CONTENTS ENVELOPE 2821 DM 582/76 002

TENEMENT: S.M.L. 4671- 4673

TENEMENT HOLDER: MINERALS PTY. LTD

REPORTS:

NICKOL D. 1976 Caroline Limestone Prospect - Mt. Gambier county of Grey, Hundred of Caroline, Section 538 and 539 (pgs. 3-17)

Plans:

S 20	Caroline Limestone Prospect	(2821-1)
S 17	Locality Map	(pg. 5)
S 19	Caroline Limestone Prospect Regional Geology and Locality Plan.	(pg. 7)

REPORTS:

NICKOL, D. 1978 Caroline Limestone Prospect- Mt. Gambier Development Proposal (No Plans) (pgs. 18-25)

ARCHER, R.H. 1980 Caroline Limestone Deposit Mt. Gambier Development Plan. (pgs. 26-29)

MINERALS PTY. LTD.

RAW MATERIALS DIVISION.

003

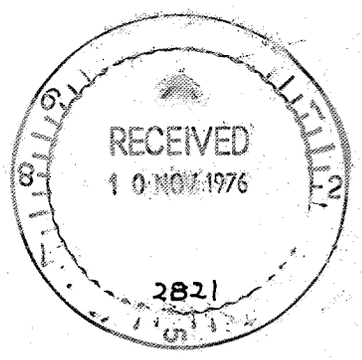
CAROLINE LIMESTONE PROSPECT - MT.GAMBIER.

COUNTY OF GREY, HUNDRED OF CAROLINE, SECTION 538,& 539.

BY

DOUGLAS NICHOL

MANAGER RAW MATERIALS.



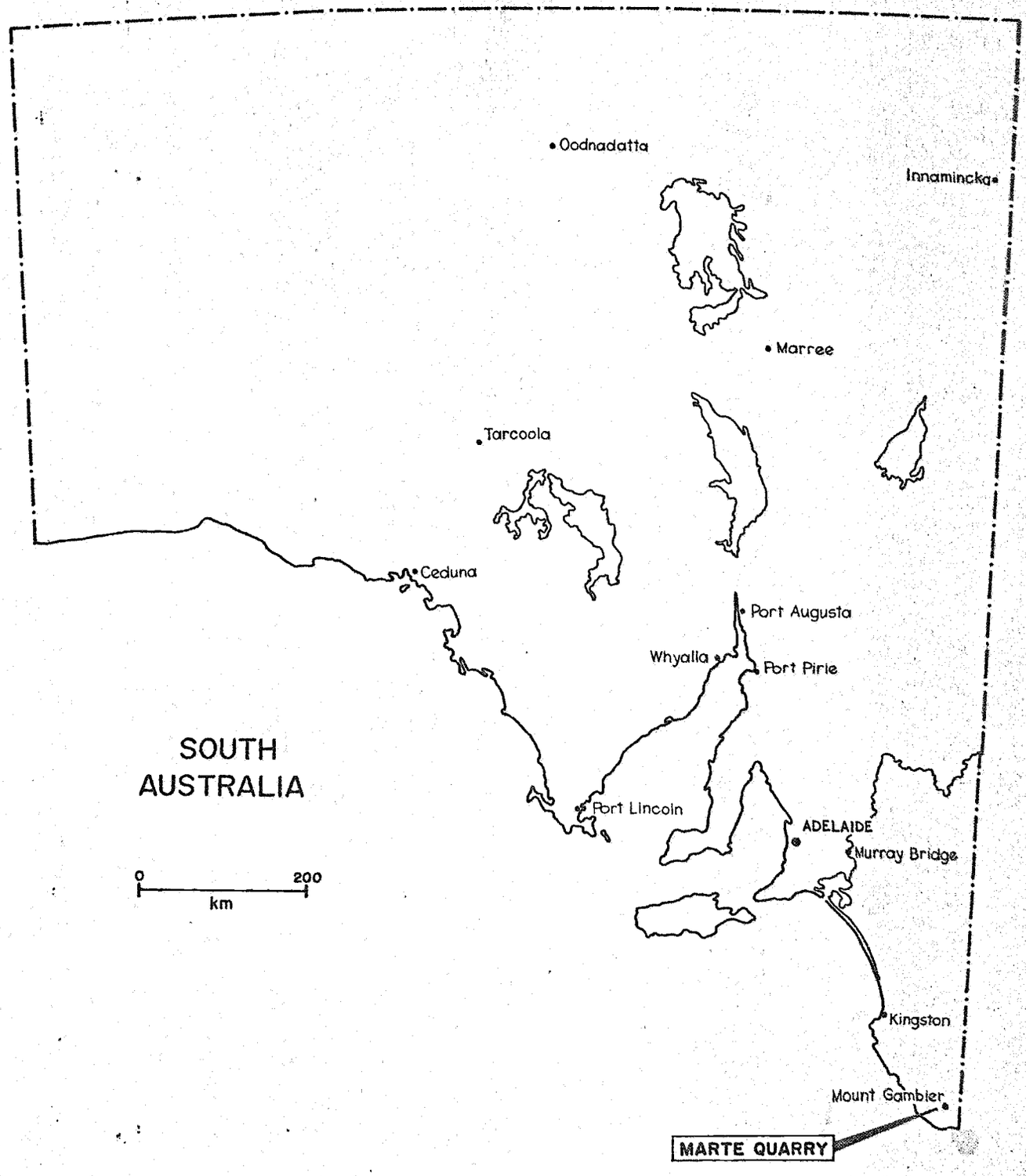
14TH SEPTEMBER,1976

REPORT NO. 10/76.

CONTENTS.

PLANS ACCOMPANYING REPORT

NO.	TITLE.	SCALE.
S19	Caroline Limestone Prospect Regional Geology and Locality Plan	1:650,000
S20	Caroline Limestone Prospect Site Plan	1: 2,000



MARTE LIMESTONE QUARRY – MOUNT GAMBIER

SECTION 26 HUNDRED OF BLANCHE

LOCALITY MAP

S17

MINERALS PTY. LTD.

RAW MATERIALS DIVISION.

Report No. 10/76

Caroline Limestone Prospect - Mt. Gambier.

