728001

[redacted]

SILICA SAND EXPLORATION

Lapoinya and Boat Harbour Areas

Tasmania

88-2868 (R)

MINES

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BY: ZETETIC

Consulting Economic Geologists

January, 1986

AMG REFERENCE POINTS ADDED

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FIGURES

APPENDICES

1. INTRODUCTION

ZETETIC was engaged by Monier to supervise an auger drilling programme for silica sands in the Savage River, Boat Harbour and Lapoinya areas of N.W. Tasmania, as follows:

Area	Drill Locations	No. of Holes	Test Pits	Days Drilled
Savage River	39(85/1 to 84/39)	41	Nil	12
Boat Harbour	10(85/40 to 85/49)	14	21	4
Lapoinya	10(85/50 to 85/59)	10	5	3

The above programme was carried out between November 13th and December 12th, 1985.

This document deals only with the Boat Harbour and Lapoinya areas. Technical details of the silica sand exploration in the Savage River area have previously been reported to Monier.

As requested by Monier, this document records the results of the drilling without comment as to their economic importance or geological content. However, in order to provide a basis for further drilling programmes of this kind, section 3 of the document comments on the drilling techniques employed, the validity of sampling methods and suggested future improvements.

2. SITE LOCATION AND REGIONAL GEOLOGICAL SETTING

The holes and pits excavated in the Boat Harbour area were located in a block of land owned by Brambles Holdings Ltd., approximately 2.0 kilometres SW of Boat Harbour Beach (see Figures 1 and 2).

The work completed in the Lapoinya area was situated near the eastern boundary of Monier's EL 15/85, some 2.5 kms SW of Lapoinya (see Figures 1 and 3).

Drilling and pitting in both areas tested potential silica sand deposits formed as a product of weathering of the steeply dipping Proterozice Jacob Orthoquartzite.

3. METHODS OF INVESTIGATION

Sub-surface samples were obtained mainly by the use of a trailer mounted Gemcodril 210D continuous flight auger. In the Boat Harbour area, drilling was supplemented by pitting with a Kato tracked excavator, while at Lapoinya the D4 bulldozer required for rig access was used to scrape excavations to confirm suspected shallow bedrock detected by the drill.

Samples in the pits were obtained by standard channel-sampling procedures; no samples were obtained from the bulldozer scrapes in the Lapoinya area.

Samples from the drill were collected by three different methods:

(i) from the turning augers as samples were returned to collar elevation; samples thus taken were suffixed 'F';

(ii) from the augers as they were pulled, usually to clear the bit, at the end of a hole or when tube-sampling failed; samples thus taken were suffixed 'F*' in the log-sheets;

(iii) by 'tube-sampling'; this entailed attaching a hollow steel-tube to the end of the auger string and pressing the tube into the virgin down-hole ground; samples thus taken were suffixed 'T' in the log-sheets.

The above methods (ii) and (iii) were attempts to obtain uncontaminated samples from known depths, but were of only limited success for the following reasons:

Samples direct from pulled flights

- where the hole had been widened by drill-string vibration and flexure, samples often shook-off or washed off the flights as they were pulled;

- when the auger-string was pulled, material was often scraped off the sides of the hole on the way up, thus contaminating the samples on the auger flights.

Tube samples

- the main problem was caving of the hole prior to insertion of the tube; this resulted in a sample contaminated by up-hole material; where this occurred the sample was rejected;

- secondary problems were caused by the sample falling out of the tube as it was extracted from the hole and the difficulty of forcing the tube into the down-hole virgin ground, the drill occasionally being inadequately powerful for this purpose.

Other difficulties encountered included damp clayey silts packing around the bit and lower flights, thus preventing efficient sample return, and excessive bit wear owing to the abrasiveness of the sands.

It is recommended that, for future augering exercises, thought is given to utilising hollow-stem sets of auger flights as these may provide higher quality samples. Alternatively, a more expensive and more cumbersome reverse air circulation rig may be appropriate. Where possible, test-pitting should be carried out before drilling.

4. RESULTS

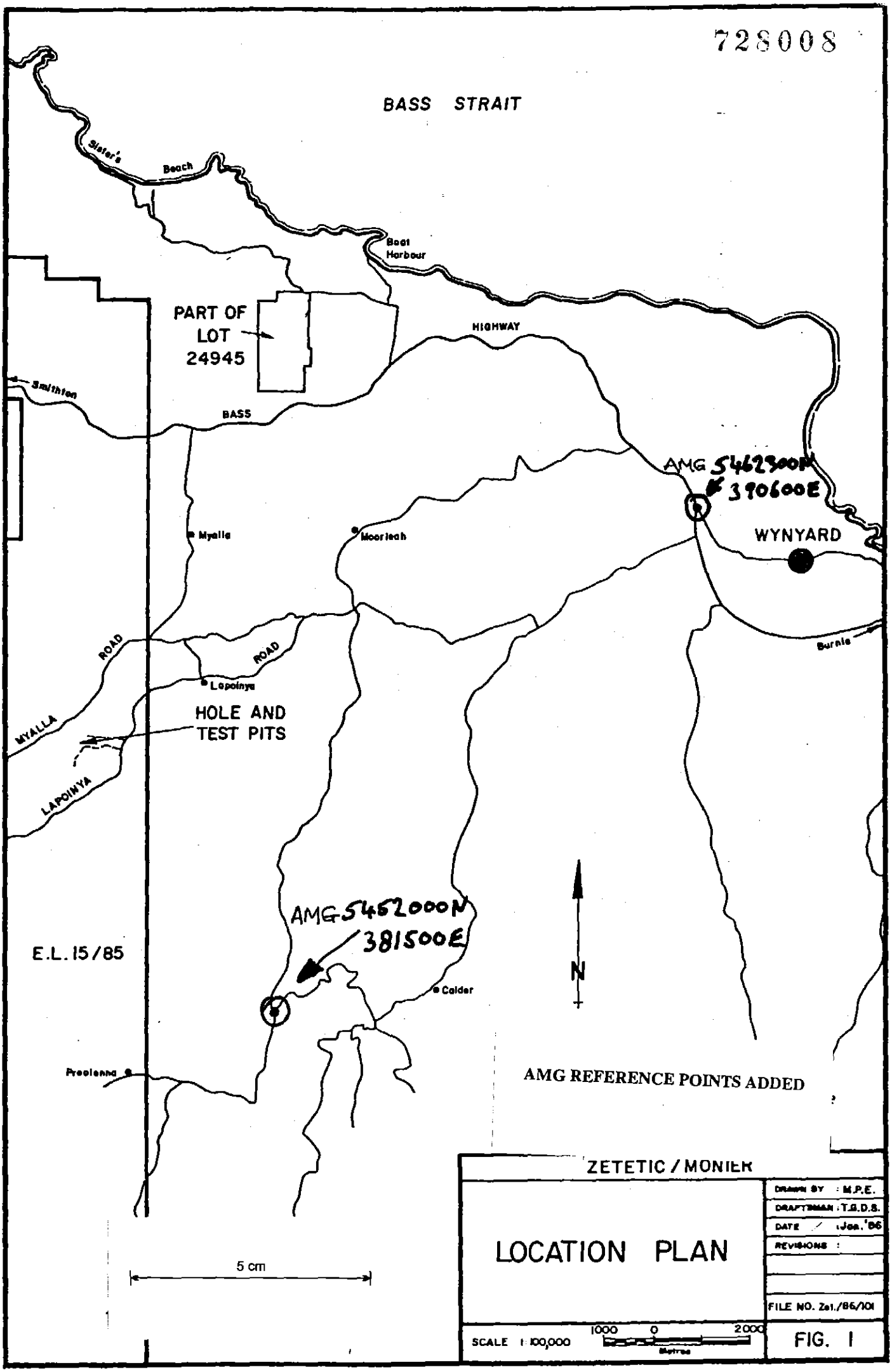
Drill and test pit log-sheets are to be found in Appendix 1 of the document and the sample results in Appendix 2.

