative and supply aspects of the work, much help has been received from the State Controller and Officers of the Department of Supply and Development, Brisbane.

PEFFERENCES.

Figher, N.H. 1948: The Heavy Mineral Deposits of the Wast Coast of Australia. Mining Technology, NOV.

Fisher, N.H., 1949(a): Mineral Pesources of Australia, Summary Report No. 1 Zirconium, Commonwealth Bureau of Mineral Resources, Ceology and Goophysics.

Ficher. N.H. 1949 (b): Mineral Resources of Australia, Summary Report No. 2 Titanium. Commonwealth Bureau of Mineral Resources, Geology and Geophysics.

TABLE 6

LOCALITY FINGAL-CUDGEN

BLOCK 1.

DETAILED STATEMENT OF QUANTITIES BETWEEN BORE LINES.

カムわね	DISTANCE		DIH OF	And the second s	TOTAL BETWEEN I				VE RAGE	7051==
BORE LINES	BETWEEN LINES	AT LINE	SIT (YDS) AVERAGE	AREA OF DEPOSIT	Wr. of Min.	VOLUM	E (CUB, YDS)	THIC	VESS (FT)	GRADE OF DEPOSIT
00	(YDS)	41.3	42.3	(SO.YDS.	(LBS & TONS)			DEPOSIT	O'BRDN	(LBS /C
, -,			72.3	21,150	16,420,500	16,050	29,200	2.3	5.0 N	1023)
1500		43.3			7,331				-	
1500	500	43.3			24,690,000				·	
3000		54.3	48.8	24,400	10,982	36,950	60,200	4.5	7.4	666
3000		54.3		-	16,012,000					
	500		69.7	34,800		49,750	109,000	4.3	9.4	322
4500 4500		85.0			7,148					
•	500	85.0	104.2	52,050	29,583,000	64,200	770 600			
6000		123.3		1	9,189	V4, 200	117,600	3.9	6.8	321
6000	THE RESERVE OF THE PROPERTY OF	123.3	and the state of t		23,156,500	the Court Char Share a regress, and a second	-			
7500	500		82.5	41,250		46,100	66,500	3.3	4.8	502
7500		41.7	•	,	20,338	į.				•
•	500	42.7	53.7	26,850	12,690,500					····
9000		65.7	<i>34</i> ₹1	2,000	5,665	14,100	75,400	1.6	8.4	900
9000	 	45.7		16,850			;			
	500		33.7		3,691,500	4,150	31,750	0.7	5.6	890
10,500		21.7		·	1,648	• • • • • • • • • • • • • • • • • • •	1		3.0	CAO.
0,500	500	21.7	~ ^		646,500	· · · · · · · · · · · · · · · · · · ·				
1,250) JUNE	36.7	29.2	7,300	· }	1,325	20,500	0.5	8.4	488
9000		20.0			289		!			
•	500		30.9	15,400	3,604,900	5,750	92 350	-		<i>A</i> +
0,500		41.7			1,609	7977 0 /	83,350	1.1	16.2	627

TABLE 6 (Contd.)

LOCALITY FINGAL-CUDGEN

DETAILED STATEMENT OF QUARTITIES BETWEEN BORE LINES.

<u> </u>	DISTANCE		DTH OF		TOTAL BETWEEN I				VERAGE	GRADE OF
BORE	BETWEEN		SIT (YDS)	AREA OF	Wife OT MITT	VOLUME	(CUE,YDS)	THIC	KNESS (FT)	DEPOSIT
l in es	LINLS (YDE)	AT LINE	AVERAGE	DEPOSIT (SQ.YDS.)	WT. OF MIN. (LBS & TONS)	DEPOSIT	O'BRDN	DEPOSIT	O'BRDN	(LBS /CU YD)
10,500	250	41.7	27.5	6,875	1,720,250	2875	41,675	1.3	18.2	598
11,250		13.3			759					
13,975	500	16.7	40.0	20,000	2 637 000	# 700	14,600	0.7	2.2.	768
15,475	J00	63.3	40.0	20,000	3,611,000	4,700	14,000	0.7	2.2.	700
15,475	500	63.3	31.7	15,825	2,109500	2,050	4,850	0.4	0.9	1029
16,975	<i>J.</i> , <i>j.</i>		34*1	17,027	942	2,000	4,000	U•4	0.9	1029
14,725	250	40.0	22 4	9 205	3 340 050	2 075	20 205	0.5	72.0	1058
15,475	270	26.7	33•4	8,325	1,349,250	1,275	38,325	0.5	13.8	1076
15,475	500	26.7	24.2	70.300	2,895,500	4,600	44.000		11.1	629
16,975	700	21.7	24.2	12,100	1,293	4,000	44,900	1.1	1701	029
19,890	167	27.7	33•9	5,645	821,807	4,609	30.096	2.4	6.9	178
20,390	107	40.0	33•7	7,047	367		12,976	2.4	1.0.9	1 1/0
TOTAL OF	BLOCK 1.		er familie en volgen stagen in de dezemble gependen e	308,820	133,911,807	258,484	760,826	2.5	7.4	518
Colored to the colore					59,784					
			,							
	}				₹				1	

DETAILED STATEMENT OF QUANTITIES BETWEEN BORE LINES.

	1 DISTANCE		BLOCK2 DTH OF 1		TOTAL BETWEEN L	NES		Ā	VE RAGE	GRADE OF
BORE	BETWEEN	DEP0	SIT (YDS)	AREA OF		VOLUME	(CUB,YDS)	THIC	KNESS (FT)	DEPOSIT
LINES	LINLS (YDE)	AT LINE	AVERAGE	DEPOSIT (SQ.YDS.)	WT. OF MIN. (LBS & TONS)	DEPOSIT	O'BRDN	DEPOSIT	O'BRDN	(LBS /C YD)
15,475	_	-								
16,975	500	22.7	28.0	14,000	1,276,500	2,800	49,600	0.6	10.6	459
16,975		33-3 33-3	·		570					
18,575	533	21.3	27.3	14,551	1,400,191	2 , 5 05	40,988	0-5	8.5	559
18,575		21.3		,	481,290					
19,125	183	26.7	24.0	4,392	21.5	1,446	7,338	2.0	5.0	332
19,125		26.7			2,878,950	ب ميدي <u>ن مستوين از شيب</u> استوين - سيا			*	
19,890	255	60.0	43.4	43.4 11,041	/ 1,285	9,996	15,376	2.7	3.3	288
19,890		60.0		بي قايلان هر دين ۵۰۰ بر بيد سيده ۵۰۰	<u> </u>					<u> </u>
20,390	167	53•3	56.7	9,542	2,4 9 7,091	8,751	11,924	′ 2 .8	3•7	282
TOTAL OF BLO	XX 2.			53,526	8,504,022 3,796	25 ,4 98	125,226	1.3	7.0	334
					3,,,,	Legge		; ; ;		
									A STATE OF THE STA	
		-		<u> </u>						
					,		•			

HFAVY MINERAL AND OVERRURDEN IN BORES 887 east of portions 356/357 as shown

ORIGIN OF CO-ORDINATES

in Plate 1. Fig. 2.

ALSO LINE 15008 & 30008.

BORE DEPTH LBS PROM TO TO TO TO TO TO TO	BORE	į		DEF	TH	_	LBS/	0/B	DN	BO	יזכו		DE	HT		ĻF	BS/	O/BRDN
100 14 14 14 15 14 16 14 14 16 14 14 14	_		FR	OM	TO		CU. YD.	F3	•		របក	FRO)]\:	TO		CU	J .	
216 318 1023 245 14*6" 17* 18*13 3264 4*.0	ection 1/				Ž 11		ہے شہرے دیدہ			OW	01		14		No	ट डवा		d
150E	. yor	2	311 Q11	3.	ğn	1023	2	. 5			14	1611	17	1 311	No	t sai	mple	14.0
2n	200E			81	á Í		Ę	19	E)	hick			<u>"4</u>	• 311	ĭī	34	سو سو مسالس	1.00
3'6" 4' 2335 2.0 8'9" 10' Fot sampled. 3'6" 4' 2335 2.0 8'9" 10' Fot sampled. 10' His sampl	50E	0 1		511	i G	Tr.			4	10W	0		7	611	No	t sa	mple	4
3 6 4 4 6 Not sampled 10 11 3 326 7 5 26E		2"		3"	۷.,	258	a.m.n.¶	ا جيد ر		1	7	6 ¹¹	8	3"	34	7		
126E		31	611	41	O''	3332	samb1	teα. ≥Ω			8	0"	76	9 "			mpT e	
126E	•	4.	•			Not	samp]				10	•	77	1311	3 \$	65	<i></i>	7.5
100B	067	~		A 1	611	mp	-		•		11	1311	12	1 Km	13	62	men 7	La .
100B		-						2 † ¥	•	lhick	nes	. S	4)	6n	130	97	mbre	70
A 10" 8								-							·		-	
A 10" 8										ZOW	0		Ž		50 7 A	5		
A 10" 8	74E	o 1	24	2	311	407			j	ļ	6		9		67	.4		
Solid Soli		2	9"	4	6"	Not	sempl	Led	[j	91		18	•	3.2			9.7
50E 0 6 Tr		1	600	4	10 ⁿ	2069 Not	ອອຫວ _ິ	led.			_	1					*****	
50W 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	فالمالية والمقاصر والمياكة والماريون والوال					-			-	•	GE		3	71	IC	169		7.3
50W 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	50B	0		6		‡r]	_	25W			1		M		g	
50W 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	**************************************		***************************************			-			ı.	25W	וָּה		20) • 6 m	T			
50W 0 3 3 3 3 3 3 5 0 9 3 5 0 0 11 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	208		-	- 	311		-	-	• 1	Bow	0	!	5)		L'I. Rén		B	
100W 3 3 6 1351 350W 72 116 17 120W 72 116 17 120W 72 116 17 120W 72 116 120W 72 120W 72 72 72 72 72 72 72 7			3"	5	3"	68		1	2	30W	n'		11	•	T.1	•		
100W	·50W					99_			- 3	50W	Ö	l •	3	31	T	•		
100W	700	3	3"	3	En .]	5	7 ZW 2017		i	7	, • O · ·	tin Tir			
100W		· i		4		JOH	samp.	tea	6	40TY	0	1	17	71611	77	•		
S S Not sampled 1000W C C Tr 120W O C Tr 120W O C Tr 120W O C Tr 120W O C Tr 1240W O C Tr 1240W O C C Tr 1240W O C C Tr 1240W O C C C C C C C C C C C C C	TOOM	0		4	6"				7	60W	O;	!	7)				
Section A		4	611	2)] ,	H30	e emn'	100			0	1			77	.		
200W 0' 7'9" Tr 240U 0' 11' Tr 300W 0' 21' Tr 590W 0' 10' 48.4		8)	9	1		amp.	1 Gu			ď		<u> </u>		Į,	•		
590W C 10	20019	n		7	1911	Tr			- ∄	240U	0	1	13	Ī.	3	P		
10	300W	0		2		Tr				T. TN	TR S	10005						
LINE 1500S. Origin: 512 east of portion 247 as shown in Plate 1. Fig. 2. Section A. 60E 2'6" 2'6" 3'6" 1100 2.5 30F Tr 2'13" 1'9" 2133 1'9" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6	590W	ď	1	1) •	48.	4		Ö					, ea	st.	of s	out	west.
LINE 15008. Origin: 512 east of portion 247 70E 0 1.6" Tr 1.8 Section A. Section A. 60E						Tr			-	COL	ner	of.	Do:	rtio	n	125 a	ទេ ខ	nown
Origin: 512 east of portion 247 70E 0 1 6" Tr 1.8 as shown in Plate 1. Fig. 2. Section A.	647W	Q') 	<u> </u>	+1011	Tr	-		_	in	PIE	re 1		rig.	3.	•		
Origin: 512 east of portion 247 70E 0 1 6" Tr 1.8 as shown in Plate 1. Fig. 2. Section A.	LINE 1	5008	i			1			5	ectio	n /	1			+			
Section A. 60E C' 2'6" 3'6" 1100 2.5 30F C' 13" 19" 2133 10" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 3'6" 1424 15E C' 16" 10" 10" 10" 10" 10" 10" 12'6" 1141 7.5 13'6" 14'6" 14'6" 14'8	Orig	in	51	2	east	of	port1	on 247		70B	Q'		1	60	T	r	}	1.8
Section A. 2'6" 3'6" 1100 2.5 8" 2' Not sampled. 3'3" 438 0.3 30F 0' 1'3" 336 3'3" 3'6" Not sampled. 423 1'9" 3'6" 6'0 68.5 0.0 35E 0' 1' Tr 1' Tr 1'6" 15F 0' 11'6" Tr 1'6" 13'9" 885 11.5 15E 0' 7'6" Tr 11'6" 13'9" 885 11.5 15E 0' 12'6" 13' Not sampled 13'6" 52.4 13'6" 13'6" 52.4 13'6" 13'6" 13'5" 13.5	8.5	shov	n i	n []	Plate	1.	Fig.	2.	1	40E	7)	4.	7	P.T.	oft se	mnT	ed
30F 3" 336 3133 Thickness 2"11" 423 2000 35E 0" 11" 17" 1.0 15E 0" 12"6" 13"6" 1424 12"6" 13"9" 385 11.5 12"6" 13"6" 1420 13"6" 13"6" 13"6" 13"6" 13"6" 13"5 13.5		DA	ļ.	THE SEC.					!	792	4,1	†	8	it .	16	590	1	
30F 0 1 3" 336 3" 3 6" Not sampled. Thickness 2 11" 423 Thickness 2 10" 11" 423 Thic	6 0 E	Q'	! ! ん!!	2	16" 16"	TIO	n	2.5	.		81	1	2	! ! ^ !!	No	ot se	Iqui	
Thickness 3.6" 2000 68.5 0.0 35E 0. 1. Tr 24.6" 1771 1.0 15E 0. 7.6" Tr 11.6" 13.9" 885 11.5 10.6" 12.6" 13. Not sampled 13.6" 13.6" 52.4 13. 14.6" 1420 13.5	202			بيغ أبته هجي			المستقد والمستقد	207			¥1) J 11	2	611	H	so Stars	ריווני	
Thickness 3.6" 1424 24.6" 1771 1.0 15E 0. 7.6" Tr 11.6" 13.9" 385 11.5 7.6" 8.6" 420 10.6" 12.6" 1141 7.5 12.6" 13. Not sampled 13.6" 18. 1025 13.5	30F	L.F	-	1	1911 1911	213	3	• : ;		Thick	ines	ss	2	11"	4			
Thickness 3.6" 1424 24.6" 1771 1.0 15E 0. 7.6" Tr 7.6" 8.6" 420 10.6" 12.6" 1141 7.5 12.6" 13. Not sampled 13.6" 18. 1025 13.5		4	19" 12"	3	1511	500	Ď	0.0	-	n Mu	1	•				-		
15E 0 7'6" Tr 15E 0 11'6" Tr 13'9" 885 11.5 7'6" 8'6" 420 10'6" 12'6" 1141 7.5 12'6" 13' Not sampled 10' 13'6" 52.4 13' 14'6" 1420 13'6" 18' 1025 13.5	mh4 oknoes	- 4	.0			142	2 4.	0.0		35B	0 '	•	1		1			7.0
7:6" 8:6" 420 8:6" 10.6" 1141 10.6" 12.6" 1141 12.6" 13. Not sampled 13.6" 18. 1025 13.5								-	-	15E								700
	15E	O'	1611	y R	1611 1611						į,	1.611	13	1911			}	11.5
		8	62.	, R	9 76 "	175°	.		+	2 (50	1		-		+			
	,	4) 10" 2161	, 1	Z•0"	· LL4	Samn	7•2 1ed	.	37W	0	,) !	1(31611	4	2. Ø		
		Ī.	ğ•	拉	4.6"	142	0		12	į	13	3•6n	18	3•	i	25		13.5
	Thickness	;]		7	•	690	1	,			18	3∙	19	91611			amp:	Led
				-					-					7.7	+-	Marie Staffins of the		

