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Annual Report covering March 1999 - March 2000.
Arthur River Magnesite Project RL8718 - West Takone
Crest Magnesium NL*
Anon ML1M/99; RL8718

# ARTHUR RIVER MAGNESITE PROJECT

## RL 8718
## WEST TAKONE



## ANNUAL REPORT
## COVERING PERIOD
## MARCH 1999 – MARCH 2000

CREST MAGNESIUM NL
LEVEL 1/11 VENTNOR AVENUE
WEST PERTH – WESTERN AUSTRALIA

RL8718

See Folio 56

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Annual Report covering March 1999 - March 2000.
Arthur River Magnesite Project RL8718 - West Takone
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Anon ML1M/99; RL8718

Vol 1 of 3

## ABSTRACT

Retention License 8718 (together with Mining Lease Application 1M/99), cover a total area of 5 square kilometres in the Arthur River area of Northwestern Tasmania and centered about Latitude 41° 10'E, Longitude 145°27'S. Exploration completed to March 1999, comprising geological and geophysical investigations together with diamond drilling has confirmed the presence of high grade (>38% MgO) magnesite mineralisation. From this data a Measured Resource was delineated totalling 13 million tonnes, grading 43.4%MgO, 1.9%CaO, 1.3% $Fe_2O_3$ and 4.9% $Si0_2$. The recommended-going work programme comprises grade control drilling of the Measured Resource by way of 58 diamond drill holes, totalling 2760 metres.

Exploratory and in-fill drilling is also planned to investigate the mineralized zone located some 700 metres to the northeast between CRAE (1984) drill holes AR3 and AR6. The preliminary computer generated Inferred Resource for this zone totals about 10 million tonnes grading 41.52%MgO%, 2.53%CaO%, 1.86% $Fe_2O_3$ and 8.58% $Si0_2$.

Field work completed during the March 1999 – March 2000 reporting period was restricted to site visits with parties seeking in joint venture participation; investigation work relating to alternative site access routes; prospective acquisition of additional ground south of RL8718 and the identification and clearing of drill lines for planned grade-control drill holes.

In house works comprised the conversion of all current exploration results onto digital format to allow resource modelling and tonnage/grade estimates Administration works were directed towards the examination of various mining options for both production of magnesium metal and the possible manufacture of industrial magnesium products. This involved discussions with local and overseas companies.

631003

## CONTENTS



## FIGURES



## APPENDICES

## 1. INTRODUCTION

The tenement under study comprised RL8718, totalling 5 square kilometres in the Land District of Wellington and Russell, in the vicinity of Farquhars Bridge and comprises State Multiple Use Forest. The tenement is held by Tasmanian Magnesite NL which is a wholly owned subsidiary of Crest Magnesium NL.
This report covers the period 2nd March, 1999 to 2nd March 2000.

Site investigations of RL8718 (and associated MLA 1M/99), were restricted to a study of both alternative and current access routes, the siting of grade control diamond drillholes and access lines within an area designated Pit N°1, an examination, both on the ground and by aerial photostudy, of the southern boundary of MLA 1M/99 with the view to acquiring more ground and visits to the tenement with various interested, parties.

## 2. REVIEW OF PREVIOUS WORK

**Summary Report on Arthur/Lyons River, Magnesite Resources, Northwestern Tasmania**

Two deposits of magnesite mineralisation having the potential to contain at least 150 million tonnes of medium to high grade magnesite have been identified in the Arthur and Lyons Rivers region in Northwestern Tasmania. (Figures 1, 2 and 3)

The magnesite deposits were discovered in 1925 and since that time have been the subject of on going exploration, with the most recent diamond drilling investigation being completed in March 1999.

The exploratory works include geological mapping, surface chip sampling, geophysical traverses, diamond and percussion drilling, bulk sampling, coteaning, pitting and metallurgical test works.

A total of 60 exploratory, check and in-fill diamond drillholes have been completed and three major high grade resource zones designated, Proposed Pits Nos. 1 ,2 and 3 have been identified.

### RESOURCE ZONES

**Arthur River Proposed Pit No. 1**

Exploratory check and in-fill drilling carried out over a strike length of some 350 metres in the southwestern corner of RL 8718 (MLA 1/99), between the Arthur and the Keith Rivers have identified a Measured Resource totalling **13 million tonnes grading 43.4% MgO, 1.9% CaO, 1.3% $Fe_2O_3$ and 4.9% $SiO_2$ to a maximum vertical depth of 145 metres**. (Figure 4)

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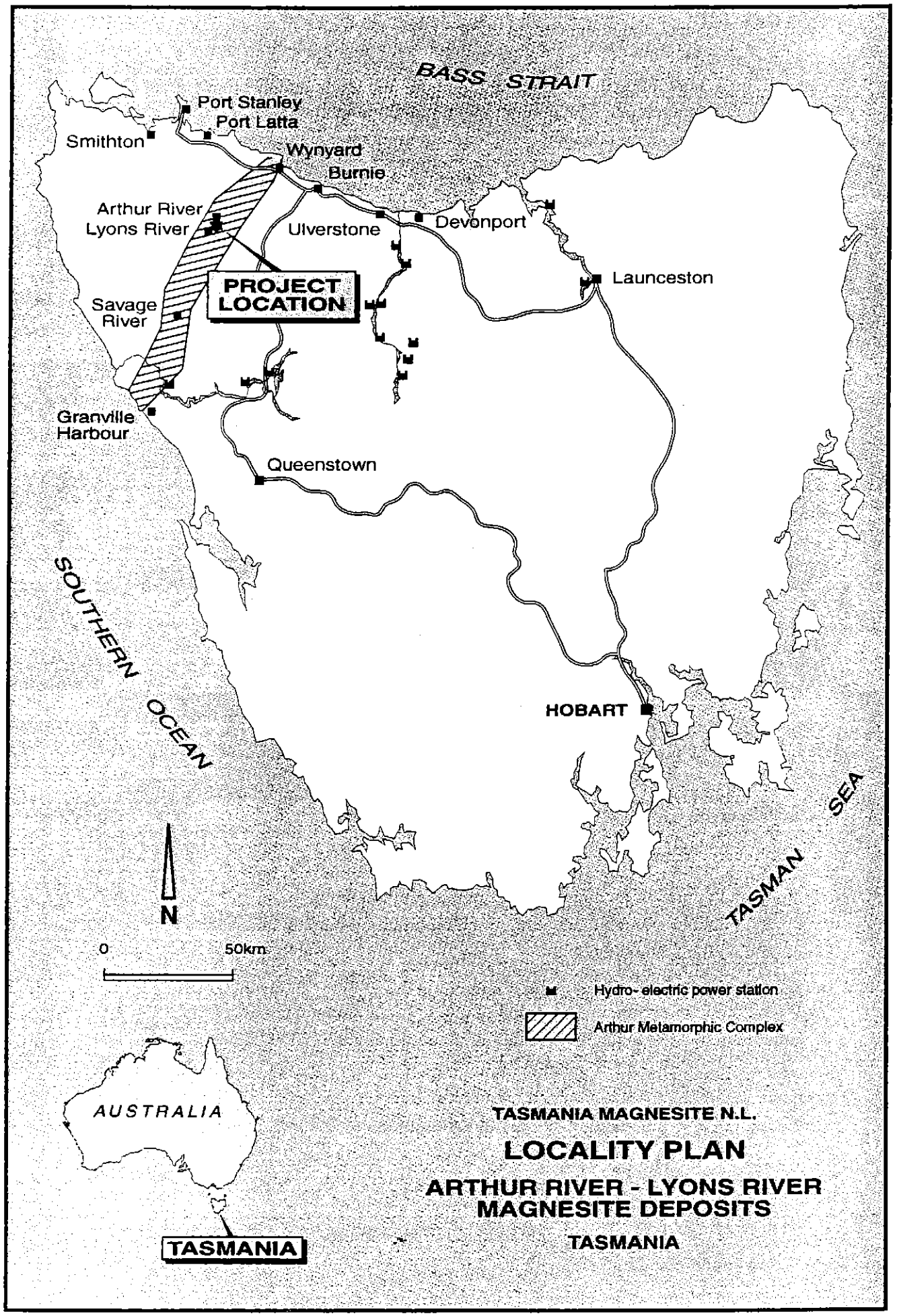


Mertson Associates (+61 8) 9321 8598

FIGURE 1

5 cm

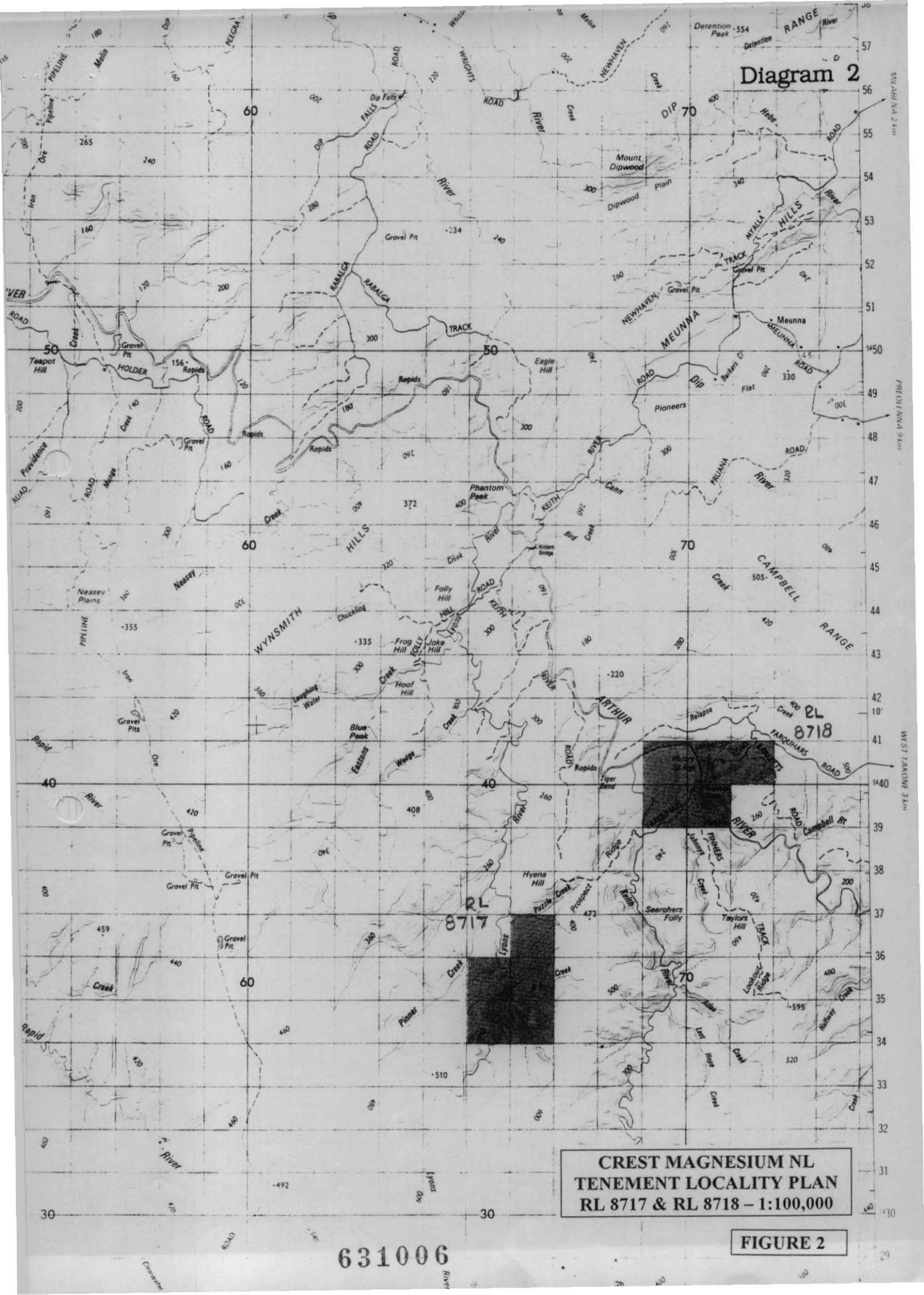
Diagram 2
RL 8717
RL 8718
CREST MAGNESIUM NL
TENEMENT LOCALITY PLAN
RL 8717 & RL 8718 – 1:100,000
FIGURE 2
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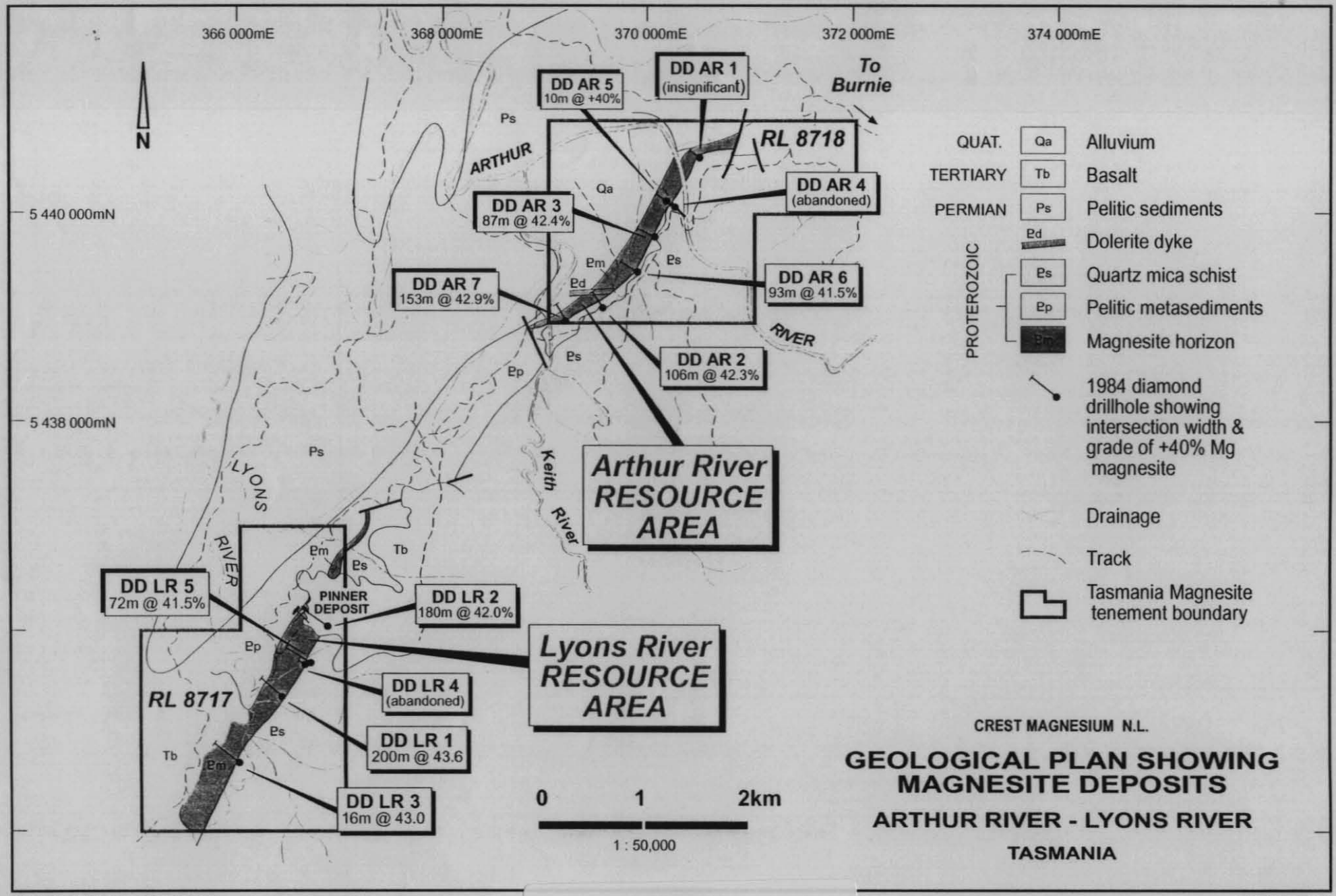


CREST MAGNESIUM N.L.