County of Grey, Hundred of Caroline, Sections 538 and 539.

ABSTRACT.

A new deposit of whiting grade limestone is required to replace Marte Limestone Quarry which has a remaining production life of only 4 years.

Initial observations indicate that a particularly high grade limestone deposit exists within the Gambier Limestone near Caroline. Detailed investigation is now required.

The prospect lies within the Caroline State Forest Reserve and the permission of the Minister for Mines is sought to conduct quarrying operations subject to completion of detailed geological site evaluation.

LOCATION. 5.5 kilometres by road north of Donovans and 25 kilometres southeast of Mount Gambier in sections 538 and 539, hundred of Caroline. The site is situated on the western side of Border Road which separates the States of South Australia and Victoria.

INTRODUCTION.

Jarvis Industries Pty.Ltd., Adelaide and Minerals (Vic) Pty. Ltd., Melbourne use limestone from the Mount Gambier district in production of particular grades of whitings for the paint, rubber, plastics, carpet and other manufacturing industries.

Whiting grade limestone is currently obtained from Marte Limestone Quarry, 10 kilometres east of Mount Gambier. Here, reserves of suitable raw material are sufficient for only a further four years. Another deposit is therefore required.

A reconnaissance exploration programme conducted over the past two years in the Mount Gambier district has isolated an area of particular interest within the Caroline State Forest Reserve.

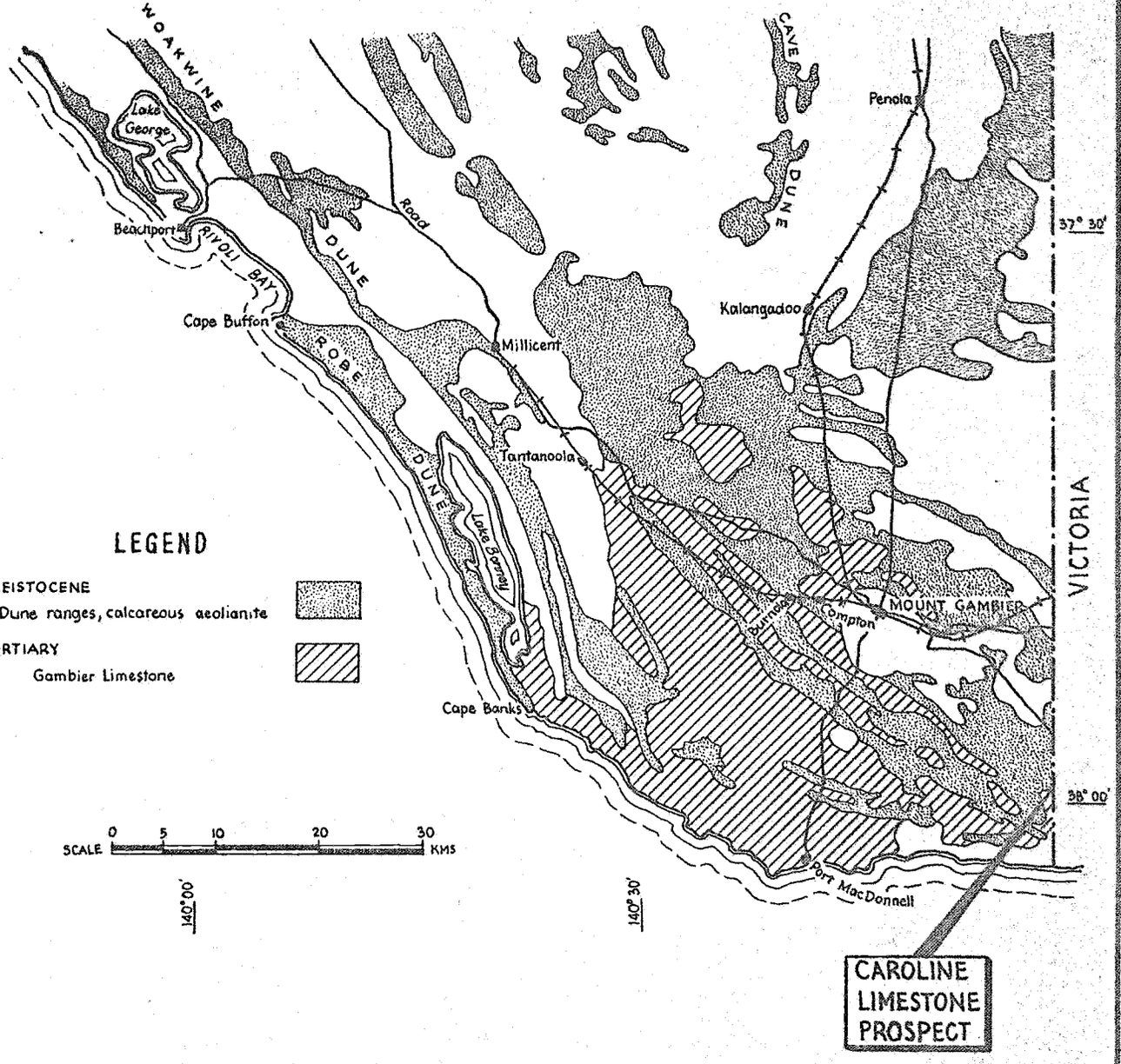
This report presents available information in support of an application to the Minister for Mines under section 9 of the Mining Regulations, 1972 for permission to conduct quarrying operations subject to completion of detailed geological site evaluation.

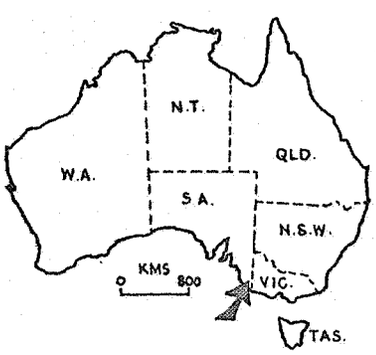
GEOLOGICAL SETTING.

Topography comprises low undulating ridges surrounded by flat terrain.

Cont'd...2

007





MINERALS Pty. Ltd.

