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REPROFILED

CAPE SORELL QUARTZITE PROJECT

CAPE SORELL PENINSULA - WESTERN TASMANIA

GEOLOGICAL REPORT

August 1971.

I.D. Picken,
Comalco Limited,
95 Collins Street,
Melbourne. 3000

001

INDEX

	<u>Page</u>
(1) SUMMARY	1
(2) RECOMMENDATIONS -	1
(a) Quartzite	
(b) Sand	
(3) LOCATION AND ACCESS	2
(4) GEOLOGY	2 - 4
(5) SAMPLE ANALYSIS -	
(a) Quartzite	4 - 12
(b) Sand	12 - 16
(6) SEISMIC INVESTIGATIONS	17

APPENDIX I

(Thermal Stability Tests by Elkem A/S Research Division, Norway).

APPENDIX II

(Geophysical Survey by A.H. Bartlett).

MAPS.

1. DETAILED SOUNDINGS OF PILOT BAY
2. CAPE SORELL PENINSULA EL 1/71
3. CAPE SORELL SAMPLE LOCATIONS
4. CAPE SORELL GEOLOGICAL MAP.

002

1. SUMMARY:

Exploration Licence No. 1/71 was granted to Comalco Limited on 6 January 1971. The Exploration Licence covers the northern-most twenty two (22) square miles of the Cape Sorell Peninsula, near Strahan, western Tasmania.

In excess of 1000 million tons of high purity quartzite rock has been proved. The quartzite is suitable for the manufacture of silicon metal in an electric furnace. The quartzite outcrops, has a steep dip, little overburden and can be mined by open-cut methods.

Small isolated zones of sand, occurring on the Cape, are suitable for white glass manufacture after beneficiation.

A potential port site exists in Pilot Bay outside the entrance to Macquarie Harbour.

A geological and sample location map is included with this report.

2. RECOMMENDATIONS:

A. Quartzite: A huge high grade quartzite deposit has been proved on Cape Sorell. However, if a mining operation is contemplated then the following recommendations are made -

- (1) That extensive costeening of all possible quarry sites be undertaken.
- (2) The costeens be sluiced clean to expose the maximum area of insitu bedrock.
- (3) Detailed close grid sampling be undertaken to determine the ultimate purity of any proposed quarry.
- (4) If, after the satisfactory completion of the above recommendations mining is still contemplated, then application must be made to the Tasmanian Mines Department for mining leases.

B. Sand: Approximately 10 million tons of marginal purity silica sand occurs on Cape Sorell. It is recommended that the sand is not mined because:

- (1) There is a very strong danger of promoting severe wind erosion of the presently stable sand dunes on the Cape.
- (2) Only small isolated zones of the sand are suitable for white glass manufacture after anionic flotation. The remaining sand is not suitable for white glass and can only be used for amber glass manufacture.

003

3. LOCATION AND ACCESS:

The Cape Sorell Peninsula comprises the relatively isolated southern arm of the entrance to Macquarie Harbour, on the west coast of Tasmania. Access to the cape is by boat across Macquarie Harbour from Strahan. Strahan is a fishing village north of the harbour and approximately seven miles from the Cape. Boat hire and provisions can be arranged in Strahan.

Strahan is serviced by a regular air service (Aerial Services of Tasmania) and two good highways. The Waratah Highway links Strahan to Queenstown, twenty two miles away and then Wynyard on the north coast. The Lyell Highway links Queenstown to Hobart.

A telecommunication cable links the signal station at Hells Gates on the Peninsula with the Strahan Post Office. Limited 240 V power generating facilities exist on the Peninsula. Two weatherboard cottages are available for hire at the Hells Gates signal station. The cottages are owned by the Hobart Marine Board.

A good jetty exists on the peninsula approximately 200 yards inside the harbour entrance.

4. GEOLOGY:

Massive and thinly bedded quartzites and shales of Upper Proterozoic age outcrop. These rocks constitute the predominating rock series throughout the whole district. The rocks have been folded, faulted and crumpled. The strike and dip varies but is generally towards the north with a tendency towards the north-east. The dip varies with the folding but is generally sub-vertical. Some drag folding has been noted. The more incompetent beds, shales and silty quartzites, have been crumpled and puckered. This feature is well exposed on the harbour beach of the peninsula near Bonnet Island. At this point the prevailing strike is 025° magnetic with a dip ranging between 75° and vertical with a westerly trend.

The massive quartzite beds form prominent strike ridges inland. Differential erosion is evident along the coast. The shales, where outcropping on the coast, have been differentially eroded to form coves.

Current bedding is evident. In some areas lenses of quartzite rock are ironstained and relatively enriched in clay. One such zone is on the western flank of Watts Hill where sample 'CSP 094' was taken. Analysis showed this material to contain 0.20% Fe_2O_3 and 1.0% Al_2O_3 . The rock has a pinkish colour with concentrated staining on some bedding planes.

004

In other areas zones have been stained a dark brown grey colour. This is particularly evident in selective beds along the Macquarie Harbour coast. Sample 'CSP 057' taken near Bonnet Island is typical. This staining owes its course to an organic origin.

Inland the massive and resistant quartzite strike ridges protrude through a sandy, peaty loam soil cover. This "blanket cover" masks the inland geology to an extent. The inland topography is relatively flat with light vegetation - mainly button grass plain. The shale beds noted inland outcrop in deeply eroded gullies. This is due to the shale being more easily eroded than the quartzite. The precise extent of the shale inland is unknown. In general, the depressions formed by the differential erosion of the shale, have been filled with soil. Hence the extent of the outcrop is not observed.

The outcropping quartzite is often highly polished due to wind-blown sand particles. The steep dip of the quartzite and relative absence of oberburden makes the deposit extremely suited to open cut mining methods. Vegetation is light.

At present two quarry sites appear feasible. The first is the old quarry site used to construct the main west breakwater due west of Prater Rock in Pilot Bay. The second site is a half-mile south west of Outer Bay in the country behind Pilot Bay Beach. This second quarry site appears to be the more extensive.

The quartzite grades into a more silty sandstone and true siltstones around Liberty Point to the south-east of Table Head. This area has not been examined in detail.

Recent sand dunes have developed on the western coast of the peninsula in the vicinity of Tiddy's Beach. These extend inland in a broad north-easterly trending arc to Pilot Bay. A seismic traverse was completed in May 1971 along a depression in the sand dunes behind Tiddy's Beach. The results indicated that bedrock (probably shale) occurs some 50 feet below ground level. This would be at 150 feet below the top of the higher sand dunes.

It appears that the sand has been deposited by wind in a trench formed by the differential erosion of massive shales. The differential erosion may have been assisted by faulting. Shales can be seen outcropping at the base of this trench at Tiddy's Beach.

Warning: If mining of the sand dunes is contemplated then serious thought must be given to the strong possibility of severe wind erosion of these dunes. The sand is relatively stable at present. However, removal of the protective vegetation will make them active - especially

005

during the strong south-westerly to north-westerly gales. These gales are frequent during the winter months.

5. SAMPLE ANALYSIS:

A. Quartzite:

(a) Samples: To date ninety-four (94) quartzite samples have been systematically taken on Cape Sorell. The samples have been indexed 'CSP'. Duplicate samples of the initial seventeen samples (CSP 001 to CSP 017) were assayed by the Comalco and Griffith-Inteco Aust. Pty Ltd. Laboratories, Melbourne. Contamination from the wearing faces of the crushing implements was apparent with each set of results. The Comalco Laboratory utilized an iron jaw crusher for primary crushing - this introduced significant iron contamination. The Griffith-Inteco Laboratory used ceramic lined crushers - this introduced significant aluminium contamination. The overall assay results of the initial seventeen samples reported is a combination of both sets of results.

The remaining samples have been assayed by the A.C.I. Technical Centre Pty. Ltd, Waterloo, New South Wales. Samples CSP 027 to CSP 034 were not assayed due to their present uneconomic geographical position.

A bulk sample obtained from samples CSP 018 to CSP 90 was forwarded to Elkem A/S Research Division in Norway. Thermal Stability tests and a bulk analysis were completed on this representative sample. The table below compares the overall A.C.I. and Elkem analyses.

<u>Element</u>	<u>Average of 69 Samples Analysed by A.C.I.</u>	<u>Bulk Sample Analysed by Elkem</u>
SiO ₂	99.40 %	99.44 %
Fe ₂ O ₃	0.031 %	0.056 %
Al ₂ O ₃	0.348 %	0.24 %
TiO ₂	0.033 %	0.015 %
MgO	0.022 %	-
L.O.I.	0.148 %	0.11 %
Cr ₂ O ₃	< 0.001 %	-
Na ₂ O	< 0.010 %	-
P	< 0.05 %	0.0003 %
CaO	< 0.010 %	0.004 %

It should be noted that the above analyses represent an average of all samples assayed. With selective mining the general requirements for metallic silicon and ceramic use can be easily met.

