

MINERAL HOLDINGS AUSTRALIA PTY LTD

**RETENTION LICENCE RL10/1997
TOGARI
(BRITTONS SWAMP)**

**FINAL REPORT ON EXPLORATION
APRIL 2017**

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ABSTRACT

RL10/1997 was granted to Mineral Holdings Australia Pty. Ltd. (MHA) on 8 May 1998, over an area of 5 square kilometres in Northwest Tasmania. The Licence is a flow on title from EL33/1990 and covers exploration for Category 3 construction materials and Category 5 industrial minerals and semi-precious stones. Previous work by MHA has established a large resource of high-grade dolomite suitable for blast furnace use.

There has been a long history of exploration by MHA, and a series of joint venture partners, for a wide range of carbonate products in Northwest Tasmania. By 1997, MHA had outlined a substantial inventory of high quality dolomite at Togari and has proceeded with a number of attempts to market material from the area.

Successful trials have been carried out for the manufacture of refractory bricks by Baker Dolomite in the USA and as a steel making furnace feed by Nittetsu Shoji Co. in Japan.

In 2010, BlueScope Steel asked MHA to supply a 5,000 tonne bulk sample of dolomite for a full scale furnace trial at Port Kembla. However, the window of opportunity was missed as environmental delays in the granting of the lease to produce the bulk sample saw the Australian steel industry facing financial difficulties.

The grade of the Togari dolomite more than favorably compares to the dolomite from Ardrossan in South Australia—the current source for the Australian steel companies—however, MHA believes it will be several years before the steel companies are willing to take dolomite from Togari as well as Ardrossan.

Attempts to market dolomite from the Togari area have continued, with Alcoa Australia showing interest in calcined dolomite for further evaluation and Grange Resources currently conducting tests to produce fluxed magnetite pellets. If Grange Resources' trials are successful, Togari is ideally located to supply dolomite for their pellets.

The dolomite resource at Togari has been estimated as 93 million tonnes to a depth of 20 metres (Appendix A). The resource is very close to Inferred category under the JORC Code.

With Mineral Resources Tasmania pressuring MHA to carry out expensive drilling campaigns, even though any prospect of production is many years away, MHA has reluctantly decided to relinquish title to the Togari/Brittons Swamp retention licence.

1.0 INTRODUCTION

RL10/1997 was granted to Mineral Holdings Australia Pty. Ltd. (MHA) on 8 May 1998 over an area of 5 square kilometres in Northwest Tasmania. The Licence is a flow on title from EL33/1990 and covers exploration for Category 3 construction materials and Category 5 industrial minerals and semi-precious stones.

The property is located in recently cleared farming land, adjacent to the Montagu River drainage channel, south of the Bass Highway and about 25 kilometres south-west of Smithton. Access is via the township of Brittons Swamp on the Bass Highway, 25 kilometres west of Smithton, thence 2 kilometres south along Salmon River Rd. and then via farm tracks to the licence area.

2.0 PREVIOUS EXPLORATION

There has been a long history of exploration by MHA, and a series of joint venture partners, for a wide range of carbonate products in Northwest Tasmania. By 1997, MHA had outlined a substantial inventory of high-quality dolomite at Togari and has proceeded with a number of attempts to market material from the area.

The Precambrian dolomite at Togari was mostly explored during the years 1995 to 1998. During that time, exploration consisted of:

- 41 shallow backhoe pits dug to provide depth of soil overburden and to provide samples of the dolomite (marked T 1 to T 41 on the map shown in Figure 2).
- 5 hammer drill holes were developed along existing tracks (marked TP 1 to TP 5 on the map shown in Figure 2)

Samples of Togari Dolomite were sent to Baker Dolomite (USA), who conducted tests on refractory bricks made from the dolomite. The results were apparently successful but a copy of the test results is missing from the files. Follow up samples were then sent to National Refractories and the Research and Development Centre for Refractory Materials. Both only carried out routine analysis of the samples but noted the high purity of the sample which they compared favourably with their own deposits. Unimin also carried out what appears to be a single assay of Togari dolomite

A 250 tonne bulk sample was sent to Nittetsu Shoji Co. in Japan for steelmaking furnace trials. The results were again very successful and were referred on to Nippon Steel. The fine ore ratio after firing was only 6.8%.