M.P. Everett

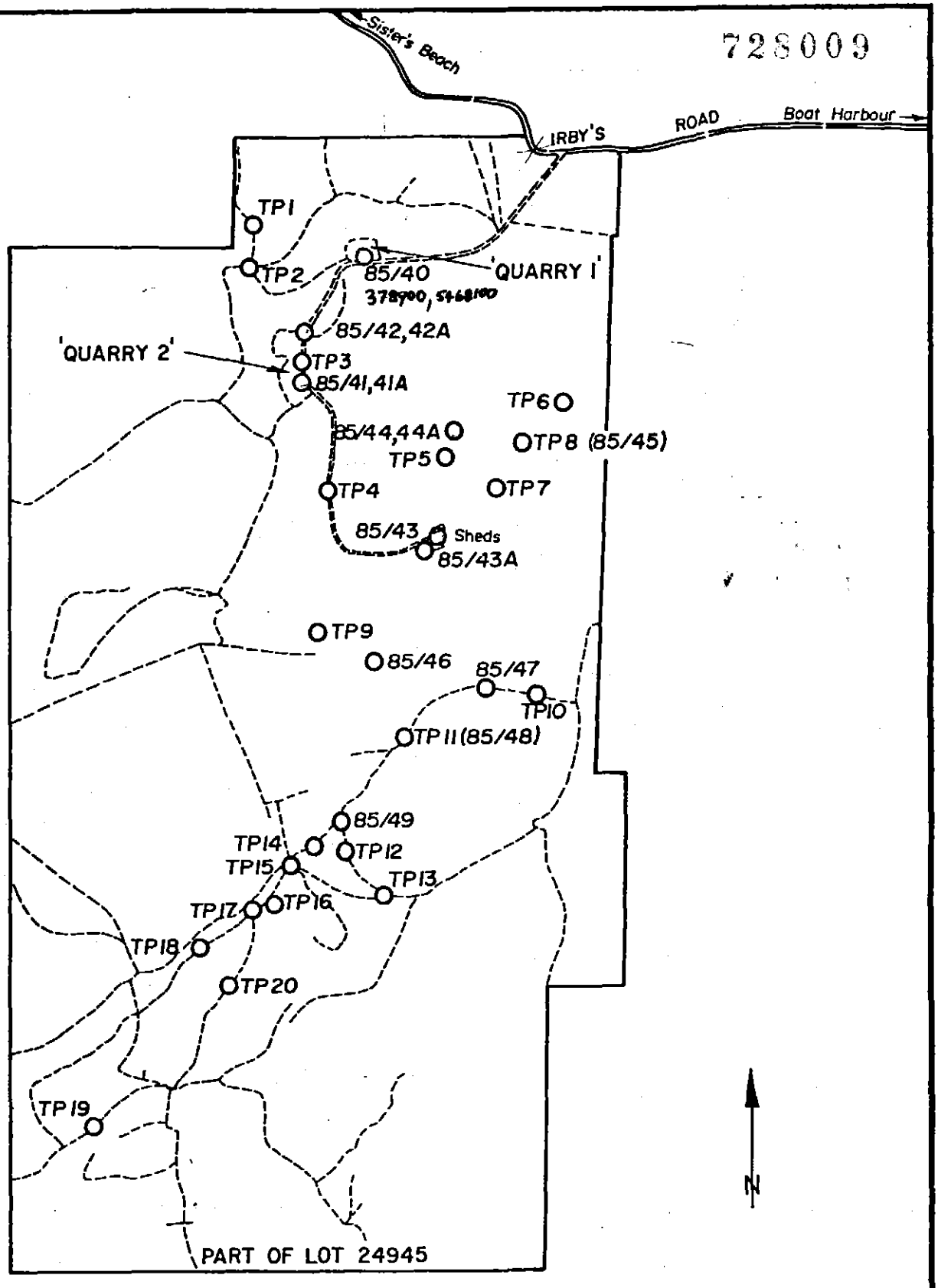
R.W.L. Shaw

ZETETIC, Jan. 1986

728008


BASS STRAIT
Sister's Beach
Boat Harbour
PART OF LOT 24945
HIGHWAY
Smithton
BASS
AMG 5462900N 390600E
WYNYARD
Myalla
Moorleah
Burnie
ROAD
ROAD
Lapoinya
HOLE AND TEST PITS
MYALLA
LAPOINYA
AMG 5462000N 381500E
E.L. 15/85
Calder
Preolenna
N
AMG REFERENCE POINTS ADDED
5 cm
ZETETIC / MONIER
LOCATION PLAN
DRAWN BY : M.P.E.
DRAFTSMAN : T.S.D.S.
DATE : Jan. '86
REVISIONS :
FILE NO. Zet./86/101
SCALE 1:100,000
1000 0 2000
Metres
FIG. 1