ANALYSIS OF QUARTZITE SAMPLES

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Exploration Licence

1/71

Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab. Reports
CSP 001	99.51	0.06	0.27	0.03	18	110				0.12	<p>Samples CSP001 to CSP017 were assayed by normal chemical methods at the Melbourne Laboratories of Comalco and Griffith -Inteco (Aust.) P/L. The two sets of results have been combined. The deficit in the total aggregate has been proportioned out amongst the individual assays for each sample.</p> <p><u>Note:</u> CSP017 is a test sample only - Taken near Queenstown at</p>
" 002	99.21	0.04	0.55	0.04	ND	113				0.14	
" 003	99.06	0.10	0.70	0.04	4	140				0.08	
" 004	99.06	0.06	0.65	0.05	25	165				0.16	
" 005	99.06	0.04	0.66	0.04	35	123				0.18	
" 006	99.06	0.05	0.76	0.02	ND	105				0.10	
" 007	99.33	0.12	0.41	0.03	ND	125				0.09	
" 008	99.42	0.07	0.42	0.02	ND	120				0.05	
" 009	99.66	0.04	0.22	0.02	ND	85				0.05	
" 010	99.65	0.03	0.26	0.02	ND	110				0.03	
" 011	99.30	0.06	0.55	0.02	ND	125				0.04	
" 012	99.40	0.07	0.43	0.06	ND	115				0.02	
" 013	98.42	0.14	1.17	0.04	ND	181				0.21	
" 014	99.39	0.13	0.40	0.02	ND	125				0.04	

NOT DETERMINED

ANALYSIS CONT.

CAPE SORELL

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Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab. Remarks
CSP 029											<p><u>NOTE: 2</u> Samples CSP 027 to CSP 034 were taken at Table Head. They appear similar to the other samples - i.e. high purity</p>
CSP 030											
CSP 031											
CSP 032	N O T	A S S	A Y E	D	N O T	A S	S A Y	E D	NOT	ASS	
CSP 033											
CSP 034											<p>The samples were not assayed due to the present uneconomic location of Table Head.</p>
CSP 035	99.2	0.035	0.62	0.040	< .010	.013	< .01	< .001		0.12	
CSP 036	99.7	0.020	0.10	0.026	< .010	< .010	< .01	< .001		0.10	
CSP 037	99.6	0.013	0.20	0.034	< .010	.010	< .01	< .001		0.12	
CSP 038	99.7	0.015	0.15	0.018	< .010	< .010	< .01	< .001		0.13	
CSP 039	99.5	0.017	0.25	0.014	< .010	< .010	< .01	< .001	0.05	0.14	<p><u>NOTE:</u> Samples CSP 024 to CSP 035 were taken on Betsy Island and sample CSP 035 at Back Again Point..</p>
CSP 040	99.4	0.025	0.41	0.034	< .010	.015	< .01	< .001		0.13	
CSP 041	99.7	0.018	0.10	0.024	< .010	< .010	< .01	< .001		0.17	

ANALYSIS CONT.

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009

Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab. Remarks
CSP 042	99.6	0.015	0.20	0.028	<.010	<.010	<.01	<.001		0.15	
CSP 043	99.8	0.012	0.08	0.008	<.010	<.010	<.01	<.001		0.11	
CSP 044	99.7	0.015	0.06	0.012	<.010	<.010	<.01	<.001		0.15	
CSP 045	99.6	0.050	0.17	0.036	<.010	.10	<.01	<.001		0.14	
CSP 046	99.4	0.022	0.17	0.018	<.010	.15	<.01	<.001		0.17	
CSP 047	99.1	0.018	0.60	0.038	.010	.030	<.01	<.001		0.18	
CSP 048	99.6	0.025	0.22	0.028	<.010	.020	<.01	<.001		0.09	
CSP 049	99.4	0.050	0.35	0.045	<.010	.060	<.01	<.001	0.05	0.12	
CSP 050	99.0	0.050	0.70	0.038	<.010	.050	<.01	<.001		0.13	
CSP 051	99.4	0.020	0.35	0.028	<.010	.012	<.01	<.001		0.13	
CSP 052	99.5	0.020	0.31	0.026	<.010	<.010	<.01	<.001		0.07	
CSP 053	99.6	0.019	0.27	0.022	<.010	.013	<.01	<.001		0.08	
CSP 054	99.7	0.025	0.15	0.034	<.010	<.010	<.01	<.001		0.11	
CSP 055	98.9	0.033	0.73	0.034	<.010	.024	<.01	<.001		0.23	

841011

ANALYSIS CONT.

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Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab.	Remarks
CSP 056	98.6	0.037	0.88	0.056	<.010	.026	<.01	<.001		0.39		
CSP 057	99.3	0.027	0.34	0.032	<.010	.015	<.01	<.001		0.23		
CSP 058	99.1	0.036	0.55	0.030	<.010	.015	<.01	<.001		0.28		
CSP 059	99.5	0.024	0.21	0.030	<.010	.013	<.01	<.001		0.16		
CSP 060	99.6	0.016	0.17	0.018	<.010	<.010	<.01	<.001		0.13		
CSP 061	99.7	0.019	0.14	0.008	<.010	<.010	<.01	<.001		0.13		
CSP 062	99.4	0.024	0.30	0.34	.010	.025	<.01	<.001		0.17		
CSP 063	99.7	0.016	0.12	0.024	.012	<.010	<.01	<.001		0.13		
CSP 064	99.6	0.014	0.18	0.024	<.010	<.010	<.01	<.001		0.13		
CSP 065	99.8	0.014	0.05	0.021	.015	<.010	<.01	<.001		0.09		
CSP 066	99.7	0.019	0.10	0.040	.015	<.010	<.01	<.001		0.10		
CSP 067	99.7	0.016	0.06	0.024	<.010	<.010	<.01	<.001		0.14		
CSP 068	99.8	0.017	0.04	0.20	<.010	<.010	<.01	<.001	0.05	0.12		

011

ANALYSIS CONT.

841012

CAPE SORELL

Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab. Remarks
CSP 069	99.7	0.018	0.13	0.020	< .010	< .010	< .01	< .001		0.14	
CSP 070	99.7	0.016	0.13	0.016	.018	< .010	< .01	< .001		0.10	
CSP 071	99.6	0.013	0.20	0.038	< .010	< .010	< .01	< .001		0.13	
CSP 072	99.8	0.015	0.08	0.022	< .010	< .010	< .01	< .001		0.09	
CSP 073	99.3	0.025	0.45	0.060	< .010	.015	< .01	< .001		0.15	
CSP 074	99.5	0.014	0.32	0.032	< .010	< .010	< .01	< .001		0.12	
CSP 075	99.6	0.013	0.25	0.028	< .010	< .010	< .01	< .001		0.11	
CSP 076	99.8	0.012	0.07	0.014	< .010	< .010	< .01	< .001		0.08	
CSP 077	99.8	0.013	0.07	0.028	< .010	< .010	< .01	< .001		0.07	
CSP 078	99.7	0.013	0.05	0.022	< .010	< .010	< .01	< .001	0.05	0.15	
CSP 079	99.8	0.015	0.05	0.010	< .010	< .010	< .01	< .001		0.07	
CSP 080	99.8	0.016	0.04	0.018	.010	< .010	< .01	< .001		0.09	
CSP 081	98.2	0.027	1.4	0.078	< .010	.031	< .01	< .001		0.25	

012

-11-

ANALYSIS CONT.

841013

CAPE SORELL

Sample	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	Cr ₂ O ₃	P	L.O.I.	Lab. Remarks
CSP 082	99.6	0.027	0.20	0.022	<.010	<.010	<.01	<.001		0.09	
CSP 083	99.6	0.014	0.26	0.025	.012	<.010	<.01	<.001		0.10	
CSP 084	99.5	0.016	0.29	0.028	<.010	<.010	<.01	<.001		0.14	
CSP 085	99.6	0.019	0.23	0.020	<.010	<.010	<.01	<.001		0.14	
CSP 086	98.8	0.018	0.90	0.036	<.010	.022	<.01	<.001		0.23	
CSP 087	99.5	0.015	0.28	0.025	<.010	.017	<.01	<.001		0.16	
CSP 088	99.5	0.024	0.23	0.018	<.010	<.010	<.01	<.001		0.19	
CSP 089	99.2	0.024	0.57	0.040	<.010	.010	<.01	<.001		0.18	
CSP 090	99.6	0.026	0.24	0.019	<.010	<.010	<.01	<.001		0.11	
CSP 091	99.8	0.015	0.07	0.020	<.010	<.010	<.01	<.001		0.10	
CSP 092	99.0	0.043	0.65	0.11	<.010	.020	.01	<.001		0.19	
CSP 093	99.4	0.022	0.31	0.061	<.010	<.010	<.01	<.001	0.05	0.17	
CSP 094	98.5	0.20	1.0	0.060	<.010	<.045	.01	<.001		0.22	

The published requirements for metallic silicon vary greatly. The ranges noted in the literature are given below.

SiO ₂	98.0	to	99.5	%	upwards
Al ₂ O ₃	0.15	to	0.50	%	downwards
Fe ₂ O ₃	0.20	to	0.50	%	downwards
P	0.005%				downwards

A size range of 30 to 150 millimeters is desired. Excess Aluminium (Al₂O₃) is not critical but in large excess tends to increase the quantity of furnace slag.

(b) Thermal Stability: Thermal stability tests were completed by Elkem A/S Research Division in Norway. A copy of the report is attached (Appendix 1). The conclusion is that the material has a high thermal stability and very good mechanical strength. The material is suitable for the production of ferro-silicon and silicon metal in an electric smelting furnace.

(c) Potential of Quartzite as Road Aggregate:

Reference is made to A.H. Bartlett's memos of 20 May 1971, Tasmania, Cape Sorell Quartzite - Uses, and of 23 July 1971, Tasmania, Cape Sorell Quartzite - Tests by C.R.B.