100 EUSTON RD ALEXANDRIA N.S.W.

CAROLINE LIMESTONE PROSPECT

REGIONAL GEOLOGY & LOCALITY PLAN

	DRN. J.A.H.	SCALE. AS SHOWN.	DRG. Nº S 19.
	CKD. D. Nichol.	DATE. 15-9-76	

The Gambier Limestone of Oligocene to lower Miocene age crops out extensively in the Mount Gambier area. The unit is traceable from near Tantanoola southwards to the coast and in a southeasterly direction to the Victorian border (see plan No. 5 19). Facies variations within the unit include

1) Sand content
2) Silt content
3) Clay content
4) Dolomite content
5) Flint nodule content
6) Iron content
7) Manganese content

as well as textural and colour variations.

SUITABILITY OF GAMBIER LIMESTONE FOR WHITING.

Limestone from Mount Gambier used for processing to whitings is exceptionally pure and typically exceeds 98% $CaCO_3$ content with G.E. brightness between 86% and 88%.

Finely pulverised Gambier Limestone has special physical properties such as high absorption and high dispersion characteristics which distinguish it from chemically similar finely pulverised marble such as Angaston Marble. These important physica differences reflect particle size distribution characteristics achieved during milling. This is illustrated in size distribution curves presented in Appendix A; comparison of Gambier Limestone (C3) and Angaston Marble (C9) pulverised under identical mill conditions shows that the Gambier Limestone product has a significantly higher minus 10 micron component.

In addition pulverised Gambier Limestone and Angaston Marble have different particle shape characteristics which affect performance properties.

Gambier Limestone is more suitable for production of micronised grades of whitings due to high naturally superfine-grained component.

SELECTION OF CAROLINE PROSPECT.

Reconnaissance exploration from 1974 to 1976 consisted of regional examination of surface outcrops, quarry inspections and discussions with Department of Mines Officers and contract water drillers at Mount Gambier.

Marte Limestone Quarry and other limestone pits in the district were originally selected as suitable sources of construction stone and most are unsatisfactory sources of whiting grade material.

The following criteria were used in selection of whiting grade limestone prospects.

1) Purity and whiteness
2) Minimum deleterious sand, silt, clay, dolomite, flint, iron, and manganese content.

Cont'd...3

3) Minimum overburden.
4) Maximum thickness above water-table.
5) Mining, land-use and environmental suitability.

Areas to the northwest of Marte have progressively shallower depths to water-table and are thus unsuitable for open cut mining. In the vicinity of Mt. Gambier, Mt. Shank, Moorak and Kangarrong, abundant deleterious components and poor colour preclude mining of whiting grade material.

The Caroline Prospect was brought to the attention of Minerals Pty.Ltd., by J.R. Davidson, contract water driller from Mt.Gambier. Mr. Davidson advised that from his wide experience of drilling in the district, a drillhole in section 538, hundred of Caroline contained limestone of outstanding whiteness.

The bore log of this hole is presented in Appendix B. Inspection of sludge samples from the hole confirmed whiteness and absence of impurities, Officers of the Mt. Gambier Branch, Dept. of Mines further confirmed exceptional purity recorded for other drillholes located nearby.

The depth to water-table is 16 metres compared with only 3 metres at Marte.

The site is mildly undulating and rocky with thin soil cover.

Although the site lies within the Caroline State Forest Reserve, the current land use is grazing (see plate).

Field reconnaissance has failed to locate an alternative site considered worthy of further investigation.

FURTHER INVESTIGATIONS.

Provided permission to conduct quarrying operations would be granted, it is proposed to conduct detailed geological site evaluation including a rotary-air drilling programme on a grid basis, sampling and laboratory testing. These investigations would define grades and reserves and provide a basis for development plans.

SUMMARY AND CONCLUSIONS.

Caroline Limestone Prospect is situated within the Caroline State Forest Reserve and application is made to the Minister for Mines under section 9 of the Mining Regulations,1972 for permission to conduct quarrying operations subject to completion of detailed geological site evaluation.

Based on available information it is considered likely that large quantities of whiting grade limestone could be quarried from the prospect site without undue environmental disturbances. Site evaluation is required to determine reserves, grades and provide a basis for development plans.

High grade limestone suitable for specialised whitings is not common in the Mt.Gambier district and consequent on depletion of reserves at Marte Limestone Quarry, then Caroline Limestone Prospect may represent an important resource.

Douglas Nichol

DOUGLAS NICHOL
MANAGER RAW MATERIALS.

DATE: 14th September,1976

PLATE. Caroline Limestone Prospect - General View.

REFERENCES

Johns, R.K., 1963 - Limestone Dolomite and Magnesite Resources of South Australia. Bull. geol. Surv. S. Aust. 38:100 pp

APPENDIX A.