728009



5 cm

LEGEND

TP	Test Pit
85/47	Bore Hole

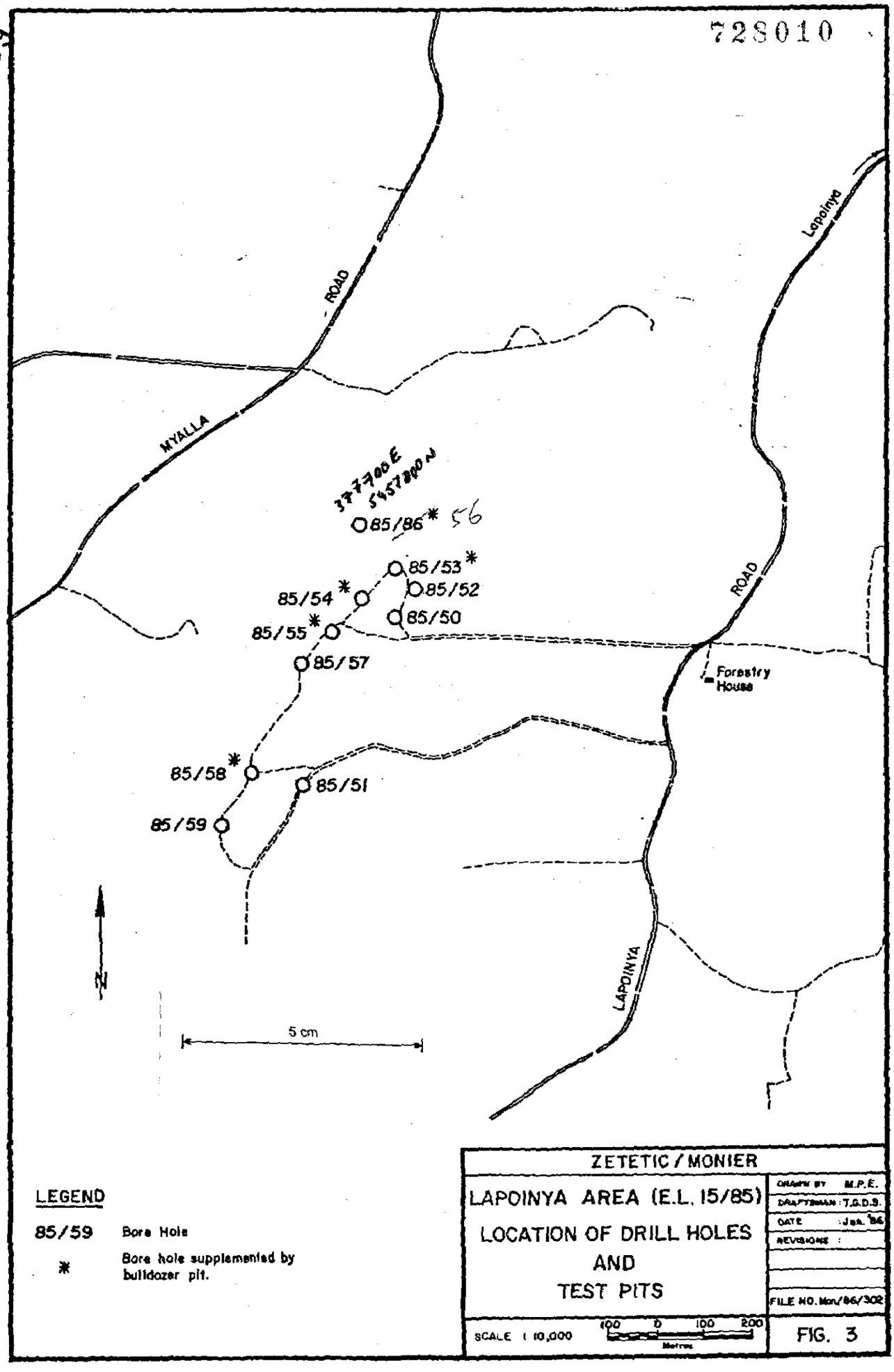
ZETETIC / MONIER

BOAT HARBOUR AREA
BRAMBLES
LOCATION OF DRILL HOLES
AND
TEST PITS

DRAWN BY : M.P.E.
DRAFTSMAN : T.S.D.S.
DATE : Jan. '86
REVISIONS :
FILE NO. Mon/86/301

SCALE 1:10,000 — 100 0 100 200 Metres

FIG. 2


728010
ROAD
MYALLA
377700E
5457800N
85/86*
85/53*
85/54*
85/52
85/50
85/55*
85/57
85/58*
85/51
85/59
Lapoinya
ROAD
Forestry House
LAPOINYA
N
5 cm
LEGEND
85/59 Bore Hole
* Bore hole supplemented by bulldozer pit.
ZETETIC / MONIER
LAPOINYA AREA (E.L. 15/85)
LOCATION OF DRILL HOLES
AND
TEST PITS
DRAWN BY M.P.E.
DRAFTSMAN T.G.D.S.
DATE Jan. '86
REVISIONS
FILE NO. Mon/86/302
SCALE 1:10,000
100 0 100 200
Metres
FIG. 3

APPENDIX 1

DRILL AND TEST PIT LOGS

TEST PITS

Boat Harbour Area

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 1
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY	Graphic Log		GENERAL COMMENTS
	0.25	Humus soil, white sand and gravel-size fragments of pink/white quartzite.			
	0.50				
	0.75				
		Loose, white, fine, equigranular sand.			
	1.00				
TP1/0.75 - 2.0	1.25				
	1.50				
	1.75				
	2.00 m	Bottom of pit in compact but friable fine, pinkish, equigranular orthoquartzite.			Excavator could not penetrate into bedrock.

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR TP 2, 3, 4, 5
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY	Graphic Log	GENERAL COMMENTS	
TP/2/0.90 - 1.60	TP 2 0.25 0.50 1.00 1.25 1.50 1.60	Humus, soil, sand and roots. Some angular blocks of pink or white orthoquartzite. 0.46 Pinkish, fine, equigranular sand and roots 0.90 Fairly clean, fine, equigranular loose pink sand. Occas. block of pinkish equigranular quartzite. Bottom of pit in fiable, weathered, pinkish orthoquartzite.			
	TP 3 0.25 0.50	Soil, humus, roots, fine orthoquartzite sand. Loose, white, fine sand with pinkish tinge. Bottom of pit in pink orthoquartzite, partly breaking down to sand.			
	TP 4 0.20	20 cm of scree material, then into weathered but extremely competent orthoquartzite bedrock.			
	TP 5 0.25 0.50 0.75	25 cms of humus, soil and roots and then into white, fine grained, equigranular bedded orthoquartzite bedrock. Bottom of pit, bedrock.			

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 6, 7
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY		Graphic Log	GENERAL COMMENTS
	TP 6				
	0.25	Humus stained off-white, fine sand; root zone.			
	0.50				
		0.70 White, fine grained, equigranular sand.			
	0.75				
	1.00				
		1.10 Pinkish-white mottled orthoquartzite bedrock, weathered and friable on touch.			
	1.25				
	1.50	Bottom of pit.			
	TP 7	Sandy humus and soil.			
	0.25	0.20 White, fine grained, equigranular sand, some roots.			
TP/7/0.20 - 1.35	0.50				
	0.75				
	1.00				
	1.25				
		1.35 Bedrock of pinkish-white, mottled orthoquartzite, weathered and friable on touch.			
	1.50				
	1.75				
	1.90	Bottom of pit.			

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 8, 9, 10
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY		Graphic Log	GENERAL COMMENTS
	TP 8				
	0.25	Pink to white equigranular sand with humus and roots.			
	0.50				
	0.75				
	1.00	0.89 Bedrock of friable, decomposing pink to white equigranular, fine grained ortho-quartzite.			
	1.25				
	1.50				
	1.70	Bottom of pit.			
	TP 9				
	0.25	Humus stained fine sand and roots.			
	0.50	Bottom of pit - bedrock of weathering fine grained, equigranular orthoquartzite.			
	TP 10				
	0.25	Humus stained fine grained, pinkish, sand.			
	0.50	0.50 Bedrock as above.			
	0.75				
	1.00	Bottom of pit.			

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 11, 12
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY		Graphic Log	GENERAL COMMENTS
	TP 11	Soil, rubble and humus.			
	0.25				
		0.35 Bedrock; white, equigranular, friable but compact orthoquartzite.			
	0.50				
	0.75				
	1.00	Bottom of pit.			
	TP 12				
	0.25	Equigranular, fine, pinkish sand mixed with large (20-30 cm) blocks of pinkish, friable but compact, orthoquartzite. Interpreted as scree deposit.			
	0.50				
	0.75				
	1.00				
	1.25				
	1.50				
	1.70	Bottom of pit (water leaking into base of pit).			

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 13, 14
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY		Graphic Log	GENERAL COMMENTS
	TP 13				
	0.25	Humus, roots, pinkish gravelly sand.			
	0.50				
		0.60			
	0.75	Pinkish, equigranular, fine grained sand becoming more compact and not so free-running at depth.			
	1.00				
TP/13/0.60 - 1.80	1.25		sands grade into bedrock		
	1.50				
	1.75				
	1.80	Bottom of pit - bedrock, pinkish, friable, compact, fine grained orthoquartzite?			
	TP 14	Humus and soil.			
	0.25				
		0.40			
	0.50	Sandy rubble, root zone, humus.			
	0.75				
		0.90 Bedrock of hard, indurated quartzite and micaccous siltstones, thinly bedded and steeply dipping.			
	1.00				
	1.25	Bottom of pit.			

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE Surface Elevation: m.a.s.l	LOG FOR T P 15, 16, 17
		Project: SILICA SAND	Method: EXCAVATOR (KATO)	
		Location: Boat Harbour, Tas.	Contractor: Brambles	Date Completed: 8 /12 /85
		LITHOLOGY	Graphic Log	GENERAL COMMENTS
	TP 15			
	0.25	Humus, sand and roots.		
	0.50	Humus stained fine sand and roots.		
	0.75			
	1.00	0.90 White to pinkish fine, compact equigranular sand.		
	1.25	1.08 Bedrock of friable, decomposing pinkish white equigranular, fine grained orthoquartzite.		
	1.50			
	1.60	Bottom of pit.		
	TP 16	Humus, roots and sand.		
	0.25	0.30 Bedrock: friable white to pinkish, equigranular orthoquartzite.		
	0.50			
	0.75			
	1.00	Bottom of pit.		
	TP 17	Humus and roots, sand.		
	0.25	0.45 Pinkish, white, equigranular, orthquartzite bedrock.		
	0.50			
	0.75			
	0.80	Bottom of pit.		