A sample of Cape Sorell Quartzite was submitted to the Materials Research Division of the Country Roads Board to determine its suitability as a road aggregate. The results are listed:

<u>Test</u>	<u>Desired Specification</u>	<u>Results on Quartzite Sample</u>
Los Angeles Abrasion Value (L.A.K.)	18 maximum	16.8 L.A.K.
Polished Stone Value (P.S.V.)	50 minimum	41-45 P.S.V. (average 43 P.S.V.)

B. Sand:

(a) Samples: To date twenty-four (24) sand samples have been taken on Cape Sorell. The samples are indexed 'CSP' with sample numbers ranging upwards from CSP 1007. In addition to the chemical analysis a size analysis was completed on each sample. The individual size analyses have been averaged to produce one analysis graph of the percentage (by weight) passing a given mesh.

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ANALYSIS OF SAND SAMPLESExploration Licence
1/71CAPE SORELL - WEST TASMANIA

<u>Sample</u>	<u>Cr₂O₃</u>	<u>Fe₂O₃</u>	<u>Al₂O₃</u>	<u>TiO₂</u>	<u>CaO</u>	<u>MgO</u>	<u>Na₂O</u>	<u>LOI</u>	<u>SiO₂</u>
CSP 1007	0.018	0.10	0.27	0.60	<0.010	0.029	0.02	0.08	99.41
" 1008	0.002	0.056	0.22	0.018	0.024	0.015	0.01	0.01	99.55
" 1009	<.001	0.018	0.14	0.014	<.010	<.010	<.010	0.13	99.70
" 1010	<.001	0.022	0.16	0.013	<.010	<.010	<.010	0.12	99.68
" 1011	.001	0.032	0.11	0.020	<.010	<.010	<.010	0.32	99.52
" 1012	.001	0.24	0.71	0.046	1.4	0.14	0.11	1.41	95.9
" 1013	.001	0.25	0.79	0.042	1.1	0.13	0.11	1.39	96.2
" 1014	.005	0.24	0.67	0.070	0.058	0.12	0.10	0.55	98.19
" 1015	.003	0.26	0.77	0.063	0.050	0.12	0.13	0.75	97.85
" 1016	.028	0.075	0.21	0.10	<.010	0.034	0.04	0.22	99.29
" 1017	.027	1.0	0.39	0.11	0.016	0.18	0.04	1.03	97.2
" 1018	.026	0.13	0.23	0.10	<.010	0.025	0.010	0.17	99.31
" 1019	.011	0.060	0.21	0.078	<.010	0.022	0.010	0.26	99.35
" 1020	.011	0.064	0.19	0.044	0.048	0.052	0.05	3.12	96.4
" 1021	.005	0.12	0.76	0.046	<.010	0.024	0.03	0.98	98.0
" 1022	.002	0.059	0.21	0.023	<.010	0.013	<.010	0.12	99.57
" 1023	.004	0.048	0.19	0.025	<.010	0.015	<.010	0.14	99.58

ANALYSIS CONT.

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CAPE SORELL

<u>Sample</u>	<u>Cr₂O₃</u>	<u>Fe₂O₃</u>	<u>Al₂O₃</u>	<u>TiO₂</u>	<u>CaO</u>	<u>MgO</u>	<u>Na₂O</u>	<u>LOI</u>	<u>SiO₂</u>
CSP 1024	.002	0.035	0.18	0.022	< .010	< .010	< .010	0.08	99.68
" 1025	<.001	0.027	0.20	0.015	< .010	< .010	< .010	0.16	99.60
" 1026	.023	0.12	0.31	0.076	0.010	0.039	0.012	0.18	99.23
" 1027	.010	0.23	0.72	0.029	2.0	0.15	0.11	2.28	94.5
" 1028	.002	0.35	0.84	0.048	2.1	0.18	0.15	2.56	93.8
" 1029	<.001	0.020	0.10	0.074	< .010	< .010	< .010	0.09	99.68
" 1030	.045	0.080	0.19	0.074	< .010	0.020	< .010	0.77	98.82

REMARKS: Spectrographic analysis completed
by ACI Technical Centre,
Waterloo, New South Wales.

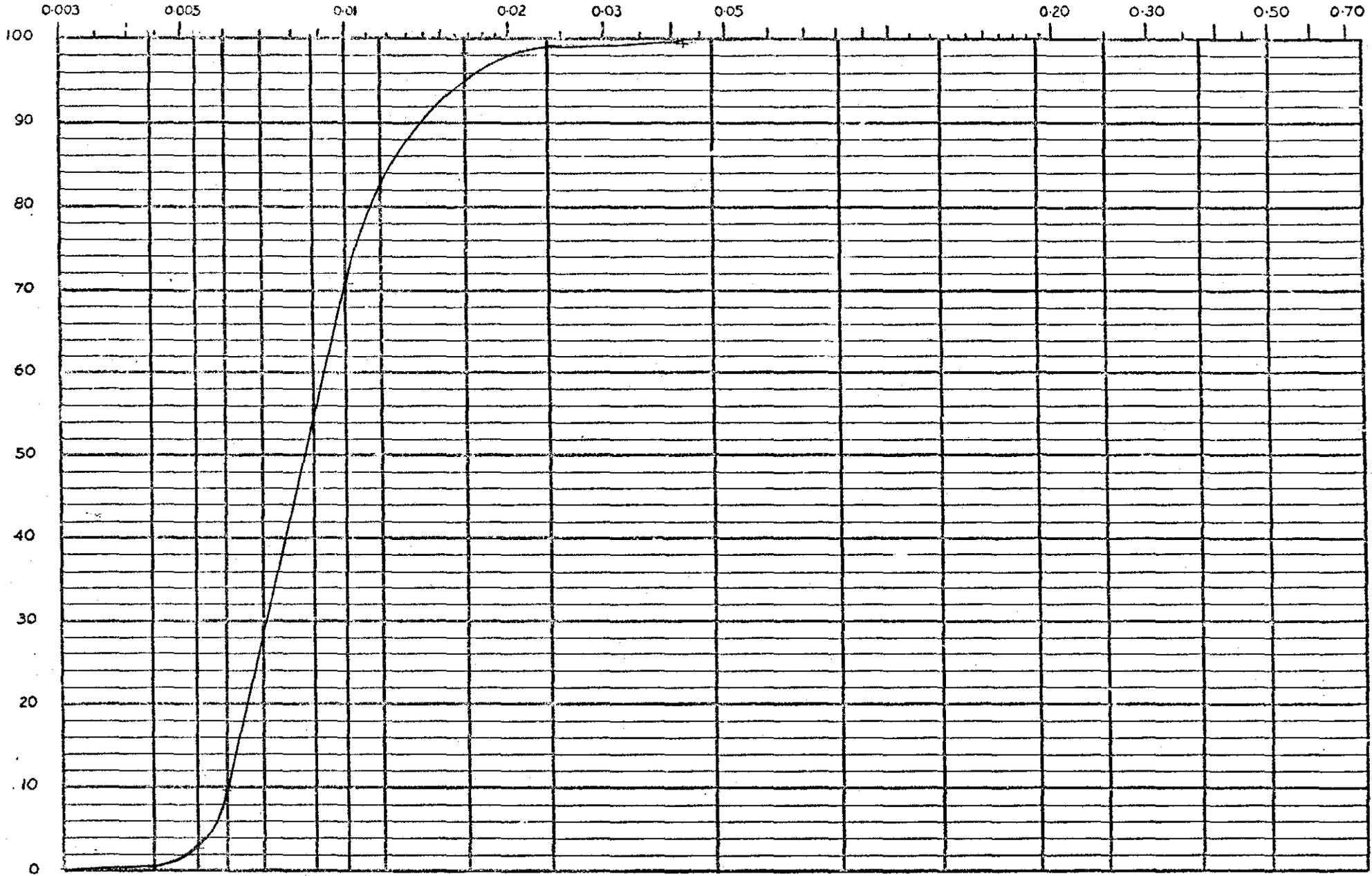
CLEAR
OPENING

INCHES.

016

841017

PERCENTAGE PASSING (BY WEIGHT)



0.003" 0.006" 0.0075" 0.0116" 0.0166" 0.0235" 0.0474" 0.0810" 0.125" 0.1875" 0.25" 0.375" 0.5" 0.75"
 N° 200 150 120 100 85 72 60 52 36 25 14 8 1/8" 3/16" 1/4" 3/8" 1/2" 3/4"

-15-

MECHANICAL ANALYSIS CHART

Average of twenty-four (24) sand samples taken by hand auger on Cape Sorell, Western Tasmania. The samples sized were CSP 1007 to CSP 1030.

BRITISH STANDARD SIEVE SIZES.

017

(b) Beneficiation Studies: The A.C.I. Technical Centre was asked to determine the possibility of upgrading the sand on Cape Sorell to 'white sand' specifications. After the chemical analysis of the CSP sand samples had been completed, those samples assaying more than 0.040% Fe₂O₃ were subjected to flotation trials. These iron enriched samples were bulked together to form two samples - Apparent White Sand and Amber Sand. The two samples CSP 1007 and 1008 were not included in these tests.

<u>Samples Bulked for Apparent White</u>	<u>Samples Bulked for Amber</u>	
CSP 1016	CSP 1012	CSP 1022
CSP 1019	CSP 1013	CSP 1023
CSP 1020	CSP 1014	CSP 1027
CSP 1021	CSP 1015	CSP 1028
CSP 1026	CSP 1017	
CSP 1030	CSP 1018	

The White Sand responded to anionic flotation to produce an 0.020% Fe₂O₃ sand. Cationic flotation, to remove the feldspar minerals had no effect on lowering the product Fe₂O₃ below that obtained with removal of iron-bearing minerals by anionic flotation. The mineral floated in the cationic stage was mostly quartz. The chemical analysis after each flotation run - anionic then cationic - is the same except that the Al₂O₃ is lowered from 0.10% to 0.07% by the cationic float. This indicates that only minor feldspar is present.