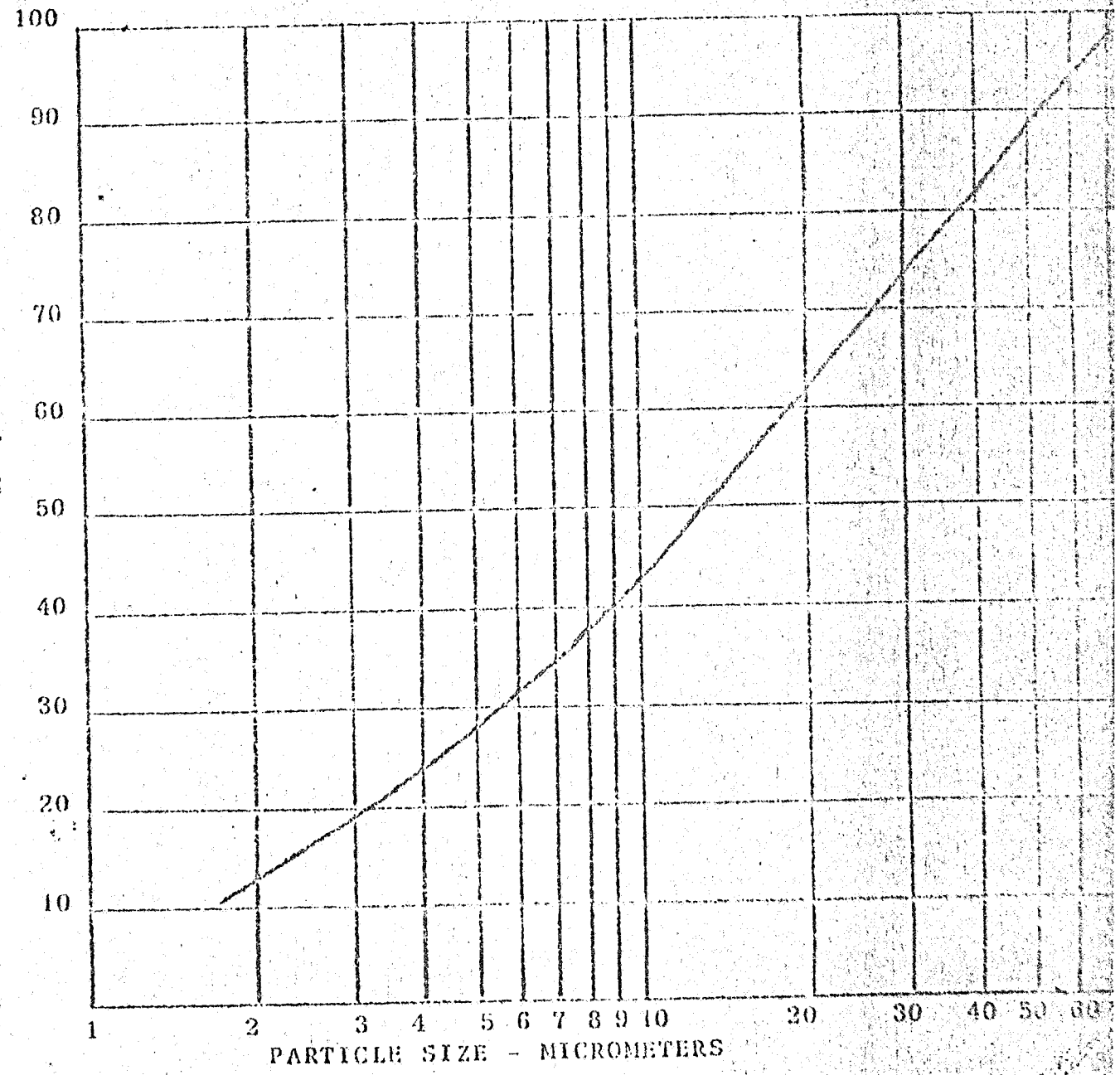
SIZE DISTRIBUTION CURVES.

R. FOWLER LIMITED
LABORATORY

FILE No. 18/75

DESCRIPTION JARVIS MINERALS C3

SAMPLE NUMBER 64

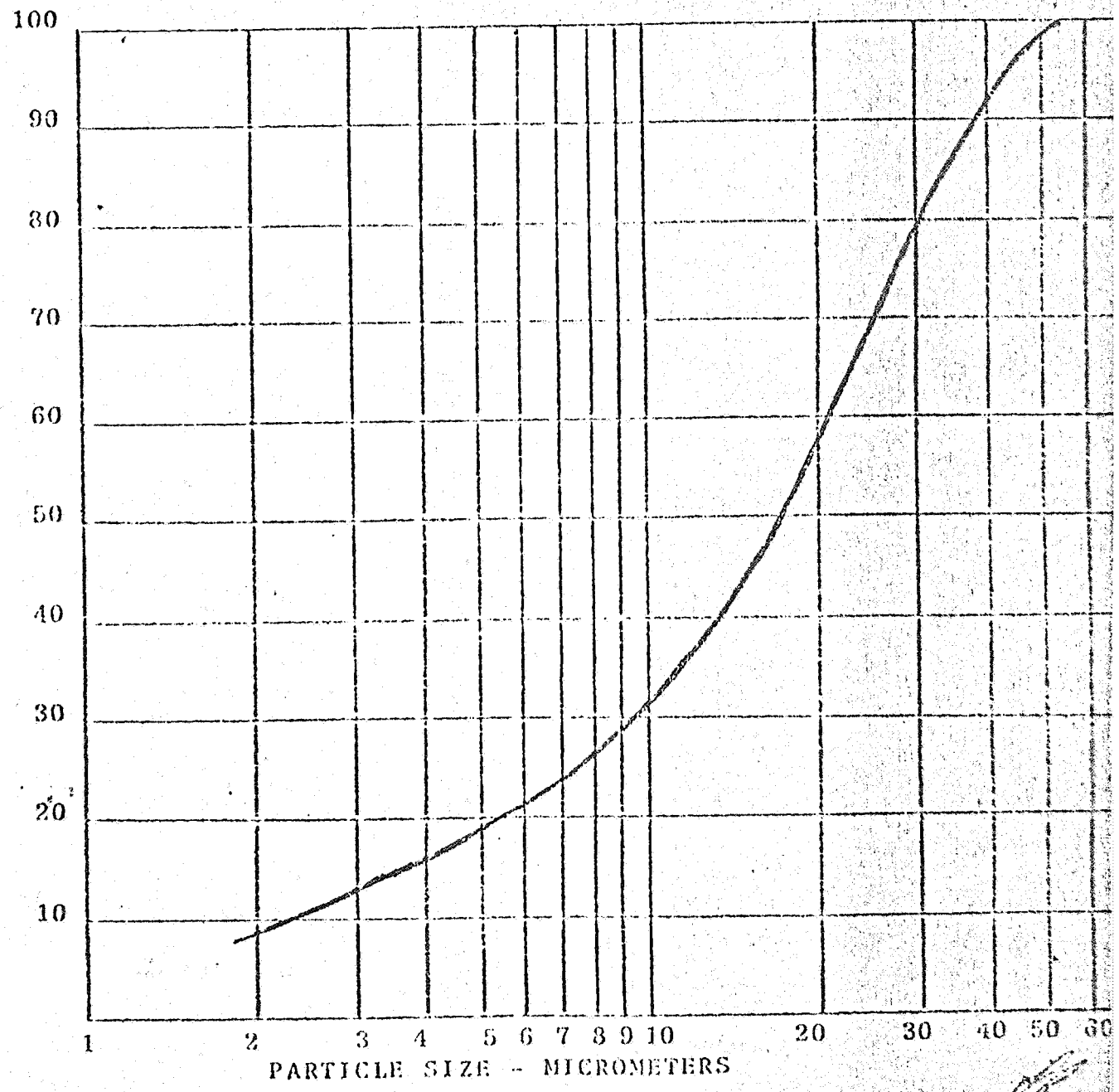


R. FOWLER LIMITED
LABORATORY

FILE No. 18/75

DESCRIPTION JARVIS MINERALS
C9

SAMPLE NUMBER 69



APPENDIX B.

