

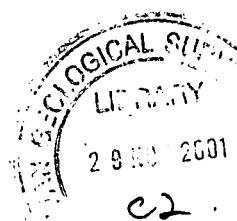
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DEPARTMENT OF SUPPLY AND SHIPPING.
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BEACH SANDS INVESTIGATION.

THE AREA BETWEEN THE ALLOTMENT FRONTAGES AND D.C.22, SEASHELL AVENUE TO RIVIERA ROAD, NORTH BURLEIGH, QUEENSLAND.

by

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Geologist

Laboratory Work by J. Ward, Geologist.

SOUTHPORT, QUEENSLAND.

30th September, 1948.

DEPARTMENT OF SUPPLY AND DEVELOPMENT.

Bureau of Mineral Resources, Geology and Geophysics.

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A plan and sections of the area dealt with are included at the back of this report.

BORING AND SAMPLING.

The area was bored and sampled in May, 1948. Bores were put down to water level, using a post-hole digger. When the sand brought up from the boreholes appeared to contain appreciable quantities of heavy minerals, it was sampled by quartering.

DETERMINATION OF SAMPLES.

Samples were dried, and their weights and volumes determined. The samples were then concentrated by panning, and the weights and volumes of the dry concentrates were determined. The percentage composition of a composite sample of concentrates from each bore line was determined by grain counting.

RESULTS.

Estimates of the quantities and grades of heavy mineral concentrates, the quantities of overburden, and the quantities of each of the heavy minerals are tabulated in this report as follows:-

Table 1. Tonnage of Heavy Mineral Concentrate, Volumes and Average Thicknesses of Mineral-Bearing Sands and of Overburden, and Average Grades of Mineral-Bearing Sands.

Table 2. Tonnages of Heavy Mineral Concentrate, Volumes and Average Thicknesses of Mineral-Bearing Sands and of Overburden, and Average Grade of Mineral-Bearing Sands in a Strip 1 Yard Wide along Each Bore Line.

Table 3. Tonnages of Each of the Heavy Minerals.

The figures of Tables 1, 2 and 3 were derived from data tabulated in the Appendix as follows:-

Appendix.

Table A. Quantities of Heavy Minerals Intersected in Bores.

Table B. Weight of Mineral in 1 Yard Strip along Bore Line.

Table C. Volume and Average Thickness of Mineral-Bearing Sand along Bore Line.

Table D. Volume and Average Thickness of Overburden along Bore Line.

Table E. Average Weight of Heavy Mineral Concentrate per 1 Yard Strip between Bore Lines, and Average Area of Longitudinal Section of Mineral-Bearing Sands and of Overburden between Bore Lines.

Table F. Total Weight of Heavy Mineral Concentrate, Total Volume of Mineral-Bearing Sands, and Total Volume of Overburden between Bore Lines.

Table G. Average Thickness of Mineral-Bearing Sands and of Overburden.

Table H. Percentage Compositions of Concentrates.

REMARKS.

The general distribution of heavy mineral concentrate in the area is indicated in Table 1. The quantities of heavy mineral concentrate along each bore line is shown in Table 2. It can be seen, in Tables 1 and 2 and in Appendix Table A. that a large thickness of sand was sampled in bore lines 1450S and 2250S, but that the grade is comparatively low. Closer sampling may have given a smaller tonnage, but better grade. Similarly, it can be seen in Appendix Table A. that the overall grade could be improved by rejecting low-grade sand in several of the bores.

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30/9/1948.



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TABLE 1.

TONNAGES OF HEAVY MINERAL CONCENTRATE, VOLUMES AND AVERAGE THICKNESSES OF MINERAL-BEARING SANDS AND OF OVERBURDEN, AND AVERAGE GRADES OF MINERAL-BEARING SANDS.

AREA BETWEEN BORE LINES.	WEIGHT OF HEAVY MINERAL CONCEN- TRATE.	VOLUME		AVERAGE THICKNESSES				AVERAGE GRADE OF MIN- ERAL-BEARING SANDS.
	(TABLE F.)	MINERAL-BEARING SANDS	OVER- BURDEN	MINERAL-BEARING SANDS	OVER- BURDEN			LBS. OF HEAVY MINERAL CONCENTRATE PER CUB YD
	TONS	(TABLE F.) CUBIC YDS.	(TABLE F.) CUBIC YDS.	(TABLE G.) FEET INCHES	(TABLE G.) FEET INCHES	FEET	INCHES	
5400S to 6200S	414.1	7,082.8	13,200.2	3	7	6	9	130.9
6200S to 7000S	641.8	4,832.1	10,000.1	2	5	5	1	297.5
7000S to 7800S	766.5	3,858.7	11,600.1	2	0	5	11	445.0
7800S to 450S	4,238.6	23,456.0	34,994.2	4	9	7	1	500.2
450S to 1450S	5,577.8	39,416.3	32,413.0	6	5	5	4	317.0
1450S to 2250S	1,821.2	33,733.7	20,162.9	6	11	4	1	121.0
5400S to 2250S	13,460.	112,379.6	122,370.5	5	2	5	7	268.3

TABLE 2.

TONNAGES OF HEAVY MINERAL CONCENTRATE, VOLUMES AND AVERAGE THICKNESSES OF MINERAL-BEARING SANDS AND OF OVERBURDEN, AND AVERAGE GRADE OF MINERAL-BEARING SANDS, IN STRIP 1 YARD WIDE ALONG BORE LINES.

LINE	WEIGHT OF HEAVY MINERAL CONCENTRATE		VOLUME		AVERAGE THICKNESS				AVERAGE GRADE OF MINERAL-BEARING SANDS. LBS. OF HEAVY MINERAL CONCENTRATE PER CUBIC YARD.
			MINERAL-BEARING SANDS	OVER-BURDEN	MINERAL-BEARING SANDS		OVER-BURDEN		
	(TABLE C.)	(TABLE C.)	(TABLE D.)	(TABLE C.)	(TABLE D.)				
	LBS.	TONS	CUBIC YDS.	CUBIC YDS.	FEET INCHES		FEET INCHES		
5400S	4,485.8	2.0	32.52	60.5	4	6	8	3	137.9
6200S	2,471.7	1.1	20.6	38.5	2	10	5	3	120.0
7000S	8,311.5	3.7	15.64	36.6	2	2	5	0	551.4
7800S	4,566.1	2.0	13.5	50.4	1	10	6	10	343.3
450S	56,657.7	25.3	109.06	132.2	5	11	7	3	519.4
1450S	18,308.9	8.2	127.42	62.3	6	11	3	5	143.6
2250S	12,288.1	5.5	125.6	88.9	6	10	4	10	97.8

TABLE 3.