343ft. east of southwest corner of

ORIGIN OF			_]	cortion	425 ns	shown		e l. Fig.	5.
	است مذهاه المعلقة بريد مذها موجوع المعلقة	and of the second different contracts of the	uso Line	~	A conditional state of the	. 600			A Annae
BORE	DEP	TH	LBS/ CU.	O/BRDN FT.	BOPE	To manufacture de principio	DP H	LBS; CU.	O/BRDN FT.
	FROM] TO	YD.	1	· 经 · 经	FROM	TO	YD.	± • •
Section	. Con	td.		1	kg epitamataminihanihani	15'	18•	52.9	
6517	0.	1	169		4	18.	21.	128	
	31	3.	87.6	ļ	· 100-40	21	54.	Tr	•
	ة. 91	91	87.6	*		27	27:	52.9 57.3	
	356	12'	177	F	1	:301	30°	57.3 108	
-	18.	18:	169 87.6 87.6 148 177 123	0.0	Other	33.	34	T.	
	51.	21.	15	-		kness		124	
Thicknes		31.	132	•	170W		3.	Tr no samo	1.0
93N	0,	10'	Tr			3.	9.	57.3	19.5
	10.	55,	Tr.	9.0	4	9. 11.6"	13'6"		
Average		5.2	434	7.5	Aver		3.7	% r 243	10.6
158A	0'	20.	77		5808	0.	16	Tr	
2379	1.	140	Tr		3309	0'	11.	Tr Tr	
	tone				260m	0.	11.	No Tr.	
Crisin :		ft. ea	et of or	own of	10000	0.	61	Tr	
Fingal R	å. 85								
	Fig.	2.			5:	NE 525			
Section	l.			-	Origi	n : III	BO Et.	east of c m in Ple	rom of
8 5 E	0147	Tr	2.8		F16.	2.	GED DYSUS	ns an rae	in Th
37E	01	3	113.		ACOM		31	102	,
	31611	3.6"	1478 273	0.0	44.263.88	3.	3:	133 101	
Thickness		5.9"	286	1,7012	4800	10 •	3.	77.5	
15%	0.	919"	74.9		1	3.	; 0 •	53.9 20.2	
	91911	1013"	780 Not sa	na ea		9.	9.	53.9 20.2 15.2	
	11.9"	is.	1730	9.7	5600	0.	3.	67.4	
Min of Allege of the	Is.	151	Tr		Zioni	3.		Tr	
শুনা oknes: 9ল	0'	216"	558 Tr	-	6400	°.	3.	75.8 77.5	diameter and the second
⊅ €∂	3.6"	3'6"	Not sa	pled	7200	Ŏ•		Tr	
	15"	7.	490	,		ુ3•	3:	Tr	
	20'	10.6"	7100	5.0	8807	0'	9.	22	
مة تم معربيس	10.64	12:	53.5 187		9609	,0°	∴6•	Tr Tr	
Thicknes		5'6"	The same of the sa	1.	1040W	0 '	6.	110	
3517	1201311	12.34	737	•	33500	10'	11.	Tr	
•	13.40	13.42	Not sa		No'	o enoug	gh minei calcula	gaola ler	this lin
	14.4"	15'	S310	12.2					
Thi clare	: 本フ・ おお	5.0"	Not sai	10160		E 60008	- T		
560	0.	13.6"	Not sa	apled	or1	gin :	1266 ft. 98. es	east of	crown of
V - 1-	1316"	2413"	375		ij.	ingal !	Fig. 2	kown in	Tate 1.
	14.3"	15.3"	Not and	pled 13.5	i Sank	ion A			
	1513"	18.94	Not sa	pled	60E	O A	Z+6#	Tr	0.5
	18.6n	24.6"	695		30E	0.	1	980	
Thickne	19.	5.60	146			1.	3.6"	77.	0.0
308	0	3:	40.5	1	4	7			
-	3.		50.6	. ويام	1	¢ \$	į		
	91	12.	27.0 Tr			2 1			
	13.	15.	121	15.0	* f		*		

FINGAL - CUDGEN.

HEAVY MINERAL AND OVERPURDEN IN BORES

ORIGIN OF CO-OFDINATES:

1266 ft. east of crown of Fingal Rd. as

LINE 6000			s	hown in		. Fig.		501 214	
DODE	DE?	I'H	LBS/	O/B.DN	. BUPE	757	OH	LBS/	O/BRDN
BORE	FROM	TO	ĊU. YD.	F.	. DUFE	FROM	TO	CU. YD.	FT.
low	0.	10.6"	Tr	Street, Street	99.5M	9.	611	Not sa	pled
,		10'10"				6"	21 213"	368 Not sa	77.04
	10' k 0	11.6"	Not san 2220	11.0	1040W			33.7	shred
	11.6"	13.8"	Not sai	npled	201011	3.	3:	295	~
ma a san	13.8"		2650			6.	91	295 179	
Thickn	<u> </u>	3'	653		ምክፋ ላ	9: kness	6.	Tr 237	
60M	916"	9'6" 10'6"	Tr Tr		1080W			Tr	
	1016"	10'10"	2008	10.5		3 •	3.	Tr	
	10'10	713.6	142 666	•	1160W	0	61	Tr	
Thickn	1316"	3•6n	214		1240W	01	111	Tr	
120W	01	5,	Tr		KRAN	XXXXX	XXXXXX	XXXX	
#50W	21	3.6"	730	-					
	3.6"	4.	Not sar		LI	18. 6750	3 se	east of	
	419"	419n 519n	150 1990	S•0	Fing	al Road	as s	hown in	Plate 1.
	51911	81611	176	1		Fig.	2.	; ;	
Th1ck	ness	6.6"	512	{	1160W	0.	11'	TT	
150W	0.	3°	515	2	1240W	01	6.	Tr	
	3!	91	47.2 418	T .	1320W	0.	11.	Tr	4 director
	91	12.	563						
	12	1416	293 145	0.0	Ortes	E. 750	08	east of	270777
•	14.6"		1224	:	Fing	al Road	. as s	hown in	Plate 1.
	15	18.	53.9 tr.	· ;	:	F1	g. 2.	¢	
Thicknes	,	150	259	;	Sec	tion A.			
190W	01	70	94	<u> </u>	70E	0	∓9 #	153	1.9
	71611	716" 816"	629	j 1	:	9"	1'	Not sa	pled
	8.6"	9'	Not sai	apled	30E	6"	6"	1053	
	91	10'	Not sa	mpled ;	•	1.	116"	Not sa	abreq
material control	10.	150	Tr.		· ·	116"	21	855 1775	0.0
Thickne		2.	355	; 	•	21	3.3"	Not sa	pled -
250W	911	31611	574 05	0.0	Thiel	kness	319"	2440 816	İ
	31611	816"	95 58	0.0		0.	101	Tr	
310W	0:	6"	Tr	0.4	1	10	10.9"	1230	
		3.61	385	4.1	• •	10'9"	11 3"	Not sa 2450	
Averag				704	•	11 15"	12.6"	Not sa	10.0
470W 610W	0,	14'	7x 58,3	· •		12161	14*3"	2675	
650W	0"	3.	176			kness	4'3"	783	
690W	0.	3.	102		loe	11:3"	11'3"	Tr 1619	
720W 77 0W	0'	3'	9 4 74	,	<u>.</u>	12.3"	12*6"	Not sa	pled.
810W	0.	300000	341	į į		1216"	14'	2883	11.2
850W	0	3.	Tr	,	- ምክፋለን	14' mess	3'9"	1125 1885	
-	3.	3'3" 3'3"	442		30W	O.	101	Tr	
UNAW	3.3"		Not sa	spred	•	10	11'	1177	10.0
890W	_i	3.	Tr		-	11.	13'	Not sa	pled
930W	1161	3'	Not sa	npled	-	13' 13'3"	13'3" 16'	574 Not sai	haled
970W	01	1.		npled.	Thick	mess	313"	406	72.42.44
)/VII	1'	219"	335	. , í	· · · · · · · · · · · · · · · · · · ·		 		
•	219"	3'	Not sa	mpled.	i i >	z ; (
					:		1		