The Amber Sand is unsuitable for flotation treatment. The product is 0.10% Fe₂O₃ due to excessive surface staining. There is also a high shell content which interferes with the conditioning stage.

Sample	%	%	%	%	%	%	%	%
	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CaO	MgO	Cr ₂ O ₃	Na ₂ O	K ₂ O
<u>CSP White</u>								
Anionic -	0.020	0.10	0.012	<0.010	<0.010	<0.001	<0.01	<0.01
Cationic-	0.020	0.07	0.012	<0.010	<0.010	<0.001	<0.01	<0.01
<u>CSP Amber</u>								
Anionic -	0.01	0.41	0.022	0.07	0.028	0.001	0.04	0.18

Conclusion: Only the CSP White sand is amenable to flotation, to produce white glass making sands. The CSP Amber sand would only be suited to amber glass production after treatment.

018

6. SEISMIC INVESTIGATION:

With a view to establishing a port in Pilot Bay a series of seismic traverses was completed to determine the approximate depth of overburden to bedrock in Pilot Bay. A copy of A.H. Bartlett's report on this survey is attached with this report (Appendix 2).

019

THERMAL STABILITY TESTS BY ELKEM A/S RESEARCH DIVISION, NORWAY

020

841021



Research Division, Fiskaa Verk

Date
2nd March, 1971

Report No.
F/FV 38/71

File
1773 C

LABORATORY TEST OF A QUARTZITE SAMPLE FOR
COMALCO LIMITED

021

841022

LABORATORY TEST OF A QUARTZITE SAMPLE FOR COMALCO LIMITED

Sample : 4.5 kg quartzite
Received : February 18th 1971
Our ref. No: 14/71

1. INTRODUCTION

The sample received consisted of pieces of grain size between 3/4 and 2 inches.

Visual examination showed mainly two types, one fine grained type, white or light grey in colour, and the other one a little more coarse grained and darker in colour. A few pieces were transitional to the two mentioned types.

The sample has been tested on thermal stability according to our normal method.

Chemical analyses have not been carried out.

2. CONCLUSION

The quartzite sample examined has a high thermal stability and a very good mechanical strength, and should from this point of view be well suitable for use as a raw material for production of ferro-silicon and silicon metal in electric smelting furnaces.

3. PROCEDURE

The thermal stability has been determined according to the method description No 21, given as appendix 1.

4. RESULTS

Sieve curves showing the disintegration after heat treatment and after further tumbling are given in appendix 2.

Thermal stability (+3/4" after heat treatment)	73%
Mechanical strength (+5 mm after heating and 100 revolutions in the drum)	95%

Kr. sand S, 2nd March, 1971

TA/mh

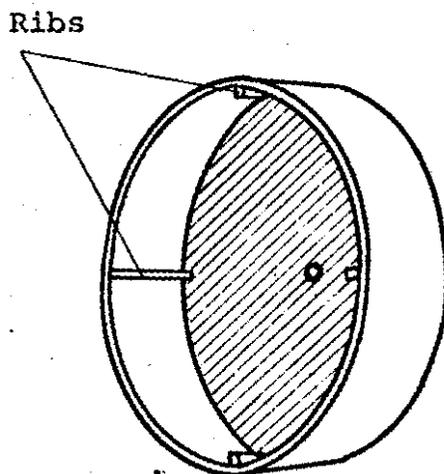
T. Anderssen

THERMAL STABILITY OF QUARTZ.

The - 1.06 + 3/4" U.S. sieve fraction is prepared. A graphite crucible containing about 200 g quartz is placed into a Tamman furnace at 1300°C and held at this temperature for one hour. The crucible is then withdrawn and cooled to room temperature. Sieve analysis is carried out. The whole sample is placed in the drum shown in the sketch and rotated for 100 revolutions (2½ minutes).

Finally, sieve analysis is again carried out.

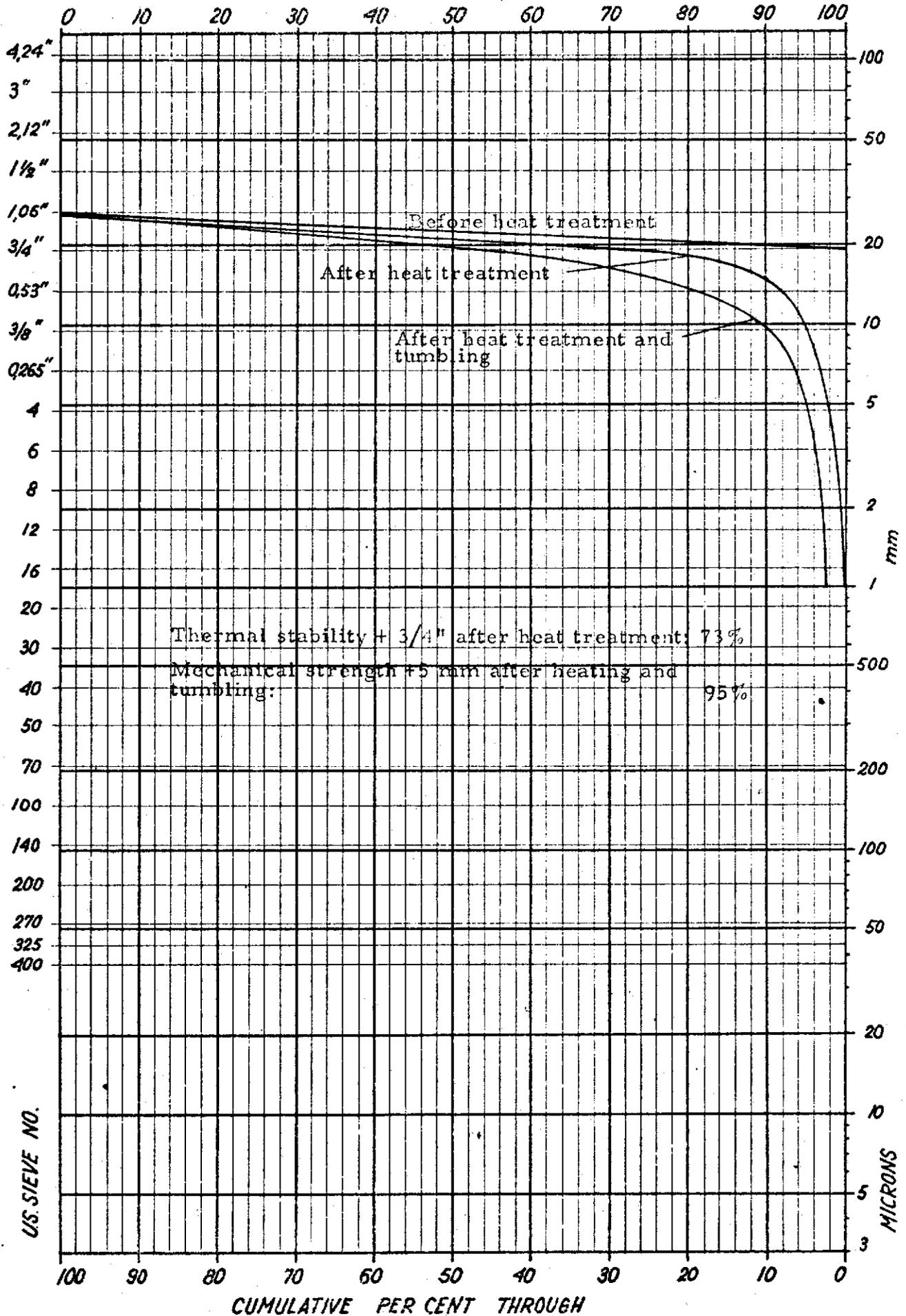
The result is given as sieve curves. The amount of + 3/4" fraction after heat treatment and of + 5 mm after 100 revolutions are especially noted.



CUMULATIVE PER CENT RETAINED

841024

0.25



Thermal stability + 3/4" after heat treatment: 73%

Mechanical strength + 5 mm after heating and tumbling: 95%

Quartzite from COMALCO LIMITED
Our ref. No 14/71

ELKEM
RESEARCH DIVISION
FISKAA VERK

5 cm

023

024

GEOPHYSICAL SURVEY BY A.H. BARTLETT

COMALCO LIMITED
841026



Memorandum

Ref Date 5th April, 1971.
To D.M. CRAWFORD From A.H. BARTLETT
At 18th Fl., C.R.A. At 7th Fl., I.A.C.
Copies D.B. Graham Subject TASMANIA, CAPE SORELL
W.G. Fenner SEISMIC TRAVERSES RESULTS.
K.L.S. Ford/K.V. Ayyar

SUMMARY

Seismic work has been carried out to determine approximately the depth of sand or gravel or boulders overlying the quartzite or shale bedrock in Pilot Bay.

Refer to attached drawings.

Traverses 1, 2 & 3 along Pilot Bay beach indicated that there is at least 100 feet of predominantly sand overlying bedrock. A hump of gravel and boulders occurs between chainages 500' to 800'.

