

574001

(6)

MICROFILMED

JOI M.	A.C.	C.G.	E.O.	D.S.
				Registr.
G. DIR.	25 JUN 1984			E & IL
	DEPT. OF MINES			
	6299/84			

QUARTZITE QUARRY

SMITHTON - TASMANIA

E.L. 29/80

Kaiser Aluminum & Chemical Corporation
(Australia) Pty. Ltd.

3/243/0-MD1217/83

October 1982

OPEN FILE



574002

The Australian
Mineral Development
Laboratories

amdel

100 King Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

4 October, 1982.

MD 3/243/0
1217/83

Mr. J. H. Callender,
Senior Geologist,
Kaiser Aluminum & Chemical Corporation
(Australia) Ltd.,
GPO Box 2735,
SYDNEY NSW 2001

REPORT MD 1217/83

YOUR REFERENCE:

Verbal discussions between
J. H. Callender and M. D. Ware,
AMDEL telex dated 16.8.82 re
estimated costs, Kaiser telex
to Mr. N. Thomas dated 16.8.82
and Kaiser telex dated 3.9.82 re
authority to proceed.

SUBJECT:

Quartzite Quarry within EL29/80,
Smithton - Tasmania.

WORK REQUIRED:

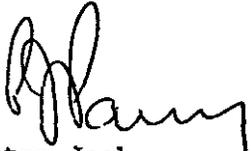
Preliminary drilling of quartzite
and analysis of samples.

Investigation and Report by: M. D. Ware

Chief, Materials Section: Philip J. Parry

Manager, Mineral and Materials Sciences Division: Dr. William G. Spencer

Head Office:
100 King Street, Frewville
South Australia 5063,
Telephone (08) 79 1662
Telex: Amdel AAB2520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 8053
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Townsville
Queensland 4814
Telephone (077) 75 1377


for Norton Jackson
Managing Director

1. INTRODUCTION

The immediate area in the vicinity of the southernmost quartzite quarry within the Smithton EL29/80 was test drilled on September 15, 1982, to provide initial data relative to the potential of the quartzite as a source of high grade silica.

Drilling was undertaken using an Atlas Copco ROC 701 Air Trak rig, XAS 350 Compressor, and 75 millimetre, hard button, T38 bits. All equipment was hired from Atlas Copco, Somerset, who also provided a sub-contracted local driller to undertake the work under the direction and supervision of the writer.

Eight holes, drilled during the day, were logged with chip and dust samples collected for analysis.

2. LOCATION

The quarry is located five kilometres south-east of Smithton and is the most southern of five quarries within an exposure of quartzite along the western edge of the Beacom Hills which rise abruptly to the east of flat low lying grazing land. Access is via the Bass Highway to the Irishtown turnoff, 2.5 kilometres south-east of Smithton, thence 1.6 kilometres along the Irishtown Road to an easterly trending gravel track. The quarry is 1.6 kilometres down track from the turnoff south of an operating D.M.R. and an abandoned quarry (ownership unknown).

The quarry is fenced with a wire gate across the track at the entrance to the former workings. Immediately prior to the gate the track branches with the left fork running up a ridge behind the quarry and thence east into undeveloped relatively flat scrub land. The general detail of the quarry area, reference Circular Head 1:100 000 Topographic Map Sheet 7916 (Edition 1) Grid CQ 449 730 is shown in Figure 1.

3. TEST DRILLING

Two holes, DH1 and DH7, were sited within the quarry and the remaining 6 on the ridge behind the quarry. Drill hole locations are shown on Figure 1.

In general the rig handled the conditions reasonably well although very high bit wear was experienced with a new bit showing substantial button wear after 40 metres of drilling. Holes caving tended to be a problem when softer material was encountered and when the bit, by following steeply dipping joint and bedding planes, deviated from the vertical.

A visual analysis of washed samples suggests that those intervals logged as soft quartzite or soft off-coloured sand consist at least in part of hard quartzite in conjunction with softer sandy beds. Off-colour material when washed yields a cinnamon coloured quartzite and sand which under the microscope appears mineralogically similar to the white quartzite.

An initial six samples from holes DH1 and DH4 were selected for chemical analysis to determine the relative purity of the white and cinnamon coloured quartzite.

Drill hole logs are presented in Table 1.

4. CHEMICAL ANALYSES AND RESULTS.

Six samples were selected for preliminary analysis: -

Sample 1	Drill Hole 1	Interval	1 - 3 metres
Sample 2	Drill Hole 1	Interval	3 - 5 "
Sample 3	Drill Hole 4	Interval	1.8 - 3 "
Sample 4	Drill Hole 4	Interval	3 - 6 "
Sample 5	Drill Hole 4	Interval	6 - 9 "
Sample 6	Drill Hole 4	Interval	12 - 15 "

Each sample was washed over a 1.5 millimetre screen, dried, siebed in a tungston carbide mill to minus 200 mesh BSS and analysed by the standard procedure of hydrofluoric acid digestion followed by analysis of the residue and calculation of the silica value to difference.