TABLE

FINGAL - CUDGEN
HEAVY MIJERAL AND OVERBURDEN IN BORES

### ALSO LINE 90008. 105008. BORE DEF LIBS O/F DK PROL TO YD. FT. Section A Contda 55% 0' 3' 40.5 3' 6' 7' 3 6'	LINE 75008	. Con	td.		hown 1n			2.		
BORE		DES	TH		and the second s	17 17	CONTRACTOR OF THE PERSON OF TH	H	LBS/	O/BRDN
1	BORE	12-42-4-4	de la constantina	CU.		BURE	FROIn	TO	CU.) '
1	Section A	Cont	1.		, province of the second of th	157W	0	3.		
24	gypenalog v Hitches	61 91 121	9° 12° 15° 18°	30.3 40.5 47.2 74.2 104.5	**************************************		9' 12' 15' 18'	9: 12: 15: 18: 21:	57.3 60.7 50.6 93.5 53.9	13.0
Average 2.7 965 6.9 3 6.5 Tr 115W 0' 7' Not sampled 15' 18' 33.7 24IW 0' 5' Tr 1400W 0' 11' Tr 1450W 0' 6' Tr 1560W 0' 6' Tr 1640W 0' 11' Tr 1720W 0' 11' Tr 18W 1050Ss Origin: 3790 ft. east of Pacifit in Shown in Plate 1. Fig. 2. Section Al. 60E 0' 2'6" Tr 10' 10' 5" Section Al. 60E 0' 9" 3'9" 80.2 0.0 15E 0' 16" Tr 0.75 15E 0' 10' 10' Tr 10'		21'	241	34.4 45.7		Ave	age	1.0	252	12.5
11-	Average	-			6.9	237W		3.	Tr	
24 W 0' 5' Tr 1400W 0' 11' Tr 1450W 0' 6' Tr 1560W 0' 6' Tr 1640W 0' 6' Tr 1640W 0' 6' Tr 1640W 0' 6' Tr 1640W 0' 11' Tr 120W 0' 11' Tr 120W 12'	11577				pled		151	18•	33.7	De a calanta
1450W 0' 6' Tr 1560W 0' 6' Tr 1640W 0' 6' Tr 1720W 0' 11' Tr LINE 90008. Origin: Above top of beach, as shown in Plate 1. Fig. 2. Section Al. 60E 0' 2'6" Tr 40E 0' 9" 192 9" 3'9" 80.2 0.0 15E 0' 10' Tr 0.75 15E 0' 10' 10' Tr 10' 10'6" 12' Not sampled 12' 12'4" 318 OO 0' 8'3" Tr 110' 10'6" 12' Not sampled 12' 12'3" Tr 13'3" 409 13'3" 89" 2930 8.2 8'9" 12'3" Tr 32E 0' 8'6" Tr 100 0' 8'3" Tr 13'3" 15'6" 10' 10' 12' Not sampled 13' 8'9" 2930 8.2 8'9" 12'3" Tr 13' 13'3" 409 13'3" 15'6" 10' 10' 12' Not sampled 9'6" Not sampled 9'6" Not sampled 13' 13'3" 15'6" 10' 10' 12' Not sampled 9'6" Not sampled 15'6" 15'9" Not sampled 15'6" 10' 10' Not sampled 15'6" 10' 10' 10' Not sampled 15'6" 10' 10' 10' 10' Not sampled 11' 10' 10' Not sampled 12' 14' 12' Not sampled 11' 10' Not sampled 11' 10' Not sampled 11' 10' Not sampled 12' 12' Not sampled 12' 12' Not sampled 11' 12' Not sampled 11' 12' Not sampled 11' 12' Not sampled 11' 12' Not sampled 12' 12' 14' 10' 10' 12' Tr 12' 12' 12' Not sampled 12' 14' 12' Not sampled 12' 14' 12' Not sampled 12' 12' Not sampl			· •			317W		1 1	Ţr	
1560W 0 6 Tr 1640W 0 6 Tr 1720W 0 11 Tr 17 1720W 11 Tr 17 1720W 17 17 17 17 17 17 17 1		0	6.						Ţr	
1720W 0	1560W	0'	61	Tr				por sourced		
LINE 90008. Origin: Above top of beach, as shown in Plate 1. Fig. 2. Section Al. 60E 0' 2'6" Tr 30E 0' 6" 1'6" Tr 0.75 40E 0' 9" 192 80.2 0.0 15E 0' 10' Tr 0.75 15E 0' 10' 10'6" 920 10'6" 12' 12'4" 12'9" Not sampled 12' 12'4" 12'9" Not sampled 12' 12'4" 12'9" Not sampled 12' 12'4" 318 OO 0' 8'3" Tr 10' 10'6" 12' 12'6" 13' 850 12'6" 13' 850 12'8" 12'8" 12'8" 10' 10' 10' 10' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12								,		D4-64
Section Al	Origin:	Above	top of	beach,	as	Sect	fi ion Al	g. 2.		
60E 0 2 6 Tr		1			in .					
9" 3'9" 80.2 0.0 15E 0' 10' Tr 0.75 15E 0' 10' Tr 920	60e	0				30E	6"	1.	869.2	0.50
10' 10'6" 12' Not sampled 12'4" 12'9" Not sampled 12'4" 12'9" Not sampled 12'4" 12'9" Not sampled 12'4" 12'9" Not sampled 12'6" Tr 14.3		9"	3.6"	80.2	0.0	15E		10'	Tr	بوس بيواد ودست بيدس بيسياء
10'6" 12'4" 845 10.0 00 0' 13' Tr 14.3	1 28		10.6"			Ave	rage	0.25	869	0.6
Thickness 2'4" 318 OO O' 8'3" Tr 12'6" 13' 850 OO O' 8'3" Tr 2930 8.2 13'3" 15'6" 910 12.5 32W O' 8'6" Tr 1207 8.5 O' 0' 0'6" Not sampled 15'9" 16'3" 1013 8'6" 9'6" Not sampled 15'9" 16'3" 1013 9'6" 9'10" 2387 9'10" 11'6" Not sampled 50W O' 7'6" Tr 9'10" 10'6" Not sampled 10'6" 11' 54 Average O'8' 897 7.0 Section All. 97W O' 28' Tr 13.0 127W O' 28' Tr 13.0 127W O' 12' Tr 13.0							4.4	4 4		1
Thickness 2'4" 318 OO O' 8'3" Tr 8'9" 2930 8.2 13'3" 15'6" 910 12.5 8'9" 12'3" Tr 15'6" 15'9" Not sampled 32W O' 8'6" Not sampled Thickness 3'9" 830 9'6" 9'10" 2387 9'10" 11'6" Not sampled 7'6" 8'6" 109 Thickness 1'4" 1049 97W O' 28' Tr 9.2 Average 0'8' 897 7.0 Section All. 97W O' 28' Tr 13.0 12'6" 12'0" 16'3" 10'3 Not sampled 7'6" 8'6" 109 10'6" 11' 54 11' 12' Not sampled 12' 12'4" 387 Section All. 97W O' 28' Tr 13.0 12'0" 16'9" 806 16'0 12'10" 16'9" 806 16'0 12'10" 16'9" 806 16'0 12'10" 15'6" Not sampled 16'9" 17'3" Not sampled 17'9" 21' Tr		10'6"	121	Not sam						
13		10'6"	1214"	845	10.0	00	01	13'		14.3
32W 0' 8'6" Tr 1207 8.5	Thickr	10'6" 12' 12'4"	121- 1214" 1219" 214"	845 Not sam	10.0	00	0.	13'	Tr	14.3
## 10 11 6 Not sampled 7 6 8 6 10 9 10 10	° 00	10'6" 12'4" 12'4" 10'8	1214" 1214" 1219" 214" 813" 819" 1213"	845 Not sam 318 Tr 2930	10.0 pled	00	0' 12'6" 13'3" 15'6"	13' 12'6" 13' 13'3' 15'6'	Tr 850 409 910 Not sa	12.5
97W 0° 28° Tr 9.2 10°6" 11° 54 Average 0.8° 897 7.0 12° 12°4" 387 Section All. 97W 0° 28° Tr 13.0 12°6" Not sampled 12°6" 12°10" 270 12°10" 16° Not sampled 16°9" 806 16.0 12°14° 15°6" Not sampled 17°3" 17°9" 1306 15°6" 17° Tr 12.0 17°9" 21° Tr	° 00	10'6" 12'4" 12'4" ess 0' 8'3" 8'9"	12'4" 12'4" 2'4" 8'3" 8'9" 12'3" 5'6" 9'6"	Not sam 318 Tr 2930 Tr 1207 Not sam	10.0 pled 8.2	00 30W	0' 12'6" 13'3" 15'6" 15'9" 16'3" kness	13' 12'6" 13'3' 15'6' 15'9' 16'3' 17' 3'9"	Tr 850 409 910 Not se 1013 Not se 830	12.5
Average 0.8° 897 7.0 Section All. 97W 0° 28° Tr 13.0 12° 12°4" 12°6" Not sampled 12°10" 270 12°10" 16° Not sampled 16°9" 806 16.0 12° 14° 252 16°9" 17°3" Not sampled 17°3" 17°9" 1306 15°6" 17° Tr 12.0 17°9" 21° Tr	∘ 00 32₩	10'6" 12'4" 12'4" 8'3" 8'9" 0' 8'6" 9'6" 9'6"	12'4" 12'4" 2'4" 8'3" 8'9" 12'3" 5'6" 9'6" 9'10" 11'6"	Not sam 318 Tr 2930 Tr 1207 Not sam 2387 Not sam	8.2 8.5 pled	00 30W	0° 12°6" 13°3" 15°6" 15°9" 16°3" kness	13' 12'6" 13'3' 15'6' 15'9' 16'3' 17' 3'9" 7'6"	Tr 850 409 910 Not sa 1013 Not sa 830	12.5 mpled mpled
97W 0' 28' Tr 13.0 12'10" 270 12'10" 16' Not sampled 12' 14' 252 16'9" 17'3" Not sampled 15'6" 17' Tr 12.0 17'9" 21' Tr	00 32W	10'6" 12'4" 12'4" 8'3" 8'9" 0' 8'6" 9'10" 1000	12'4" 12'4" 2'4" 8'3" 8'3" 12'3" 5'6" 9'6" 9'10" 11'6" 1'4"	845 Not sam 318 Tr 2930 Tr 1207 Not sam 2387 Not sam 1049	8.2 8.5 pled pled	00 30W	0' 12'6" 13'3" 15'6" 15'9" 16'3" kness 0' 7'6" 8'6"	13' 12'6" 13' 15'6' 15'9' 16'3' 17' 3'9" 7'6" 8'6" 10'6'	Tr 850 409 910 Not ss 1013 Not ss 830 Tr 109 Not ss	12.5 mpled mpled
127W 0' 12' Tr 16' 16'9" 806 16.0 12' 14' 252 16'9" 17'3" Not sampled 17'3" 17'9" 1306 15'6" 17' Tr 12.0 17'9" 21' Tr	32W Thickr 97W Avera	10'6" 12'4" 12'4" 12'4" 8'3" 8'9" 0'6" 9'6" 9'6" 9'10" less	12'4" 12'4" 2'4" 8'3" 8'3" 8'9" 12'3" 9'6" 9'6" 9'10" 11'6" 1'4"	845 Not sam 318 Tr 2930 Tr 1207 Not sam 2387 Not sam 1049	8.2 8.5 pled oled	00 30W	0' 12'6" 13'3" 15'6" 15'9" kness 0' 7'6" 8'6" 10'6"	13' 12'6" 13'3' 15'6' 15'9' 16'3' 17' 3'9" 7'6" 8'6" 10'6 11' 12' 12'4	Tr 850 409 910 Not sa 1013 Not sa 830 Tr 109 Not sa 54 Not sa	12.5 mpled mpled mpled
14' 15'6" Not sampled 17'3" 17'9" 1306	32W Thickr 97W Avera	10'6" 12'4" 12'4" ess 0'8'9" 0'8'6" 9'6" 9'6" 9'10" ess 0'	12'4" 12'4" 8'3" 8'3" 8'9" 12'3" 9'6" 9'6" 11'6" 1'4" 28'	845 Not sam 318 Tr 2930 Tr 1207 Not sam 2387 Not sam 1049 Tr	8.2 8.5 pled oled 9.2 7.0	00 30W	0° 12°6" 13°3" 15°6" 16°3" kness 0° 7°6" 8°6" 10°6" 11° 12° 12°4"	13' 12'6" 13'3' 15'6' 15'9' 16'3' 17' 3'9" 7'6" 10'6' 12' 12'4)	Tr 850 409 910 Not sa 830 Tr 109 Not sa 54 Not sa 54 Not sa	12.5 mpled mpled mpled
Thickness 1'9" 718	32W 32W Thickr 97W Avera	10'6" 12'4" 12'4" ess 0'8'9" 0'8'6" 9'6" 9'6" 9'10" ess 0'	12'4" 12'4" 8'3" 8'3" 8'9" 12'3" 9'6" 9'10" 11'6" 1'4" 28'	845 Not sam 318 Tr 2930 Tr 1207 Not sam 2387 Not sam 1049 Tr	8.2 8.5 pled oled 9.2 7.0	00 30W	0' 12'6" 13'3" 15'6" 16'3" kness 0' 7'6" 10'6" 11' 12'4" 12'4" 12'10	13' 12'6" 13'3' 15'6' 15'9' 16'3 17' 8'6" 10'6" 12'4 12'4 12'4 12'4	Tr 850 409 910 Not ss 1013 Not ss 830 Tr 109 Not ss 54 Not ss 74 Not ss 1387 Not ss 109 Not ss 109	12.5 mpled mpled mpled mpled mpled mpled