TONNAGES OF EACH OF THE HEAVY MINERALS

ESTIMATED FROM PERCENTAGE COMPOSITIONS DETERMINED BY GRAIN COUNTING

AREA BETWEEN BORE LINES.	TONNAGES OF HEAVY MINERAL CONCENTRATES.	PERCENTAGE COMPOSITIONS & TONNAGES OF HEAVY MINERALS.											
		M O N A Z I T E		Z I R C O N		R U T I L E		I L M E N I T E		G A R N E T		OTHER MINERALS	
		%	TONS	%	TONS	%	TONS	%	TONS	%	TONS	%	TONS
5400S to 6200S	414.1	0.6	2.43	38.9	161.08	35.0	144.94	23.4	96.90	0.8	3.31	1.3	5.39
6200S to 7000S	641.8	0.56	3.59	38.6	247.73	33.9	217.57	23.8	152.75	1.1	7.06	2.04	13.10
7000S to 7800S	766.5	0.59	4.52	39.1	299.70	33.3	255.24	24.1	184.73	1.1	8.43	1.81	13.88
7800S to 450S	4,238.6	0.7	29.67	40.03	1690.71	35.2	1491.99	22.13	938.00	0.82	34.76	1.12	47.47
450S to 1450S	5,577.8	0.69	38.49	40.5	2259.01	35.0	1952.23	22.0	1227.12	0.7	39.04	1.11	61.91
1450S to 2250S	1,821.2	0.55	10.02	41.4	753.93	34.9	635.60	21.8	397.02	0.5	9.11	0.85	15.47
TOTAL:	13,460.	0.66	88.77	40.25	5418.21	34.90	4697.57	22.26	2996.52	0.75	101.71	1.18	157.22

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R.L.	CO-ORDINATES FROM 126' SOUTH OF PER- LESS AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
LINE 5400S.									
1.	5400S/42E.	1	L3843	0	8'	Tr.	Tr.	-	
12.08		2	L3844	8'	11'	82.3	3.0	246.9	
					Thickness	of 3' -	82.3		246.9
2.	5400S/75E.	1	L3845	0	10'	Tr.			
16.66		2	L3846	10'	15' 6"	73.6	1.8	404.8	
					Thickness	of 5' 6" -	73.6		404.8
3.	5400S/108E.	1	L3847	0	5'	51.83	1.0	-	
10.83		2	L3847A	5'	8' 9"	370.8	12.86	1390.5	
					Thickness	of 3' 9" -	370.8		1390.5

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

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QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R. L.	CO-ORDINATES FROM 126' SOUTH OF PEER- LESS AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
<u>LINE 7000S.</u>									
1. 10.5	7000S/39E.	1	13884	0	6' 8"	Tr.	Tr.		
		2	13885	6' 8"	7' 0"	501.8	16.7	167.3	
		3	13886	7' 6"	7' 10"	251.9	9.3	83.96	
		4	13887	7' 10"	8' 4"	122.7	4.5	61.35	
				Thickness of 1' 8"		187.6		512.61	
2. 11.0	7000S/73E.	1	13888	0	6'	12.3	0.5		
		2	13889	6'	6' 6"	No results			
		3	13890	6' 6"	7' 6"	96.01	2.9	96.01	
		4	13891	7' 6"	7' 10"	1364.	40.8	456.7	
		5	13892	8' 1"	8' 9"	2130	56.1	1480.0	
				Thickness of 2' 3"		986.35		1972.71	
3. 7.9	7000S/105E.	1	13893	0	4' 6"	60.95	2.2	274.3	
				Thickness of 4' 6"		60.95		274.3	

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R. L.	CO-ORDINATES FROM 126' SOUTH OF PIER- LINE AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
LINE 78008.									
1.	78008/42E.	1	13899	0	9' 6"	24.12	0.7		
13.75		2	13900	9' 6"	10' 0"	394.8	13.6	197.4	
		3	13901	10' 0"	10' 6"	102.23	3.7	51.12	
		Thickness of 1' 0"		-	248.52		248.52		
2.	78008/75E.	1	13895	0	9' 0"	13.03	0.5		
13.48		2	13896	9' 0"	9' 6"	619.6	14.3	509.8	
		3	13897	9' 6"	10' 0"	571.1	18.9	285.55	
		4	13898	10' 0"	10' 6"	579.2	19.8	289.6	
		Thickness of 1' 6"		-	589.9		884.95		
3.	78008/206E.	1	13894	0' 0"	3' 3"	145.3	5.3	472.2	
7.0		Thickness of 3' 3"		-	145.3		472.2		

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R. L.	CO-ORDINATES FROM SOUTH-EAST CORNER OF BEACH AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
<u>LINE 450S.</u> 1. 15.48	450S/00.	1	L3911	0' 0"	10' 6"	72.33	3.1	759.5	
				Thickness of 10' 6"		72.33		759.5	
2. 16.30	450S/33E.	1	L3909	0' 0"	10' 0"	132.8	4.9	1328.0	
		2	L3910	10' 0"	11' 0"	57.82	2.1	57.82	
				Thickness of 11' 0"		125.98		1385.82	
3. 20.46	450S/66E.	1	L3902	0' 0"	6' 0"	Tr.	Tr.		
		2	L3903	6' 0"	12' 0"	72.01	2.6		
		3	L3904	12' 0"	12' 4"	1288.0	38.4	429.3	
		4	L3905	12' 4"	13' 0"	441.1	15.4	294.1	
		5	L3906	13' 0"	13' 8"	1381.0	41.1	920.7	
		6	L3907	13' 8"	14' 3"	378.4	13.1	220.7	
		7	L3908	14' 3"	15' 0"	1945.0	53.9	1458.55	
				Thickness of 3' 0"		1107.8		3323.35	
4. 20.5	450S/99E.	1	L3913	0' 0"	8' 0"	Tr.	Tr.		
		2	L3914	8' 0"	13' 0"	450.4	16.8	2252.0	
		3	L3915	13' 0"	13' 6"	112.0	3.6	56.0	
		4	L3916	13' 6"	14' 3"	171.8	6.3	128.85	
		5	L3917	14' 3"	16' 0"	2556.0	65.5	4475.0	
				Thickness of 8' 0"		863.73		6909.85	
5. 18.61	450S/132E.	1	L3918	0' 0"	9' 0"	37.34	1.3		
		2	L3919	9' 0"	11' 6"	34.91	1.2		
		3	L3920	11' 6"	12' 3"	1375.0	40.2	1031.25	
		4	L3921	12' 6"	13' 3"	2985.0	73.4	2236.75	
		5	L3922	13' 9"	14' 0"	736.0	22.4	184.0	
				Thickness of 2' 6"		1381.6		3454.0	

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

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QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R.L.	CO-ORDINATES FROM SOUTH-EAST CORNER OF BEACH AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
<u>LINE 1450S.</u> 1.	On Worked Area.								
2. 18.57	1450S/33E.	1	I3923	0' 0"	8' 0"	178.0	6.6	1424.0	
		2	I3924	8' 0"	13' 0"	34.8	1.2		
				Thickness of 8' 0"		178.0		1424.0	
3. 18.23	1450S/66E.	1	I3925	0' 0"	9' 0"	42.0	1.5		
		2	I3926	9' 0"	13' 0"	145.8	5.3	563.2	
				Thickness of 4' 0"		145.8		563.2	
4. 17.77	1450S/99E.	1	I3927	0' 0"	9' 0"	36.5	1.4	328.5	
		2	I3928	9' 0"	12' 6"	42.9	1.5	150.15	
				Thickness of 12' 6"		38.8		478.65	
5. 17.94	1450S/132E.	1	I3943	0' 0"	8' 0"	Tr.	Tr.		
		2	I3944	8' 0"	10' 0"	123.8	4.6	247.6	
		3	I3945	10' 0"	10' 6"	238.7	7.8	119.35	
		4	I3946	10' 6"	12' 6"	231.7	8.4	463.4	
		5	I3947	12' 6"	18' 6"	1423.0	40.9	1423.0	
				Thickness of 5' 6"		409.7		2253.35	
6. 13.61	1450S/165E.	1	I3948	0' 0"	9' 6"	50.4	1.8	473.8	
				Thickness of 9' 6"		50.4		478.8	

QUANTITIES OF HEAVY MINERALS INTERSECTED IN BORES.