The results given in Table 2 indicate the white quartzite is of high purity, low in iron, alumina, titanium and calcium. Phosphorus levels in samples 1 and 2 from drill hole 1 are slightly high possibly due to the presence of traces of apatite or zeolite.

In drill hole 4 the white quartzite is of similar purity however the off-colour quartzite encountered below 6 metres shows a slight increase in iron (although still low) and an increase in both potash and alumina, possibly due to the presence of muscovite, with a corresponding decrease in silica content.

5. DISCUSSION

The results suggest the quartzite has been subjected to a degree of secondary silicification and surface leaching which results in a decrease in purity with depth. Never-the-less, the quality of the material analysed is high, particularly with regard to the iron content and it is possible that up to 6 metres depth of premium grade material may be available and considerably more if the higher alumina material can be accommodated.

At this stage the results and field observations by the writer suggest the quartzite deteriorates with depth and to the east. However, a significant quantity may be available to the north of the existing quarry. (The possibility of an extension to the south-east along the ridge has not been investigated.)

Currently the boundaries of those leases to the north of the area investigated are unknown.

Since the observable extension of the quartzite within the E.L. is toward the north, and the Bass Highway, this detail is important relative to assessing the broad potential of the area and formulating a recommendation for further investigation.

TABLE 1.

DRILL HOLE LOGS - SMITHTON QUARTZITE PROSPECT

DH1	Estimate 5 metres above main floor.	
	1 - 3 metres	Hard white Quartzite
	3 - 3.2	Soft Quartzite (Sand?)
	3.2 - 5	Slightly off colour sandy Quartzite
DH2	0 - 1	Top Soil
	1 - 3	Hard white Quartzite
	3 - 5.5	Hard white Quartzite
	5.5 - 6	Softer off-colour Quartzite/Sand
	6 - 6.5	Softer off-colour Sand
	6.5	Dark brown/black sandy Shale
DH3	0 - 0.8	Top Soil
	0.8 - 3	Hard white Quartzite
	3 - 4.2	Hard white Quartzite
	4.2	Soft off-colour Sand
DH4	0 - 1	Top Soil
	1 - 1.8	Soft white Quartzite
	1.8 - 3.5	Hard white Quartzite
	3.5 - 6	Softer white Quartzite (medium-hard drilling)
	6 - 9	Softer off-colour Quartzite (medium-hard drilling)
	9 - 12	Softer and hard slightly yellow Quartzite (medium-hard drilling)
	12 - 15	Off-colour yellowish and white Quartzite (medium-hard drilling)
DH5	0 - 0.8	Top Soil
	0.8 - 4	Hard white Quartzite
	4 - 6	Mixed white and off-white Quartzite. Hard.
	6 - 9	Mixed white and off-white Quartzite. Some iron staining on joints.
	9 - 12	Mixed white and off-white Quartzite. Hard.
	12 - 15	Mixed white and off-white Quartzite. Hard.
DH6	0 - 1	Top Soil
	1 - 2	White hard Quartzite
	2 - 3	Brown Sand

Table 1 (Cont'd)