TABLE 7

ORIGIN OF CO-ORDINATES: 3790 ft. east of Pacific Highway as shown

LYNR 10	500s.	Contd.	ALSO LI	in Pl NE 1125	late 1. OS. 12		139758		
BORE	DEP FROM	TH TO	LBS/ CU.	O/BLDN FT.	BORE	en a monte proper part a la calante	CH .	LBS/ CU.	O/BRDN FT.
			YD.			FRon	TO	YD.	
	1. Cor	,			llow	0	3.	Tr Missin	
70 w	20.	20. 50.	Tr 9.9		į	3.	9•	The server	
**************************************	21.6"	221	627	ر. از جم جہ		121	121	Te Te	13.0
	25.	251	29.7 Tz	21.5		251	18.	· Missin	
Thi ckn	อรร	28 t	627	,		21	26	1 <i>5</i> 4 Tr	
125W		91	Tr 9.4	ì	A 47	erage	1.5	154	18.7
	121	18•	16.8	21.75	AV.	~a8e		1)T	7041
	18.	291	Tr		ĻI	NE 1200	208.		<u>[</u>
Averag		1.2	778	18.0	Orig nmods	in a No	ear top	of fore	dune, as
175W 305W	0.	201	Tr Tr	. ~ .	8.10.07	nd sec	tion in	Plate 2	
375W	0	20.3"	Tr	, i	1358	0.	At	Tr	
4950	0'	71	Tr Tr		85E	2.	6"	Not sa	npled
630w 813w	0	17 · 20 ·	Tr			6n 1'	1*	328 Tr	
913W	01	91 1316"	Tr Tr		60E	0.	14.	Tr.	
1013W 1060W	0'	1.8	Tr	1	35E	O*	8•	Tr	·
1180W	0.	6	Tr			8• 8•3"	8*3"	194 Not sa	nnī eð
. 1330W 1530W	0'	8• 8•	Tr Tr	į. Į.	00	0.	20161	Tr.	apa cu
1730W	0.	8•	Ţr	ì	30 ए	0'	171	Tr	
. 1930W	6:	61 81	Tr Missing		80W 130W	0'	21.6	Tr Tr	}
2130W	0.	6.	Tr		SOOM	0.	23.	Tr	·
2430W	0.	6'	Tr		300W 375W	0'	17.	Tr Tr	
LINE 1	2509	3			445W	01	7161	Tr	.
Origin :	at to	p of be	each as s	hown in	545W 645W	0.	5.	Tr Tr	
	Plate	i. Fig	. 2.		800W	0.	91611	Tr	
40E	0.	17.16"	Tr	11.7	950N 1100N		7:3"	Tr Tr	
00	0.	11'6"	Tr	ì	1250W	00	S1 . 6	Tr	
	11'6"	12°	687 Not sam	11.5	1300%		24	Tr	calculations
30W	0.	7403"	Tr	pr. ca				uueo in in g rad	
_	14*3"	14.9"	912	- 1 - A					
	150	16.	Not sam	14.2		E 1397		east of	western
Mhd atau	16.	17'6"	Not san	pled		of Ma	rine Pa	rade, as	shown in
Thickner 70W	0.	1'9"	334 Tr			Plate	1. F1	. 2.	
, 010	6.	9.	32 61	2		ion A.		- 6-	
	9° 12°	12.	61 62	15.1	140E 90E	0"	2'3"	161 1672	0.0
	151	18*	Ţr	- /- * ;	.2045	0.5.	819"	TO	0.0
	21	21 24	21.1 Tr		Ave		1.2	266	0.0
	241	27•	15.2): 	60E	0	81611	Tr	
Avera	ge	0.71	413	13.05	30E	1019"	10.9	Tr 210	
70W	0:	61	Tr	,		11.30	12.6	Not sa	mpled
•	61	91	32 61	, ,	5 £	12.6"	12 '9 '	940 Not se	mpled
	12.	15.	62		00	→ 0•	17'6		
•	15° 18°	18· 21·	Tr 21.1	19.5		,			
. •	5 1	Tx 24	· Tr.						
	241	271	15.2	- <u>!</u>	,	١			·

HEAVY MINERAL AND OVERBURDEN IN BORES

ORIGIN OF CO-ORDINATES: 269 ft. east. of western fence of Marine

LINE. 13975	LINE. 13975S. Contd.			, as sh IE 14725	own in 1 8. 1547	71ate 1	. Fig.	2.	
BORE	DEP	TH	LBS/	O/EI DH	j i	5.00	PH	LBS/	O/BRDN .
DONE	FROM	TO	CU. YD.	F.		FROM:	TO	CU. YD.	FT.
35 W	0:	3:	Tr 35.4		Aver	-	0.21	1426	14.1
e (/ p.a.m.).	91	9' 12' 13'	30.3 Tr Not sam	pled		0.36	55. 9.	77.5 Tr Tr	
	13' 13'4" 15'	17'	Not san	pled	240W. 4	0' 9' 12'	9' 12' 25'	Tr 125 Tr	
155₩ 300₩ 475₩	0; 0;	19* 16*6" 17*	Tr Tr Tr		320W 320W		27° 27°	T	
615W 800W 850W 1015W 1220W	0'	8, 13, 8, 14,3	Tr Tr Tr Tr		Orig	f Warin	2 ft.	đe, as si	vestern fen- hown in
1255W 1455W	0'	12° 8'6"	Tr Tr	The state of the s	<u>Sec</u> 220E	tion A.	216"	Tr	0.4
1755 W 2055 W 2555W	0; 0;	81 81 71	Tr Tr Tr	2	1302	9" 04	9" 3•	1545 Tr	0.0
3055W 3555W 4055W	0°	6, 8, 8,	Tr Tr Tr		90E	01 611 811 41411	611 811 41411 51611	900.3 1356 133	0.0
LINE 1.	17258 367		t of west	fence		ckness	8n	1233	
of Marine	Parad Fi	e, as s. 2.	shown in	Plate 1	•	513" 616"	51311 61611 81611	Tr 292.1 Tr	5.2
Section	A.	i i	10 mm		30E	01	3:	7r 38.8	
00	0' 9' 12'	9: 12: 21:	78.3 Tr	the expension of the ex		3' 6' 12' 15'	12'	Tr 22.4	5 . 9
40W	0°	9' 12'	Tr 14.1			18'	20161		
	121	12' 17'6" 17'10	Tr 433	17.5	Aver		0.61	1040	1.4
80W	17'10'	31	Tr 71.8	and the state of t	<u>Sec</u>	tion B. 0' 12' 12'3"	12' 12'3" 17'	Not sai	12.0 mpled
dia s s.	9' 11' 11'3" 13'6"	11 • 11 • 3 " 13 • 6 " 16 •	118 Tr	11.0	45W	0' 13'8" 14' 14'3" 15'	13'8" 14' 14'3" 15' 16'6"	Not sai	apled apled 13.7
Thickner 1 20W		3"	2228			kness	1440	1041	
120W	0' 12' 15' 15'3"	12" 15' 15'3" 18'	32	15.0	8ow	01 1413# 1417#	19'	312.4 Not sa	14.3 npled
-	نسيب سيسب		Tr	-	Aver	age O	0.81	900	13.4
160W	61	61	Tr 45.5	1	100W	0.	16.61	Tr	
i	9' 12' 15' 18' 24' 27'	12* 15* 18* 24* 27* 30*	19.6 107 Tr 86	15.1		ection O' 7'- 7'\$"	C. 7! 7!4" 9!	Not sa Tr Not sa	mpled
	30.	31.	77 23			9° 10°6"	10.60	89.6 Not sa	10.0 mpled

HEAVY MINERAL AND OVERBURDEN IN BORES

ORIGIN OF CO-OFDINATES:

332 ft. east of western fence of Marine

LINE 154758	3. Cont		LINE 1	Parade.		own in	Plate 1	. Fig. 2	
	DEP	4.00	LBS/	O/B! DN		1,7,1	? ZH	LBS/	O/BRDN
BORE	FROM	TO	CU. YD.	F.	BURE	FROIT	TO	CU. YD.	FT.
Section	. Cont	da		A Tomas of the last of the las	865W	0.	51.	Tr	
195W	0' 9'6" 10'6" 15'	9•6" 10•6" 15• 17•	Not se	1	905W 945\V 985W 1025W 1125\V	0.	22' 16' 12' 7'	Tr Tr Tr Tr	
240W	0.	17'	Ir	10.0	1225W	01	7.	Tr	
Average		0.5	388	9.75	1325W	0:		Tr Tr	
285W	0.	23!	Tr		1525W	04	12.	Tr	
330W	0'	22*	Tr		1625W	0'	7.	Tr	
390W 510W	0'	19 '	Tr		1725W 2025W	0'	7.	Tr Tr	
610W	Ŏ•	9•	Tr		2125	0'	12.64	Tr	
875W	0.	11.	Tr		2225W	0'	7:	Tr	
955W 985W	0	19	Tr		2325W	0.		Tr	
905 % 1080ए	0.	231	Tr	; ;	2525W 2825W	0.	7.	Tr Tr	
1135W	ŏ•	7.	Tr		3125W	0*	12	Tr	
	69758				3425W	0"	6.	Tr	
		t. ass	t of we	stern fer	3725	0	7'	Tr Tr	
of Marin	e Para	de, as	shown	14	4325W		71	Tr.	
Pla	te 1.	Fig. 2	•	T. A. C.					
35E	0.	21	410	0.0	011		31 ft.	west of	
00	0.	12'	Tr	ţ, ţ,	Para	de as	shown 1	n Plate	. Fig. 2.
	12'3"	12'3"		ampled	50B			Not sai	pled
	13'	14.	803	12.0	16E	0.	16.	Tr	
	14	16.	Not s	ampled	00	0.	3.	11	
Thick		21	465		•	3'		Tr	
30W	01	10'6"	Tr 148	10.5	***************************************	9•	91	72.1 Tr	
	10'9"	13.		ampled		121	15.	14.5	
Average		1.60	435	8.4 -		15*	18.5	Ţr	
Section	1		737		40W	6.	9:	Tr	
65W	0.	16161	Tr	12.6		9•	111	27.0 Tr	
115%	0'	91	Tr	750	100W	Ó	11	ŢŢ	
TTM	91	913"	141			ction			
	913"	12'	Not s	ampled	1600	0.	3.	25.3	
	12.	13'3'	476	12.0		3'	3.	Tr	
	13'3'	814"		ampled	!	61 71	71	79.2	7.0
165W	814"	8.6"	718	empled 8.3	i .	7.6"	9.3"	452 82•8	7.0
	8.6"	91	Not a	ampled		913"	11.	Tr	
Aver	ege	0.7		11.2	200A	01	51911	Not sa	apled
255W	0.	13'	Tr	ı		219"	3:	1250 Not sa	2.7
320W 425W	0.	18.	Tr	-	224W	0.	70	105	aprea
425W 445W	16.	16° 23°6°	Tr	; 	60 711	7•	10.	Tr	2.9
46 SM	0.	22	Tr	+	ATT	rage	0.31	807	4.1
50 5W 54 5W 58 5W 625W 66 5W	0	221	Tr		250W	O	15.3*	Tr	404
54 5W	0.	55.	TP		390W	0.	17'9"	Tr	*
• 625W	0'	17.	Tr		565₩	0.	16'	Tr	
665W	0.	16.	Tr		720W	0.	14'	Tr	
705W	0.	12'	Tr				. }		
745W 785W	0.	16°	Tr Tr	1	,	:	1		
705W 825W	0.	12'	Tr	, ;					
~ to \$11	"		• •••		• •	•	ş		