BORE NO. & R.L.	CO-ORDINATES FROM SOUTH-EAST CORNER OF BEACH AVENUE.	SAMPLE NO.		DEPTH		QUANTITY OF HEAVY MINERALS		THICKNESS OF SAMPLE (FT.) X (LBS. PER CU. YD).	REMARKS.
		FIELD	LABOR- ATORY	FROM	TO	LBS PER CU. YD.	WT. PER CENT		
LINE 2250S. 1. 19.83	2250S/00.	1	L3929	0' 0"	8' 0"	Tr.	Tr.		
		2	L3930	10' 0"	14' 0"	96.61	3.8	386.41	
				Thickness	of 4' 0"	-	96.61	386.44	
2. 19.66	2250S/33E.	1	L3931	0' 0"	8' 0"	55.37	1.3	282.96	
		2	L3932	8' 0"	14' 0"	36.9	1.4	221.4	
				Thickness	of 14' 0"	-	36.0	504.36	
3. 26.21	2250S/66E.	1	L3933	0' 0"	8' 0"	-	1.4		
		2	L3934	8' 0"	12' 6"	144.8	5.2	650.7	
		3	L3935	12' 6"	13' 3"	992.8	29.0	744.6	
		4	L3936	13' 3"	14' 6"	137.8	4.8	172.25	
				Thickness	of 6' 6"	-	241.2	1567.55	
4. 12.71	2250S/99E.	1	L3937	0' 0"	7' 6"	23.3	0.8	184.75	
				Thickness	of 7' 6"	-	23.3	184.75	
5. 16.27	2250S/132E.	1	L3938	0' 0"	8' 0"	9.6	0.3		
		2	L3939	8' 0"	12' 0"	28.0	1.0	112.0	
				Thickness	of 4' 0"	-	28.0	112.0	
6. 12.73	2250S/165E.	1	L3940	0' 0"	6' 6"	32.87	1.2		
		2	L3941	6' 6"	7' 0"	2358.0	58.3	1179.0	
		3	L3942	7' 0"	8' 6"	29.8	1.1		
				Thickness	of 0' 6"	-	2358.0	1179.0	

APPENDIX. TABLE B.- Page 1.

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

BORE NOS.	LBS. OF MINERAL PER SQ. YD. AT BORE. (FROM TABLE A.)	AVERAGE LBS. WEIGHT OF MINERAL PER SQ. YD. BE- TWEEN BORES.	DISTANCE BETWEEN BORES (YDS) (FROM TABLE A.)	WEIGHT OF MINERAL In 1 YD. STRIP BE- TWEEN BORES (LBS)
<u>LINE 5400S.</u>				
1.	$\frac{246.9}{3} = 82.3$	$\frac{217.2}{2} = 108.6$	11	1,194.6
2.	$\frac{404.8}{3} = 134.9$			
2.	134.9			
3.	$\frac{1390.5}{3} = 463.5$	$\frac{598.4}{2} = 299.2$	11	3,291.2
Total for line:				4,485.8
<u>LINE 6200S.</u>				
1.	$\frac{923.2}{3} = 307.7$	$\frac{507.7}{2} = 153.8$	11	1,691.3
2.	Tr. = Tr.			
2.	Tr.	$\frac{141.8}{2} = 70.9$	11	779.9
3.	$\frac{425.4}{3} = 141.8$			
Total for line:				2,471.7

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

BORE NOS.	LBS. OF MINERAL PER SQ. YD. AT BORE. (FROM TABLE A.)	AVERAGE LBS. WEIGHT OF MINERAL PER SQ. YD. BE- TWEEN BORES.	DISTANCE BETWEEN BORES (YDS) (FROM TABLE A.)	WEIGHT OF MINERAL In 1 YD. STRIP BE- TWEEN BORES (LBS)
LINE 7000S.				
1.	$\frac{312.6}{3} = 104.2$	$\frac{761.8}{2} = 380.9$	11.33	4,315.6
2.	$\frac{1972.7}{3} = 657.6$			
2.	657.6			
3.	$\frac{274.3}{3} = 91.4$	$\frac{749.0}{2} = 374.5$	10.67	3,995.9
Total for line:				8,311.5
LINE 7800S.				
1.	$\frac{248.5}{3} = 82.8$	$\frac{377.8}{2} = 188.9$	11	2,077.9
2.	$\frac{884.6}{3} = 295.0$			
2.	295.0			
3.	$\frac{472.2}{3} = 157.4$	$\frac{452.4}{2} = 226.2$	11	2,488.2
Total for line:				4,566.1

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

BORE NOS.	LBS. OF MINERAL PER SQ. YD. AT BORE. (FROM TABLE A.)	AVERAGE LBS. WEIGHT OF MINERAL PER SQ. YD. BE- TWEEN BORES.	DISTANCE BETWEEN BORES (YDS) (FROM TABLE A.)	WEIGHT OF MINERAL In 1 YD. STRIP BE- TWEEN BORES (LBS)
<u>LINE 4008.</u>				
1.	$\frac{752.5}{3} = 253.2$	$\frac{715.1}{3} = 237.5$	11	3,032.5
2.	$\frac{1285.8}{3} = 428.6$			
2.	461.9			
3.	$\frac{3323.3}{3} = 1107.8$	$\frac{1869.7}{2} = 934.8$	11	8,632.8
3.	1107.8			
4.	$\frac{6909.8}{3} = 2303.3$	$\frac{3411.1}{2} = 1705.5$	11	18,760.3
4.	2303.3			
5.	$\frac{3454}{3} = 1151.3$	$\frac{3454.6}{2} = 1727.3$	11	19,000.3
5.	1151.3			
6.	?	$\frac{1151.3}{2} = 575.6$	11	6,331.6
Total for line:				56,657.7