BORE LOG.

DEPARTMENT OF MINES SOUTH AUSTRALIA

016

HYDROGEOLOGY SECTION

BORE LOG

HIRER K.McEACHERN, BOX 98, MT.GAMBIER

Drill type CABLE TOOL
Circulation WATER
Driller J.R.DAVISON
Start 30/3/75
Finish 30/3/75

Logged by J.LAWSON
Date logged 6/8/76
Bore Diameter 152mm
DEPTH 30m

A.M.G. Zone
Coords. E
" N
Datum Elev.
(m) Ref. Pt. Elev.
Surface Elev.

HUNDRED CAROLINE
SECTION 538
STATE No. 286053805
Project No.
Docket No.
Bore Serial No.

Depth to Water cut (m)	Depth to standing water (m)	SUPPLY litres/sec.	SUPPLY Method of test	TOTAL DISSOLVED SOLIDS Milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis W. No.
16m	16m	0.75		215 CONDUCTIVITY 440	W2918/75

REMARKS

Temporary No. WC08 Drilled to supply Stock
Unit No. 7022002WW00542

CASING: 3m of 152mm PVC

DEPTH (m) from	to	DESCRIPTION
0	18m	FOSSILIFEROUS CALCARENITE - white, unconsolidated. Well preserved Bryozoa to 10mm. 30% Calcisilitite - White
		40% Calcisiltite - White
		20% Calcisiltite - White

UNIT: GAMBIER LIMESTONE

RECEIVED
30 AUG 1976
Ans'd.....

Drn:	Sheet 1 of 2
Date:	Bore Folder No.

PF Nº S10537 MH

DEPARTMENT OF MINES — SOUTH AUSTRALIA

017

CASING | WATERS CUT | WATER LEVEL | DEPTH (m) | CORE | GRAPHIC LOG | AGE | UNIT

DEPTH (m) from	to	DESCRIPTION
18m	27m	FOSSILIFEROUS CALCARENITE - offwhite to ironstained, strongly cemented to unconsolidated. Bryozoa and shelly material to 5mm. Fossils larger than previous 18m. 5 -10% Calcisilitite - white Traces of glauconite
27m	30m	CALCARENITE - off white, strongly cemented. 5% Fossiliferous CALCARENITE-As above
		END OF HOLE 30m

UNIT: LIMESTONE — GAMBIER

Borehole State No.

Drn:

Date:

Sheet 2 of 2

Bore Folder No.

PF Nº S10537a MH

M M

TO CAROLINE
AND PRINCESS HIGHWAY.

TO PRINCESS MARGARET ROSE CAVES

Tank

AUSTRALIA

VICTORIA

AREA

OF

INTEREST

ROAD

Bench mark
D&M Observation Bore
N° CAR 22

Ruin

Sec. 538
Sec. 539

SOUTH

OF

STATE

BORDER

STATE

20

30

Creek

Dry

Sec 614

TO DONOVANS 2 KM.

RIVER

GLENELG

LEGEND

- Road.
- Track.
- 20 Contour (metres A.S.L).
- Section boundary
- Tree line.
- Creek.

MINERALS Pty. Ltd.
100 EUSTON RD ALEXANDRIA N.S.W.

2821-1

CAROLINE LIMESTONE PROSPECT
SITE PLAN

DRN. J.A.H.	SCALE. 1.2000	DRG N°
CKD	DATE. 29/9/1976	S 20

MINERALS PTY. LTD.

RAW MATERIALS DIVISION.

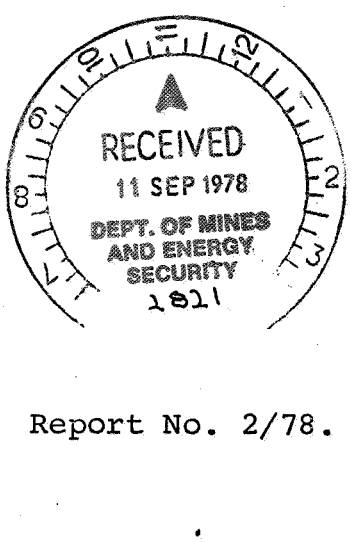
CAROLINE LIMESTONE PROSPECT - MOUNT GAMBIER.

DEVELOPMENT PROPOSAL.

By

D. NICHOL

MANAGER RAW MATERIALS.



4th September 1978.

Report No. 2/78.

CONTENTS.

PLANS ACCOMPANYING REPORT

No.	Title.
S19	Caroline Limestone Prospect. Regional Geology and Locality Plan.

MATERIALS PTY. LTD.

RAW MATERIALS DIVISION.

Report No. 2/78.

CAROLINE LIMESTONE PROSPECT - MOUNT GAMBIER.

DEVELOPMENT PROPOSAL.

INTRODUCTION.

Minerals Pty.Ltd. use limestone from the Mount Gambier district in production of particular grades of whitings for the paint, rubber, plastics, carpet and other manufacturing industries.

Whiting grade limestone is currently extracted at a rate of 10,000 tonnes yearly from Marte Limestone Quarry, 10 kilometres east of Mount Gambier. Reserves at Marte are sufficient for only a further 2 years.

An exploration programme in the Mount Gambier district identified the Caroline Limestone Prospect and Mineral Claims 845, 846 and 847 were obtained to cover the deposit.

Subsequent site investigations and plant trials confirmed the worth in development of the prospect.

This report is presented in support of application for mining leases over the area covered by the mineral claims.

LOCATION.

Mineral Claims No. 845, 846 and 847 are situated 5.5 kilometres by road north of Donovans and 25 kilometres southeast of Mount Gambier in sections 538 and 539, hundred of Caroline and on the western side of Border Road which separates the States of South Australia and Victoria.