Traverses 4, 5, 6, 7, 8 & 9 were carried out using hydrophones in the water of Pilot Bay. The varying depths of the layers are shown on the attached section drawings. It can be assumed that a velocity of 5400 - 6000 ft/sec. represents predominantly sand, whereas 6,000 to 7,800 ft/sec. represents gravel and boulders.

Traverse 10 was carried out along a depression behind the sand dunes which ran parallel to Tidley's Beach. Shale or quartzite bedrock occurs some 50 feet below, which would be at 150 feet below the top of the higher sand dunes.

NOTE : SEISMIC WORK GIVES ONLY APPROXIMATE INDIRECT DEPTH DETERMINATIONS AND SHOULD NOT BE USED FOR DESIGN PURPOSES WITHOUT CONFIRMATORY DRILLING.

...2/

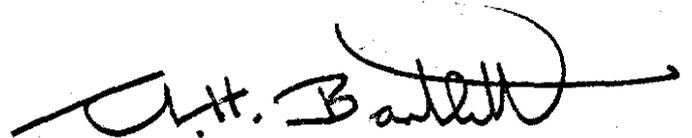
026

841027

- 2 -

PROBABLE INTERPRETATION OF SEISMIC WAVE VELOCITIES

<u>Wave velocity</u> feet/second	<u>Rock Type inferred</u>
1,000 or less	Dry sand or topsoil
5,200	Sea water
5,400 - 6,000	Saturated SAND
6,000 - 7,800	Saturated GRAVEL/BOULDERS with SAND packed between.
8,000 - 10,000	Probably SHALE
10,000 - 20,000	QUARTZITE.



A.H. BARTLETT
Divisional Manager - Exploration

Light House
and Cape.

CAPE SORELL.

TASMANIA

True North
Magnetic North

841028

Light-House Track

Pratar Rock
Tr 8
Tr 9

Tr 7

Tr 6

Tr 5

Tr 4

PILOT BAY

PILOT BAY BREAKWATER

Tiddy's Track

Tr 1
Tr 2
Tr 3

Pilot Bay Beach

BREAKWATER

Light-House Track.