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

BORE NOS.	LBS. OF MINERAL PER SQ. YD. AT BORE. (FROM TABLE A.)	AVERAGE LBS. WEIGHT OF MINERAL PER SQ. YD. BE- TWEEN BORES.	DISTANCE BETWEEN BORES (YDS) (FROM TABLE A.)	WEIGHT OF MINERAL In 1 YD. STRIP BE- TWEEN BORES (LBS)
<u>LINE 14508.</u>				
1.	On worked area.			
2.	$\frac{1424}{3} = 474.7$	$\frac{474.7}{2} = 237.35$	11	2610.8
2.	474.7			
3.	$\frac{583.2}{3} = 194.4$	$\frac{679.1}{2} = 339.55$	11	3735.1
3.	194.4			
4.	$\frac{478.65}{3} = 159.5$	$\frac{353.9}{2} = 176.95$	11	1946.4
4.	159.5			
5.	$\frac{2253.35}{3} = 751.1$	$\frac{910.6}{2} = 455.3$	11	5008.3
5.	751.1			
6.	$\frac{478.8}{3} = 159.6$	$\frac{910.7}{2} = 455.3$	11	5008.3
Total for line:				18308.9

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

BORE NOS.	LBS. OF MINERAL PER SQ. YD. AT BORE. (FROM TABLE A.)	AVERAGE LBS. WEIGHT OF MINERAL PER SQ. YD. BE- TWEEN BORES.	DISTANCE BETWEEN BORES (YDS) (FROM TABLE A.)	WEIGHT OF MINERAL In 1 YD. STRIP BE- TWEEN BORES (LBS)
<u>LINE 2250S.</u>				
1.	$\frac{386.4}{3} = 128.8$	$\frac{290.92}{2} = 145.5$	11	1,633.3
2.	$\frac{504.36}{3} = 168.12$			
2.	168.12			
3.	$\frac{1567.55}{3} = 522.52$	$\frac{757.3}{2} = 378.6$	11	4,164.6
3.	522.52			
4.	$\frac{184.75}{3} = 61.58$	$\frac{650.76}{2} = 325.4$	11	3,579.4
4.	61.58			
5.	$\frac{112.0}{3} = 37.33$	$\frac{98.91}{2} = 49.4$	11	543.4
5.	37.33			
6.	$\frac{1179.0}{3} = 393.0$	$\frac{450.33}{2} = 225.2$	11	2,367.2
Total for line:				12,263.1

VOLUME AND AVERAGE THICKNESS OF MINERAL-BEARING SAND ALONG BORE LINE.

BORE NO.	THICKNESS (TABLE A.)			DISTANCE BETWEEN BORES. (TABLE A.)	AREA OF LONGITUDINAL SECTION		COMPLETE BORE LINE		
	AT BORE	AV. BETWEEN BORES			BETWEEN BORES.		AV. THICKNESS		VOLUME OF LYD. STRIP
	INCHES	INCHES	FEET		FEET	SQ. FEET	SQ. YDS.	FEET	INCHES
<u>LINE 54008.</u>									
1.	36	51	4.25	33	140.25	15.58			
2.	66								
2.	66	35.5	4.62	33	152.46	16.94			
3.	45								
Total line:				66	292.71	32.52	4.45	54.4	32.52
<u>LINE 63008.</u>									
1.	102	51	4.25	33	140.25	15.58			
2.	0								
2.	0	16.5	1.37	33	45.21	5.02			
3.	33								
Total line:				66	185.46	20.60	2.81	33.7	20.6
<u>LINE 70008.</u>									
1.	20	23.5	1.96	34	66.64	7.40			
2.	27								
2.	27	40.5	3.37	32	74.14	8.34			
3.	54								
Total line:				66	140.78	15.64	2.15	25.6	15.64

VOLUME AND AVERAGE THICKNESS OF MINERAL-BEARING SAND ALONG BORE LINE.

BORE NO.	THICKNESS (TABLE A.)			DISTANCE BETWEEN BORES. (TABLE A.)	AREA OF LONGITUDINAL SECTION		COMPLETE BORE LINE		
	AT BORE	AV. BETWEEN BORES			BETWEEN BORES.		AV. THICKNESS		VOLUME OF 1YD. STRIP
	INCHES	INCHES	FEET		FEET	SQ. FEET	SQ. YDS.	FEET	INCHES
<u>LINE 78003.</u>									
1.	12	15	1.25	33	41.25	4.58			
2.	18								
2.	18	23.5	2.38	33	78.54	8.72			
3.	39								
Total line:				66	119.79	13.30	1.815	21.8	13.3
<u>LINE 4502.</u>									
1.	126	129.	10.75	33	354.75	39.42			
2.	132								
2.	152	84.	7.0	33	231.0	25.67			
3.	36								
3.	36	66.	5.5	33	181.5	20.16			
4.	96								
4.	96	63.	5.25	33	173.25	19.25			
5.	30								
5.	30	15.	1.25	33	41.25	4.58			
6.	?								
Total line:				165	981.75	109.08	5.95	71.4	109.08

[illegible]

VOLUME AND AVERAGE THICKNESS OF MINERAL-BEARING SAND ALONG BORE LINE.

[illegible]

BORE NO.	THICKNESS (TABLE A.)		DISTANCE BETWEEN BORES (TABLE A.)	AREA OF LONGITUDINAL SECTION BETWEEN BORES.		COMPLETE BORE LINE.	
	AT BORE	AVERAGE BE- TWEEN BORES				AVERAGE THICKNESS	VOLUME OF 1YD STRIP
	FEET	FEET		FEET	SQUARE FEET	SQUARE YARDS	FEET
<u>LINE 5400S</u>							
1.	8.0	9.0	33	297.0	33.0		
2.	10.0						
2.	10.0	7.5	33	247.5	27.5		
3.	5.0						
Total:			66	544.5	60.5	8.25	60.5
<u>LINE 6200S.</u>							
1.	7.0	7.0	33	231.0	26.7		
2.	7.0?						
2.	7.0?	3.5	33	115.5	12.8		
3.	0.0						
Total:			66	346.5	38.5	5.25	38.5
<u>LINE 7000S.</u>							
1.	6.67	6.58	34	223.7	24.8		
2.	6.5						
2.	6.5	3.3	32	105.6	11.7		
3.	0.0						
Total:			66	329.3	36.6	5.0	36.6

VOLUME AND AVERAGE THICKNESS OF OVERBURDEN ALONG BORE LINE.

BORE NO.	THICKNESS (TABLE A.)		DISTANCE BETWEEN BORES (TABLE A.)	AREA OF LONGITUDINAL SECTION BETWEEN BORES.		COMPLETE BORE LINE.	
	AT BORE	AVERAGE RE- TWEEN BORES				AVERAGE THICKNESS	VOLUME OF 1YD STRIP
	FEET	FEET		FEET	SQUARE FEET	SQUARE YARDS	FEET
<u>LINE 7800S.</u>							
1.	9.5	9.25	33	305.25	33.92		
2.	9.0						
2.	9.0	4.5	33	148.5	16.5		
3.	0.0						
Total:			66	453.75	50.42	6.875	50.4
<u>LINE 450S.</u>							
1.	0.0	0.0	33	0.0	0.0		
2.	0.0						
2.	0.0	6.0	33	198.0	22.0		
3.	12.0						
3.	12.0	10.0	33	330.0	36.7		
4.	8.0						
4.	8.0	9.8	33	323.4	35.9		
5.	11.5						
5.	11.5	10.25	33	338.25	37.58		
6.	9.0?						
Total:			165	1189.65	132.18	7.21	132.2

VOLUME AND AVERAGE THICKNESS OF OVERBURDEN ALONG BORE LINE.