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE Surface Elevation: m.a.s.l	LOG FOR T P 18, 19
		Project: SILICA SAND	Method: EXCAVATOR (KATO)	
		Location: Boat Harbour, Tas.	Contractor: Brambles	Date Completed: 8/12/85
		LITHOLOGY	Graphic Log	GENERAL COMMENTS
	TP 18	Humus and roots.		
	0.25	0.20 Pinkish, loose, fine grained, equi-granular sand.		
	0.50			
	0.75			
	0.80	Bottom of pit; pinkish orthoquartzite, veining noted.		
	TP 19			
	0.25			
	0.50	Light coloured humus stained fine grained sand.		
TP19/0.70 - 1.90	0.75	0.70 Pinkish tinged white very fine sand; no grit or gravel.		
	1.00			
	1.25			
	1.50	Ditto.		
	1.75			
	2.00	1.90 Bedrock of pinkish, friable, orthoquartzite, steeply dipping, blocky fracture.		Bedrock 'higher' on other side of pit; shows bedrock sloping down hill contours.
	2.25			
	2.50	Bottom of pit.		

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER/BRAMBLES	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR T P 20, 21
		Project: SILICA SAND	Method: EXCAVATOR (KATO)		
		Location: Boat Harbour, Tas.	Contractor: Brambles		Date Completed: 8/12/85
		LITHOLOGY		Graphic Log	GENERAL COMMENTS
	TP 20				
	0.25	Humus, sand, gravel and rubbly bedrock.			
	0.50				
	0.75				
		0.83 Bedrock, pinkish orthoquartzite, decomposing and friable.			
	1.00				
	1.25				Bedrock exposed on track 40 m from pit.
	1.50	Bottom of pit.			
	TP 21				
	0.25	Humus, fine sand and roots			
		0.40			
	0.50				
	0.75	Whitish fine grained, equigranular sand.			
	1.00				
	1.25				
	1.50	Bottom of pit. Bedrock of pink tinged white orthoquartzite.			

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BORE HOLES

Boat Harbour Area

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR BH 85/40
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 3 / 12 / 85

LITHOLOGY		Graphic Log	GENERAL COMMENTS
Surface of white medium sand.			
V.Fine, equigranular, off-white sand; no grit or gravel component.	off-white		
Ditto.			Penetrating weathered bedrock? - see following notes.
Ditto; becoming slightly grey.		? ? ? ?	
Ditto; greyish v. fine equigranular sand.	greyish		
Ditto; v.fine equigranular sand; colour change to greenish-khaki.			
Ditto.	greenish-khaki		

85/40/1.5F

85/40/5.0F*

85/40/10.0F*
(Hole caving; tube sampling abandoned)

85/40/12F

(*F Sample taken from auger flights after rods pulled.)

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR BH 85/40
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 3 / 12 / 85
		LITHOLOGY	Graphic Log	GENERAL COMMENTS	
	16				
	17	Ditto			
85/40/18F	18				
	19				
	20	Ditto ; but colour change to deeper khaki colour with orangey-brown bands.			
	21				
(Sample at 22 m too contaminated by up-hole material.)	22			No penetration on siliceous zone; presumably fresh bedrock.	
	22.50 EOH			N.B. No obvious bedrock was encountered until 22.50 m. However, experience from subsequent holes in this area showed that the auger was capable of penetrating weathered, rotting bedrock (e.g. Hole 85/45) for some distance. Since this hole was drilled on the side of a steep hill (at "Quarry 1"), it may have penetrated "soft" bedrock from at least 5 m onwards.	

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE Surface Elevation: m.a.s.l.	LOG FOR B H 8 5 / 4 1
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)	
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE	Date Completed: 4 / 12 / 85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
85/41/+2 - 3C (exposure in quarry face above collar elevation) +1 to +2 - not sampled, slumped material.	+3	Slightly pinkish fine, equigranular sand.		
	+2			
	+1			
	0 Collar	-25 cms of pinkish fine sand with 50-60 mm clasts of Jacob orthoquartzite		Difficult drilling.
	1	-50 cms change to off-white silica 'flour' (i.e. ultrafine sand).		0.50 cms Interpreted as change to weathered bedrock (see Test Pit 3 for subsequent verification).
35/41/1.5F	2	Ditto, becoming light grey with off-white 'flecks'.		
	3	Ditto.		
5/41/4F	4	Ditto, grey-black, fading quickly.		
		4.75 Ditto, light brown bands.		
	5	Ditto.		
	6 EOH	Hard, silicous layer - fresh bedrock?		Very slow drilling.

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR B H 8 5/4 1A
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location. Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 4 / 12 / 85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
		Pink tinged fine sand.		Located 5 m E of 85/41.
85/41A/1F	1	Ditto.		
		1.5 m Ditto, occas. 40-50 mm clasts of pink		
	2	Jacob orthoquartzite, crumbly when touched.		
	3	Change to light khaki silica 'flour' with some grit of pink quartzite.		3 m. This fining of the sample grain size thought to be caused by the auger penetrating rotting bedrock. Subsequently confirmed by Test Pit 3.
	4			
85/41A/5F	5	Ditto.		
	6			
		Ditto.		
	7			
85/41A/7.5F*	7.6 EOH	Fresh bedrock?		No drill penetration.

*F sample taken from auger flights after rods pulled.)

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER Project: SILICA SAND Location: Boat Harbour, Tas.	Logged by: MPE Method: AUGER (GEMCODRIL 210D) Contractor: H. STACPOOLE	Surface Elevation: m.a.s.l	LOG FOR BH 85/42, 42A Date Completed: / 12/ 85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
	85/42	0-0.75 m - brownish fine sand, some clay 0.75-1.10 m - off-white silica 'flour'		0.75 m Interpreted as weathered bedrock.
85/42/1F	1			No drill penetration.
	1.10EOH	Fresh bedrock?		
	85/42A			Located 5 m S of 85/42
	0	0-1.40 m brownish fine sand, becoming 'flour'.		Interpreted as weathered bedrock at ± 1.0 m.
	1			
	1.4EOH	Fresh bedrock?		No drill penetration.

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE Surface Elevation: m.a.s.l.	LOG FOR BH 85/43
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)	
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE	Date Completed: 4 / 12 / 85

		LITHOLOGY	Graphic Log	GENERAL COMMENTS
		20 cms of mud and humus.		
	1	Medium-brown, fine, equigranular sand (occas. grit of pink, friable quartzite).		
	2	2.5 Change to off-white silica 'flour' as pellets in sand.		2.5 Interpreted subsequently as start of weathered bedrock.
85/43/3F	3			V. slow drilling penetration.
	4	Ditto, now all 'flour', usually light khaki colour.		
	5			Poor sample return.
	6	Ditto.		
	7 EOH	Ditto.		Hole abandoned; rod string snapped; redrilled nearby as 85/43A.