# GEOLOGICAL PLAN SHOWING MAGNESITE DEPOSITS

## ARTHUR RIVER - LYONS RIVER

## TASMANIA

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5 cm

FIGURE 3

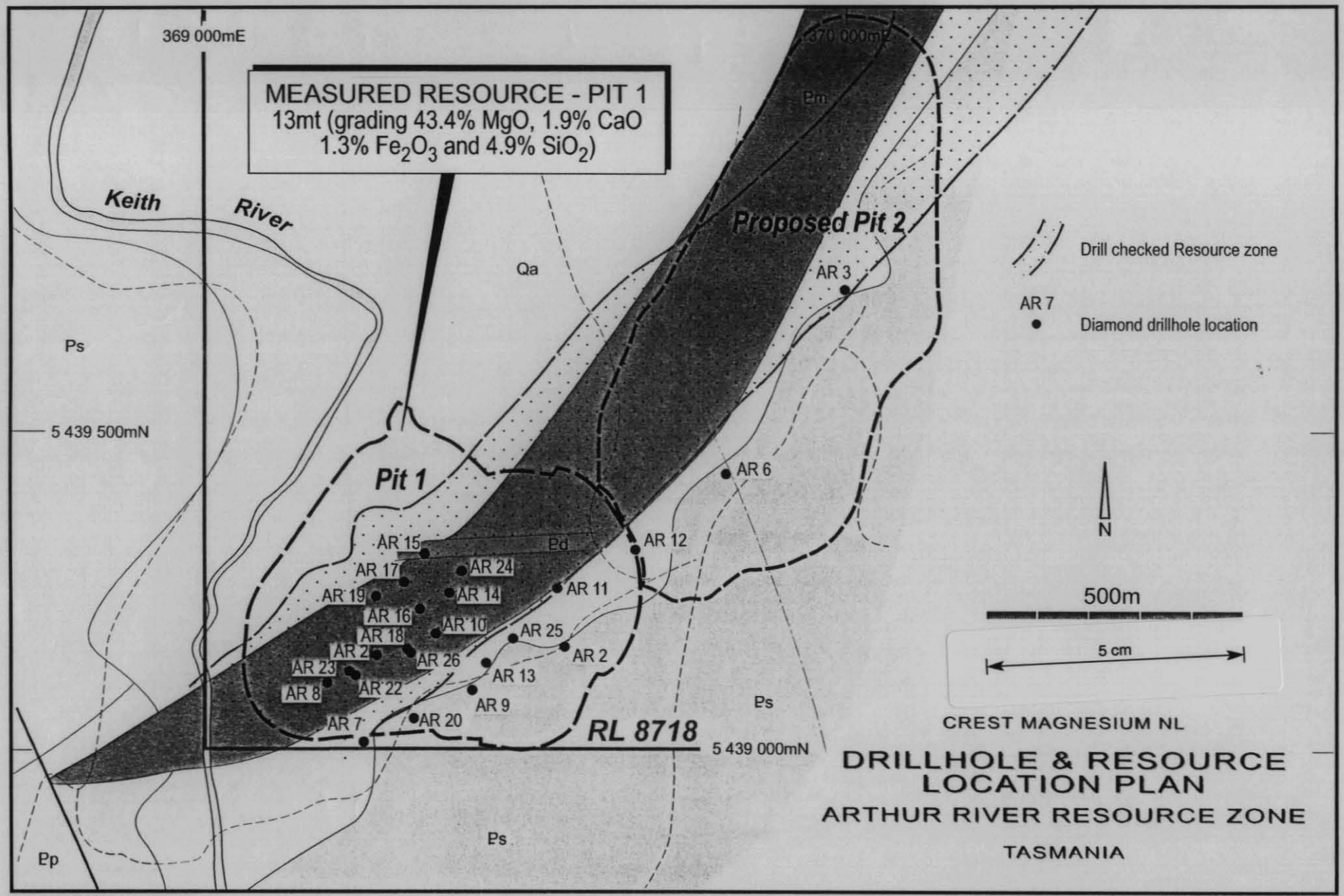


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Figure 4

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This resource zone occupies only 250 metres of the Arthur River carbonate body which, within the boundary of RL 8718, has an estimated strike length of about 3500 metres.

Cut off grades used in resource calculations were based on data provided by consultants, Hatch and Associates, following metallurgical test works carried out in Canada, using drillcore samples obtained from the three drilling programmes, namely CRAE (1983), Tasmania Magnesite NL (1997) and Crest Magnesium NL (1998/1999).

The cut off grades applied were as follows:

| | |
|---|---|
| MgO | 38% |
| CaO | 4% |
| $Fe_2O_3$ | 6% |
| $SiO_2$ | 12% |

The drilling information and core analysis results have been converted to digital format to allow further processing. Resource modelling and tonnage/grade estimates have been carried out using the Surpac 2000 mining software package.

Plans and sections detailing Proposed Pit No.1 are contained in Appendix 1.

**Industrial Magnesium Products Potential**

As a source of industrial high grade magnesite, two zones were identified within Proposed Pit No.1 to a maximum depth of 50 metres vertical (85m RL).

The identified resource in this area totals **4.6 million tonnes grading 43.0% MgO, 1.89% CaO, 1.12% $Fe_2O_3$ and 3.82% $SiO_2$.**

Resource estimates and grades have been identified for four options within the main pit as follows:

**LARGE SLOT 20140N – 20400N to 25m depth (110m RL)**

Resource: 2.02 tonnes
Grade: 43.79% MgO, 1.9% CaO, 1.05% $Fe_2O_3$, 3.88% $SiO_2$
Strip ratio: **2.0:1**

**SMALL SLOT 20140N – 20260N to 25m depth (110m RL)**

Resource: 1.02 million tonnes
Grade: 43.70% MgO, 1.82% CaO, 1.26% $Fe_2O_3$, 3.73% $SiO_2$
Strip ratio: **1.4:1**

**SMALL SLOT 20260N – 20400N to 25m depth (110m RL)**

Resource: 1.00 million tonnes
Grade: 43.87% MgO, 1.98% CaO, 0.83% $Fe_2O_3$, 4.03% $SiO_2$
Strip ratio: **2.7:1**

**LARGE SLOT 20140N – 20400N to 50m depth (85m RL)**
Resource: 4.60 million tonnes tonnes
Grade: 43.80% MgO, 1.89% CaO, 1.12% $Fe_2O_3$, 3.82% $SiO_2$
Strip ratio: **1.4:1**

**SMALL SLOT 20140N – 20260N to 50m depth (110m RL)**
Resource: 2.02 million tonnes
Grade: 43.69% MgO, 1.82% CaO, 1.29% $Fe_2O_3$, 3.74% $SiO_2$
Strip ratio: **1.2:1**

**SMALL SLOT 20260N – 20400N to 50m depth (110m RL)**
Resource: 2.60 million tonnes
Grade: 43.88% MgO, 1.94% CaO, 0.99% $Fe_2O_3$, 3.88% $SiO_2$
Strip ratio: **1.6:1**

Details of rock type tonnages and grades for the above industrial products resource mining options are contained in Appendix 2 together with proposed drillhole sections and grade control drill locations for the small slot, 20140N – 20260N, and a 25 metre deep pit.

Depending on ground conditions encountered and drill core recoveries it is estimated that grade control drilling for the resource between 20140N – 20260N will require about 58 holes for a maximum of 2760 metres of drilling.

**Arthur River Proposed Pit No.2**
In 1983, the northeastern extension of the Arthur River magnesite resource zone was investigated by CRAE using two diamond drill holes AR3 and AR6. (Figure 2)

In summary, the results of this work contained in CRAE reports indicate approximately 100 metres thickness of high-grade magnesite mineralisation to a maximum drill depth of about 350 metres, averaging **41.9% MgO, 2.3% CaO, 1.6% $Fe_2O_3$ and 6.4% $Sio_2$.**

The above resource grades which were inferred from only two holes will have to be verified by additional check and in-fill drilling:
A twelve hole diamond drilling programme has been planned and a request to carry out the work was submitted to the relevant Government Authorities in mid-1999.

A summary of the drilling results and analysis for the two holes completed by CRAE is a follows:

**DDH AR3**

Total carbonate thickness 317 metres with some sandstone interbeds. Footwall rock was pyritic siltstone. The results confirm the general continuity of the magnesite mineralisation encountered in drillhole AR2 and also indicated the presence of significant karstic (sinkhole) features.

The drill log summary is:

| | |
|---|---|
| 0-78 metres | Weathered and karstic magnesite |
| 78-125 metres | Magnesite/dolomite interbeds |
| 125-130.5 | Quartz sandstone |
| 130.5-132.5 metres | Magnesite/dolomite interbeds |
| 132.5-134.0 metres | Quartz sandstone |
| 134.0-161.2 metres | Magnesite/dolomite mix |
| 161.2-163.6 metres | Quartz sandstone |
| 163.6-393.2 metres | Magnesite/dolomite mix |
| 393.2-408.0 metres | Schist/siltstone/possible amphibolite |

Analyses were:

DDH AR3

| Interval | m | MgO | $Fe_2O_3$ | CaO | $SiO_2$ | LOI |
|---|---|---|---|---|---|---|
| 78.0- 90.0 | 12.0 | 41.67 | 3.63 | 0.36 | 8.47 | 45.59 |
| 139.0-144.0 | 5.0 | 40.48 | 1.47 | 5.28 | 4.31 | 48.21 |
| 159.0-161.2 | 2.2 | 42.27 | 1.27 | 1.19 | 12.27 | 44.48 |
| 167.0-179.0 | 9.0 | 41.48 | 1.53 | 2.17 | 7.33 | 47.31 |
| 184.0-225.0 | 41.0 | 42.90 | 2.36 | 2.28 | 3.19 | 49.08 |
| 235.0-242.6 | 7.6 | 44.13 | 0.74 | 2.64 | 2.71 | 49.68 |
| 243.0-249.1 | 6.1 | 43.51 | 1.07 | 2.70 | 2.85 | 49.19 |
| 251.3-256.0 | 4.7 | 41.29 | 0.93 | 2.31 | 8.38 | 46.63 |
| **Average** | 86.6 m | 42.44 | 2.06 | 2.05 | 4.84 | 48.18 |

**DDH AR6**

The total carbonate thickness for this hole was 279 metres with a number of cavities recorded throughout the drill section and the presence of fault gouge reported at the bottom of the hole.

The log summary is:

| | |
|---|---|
| 0.0- 71.0m | No core, tricone drilling in weathered schist |
| 71.0- 76.4m | Angular magnesite breccia |
| 76.4-114.0m | Rubble filled cavity |
| 114.0-271.0m | Magnesite massive ore brecciated |
| 271.0-282.0m | Magnesite |

| | |
|---|---|
| 282.2-352.3m | Massive magnesite |
| 352.3-382.0m | Cavity |

The drillcore analyses are:

| Interval | m | MgO | $Fe_2O_3$ | CaO | $SiO_2$ | LOI |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| 114.2-116.3 | 2.1 | 42.4 | 0.22 | 1.75 | 8.13 | 47.3 |
| 124.0-125.8 | 1.8 | 41.0 | 0.45 | 2.83 | 9.05 | 46.6 |
| 130.3-132.4 | 2.1 | 43.0 | 0.55 | 1.66 | 6.61 | 47.5 |
| 133.0-143.0 | 10.0 | 41.9 | 0.37 | 2.18 | 8.41 | 47.0 |
| 163.0-166.4 | 3.4 | 41.1 | 0.81 | 2.42 | 8.96 | 46.2 |
| 179.3-189.0 | 9.7 | 40.8 | 0.57 | 2.99 | 8.82 | 46.7 |
| 194.0-208.0 | 14.0 | 41.1 | 3.87 | 3.03 | 7.98 | 46.8 |
| 224.0-229.0 | 5.0 | 40.1 | 3.42 | 2.74 | 5.16 | 47.5 |
| 280.0-287.0 | 7.0 | 41.1 | 1.14 | 2.93 | 7.59 | 47.2 |
| 293.4-298.0 | 4.6 | 42.6 | 0.77 | 1.81 | 7.09 | 47.7 |
| 303.0-313.0 | 10.0 | 42.9 | 0.31 | 3.05 | 5.10 | 48.7 |
| 318.0-323.0 | 5.0 | 41.3 | 1.06 | 1.46 | 10.15 | 15.9 |
| 328.0-336.4 | 8.4 | 41.7 | 1.26 | 2.03 | 7.97 | 16.9 |
| 338.0-348.0 | 10.0 | 41.1 | 0.77 | 2.41 | 9.27 | 46.5 |
| Average | 93.1 m | 41.5 | 1.33 | 2.50 | 7.86 | 47.1 |

Based on this information a computer generated Inferred Resource within Proposed Pit No.2 was as follows:

**10 million tonnes grading 41.52% MgO, 2.53% CaO, 1.86% $Fe_2O_3$ and 8.58% $SiO_2$.** Details of the various resource types, and waste rock tonnages are contained in Appendix 3.

Whereas there is information from only two holes the evidence of extensive magnesite mineralisation, comparable having a geological setting and similar high grades indicates that Proposed Pit No.2 is sited on a high grade magnesite resource similar to that delineated by the in-fill drilling programme, carried out 500metres to the southwest and the results of drilling at Lyons River within RL8717.

**Lyons River RL 8717**

Between 1983-1984 CRAE carried out a limited programme of reconnaissance diamond drilling comprising holes LR 1,2,3,4,5,6 and 11A which investigated approximately 1200 metres of the main magnesite mineralisation. In 1989, a further 25 short (40m) holes were drilled to investigate part of what was called the Pinner Quarry Deposit.

This latter programme was largely inconclusive because of poor core recoveries, deep weathering and the presence of dolomitic horizons. CRAE estimated that the Lyons River area had the potential to host possibly 100 million tonnes of high grade magnesite grading in excess of 40% MgO.

Using the CRAE drilling data, a computer generated resource was **121.3 million tonnes grading 41.1% MgO, 2.8% CaO, 1.0% $Fe_2O_3$ and 8.0% $SiO_2$**, which generally supports the CRAE estimate.

**Proposed Pit No. 3 (Pit based 200m AHD)**
Using the results of metallurgical test works carried out on core derived from detailed drilling in the Arthur River area (RL 8718), the potential of the Lyons River area has been reassessed using more appropriate cut off grades.

In an attempt to reduce the probable influx of groundwater, the design for Proposed Pit No. 3 limited mining to a maximum vertical depth of 200m AHD, which is some 10 metres above the Lyons River channel invert. (Figure 3)

The preliminary resource tonnages and grade calculated for Proposed Pit No. 3 were as follows:

**15.8 million tonnes grading 39.9% MgO, 2.9% CaO, 0.62% $Fe_2O_3$ and 10.6% $SiO_2$.**

A more detailed breakdown of the various resource types and waste rock are contained in Appendix 4.

**Proposed Pit No. 3 (Pit base 135m AHD)**
Based on the best results from the diamond drillholes namely $LR^s$ 1,5,2,6,9,10 and $11^A$, a nominal pit to a approximate depth of 75 metres (135m AHD) generates an Inferrred Resource of **53.5 million tonnes grading 40.47% MgO, 3.42% CaO, 0.92% $Fe_2O_3$ and 8.29% $SiO_2$.** (Figure 4)

It should be noted that the Lyons River, resource estimates have been derived from only limited drilling data, namely five hole. LR's 1,2,5,6 and 11A. For more reliable estimate a further 20 holes totalling 4000 metre are proposed.

## 3. EXPLORATION COMPLETED DURING THE REPORT PERIOD

### 3.1 Regional exploration activities

1. None

**a. Prospect based exploration activities**

1. Site inspections, drill site location, line cutting and planning.
2. Resource modelling involved the calculation of resource zones using Surpac Mining Software for two proposed pits which covered a number of mining options and resource tonnages. Details of this work are summarized in attached Appendices.

## 4. DISCUSSIONS OF RESULTS

### 4.1 Proposed Pit No 1

For magnesium metal production a Measured Resource of 13 million tonnes was delineated. This resource was to be accessed by Pit No 1 mined in five stages to a maximum depth of 145 metres below ground level. Mining rates were to be varied from a minimum of about 300,000 tpa to a maximum of 1,000,000 tpa, depending on the final treatment plant design.

In addition to the production of magnesium metal, investigations are proceeding into the production of industrial magnesite, with mining tonnages being much smaller and with pit levels being restricted to maximum of 50 metres below the overburden cover.

### 4.2 Proposed Pit No 2

An additional resource zone has been delineated elsewhere within the tenement as Proposed Pit No 2. This resource is designated Inferred and will require further exploratory and in-fill diamond drilling before the resource status can be upgraded to either Indicated or Measured Status.

## 5. CONCLUSIONS

The Measured Resource totalling **13 million tonnes grading 43.4% MgO, 1.9% CaO, 1.3% $Fe_2O_3$ and 4.9% $SiO_2$** has been identified in the area currently under investigation. This resource is suitable for both the production of magnesium metal and/or industrial magnesite.