PHYSICAL FEATURES.

1. Topography and Drainage.

Topography comprises low undulating ridges surrounded by flat terrain. Elevations range from 25 metres to 30

Cont'd....2

metres above sea level.

Dry Creek, situated 1.2 kilometres southwest of Caroline Prospect, drains southeastwards into the Glenelg River. The Glenelg River is the main drainage channel in the district and passes within 1.5 kilometres of Caroline Prospect.

No surface drainage channels cross Caroline Prospect.

Run-off is less significant as the means of drainage than percolation through the porous limestone. At Caroline Prospect the depth to water-table is 16 metres.

2. Geological Setting.

The Gambier Limestone of Oligocene to lower Miocene age crops out extensively in the Mount Gambier area. The unit is traceable from near Tantanoola southwards to the coast and in a southeasterly direction to the Victorian border. Facies variations within the unit include -

1) Sand content.

2) Silt content

3) Clay content

4) Dolomite content

5) Flint nodule content

6) Iron content

7) Manganese content

as well as textural and colour variations.

At Caroline Prospect colour is white and impurities either absent or almost absent. Average chemical analysis calculated from 14 drillholes each 5 metres deep is as follows :-

$CaCO_3$	96.30	per cent
$MgCO_3$	2.10	per cent
SiO_2	0.48	per cent
Al_2O_3	0.11	per cent
Fe_2O_3	0.05	per cent

The quality of the material for production of whiting appears superior to that currently being supplied from Marte Quarry.

In addition to purity and whiteness the Caroline Prospect site was selected on the basis of depth to water-table, thin overburden and mining, land use and environmental suitability.

BIOLOGICAL FEATURES.

1. Vegetation.

Thin soil between rocky outcrops supports only grass vegetation.

Cont'd...3

2. Fauna.

Domestic animals only.

HUMAN FEATURES.

1. Land use.

The present land use is light grazing.

2. Settlements.

The nearest village is located at Donovans, 5.5 kilometres to the south. The nearest occupied dwelling is "Honeysuckle" farmhouse, 2.1 kilometres to the north. An abandoned, derelict ruin of no consequence is situated on the eastern part of M.C. 847.

3. Roads.

Border Road, an unsealed, poorly graded, single track adjoins the eastern boundary of M.C.847.

4. Access.

Existing access to the Caroline Prospect is by farm track along the northern fence boundary.

5. Additional road construction.

It is proposed to construct a new access route at the intersection of Border Road and the boundary between sections 538 and 539. The anticipated length of the new road would be 1.2 kilometres. Some upgrading of parts of Border Road may be necessary.

6. Existing features.

No workings, plant, buildings, dumps or historic relics exist on the site.

LAND USE CONSTRAINTS.

1. Planning Area: South-East.

2. Council Area: District Council of Mount Gambier.

3. Reserves:

The Caroline Limestone Prospect is situated within the Caroline State Forest Reserve. Discussions have been undertaken with the S.A. Woods and Forests Department to seek support for mining within the Reserve. It is understood that the area of the Caroline Limestone Prospect contains insufficient soil depth to support forest industry. Further discussion with Woods and Forests Department is necessary to ensure that mining operations would not conflict with forest operations.

4. Other significant features.

The Piccaninnie Ponds National Park is located 9 kilometres southwards and on the coast.

The Princess Margaret Rose Caves, a local tourist attraction

Cont'd...4

are situated 4 kilometres east of Caroline Prospect in Victoria.

5. Potential Impacts.

1. Visual. Operations will not be clearly visible from major roadways. No obtrusion on the local landscape is anticipated.

2. Noise. Blasting will not be conducted and noise will be restricted to earthmoving equipment and trucks.

3. Dust. Dust problems have not been experienced at Marte Quarry and it is expected that similar operations at Caroline would not produce higher dust levels.

4. Traffic. Production levels of 10,000 tonnes yearly will result in two tipper truck journeys per day along Border Road. Direction of travel of loaded trucks will be northwards.

MINING PROPOSALS.

1. Extraction method.

The extraction of limestone will involve heavy earth-moving equipment. Explosives are unnecessary. Scrapers will excavate material and cart to the stockpile. Winning programmes will be restricted to dry summer months and the annual requirement stockpiled in a single operation lasting 2-3 weeks.

Stockpiling is a production requirement to achieve consistency of quarry product.

Loading and carting will be a continuous operation.

2. Area.

The excavation will commence near the centre of the area covered by claims and progressively enlarge and become deeper. No benches or berms will be cut and the quarry faces will comprise regular slopes suitable for operation of the scraper.

3. Production Rates.

Initial production rate will be 10,000 tonnes yearly increasing to 20,000 tonnes after 5 years. Anticipated commencement date is November 1979.

4. Dumps.

Soil overburden is thin, being less than 0.5 metres deep and will not constitute an unmanageable volume. This material will be heaped near the eastern boundary of the lease to provide a long, low mound which will screen operations from Border Road. The mound will be grassed to prevent obtrusion on the local landscape.

5. Drainage.

No provision for natural drainage from the quarry is possible. Water will collect at the lowest portion of

Cont'd...5

the excavation. It is expected that much of this water will seep from the sump downwards through the underlying limestone to the water table. However any collected water present in mid-summer will be removed by pumping prior to winning programmes.

6. Fencing.

Temporary fencing will be constructed around the quarry area to prevent domestic animals from entering the excavated area. This fencing is necessary to prevent accidental injury to the animals and to avoid contamination of clean limestone.

7. Buildings.

A single lock-up shed measuring approximately 10 metres by 10 metres and 6 metres high will be erected near the north-eastern corner of M.C.846. This shed will provide garaging facilities for the front-end loader as well as storage for consumable tools and shelter facilities in wet weather conditions.

An adjoining smaller shed approximately 2 metres by 3 metres and 2 metres high will be used for fuel storage. The quantity of fuel to be stored will be low and sufficient only for the front-end loader.

During the summer winning programme a transportable toilet will be temporarily on site for use by the machine operator.