TIDDY'S

BEACH

Entrance Island

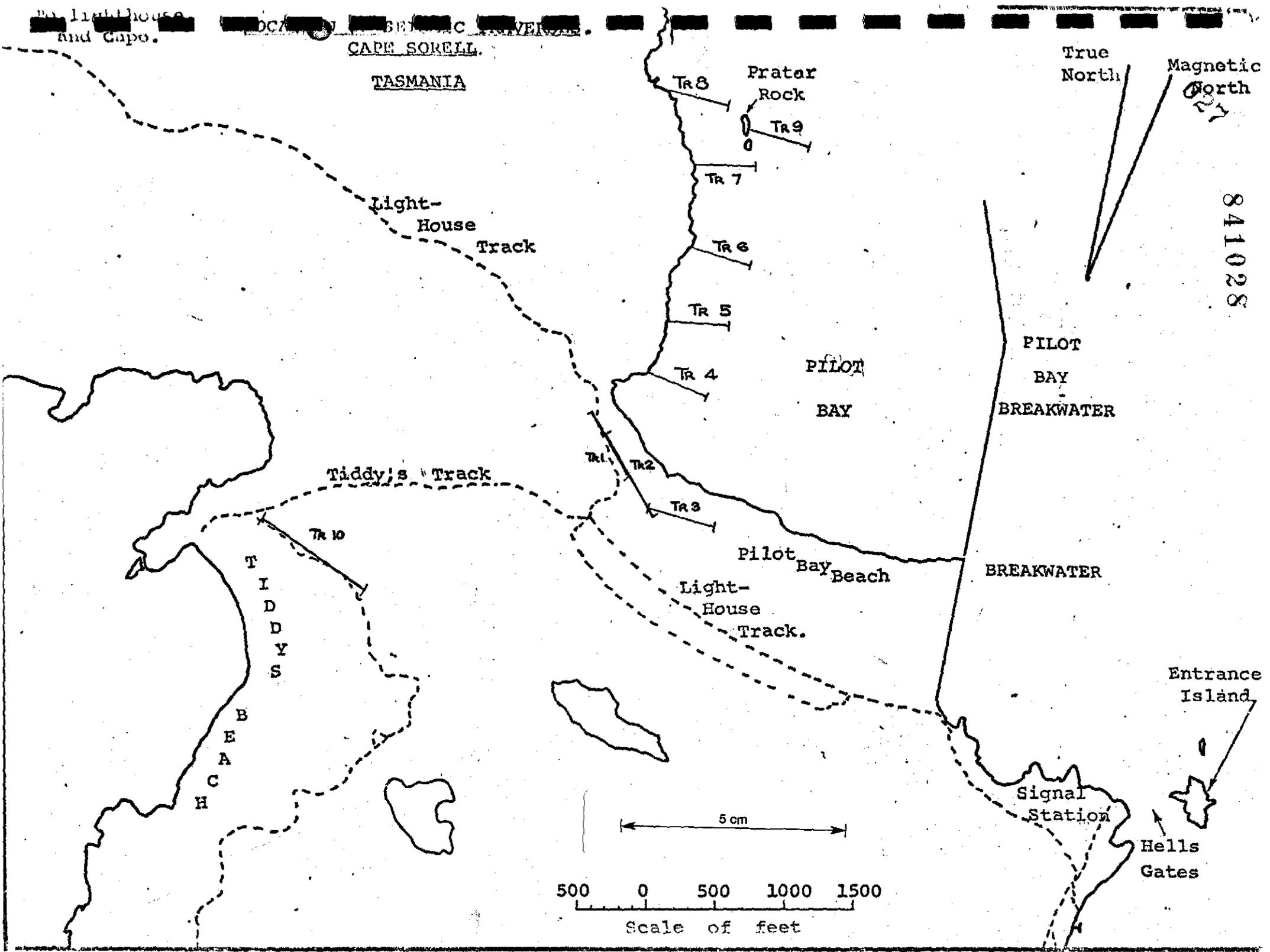
Signal Station

Hells Gates

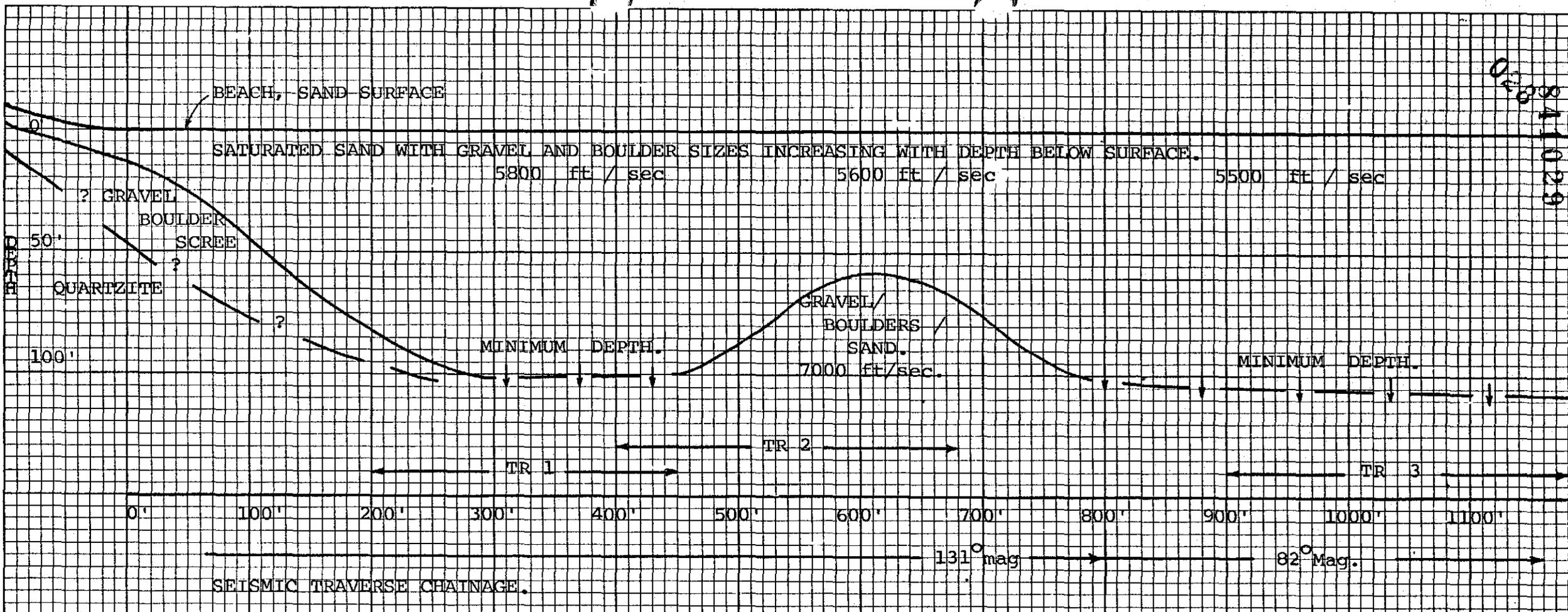
5 cm

500 0 500 1000 1500

Scale of feet

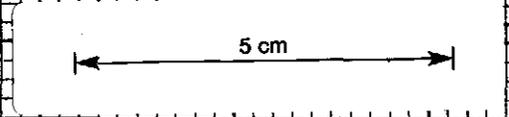


01288
241029

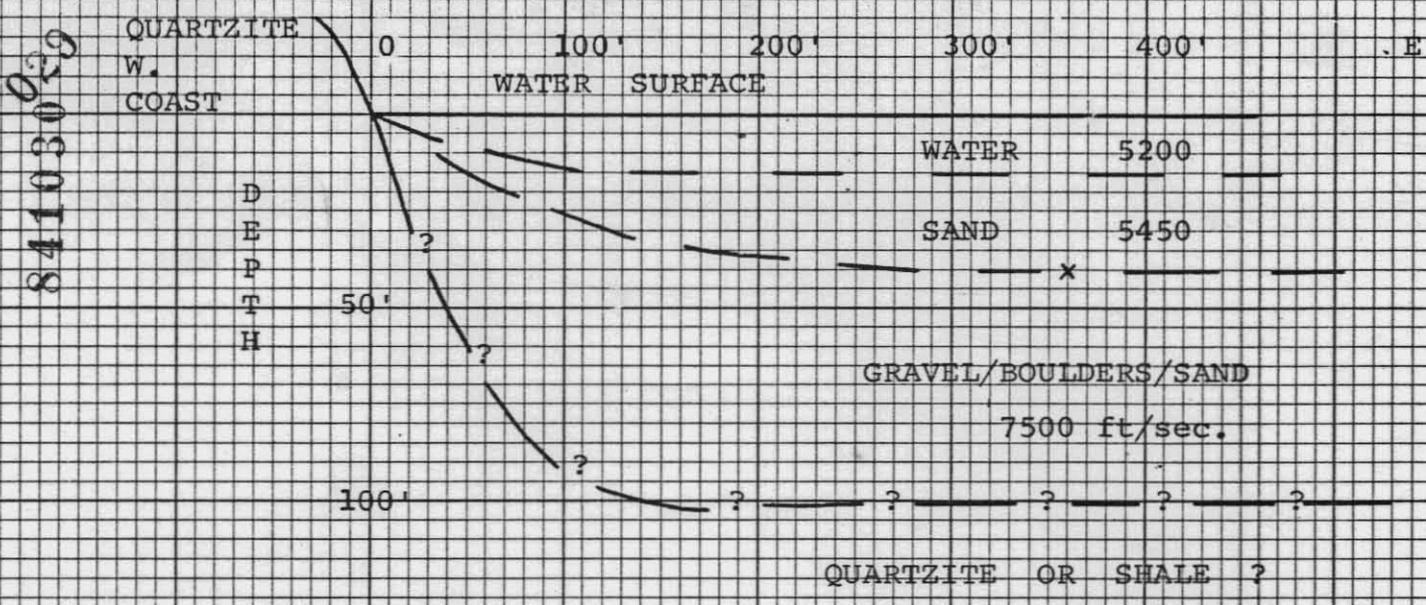


TASMANIA. CAPE SORELL.
Seismic Traverses along Pilot Bay Beach.
Interpretation of Results

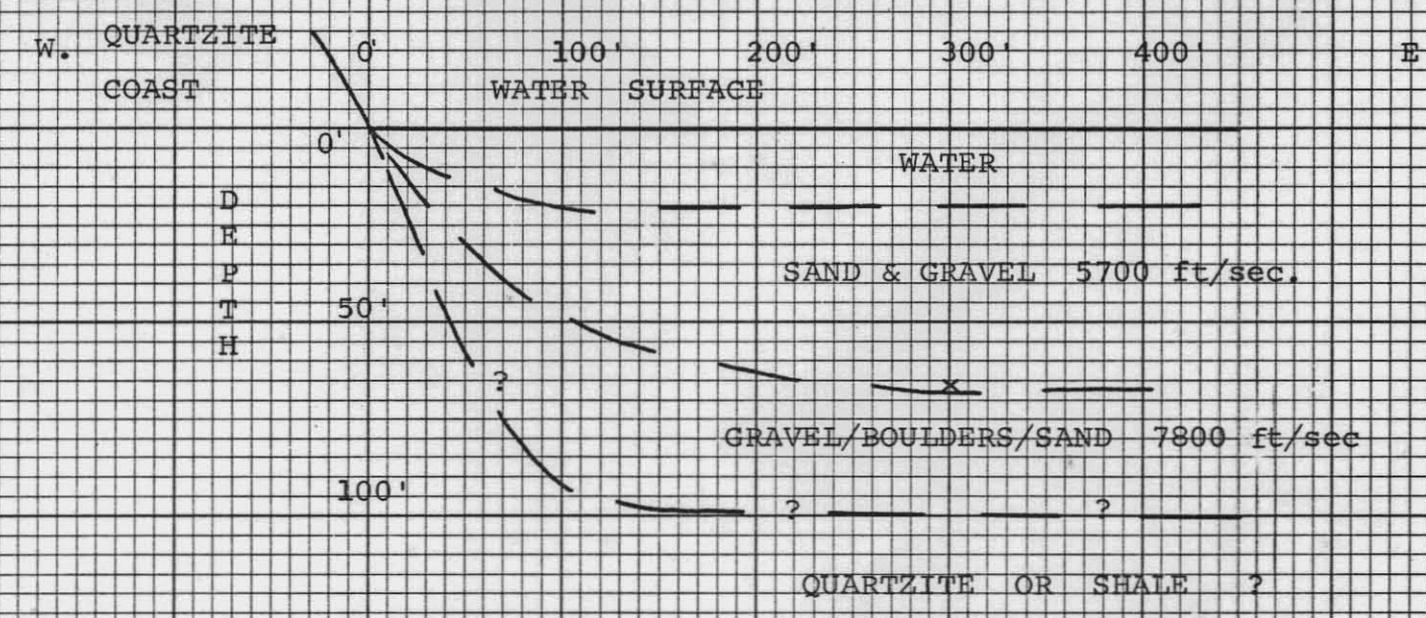
Scales: HORZ. 1 inch = 100 feet .
 VERT. 1 inch = 50 feet .



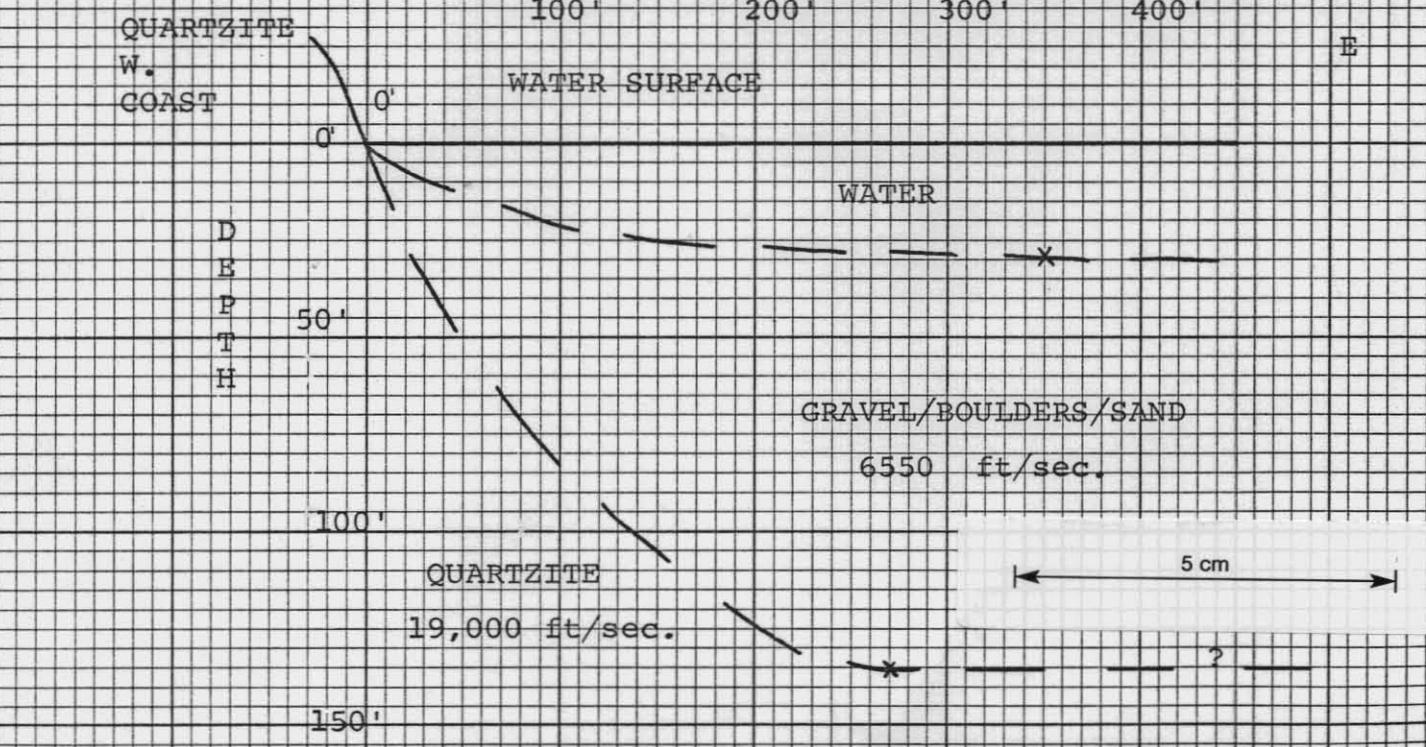
TRAVERSE 4 IN water extending eastwards from west side of Pilot Bay



TRAVERSE 5. in water extending eastwards from west side of Pilot Bay.