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Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l	**LOG FOR** BH85/43A
Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
Location. Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 5 / 12 / 85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	GENERAL COMMENTS
		Soil and brown fine equigranular sand becoming off-white at 1.0 m.	
	1		
		1.75 Change to off-white silica 'flour', no grit or gravel content.	
	2		
85/43A/3F	3	Ditto.	
	4	Ditto, change to khaki colouration, with white 'flour' pellets.	
85/43A/5F	5		
	6	Ditto, khaki 'flour'.	
		6.75 Hard layer.	
	7		Poor sample return; reduced speed of penetration.
	8	H_2O Table. Becoming darker brown, fine equigranular sands, not 'flour' (i.e. slightly increased grain size).	
85/43A/9F*	9	Ditto, brown fine sand.	
	10		
	11		V. Poor sample return.
(*F Sample taken from auger flights after rods pulled.)	12		
	13		
	14		
5/43A/15F	15	Ditto.	

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR BH 85/43A
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location. Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 5/12/85

Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
16	No sample return.		Hole filling with water which washes sample from flights.
17 EOH	Hole abandoned.		
			N.B. Subsequent interpretation of this hole (see Graphic log) puts weathered bedrock at 1.75 m; increasing grain size noted at water-table (7.5 to 8.0 m) presumably due to lessening resistance of bedrock to the drill bit below water level.

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l	LOG FOR BH85/44, 44A
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 5 / 12 / 85

		LITHOLOGY	Graphic Log	GENERAL COMMENTS
	85/44 0.3 m EOH	Failure to penetrate beyond 0.3 m.		Outcrop of hard, white quartzite noted nearby.
	85/44A 0 1 EOH	Pinkish fine sand and numerous angular fragments (20-40 mm) of hard quartzite. 1 m - Hole abandoned - Bedrock?		No drill penetration.

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Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR BH 85/45
Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE		Date Completed: 5/12/85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
		Humus and sand.		
		0.5 m Pinkish sand, fine, some humic staining.		
85/45/1.5F	1	1.0 m Change to white ultrafine silica 'flour'.		
	2			
	3			N.B. Drill penetrated quite easily, although with severe bit wear to 16 m. Subsequent interpretation of bedrock at 1.0 m was confirmed by the later Test Pit 8.
	4			
85/45/5F	5	Ditto.		
	6	6.5 Ditto but becomes light grey.		
	7			
	8			
35/45/9F*	9	Ditto.		
	10			
F* Sample taken from auger flights after rods pulled.)	11			
	12			
	13	Ditto, becoming browner and mottled.		
5/45/14.5F*	14			
	15			
	16.40EOH	Hole abandoned.		No penetration. Becoming wet.

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SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	GENERAL COMMENTS
85/46/1.5F	1	Pinkish, fine, equigranular, some humus staining.	
	2	2 m. Change to white to off-white silica 'flour'.	
85/46/3F	3		N.B. Interpretation of bedrock at 2 m supported, subsequently, by nearby Test Pits, 11 and 9.
	4	Ditto	
	5		
	6	Ditto, becoming light-brown.	
85/46/7.5F	7		
		Ditto, becoming darker brown.	
	8		
	9	Change to light brown fine sand with minor clay pelleting.	Poor sample return.
85/46/10F*	10		
	11 EOH	Hole abandoned.	No penetration; bit binding.

F* Sample taken from auger flights after rods pulled.)

Client: MONIER
Project: SILICA SAND
Location: Boat Harbour, Tas.
Logged by: MPE Surface Elevation: m.a.s.l
Method: AUGER (GEMCODRIL 210D)
Contractor: H. STACPOOLE

LOG FOR BH85/46

Date Completed: / 12 / 85

Graphic Log

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE Surface Elevation: m.a.s.l	LOG FOR BH85/47
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)	
		Location. Boat Harbour, Tas.	Contractor: H. STACPOOLE	Date Completed: 6/12/85

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
85/47/1.5F	1	Variously coloured clayey silt to 1.50 m		
	1.5	Fine off-white clayey silt.		
	2			
	3			
	4			
85/47/4.5F		Ditto.		
	5			
	6			
	7			
85/47/9F	8	Ditto.		
	9			
	10			
	11			
85/47/12F*		Ditto.		
	12			
	12.50 EOH	Hole abandoned.		Sample return poor; v. slow drilling.

(N.B. Sample taken from auger flights after rods pulled.)

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE Surface Elevation: m.a.s.l.	LOG FOR BH 85/48
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)	
		Location. Boat Harbour, Tas.	Contractor: H. STACPOOLE	Date Completed: 6 / 12 / 85

	LITHOLOGY	Graphic Log	GENERAL COMMENTS
	0 to 0.50m Soil, humus, rubbly quartzite.		Two attempts at this location failed to penetrate beyond 1.5 m. Subsequent Test Pit 11 confirmed quartzite bedrock at 0.35 m below surface.
1	0.50 to 1.50 m Bedrock of quartzite?		
1.5 EOH	Hole abandoned.		

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE Surface Elevation: m.a.s.l.	LOG FOR BH85/49
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)	
		Location: Boat Harbour, Tas.	Contractor: H. STACPOOLE	Date Completed: 6 / 12 / 85

LITHOLOGY	Graphic Log	GENERAL COMMENTS
Orangey-brown clayey silt, 'pelletises' on drilling.		
1		
2		
3		
4 Ditto.		
5 Brown to orangey brown clayey silt.		
6		
Light brown clayey silt.		
7		
8		
9		
Water table.		
10		
11 EOH Hole abandoned in slimey clayey silts, dirty khaki brown in colour.		

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BORE HOLES

Lapoinya Area

SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l.	LOG FOR B H 8 5 / 5 0
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location: Lapoinya Tas (EL15/85)	Contractor: H. STACPOOLE		Date Completed: 11 / 12 / 85
		LITHOLOGY	Graphic Log		GENERAL COMMENTS
					Hole located on side of steep hill.
	+2	Humus, fine sand and root zone.			
85/50/+0.0 - 1.5C (track cutting)	+1.5	Fine white equigranular sand containing blocks of decaying bedrock (friable orthoquartzite)			
	+1				
	0	Collar at surface. Fine grained, white to off-white equigranular sand.			Outcrop of decomposing white/pinkish orthoquartzite noted nearby.
	1				
	2	Ditto.			
85/50/2F					
	3	Ditto, but some 'flour' - start of weathered bedrock?			Drilling slows; possible commencement of weathered bedrock.
	4	Sand with greyish 'flour'			
	5	Ditto.			
	6	Ditto.			
85/50/6.5F	7 EOH	Fresh bedrock?			Drill penetration very slow; fresh bedrock?

Increasing 'flour' content of sample.

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Field	Value	Field	Value
Client:	MONIER	Logged by:	MPE
Project:	SILICA SAND	Method:	AUGER (GEMCODRIL 210D)
Location:	Lapoinya Tas (EL15/85)	Contractor:	H. STACPOOLE
Surface Elevation:	m.a.s.l.	Date Completed:	11 / 12/ 85

LOG FOR BH 85/51, 52

SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	GENERAL COMMENTS
	BH 51		
85/51.+0.0 - 0.5C (track cutting)			
	+0.5	White, fine grained, equigranular sand.	
	0	Ditto, but 10-15 mm clasts of friable white quartzite.	
	1		
	2	Ditto	
85/51/2.5F	3	Change to dark brown clayey sand (basaltic?)	
	4 EOH		
	BH 52		
85/52/+0.0 - 1.0C (track cutting)	+1	+1.25 Humus, sand and roots. +1.00 White to off-white, equigranular, fine-grained sand; some clasts of disintegrating bedrock.	
	0	0 Collar at surface. White to off-white sand as above.	
	1		1.5 Drilling slows - weathered bedrock?
85/52/2F	2	Change to 'floury' silica sand, white.	
	3	Ditto	
	4 EOH	Ditto	No drill penetration.