8. Equipment.

Excavation operations will be conducted by a scraper and yearly requirement of whiting grade limestone stockpiled on a limestone pad adjoining the quarry. The scraper is anticipated to be on site for 3-4 weeks in mid-summer.

For the remainder of the year the only on-site equipment will be a front-end loader used for loading road trucks.

9. Ameliorative Measures:

Grassing of soil overburden mounds.

10. Rehabilitation.

With removal of limestone, an excavation progressively increasing in area and depth will be developed.

The suggested end use of such an excavation is an artificial lake. Development of a lake would require sealing the pit slopes with swelling type bentonite to prevent water leakage.

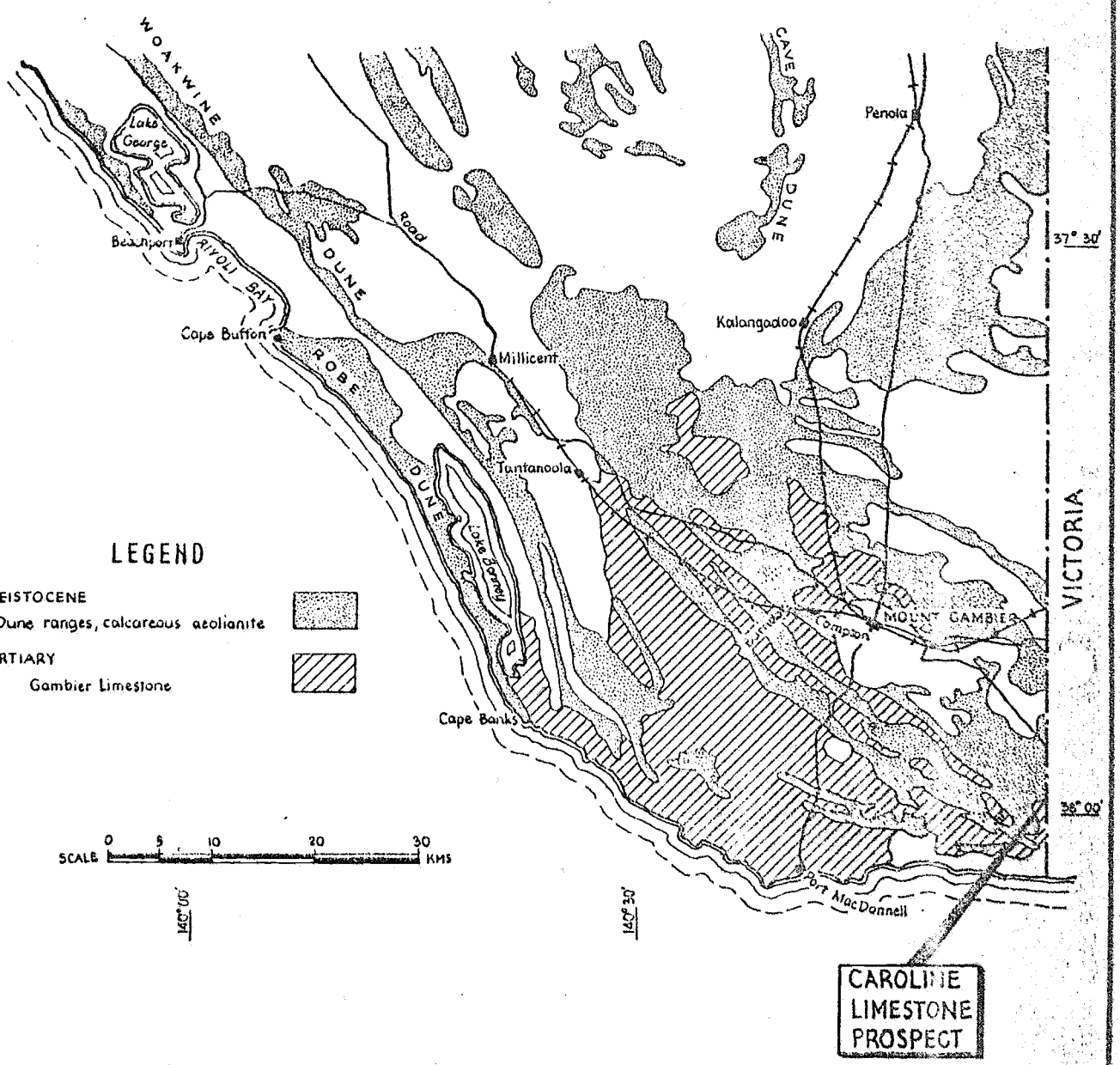
11. Life.

It is anticipated that the life of the limestone mining operations will exceed 30 years.

D. Nichol

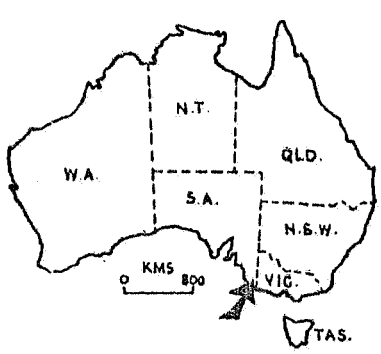
4th September,1978. D. NICHOL.

Duplicate



CAROLINE LIMESTONE PROSPECT

2821



MINERALS Pty. Ltd.

100 EUSTON RD ALEXANDRIA N.S.W.

CAROLINE LIMESTONE PROSPECT

REGIONAL GEOLOGY & LOCALITY PLAN

	DRN. J.A.H.	SCALE. AS SHOWN.	DRG. Nº S 19.
	CKD. D. Nichol.	DATE. 15-9-76	

MINERALS

026

Minerals Pty. Ltd.
Cnr. Toogood Avenue and Ledger Road,
Beverley, S.A. 5009
P.O. Box 157, Kilkenny, S.A. 5009
Telephone: (08) 268 3555
Telex: 88534 (Minjar)

The Director General
Department of Mines and Energy,
P.O. Box 151,
EASTWOOD S.A. 5063

18 th July 1980

Reference : DM 582/76 EBB;PAL

Attention: Chief Inspector of Mines

Dear Sir,

CAROLINE LIMESTONE DEPOSIT - MOUNT GAMBIER

Following recent discussions with Mr E.B. Bartos, Mining Engineer - District Inspector of Mines, I wish to submit a development plan for our proposed Limestone quarrying operations on MLS 4671-4673 near Mount Gambier. The plan is an amalgamation of previous submissions made by this company (4 th September 1978 and 31 st July 1979) but, in addition, contains information recently requested by Mr Bartos.