BORE NO.	THICKNESS (TABLE A.)		DISTANCE BETWEEN BORES (TABLE A.)	AREA OF LONGITUDINAL SECTION BETWEEN BORES.		COMPLETE BORE LINE.	
	AT BORE	AVERAGE BE- TWEEN BORES		SQUARE FEET	SQUARE YARDS	AVERAGE THICKNESS	VOLUME OF 1YD STRIP
	FEET	FEET				FEET	CUBIC YARDS
<u>LINE 14508.</u>							
1.	Worked area	0.0	33	0.0	0.0		
2.	0.0						
2.	0.0	4.5	33	148.5	16.5		
3.	9.0						
3.	9.0	4.5	33	148.5	16.5		
4.	0.0						
4.	0.0	4.0	33	132.0	14.6		
5.	8.0						
5.	8.0	4.0	33	132.0	14.7		
6.	0.0						
Total:			165	561.0	62.3	3.4	62.3

VOLUME AND AVERAGE THICKNESS OF OVERBURDEN ALONG BORE LINE.

BORE NO.	THICKNESS (TABLE A.)		DISTANCE BETWEEN BORES (TABLE A.)	AREA OF LONGITUDINAL SECTION BETWEEN BORES.		COMPLETE BORE LINE.	
	AT BORE	AVERAGE BE- TWEEN BORES		SQUARE FEET	SQUARE YARDS	AVERAGE THICKNESS	VOLUME OF 1YD STRIP
	FEET	FEET				FEET	CUBIC YARDS
<u>LINE 22508.</u>							
1.	10.0	5.0	33	165.0	18.53		
2.	0.0						
2.	0.0	4.0	33	132.0	14.67		
3.	8.0						
3.	8.0	4.0	33	132.0	14.67		
4.	0.0						
4.	0.0	4.0	33	132.0	14.67		
5.	8.0						
5.	8.0	7.25	33	239.25	26.58		
6.	6.5						
Total:			165	800.25	88.82	4.85	88.9

APPENDIX. TABLE. E.

AVERAGE WEIGHT OF HEAVY MINERAL CONCENTRATE PER 1 YARD STRIP BETWEEN BORE LINES, AND AVERAGE AREA OF LONGITUDINAL SECTION OF MINERAL-BEARING SANDS AND OF OVERBURDEN BETWEEN BORE LINES.

LINES	A T J I G B O R E L I N E S			A V E R A G E B E T W E E N B O R E L I N E S		
	WEIGHT OF MINERAL	AREA OF LONGITUDINAL SECTION OF		WEIGHT OF MINERAL	AREA OF LONGITUDINAL SECTION OF	
	PER 1 YARD STRIP.	MINERAL-BEARING SANDS	OVERBURDEN	PER 1 YARD STRIP.	MINERAL-BEARING SANDS	OVERBURDEN
	FROM TABLE B.	FROM TABLE C.	FROM TABLE D.			
	LBS.	SQ. YARDS	SQ. YARDS	LBS.	SQ. YARDS	SQ. YARDS
5400S	4,485.8	32.52	60.5			
6200S.	2,471.7	20.60	38.5	3,478.8	28.56	49.5
6200S	2,471.7	20.60	38.5			
7000S.	8,311.5	15.64	36.6	5,391.6	18.12	37.55
7000S	8,311.5	15.64	36.6			
7800S.	4,566.1	13.30	50.4	6,438.8	14.47	43.5
7800S.	4,566.1	13.30	50.4			
450S.	56,657.7	109.08	132.18	30,611.9	61.19	91.29
450S.	56,657.7	109.08	132.18			
1450S.	18,308.9	127.42	62.3	37,463.3	118.25	97.24
1450S.	18,308.9	127.42	62.3			
2250S.	12,298.1	125.58	88.92	15,298.5	126.5	75.61

APPENDIX. TABLE F.

TOTAL WEIGHT OF HEAVY MINERAL CONCENTRATE, TOTAL VOLUME OF MINERAL-BEARING SANDS AND TOTAL VOLUME OF OVERBURNEN BETWEEN BORE LINES.

BORE LINES (TABLE A.)				WT. OF HEAVY MIN. CONC.		VOL. OF MINERAL-BEARING SANDS		VOL. OF OVERBURDEN	
DESIG-NATION	LENGTH	DISTANCE BETWEEN	AREA BETWEEN	AV. PER 1 YD. STRIP (TABLE E.)	TOTAL BETWEEN LINES	AV. AREA OF LONGI-TUDINAL SECTION. (TABLE E.)	VOL. BETWEEN BORE LINES.	AV. AREA OF LONG. SECTION (TABLE E.)	VOL. BETWEEN BORE LINES.
Y	YDS.	YDS.	SQ. YDS.	LBS.	TONS	SQ. YDS.	CU. YDS.	SQ. YDS.	CU. YDS.
5400S	22	266.67	5,866.7	3,478.8	414.1	26.56	7,082.8	49.5	13,200.2
6200S	22	266.67	5,866.7	5,591.6	641.8	19.12	4,832.1	37.55	10,000.1
6200S	22	266.67	5,866.7	6,438.8	766.5	14.47	3,858.7	43.5	11,600.1
7000S	22	385.33	14,758.2	30,611.9	4,238.6	61.19	23,456.0	91.29	34,994.2
450S	55	333.33	18,333.1	37,483.3	5,577.8	118.25	39,416.3	97.24	32,413.0
1450S	55	266.67	14,666.8	15,298.5	1,821.2	126.5	33,733.7	75.61	20,162.9
TOTAL:			65,358.2		13,460.		112,379.6		122,370.5

APPENDIX. TABLE G.

AVERAGE THICKNESSES OF MINERAL-BEARING SANDS AND OF OVERBURDEN.