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SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
		Med. brown & slightly gravelly, fine sand.		Outcrop noted 10 m from rig and about 1 m below collar elevation.
85/53/1.5F	1	0.75 Change to silica 'flour', off-white; probably ground orthoquartzite bedrock		
	2	Ditto.		
	3	Ditto.		
85/53/3F				
	4	Light Khaki 'flour'. Bedrock?		
85/53/4.5F	4.5EOH	Fresh bedrock?		No drill penetration.

Client: MONIER
Project: SILICA SAND
Location: Lapoinya Tas (EL15/85)
Logged by: MPE Surface Elevation: m.a.s.l.
Method: AUGER (GEMCODRIL 210D)
Contractor: H. STACPOOLE

LOG FOR BH85/53

Date Completed: 11 / 12 / 85

N.B.

The on-site D4 bulldozer was used to scrape a pit at this site; blocky fractured orthoquartzite bedrock was uncovered at 1 m below surface.

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SAMPLE NUMBER	Depth below surface (m)	Client: MONIER Project: SILICA SAND Location: Lapoinya Tas (EL15/85)	Logged by: MPE Surface Elevation: m.a.s.l. Method: AUGER (GEMCODRIL 210D) Contractor: H. STACPOOLE	LOG FOR BH85/54, 55, 56 Date Completed: 12/12/85
		LITHOLOGY	Graphic Log	GENERAL COMMENTS
	85/54 0.75EOH	Light brown sand, humus and roots. No penetration, bedrock.		2 further tries to drill at this site failed to penetrate beyond 0.50 m. (Shallow bedrock subsequently confirmed by bulldozer scrape.)
	85/55			
85/55/1F	1	Khaki coloured, fine grained equigranular sand.		
	2	1.25 Change to off-white silica 'flour': ground-up bedrock.		Bulldozer scrape later confirmed shallow bedrock of decomposing, blockily fractured, steeply dipping orthoquartzite.
85/55/2.5F	2.5EOH	Ditto bedrock.		
	85/56	Two attempts to drill failed to penetrate beyond 0.3 m.		Shallow bedrock confirmed by bulldozer scrape.

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SAMPLE NUMBER	Depth below surface (m)	LITHOLOGY	Graphic Log	GENERAL COMMENTS
	85/57	Client: MONIER Project: SILICA SAND Location: Lapoinya Tas (EL15/85) Logged by: MPE Surface Elevation: m.a.s.l Method: AUGER (GEMCODRIL 210D) Contractor: H. STACPOOLE		LOG FOR BH85/57 Date Completed: 12/12/85
85/57/1F	1	Fine grained, equigranular, off-white sand:- no grit or gravel.		
	2	Ditto.		
	3			
85/57/3.5F	4	Ditto, but becoming lighter grey.		
	5		gradational change	Drill rate decreases.
85/57/5.5F		Ditto, but becoming 'floury' - bedrock?		
	6	Greyish-green 'flour' with clay pellets.		Drill penetration very slow.
85/57/7F*	7 EOH			

(*Sample taken from auger flights after rods pulled.)

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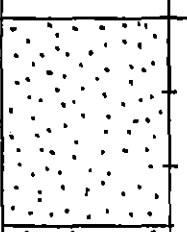
SAMPLE NUMBER	Depth below surface (m)	Client: MONIER	Logged by: MPE	Surface Elevation: m.a.s.l	LOG FOR BH85/58, 59
		Project: SILICA SAND	Method: AUGER (GEMCODRIL 210D)		
		Location: Lapoinya Tas (EL15/85)	Contractor: H. STACPOOLE		Date Completed: 12 / 12 / 85
		LITHOLOGY	Graphic Log		GENERAL COMMENTS
85/58/1F	85/58 1 1.5EOH	Off-white, fine grained, equigranular sand with clasts of weathered orthoquartzite. 1.25 Becoming 'flour' - bedrock?			Rotting bedrock observed in road cutting 20 m away from collar. No drill penetration. (Shallow bedrock confirmed by bulldozer scrape).
85/59/1F	85/59 1 2 3 EOH	Slightly pinkish, white, fine grained, equigranular sand. Ditto, but pale brown. 2.90 Hard, siliceous zone. Rock 'flour' on flights. Bedrock.			No drill penetration.

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APPENDIX 2

SAMPLE RESULTS

SAMPLE RESULTS

TEST PITS

BOAT HARBOUR AREA

Sample Numbers	Al_2O_3 ppm	Fe_2O_3 ppm	TiO_2 ppm
TP 1/0.75 - 2.0 m	940	300	950
TP 2/0.9 - 1.6 m	330	250	470
TP 2/1.6 m	495	340	880
TP 7/0.2 - 1.35 m	450	155	820
TP13/0.6 - 1.8 m	3500	720	3000
TP19/0.7 - 1.9 m	1060	510	1200

LABORATORY: S.G.S. Aust. Pty. Ltd.

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SAMPLE RESULTS

BORE HOLES

BOAT HARBOUR AREA

Sample Numbers	Al_2O_3 ppm	Fe_2O_3 ppm	TiO_2 ppm
85/40/ 1.5 F	680	530	850
" 40/ 5 F	315	835	570
" 40/10 F	290	1140	580
" 40/12 F	340	8670	730
" 40/18 F	375	7150	720
" 41/1.5 F	560	6460	1400
" 41/2-3 C	445	490	730
" 41/4 F	340	6850	750
" 41A/1 F	440	425	540
" 41A/5 F	430	3200	950
" 41A/7.5 F	540	1.19%	1260
" 42/1 F	960	3200	2150
" 43/3 F	400	5360	690
" 43A/3 F	320	1000	760
" 43A/5 F	650	1150	740
" 43A/9 F	565	1280	720
" 43A/15 F	3600	2670	930
" 45/1.5 F	470	580	490
" 45/5 F	575	710	490
" 45/9 F	570	1610	460
" 45/14.5 F	1520	2240	1040
" 46/1.5 F	360	810	830
" 46/3 F	650	830	960
" 46/7.5 F	4650	2070	3850
" 46/10 F	6.8%	1.48%	4200
" 47/1.5 F	21.2%	1.11%	1.02%
" 47/4.5 F	12.7%	7200	1.02%
" 47/9 F	13.1%	7400	4400
" 47/12 F	11.2%	1.52%	7800

LABORATORY: S.G.S. Aust. Pty. Ltd.

SAMPLE RESULTS

BORE HOLES

LAPOINYA AREA

Sample Numbers	Al_2O_3 ppm	Fe_2O_3 ppm	TiO_2 ppm
85/50/0 - 1.5 C	795	210	520
" 50/2 F	695	1060	380
" 50/6.5 F	690	2300	370
" 51/0 - 0.5 C	880	1100	1200
" 51/2.5 F	695	605	660
" 52/0 - 1 C	730	720	810
" 52/2 F	870	2630	880
" 53/1.5 F	1800	890	1500
" 53/3 F	2350	2660	2700
" 53/4.5 F	1500	2650	1620
" 55/1 F	790	4530	640
" 55/2.5 F	1000	1500	690
" 57/1 F	605	1220	730
" 57/3.5 F	950	1220	840
" 57/5.5 F	780	7530	860
" 57/7 F	800	5600	690
" 58/1 F	780	1020	940
" 59/1 F	590	570	530

LABORATORY: S.G.S. Aust. Pty. Ltd.

APPX 3

728048

EXTRACT FROM 87-2722

In order to resolve these variations in depth, six seismic traverses were located in the area of interest between the two small existing quarries.

As shown in Figure A.2.1 (a), in Appendix A2 the interpreted depth of recoverable material ranges from about 15 to 20 metres, with an average depth of about 17 metres.

Provided these depths are maintained over the whole of the deposit, a reserve of about 2 million tonnes is inferred.