## 6. RECOMMENDATIONS

Recommended exploration to confirm the results of exploration completed to date and to provide grade control data will involve a drilling programme within the area designated Pit No1 comprising 58 short (± 40m) holes for a total of 2760 metres at a cost of between $500,000 to $600,000. To upgrade the Inferred Resource delineated by CRAE in 1984 (AR3 and AR6) in the vicinity of Pit No2, a further 12 exploratory and in-fill holes are planned.

These holes will be drilled a 100m spacings along four lines spaced 150 metres apart. Inclined at -46° and drilled to a maximum depth of possibly 250 metres. Depending on the results of this work further

drilling may be required. The drilling programme will cost in the vicinity of $500,000.

## 7. ENVIRONMENT

During the reporting period environmental studies comprising flora and fauna studies, hydrological testing (which included the construction of 5 monitoring and 1 pumping bore) are pump tests were carried out. This work was carried out by Pitt and Sherry Consulting Engineers, Hobart. This report is not yet complete.

## 8. EXPENDITURE

**RL 8718 $5,279,800**

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**10. KEYWORDS**

**ARTHUR RIVER; MAGNESITE; RL8718; MLA 1M/99; FARQUHARS BRIDGE NORTHWESTERN TASMANIA; ARTHUR LINEAMENT; CRAE; NYE, PB; TASMANIA MAGNESITE NL; CREST MAGESIUM NL.**

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# APPENDICES 1 - 4

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# APPENDIX 1

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Annual Report covering March 1999 - March 2000.
Arthur River Magnesite Project RL8718 - West Takone
Crest Magnesium NL*
Anon ML1M/99; RL8718 Vol. 2 of 2



# APPENDICES 1-4

To accompany
Summary Report on Arthur/Lyons River
Magnesite Resources
Northwestern Tasmania

January 2000

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# APPENDIX 1

# Arthur River Magnesite Project

## RL8718

## West Takone – Northwestern Tasmania

## Annual Report

## Covering period 1998 –1999

**Crest Magnesium NL**
**Level 1/11 Ventnor Avenue**
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St George's Terrace
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May 1999

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**TABLE OF CONTENTS**

631023

## FIGURES



## APPENDICES

## 1. LOCATION

The Lyons and Arthur Rivers Magnesite Project is located in the West Takone area of Northwestern Tasmania, and some 52 kilometres southwest of the Port of Burnie (Figure 1).

Access from Burnie is by way of the small village of Yolla, along the sealed Rosebery – Queenstown Highway to the West Takone turn off, a distance of 24.5 kilometres, thence a further 6.8 kilometres of bitumen by way of Takone. At 33.1 kilometres, the bitumen gives way to a graded gravel road.
The proposed mine site is a further 19.4 kilometres along Farquhars Road, on the western side of the Arthur River (30 tonnes capacity) and just short of Keith River, which is spanned by the Wenzel Bridge having a 5 tonne capacity.

## 2. TOPOGRAPHY, DRAINAGE AND VEGETATION

The topography of the area investigated, namely Mining Lease Application 1M/99, ranges from 139 metres AHD at the Keith River to 190 metres AHD in the vicinity of a mafic intrusive centered about Drillhole AR011.

The area is drained by the Arthur River (136AHD) and its tributaries, the main tributary being the Keith River, which bounds the resource zone along its western margin and drains northerly into the Arthur River.

Three small intermittently flowing creeks drain both westerly and northerly into the Keith and Arthur Rivers (Figure 2).

The vegetation is dense regrowth forest comprising eucalypts, myrtle and a virtually impenetrable, undercover of ferns and brambles together with fallen timber.

## 3. TENEMENT INFORMATION

Work completed during the reporting period was carried out within Retention Licence 8718 at Arthur River, West Takone, Northwestern Tasmania. This tenement has an area of five square kilometres and is one of two similarly sized licences covering an extensive zone of magnesite mineralisation. (Figures 2 and 3)

The second Retention Licence 8717, located at Lyons River some 4 kilometres southwest, covers the southern extension of the Arthur River magnesite resource which was the subject of diamond drill exploration during 1998/1999. Apart from reconnaissance inspections and data research no work was carried out in RL8717.

In February 1999, a Mining Lease, 1M/99, having an area of approximately 195 hectares was applied for within RL8718. This Mining Lease covers about 1.5 kilometres strike length of high grade magnesite mineralisation. The proposed mining operation to extract some 15 million tonnes of this high grade resource will be located in the southwestern corner of the mining lease.

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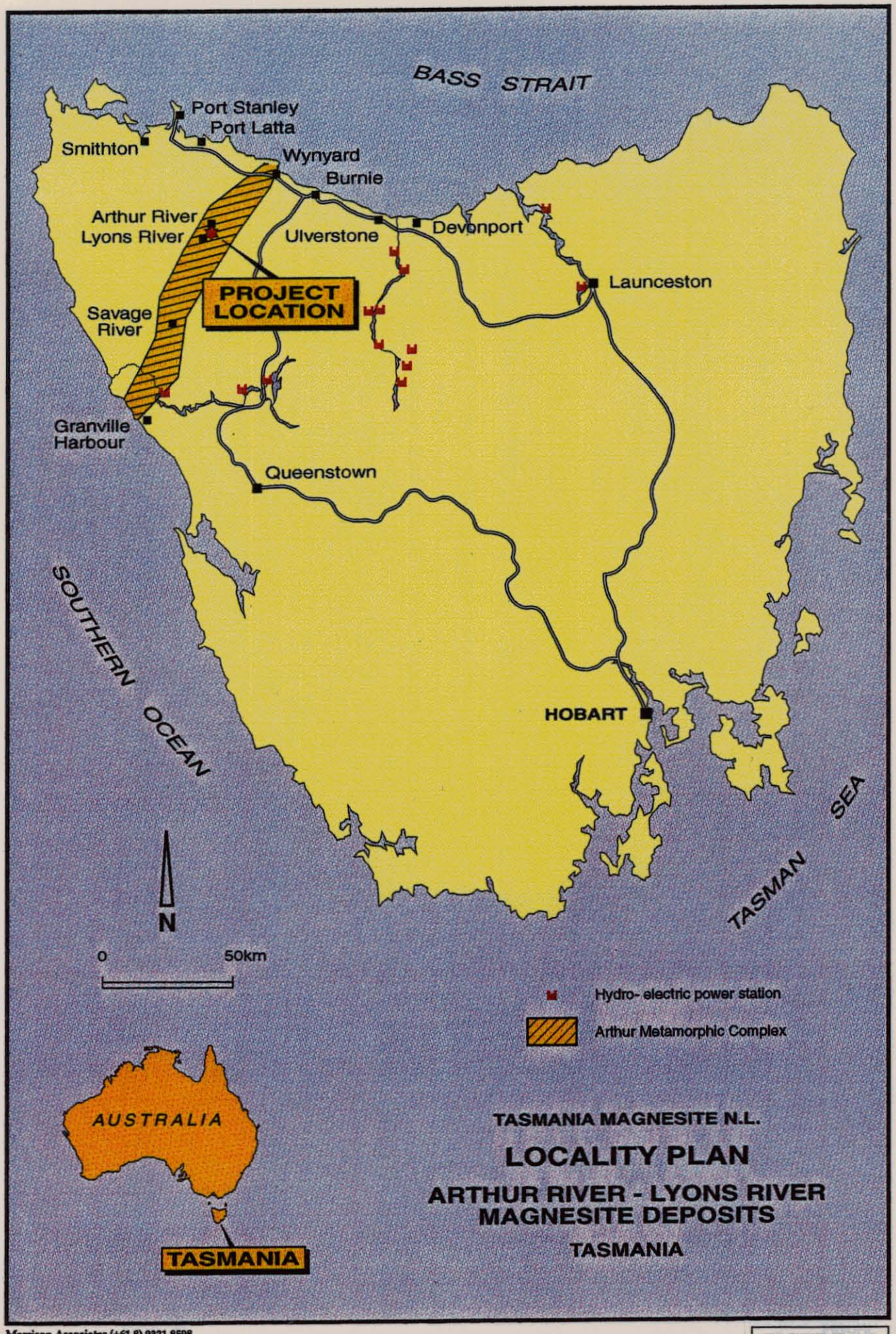


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**FIGURE 1**

5 cm

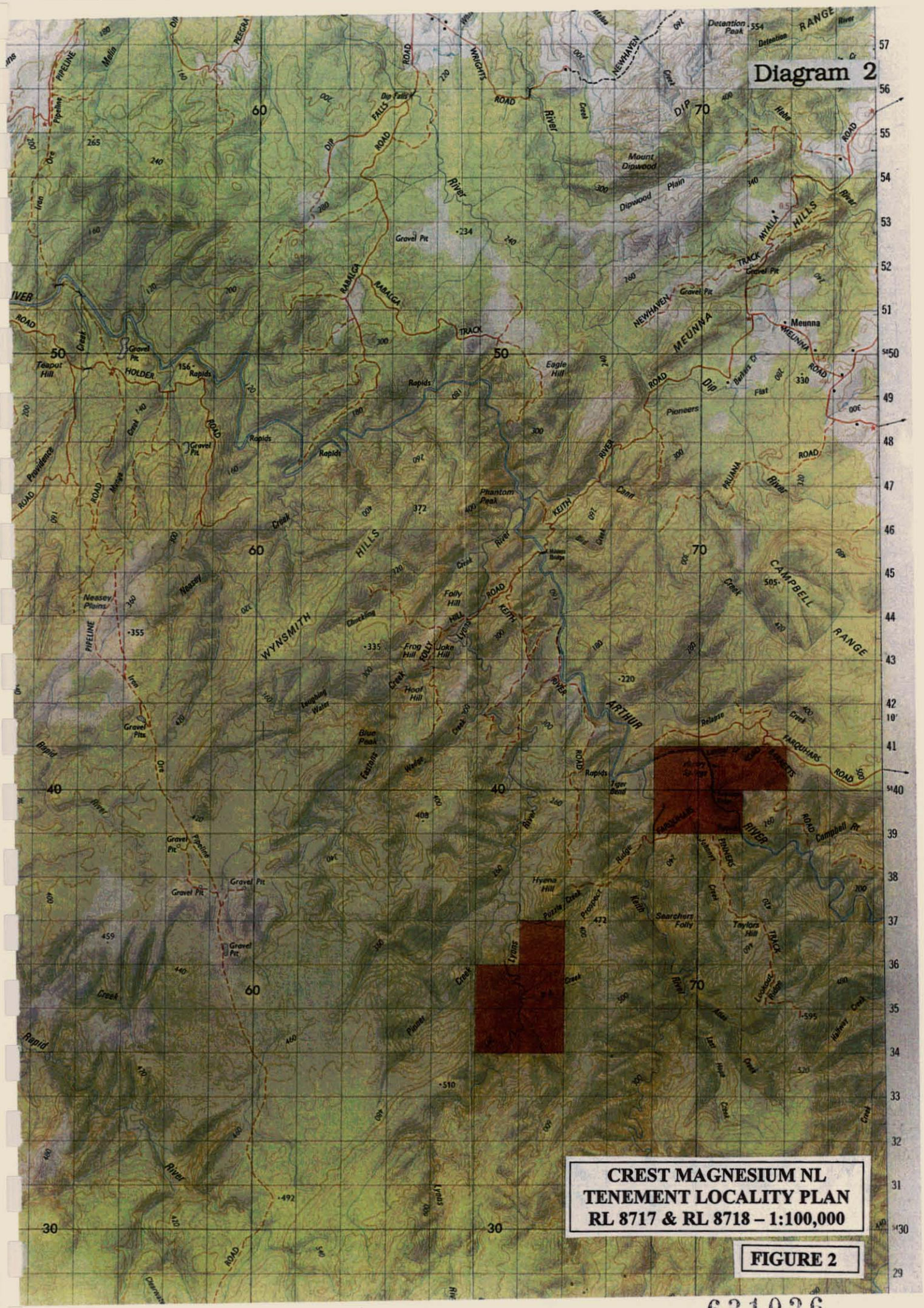
Diagram 2
CREST MAGNESIUM NL
TENEMENT LOCALITY PLAN
RL 8717 & RL 8718 – 1:100,000
FIGURE 2

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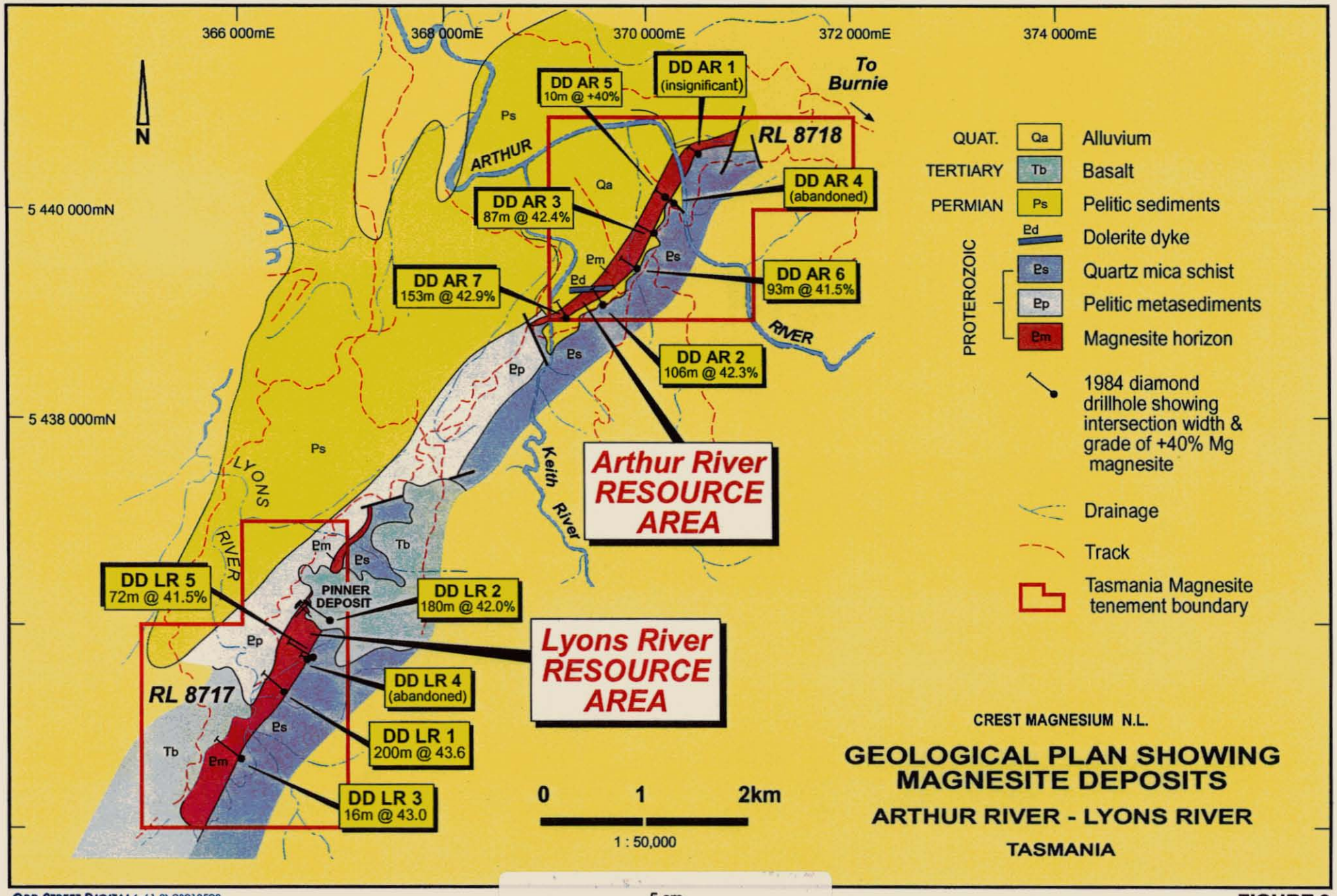


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FIGURE 3

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## 4. SUMMARY OF PREVIOUS EXPLORATION

The Arthur River magnesite deposit was first discovered in 1925. In 1970, Mineral Holdings Australia Pty Ltd (MHA) were granted a large exploration licence (EL43/70) over the area and during the next three years carried out exploration in association with a number of joint venture partners. Up to 1981, MHA continued exploration, which resulted in the discovery of magnesite at Lyons River, about 4 kilometres along strike south of the Arthur River deposit.