Comalco and APPM carried out whiteness tests for paper manufacture without any success.

In 2010, BlueScope Steel requested a 5,000 tonne bulk sample of Togari dolomite for a full-scale furnace trial at their Port Kembla steelworks. Even though the site was on fully cleared farming land and there were no objections from the landowner, the public or the local council, it took over a year for the environmental approval to be given for the sample to be taken under mining lease 1906P/M, and by this time the steel industry in Australia was struggling and the trial was abandoned. It is likely to be several years before BlueScope Steel is willing to resume the test program.

3.0 GEOLOGY

The Togari area lies on the steeply dipping east limb of a major anticline and, with a stratigraphic thickness well in excess of 1,000 metres, a very large resource of dolomite is certainly available. However, the dolomite is generally low-lying in an extensive plain, covered by a thin black soil layer, and is only exposed in drainage trenches. Where it can be seen, the dolomite is white to pale grey in colour and is a hard, massive, very fine grained marble. No banding is visible but it is believed the dolomite dips at 20 to 30 degrees to the east in this area.

An average assay of the material is given in the table below along with comparison assays of Ardrossan and ACI Mt. Gambier dolomites. The grade compares more than favourably with the average grade of those existing suppliers.

Element/Oxide	Dolomite		
	Togari	BHP Ardrossan	ACI Mt. Gambier
SiO ₂	0.44	2.00	1.0
TiO ₂	0.01	0.01	-
Al ₂ O ₃	0.54	0.39	0.5
Fe ₂ O ₃	0.24	0.80	0.21
MnO	0.005	0.14	-
MgO	19.62	21.00	18.8
CaO	32.86	29.00	33.7
Na ₂ O	0.08	-	-
K ₂ O	-	0.048	-
P ₂ O ₅	-	0.05	-
SO ₃	-	0.15	-
LOI (%)	46.1	46.40	-

TABLE 1: DOLOMITE ASSAY COMPARISON

Mineral Resources Tasmania asked for a resource estimate for the dolomite at Togari. A copy of the resource estimate of 93 million tonnes to 20 metres depth is attached in Appendix A (Please note that the resource estimate provided in the annual report for 2016 contained numerous typing errors and should be ignored).

The resource is very close to Inferred category under the JORC Code and, because of the very large tonnage, further drilling to better define the Inferred category is unwarranted until the steel companies decide to trial the dolomite in production trials.

4.0 CURRENT STATUS

MHA has made considerable efforts to interest major Australian and overseas groups in its carbonate holdings in Northwest Tasmania and RL10/1997 has been an integral part of our 'Pilbara of Carbonates' program.

A major part of this program is to interest those companies in the benefits of mining high-purity materials that are cryptocrystalline in nature and therefore suitable for use in vertical kilns where it is possible to trap the CO₂ off-gas. There would appear to be large advantages for companies seeking to reduce their carbon footprint; particularly the cement companies with which we have had numerous discussions, including Adelaide Brighton.

Alcoa Australia have also shown considerable interest in the supply of dolomite from Togari and, although they do not use dolomite in their current process, they have requested a 10 kilogram sample of calcined dolomite from the site for further evaluation.

Grange Resources is currently conducting tests to produce fluxed magnetite pellets and if these trials are successful, Togari is ideally located to supply dolomite for their pellets.

Further discussions and information exchanges have been made with the steel companies, BlueScope and Arrium; however, MHA believes it will be several years before they decide to take dolomite from Togari in addition to Ardrossan.

As Mineral Resources Tasmania is pressuring MHA to carry out expensive drilling campaigns—even though any prospect of production is many years away—MHA has reluctantly decided to relinquish title to the Togari/Brittons Swamp retention licence.

5.0 ENVIRONMENT

There are no outstanding environmental issues.

6.0 REFERENCES

Dickson, T. W. 2012. Retention Licence 10/1997 Togari. Report on Exploration March 2010 to March 2012. Mineral Holdings Australia Pty Ltd

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7.0 KEYWORDS

Togari, Dolomite, Precambrian, Cryptocrystalline.