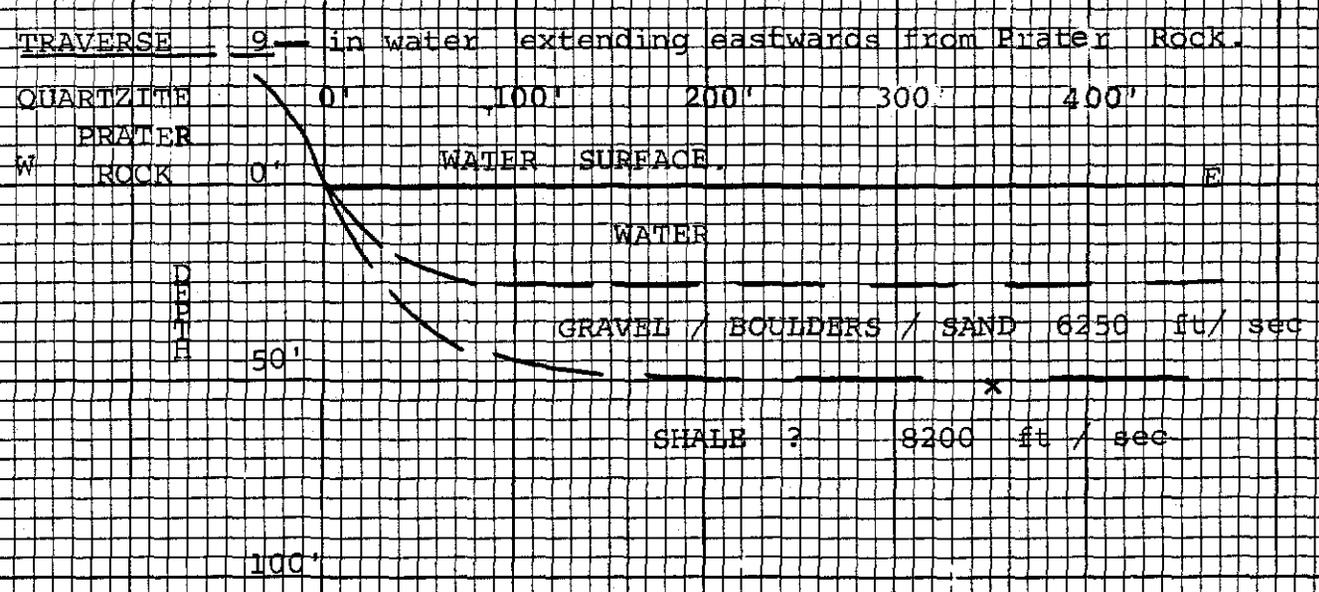
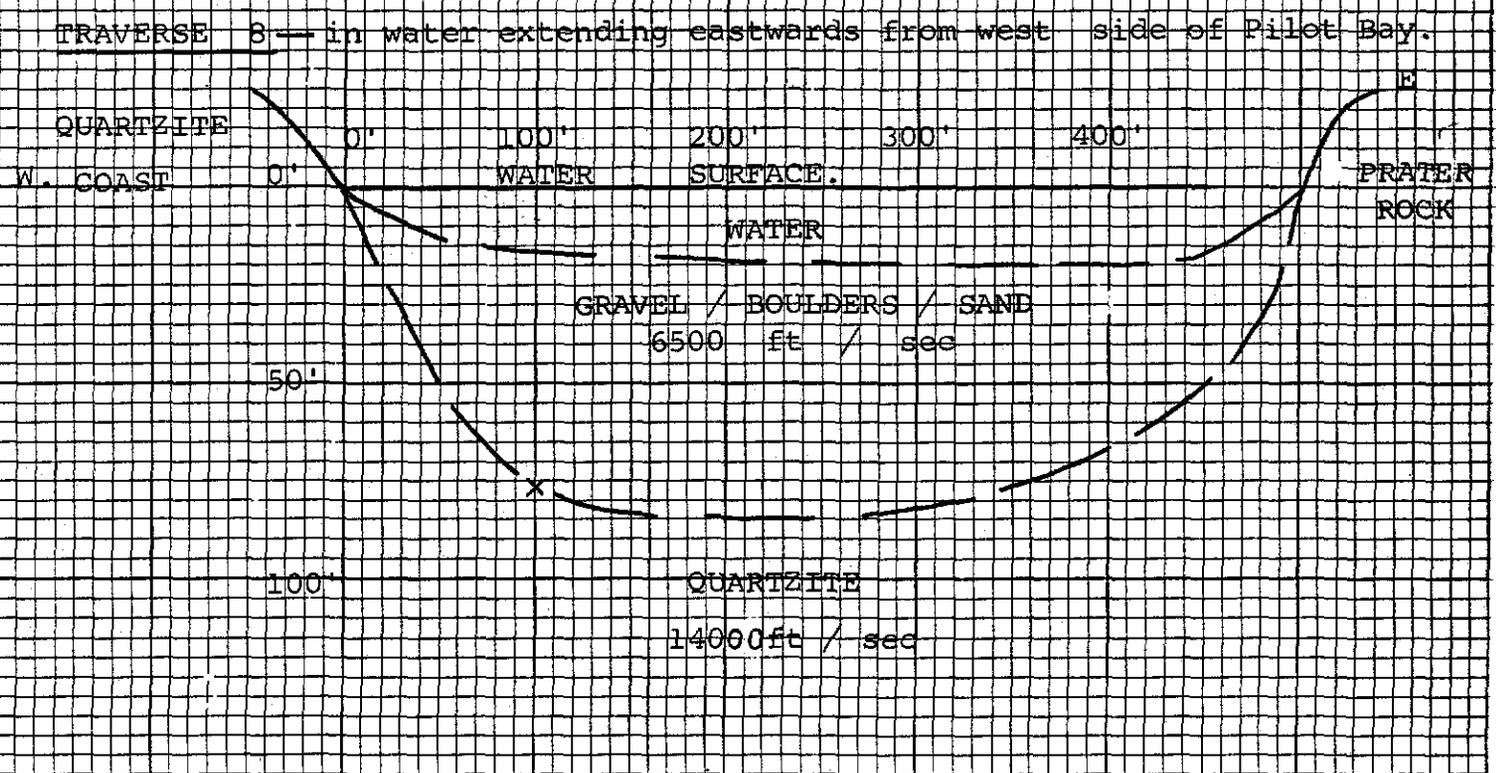
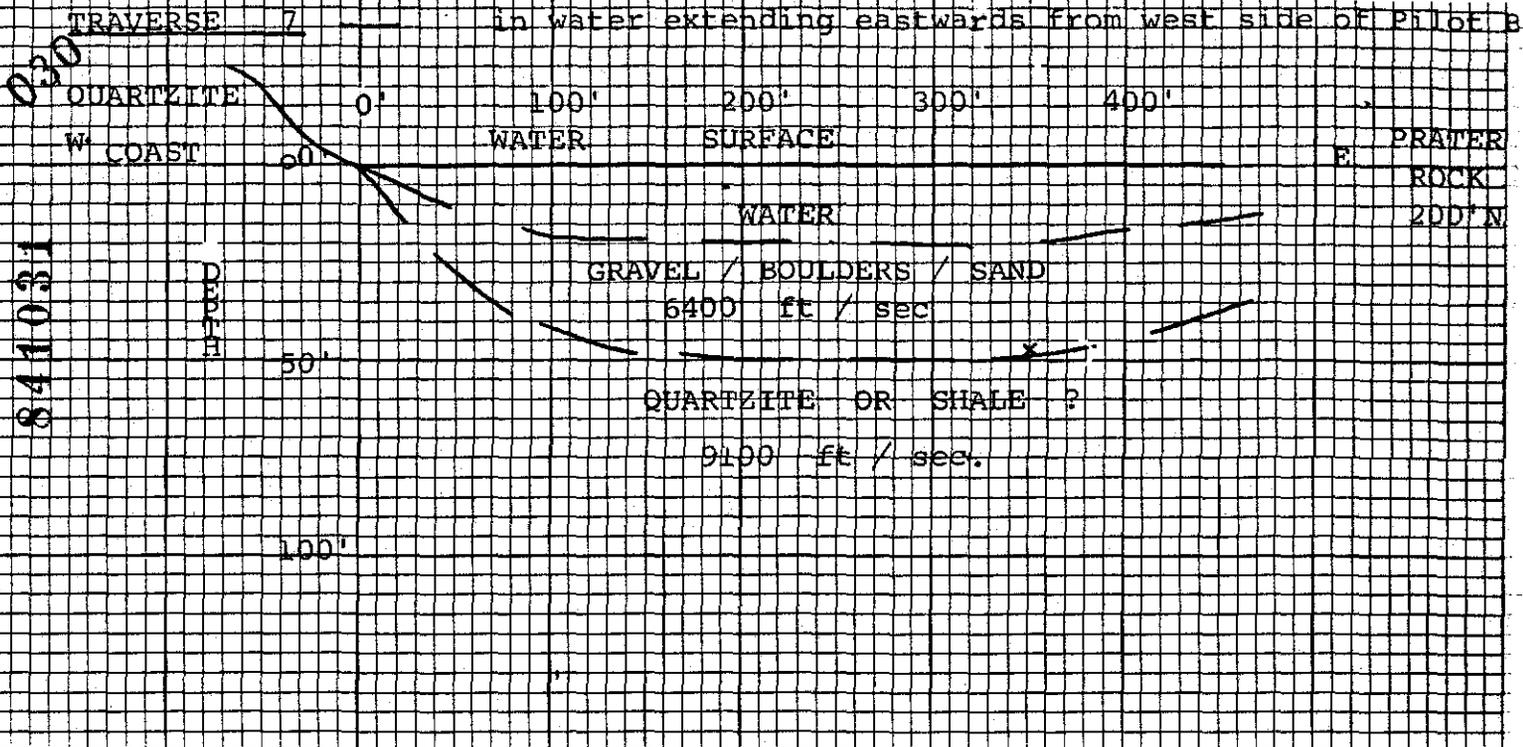
TRAVERSE 6. in water extending eastwards from west side of Pilot Bay.