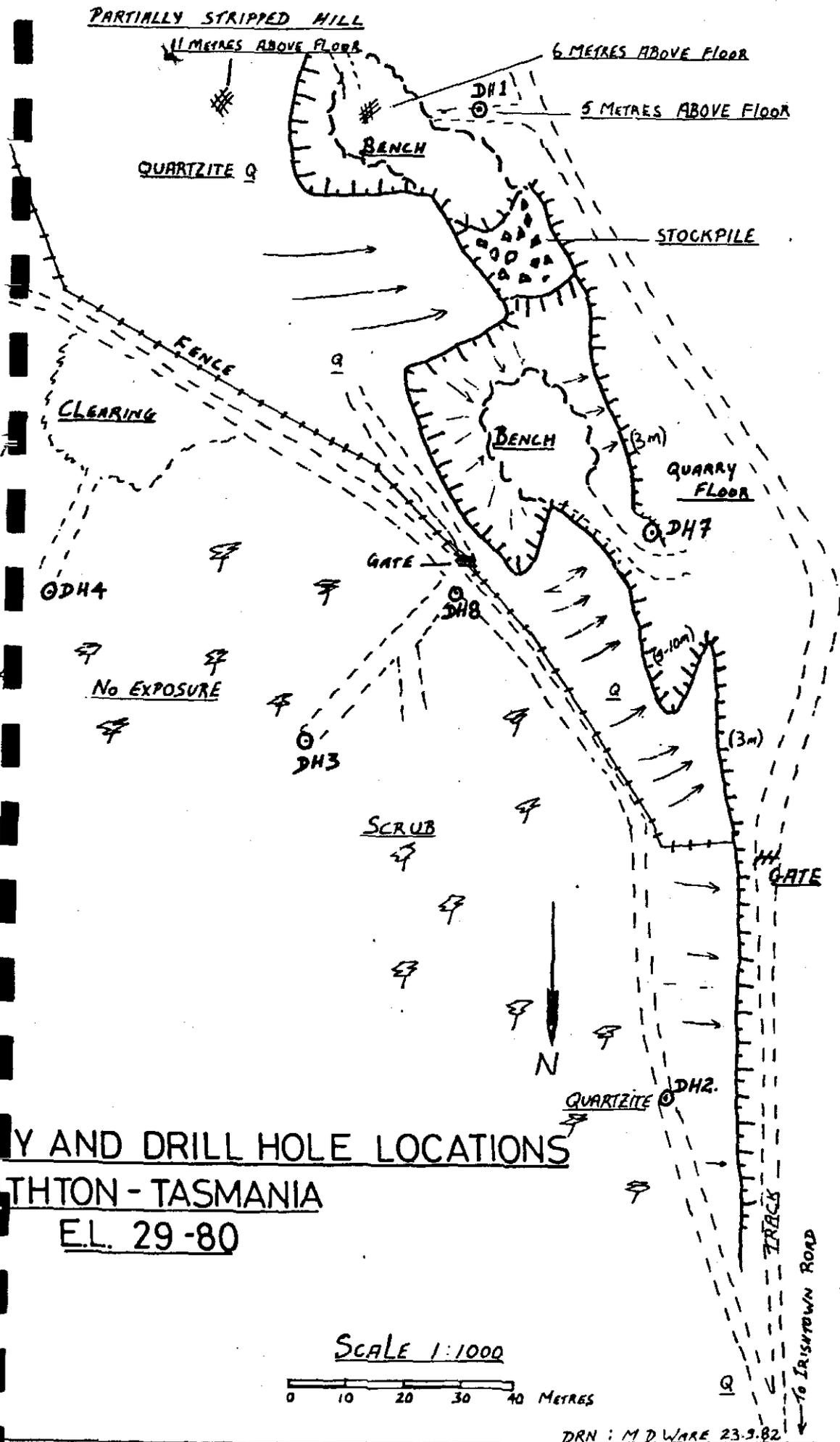
DH7	0 - 0.7	Hard white Quartzite
	0.7-0.9	Off-colour Sand
	0.9-2.6	Hard white Quartzite
	2.6-2.8	Off-colour Sand
	2.8-4.3	Off-colour to very brown Sand
DH8	0 - 1	Hard white Quartzite
	1 - 3	Sand. Hole caving.

TABLE 2.

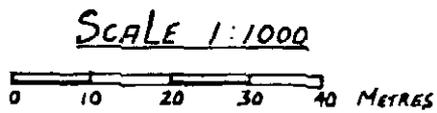
CHEMICAL ANALYSES

	10521	10521	10521	10521	10521	10521
	1	2	3	4	5	6
TiO ₂	0.042	0.057	0.037	0.038	0.023	0.019
Al ₂ O ₃	0.050	0.040	0.029	0.032	0.294	0.310
Total Fe as Fe ₂ O ₃	0.012	0.009	0.010	0.009	0.013	0.023
MnO	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MgO	0.004	0.003	0.003	0.003	0.016	0.022
CaO	0.006	0.006	0.006	0.007	0.006	0.014
Na ₂ O	0.006	0.004	0.006	0.007	0.005	0.008
K ₂ O	0.008	0.005	0.004	0.005	0.058	0.057
P ₂ O ₅	0.014	0.033	0.002	0.003	0.008	0.009
*WC	0.073	0.063	0.162	0.151	0.071	0.135
*CaO	0.009	0.008	0.022	0.019	0.009	0.018
LOI	0.02	0.13	0.04	0.10	0.18	0.21
SiO ₂ (By diff.)	99.76	99.64	99.68	99.63	99.32	99.18

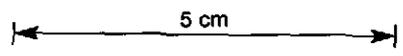
* Contaminants introduced during siebing.