4.5 Lapoinya

This area (Figure 4.5, 4.7 and 4.7(a)) has previously been sampled and tested. During the current fieldwork, several shallow seismic traverses were carried out, to confirm average depths of easily extractable silica sand.

The previous work consisted of rotary boreholes and dozer pits by Zetetic Consulting Economic Geologists, supplemented by a further 8 percussion holes.

Analysis of raw product shows, typically:

Al_2O_3	550 (ppm)
Fe_2O_3	120 (ppm)
TiO_2	230 (ppm)

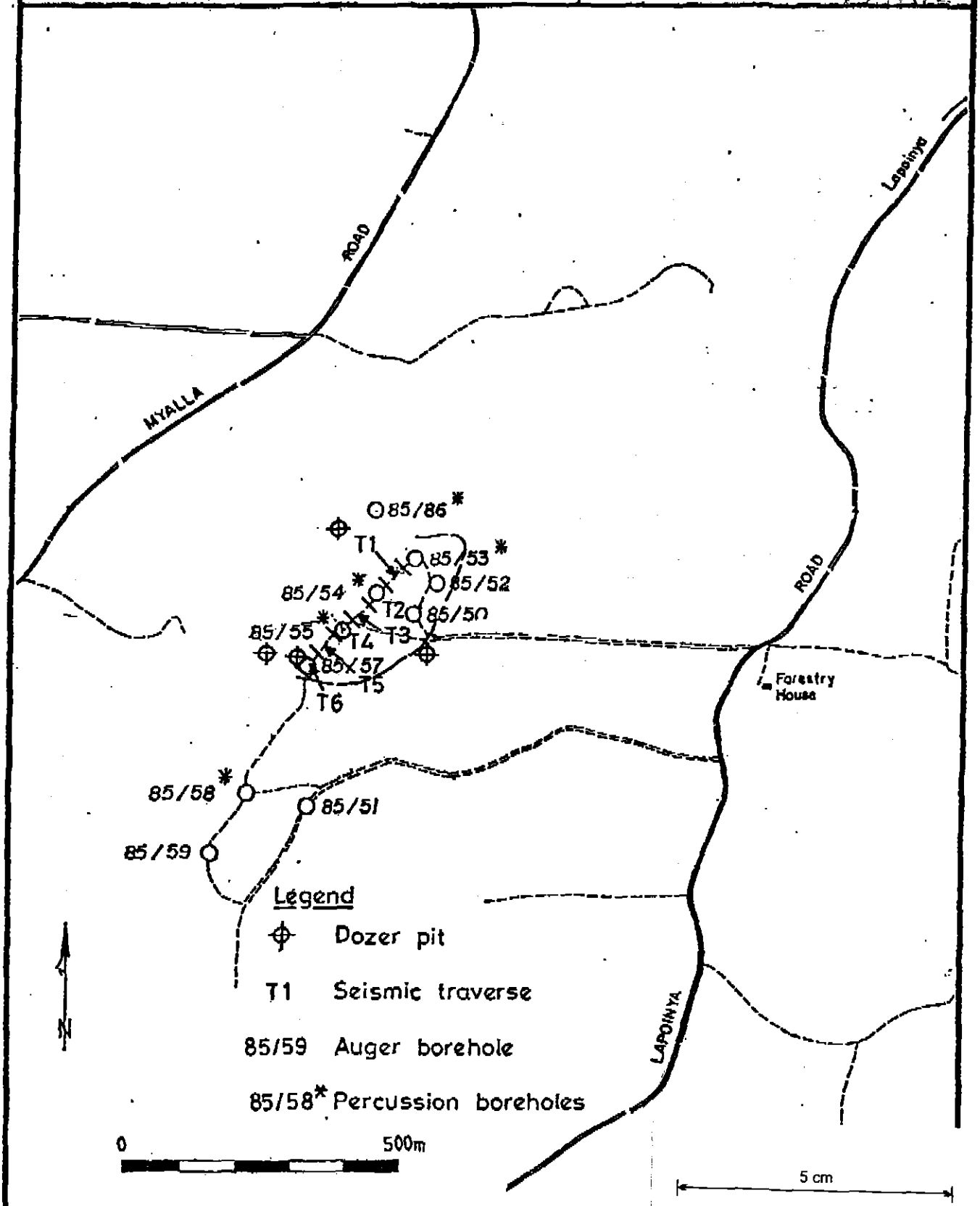
The deposit abuts a ridge of quartzite, the flanks of which are covered by significant depths of silica sand.

Other analytical data from the percussion holes shows that:-

LAPOINYA

FIGURE No 4.7

728049



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3 Eden Street, Crows Nest 2065 Telephone 929 0122
LONGWORTH & McKENZIE PTY. LIMITED

Job No
YGT0358

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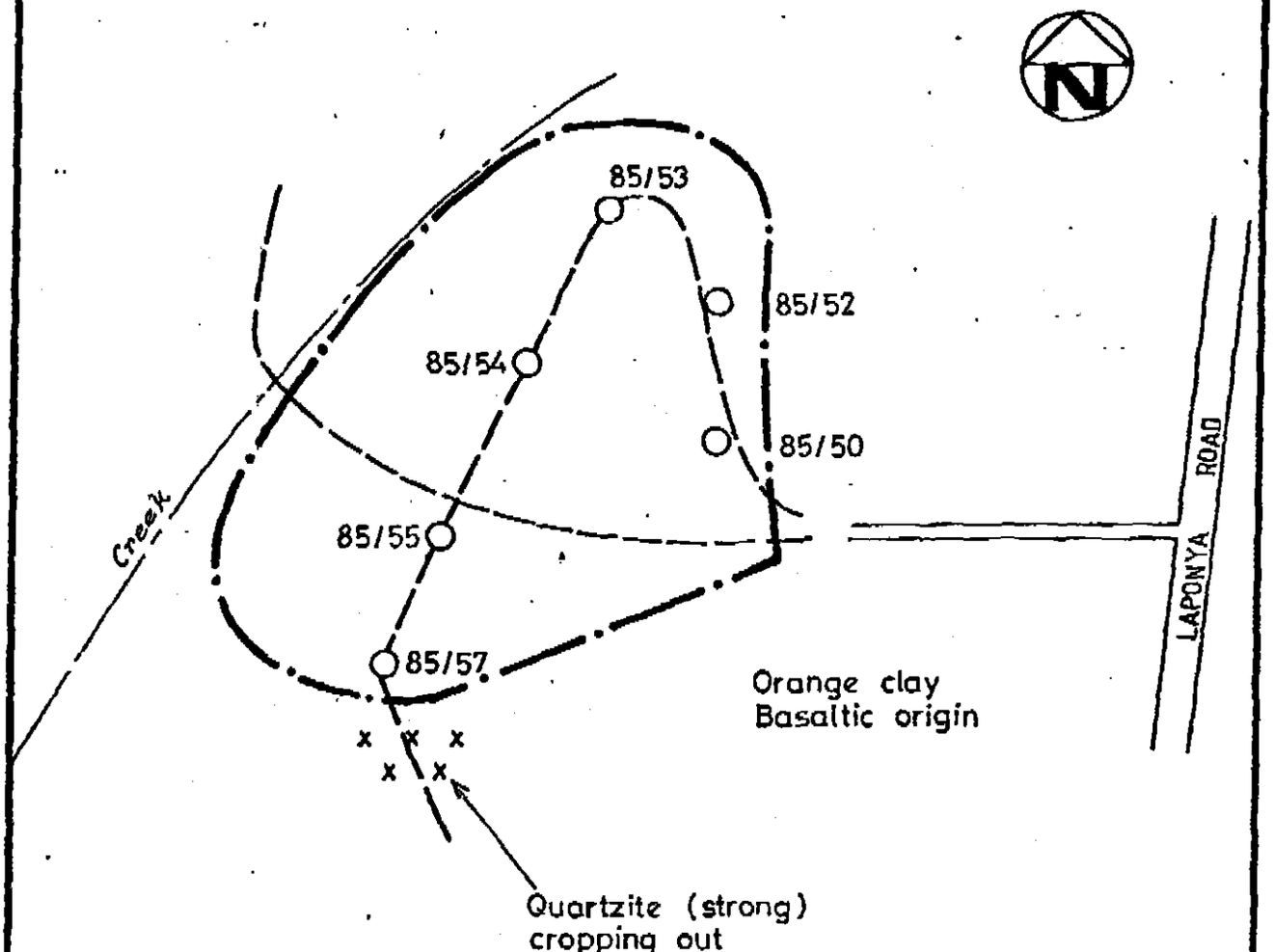
SKETCH PLAN LAPOINYA