Between 1982 and 1988, MHA in joint venture with CRAE, carried out exploration comprising geological mapping, geophysical gravity surveys, diamond drilling, metallurgical testing and feasibility and marketing studies with the view to assessing the deposit as a source of dead-burned magnesite, caustic calcined magnesite and direct shipping ore.

This work delineated a carbonate body at Arthur River occurring over a 3,500 metres strike length and a similar magnesite body at the Lyons River, some 2000 metres long.

In 1997, Tasmania Magnesite NL entered into an option agreement to purchase the deposit from MHA. Check and exploratory diamond drilling at Arthur River comprising seven holes totalling 1254.3 metres confirmed the results of earlier workers with the delineation of an Indicated Resource totalling some 29 million tonnes at an average grade of 42.8% MgO and 5.3% $SiO_2$.

It has been estimated from past and recent drilling that the Arthur and Lyons Rivers magnesite deposits possibly contain as much as 180 million tonnes of high grade magnesite mineralisation to a vertical depth of 150 metres. Diamond drilling evidence indicated that the high grades encountered continue at depth to at least 400 metres and probably much deeper.

## 5. SUMMARY OF WORK COMPLETED DURING PERIOD

Commencing on 25 November 1998 and finishing on the 20 March 1999, a programme of in-fill diamond drilling, totalling 2759.9 metres in fifteen holes was carried out within RL8718.

The programme was designed to upgrade the Indicated Resource delineated by Tasmania Magnesite NL in 1997 to Measured Resource status, so as to allow a bankable feasibility study to proceed.

Thirteen out of the 15 holes intersected high-grade magnesite, whilst the remaining two holes confirmed the presence of a dolerite intrusive (or intrusives) which intersects the magnesite body between MB004 and AR012.

Applying cut off grades derived from preliminary metallurgical test works, a Measured Resource was identified over a 250 metre strike length and to an average depth of 145 metres, of 13 million tonnes grading 43.4% MgO, 1.9% CaO, 1.3% $Fe_2O_3$ and 4.9% $SiO_2$. This resource does not include 3.7 million tonnes of clayey and calcium oxide rich, high-grade magnesite which will be used for blending as feedstock for the proposed treatment plant.

The Measured Resource identified to date comprises only part of the magnesite mineralisation indicated by others within RL8717 (Lyons River) and RL8718 (Arthur River). This mineralised zone has a total strike length of about 5 kilometres, a maximum width in excess of 300 metres and a depth of at least 400 metres with no indication of weakening grade.

The data derived from this latest programme of in-fill drilling, together with check holes drilled in 1997, have been converted into digital format to allow further processing. Resource modelling and estimation have been carried out using the Surpac 2000 mining software package.

## 6. SPECIFIC SURVEYS

### 6.1 Topographic Surveys

In 1999, both ground Theodolite and GPS surveys were carried out by Peacock, Darcey and Anderson Pty Ltd of Burnie in the Arthur River Project Area to establish the location of all completed drill holes, pump and monitoring water bore holes and access tracks. (Figure ).

### 6.2 Test Pitting

A short programme of test pitting to check on the characteristics of the overburden in the vicinity of the proposed open pit mine was carried out by Pitt & Sherry, Consulting Engineers of Tasmania. A copy of their draft report is attached as Appendix No. 4.

### 6.3 Pump and Monitoring Bore Testing

Under Crest's supervision, five monitoring bores and one pump bore were drilled for Golder Associates Pty Ltd to allow preliminary pump testing to be carried out as part of drainage design studies.

### 6.4 Density Tests

Density tests were carried out on various types of resource and rock units and these results are contained in Appendix No. 5.

### 6.5 Petrographic Thin Section Identification

Drill core from several holes were submitted for petrographic thin section studies. These results are contained in Appendix No. 6.

## 7. REGIONAL GEOLOGY

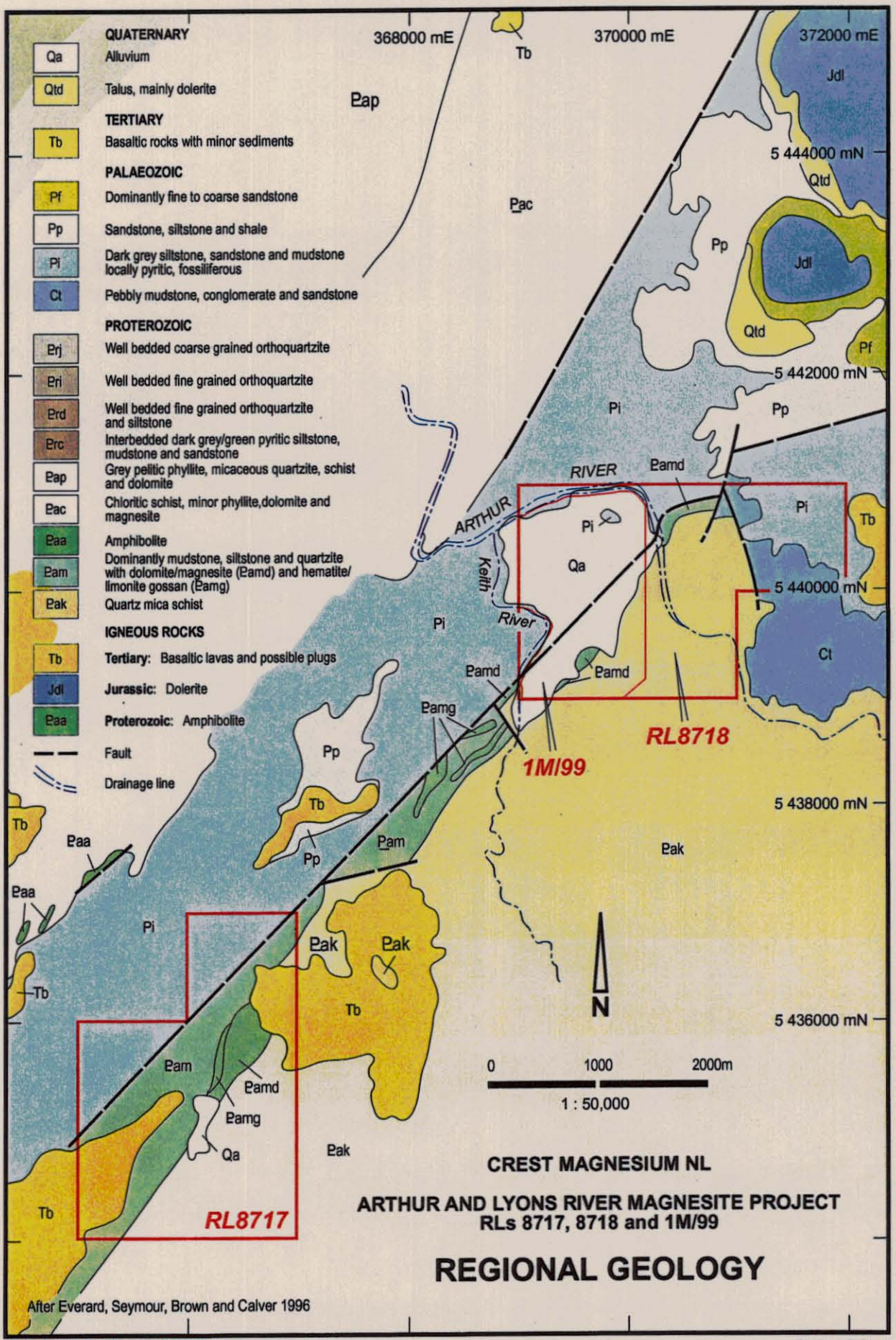
The magnesite deposits of the Arthur and Lyons Rivers area are located within the Arthur River lineament, a north-northwesterly striking belt of metamorphosed Pre-Cambrian (Proterozoic) rocks, which extends from Wynyard in the north to Granville Harbour on the west coast, a distance of some 105 kilometres (Figure 1).

The regional geological setting of the area covering RL8717 and RL8718 comprises a steeply-dipping (65 – 80 degrees) sequence of folded quartz schist, quartzite and phyllite with minor dolomite, overlying a magnesite and dolomite sequence up to 400 metres thick which in turn overlies pyritic siltstone, mudstone and quartzite with minor carbonate and amphibolite. Intrusive into the Proterozoic sequence are mafic dolerite / gabbro dykes and/or plugs of both Proterozoic and Jurassic age.

These rocks are in turn overlain by younger Permian-aged siltstones, mudstones, fine-grained sandstones and carbonaceous phyllite.

In the Lyons River area there is extensive cover of Tertiary basalt, both as flows and possibly plugs, whilst in the Arthur River tenement area, with the exception of minor exposures in the watercourses, almost all the resource zone is concealed beneath a cover of Quaternary-aged alluvium, scree and residual soils (Figure 4).

631030




ORD STREET DIGITAL (+61 8) 93218598

FIGURE 4

5 cm

## 8. DETAILED GEOLOGY – RL8718 AND 1M/99 (applied for)

The Arthur River deposit occurs within Retention Licence 8718 which has an area of 5 square kilometres. Within this Retention Licence a magnesite resource has been identified by exploratory check and in-fill drilling having a strike length of about 3,500 metres and ranging in width from 100 metres to at least 350 metres and dipping steeply to the southeast.

The geology of the mining lease is almost totally concealed beneath a 10-15 metres deep cover of recent sand, gravel and boulder sediments, scree and residual soils together with a dense cover of regrowth forest vegetation.

Outcrop is negligible, being confined to in-situ magnesite in watercourses draining the area, together with scree material commonly exposed adjacent to the main, formed gravel forestry maintenance track which skirts the southern side of the resource zone (Figure 5).

In addition to mapping carried out by earlier workers, the bulk of the subsurface geological information has been obtained from drill core recovered during the three exploration programmes carried out by CRAE in 1983, Tasmania Magnesite NL in 1997 and Crest Magnesium NL in 1998/1999.

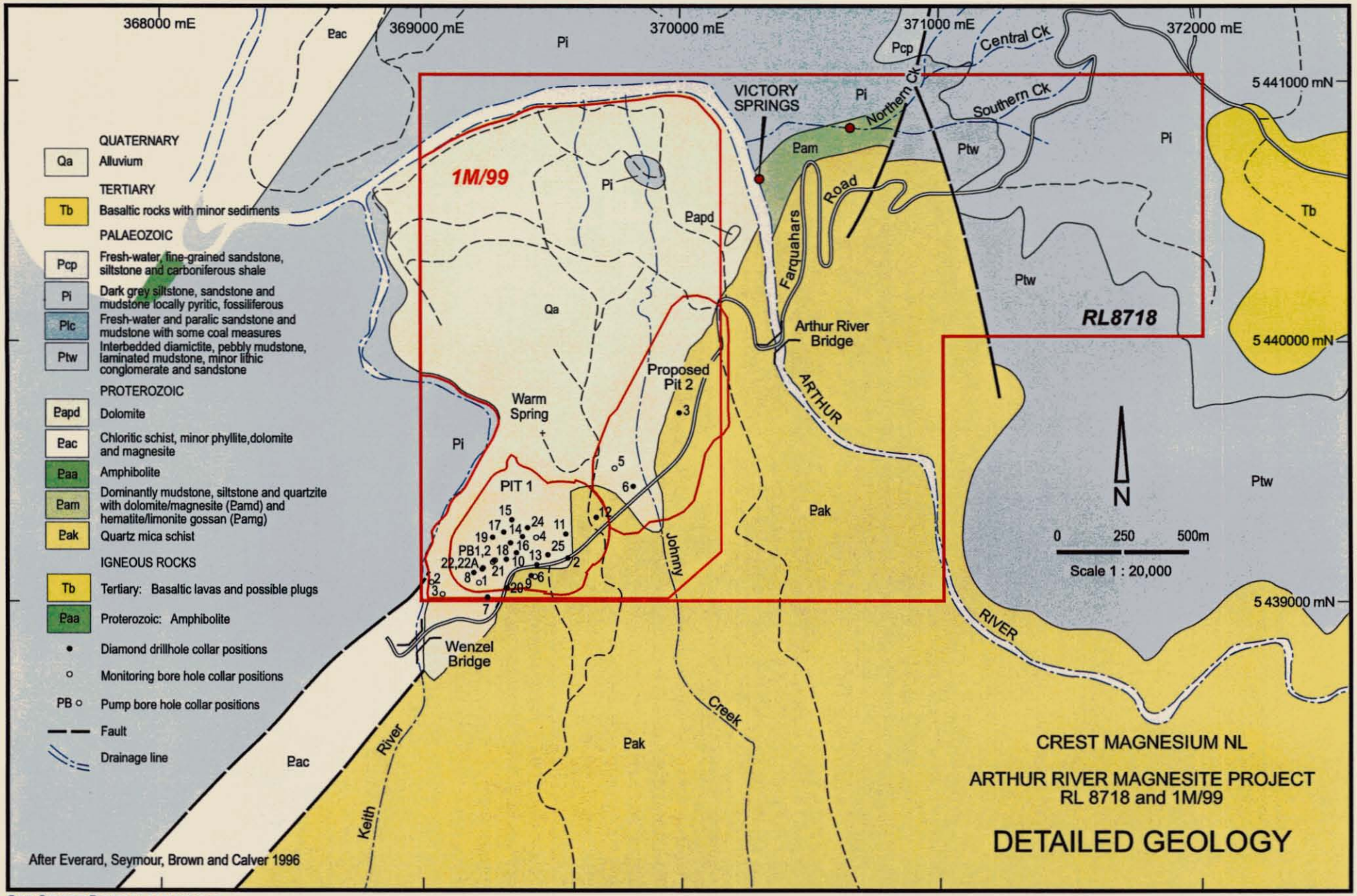
The geological setting is summarised as follows:

- Recent/Quaternary
  - Grey sand/silt/boulder alluvium, red-brown limonitic clay at the northeastern end of the resource zone (where dolerite scree indicates on the presence of underlying igneous intrusives), schistose scree and residual soils. The igneous intrusive(s) were encountered in several holes, but in the absence of sufficient drilling information, their geological setting is still unclear
- Tertiary
  - Basaltic rocks with minor sediments
- Paleozoic
  - Permian sandstones, siltstones and mudstones
- Proterozoic
  - Hanging wall quartz schist
  - Magnesite with minor dolomitic horizons
  - Footwall pyritic schist, dolomite and siltstone which is commonly contorted and brecciated adjacent to the contact with the overlying magnesite
- Proterozoic/Jurassic
  - Intrusive dolerite dykes or plugs

## 9. DRILLING

The 1998/1999 in-fill drilling programme was carried out by two local drilling contractors, using three drilling rigs, working one 10 hour shift for 12 days on then 2 days off.