Y AND DRILL HOLE LOCATIONS
HTON - TASMANIA
E.L. 29-80



DRN : M D WARE 23.3.82



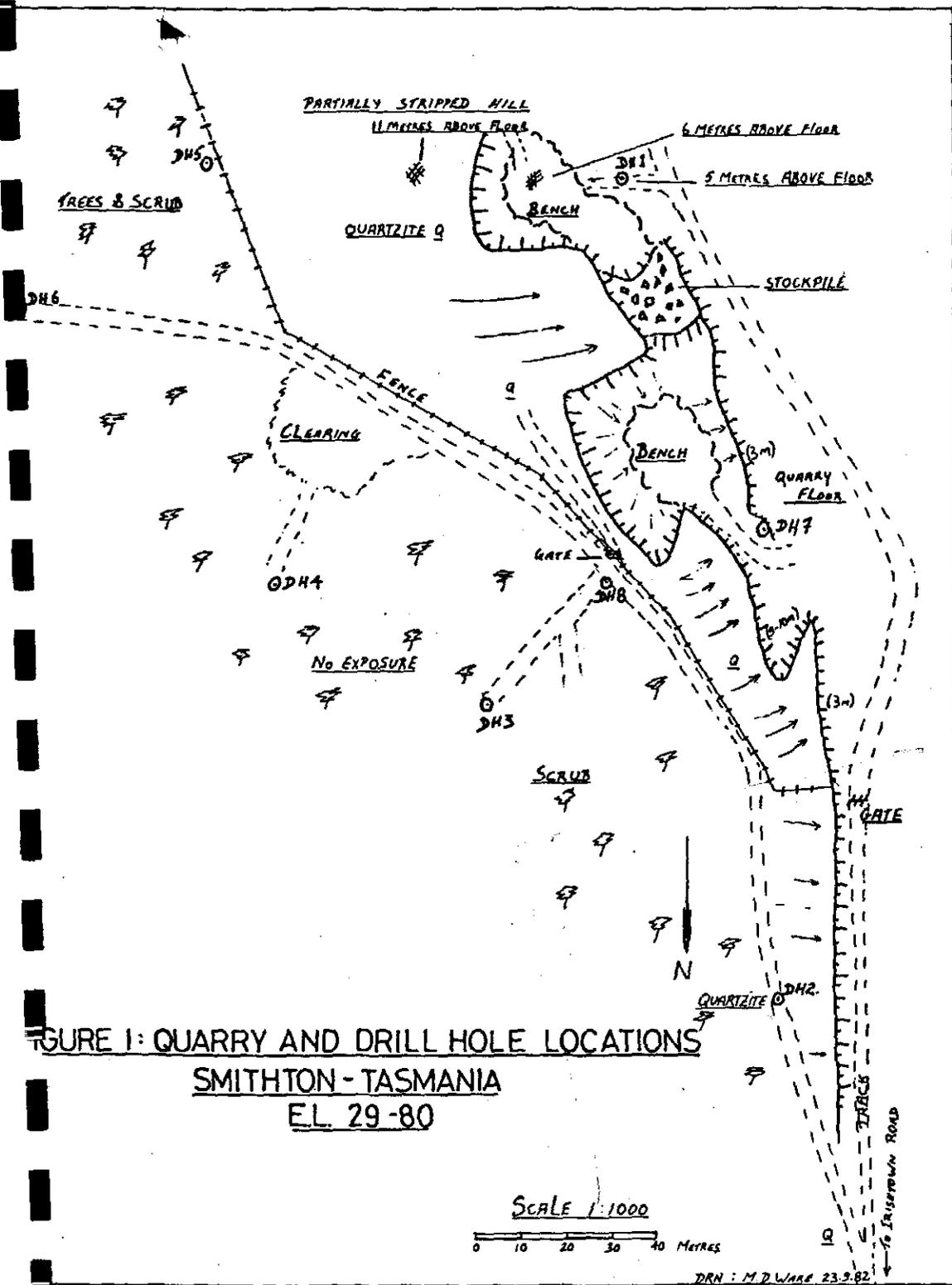


FIGURE 1: QUARRY AND DRILL HOLE LOCATIONS
SMITHTON - TASMANIA
EL. 29-80

5 cm



The Australian
Mineral Development
Laboratories

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

574013

Received

14.4.83

amdel

11 June 1982

MD 3/243/0

5858/82

EXPLORATION LICENCE EL.29/80

NORTH WESTERN TASMANIA - 5 MILES SOUTH EAST OF
SMITHTON

REPORT MD 5858/82

YOUR REFERENCE:

Letter dated 30 April 1982.

SUBJECT:

Tasmanian Quartzite Analysis.

INFORMATION REQUIRED:

Chemical and Sizing Analyses
Petrographic Description.

Investigation and Report by: M.D. Ware and D. McColl.

Chemical Analyses by: AMDEL Analytical Section.

Chief, Materials Section: Philip J. Parry.

Manager, Mineral & Materials Sciences Division: Dr William G. Spencer

for Norton Jackson
Managing Director

83-1977
Head Office:
Flemington Street, Frewville
South Australia 5063,
Telephone (08) 79 1662
Telex: Amdel AA82520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 8053
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Townsville
Queensland 4814
Telephone (077) 75 1377

1. INTRODUCTION

Four samples of Tasmanian quartzite were sampled and submitted by Mr J.H. Callender to AMDEL for examination and analysis as requested in correspondence dated 30 April 1982.

2. PROCEDURES AND RESULTS

Samples S10/82, S11/82, S12/82

Samples were individually crushed to a nominal 50 mm size by laboratory Jaw crusher and screened over a 9.5 mm (3/8 inch) screen. The weights of fine and coarse material were determined prior to milling the oversize to nominally 1.7 mm, subsampling by riffing and sieving the fraction in a Tungsten Carbide mill to minus 200 mesh (B.S.S.) for analysis.

The minor contaminants were analysed using Induced Coupled Plasma Atomic Emission Spectrometry techniques on the residues after hydrofluoric acid digestion of the silica. Two silica values are presented being (a) silica by difference based upon 100% less the total of the trace elements and (b) silica by HF being the weight loss of the sample after hydrofluoric acid digestion.