BORE LINES (TABLE F.)		VOLUME (TABLE F.)		AVERAGE THICKNESS.			
DESIGNATION.	AREA BETWEEN LINES	MINERAL-BEARING SANDS	OVERBURDEN	MINERAL-BEARING SANDS		OVERBURDEN	
	SQUARE YARDS	CUBIC YARDS	CUBIC YARDS	FEET	INCHES	FEET	INCHES
5400S 6200S	5, 866.7	7,082.8	15,200.2	3	7	6	9
6200S 7000S	5, 866.7	4,832.1	10,000.1	2	5	5	1
7000S 7800S	5, 866.7	3,858.7	11,600.1	2	0	5	11
7800S 450S	14, 758.2	23,456.0	34,994.2	4	9	7	1
450S 1450S	18, 333.1	39,416.3	32,413.0	6	5	5	4
1450S 2250S	14, 666.8	33,733.7	20,162.9	6	11	4	1

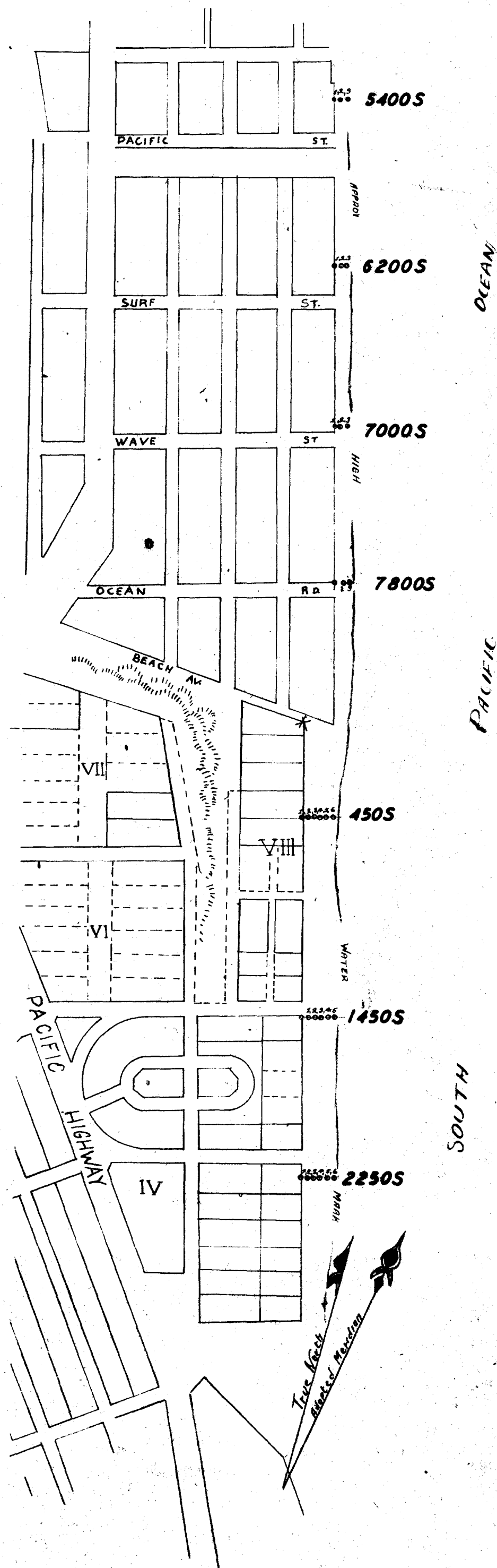
APPENDIX.

TABLE H.

PERCENTAGE COMPOSITIONS OF CONCENTRATES

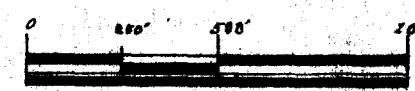
From Table E.

LINE	LABORATORY DETERMINATIONS						WEIGHT (LBS.) OF MINERAL IN 1 YD. STRIP ALONG BORE LINE						
	Mon.	Zir.	Rut.	Ilmen.	Gar.	Others	Total Conc.	Monazite	Zircon	Rutile	Ilmen.	Garnet	Others
5400S	0.5	38.7	35.2	23.8	0.6	1.2	4,485.8	22.4	1,736.0	1,578.0	1,067.6	26.9	53.9
6200S	0.8	39.3	34.8	22.6	1.1	1.4	2,471.7	19.8	971.4	860.2	558.6	27.2	34.6
Average:	0.6	38.9	35.0	23.4	0.8	1.3	<u>6,957.5</u> 2	<u>42.2</u> 2	<u>2707.4</u> 2	<u>2439.2</u> 2	<u>1626.2</u> 2	<u>54.1</u> 2	<u>88.5</u> 2
6200S	0.8	39.3	34.8	22.6	1.1	1.4	2,471.7	19.8	971.4	860.2	558.6	27.2	34.6
7000S	0.5	38.4	33.6	24.2	1.1	2.2	8,311.5	41.6	3191.6	2792.7	2011.4	91.4	182.8
Average:	0.56	38.6	33.9	23.8	1.1	2.04	<u>10783.2</u> 2	<u>61.4</u> 2	<u>4163.0</u> 2	<u>3652.9</u> 2	<u>2570.0</u> 2	<u>118.6</u> 2	<u>217.4</u> 2
7000S	0.5	38.4	33.6	24.2	1.1	2.1	8311.5	41.6	3191.6	2792.7	2011.4	91.4	182.8
7300S	0.75	40.5	32.8	23.8	1.1	1.05	4566.1	34.2	1849.3	1497.7	1086.7	50.2	48.0
Average:	0.59	39.1	33.3	24.1	1.1	1.81	<u>12977.6</u> 2	<u>75.8</u> 2	<u>5040.9</u> 2	<u>4290.4</u> 2	<u>3098.1</u> 2	<u>141.6</u> 2	<u>230.8</u> 2
7800S	0.75	40.5	32.8	23.8	1.1	1.0	4566.1	34.2	1849.3	1497.7	1086.7	50.2	48.0
450S	0.7	40.0	35.4	22.0	0.8	1.1	56657.7	396.6	22663.1	20056.8	12464.7	453.3	623.2
Average:	0.7	40.03	35.2	22.13	0.82	1.12	<u>61223.9</u> 2	<u>430.8</u> 2	<u>24512.4</u> 2	<u>21554.5</u> 2	<u>13551.4</u> 2	<u>503.5</u> 2	<u>671.2</u> 2
450S	0.7	40.0	35.4	22.0	0.8	1.1	56657.7	396.6	22663.1	20056.8	12464.7	453.3	623.2
1450S	0.65	42.1	33.9	21.9	0.45	1.0	18308.9	119.0	7708.0	6206.7	4009.6	82.4	183.2
Average:	0.69	40.5	35.0	22.0	0.7	1.1	<u>74966.6</u> 2	<u>515.6</u> 2	<u>30371.1</u> 2	<u>26263.5</u> 2	<u>16474.3</u> 2	<u>535.7</u> 2	<u>806.4</u> 2
1450S	0.65	42.1	33.9	21.9	0.45	1.0	18308.9	119.0	7708.0	6206.7	4009.6	82.4	183.2
2250S	0.4	40.3	36.3	21.6	0.55	0.85	12238.1	49.2	4952.1	4460.6	2654.2	67.6	104.4
Average:	0.55	41.4	34.9	21.8	0.5	0.85	<u>30597.0</u> 2	<u>168.2</u> 2	<u>12660.1</u> 2	<u>10667.3</u> 2	<u>6663.8</u> 2	<u>150.0</u> 2	<u>287.6</u> 2



PLAN OF BORING

SCALE —



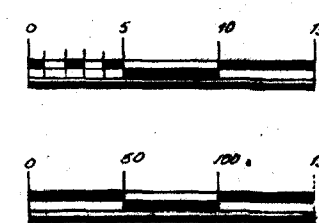
1 CHAIN STRIP

FROM SEASHELL AV. TO RIVIERA RD.