The drilling commenced on November 25, 1998 and was completed on 15 March 1999 for a total of 2759.9 metres in 15 holes. (Table 1 and Figure 6)




ORD STREET DIGITAL (+61 8) 93218598

Figure 5

5 cm

631032

631033

DIAMOND DRILL HOLE COLLAR POSITIONS

COORDINATES AND HEIGHTS DERIVED FROM GPS OBSERVATIONS ON 19 JAN 1999 BASED UPON STATE TRIG 470 AT WEST TAKONE ( AGD 66 & AHD 83 )

| Hole No . | Easting | Northing | Height |
|---|---|---|---|
| AR02 | 369561.60 | 5439170.30 | 172.50 |
| AR06 | 369812.10 | 5439445.20 | 174.20 |
| AR07 | 369249.10 | 5439021.30 | 148.30 |
| AR08 | 369195.20 | 5439112.60 | 146.00 |
| AR09 | 369418.20 | 5439102.60 | 169.90 |
| AR10 | 369360.70 | 5439190.00 | 154.90 |
| AR11 | 369550.10 | 5439263.10 | 189.90 |
| AR12 | 369668.60 | 5439326.40 | 202.20 |
| AR13 | 369439.50 | 5439145.70 | 164.50 |
| AR14 | 369382.00 | 5439252.90 | 156.40 |
| AR15 | 369343.00 | 5439317.50 | 151.50 |
| AR16 | 369337.40 | 5439229.00 | 152.90 |
| AR17 | 369312.50 | 5439270.40 | 150.60 |
| AR18 | 369318.90 | 5439165.60 | 151.30 |
| AR19 | 369268.50 | 5439248.80 | 148.80 |
| AR20 | 369328.00 | 5439058.80 | 156.00 |
| AR21 | 369272.90 | 5439157.40 | 149.20 |
| AR22 | 369229.80 | 5439130.20 | 146.30 |
| AR22A | 369229.70 | 5439132.00 | 146.40 |
| AR24 | 369402.20 | 5439288.10 | 157.00 |
| AR25 | 369480.70 | 5439184.60 | 166.50 |

GROUND WATER BORE HOLE COLLAR POSITIONS
( At ground level )

| Hole No . | Easting | Northing | Height |
|---|---|---|---|
| MB01 | 369216.20 | 5439073.20 | 146.80 |
| MB02 | 369035.60 | 5439075.60 | 143.50 |
| MB03 | 369073.80 | 5439031.40 | 143.80 |
| MB04 | 369438.60 | 5439250.40 | 160.90 |
| MB05 | 369741.20 | 5439514.30 | 176.20 |
| MB06 | 369426.00 | 5439100.40 | 170.10 |
| PB01 | 369270.50 | 5439152.70 | 148.90 |
| PB02 | 369276.60 | 5439159.30 | 149.10 |

369000E 369200E 369400E 369600E 369800E

5439400N 5439200N 5439000N

Lease Boundary

MB01 ( Staked Position )
MB02
MB03 ( Staked position )
MB04
MB05
MB06
PB01
PB02
AR02 AR06 AR07 AR08 AR09 AR10 AR11 AR12 AR13 AR14 AR15 AR16 AR17 AR18 AR19 AR20 AR21 AR22 AR22A AR24 AR25

7.7m
10.1m
Star bar placed in river bank

SP01 GPS STN 1
RECOVERY STAR
SP02 GPS STN 2
SP03 GPS STN 3

KEITH RIVER
Bidor Level Bridge 17.339 RL 139.7

5 cm

0 5 10 20 30 40 50 60 70 80 90 100 METRES

PEACOCK, DARCEY & ANDERSON PTY. LTD.
AUTHORISED SURVEYORS, ENGINEERS & PLANNERS
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CREST MAGNESIUM NL
DIAMOND DRILL HOLE LOCATIONS
ARTHUR RIVER RESOURCE ZONE

DATE 18 MAR 1999
SCALE
SHEET 1 of 1
DRAWING No. 12623-02

GEOCOMP 2623 | SURVEYOR CGJ | DRAWN CGJ | CHECKED | APPROVED BJR

## TABLE 1

**Drillhole Collar Locations and Hole Orientations – 1998 to 1999 Drilling**

| HOLE ID | AMG N | AMG E | COLLAR RL | TOTAL DEPTH | DIP | AZI AMG |
|---|---|---|---|---|---|---|
| AR013 | 5439145.7 | 369439.5 | 164.5 | 204.3 | -46 | 330 |
| AR014 | 5439252.9 | 369382.0 | 156.4 | 124.1 | -46 | 330 |
| AR015 | 5439317.5 | 369343.0 | 151.0 | 107.6 | -46 | 330 |
| AR016 | 5439229.0 | 369337.4 | 152.9 | 278.6 | -46 | 150 |
| AR017 | 5439270.4 | 369312.5 | 150.6 | 182.5 | -46 | 330 |
| AR018 | 5439165.6 | 369318.9 | 151.3 | 244.5 | -46 | 330 |
| AR019 | 5439248.8 | 369268.5 | 148.8 | 120.4 | -46 | 330 |
| AR020 | 5439058.8 | 369328.0 | 156.0 | 256.0 | -46 | 330 |
| AR021 | 5439157.4 | 369272.9 | 149.2 | 214.0 | -46 | 330 |
| AR022A | 5439132.0 | 369229.7 | 146.4 | 51.0 | -46 | 330 |
| AR022B | 5439132.0 | 369229.7 | 146.4 | 225.3 | -46 | 330 |
| AR023 | 5439129.0 | 369232.7 | 146.4 | 349.0 | -46 | 150 |
| AR024 | 5439288.1 | 369402.2 | 157.0 | 67.7 | -46 | 330 |
| AR025 | 5439184.6 | 369480.7 | 166.5 | 74.6 | -46 | 330 |
| AR026 | 5439162.6 | 369322.0 | 151.3 | 260.6 | -46 | 150 |
| MB002 | 5439075.6 | 369035.6 | 143.5 | 25.6 | -90 | 0 |
| MB003 | 5439031.4 | 369073.8 | 143.8 | 31.0 | -90 | 0 |
| MB004 | 5439250.4 | 369438.6 | 161.4 | 41.0 | -90 | 0 |
| MB005 | 5439514.3 | 369741.2 | 176.8 | 50.0 | -90 | 0 |
| MB006 | 5439100.4 | 369426.0 | 170.6 | 51.0 | -90 | 0 |
| PB001 | 5439152.7 | 369270.5 | 148.9 | 30.0 | -90 | 0 |
| PB002 | 5439159.3 | 369276.6 | 149.5 | 61.0 | -90 | 0 |

Non-coring Tricone bits were used to penetrate the overburden with coring commencing when hard rock was encountered. All holes were started in PQ size, using both 1.5 and 3.0 metre triple tube, split barrels. When poor ground was encountered, the holes were reduced to HQ and if absolutely necessary, to NQ. Only two holes were completed in NQ size, namely AR021 and AR023.

Skid-mounted Longyear 38, Longyear 44 and Mindrill 52 machines were used and the drilling contractors were Diamond Drilling Tasmania and Contract Diamond Drillers, both Tasmanian-based companies.

The overall core recoveries averaged 86.4%, with the bulk of the core losses being recorded in the upper 70 metres of drilling where silt-filled cavities were numerous.

Drill access was by way of forestry tracks to the Arthur River Bridge and from the bridge to the site the rigs and equipment were hauled by bulldozer. Site clearing and access was carried out by Messrs A & R Champion, a local contractor, using a Komatsu Excavator and bulldozer.

Prior to commencing the programme, remedial strengthening works were carried out on the Arthur River bridge which allowed up to 30 tonne loads to be safely transported.

The drill core was collected in 1 metre long aluminium core trays and immediately photographed and then logged. Each day all the core was removed from the site and delivered to Analabs Pty Ltd, Burnie. The core was then quartered using a diamond saw and one quarter prepared for analysis. Sample analyses were carried out by Analabs in Perth, Western Australia. Bulk samples comprising

both drill core from 1983 (CRAE) and 1997 (Tasmag) exploration and pulps from the 1998/1999 (Crest) drilling were submitted for metallurgical test work.

The sample preparation and analytical methods used by Analabs are summarised below:-

## SAMPLE PREPARATION.

**A. SO62** The Diamond drill core samples are cut using a diamond saw

**S005/020** The total sample is dried, to a core temperature of 110C, jaw crushed, split and milled in a ungsten-carbide bowl to a nominal 90% passing 75pm. An analytical pulp of approximately 100g is achieved and the coarse residue is retained for future reference.

## ANALYTICAL METHODS

**X048** The sample is fused with 12/22 flux to form a glass fusion disc. This disc is presented to the XRF instrument for the determination of the silicate rock elements. An L.O.I is performed at 1000C the combination of the XRF analytical work and the L.O.I. will generally provide totals of 100% + 0.5%

| | | | |
|---|---|---|---|
| $S_iO_2$ (0.02%) | $T_iO_2$ (0.01%) | $Al_2O_3$ (0.02%) | $Fe_2O_3$ (0.01%) |
| MnO (0.0025%) | MgO (0.02% | CaO (0.02%) | $Na_2O$ (0.05%) |
| $K_2O$ (0.005%) | $P_2O_5$ (0.005%) | $SO_3$ (0.005%) | L.O.I. (0.01%) |

The remaining core, sample duplicates and excess pulps are stored in Burnie.
Preliminary metallurgical testing was carried out on bulked drill core samples. These tests were established a cut off grade for the resource of 33% Mgo,4% Cao, 6% $Fe_2O_3$ and 12% $Si0_2$.

### 9.1 Drillhole AR013 – 369439.50 E, 5439145.70N – Figure 7

Diamond drillhole AR013 was commenced on 25 November 1998 and completed on the 8 December 1998 at a drill depth of 204.3 metres with an average core recovery of 76%.

The hole intersected 55.9 metres of ferruginous yellow-brown clays (decomposed hanging wall schist), before encountering hard, white, crystalline magnesite which contained occasional cavities to a drill depth of 83.0 metres. Drilling records show the cavities range from 10 centimetres to 2.4 metres in size and are commonly filled with red brown sandy silt and clay (see Appendix 3 AR13 54.2 – 78.6 m). At a drill depth of 161.1 metres the drill encountered dark, greenish black, talcose sheared dolerite which was still present when the hole was terminated at a depth of 204.3 metres. Identification of the dolerite was made following thin section petrographic examination. (see Appendix 6).

631036

9900E

10000E

10100E

AR015

AR014

AR013

87.5m @ 33.50, 3.53, 5.64, 12.82

37.40, 0.21, 4.37, 13.74

29.29, 3.21, 8.54, 15.94

37.59, 7.70, 1.32, 5.71

107.6

72.1m @ 43.58, 2.51, 0.38, 4.74

43.58, 2.51, 0.38, 4.74

124.1

103.68m @ 44.12, 3.33, 0.51, 1.86

45.35, 1.97, 0.42, 1.72

38.36, 9.13, 1.24, 2.21

43.79, 3.87, 0.43, 1.99

204.3

Footwall rock

Hangingwall rock

100RL

100RL

0RL

0RL

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER AND CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

9900E

10000E

crestxsf.pf

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CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20380N
Holes AR013, AR014, AR015

| Scale: 1: 1000 | Plan No. | Date: 04-May-99 |
|---|---|---|

FIGURE 7

Four zones, containing CaO above the acceptable 6% were intersected as follows:

- 100.2 m - 101.6 m 1.4m @ 9.4% CaO
- 116.6 m - 118.2 m 1.4m @ 12.8% CaO
- 100.2 m - 125.6 m 1.4m @ 15.5% CaO
- 158.6 m - 161.2 m 2.6m @ 12.0% CaO

These high calcium zones could not be identified in hand specimen, which indicates that grade control will have to be carried out during mining. Overall, the hole intersected 103.68 metres of high grade magnesite averaging 44.12 MgO, 3.33% CaO, 0.51% $Fe_2O_3$ and 1.86% $SiO_2$.

**9.2 AR014 - 369382.0E, 5439252.9N – Figure 7**

Diamond drillhole AR014 was commenced on 10 December 1998 and completed on 17 December 1998 at a drill depth of 124.7m. The average core recovery was 94%. The hole was collared in grey, sandy, pebble alluvium and entered hard, white crystalline magnesite at a drill depth of 18.7 metres. Between 18.7 metres and 99.5 metres, when dolerite was intersected, the hole was drilled in crystalline magnesite which contained 15 cavities, ranging in size from a few centimetres to as much as 3.70 metres (54.5m – 58.2m). Diamond drillhole AR014 intersected 72.1 metres of high grade magnesite having an average grade of 43.58% MgO, 2.51% CaO, 0.38% $Fe_2O_3$ and 4.74% $SiO_2$.

Three CaO zones were encountered as follows:

- 21.6 m - 23.5 m 1.9 m 12% CaO
- 29.2 m - 30.7 m 1.5 m 11% CaO
- 32.2 m - 33.7 m 1.5 m 8% CaO

**9.3 AR15 - 36934.0E, 5439317.5N – Figure 7**

Diamond drillhole AR015 has commenced on 10 December 1998 and completed on the 17 December 1998 at a drill depth of 107.6 metres. The average core recovery was 81%. The hole was collared in grey, pebble alluvium and after 14.3 metres passed into red, brown and yellow clays comprising decomposed high and low grade magnesite and ferruginous limonite. At 73.0 metres the hole encountered hard, white magnesite and at 106.2 metres passed into dark grey pyritic (footwall) siltstone.

Cavities were encountered between 16.0 metres - 67 metres with the most significant occurring between 16.0 m - 18.5 metres and 46.4 m - 50.7 metres. Between 50.7 metres - 69.4 metres the puggy clays contained numerous hard limonitic fragments. Between 84.0 metres - 106.0 metres the crystalline magnesite averaged in exess of 7% CaO.

Diamond drillhole AR015 encountered 87.5 metres of low-grade clays and magnesite averaging 33.5% MgO, 3.53% CaO, 5.64% $Fe_2O_3$ and 12.82% $SiO_2$.

None of the resources intersected in AR015 were included in the resource tonnage calculations although if necessary, some mineralised sections of this hole could supply suitable resource tonnages for blending with higher grade material.

### 9.4 AR016 – 369337.4E, 5439229.ON – Figure 8

Diamond drillhole AR016 was commenced on 14 December 1998 and completed on 30 January 1999 at a drill depth of 278.6 metres in hard, white, high-grade magnesite. Core recovery for the hole averaged 94%.

The hole was drilled southerly at -46° in the direction of 139° (Mag) in an attempt to provide information of the position and dip of the hanging wall magnesite / schist contact. The hole was terminated at the southern boundary of the tenement before reaching its target, which indicates that the hanging wall magnesite/schist contact has a flatter dip than that inferred by previous workers.

Diamond drillhole AR016 was collared in grey, sandy, pebble alluvium and at 15.4 metres intersected khaki coloured clay and low-grade, broken, grey dolomitic magnesite. Between 15.4 metres to 43 metres, the hole passed through dark red-brown ferruginous clays and broken dolomite and magnesite ranging in grade from 25% to 44% MgO.

From 43 metres to the end of the hole at 278.6 metres, the hole passed through hard, white, high-grade magnesite. Cavities were confined to the upper 52 metres with cavities ranging up to a maximum of 2 metres.

Overall, AR016 intersected 260.8 metres of high-grade crystalline magnesite averaging 41.93% MgO, 2.23% CaO, 0.77% $Fe_2O_3$ and 7.61% $SiO_2$.

### 9.5 AR017 – 369312.5E, 5439270.AN – Figure 8

Diamond drillhole AR017 commenced on 5 January 1999 and has completed on 19 January 1999 at a drill depth of 182.5 metres in dark grey, pyritic footwall siltstone. Core recoveries average 88%.

The hole was collared in grey, sandy, pebble, alluvium and at 17.1 metres entered iron-stained cavernous magnesite. Between 17.1 metres to 89.6 metres the hole was drilled through ferruginous clayey and cavernous low-grade magnesite containing cavities up to 2.5 metres in size. The average grade of this dolomitic limestone was 34.6% MgO, 5.4% CaO, 4.5% $Fe_2O_3$ and 11.3% $SiO_2$. Between 89.6 metres – 180.5 metres, the hole intersected hard, white magnesite, containing seven low-grade zones, some having a CaO content in excess of the 4% cut off.

At 180.5 metres the hole entered pyritic siltstone footwall rocks and the hole was terminated at 182.5 metres.

Overall, AR017 intersected 153.8 metres of magnesite having an average grade of 37.68% MgO, 6.18% CaO, 2.70% $Fe_2O_3$ and 6.12% $SiO_2$, which is very close to the acceptable feedstock cut off. Whereas it is likely that the high CaO lenses close to the pyritic siltstone contact will remain unmined, much of this rock could be stockpiled for future blending with higher grade material.

### 9.6 AR018 – 369318.9E, 5439465.6N – Figure 9

Diamond drillhole AR018 commenced on 30 January 1999 and was completed on the 19th February 1999 at a drill depth of 244.5 metres in pyritic footwall siltstone. The core recoveries averaged 88%.

631039

9900E

10000E

10100E

AR017

AR016

AR010

AR009

MB006

153.8m @ 37.68, 6.18, 2.70, 6.12

197.2m @ 41.69, 3.20, 1.71, 5.44

179.8m @ 43.35, 3.40, 0.51, 3.2

260.8m @ 41.93, 2.23, 0.77, 7.61

100RL

Footwall rock

Hangingwall rock

182.5

219.5

254.9

0RL

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER & CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20340N
Holes AR009, AR010, AR016, AR017

| Scale: 1: 1000 | Plan No. | Date: 04-May-99 |
|---|---|---|

crestxse.pf

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FIGURE 8

631040

9900E

10000E

10100E

AR019

AR018

AR026

73.8m @ 38.81, 3.54, 4.22, 5.62

42.61, 0.52, 3.69, 5.14

24.85, 13.42, 6.28, 15.18

44.16, 0.37, 3.38, 1.70

228m @ 42.35, 2.06, 2.79, 3.96

43.25, 0.13, 3.25, 3.85

29.19, 0.31, 15.88, 10.10

43.59, 1.28, 2.30, 3.65

42.82, 1.10, 0.93, 7.11

39.57, 6.30, 1.57, 3.91

244.6m @ 41.44, 2.83, 0.89, 7.45

44.47, 1.74, 0.38, 4.19

37.41, 6.82, 0.84, 8.47

35.63, 9.42, 0.71, 9.63

42.48, 3.62, 1.77, 2.63

120.4

244.5

100RL

ORL

Hangingwall rock

Footwall rock

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER AND CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20280N
Holes AR018, AR019, AR026

Scale: 1: 1000 | Plan No. | Date: 04-May-99

FIGURE 9

crestxsd.pf

SURPAC SOFTWARE INTERNATIONAL. AUSTRALIA

The hole was collared in sandy, pebble alluvium which extended to a drill depth of 12.0 metres. From 12.0 metres to 32.5 metres the hole passed through mainly dark brown ferruginous clays and limonite. A number of cavities were encountered containing brown silt and clay. Thin intersections of hard, white magnesite occurred at 12.0 – 14.0 metres, 24.0 – 26.0 metres and 32.0 – 34.0 metres. From 34.0 metres to 82.0 metres the magnesite was iron-stained and in places decomposed and clayey. From 82.0 metres – 175.5 metres the magnesite was only slightly iron-stained but very jointed and extremely fragmented. From 175..5 metres – 197.7 metres the magnesite was very iron-stained and decomposed. From 197.7 metres – 239.8 metres the magnesite was mainly massive, hard and white. At 239.8 metres the hole intersected contorted pyritic siltstone and the hole was terminated at 244.5 metres.