Both WC (Tungsten Carbide) and CoO (Cobalt Oxide) values given in Table 2 are contaminants introduced during the final milling of the samples for analysis.

Sample S13/82

The sample was thin sectioned for a petrographic analysis, noting "way up" and north orientation, with particular attention given to mode of formation and possible evidence of secondary silification.

The petrographic report is appended. The thin section has been forwarded to Mr J.H. Callender as requested.

dt.

TABLE 1: SIZE ANALYSIS (JAW CRUSHED MATERIAL)

Sample No.	-9.5 mm		+9.5 mm	
	gms	%	gms	%
S10/82	975.1	59.3	670.2	40.7
S11/82	390.0	25.9	1118.7	74.1
S12/82	1971.9	74.6	671.4	25.4

TABLE 2: CHEMICAL ANALYSES

Sample No.	S 10/82	S 11/82	S 12/82
TiO ₂	0.081	0.032	0.073
Al ₂ O ₃	0.115	0.041	0.043
Fe ₂ O ₃	0.030	0.031	0.019
MnO	<0.001	<0.001	<0.001
MgO	0.008	0.003	0.003
CaO	0.008	0.007	0.005
Na ₂ O	0.002	0.002	0.002
K ₂ O	0.014	0.007	0.007
P ₂ O ₅	0.014	0.005	0.003
WC	0.051	0.052	0.065
CoO	0.006	0.006	0.007
LOI	0.24	0.24	0.20
Total traces	0.57	0.43	0.42
SiO ₂ by difference	99.43	99.57	99.58
SiO ₂ by HF	99.54	99.60	99.72

PETROGRAPHIC DESCRIPTIONSample: S13/82; TSC36285

Rock Name:

Quartzite.

Hand Specimen:

A massive pure white quartzite with a faint texture of fine granular mottling and thin healed random fractures (?joints) traversing the specimen.

Thin Section:

A visual estimate of the constituents is as follows:-

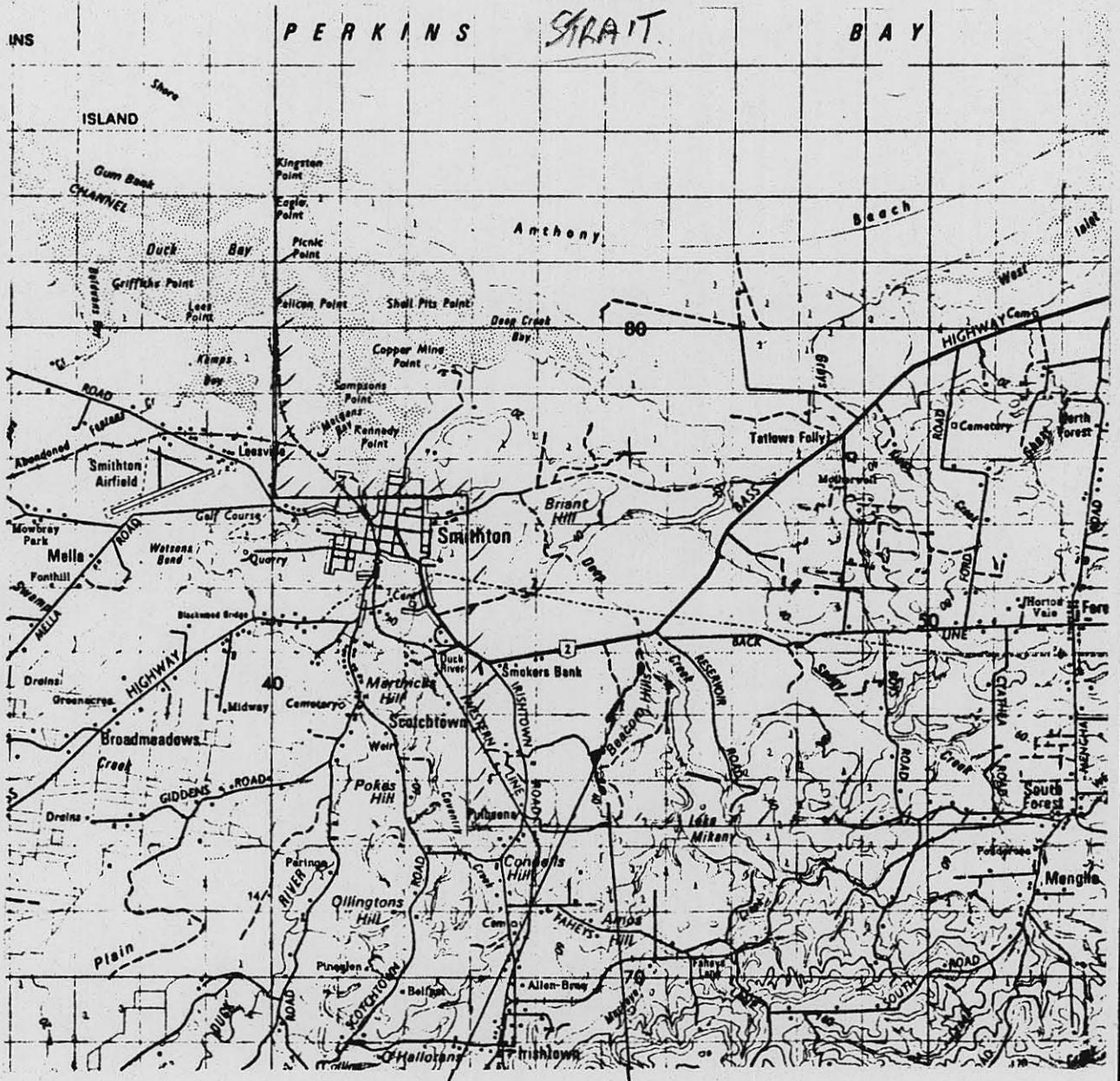
	<u>%</u>
Quartz	>98
Clay minerals?	trace
Iron minerals (?hematite)	trace