FIGURE Nº 4.7(a)

728050



Not to scale

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LONGWORTH & McKENZIE PTY. LIMITED

Job Nº YGT0358

Hole	Depth (m)	Raw Fe_2O_3 (ppm)
85/52	3	164
85/52	6	106
85/53	3	768
85/53	6	369
85/53	9	721
85/53	12	944
85/55	3	215
85/55	6	265
85/55	9	283
85/55	12	784
85/56	3	227
85/56	6	3,289
85/56	9	878
85/56	12	712

From these previous data, it is accepted that the most prospective area is in the Northern part of the deposit (covered by rotary holes 50 and 52 to 57 and percussion holes 52 to 56), whilst the Southern portion (rotary holes 51, 58 and 59) has only very shallow sand.

It is over the Northern Aree - some 500 m long by 300 m wide - that the seismic traverses were carried out to correlate depths indicated by the percussion boreholes. The extent of the deposit, however, may be greater to the west, as this boundary has not yet been mapped.

Borehole	Refusal Depth for Rotary Drill	Percussion Depth
85/50	7 m	-
85/52	4 m	+12 m
85/53	4½ m	+12 m
85/54	3/4 m	+12 m
85/55	2½ m	+12 m
85/56	1/3 m	+12 m
85/57	7 m	-

LM

The seismic traverses (T1 to T6) started near borehole 53 and ended at borehole 57 over a distance of 240 metres.

It is evident from the seismic results (Figure A.2.1(b) of Appendix A2) that the Gemco auger drill has penetrated only very low velocity material (less than 500 m/s) whereas the percussion Airtrak rig has penetrated somewhat more consolidated strata (up to 1500 m/s) which is, however, relatively easy to excavate. The depth to hard bedrock ranged from about 6 to 22 metres, with an average depth of about 16 metres. Provided these depths are maintained over the whole of the deposit, the area has potential reserves of about 4 million tonnes of silica sand.

4.6 Calder Pit

This existing sand and gravel pit (See Figure 4.5) was sampled. Analytical results for two samples showed raw Fe_2O_3 values of 500 and 390 ppm, reducing to 145 and 135 ppm respectively, after acid washing and removal of heavy minerals. Although large reserves are known to be present, they have not been quantified.

Visually, the material is more coarse grained than that sampled from other areas, but is silica rich. Due to the nature of the deposit (Alluvial) it should be expected, however, that variation in quality will occur throughout. Thus, the proving of the area would most probably require a more intensive investigation than would normally be implemented for, say, a stable dune deposit.

4.7 Hellyer Siding

A brief inspection was made of this site (Figure 4.5) and a single auger hole bored to a depth of 3 m, at which depth the hole was abandoned due to groundwater. The material is of high quality (Raw Fe_2O_3 about 265 ppm, reducing to 125 ppm after acid washing and removal of heavy minerals).

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APPX 4
ATTACHMENT
88-2868A

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728053

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5th October 1988

Department of Mines
P.O. Box 56
ROSNY PARK TAS 7018

MINES
File Ref. E.L. 15/85
13 OCT 1988
Doc. Ref. 2677
Action Officer | Initials
MDD
P.W.
Resubmit to | Date

88-2868 (R)

Attention Mr. P.K. Wrigley

Dear Mr. Wrigley,

E.L. 15/85 Relinquishment and R.L.A. 8817

Attached is the report by Zetetic which should have been sent with the quarterly report at the end of March 1986. Zetetic investigated the silica sand at Lapoinya in E.L. 15/85 and an existing sand pit at Boat Harbour owned by Brambles Industrial Services. The drilling was done by auger and difficulty was experienced in determining the depth of the deposit due to hole collapse, sample contamination from the flights and inability to penetrate sand that was not loose.

The deposit was drilled by an "Air Trak" drill rig in the Autumn of 1987, however, hole collapse and the inability to purge the drill string limited the hole depth to 12 metres. This drilling was done in conjunction with Mineral Holdings Dip Range silica prospect.

Following on from this Longworth and McKenzie used "Hammer Seismic" techniques to determine the depth of friable material and the probable outline of the deposit. They assessed the parameters of the deposit to be :

Average depth	16 metres
Length	400 metres
Width	300 metres
Volume	1-9 million cubic metres
Sand Mass	4 million tonnes

It was intended to develop a silica sand export business using the Lapoinya deposit, the Boat Harbour/Sisters Hills sand pit owned by Brambles Industrial Services and the Dip Range deposit held by Mineral Holdings. With the rise in freight rates this year as a result of the increase in world trade the differential in freight cost between Burnie and Japan and Cape Flattery or Brisbane and Japan is too high. The result was that the F.O.B. price would have to be depressed too far to enable the sand to compete with material from Cape Flattery or North Stradbroke Island. The identified customer - Nippon Sheet Glass would prefer not to buy from Cape Flattery because it is owned by the parent of its major competitor - Asahi Glass, however, it cannot justify paying a higher price.

At the moment silica sand has a Japanese port C.I.F. value of US $30.00 i.e. Aust $38.50 the freight cost due to distance and a necessarily slow loading system at least in the early stages would be $US $20.00 compared with US $15-18 for Cape Flattery depending on vessel size.

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The net F.O.B. price of US$10 or $Aust 12.80 does not leave enough for mining, processing, transport, ship loading and profit. From our silica sand export business through Kwinana W.A. a F.O.B. price of Aust $15 is sufficient at todays costs for 20,000 tonne orders if a high speed low cost ship loader is available.

The operating costs would be in the order of :

Mining	$2/tonne
Processing	$4/tonne
Shiploading	$3/tonne
Transport	$3.50/tonne
Depreciation	$0.50/tonne
Profit contribution to overheads to cover management, marketing accounting and profits !	$2/tonne
	$15/tonne

If the iron ore shiploader at Port Latta becomes available following the closure of the Savage River Iron Ore mine then that would go a long way to getting a silica sand export business established. The Western Australian silica sand business is based on the Australian Iron and Steel pig iron ship loader at Kwinana.

The establishment of a purely domestic fine silica sand business on the North West coast of Tasmania is considered to be impractical due to A.C.I.'s glass factory being in Hobart. Most industrial sand is relatively coarse and is used for filtration, packaged concrete and mortar mixes, foundry moulding etc. and is best supplied from the coarse sand deposits near Scottsdale.

Once an export sand business was established on the N.W. coast there would of course be sales of lower grade material for asphalt, concrete, etc. which would have to compete with the material from the Calder Valley.

retention

A relinquishment licence is requested to preserve the fine silica sand deposit at Lapoinya so that it can be developed when the economic climate is appropriate.

Yours faithfully,

B.R. Harrison

B.R. HARRISON
Development Manager
Construction Materials Division

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