Scales: Horz. 1 inch = 100 ft
Vert. 1 inch = 50 ft

TASMANIA. CAPE SORELL
Seismic Traverses in Pilot Bay.

Interpretation of Results

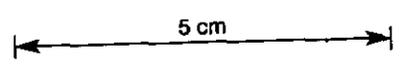


TASMANIA. CAPE SORELL

Seismic Traverses in Pilot Bay.

Interpretation of Results.

Scales: Horz. 1 inch = 100ft.
Vert. 1 inch = 50ft.



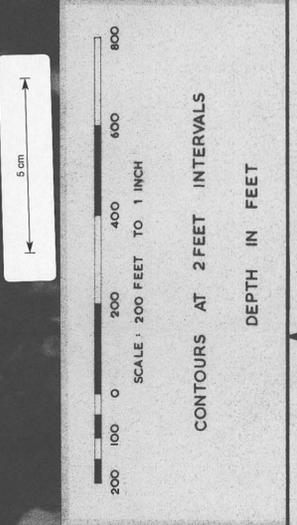
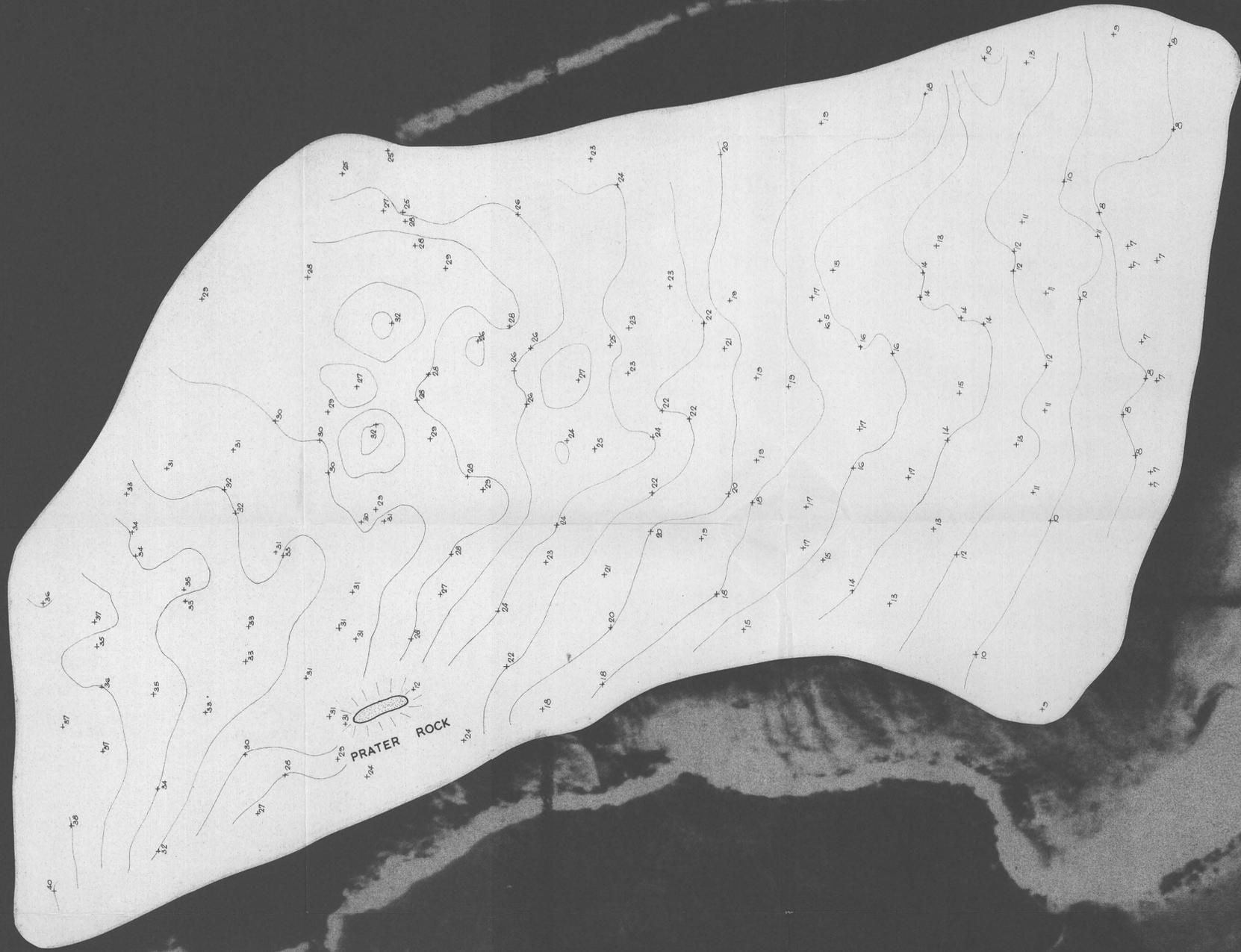
031

APPENDIX III

841032

PHOTOGRAPHS

A
B
C
D
E
F



RINNAIRD HILL de ROHAN and YOUNG PTY. LTD.
CONSULTING ENGINEERS
882 ST. KILDA ROAD, MELBOURNE, VICTORIA, 3004 - 51 8694
OFFICES ALSO AT - ADELAIDE - SYDNEY - CANBERRA - PERTH

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REFERENCE	DRAWING	REV	DATE	No.	REVISIONS	DATE	BY	CKD.	APP.

SPEC. No.	
COST CODE	
REQ. No.	
PROJECT No.	
FIELD BOOK	
COMMISSIONED BY	

DRAWN	B.L.K.	DATE	APR. 71
CHECKED	R.S.W.		
PASSED			
APPROVED			

COMALCO LIMITED 71-787 **COMALCO**

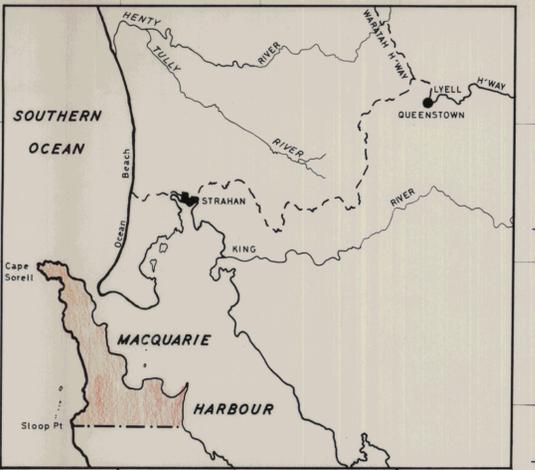
TASMANIA - WEST COAST
ENTRANCE TO MACQUARIE HARBOUR

DETAILED SOUNDINGS OF PILOT BAY

DRAWING No. 841033

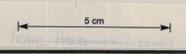
REVISION No. SHEET No. SHEETS

SCALE	0 1 2 4 CENTIMETRE
NORTH	



LOCALITY PLAN
1:250 000.

- LEGEND**
- E.L. 1/71 BOUNDARY.....
 - VEHICULAR TRACK.....
 - WATER COURSE.....
 - LIGHTHOUSE.....
 - SAND FLATS.....



71-787

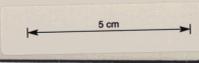
COMALCO LIMITED		
CAPE SORELL PENINSULA WEST TASMANIA E.L. N° 1/71		
1110		
COMPILED BY B.F.B.	DRAWN BY B.F.B.	EXPLORATION DEPARTMENT
DATE. 30-3-1971	SCALE 1 INCH = 556 YDS	N° TAS/C.S/71/1.

841034



LEGEND

QUARTZITE SAMPLE
 SAND SAMPLE
 TRACK
 LIGHTHOUSE
 HOUSES



TRANS. HEAD 71-787		
COMALCO LIMITED		
CAPE SORELL, E.L. 1/71		841035
SAMPLE LOCATIONS. 1111		
COMPILED. I.D.P. & B.F.B.	DRAWN BY M.M.W.	EXPLORATION DEP'T.
DATE. 11-5-1971	SCALE 1 INCH=830 FEET.	Nº TAS/CS/71/2



LEGEND

GEOLOGICAL TREND LINE
 DIP AND STRIKE 50°
 FAULT
 " INFERRED
 TRACK
 LIGHTHOUSE
 HOUSE

LEGEND

RECENT SAND
 PROTEROZOIC QUARTZITE
 SHALE

LEGEND

B. DETAILED RECONNAISSANCE - NUMEROUS TRAVERSES WITH AIR PHOTO INTERPRETATION.
 C. AIR-PHOTO INTERPRETATION



TRANS HEAD IN LWS 71-787

COMALCO LIMITED		841036
CAPE SORELL E.L.I. 71		1112
GEOLOGICAL MAP		
COMPILED. I.D.P. & B.F.B.	DRAWN BY B.F. BRADY.	EXPLORATION DEPT.
DATE. 11-6-1971	SCALE. 1 INCH = 830 FT	Nº TAS/CS/71/3