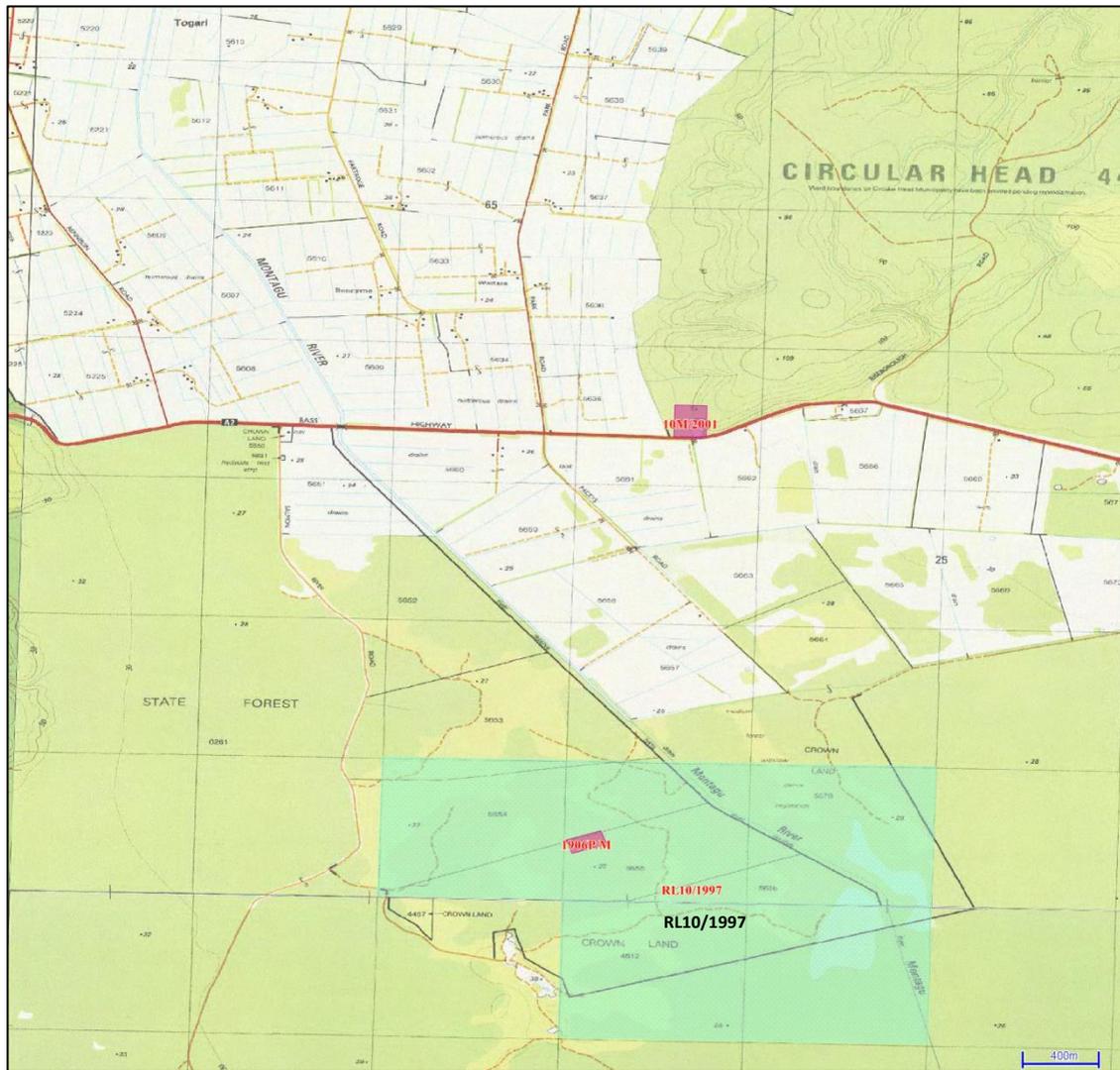


Figure 1: Location Diagram - RL10/1997 Togari
South of the Bass Highway and 1km south-west of Brittons Swamp