Overall diamond drillhole AR018 intersected 228.0 metres of magnesite having an average grade of 42.35% MgO, 2.06%, 2.79% $Fe_2O_3$, $SiO_2$.

**9.7 AR019 – 369268.5E, 5439248.8N – Figure 9**

Diamond drillhole AR019 was commenced on 21 January 1999 and completed on 26 January 1999 at a drill depth of 120.4 metres in pyritic siltstone.

The hole was collared in grey, sandy, pebble alluvium, which extended to a drill depth of 17.0 metres. From 17.0 metres to about 71.0 metres the magnesite was iron-stained and clayey and contained high CaO (13%) and $SiO_2$ (18%) levels between 55.6 metres – 71.5 metres. Between 71.5 metres – 90.8 metres, the magnesite was slightly iron-stained, very jointed and fractured but very high-grade, averaging 44% MgO. At 90.8 metres the hole entered contorted pyritic footwall siltstones. From 90.8 metres to the end of the hole at 120.8 metres, the hole was drilled in banded and contorted pyritic sediments.

Overall, AR019 contained 73.8 metres of magnesite which averaged 38.81% MgO, 3.54% CaO, 4.22% $Fe_2O_3$ and 6.62% $SiO_2$. This resource zone will probably be stockpiled for later blending with more suitable feedstock, which contains fewer clay zones.

**9.8 AR020 – 369328.0E, 5439058.8N – Figure 10**

Diamond drillhole AR020 commenced on the 28 November 1998 and was completed on the 9 December 1998 at a drill depth of 256.0 metres. Core recoveries averaged 81%. The hole was collared in sandy alluvium before passing into ferruginous clays. At a drill depth of 57.7 metres the hole intersected hard, white magnesite containing numerous silt-filled cavities. Between 57.7 metres to 246.5 metres a total of 53 cavities were encountered ranging in size from a few centimetres to as much as 2.0 metres. The magnesite contained a number of iron-stained and clayey zones usually associated with recorded cavities.

631042

9900E

10000E

10100E

AR021
PB002
PB001

AR020

30.0

61.0

100RL

100RL

43.41, 1.29, 1.84, 4.89

187.5m @ 42.23, 2.64, 1.66, 4.56

42.44, 1.73, 1.05, 5.31

198.3m @ 41.89, 2.09, 2.11, 5.96

42.65, 1.32, 2.30, 6.77

38.73, 6.98, 1.75, 3.95

214.0

286.0

Footwall rock

Hangingwall rock

0RL

0RL

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER AND CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20240N
Holes AR020, AR021, PB001, PB002

| Scale: 1: 1000 | Plan No. | Date: 04-May-99 |
|---|---|---|

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**FIGURE 10**

Between 143.0 metres and 200.0 metres, the magnesite was generally very iron-stained, fragmented and partially decomposed. Similar smaller, broken and iron-stained zones occurred between 214.0 metres – 218.0 metres and 223.0 metres – 231.0 metres. At a drill depth of 256.0 metres the hole was terminated in high grade magnesite, when problems were experienced with the drill rig. At this point, the hole was already 50.0 metres past the anticipated mining depth of the proposed pit.

Overall AR020 intersected 198.3 metres of high-grade resource averaging 41.80% MgO, 2.09% CaO, 2.11% $Fe_2O_3$ and 5.96% $SiO_2$.

**9.9 AR021 – 369272.9E, 5439157.4N – Figure 10**

Diamond drillhole AR021 commenced on the 14 December 1998 and was completed on 7 January 1999 at a depth of 24.0 metres in footwall dolomitic sediments. Core recoveries for the hole averaged 91%.

The hole was collared in sandy, pebble alluvium and at 14.5 intersected magnesite. Between 14.5 metres and 50.0 metres the magnesite was iron-stained, cavernous and decomposed, becoming harder but more fragmented between 50.0 metres to 70.0 metres. From 70.0 metres to 108.0 metres the magnesite was generally hard, white and crystalline. From 108.0 metres to 177.0 metres the magnesite was again very jointed and fragmented and with an increase in CaO content (more dolomitic). The hole was terminated at 214.0 metres.

The cavities in AR021 are generally small and confined to the upper 40.0 – 50.0 metres of the hole. The largest recorded cavity being 2.2 metres between 28.0 – 30.0 metres. Evidence that the magnesite contains some interconnected cavities in the upper part of the section is provided by the fact that when Pump Bores No.'s 1 & 2 were drilled, ground collapse occurred during hole development. At the same time and probably as a result of this pumping, there was silt influx into AR022 some 50.0 metres to the west.

Overall, diamond drillhole AR021 intersected 187.5 metres of magnesite resource grading 42.23% MgO, 2.54% CaO, 1.66% $Fe_2O_3$ and 4.56 $SiO_2$.

**9.10 AR022 – 369229.8E, 5439130,2N – Figure 11**

Diamond drillhole AR022 commenced on 12 January 1999 and was abandoned of 22 January 1999 in caving ground at 34.2 metres drill depth. Core recoveries averaged 78%.

The hole was collared in pebble alluvium and at 19.7 metres intersected hard, white, high-grade magnesite. From 28.1 metres to 34.2 metres when the hole was abandoned the magnesite was broken, iron-stained and cavernous.

**9.11 AR022A – 369229.7E, 5439132.ON – Figure 11**

Diamond drillhole AR022A was commenced on 24 January 1999 and completed on 28 January 1999 at a drill depth of 47.0 metres in hard, white magnesite when the hole deviated off line after entering a cavity. Between 22.9 metres to 43.0 metres the hole encountered eight cavities ranging in size from a few centimetres up to 0.60 metre. Core recoveries from this hole averaged 82%.

### 9.12 AR022B – 369229.7E, 5439132.0N – Figure 11

Diamond drillhole AR022B was re-commenced at a depth of 37.0 metres in AR022A on 29 January 1999 and completed on 6 February 1999 at a depth of 225.3 metres. Core recoveries averaged 98%.

Between 37.0 metres to 69.0 metres the core was jointed and fragmented and slightly iron-stained. From 69.0 metres to 164.5 metres the hole intersected hard, white, high- grade magnesite, with one lower-grade dolomitic lens containing CaO in excess of 10%, occurring between 145.0 metres – 157.0 metres. From 164.5 – 171.7 metres, the core was extremely broken, brown in colour and although appearing dolomitic was in fact, very high-grade magnesite averaging in excess of 45% MgO and less than 2% CaO. From 171.7 – 178.0 the core was dolomitic and pyritic with up to 30% $Fe_2O_3$. From 178.0 metres to 205.0 metres the core was hard, white, veined magnesite. From 205.0 metres to the end of the hole the core was a mix of brecciated, grey, pyritic dolomite and minor magnesite.

Overall AR022A and AR022B contained 189.5 metres of magnesite resource averaging 41.82% MgO, 3.73% CaO, 1.66% $Fe_2O_3$ and 3.63 and $SiO_2$. Core recoveries averaged 82.3%.

### 9.13 AR023 – 369232.7E, 5439129.0N – Figure 11

Diamond drillhole AR023,which was commenced on 9 February 1999 and completed on 9 March 1999 was collared in sandy, pebble alluvium and entered hard, white magnesite at 21.0 metres. From 21.0 metres to 153.0 metres the magnesite was generally iron-stained and contained a number of decomposed clayey zones and silt / clay-filled cavities up to 2.8 metres in size. A total of 35 cavities were recorded by the drillers over this interval. From 153.0 metres to the end of the hole at 205.0 metres where it passed out of the lease, the magnesite was hard, white and noticeably veined.

Overall, AR023 contained 185.3 metres of magnesite resource grading 39.40% MgO, 2.52% CaO, 2.49% $Fe_2O_3$ and 9.92% $SiO_2$.

Because of the proximity of the southern boundary of MLA IM/99, only the upper 50 metres of this resource zone will be mined. This section averages 41.7% MgO, 1.1% CaO, 3.3% $Fe_2O_3$ and 6.9% $SiO_2$. Core recoveries averaged 86%.

### 9.14 AR024 – 369402.2E, 5439288.1N – Figure 12

Diamond drillhole AR024, which commenced on 27 January 1999 and was completed on 2 January 1999 was sited at the north-eastern boundary of the resource zone adjacent to the intrusive mafic which cuts across the magnesite resource zone, dividing it into two parts (Figure 6). The hole was collared in alluvium and entered ferruginous clays and decomposed dolerite at 25.5 metres drill depth. Three thin zones of low-grade dolomitic magnesite were intersected between 38.0 metres to 41.6 metres, 44.8 metres to 47.2 metres and 48.4 metres to 51.5 metres, before the hole entered broken, iron-stained dolerite. The hole was terminated at 67.7 metres in fresh dolerite. Core recoveries in this hole averaged 86.5%.

### 9.15 AR025 – 369480.7E, 5439184.6N – Figure 12

Diamond drillhole AR025, which commenced on 2 January 1999 and was completed on 5 January 1999 was collared in brown, ferruginous clays and at 42.5 metres entered decomposed dolerite. Between 42.5 metres and 74.6 metres, the hole intersected decomposed clayey dolerite. The hole was stopped at 74.6 metres in dolerite. Core recoveries averaged 95%.

631045

9900E

10000E

10100E

AR022A&B

AR023

Hangingwall rock

100RL

Footwall rock

100RL

43.31, 1.20, 1.54, 5.04

41.67, 1.07, 3.32, 6.90

P1.0

189.5m @ 41.82, 3.73, 1.66, 3.63

38.11, 8.78, 0.95, 7.68

45.28, 1.54, 0.52, 2.29

185.3m @ 39.40, 2.52, 2.49, 9.92

38.65, 2.65, 3.20, 10.28

38.01, 6.41, 0.77, 6.38

43.71, 4.28, 0.70, 0.40

37.13, 10.98, 1.18, 1.08

40.18, 3.52, 4.95, 1.95

38.51, 3.63, 0.62, 12.12

40.71, 5.48, 1.47, 3.24

ORL

ORL

225.3

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER AND CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

30066

10000E

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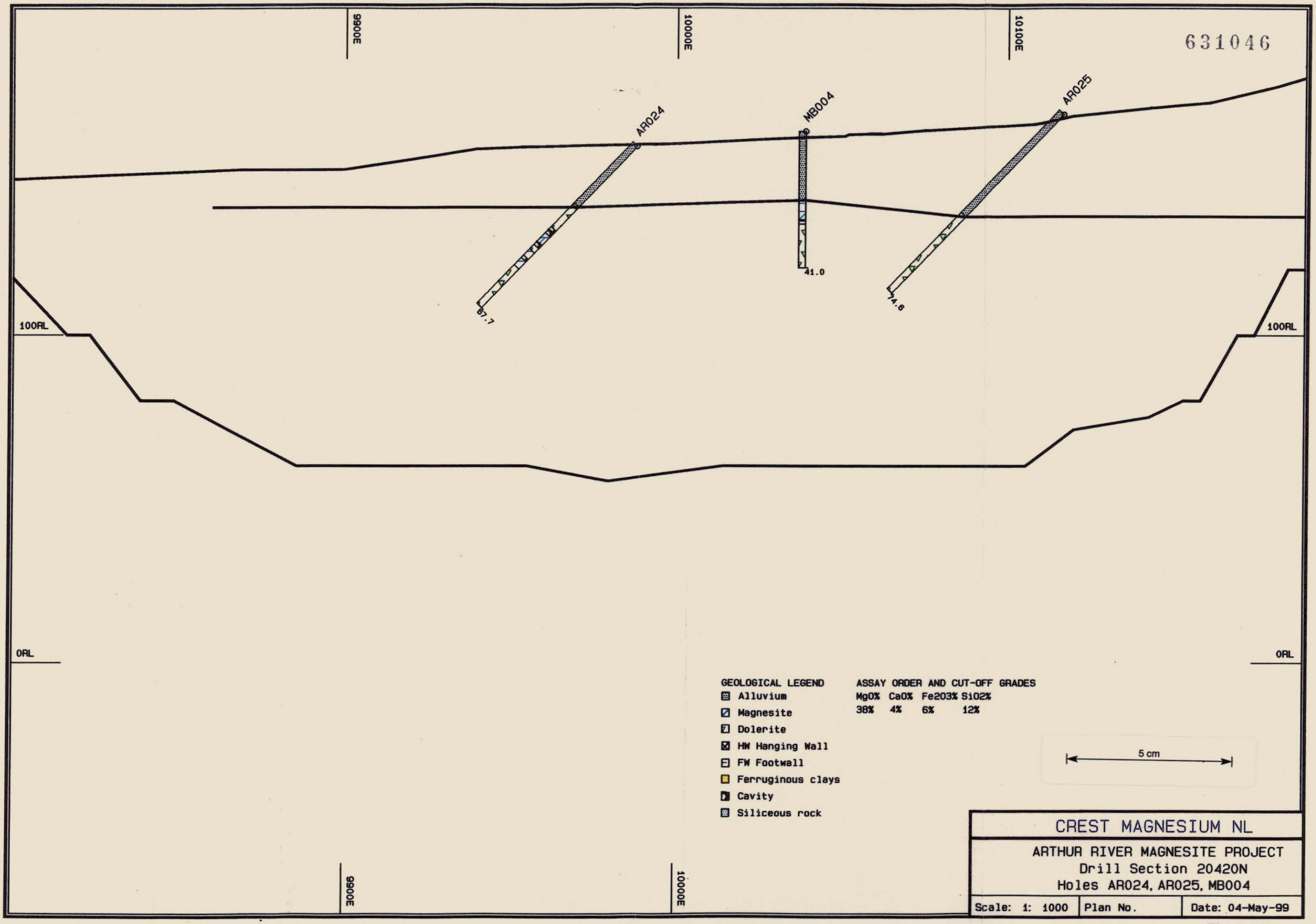
CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20200N
Holes AR022A&B, AR023

| Scale: 1: 1000 | Plan No. | Date: 04-May-99 |
|---|---|---|

FIGURE 11

631046




GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock

ASSAY ORDER AND CUT-OFF GRADES

| MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|
| 38% | 4% | 6% | 12% |

5 cm

CREST MAGNESIUM NL

ARTHUR RIVER MAGNESITE PROJECT
Drill Section 20420N
Holes AR024, AR025, MB004

| Scale: 1: 1000 | Plan No. | Date: 04-May-99 |
|---|---|---|

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FIGURE 12

### 9.16 AR026 – 3693220.E, 5439162.6N – Figure 9

Diamond drillhole AR026, which commenced on 23 February 1999 and was completed on 15 March 1999, was collared in grey, sandy, pebble alluvium and entered massive magnesite at a drill depth of 16.0 metres. Between 16.0 metres to 67.6 metres the magnesite was broken, iron-stained and contained a number of cavities up to 1.0 metre in size. From 67.6 metres to the end of the hole at 260.6m the hole was drilled in hard, white, veined magnesite. This hole, which was drilled in a southerly direction in an attempt to establish the dip of the hanging wall magnesite schist contact was terminated in massive, high-grade magnesite when the hole reached the southern edge of the lease boundary.

Overall, AR026 intersected 244.6 metres of high grade resource averaging 41.44% MgO, 2.83% CaO, 0.89% $Fe_2O_3$ and 7.45 $SiO_2$. The average core recovery was 99%. Again because of the proximity of the resource to the southern boundary of the lease any proposed mining would most likely be restricted to the upper 80.0 metres of this hole, which has an average grade of 42.82% MgO, 1.1% CaO, 0.93% $Fe_2O_3$ and 7.1% $SiO_2$.