TABLE

7

ORIGIN OF CO-ORDINATES :

367 ft. east of western fence of

· <u> </u>	•		DINALES	_	-	_east_o				TP-Mp-mile March
	LIN	E 1912		SO LINE	-			iown_in	Plate 1.	_F1g.2.
		DEP		1		; - \		e ZH	ring /	O CO PONT
B0	RE .	DD7	III	LBS/	O/BRDN	EONI	a macabassinic more	LIT t	LBS/ C U.	O/BRDN FT.
		FROM	TC	YD.	F.L.		FROM	TO	YD.	
	60W	No sa	mpled		3		61	91	80	8.0
1.	WOO.	0.	13.	Tr	-		11.	14.	57 22	
-	ection	5				203W	61	6°	Not sai	npled
14	4019	0.	61611	Tr			. 8‡ ∶8‡	916	712	_7_4
	3	616"			6.5		. 9 1611	10'	Not ser 385	6*0 abred
		6:10"	h	Not san	apled		10	1119"	Not sar	
1	r80M	0.	5.6"	Tr		Th1	ckness	41	404	1 2 2
		516" 813"	813"	233 Not sam	5.5 apled	2320	;	716"		5.5
5	SSOM	01	51611	Tr		255W		31	421	Process to the Constitution of the Constitutio
Store :	1	51611	5110"	638	5.5			3:	137	
	1	5110"		Missing	Ř.	ì	3,	9.	Tr	0.0
	A == - The f					Th	ickness	6•	279	į
	Averag	1 .	1.5	266	5.7	295W		i	291	
	260W	0.	15'	Tr		,	7.1	3.	171	:
	300M	No sa	mple	1000		•	61	91	60.2	0.0
							90	11.	21.6	a with
	12	198908		1			ckness		231	
				stern fer		335W		3'	119	-
	(ingscl	iffe S	t. as	shown in		!•	31	4	27	3∙ 0
*		Fig. 2	!) 	4.	7*	Tr	<u> </u>
	60E		1.6"	60.1	0.6		rage	3.2	292	3.5
K	SOE	0.	6"	no sami	ple	395W	0.	17'6		A
* -	,	6"	2"6"	1251	0.5	495	01	150	Tr	[
	-	9"	1	1		540W	01	21	Tr	4
	00	0.	10.	Tr	0,6	580W	01	21.	Tr Tr	
	Avera	20	0.1	1251	0.55	620M	0.	211	Tr	
						660W	0.	21. 16. 17. 16.	Tr	
		on A.			**	700W	0.	171	Tr	1
	5W	0.	3:	42 68	1	740W	0.	16.	Tr	į
-	,	3.		68	1	820W	• O•	16.	Tr	Į
•	,		91	Tr 70	į į	9001	: 0•	12.	Tr	1. 2.
	,	91	12.6	70 Tr	1	980W	0'	61	Tr	•
	,	12.6"	15.	24	ļ tī	1060W	0'	6	Tr	T. Carlotte
	~ 77sa	0.	71	Tr		1140W 1220W		7:	Tr Tr	į į
	37W	7.	8.9"	Not sp	Ln2	LCGVIT		16	- Ta	i.
	Ī	8191	91311	Not sai 503	8.75	T.TNE	203908	į		. De
		9.3"	913"	No sam	ble.	Origi	n: 492	ft. e	ast of W	estern fen
-	70W	0.					ngscl11	fe St.	as shows	n in Plate
	, ,		3.	Tr 36	4	Ì	1. F	1g. 2.	;	# () () () () () () () () () (
	ļ.	3.	91	295		00	0.		52.9	<u> </u>
	1	91	12.64	124	6.0		٦٠ ١	3.	Tr	
	į	12'	12.64	24 36	1		3.	91	Tr 67.4	7.5
	· · · · · · · · · · · · · · · · · · ·	12.6	15"	36	·	:	9'	12*	96.1	
	Thick	<u> </u>		210			12.	13'	TP	
	120W	O.	3.	80	į li	407/	01	3.	103	į
	į	3.	6.	Tr	<i>i</i> * <i>j</i>		3:	3:	103 53.9 146	
	Ÿ	9.	91	31 116	lan S	· .	61	9•	146	6.0
	1	12.	12.	46	9.0		91	13.6	" Tr	
≯ ,	ř	15.	17.	Tr	a r	804	O.	3.	Tr	
May be and I were	* *					₽ Cum de	3'	6	77.5	
	Averag		3.1	219	7.4		6'	91	122	6.0
t	Sect	ion B.			;		9.	12'9	" Tr	-Ci-
•	155W		T !	23	$i = -\frac{1}{I}$	•	TC.	15.7	4.4	
		3*	3.	23 77	# <u>*</u>	· ·	į			i i
	,	1 2	, k	P.		,	i			<u> </u>

TABLE 7

HEAVY MINERAL AND OVERBURDEN IN BORES

ORIGIN OF CO-ORDINATES:

492 ft. east of Western fence of

LINE 203908. Cont.

Kingscliffe St. as shown in Plate 1 Fig. ?.

~		·	194				<u> </u>		PIR. 2.
BORE	DEP	TH	LB\$/	O/BRDN	BORE	DE	PTH	LBS/	O/BRDN
	FROM	TO	YD.	FT.		FROM	TO	CU. YD.	FT.
120W		3'0" 6'0" 9'0" 12'0" 13'0"	67.4 80.2 41.1 Tr Tr	7.5				·	
1207	Ut.	31011	67.4			r *			
1200	3'0" 6'0" 9'0" 12'0"	6'0" 9'0" 12'0" 1 3' 0"	80.2 41.1 Tr	7•5 °					
160147	01 310" 610" 910" 1210"	3'6" 6'0" 9'0" 12'0" 14'0"		6.0		· outer of undergrades of undergrades.	A consistence of the state of t		
200W	3'0" 6'0" 9'0" 12'0" 15'0"		1103	6.0			And the state of t	ranged prices to the	
240W	0' 2'0" 3'0" 6'0" 9'0"	210" 310" 610" 910" 1210"	260 1030 Tr Tr	0.0		Account of the second		aeran	
2800	0' 3'0" 6'0" 9'0"	3'0" 6'0" 9'0" 12'0"	104 43.8 Tr Tr	1.5		The state of the s	Control Prince	ಲಿಗ್ ಕ್ ಕ್ ಕ್ಷ್ಮ್ ಬ '	3 3 (1)
Average	Compositions	2.251	265	Ā. j	میشاد د ۱۰	, , , ,		hedred by a race manual	encomments &
360W	01 310" 610" 910"	310" 6'0" 9'0" 12'0"	Tr 86.3 67.4 62.4					,	
4000	0' 3'0" 6'0"	3'0" 6'0" 12'0	30.3 Tr Tr			in the second			
440m	01 310" 610" 910"	3'0" 6'0" 9' 0" 21'0"	Tr Tr Tr		The second control of) * * * * * * * * * * * * * * * * * * *	C)	The second secon
The second secon					1	0			

TABLE HEAVY MINERAL AND OVERBURDEN IN BORES

				1			
BORE	FROM	TO	iBa/Cu.YD.	O/BRDN FT	SECT'L AR	EA(SQ.FT) D/BURDEN.	AREA MIN SAND X AV. GRADE.
tINE 30 Ofigin corne Plate	: 343 f	t. eas	of south-we 25 as shown	st in			
<u>Section</u> 70E	A. 01	1.6"	Tr				
40E Thi ckne	0' 4" 8" 2' 3'3" ss	4" 8" 2' 3'3" 3'6" 2'77"	Not sampled 1690 Not sampled. 438 Not sampled. 423.				
3 <i>5</i> E	0'2'	24'6"	Tr.				
15E	0'	7319"	Tr. 885				
35W 65W 65W Average 128W 237W INE 4 Origin Fingal	0'10'	10' 13'6" 18' 19'6" 12' 15' 18' 21' 31' 18' 22' 5.2' 20' 14'	42.8 52.4 1025 Not sampled 169 87.6 87.6 148 177 123 15 Tr 132 Tr 434 Tr t of crown of				
<u>Sectio</u> 85度			2.8				
35E Thickn	31 316" aess	31 316# 519# 519#	113 1478 272 286				
1 5E Thi ckr	10'3"	919" 1013" 1116" 121 151 213"	74.9 780 Not sampled 1730 Tr 558			***	

BORE	DEPT FROM	H TO	LBS/CU.YD.	O/BRDN FT	SECT'L AR	ea(sq.ft)	AREA MIN SAN
	PKOM	10		1771	MIN. SAND	O/BURDEN.	X AV. GRADE.
W	0'	31611	Tr	Charles Caster American			
	3'6"	5'	Not sampled		PERMITSHOOT		
	7	7'	490 T r			Na Carlo	
	70'	10.6"	2100		Tagenta and the same of the sa		
	7016"	12'	53.5 18 7		ar andono		
<u>hicknes:</u> 5W	0'	516" 1213"	187 Tr				
	7213"	731411	737		T Commence		
a.	1314"	74 1411	Not Sampled		a probable on		· ·
Å.	74141	15'	2310 Not sampled			A SALES SALE	•
hi cknes:		219"	Not sampled 850			Downsta	
6W	0'	13'6"	Not Sampled	1	and the control of th		
•	7-316"	7413"	375 Not Sampled	!			
	7416"	75'3"	232	Ì			
	15:3"	1818"	Not Sampled				•
	1818"	191 2416"	695 Tr				•
<u>hicknes</u>		51611	146				
OW	0'	31	40.5	arminate at a second	5		
	3'		50.6	STATE OF THE STATE			· · · · · · · · · · · · · · · · · · ·
	91	91	27.0 Tr	1			
	721	751	121				•
	151	181	52.9 128	* * * * * * * * * * * * * * * * * * *	- Transport		
	21	21'	Tr		A Characteristics		
8	241	271	52.9			1	
	27!	30'	<i>5</i> 7.3				
	30!	331	Tr				
hicknes	\$	341	124	1			
70W	0'	31	Tr No Sample				
	31	91	57.3				
	91	7716"	47. 2				
	7716"	73'	Tr				
verage		3.7'	243		1		
280W	0'	761	Tr Tr				
330W 760W	0'	6.	No. Tr.				
380W .	01	17!	Tr				•
DOOM	0'	61	Tr				
INE 52	os.						•
Onigin.	11180	ft. eas	t of crown				
of Fingapiate	Fig.	as sno	ANT TTT				
BOOW	0'	771	Tr				
W088	01	61	Tr				
960W	0'	61	Tr Tr				
040W 1 20W	0'	771	Tr			- {	•
Not eno	ugh mir	eral a	hong this				
line to	car cul	ate.		1			•
	1			₫	1	1	