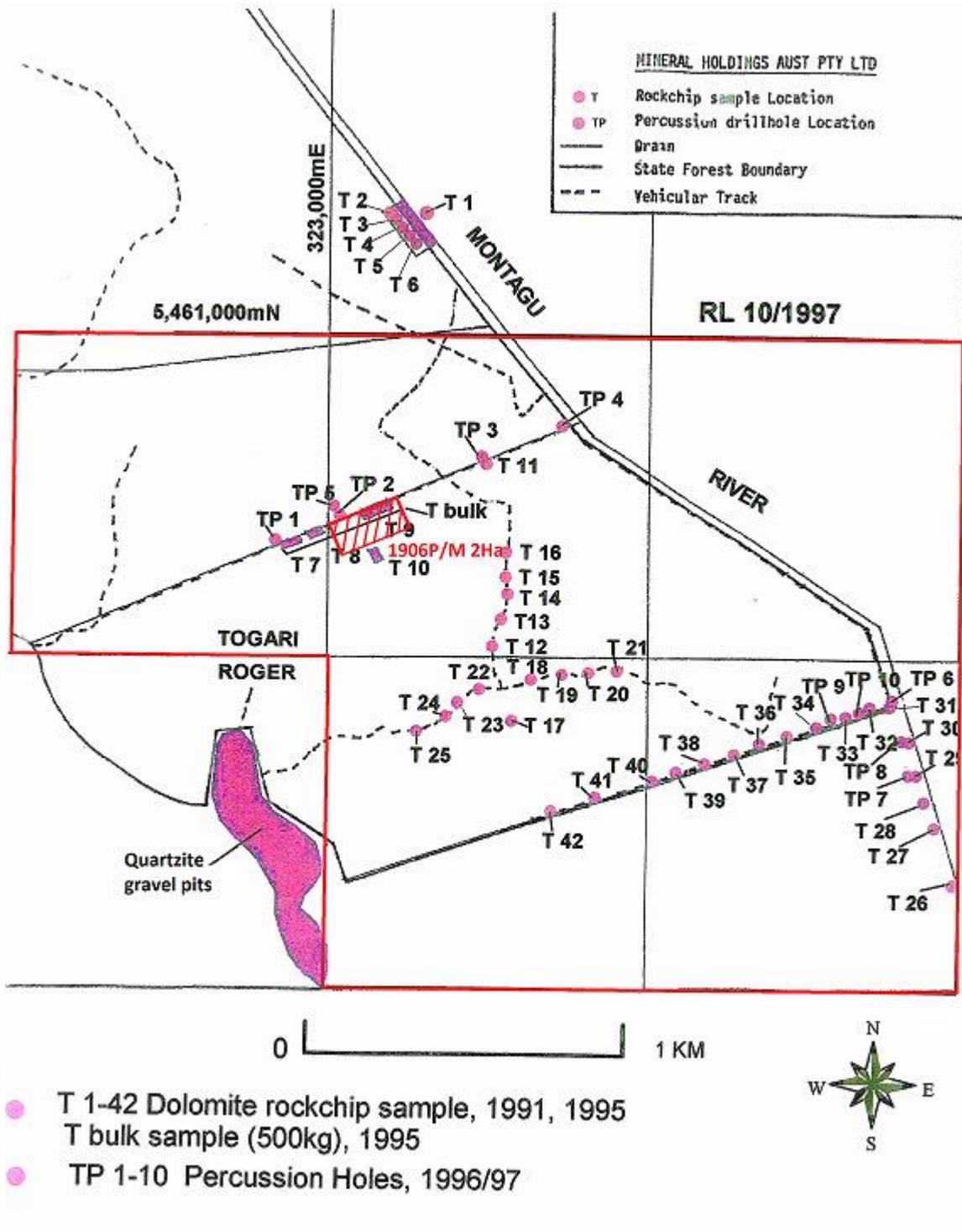
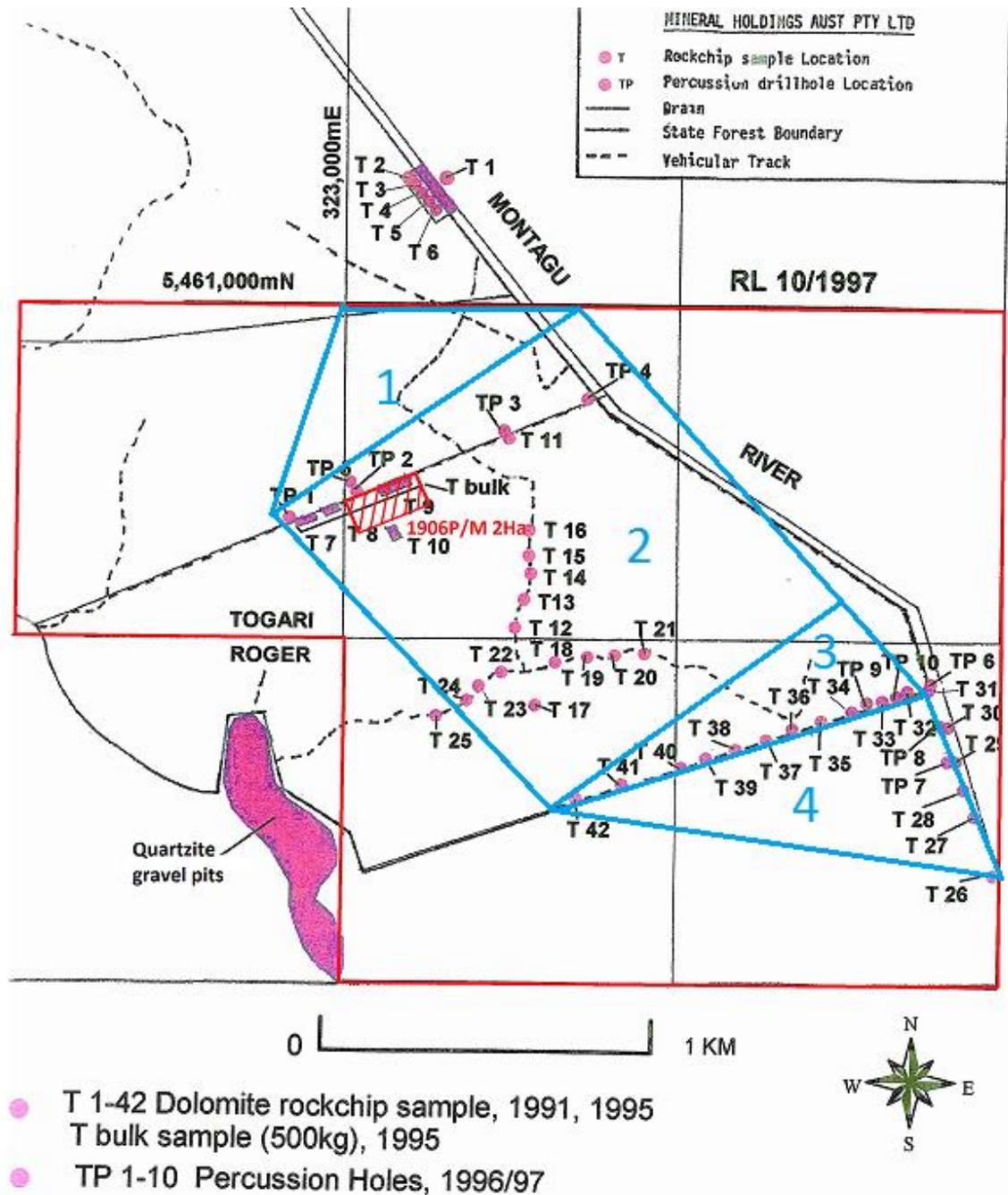


Figure 2: MHA Dolomite Sampling & Drilling - RL10/1997

APPENDIX A

TOGARI DOLOMITE ORE RESERVE CALCULATIONS



Note: All areas in resource match or exceed Ardrossan specifications. Pits 1 to 6 outside title.

TOTAL AREA: 2,035,000 m²

[AREA 1: 230,000 m², AREA 2: 1,210,000 m², AREA 3: 196,999 m², AREA 4: 397,999 m²]

COVER (2m depth): 7.3 million tonnes

[mass = volume x density = (2,035,000 x 2) x 1.8 = 7,326,000 t]

DOLOMITE (to 20m depth): 93 million tonnes

[mass = volume x density = (2,035,000 x (20 - 2)) x 2.56 = 93,772,800 t]