## 10. CONCLUSIONS AND RECOMMENDATIONS

The 1998/1999 diamond drilling exploration programme has confirmed the presence of a high grade (>38% MgO) magnesite resource which to a maximum open pit mining depth of 140.0 metres, totalled about 15 million tonnes grading 42.9% MgO, 2.4% CaO, 1.25% $Fe_2O_3$ and 4.80% $SiO_2$. This resource has been assigned Measured Resource status.

Based on diamond drilling evidence the resource has been divided into the following categories.

- Hard crystalline magnesite
- Iron-stained, hard crystalline magnesite
- Broken, hard crystalline magnesite
- Cavernous decomposed magnesite
- High-grade, clayey magnesite
- Low grade, clayey magnesite

From preliminary metallurgical test work the cut-off grades used in this resource estimate were 38% MgO, 4% CaO, 6% $Fe_2O_3$ and 12% $SiO_2$.

It is understood that the high and low-grade, clayey magnesite, which totals some 3.7 million tonnes, will be stockpiled for probably future use as feedstock once the plant is fully operational.

The exploratory and infill drilling programme has established the presence of a mafic dolerite intrusive which divides the magnesite resource zone into two parts. The dimensions and attitude of this intrusive body, which may in fact comprise two separate dykes or plugs, are still uncertain and will only be resolved once mining commences.

Concerning the detailed geology of the resource, whereas the footwall contact is fairly well understood, the dip of the hanging wall contact has still not been established because exploratory holes designed for this purpose had to be terminated when they reached the southern boundary of the Tenement. It seems probable however, that the dip is somewhat flatter, at possibly 65-75°, than that assigned by earlier workers. In each case the drill holes AR016, AR023 and AR026, drilled in a southerly direction, failed to intersect hanging wall schists and were terminated in high-grade, crystalline magnesite.

Some unexpected intersections of the footwall contact indicate that it may be either faulted, drag folded or have a variable dip. There is insufficient exploratory drilling to establish the correct interpretation.

The inability to more accurately define the detailed geological setting within IM/99 stems from a reluctance to allocate funds from the exploration budget for purely stratigraphic drilling, especially when it has been established that ample high-grade resources are present within the tenement to sustain a long term mining operation.

In-fill drilling has established the presence of both high CaO and $SiO_2$ zones within the resource zone which cannot be identified in hand specimen. Where these zones have been identified by sample analysis, they have been excluded from resource tonnages calculations

Because of the proximity of the identified resource both to the Keith River and the southern boundary of the tenement, it has been recommended that further drilling be carried out in 1M/99 between AR003 and AR006 (CRAE 1983). The results from the above two holes indicated the presence of a high grade magnesite resource some 100.0 metres thick, having a strike length of at least 500.0 metres and extending to a depth in excess of 300.0 metres vertical. Application has been made and preliminary approvals were given, to carry out this in-fill drilling programme in Crest's 1998/99 programme, but this work has been deferred, possibly until the summer of 1999/2000.

It is anticipated that this drilling will identify a further 10.0 - 15.0 million tonnes of high-grade magnesite resource.

The proposed programme is expected to comprise at least 12 holes totalling 3,000 metres of diamond drilling at a cost of $680,000, including sample analysis, supervision and administration.

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631049

**ARTHUR RIVER MAGNESITE PROJECT** 21-Jan-00
**In-Pit Resource Estimate - Large Pit to 10mRL**
**Based on IDW block model - April 1999**

| MATERIAL TYPE | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|
| **Magnesite (>38% MgO)** | | | | | | |
| Hard crystalline magnesite | 4873250 | 13157775 | 43.35 | 1.92 | 1.27 | 4.87 |
| Fe stained hard magnesite | ) not modelled | | | | | |
| Broken hard magnesite | ) not modelled | | | | | |
| Subtotal | 4873250 | 13157775 | 43.35 | 1.92 | 1.27 | 4.87 |
| **Other Magnesite Mineralisation** | | | | | | |
| Cavernous decomposed magnesite | ) not modelled | | | | | |
| High grade clay magnesite | 597250 | 1552850 | 40.89 | 0.71 | 3.33 | 8.31 |
| Low grade clay magnesite | 238250 | 619450 | 28.38 | 9.49 | 5.81 | 14.69 |
| Hard crystalline high CaO (waste) | 800000 | 2160000 | 39.83 | 6.18 | 1.26 | 3.78 |
| Subtotal | 1635500 | 4332300 | 38.57 | 4.69 | 2.65 | 6.96 |
| **Waste Rock** | | | | | | |
| Overburden | 3636250 | 7272500 | | | | |
| Waste | 5024500 | 12871050 | | | | |
| Subtotal | 8660750 | 20143550 | | | | |
| **Summary** | | | | | | |
| **Total desirable resource** | 4873250 | **13157775** | **43.35** | **1.92** | **1.27** | **4.87** |
| Total waste | 10296250 | 24475850 | | | | |
| Strip Ratio Waste:Ore | 1.86 : 1 | | | | | |

# APPENDIX 2

631051

**TABLE 2**
**ARTHUR RIVER MAGNESITE PROJECT**
Sectional Resource Estimate September 1999
Inside Slot (Pit) 1, Large Slot 20140-20400N to 50m depth (85mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 1261006 | 3404715 | 43.80 | 1.97 | 1.07 | 3.77 |
| Fe stained hard magnesite | 90 | 107495 | 290236 | 43.22 | 0.98 | 1.83 | 5.36 |
| Broken hard magnesite | 100 | 339389 | 882411 | 43.97 | 1.85 | 1.09 | 3.49 |
| Subtotal | | 1707890 | 4577362 | 43.80 | 1.89 | 1.12 | 3.82 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 1788 | 4827 | 40.88 | 1.89 | 0.55 | 10.54 |
| Fe stained hard magnesite LG | 91 | 115348 | 311439 | 33.94 | 1.41 | 4.35 | 19.54 |
| Broken hard magnesite LG | 101 | 20014 | 52035 | 33.93 | 5.35 | 9.54 | 3.81 |
| Subtotal | | 137150 | 368301 | 34.03 | 1.97 | 5.03 | 17.20 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 50396 | 131028 | 40.86 | 1.39 | 3.39 | 7.83 |
| High grade clay magnesite | 70 | 462034 | 1201289 | 40.92 | 0.64 | 3.56 | 7.90 |
| Low grade clay magnesite | 80 | 205559 | 534454 | 28.64 | 9.16 | 6.75 | 12.84 |
| Hard crystalline high CaO | 60 | 376336 | 1016108 | 37.82 | 7.38 | 1.46 | 4.65 |
| Subtotal | | 1094325 | 2882879 | 37.55 | 4.63 | 3.40 | 7.67 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 904672 | 2261681 | | | | |
| FW Rock | 20 | 166959 | 417397 | | | | |
| HW Rock | 40 | 215285 | 538213 | | | | |
| Dolerite | [illegible] | 48944 | 126749 | | | | |
| Subtotal | | 1333860 | 3344040 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 1707890 | 4577362 | 43.80 | 1.89 | 1.12 | 3.82 |
| Total undesirable rock (including overburden and adjacent rock) | | 2565335 | 6595220 | | | | |
| Strip Ratio | | | 1.4 | :1 | | | |

## TABLE 4

**ARTHUR RIVER MAGNESITE PROJECT**
Sectional Resource Estimate September 1999
Inside Slot (Pit) 3, Small Slot 20260-20400N to 50m depth (85mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 948336 | 2560507 | 43.88 | 1.94 | 0.99 | 3.88 |
| Fe stained hard magnesite | 90 | 0 | 0 | | | | |
| Broken hard magnesite | 100 | 0 | 0 | | | | |
| Subtotal | | 948336 | 2560507 | 43.88 | 1.94 | 0.99 | 3.88 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 1739 | 4694 | 40.94 | 1.84 | 0.55 | 10.50 |
| Fe stained hard magnesite LG | 91 | 47705 | 128803 | 40.09 | 2.89 | 4.70 | 3.97 |
| Broken hard magnesite LG | 101 | 0 | 0 | | | | |
| Subtotal | | 49444 | 133497 | 40.12 | 2.85 | 4.56 | 4.20 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 0 | 0 | | | | |
| High grade clay magnesite | 70 | 359170 | 933842 | 40.53 | 0.34 | 3.97 | 8.62 |
| Low grade clay magnesite | 80 | 189434 | 492527 | 28.34 | 8.91 | 7.09 | 13.33 |
| Hard crystalline high CaO | 60 | 178544 | 482069 | 37.83 | 6.93 | 1.61 | 3.41 |
| Subtotal | | 727148 | 1908438 | 36.70 | 4.22 | 4.18 | 8.52 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 563707 | 1409268 | | | | |
| FW Rock | 20 | 59672 | 149180 | | | | |
| HW Rock | 40 | 159320 | 398299 | | | | |
| Dolerite | 30 | 46944 | 126749 | | | | |
| Subtotal | | 829643 | 2083496 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 948336 | 2560507 | 43.88 | 1.94 | 0.99 | 3.88 |
| Total undesirable rock (including overburden and adjacent rock) | | 1606235 | 4125431 | | | | |
| Strip Ratio | | | 1.6 | :1 | | | |

631053

## TABLE 3

**ARTHUR RIVER MAGNESITE PROJECT**

Sectional Resource Estimate September 1999

Inside Slot (Pit) 2, Small Slot 20140-20260N to 50m depth (85mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 312670 | 844208 | 43.56 | 2.08 | 1.32 | 3.44 |
| Fe stained hard magnesite | 90 | 107495 | 290236 | 43.22 | 0.98 | 1.83 | 5.36 |
| Broken hard magnesite | 100 | 339389 | 882411 | 43.97 | 1.85 | 1.09 | 3.49 |
| Subtotal | | 759554 | 2016855 | 43.69 | 1.82 | 1.29 | 3.74 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 49 | 133 | 38.47 | 3.68 | 0.62 | 12.11 |
| Fe stained hard magnesite LG | 91 | 67643 | 182636 | 29.60 | 0.37 | 4.10 | 30.52 |
| Broken hard magnesite LG | 101 | 20014 | 52035 | 33.93 | 5.35 | 9.54 | 3.81 |
| Subtotal | | 87706 | 234804 | 30.56 | 1.48 | 5.30 | 24.59 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 50396 | 131028 | 40.86 | 1.39 | 3.39 | 7.83 |
| High grade clay magnesite | 70 | 102864 | 267447 | 42.29 | 1.70 | 2.13 | 5.42 |
| Low grade clay magnesite | 80 | 16126 | 41927 | 32.20 | 12.05 | 2.72 | 7.07 |
| Hard crystalline high CaO | 60 | 197792 | 534039 | 37.81 | 7.78 | 1.31 | 5.76 |
| Subtotal | | 367178 | 974441 | 39.21 | 5.44 | 1.88 | 6.00 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 340965 | 852413 | | | | |
| FW Rock | 20 | 107287 | 268216 | | | | |
| HW Rock | 40 | 55865 | 139914 | | | | |
| Dolerite | 30 | 0 | 0 | | | | |
| Subtotal | | 504217 | 1260543 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 759554 | 2016855 | 43.69 | 1.82 | 1.29 | 3.74 |
| Total undesirable rock (including overburden and adjacent rock) | | 959101 | 2469788 | | | | |
| Strip Ratio | | | 1.2 | :1 | | | |

631054

# TABLE 1

**ARTHUR RIVER MAGNESITE PROJECT**

Sectional Resource Estimate September 1999

Inside Slot (Pit) 1, Large Slot 20140-20400N to 25m depth (110mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SIO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline Magnesite | 50 | 542905 | 1465844 | 43.77 | 2.00 | 0.99 | 3.86 |
| Fe stained hard magnesite | 90 | 41368 | 111693 | 43.21 | 0.84 | 1.66 | 5.69 |
| Broken hard magnesite | 100 | 171283 | 445337 | 43.98 | 1.83 | 1.10 | 3.47 |
| Subtotal | | 755556 | 2022874 | 43.79 | 1.90 | 1.05 | 3.88 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline Magnesite LG | 51 | 0 | 0 | | | | |
| Fe stained hard magnesite LG | 91 | 56193 | 151721 | 30.63 | 0.62 | 4.16 | 27.91 |
| Broken hard magnesite LG | 101 | 10018 | 26047 | 33.93 | 5.35 | 9.54 | 3.81 |
| Subtotal | | 66211 | 177768 | 31.11 | 1.31 | 4.95 | 24.38 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 17164 | 44626 | 41.39 | 1.12 | 3.43 | 7.23 |
| High grade clay magnesite | 70 | 367275 | 954915 | 40.90 | 0.51 | 3.73 | 7.98 |
| Low grade clay magnesite | 80 | 142059 | 369354 | 28.93 | 8.31 | 7.34 | 12.59 |
| Hard crystalline high CaO | 60 | 143751 | 388127 | 37.80 | 7.20 | 1.31 | 4.59 |
| Subtotal | | 670249 | 1757022 | 37.71 | 3.64 | 3.95 | 8.18 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 757138 | 1892845 | | | | |
| FW Rock | 20 | 35985 | 89963 | | | | |
| HW Rock | 40 | 78164 | 195411 | | | | |
| Dolerite | 30 | 5025 | 13568 | | | | |
| Subtotal | | 876312 | 2191787 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 755556 | 2022874 | 43.79 | 1.90 | 1.05 | 3.88 |
| Total undesirable rock (including overburden and adjacent rock) | | 1612772 | 4126577 | | | | |
| Strip Ratio | | | 2.0 | :1 | | | |

631055

# TABLE 2

**ARTHUR RIVER MAGNESITE PROJECT**

Sectional Resource Estimate October 1999

Inside Slot (Pit) 3, Small Slot 20260-20400N to 25m depth (110mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 371192 | 1002219 | 43.87 | 1.98 | 0.83 | 4.03 |
| Fe stained hard magnesite | 90 | 0 | 0 | | | | |
| Broken hard magnesite | 100 | 0 | 0 | | | | |
| Subtotal | | 371192 | 1002219 | 43.87 | 1.98 | 0.83 | 4.03 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 0 | 0 | | | | |
| Fe stained hard magnesite LG | 91 | 5528 | 14925 | 40.09 | 2.89 | 4.70 | 3.97 |
| Broken hard magnesite LG | 101 | 0 | 0 | | | | |
| Subtotal | | 5528 | 14925 | 40.09 | 2.89 | 4.70 | 3.97 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 0 | 0 | | | | |
| High grade clay magnesite | 70 | 323704 | 841629 | 40.71 | 0.35 | 3.94 | 8.32 |
| Low grade clay magnesite | 80 | 132559 | 344662 | 28.70 | 8.05 | 7.68 | 12.99 |
| Hard crystalline high CaO | 60 | 62439 | 168585 | 37.99 | 6.19 | 1.36 | 2.77 |
| Subtotal | | 518702 | 1354866 | 37.31 | 3.03 | 4.57 | 8.82 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 468568 | 1171420 | | | | |
| FW Rock | 20 | 15075 | 37688 | | | | |
| HW Rock | 40 | 61161 | 152902 | | | | |
| Dolerite | 30 | 5025 | 13568 | | | | |
| Subtotal | | 549829 | 1375578 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 371192 | 1002219 | 43.87 | 1.98 | 0.83 | 4.03 |
| Total undesirable rock (including overburden and adjacent rock) | | 1074059 | 2745369 | | | | |
| Strip Ratio | | | 2.7 | :1 | | | |