BORE	DEPI	'H	LBS/CU.YD.	O/BRDN	SECT'L AR	EA(SQ.FT)	AREA MIN SAND
	FROM	TO		Edi	MIN. SAND	BURDEN.	X AV. GRADE.
	 		and the state of t	TOTAL AMERICAN STREET, STANSON	Schooling to an experimental programming provide service		
TINE 600	φ <u>s</u>				or marchine		
Fingal R	1200 10	shown	of crown of in Plate 1.	and the state of t		1997 Y CALL	
Fig. 2.						ool Creen	•
610W 650W	0'	3'	58.3		22 Table Commerce Code	CONTRACTOR CONTRACTOR	
690W	0'	3	176 102		All Control of the Co	io consecutiva	
720W	0'	3'	94			Surpress (Vances)	
770W 87 OW	0'	กกกกก	74 341		The state of the s	NAME OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE	
850W	0'	3.	Tr			entergia de	Ve.
	3'	3!3" 4!	442			**************************************	
890W	313"	31	Not Sampled	2			
	1			·			
9.30W	716"	716" 31	Not Samples				,
970W	01	71	Not Sampled				•
<i>)</i> / O !!	71	219"	335	÷			
0000	219"	31	Not Sampled				
992W	6"	2	Not Sampled 368				
•	21	213"	Not Sampled			3.0	
7040W	01	3'	33.7			-	
	31	6'	295		out-out-out-out-out-out-out-out-out-out-		
•	91	91	579 Tr		Projection of the state of the		
Thicknes	\$	61	237				
7080W	0'	3'	Tr				
1160W	01	61	Tr				•
7 24 OW	0'	17'	Tr				
Line 675	os.				-		
Origin:	1382 ft		of crown				
of Fings		as sn	own in				
Plate 1,	0'	777	Tr				
7 240W	01	61	Tr				
7320W	0'	11'	TR				
TINE 750	005	ft oss	t of crawn				
Origin: of Fings			lown in			:	
Plate 1	Fig.	,			• Villean		
Section	A.	6"	1053		many Yang		•
70E	6"	7*	1053 Not Sample	d		-	
	7.	1:6"	855 1775		direction		
	7'6"	21	Not Sample	đ			•
	3 3"	319"	24 40		į		
Thickne	ss O'	319"	816 Tr				
77E	701	7019"	1230				·
	7019"	7713"	Not Sampled				•
*	7713"	1115"	2450 Not Sampled				
	1216"	74 3"	2675				
Thickne	4	413"	783				



BORE	DEP FROM		LBS/	O/BRDN	BORE		PH .	LBS/	O/BRDN
	TITOM	TO	CU. YD.	F	Denn	FROM	TO	CU. YD.	FT.
1 · · · · · · · · · · · · · · · · ·			- / /		THE THE PARTY OF T	A THE RESERVE OF THE PERSON OF			CD.
Average	<u> </u>	1.2'	266		1	,			
60E	0'	8'6"	Tr	200 100 100 100 100 100 100 100 100 100		e e e e e e e e e e e e e e e e e e e			
3OE	10191	10'9"				on seen a			
•	11'3"	12'6" 12'9"	Not Samo	leď		17			
	12.0"	18'	940 Not Samp	led					
3 5W	0'	3'	Tr						
	3.	369	35.4 30.3						
	91	12'	Tr						
	12' 13'	13' 13'4"	Not Sam T r	pled					
	13'4'	15'	Not Sam	pled				er valkelift, i.,	Name agent, into a c
155W	15'	17'	Tr.	The control of the co	j j			E accentige such	
300W	0'	16'6		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				The Control of the Co	
475W 615W	0'	17'	Tr					And the control of th	
800W 850W	0'	13' 13'	Tr Tr	The second of th		o ne			THE THE PARTY OF T
1015W	01	81	Tr	The second	See the see that t	Control of the contro	- Val. 500	district to the second	
1220W 1255W	8:	14'	" Tr Tr		To the second se		} 		1
1455W	01	81611	Tr	e de la companya de l	er en	학 기계 기계 기		74 0 47 64	
1755W 2055W	0	81	Tr			State of the state		in the second se	
2555W	01	7!	Tr Tr	TO STATE OF THE ST	. #			are en volt g	
30 <i>55</i> W 3 <i>555</i> W	0'	81	Tr	No. of the last of	Stranger Co. Co.	And the state of t		Contract to the contract of th	
4055W	0'	81	Tr			The second secon			
LINE 14725 Origin: 3	<u>\$</u> . 67 ft.	east	of west					A CONTRACTOR AND A CONT	
fence of M	arine	⊉arade	, as		· · · · · · · · · · · · · · · · · · ·	20 20 20 20 20 21 21 21 21 21 21 21 21 21 21 21 21 21	To a second		
shown in P		Fig.				re come	Transfer design design de		
Section A.	0'	91	Tr	ė i		or description		Wagner in Bayes	
	9'	12' 21'	78.3 Tr	and the state of t		Carried C			
40W	0'	9	Tr	<u>.</u>	4	Andrews Andrews			
	9'	12'	14.1 Tr				And the American State of the S		
	1716	17:10	433		Service of the servic				
SOM	17'10	ب البوادي البوادين.	Tr	S. Salara		Second Library Contracts		4-7-10-00-00-00-00-00-00-00-00-00-00-00-00-	
80W	3'	3'	71.8	2 9		The safe Color		Policy of the Control	
	61	9'	Tr 42.7	1 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -		es the second		. N. C.	
•	9'	1113	2228		1	The state of the s	1	0.00 m.	
	11'3	13'6 16'	Tr	F		*America results	100000		
Thickness	5	31	2228			e object		Become a service	
120W	12'	12' 15' 13'	Tr 50.7			Martine Caraller	1	And the second s	
ζ	151	13!	1288	The second secon		Rhopers : SA		grander control	
	15'3" 18'	18'	32 T r			- Career or - Care	\$ 4 2	and the second	
					13 . 24 .	in the second se	1		

BORE	DEP FROM	TH TO	LBS/ CU. YD.	o/BRDN F	BORE	T)33)	TO	LBS/ CU. YD.	O/B RO N FT.
160W	12' 15' 18' 24'	6' 9' 12' 15' 18' 24' 27'	Tr 45.5 Tr 19.6 107 Tr 86	The state of the s					
200W 240W	27' 30' 0' 3' 6'	30' 31' 3' 6' 22' 9' 12'	77 23 77.5 Tr Tr 125						
280W 320W LINE 1547 Origin: 3 fence of	32 ft.	25' 27' 27' east Parad	Tr Tr Tr of wester	n own	স্থা প্রকাশ হ'ব বিশ্বাস্থার সূত্র নার্লান্ত প্রকাশ করা		No. 1. No. 2. C. Control of Contr	verous additions, joint are tab distriction about	
in Plate Section A 220E 130E	1, Fig	2.6" 2.6" 3.	Tr 1545 Tr	en gestiveren soons i metta soon - dresso - dessent		instructive configurations of the configuration of		The state of the s	•
90E Thickness	101	4141	1356 Tr 133 1233	Andrea - Calledon Andreas (Andreas Andreas And		Market County (American) a county from the county of the c		alle de la companya d	
30E	553" 616" 0' 3' 6' 12' 15' 18'	8'6" 3' 6' 12' 15' 20'6"	Tr 38.8 Tr 22.4 25.3 Tr	Market in the magnificence and the Property of the Control of Company of the Control of Company of the Control of Control		roman for proving place to the control of the contr	Agrandistante de l'experience	ADD COME A PROPERTY OF THE PRO	
Average Section 00 7	B. 0' 12' 12'3'	12' 12'3' 17'	Tr 266 Not sam	<u> </u>	The second secon	e verd i man der entre de	A THE PROPERTY OF THE PROPERTY	Control of the Contro	
Thickne	13'8' 14' 14'3' 15'	14'3' 14'3' 15' 16'6'	2676 Not san 1257 Not San	pled		errip about takens takens takens begins in		A CONTRACT C	
Average	14'3	11417"	312. Not sam 900	4		Becamenous and the second			
100W 122W	0'	16'6"		T.C. D		American v Chica	The same of the sa	Todakonina	1 1 1 1 1