This is a granuloblastic mosaic of polygonal quartz crystals with relatively straight intergranular boundaries, and virtually no intergranular interstices. Many crystals show a sharp curved ring of inclusions indicating the surface of original sedimentary quartz and grains, the average size of which was from 0.1 to 1.0 mm diameter. Many crystals also show internal stress patterns and traces of former fractures which extend through the original curved outlines of the grains, suggesting that the metamorphic recrystallisation and silicification which developed the quartzitic texture was accompanied by considerable stress and fracturing of the grains. Such an effect would be expected from deep seated regional rather than localised silicification processes.

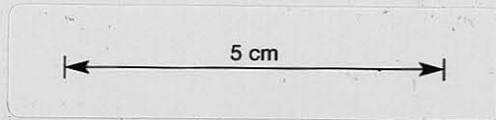
The broad relatively straight fracture zones (?joint planes) which extend through the rock are generally about 0.2 mm wide, but may be as much as 1.0 mm and surrounded by a faintly turbid aureole extending for a further 1mm or so. These fractures are commonly occupied by a finer grained quartz mosaic, produced at least in part by brecciation and stress recrystallisation of the original grains. Along these zones there is also a slightly greater turbidity of inclusions. These are likely to be partly argillaceous, and there are a few traces of pinkish ?hematite, especially where the fractures contain vugs lined with drusy euhedral quartz crystals.

The section shows almost 10 cm of rock inwards from an external surface exposed to the weather. There is no suggestion of silcrete formation or silicification by soil processes. Traces of ?weathering effects probably exist along the rock jointing pattern, but within the granular texture the silicification is uniform throughout and shows no signs of textural graduations. It is classified as an extremely pure regionally metamorphosed quartzite derived from a well sorted sandy sediment.

BASS.
STRAIT.



- Quarries - - Sample Site -



EL 29/80 TASMANIA

TITLE -

SMITHTON QUARTZITE

Drawn by

Date 31 MAY, 1982

Scale 1:100 000

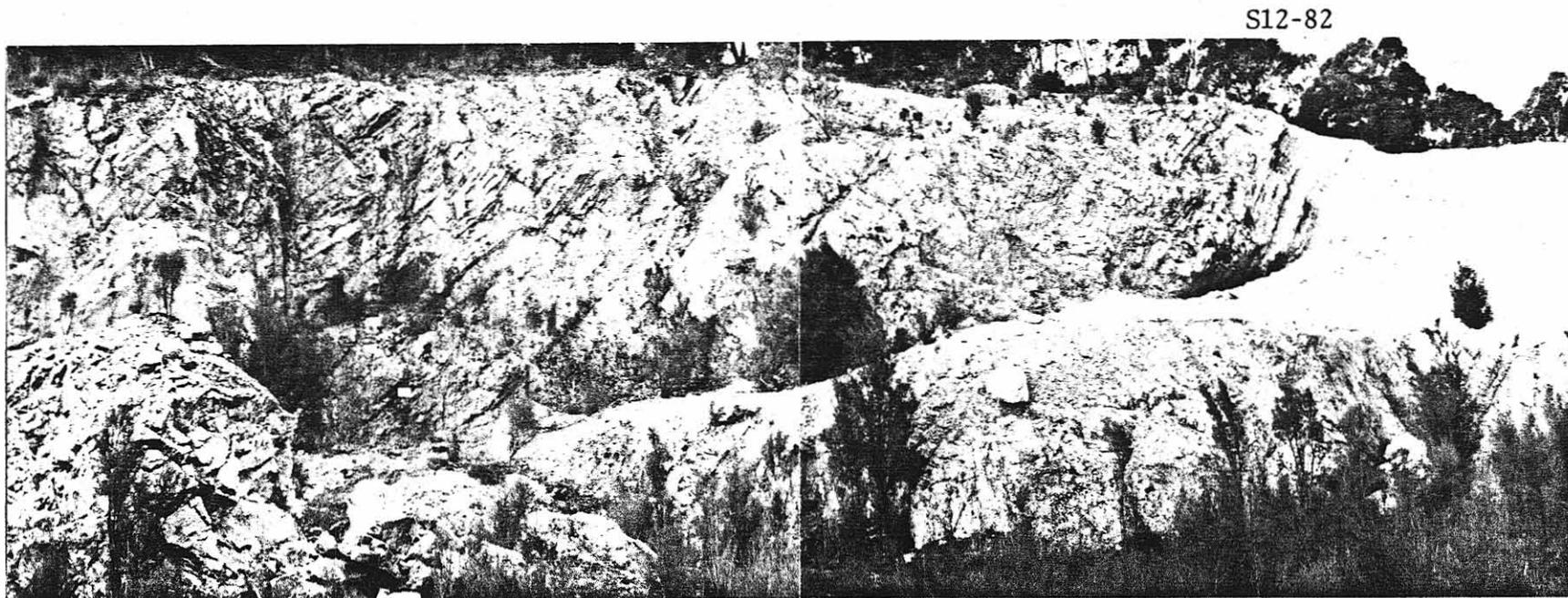
Drawing No.