NORTH BURLEIGH AREA

SECTION ALONG BORE LINES

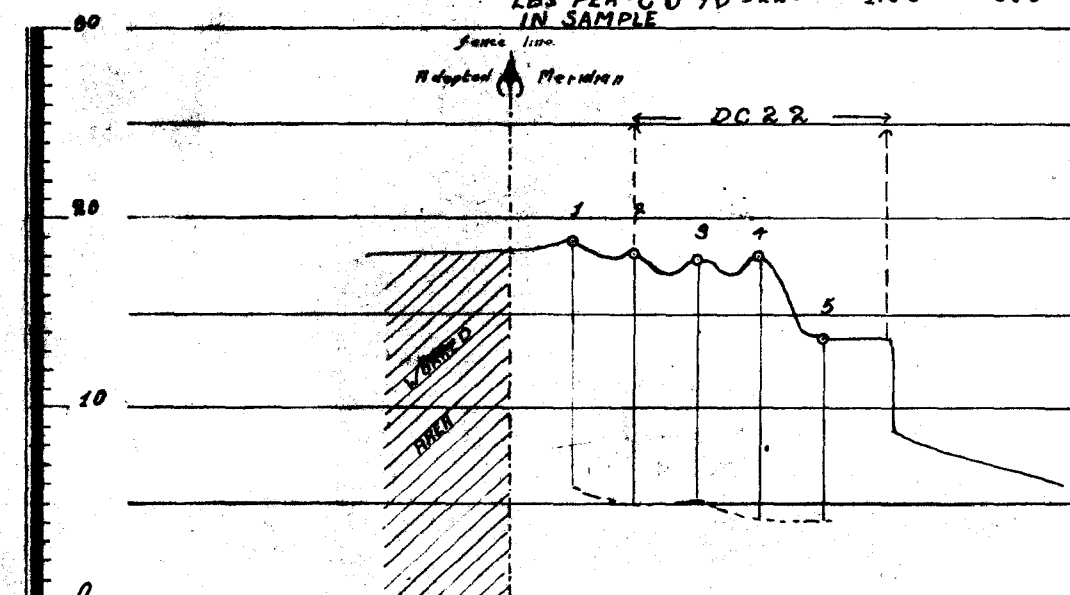
VERTICAL
SCALE
HORIZONTAL



By R.D. Cameron

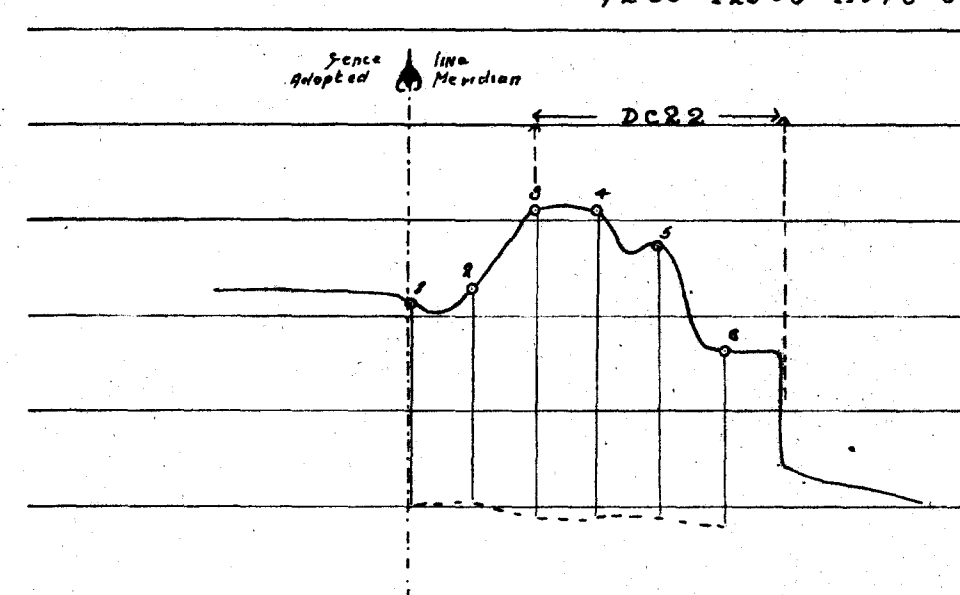
12/8/58

BORE N°	1	2	3	4	5
OVERBURDEN FT	0.5	0.5	0.5	0.5	0.5
SAMPLE FT	12.5	12.5	12.5	12.5	12.5
LBS PER CU YD IN SAMPLE	122.0	145.0	128.0	100.7	50.0



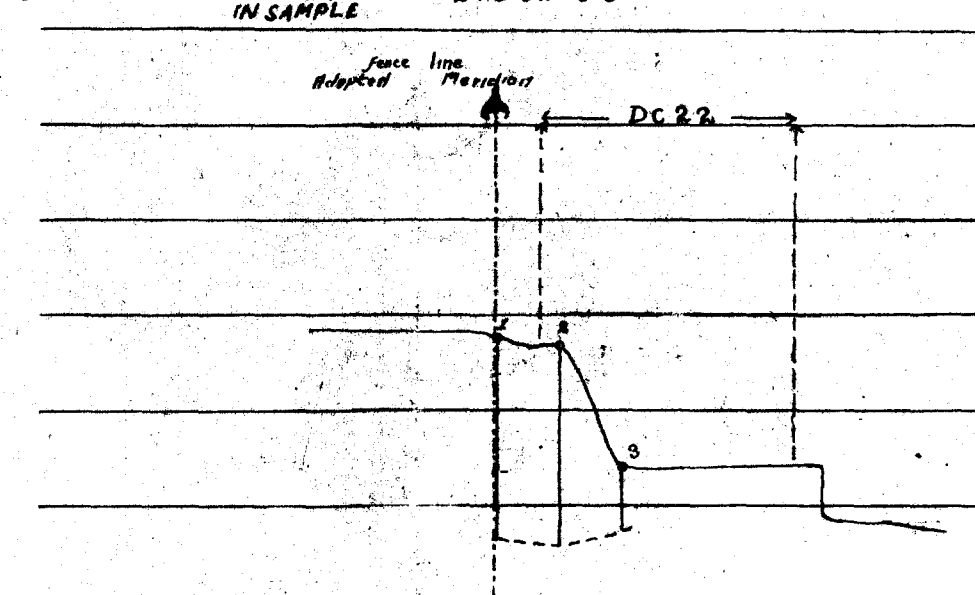
LINE 1450S

BORE N°	1	2	3	4	5	6
OVERBURDEN FT	0.5	0.5	0.5	0.5	0.5	0.5
SAMPLE FT	10.5	11.0	12.0	8.0	17.5	12.5
LBS PER CU YD IN SAMPLE	72.39	125.98	110.76	86.73	1381.0	