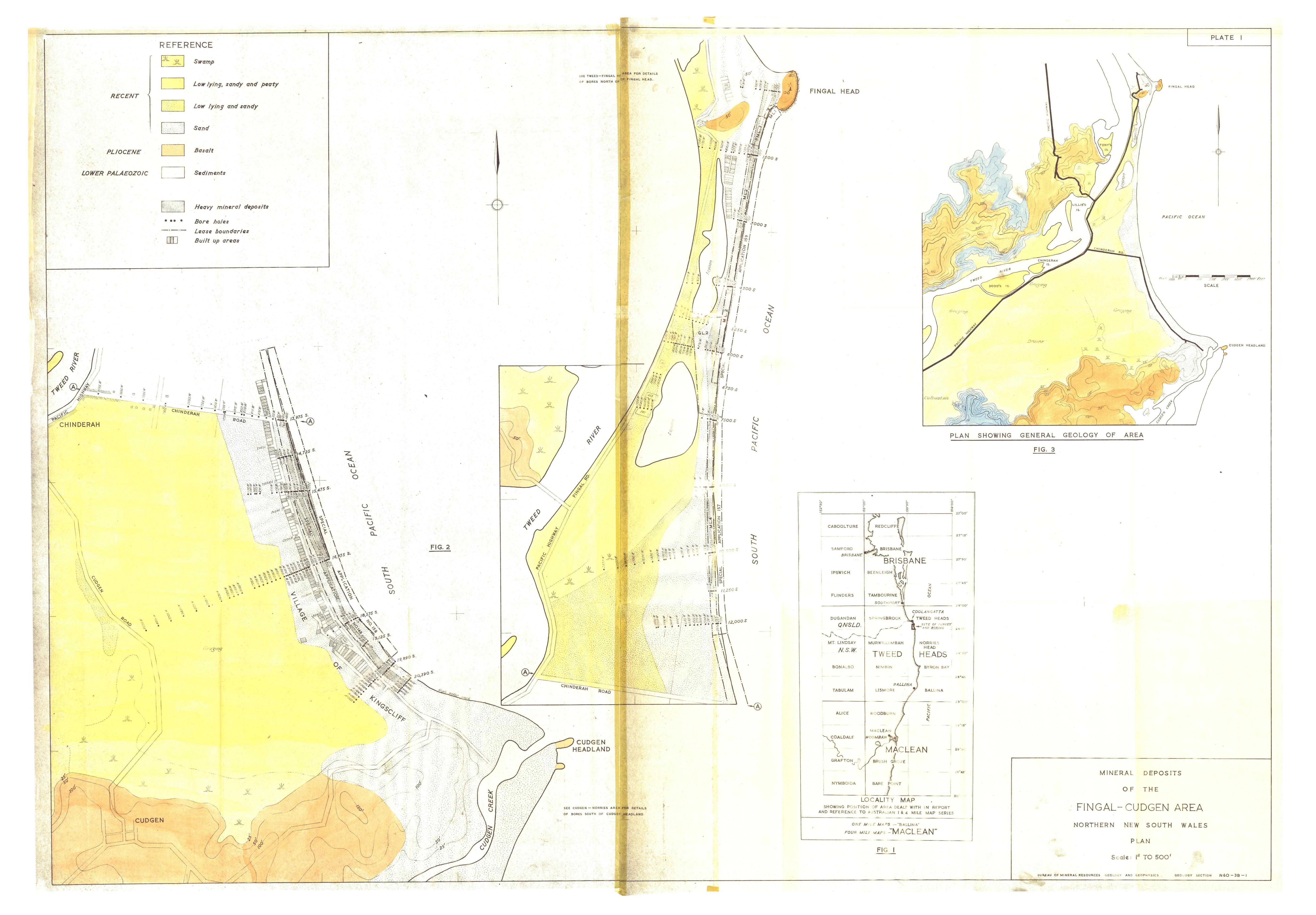
				was a first of the second seco	Canada entractions (California)	K The Contract of the Approximation of the Approxim	e versous de bajonnes de la company de la co		
BORE	DEF	TH	LBS/	O/BKDN	BORE	1)11	FCH	LBS/	O/BADN
	FROM	TO	CU. YD.	H H	DURE	FROM	TO	CU. YD.	FT.
Section C.		Constitution of the second							
172W	01	71	Not Sam	pled		1	ender of the second	And the second s	
	71714"	714"	Tr Not Sam	pled		The street of th	and a state of	• COTT Call	mercinal management of the control o
	9'10'6"	10'6"	89.6 Not Sam	1 mg			9	640, Carl Williams	was growing officer
195W	0'	9:611		0160	, La garden de la casa	Control of the contro	N delication of	- Parameter	
	916"	101611	388		a g Dr. a and b		a with a single-wave	de la france de la	r ddd wellan
	15'	17'	Not Sam Tr	ртеа		ii	Secretary of the secret	A. C. C. B. STANKER	
240W	01	17'	Tr			on the second of	277	And the second s	voice and the second se
Average		0.51	388		Andrews :			Water care	
285W	0'	23	Tr			And the state of t	71	era e e e e e e e e e e e e e e e e e e	Composition and
330W 390W	0'	22' 19'	Tr Tr		or and the second secon	*			h.
510W 610W	0'	221	Tr			ad Tiggish America			
875W	0'	9' 11'	Tr Tr				e al l'accompany	e ²	
955W 985W	0' 0'	19"	Tr				du thank is reci		·
1080W	0'	23 ' 8 '	Tr Tr			· w-againtin	Andrew Market	Section Control	
1135W	0'	7'	Tr			74 A			e jan siere. Vielen
LINE 16975S. Origin: 423	ft. es	st of	western			-	The special section of the section o		
fence. of Mar	ine Pa	rade,					on Tames on	and the second s	
in Plate 1, I					,		6 10 10 10 10 10 10 10 10 10 10 10 10 10		
35E	0'	2"	410					A CONTRACTOR OF THE CONTRACTOR	
00	0' 12'	12 ' 12 ' 3	Tr " 510	Ž.	17			- ·	
	12'3" 13'	13' 14'	Not sampl 803	.ed	State of the sta			STT's accessed	
	14'	16'	Not sampl	eđ	n poe saar			Sand South	ا المام المام المام المستور والوابق المستورين
Thickness	0'	2' 10'6"	465 Tr	to delication	A. CHERTON OF			Long Towns Control of the Control of	•
30W	1016"	1019"	148	_	Gapari Can	6 2			
	10'9"	y	Not Sampl	ed	C. Day 2	\$ 8 5 6			
Average		1.6'	435	•		Park and the second sec			
Section B.	477.4270(cm)date			Bother Spr. 12	AND PARTY AND PROPERTY.	in the state of th	-		
65W		1616"	Tr	generalization	in the second second				
115W	0' 9'	91	Tr 141	Manufacture 17	ID HARMODING				
	913		Not samp		or the state of th		e de la companya de l		
	T3,3,	T3.0.	Not samp	.ea	Alea School		Total Miles (See)		
165W	8141	814"	Not sampl	ed	. dell'Appendication		**************************************		
	8'6"		718 \ Not sampl	.ed	Challement				
Average		0.71	491	The state of the s			Deficially, C these		
		ATTENDED STATES		100 mg/s	Inverse and				And the second s
		CTTA	, , , , , , , , , , , , , , , , , , , 	Y Carlot	Mercus artico				
		of Company of the Com	Year of the second seco	ia de de de		1	Control of the Control	a and a decided	
		er see see see see see see see see see s	THE CANAL	100 000 000 000 000	The second second	in the second of the second o			

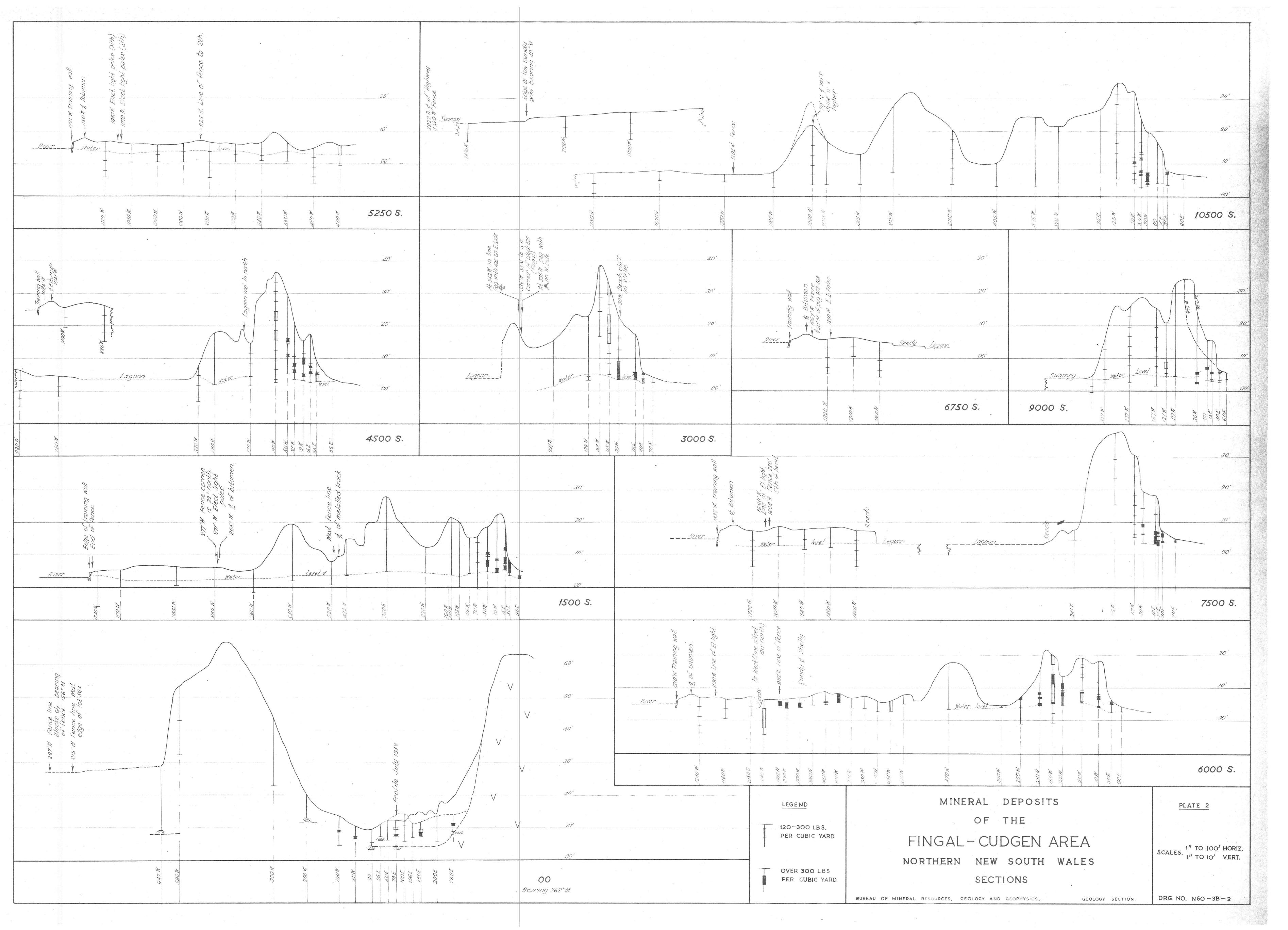
BORE	DEP	ŢΗ	LBS/	O/BRDN	BORE	DIF	TH	LBS/	O/BRDN FT.
	FROM	TO	CU. YD.	FT.	TANTAN	FR01	TO	CU. YD.	FT.
255W 325W 425W 425W 425W 425W 425W 425W 5455W 5455W 5455W 5455W 5455W 5455W 5455W 7455W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225W 1225	0'0'16'0'0'0'0'0'0'0'0'0'0'0'0'0'0'0'0'0	1 18 6 1 1 1 1 2 2 2 1 1 1 1 1 2 2 2 1 1 1 1	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	The second control of					
LINE 18575 Origin: 4 Parade as Fig. 2.	31 ft.	West o	f Marine te 1,	The Control of the Co		e, Barka a sa de friçantes que vera constituidade de la constituid		er - reason and analysis analysis and analysis analysis and analysis analysis and analysis and analysis and analysis and analysis analysis and analysis and analysis and analysis and analysis and analy	
16E	0'	16'	Tr	Name of the State	***	· Santakiiselli · · · · · · · · · · · · · · · · · ·		The same of the sa	
00 40W	0' 3' 6' 9' 12' 15'	6' 9' 11'	Tr 27.0 Tr	Carry Comment are the contract of the Carry Carr		The second secon			
100W	01	11'	Tr.		3. T	· Andrews		THE COLUMN TWO IS NOT	
			re-teriffe and a second principle of the contribution of the contr		The second secon	Promocondo Marters of Constability of Transmission (1995)	The state of the s		