It should be noted that some screening measures are proposed to be sited on our MC 1212 to the south of the three existing mineral leases. An application for a mineral lease over the area of MC 1212 will be submitted in due course and additions to the present development plan will be proposed at that stage.

Attached please find a map and cross-sections of the proposed quarry site prepared by Mr L. Barnes of the Geological Survey of South Australia. Sites mentioned below refer to borehole locations shown on this map.

1. Extraction method

The extraction of Limestone will involve heavy earthmoving equipment only; no explosives will be used. Scrapers will excavate material and carry it to the stockpile site shown on the attached map. For the most part, winning programmes will be restricted to dry summer months and the annual requirement stockpiled in a single annual operation lasting 2 - 3 weeks. Stockpiling is as essential part of the extraction programme as it will facilitate mixing of the limestone excavated and, hence, provide a consistent product.

In the short term, a minor extraction programme involving the use of bulldozers and loaders, will be required prior to the commencement of full scale mining. In the longer-term, occasional minor winter excavation programmes may be necessary to cope with periods of high demand for quarry products.

cont....

2. Area

Excavation will commence in the vicinity of sites C3, C4, C5, B4 and D4(see map), and will be progressively enlarged and deepened. No benches or berms will be cut and the quarry faces will comprise regular slopes suitable for operation of the scraper.

It is envisaged that the first ten years of operation will see the opening of a vertically-sided slot of approximately 200 m in length, 100m width and 6m depth. Subsequently the slot will be enlarged towards the general outline on the attached map. The final western margin of the pit will be a near-vertical face approximately through sites A1, A2, X10, B5 and C6. On completion of mining this face will be battered back to a safe angle and grassed.

The precise final location of the eastern margin has yet to be determined but any vertical faces will, similarly be battered back and grassed. The southern end of the quarry should, at this stage, be considered as open ended as it is intended that quarrying operations will extend southwards onto MC 1212.

A proposed final configuration for the quarry is shown in the attached cross-sections, although it is likely that the eastern margins of the quarry will be developed with a steeper face than shown, at least in the early stages of extraction. The maximum depth of the quarry will be of the order of 15 m.

3. Production rates

Anticipated production rate in the early stages of operation is 15,000 tonnes per annum, but this is expected to rise towards 30,000 tonnes per annum after five years. Excavation will commence in August 1980, subject to approval by the Department of Mines and Energy.

4. Equipment

As mentioned above, excavation will be conducted by scraper for about a three week period during the summer months with a possible requirement for occasional short periods of excavation during winter.

For the remainder of the year the only on-site equipment will be a front-end loader used for loading from the stockpile onto trucks.

5. Working hours

Hours of working in the quarry will be restricted to 7.00 a.m. - 6.00 p.m. on weekdays and 8.00 a.m. - 1.00 p.m. on Saturdays. As far as possible, loading from the stockpile trucks for transport to rail, will be restricted to the same hours but some weekend loading may be necessary during periods of peak demand.

6. Access

An access road will be constructed passing either just to the north of the ruin or just to the south of the east-west fenceline which cuts the eastern boundary of ML4672.

cont....

7. Dumps

Soil overburden is thin (less than 0.5m deep) and will generate a relatively small volume to be dumped. Some topsoil will be used to provide a screen to the south of the proposed quarry site (see below). The remainder will be retained near the eastern boundary of the lease area, in the vicinity of sites E2, E3 and E4, in a long, low mound, which will screen operations from Border Road. The mound will be grassed to prevent obtrusion on the local landscape.

8. Stockpiles

Stockpiles of limestone will be established on the eastern side of the pit area. Up to three seperate stockpiles may be present at any one time, each containing up to 12,000 tonnes of limestone. The highest grade stockpile will be located in the area between the pit and a low ridge.

9. Drainage

No provision for natural drainage from the quarry is possible. Water will collect at the lowest portion of the excavation. It is expected that much of this water will seep from the sump downwards through the underlying limestone to the water table. However, any collected water present in mid-summer will be removed by pumping prior to winning programmes.

10. Fencing

Temporary fencing will be constructed around the quarrying area to prevent domestic animals from entering the excavated area. This fencing is necessary to prevent accidental injury to the animals and to avoid contamination of clean limestone.

11. Buildings

A single lock-up shed, measuring approximately 10m by 10m and 6m high will be erected midway along the eastern boundary of ML 4672. This shed will provide garaging facilities for the front-end loader, as well as storage for tools and shelter facilities during wet weather. An adjoining smaller shed approximately 2m by 3m and 2m high will be used for fuel storage. The quantity of fuel to be stored will be small, sufficient for the front-end loader only.

12. Screening

Two measures will be adopted to screen all operations from the road which passes to the south of MC 1212:-

(i) Two or three rows of trees (of the same species as those growing in the area southeast of MC 1212) will be planted on the northern side of the road.

(ii) A portion of the topsoil removed from the quarry site will be stored in a low-profile mound along the edge of the

cont...

plateau north of Dry Creek water course. The mound will be shaped and grassed.

13. Rehabilitation

With progressive removal of limestone, an excavation increasing in area and depth will be developed. Two possible methods of rehabilitation of this excavation are proposed:-

(i) An artificial lake could be established on completion of mining by sealing the pit slopes and floor with swelling -type bentonite to prevent water leakage.

(ii) All faces could be battered back, and the mined out area grassed and returned to grazing.

Under the latter proposal, progressive rehabilitation during the life of the mine will be possible to some extent.

14. E.T.S.A. Easement

The width of the E.T.S.A. easement is 20 m.

15. Life of the excavation

Limestone mining operations are expected to continue for at least thirty years.

I hope that this submission satisfies your requirements. As previously mentioned, we are anxious to commence mining operations at Caroline as soon as possible. We would be happy to provide any additional information, or amendments to this proposal, that you may require.

Yours faithfully,
Minerals Pty. Ltd

R.H. Archer
Raw Materials Manager