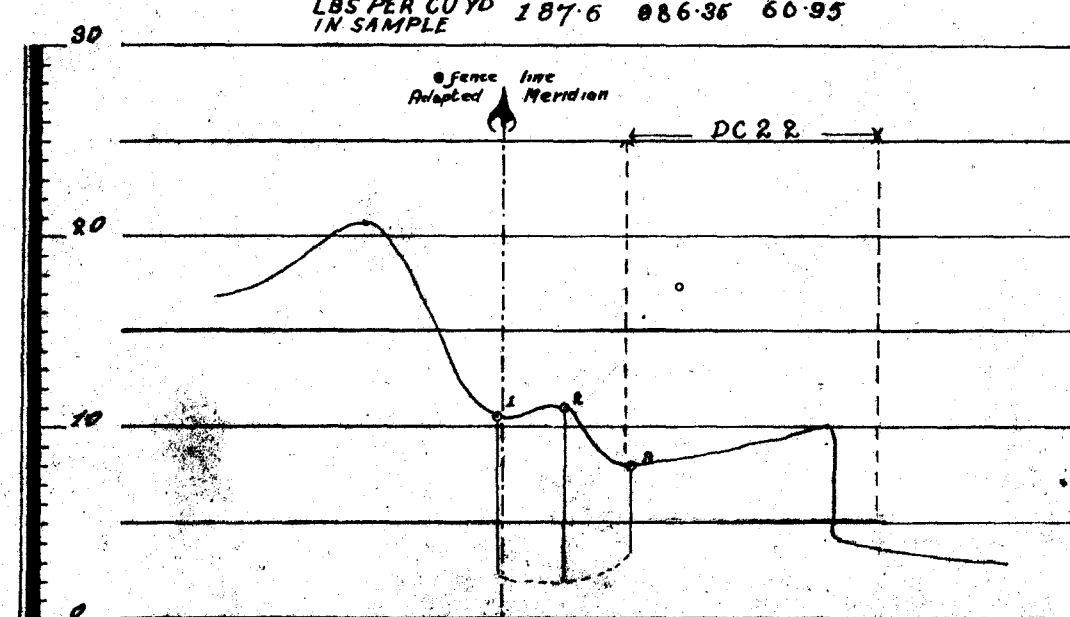
LINE 450S

BORE N°	1	2	3
OVERBURDEN FT	0.5	0.5	0.5
SAMPLE FT	1.0	7.5	8.5
LBS PER CU YD IN SAMPLE	248.52	589.9	145.0



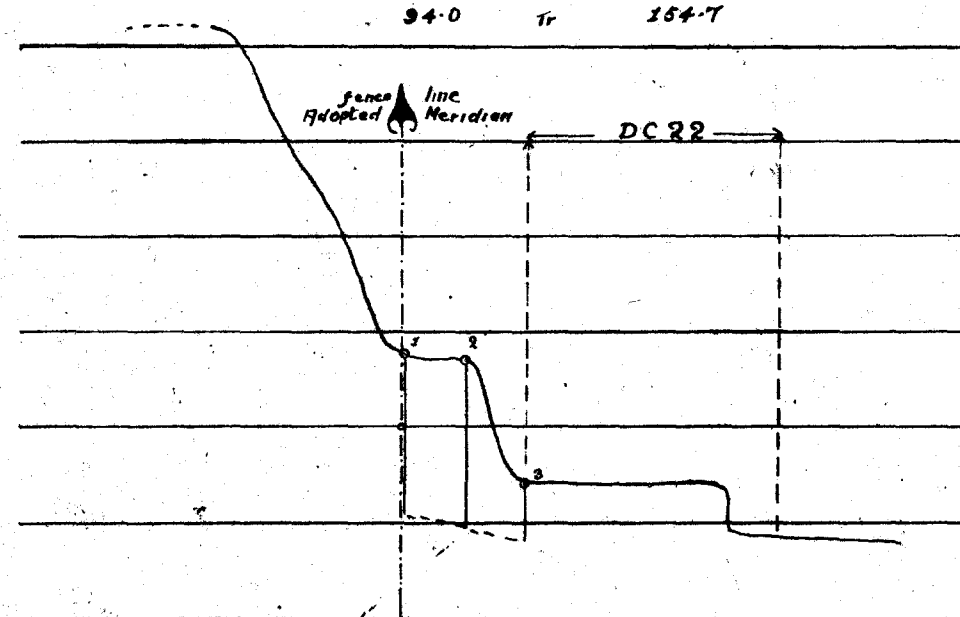
LINE 7800S

BORE N°	1	2	3
OVERBURDEN FT	0.5	0.5	0.5
SAMPLE FT	1.7	1.5	1.5
LBS PER CU YD IN SAMPLE	187.6	886.35	60.95



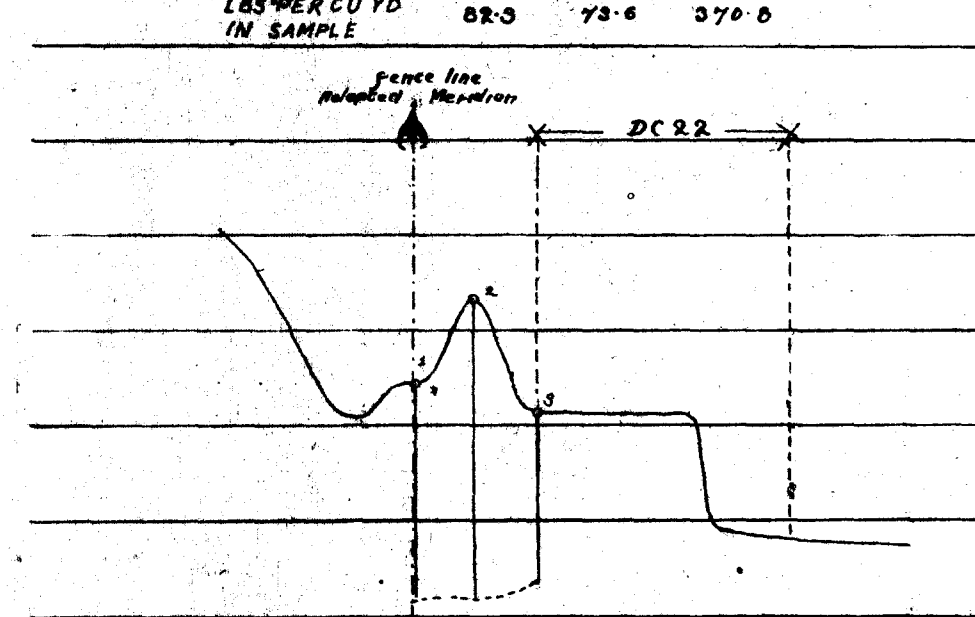
LINE 7000S

BORE N°	1	2	3
OVERBURDEN FT	0.5	1.0	0.5
SAMPLE FT	0.5	1.0	0.5
LBS PER CU YD IN SAMPLE	34.0	1.0	154.7



LINE 6200S

BORE N°	1	2	3
OVERBURDEN FT	0.5	1.0	0.5
SAMPLE FT	0.5	1.0	0.5
LBS PER CU YD IN SAMPLE	82.0	73.6	370.0



LINE 5400S