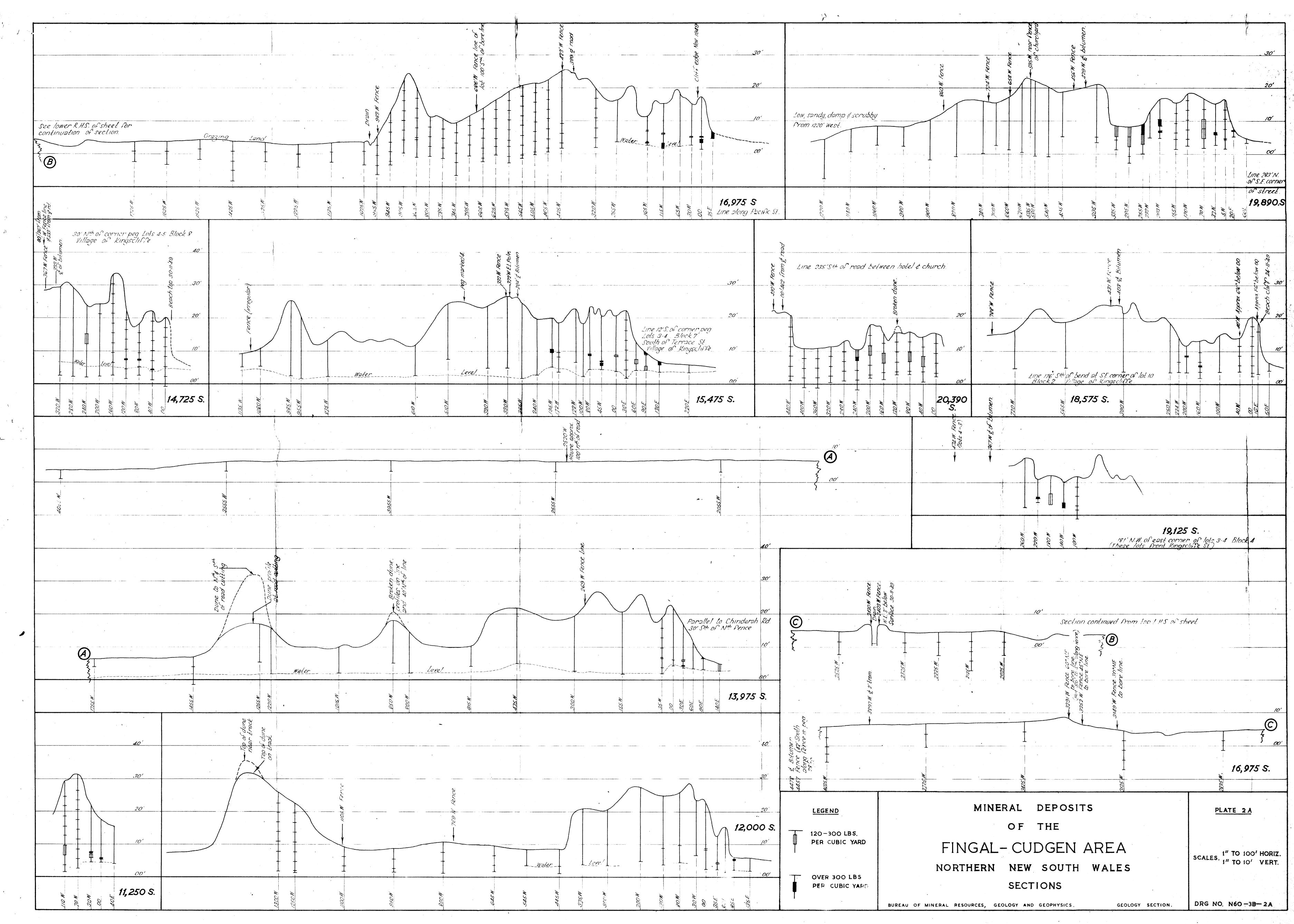
				and the second of the second o	- The suppose of Visit States and Visit	eranç ia di serion taran in spersor (Franço) que	neer er nam Gerings as en mar a		
DODE	DEP	TH	LBS/	O/BHDN	BORE	DE	"H	LBS/	O/BRON
BORE	FROM	ТО	CU. YD.	FT.	DUMB ;	FROM	TO	CU. YD.	FT.
Section A. 160W	0' 3' 6' 7' 7'6" 9'3"	3' 6' 7' 7'6" 9'3"	25.3 Tr 79.2 452 82.8 Tr	The state of the s					
200W	0! 2!9! 3!	219" 31 81	Not sai 1250 Not sa					A CONTRACTOR OF THE CONTRACTOR	The state of the s
224W	0'	7' 10'	105 T r	A property of the second secon	, N			CONTRACTOR	
Average		0.3'	807	10 A				nor entered the	
250W 390W 565W 720W	0' 0' 0'	15'3" 17'9" 16' 14'	Tr Tr Tr Tr						Agency and a country of the country
60M	Not	sample	ed .	Consideration (1986)		44	7	to contract Application	ar-manus Colonia
100W	0'	13'	Tr	The second secon		Tir september	The state of the s	de l'Enqueron et gliffe	
Section A. 140W	0' 6'6" 6'10	6'6" 6'10"	Tr 435 Not Sam	pled		Tradition (ties : vinament . v northogramment	1 Table 1 Tabl	entrapportunity Carlos many Carlos many	
180W	01 516" 813"	516" 813" 91	Tr 233 Not sam	pled		As a form of a formal production of the control of		CHANGE AND THE CHANGE	
220W	0' 5'6" 5'10'	5'6" 5'10" 7'	Missing			And the state of t	record agency of the second of		
Average		1.5'	266			5			The same of the sa
260W 300W	O' No	15' ample	Tr			aum Jauff Tep Mai Jorksvett	A CONTRACTOR OF THE CONTRACTOR	of the state of th	
LINE 198908 429ft. eas Kingscliffe Plate 1.	t of we st. Fig. 2	As show	n in	And the second of the second o		eleteka – 2 mm portugens paggaranga	AND	To the same and th	
60E	0'	1'6"	60.1.	- ·				Charles on the Control of the Contro	
20E	0 1 6 11 9 11	6" 9" 2'6"	No sampl 1251 No sampl	(A)		, remaile the commentation of the commentation	TO PROVIDE A CANADA CONTRACTOR OF THE CANADA C	in the state of th	
00	01	10'	Tr			E. I C. Doctor			
Average		0.1'	1251			e afficial		And a second to the second to	
5W	0' 3' 6' 9' 12'	3' 6' 9' 12' 12'6" 15'	42 68 Tr 70 Tr 24			Andrew Andrews Control and Table 1971		The control of the co	
			Company and the company of the compa	A STATE OF S		And a manager of the State of t	The distance of the control of the c	Lag, and an interpolation of the state of th	

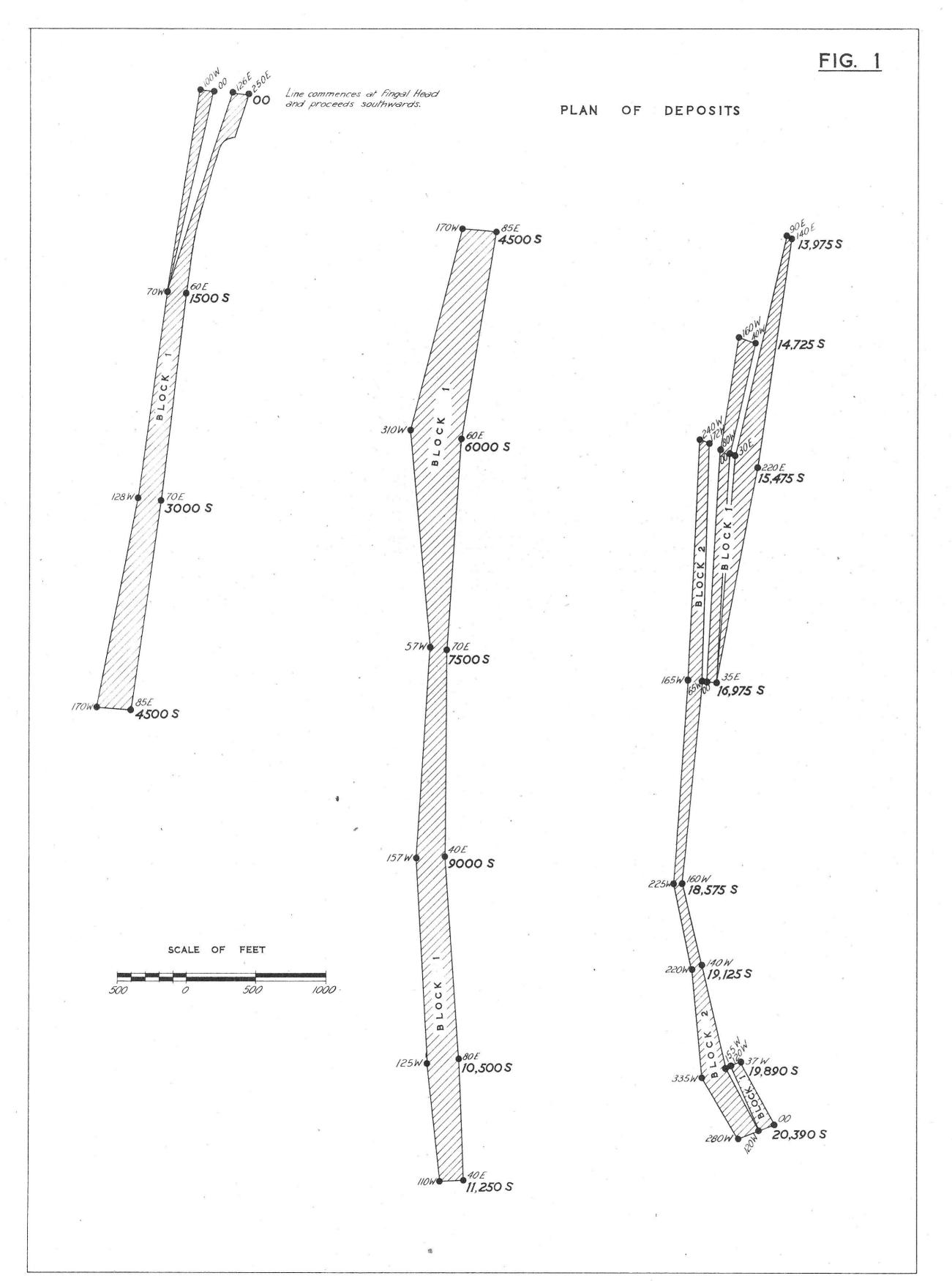
		ب سب سن من	بسيد او مايان اين	Andreas de la constante de la	The second	and the second s	energy of the second		
BORE	DEP	TH	LBS/	O/BRDN FT.	BORE	enter epocation par est strains	PPH	LBS/	O/BRDN FT.
	FROM	TO	YD.	1. 1		FROM	TO	YD.	
3 7 W	0' 7' 8'9" 9'3"	7' 8'9" 9'3" 12'6"	Tr Not sar 503 Not sar	i ii		http://dys.com			
70W Thickness		3' 6' 9' 12' 12'6" 15'	Tr 36 295 124 24 36 210	THE PROPERTY OF THE PROPERTY O	,		and the state of t		
120W	0' 3' 6' 9' 12' 15'	3' 6' 9' 12' 15' 17'	80 Tr 31 116 46 Tr	A control of the cont			TORK TRACKS		
Average		3.1'	219	The state of the s					Community of the Commun
Section B.	0' 3' 6' 9'	3° 6° 9° 11° 14° 14° 14° 14° 14° 14° 14° 14° 14	23 77 80 57 22				entrelegenschaft in der Steine der		er er de proposation de la reconstrucción de la rec
203W	0' 6' 8' 9'6" 10' Thick	6' 8' 9'6" 10' 11'9"	Not sam 712 Not sam 385 Not sam 404	pled		The state of the s	de la composition de		
232 Thickness	0' 3' 6'	7'6" 6' 9'	95 137 Tr 279			Community of the Commun	re un appellation de la company de la compan	PRODUCTION OF THE PROPERTY OF	
295W Thickness	0' 3' 6' 9'	3' 6' 9' 11'	291 171 60.2 21.6 231		§	THE REPORT OF THE PARTY OF THE	A company to the contract of t		
335W	0' 3' 4'	3' 4' 7'	119 27 Tr			A CONTRACTOR OF THE CONTRACTOR			•
Average		3.2	292	The state of the s		ACTIVITY OF CONTROL OF	1	And the state of t	
395W 495W 540W 580W 595W 620W 660W 700W 740W 820W 900W 980W	0' 0' 0' 0' 0' 0' 0' 0' 0'	17'6" 15' 21' 16'6" 21' 16' 17' 16' 16' 16'	Tr Tr Tr Tr Tr Tr Tr Tr			The second of th			

				The state of the s	and the state of t	The second second second			-	
BORE	DEP	- Train	LBS/ CU. YD.	o/BRDN FT.	BORE		TH	LBS/ CU. YD.	O/BRDN FT.	
	FROM	TO	YD.			FROM	TO	YD.		
1140W 1220W	0' 0'	7' 12'	Tr Tr							
			Additional and Control and Con	And the second s			* gage (eg) ar status in eg i sakus in			
			of the matter types covered attacks	Confirmation of Sales			SA PET	1	4.1	
			Code Co. ** ** ** ** ** ** ** ** ** ** ** ** **	Section of the sectio			2.550700 of explanations of the second	:	wo.	
The Company of the Co			TO CONTRACT OF CON		,		gaad Parky of magazin drone			
			Wilders of the New York	Section of the sectio		:		:		
			en oberende entreben		,					
			AND CARRYON CARRYON CO.	TOTAL SECTION						
		CANCALANCE CHARGE MANAGEMENT AND	na kapatitatura ka	Control of the contro		NAME OF THE PROPERTY OF THE PR				
		they do compagned and a compagned as	The Grant State of the Control of th	en engeleen of the high region.						
			e de la contraction de la cont	A company of the comp		0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		:		
			Editor and Control Control							
			er caregoria	A many parties and the second						
			Market and the second of the s	The control of the control of						
			Kadaris of K. Bernis							
			TO A MET AND THE TOTAL OF		10 mg					
			er or well allowed to the experience of the expe							
			rover a soon of the language of the soon o	the state of the s	William Carety					
			Afrikası direktik birdirek	The second secon	is and other than the control of the		The second			
			AND ADDRESS AND AD		and the state of t			** • ******	The same of the sa	
	-		100 mm (100 mm (100 mm))		To Confidence of the Confidenc					
			on version revolutions		· Canal mentals					









MINERAL DEPOSITS OF THE

FINGAL - CUDGEN AREA

NORTHERN NEW SOUTH WALES



OF HEAVY MINERAL CONCENTRATES