KAISER
REFRACTORIES

GLASTONBURY AVENUE. UNANDERRA. N.S.W. 2526.

DIVISION OF KAISER ALUMINUM & CHEMICAL CORPORATION

A4 - 221



S10-82

S11-82

S12-82

SMITHTON TASMANIA 28th April, 1982. Southern-most quartzite quarry. Rock specimen S10-82 chipped from face adjacent to white card (24 x 36cm); S11-82 chipped from face, part way up ramp; S12-82 chipped from floor behind high face.



SMITHTON TASMANIA 28th April, 1982. Road gravel quarries on western side of Beacon Hills within EL 29/80. Northern quarry (left) is privately controlled; centre D.M.R.; southern is untitled. The southern quarry was sampled.

574019

X

TELEXED ADVICE OF ANALYSIS AND PHYSICAL STRUCTURE OF THE SILICA CRYSTALS
FROM EL. 29/80 : NORTH WESTERN TASMANIA : DATED 24TH MAY, 1982.

	<u>S10/82</u>	<u>S11/82</u>	<u>S12/82</u>
SI02	99.54	99.70	99.63
SI02 2	99.48	99.68	99.60
FE203	0.071	0.027	0.030
AL203	0.151	0.053	0.059
TI02	0.097	0.054	0.161
WC	0.061	0.120	0.069
COO	0.011	0.016	0.010
P205	0.019	0.005	0.004
TOTAL			
TRACES	0.453	0.301	0.371

- 1) SI02 BY DIFFERENCE AFTER ANALYSIS CONTAMINANTS
- 2) SI01 BY HYDROFLUORIC ACID DIGESTION

S13/82 NO SURFACE SILICIFICATION DUE TO WEATHERING PROCESSES EVIDENT IN SECTION.

GRANOBLISTIC MOSAIC OF POLYGONAL QUARTZ CRYSTALS WITH RELATIVELY STRAIGHT INTERGRANULAR BOUNDRIES AND NO INTERGRANULAR INTERSTICES THROUGHOUT 10CM DEPT OF SAMPLE

STRESS PATTERNS AND TRACES OF FORMER FRACTURES WHICH EXTENDED THROUGHOUT ORIGINAL CURVED OUTLINES OF GRAINS SUGGEST METAMORPHIC RECRYSTALLIZATION AND SILICIFICATION WHICH DEVELOPED QUARTZITIC TEXTURE WAS ACCOMPANIED BY CONSIDERABLE STRESS AND FRACTURING AS MAY BE EXPECTED FROM DEEP SEATED REGIONAL RATHER THAN LOCALISED SILICIFICATION PROCESSES.

REGARDS
KIP CALLENDER



- CHIP SAMPLES TAKEN FROM A 500,000 M/TON STOCKPILE.

574021

EXPLORATION LICENSE

4. CHEMICAL ANALYSES AND RESULTS.

EL 29/80.

NO MINERAL

1977-1978

Six samples were selected for preliminary analysis:

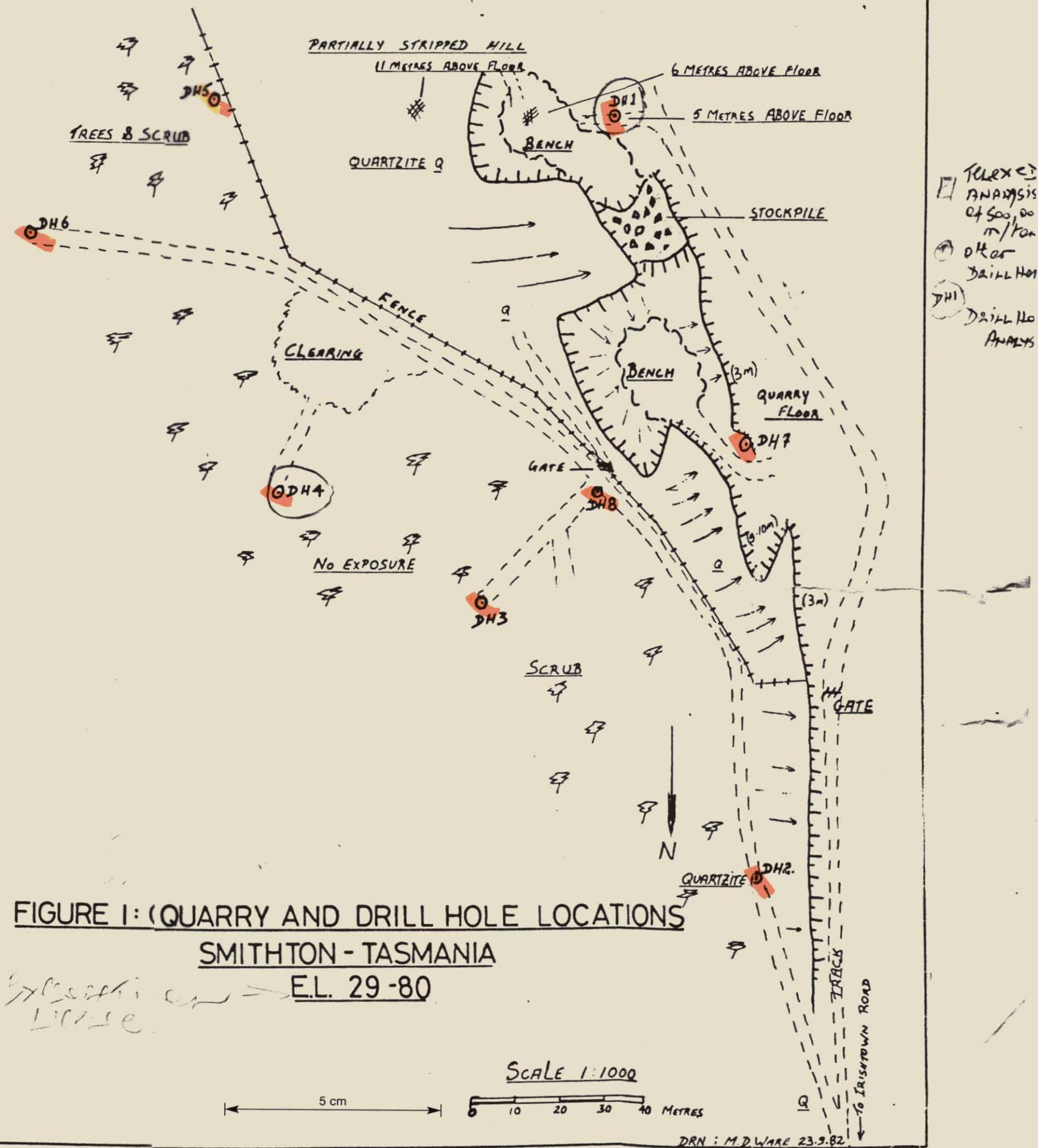
Sample 1	Drill Hole 1	Interval 1 - 3 metres
Sample 2	Drill Hole 1	Interval 3 - 5 "
Sample 3	Drill Hole 4	Interval 1.8 - 3 "
Sample 4	Drill Hole 4	Interval 3 - 6 "
Sample 5	Drill Hole 4	Interval 6 - 9 "
Sample 6	Drill Hole 4	Interval 12 - 15 "

Ex. Licence EL 29/80 374022

TABLE 5
CHEMICAL ANALYSES

	10521	10521	10521	10521	10521	10521
	1	2	3	4	5	6
TiO ₂	0.042	0.057	0.037	0.038	0.023	0.019
Al ₂ O ₃	0.050	0.040	0.029	0.032	0.294	0.310
Total Fe as Fe ₂ O ₃	0.012	0.009	0.010	0.009	0.013	0.023
MnO	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MgO	0.004	0.003	0.003	0.003	0.016	0.022
CaO	0.006	0.006	0.006	0.007	0.006	0.014
Na ₂ O	0.006	0.004	0.006	0.007	0.005	0.008
K ₂ O	0.008	0.005	0.004	0.005	0.058	0.057
P ₂ O ₅	0.014	0.033	0.002	0.003	0.008	0.009
*WC	0.073	0.063	0.162	0.151	0.071	0.135
*CaO	0.009	0.008	0.022	0.019	0.009	0.018
LOI	0.02	0.13	0.04	0.10	0.18	0.21
SiO ₂ (By diff.)	99.76	99.64	99.68	99.63	99.32	99.18

* Contaminants introduced during sieving.



**FIGURE 1: (QUARRY AND DRILL HOLE LOCATIONS
 SMITHTON - TASMANIA**

E.L. 29-80

*Expectation
 Little*