631056

# TABLE 1

**ARTHUR RIVER MAGNESITE PROJECT**

Sectional Resource Estimate October 1999

Inside Slot (Pit) 2, Small Slot 20140-20260N to 25m depth (110mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 171713 | 463624 | 43.55 | 2.05 | 1.32 | 3.50 |
| Fe stained hard magnesite | 90 | 41368 | 111693 | 43.21 | 0.84 | 1.66 | 3.69 |
| Broken hard magnesite | 100 | 171283 | 445337 | 43.98 | 1.83 | 1.10 | 3.47 |
| Subtotal | | 384364 | 1020654 | 43.70 | 1.82 | 1.26 | 3.73 |
| **Low Grade (<42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 0 | 0 | | | | |
| Fe stained hard magnesite LG | 91 | 50665 | 136797 | 29.60 | 0.37 | 4.10 | 30.52 |
| Broken hard magnesite LG | 101 | 10018 | 26047 | 33.93 | 5.36 | 9.54 | 3.81 |
| Subtotal | | 60683 | 162844 | 30.29 | 1.17 | 4.97 | 26.25 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | 17164 | 44626 | 41.39 | 1.12 | 3.43 | 7.23 |
| High grade clay magnesite | 70 | 43571 | 113286 | 42.29 | 1.70 | 2.13 | 5.42 |
| Low grade clay magnesite | 80 | 9501 | 24702 | 32.20 | 12.05 | 2.72 | 7.07 |
| Hard crystalline high CaO | 60 | 81312 | 219542 | 37.66 | 7.97 | 1.27 | 5.99 |
| Subtotal | | 151548 | 402156 | 39.04 | 5.69 | 1.84 | 6.03 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | 288570 | 721425 | 11.16 | 3.84 | 1.54 | 24.48 |
| FW Rock | 20 | 20910 | 52276 | 23.07 | 24.40 | 1.34 | 5.93 |
| HW Rock | 40 | 17004 | 42510 | 0.86 | 0.01 | 52.82 | 35.21 |
| Dolerite | 30 | 0 | 0 | | | | |
| Subtotal | | 326484 | 816211 | | | | |
| **Summary** | | | | | | | |
| Total desirable resource | | 384364 | 1020654 | 43.70 | 1.82 | 1.26 | 3.73 |
| Total undesirable rock (including overburden and adjacent rock) | | 538715 | 1381211 | | | | |
| Strip Ratio | | | 1.4 | :1 | | | |

# APPENDIX 3

631058

## TABLE 1

**ARTHUR RIVER MAGNESITE PROJECT**
Sectional Resource Estimate - January 2000
Inside Area 2 Pit to 70mRL
Inferred Resource

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 309298 | 835104 | 42.65 | 2.40 | 0.75 | 5.78 |
| Fe stained hard magnesite | 90 | | | | | | |
| Broken hard magnesite | 100 | | | | | | |
| Subtotal | | 309298 | 835104 | 42.65 | 2.40 | 0.75 | 5.78 |
| **Lower Grade (38-42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 3393909 | 9163555 | 41.41 | 2.54 | 1.96 | 6.64 |
| Fe stained hard magnesite LG | 91 | | | | | | |
| Broken hard magnesite LG | 101 | | | | | | |
| Subtotal | | 3393909 | 9163555 | 41.41 | 2.54 | 1.96 | 6.64 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | | | | | | |
| High grade clay magnesite | 70 | | | | | | |
| Low grade clay magnesite | 80 | | | | | | |
| Hard crystalline high CaO | 60 | 300250 | 810675 | 39.69 | 5.49 | 1.29 | 5.90 |
| Subtotal | | 300250 | 810675 | 39.69 | 5.49 | 1.29 | 5.90 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | | Not estimated | | | | |
| FW Rock | 20 | | Not estimated | | | | |
| HW Rock | 40 | | Not estimated | | | | |
| Dolerite | 30 | | Not estimated | | | | |
| Subtotal | | | | | | | |
| **Summary** | | | | | | | |
| Total desirable resource (>38%MgO) | | 3703207 | 9998659 | 41.52 | 2.53 | 1.86 | 6.56 |
| Total undesirable resource | | 300250 | 810675 | 39.69 | 5.49 | 1.29 | 5.90 |

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# APPENDIX 4

Copy of TCR 4415A

631060

**CREST MAGNESIUM NL**

ACN 061 375 442

# LYONS RIVER MAGNESITE RESOURCE

## PROPOSED PIT NO 3

6 AUGUST 1999

JOHN WYATT
**Principal**
GEOLOGICAL INVESTIGATIONS PTY LTD
LEVEL 20,
ALLENDALE SQUARE
ST GEORGES TERRACE
PERTH 6000

Level 1, 11 Ventnor Avenue West Perth WA 6005
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Telephone +61 8 9322 9110 Facsimile +61 8 9322 1007
www.crestmagnesium.com.au

5 August 1999

# LYONS RIVER AREA – RL8717
# SUMMARY REPORT

## INTRODUCTION

Attached are plans and sections prepared by CRAE relating to their 1983/1984 investigations. CRAE carried out a limited reconnaissance diamond drilling programme comprising LR[s] 1, 2, 3, 4, 5, 6 and 11A which investigated approximately
1200 metres of the main magnesite resource, together with a number of shorter holes which investigated parts of what was termed the Pinner (Quarry) Deposit.
CRAE calculated that this Lyons River area had the potential to host some 100 million tonnes of high grade magnesite grading in excess of 40% MgO.

Based on metallurgical test works and the more detailed check and in fill drilling carried out by Crest at the Arthur River Magnesite Resource zone located between the Arthur and Lyons River, within RL8718 and 1M/99, the potential of the Lyons River area has been reassessed using more appropriate cut-off grades and a computer generated resource.

A smaller, approximately 600 metre strike length of the Lyons River Magnesite resource was selected using data provided from CRAE holes LR [s] 2, 6, 11A and 5 together with cut off grades derived from metallurgical testing of Arthur River drill core.

In an attempt to reduce the influx of groundwater into the proposed Lyons River open pit, the pit design limits mining to a maximum vertical depth of 200 metres AHD which is some 10 metres above the Lyons River channel invert in the vicinity of LR1.

The preliminary resource tonnages and grades calculated for the proposed pit, from the CRAE diamond drill hole analyses were as follows:-

End section calculations – B Speechly

| | | | |
|---|---|---|---|
| LR2 | | - 12.2 million tonnes | |
| LR5 | | - 6.4 million tonnes | |
| | Total | 18.6 million tonnes | - 39.92% MgO |
| | Strip | Ratio 0.89 : 1 | |

Computer generated tonnages – Wildfire Resources

High Grade Magnesite - > 38% MgO

| | | | |
|---|---|---|---|
| LR2 | | - 9.9 million tonnes | |
| LR5 | | - 5.9 million tonnes | |
| | Total | 15.8 million tonnes | |

Low grade Magnesite - < 38% MgO

| | | | |
|---|---|---|---|
| LR2 | | - 6.1 million tonnes | |
| LR5 | | - 3.2 million tonnes | |
| | Total | 9.3 million tonnes | - 28.13% MgO |

The above calculations and the pit design are preliminary and based on uncontrolled topographic information for collar RL's and the geochemical analyses of only four relevant drillholes, namely LR2, LR5, LR6 and LR 11A.

Assuming a minimum production rate of 90,000 tonnes of magnesium metal per year, the anticipated mine life of pit located between drillholes LR2 and LR5, would be about 40 years.

Additional tonnages of highgrade magnesium resource are known to be available both along strike to the southwest at least as far as LR1 and also to a depth in excess of 300 metres vertical.

However, the results are very similar to those derived from the more detailed examination of the Arthur River Magnesite resource zone located some 5 kilometres along strike to the northeast. It should be noted in the vicinity of LR2 there is a basaltic overburden. Preliminary calculations based on the proposed pit design indicate that some 900,000 tonnes of this material would be produced from pit excavation. This material would be ideally suited for the construction of waste dump and associated mining area hardstands and for the surfacing of required haulage and access roadways.

## DIAMOND DRILLING INVESTIGATION

An infill drilling programme designed to up grade the resource zone within the proposed pit area to Measured Resource status would comprise about 2500 metres of drilling in 20 holes along fence lines spaced 100 metres apart and cost in the vicinity of $1,000,000 as detailed below:-

| | | |
|---|---|---|
| Drilling 4000m @ $160/metre all up | | $ 600,000 |
| Supervision 50 days @ $500 per day | | $ 75,000 |
| Analyses 1500 @ $40 each | | $ 60,000 |
| Report Compilation 30 days @ $750 per day | | $ 22,500 |
| Travel | | $ 10,000 |
| Accommodation/ Food | | $ 15,000 |
| Vehicle hire and Fuel | | $ 12,000 |
| Data Base Compilation | | $ 25,000 |
| Administration 10% Total Cost | | $ 82,000 |
| | **Total** | $ 901,500 |
| | **Rounded** | $1,000,000 |

## CONCLUSIONS

The Lyons River Magnesite resource zone contains at least 40 to 50 million tonnes of high grade magnesite to a vertical depth of 150 metres.
A proposed open pit located between LR2 and LR5 and excavated to a maximum vertical depth of no more than 200 metres AHD (which is approximately 10 metres above the Lyon River channel invert) would contain

about 16 million tonnes of high grade resource grading 39.92% MgO, 2.96% CaO, 0.62% $Fe^2O^3$ and 10.65% $SiO_2$, which are well below the preferred cut-of grades of 4% CaO, 6% $Fe^2O^3$ and 12% $SiO_2$

For a larger pit excavated to a maximum vertical depth of about 75 metres (135 AHD) a computer generated Inferred Resource of **53.5 million tonnes has been calculated grading 40.4% MgO, 3.42% CaO, 0.92% $Fe^2O^3$, 8.29% $SiO_2$**

It should be noted that additional higher grade mineralisation occurs below the proposed pit – which may be accessed – if no problems are experienced with ground water flows during mining of the near surface mineralisation.

CRAE *in their annual reporting noted that the* Lyons River Resource zone was less cavernous than the Arthur River magnesite body and this fact together with the evidence of abundant magnesite out crop at the Lyons Deposit suggests that the resources will be much more competent and could be mined to a much greater depth without incurring problems from excessive groundwater flows into the pit.

An infill diamond drilling programme designed to up grade the Indicated Resource to Measured Status would probably be satisfied by drilling a further 20 holes each ranging in length from 100 to 200 metres for a total cost of about $1,000,000.

JOHN WYATT

# LYONS RIVER MAGNESITE PROJECT

## Sectional Tonnage Computer Generated Estimate. Wildfire Resources – August 1999

**HIGH GRADE MAGNESITE**

| Section | | Volume | Tonnes | MgO% | CaO% | $Fe_2O_3$% | $SiO_2$% |
|---|---|---|---|---|---|---|---|
| LR5 | (30000N) | 2201797 | 5944852 | 38.97 | 3.23 | 0.64 | 11.85 |
| LR2 | (304CON) | 3652403 | 9861488 | 40.49 | 2.78 | 0.60 | 9.93 |
| **Sub-total** | | 5854200 | 15806340 | 39.92 | 2.95 | 0.62 | 10.65 |

**LOW GRADE MAGNESITE**

| Section | | | | | | | |
|---|---|---|---|---|---|---|---|
| LR5 | (30000N) | 2258009 | 6096624 | 27.18 | 15.37 | 0.55 | 14.76 |
| LR2 | (30400N) | 1203727 | 3250062 | 29.93 | 10.54 | 0.83 | 17.56 |
| **Sub-total** | | 3461736 | 9346686 | 28.13 | 13.69 | 0.64 | 15.74 |
| **TOTAL** | | 9315936 | 25153026 | 35.54 | 6.94 | 0.63 | 12.54 |

# CREST MAGNESIUM

## LYONS RIVER AREA

### RESOURCE CALCULATION - BRIAN SPEECHLY

| SLICE | AREA | VOL.M$^3$ | INCREMENTAL VOL BCM's |
|---|---|---|---|
| 400.00 | 750.00 | | |
| 390.00 | 6,000.00 | 29,571.00 | 29,571.00 |
| 380.00 | 22,000.00 | 131,630.00 | 161,201.00 |
| 370.00 | 37,750.00 | 295,227.00 | 456,428.00 |
| 360.00 | 57,000.00 | 470,456.00 | 926,884.00 |
| 350.00 | 74,000.00 | 653,154.00 | 1,580,638.00 |
| 340.00 | 100,250.00 | 867,936.00 | 2,447,974.00 |
| 330.00 | 109,750.00 | 1,049,642.00 | 3,497,616.00 |
| 320.00 | 115,000.00 | 1,123,648.00 | 4,621,264.00 |
| 310.00 | 117,000.00 | 1,159,986.00 | 5,781,250.00 |
| 300.00 | 113,750.00 | 1,153,712.00 | 6,934,962.00 |
| 290.00 | 105,750.00 | 1,097,257.00 | 8,032,219.00 |
| 280.00 | 97,000.00 | 1,013,435.00 | 9,045,654.00 |
| 270.00 | 84,500.00 | 906,782.00 | 9,952,436.00 |
| 260.00 | 75,000.00 | 797,028.00 | 10,749,464.00 |
| 250.00 | 64,000.00 | 694,273.00 | 11,443,737.00 |
| 240.00 | 54,000.00 | 589,293.00 | 12,033,030.00 |
| 230.00 | 37,520.00 | 453,666.00 | 12,406,696.00 |
| 220.00 | 22,750.00 | 297,036.00 | 12,783,732.00 |
| 210.00 | 11,500.00 | 168,083.00 | 12,951,815.00 |
| 200.00 | 2,500.00 | 64,540.00 | 13,016,355.00 |

x 2.2 SG = 35,144,159 Tonnes

**Section**

LR2 = 14110x320x2.7 = 12.20MT

LR5= 7870x300x2.7= 6.37MT

Total 18.57MT

Strip Ratio 0.89:1

# LYONS RIVER MAGNESITE COMPOSITE GRADES

| HOLE_ID | DEPTH_FROM | DEPTH_TO | LENGTH | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| DD82LR1 | 22.7 | 97.7 | 75.0 | 27.02 | 16.38 | 0.69 | 13.93 |
| DD82LR1 | 97.7 | 267.0 | 169.3 | 40.47 | 4.79 | 1.71 | 5.07 |
| DD82LR1 | 267.0 | 296.6 | 29.6 | 23.31 | 17.75 | 1.94 | 18.85 |
| DD82LR1 | 296.6 | 369.4 | 72.8 | 40.74 | 5.06 | 2.38 | 3.31 |
| DD83LR2 | 68.5 | 157.5 | 89.0 | 39.93 | 2.18 | 0.39 | 12.43 |
| DD83LR2 | 157.5 | 175.0 | 17.5 | 29.61 | 11.40 | 0.34 | 17.40 |
| DD83LR2 | 175.0 | 200.7 | 25.7 | 42.46 | 1.49 | 0.61 | 7.91 |
| DD83LR2 | 200.7 | 245.0 | 44.3 | 28.49 | 12.46 | 1.68 | 15.81 |
| DD83LR2 | 245.0 | 403.0 | 158.0 | 41.72 | 4.68 | 0.81 | 3.49 |
| DD83LR5 | 102.6 | 141.4 | 38.8 | 25.94 | 19.49 | 0.38 | 10.85 |
| DD83LR5 | 141.4 | 203.2 | 61.8 | 38.85 | 3.10 | 0.60 | 12.41 |
| DD83LR5 | 203.2 | 230.0 | 26.8 | 25.39 | 15.32 | 0.25 | 18.46 |
| DD83LR5 | 230.0 | 236.6 | 6.6 | 43.53 | 1.24 | 0.45 | 5.36 |
| DD83LR5 | 236.6 | 272.0 | 35.4 | 30.01 | 12.00 | 0.98 | 14.26 |
| DD83LR5 | 272.0 | 345.5 | 73.5 | 37.32 | 4.70 | 0.89 | 12.59 |
| DD83LR5 | 345.5 | 358.0 | 12.5 | 21.80 | 21.27 | 1.97 | 12.78 |
| DD83LR5 | 358.0 | 418.8 | 60.8 | 39.43 | 5.26 | 0.37 | 7.26 |
| DD83LR5 | 418.8 | 446.6 | 27.8 | 30.07 | 15.26 | 3.17 | 5.66 |
| DD84LR6 | 18.0 | 81.0 | 63.0 | 31.44 | 7.99 | 0.77 | 19.13 |
| DD84LR6 | 81.0 | 104.5 | 23.5 | 42.64 | 1.26 | 1.55 | 7.07 |
| DD84LR6 | 104.5 | 144.5 | 40.0 | 22.98 | 22.10 | 0.97 | 11.32 |
| DD84LR6 | 144.5 | 194.5 | 50.0 | 40.48 | 4.48 | 1.78 | 6.19 |
| DD84LR7 | 27.0 | 40.0 | 13.0 | 37.32 | 2.53 | 0.18 | 16.73 |
| DD84LR7 | 40.0 | 158.0 | 118.0 | 40.75 | 2.10 | 0.56 | 10.22 |

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366000E

366500E

367000E

5437000N

5436500N

5436000N

5435500N

Waste Dump

Truck Haulage

Drain

Fine Ore Pad

Crusher

ROM Pad

DD84LR8

DD84LR7

DD84LR11A

DD84LR6

DD83LR2

(Access Track

DD84LR10

DD84LR9

DD83LR5

Drain

DD82LR1

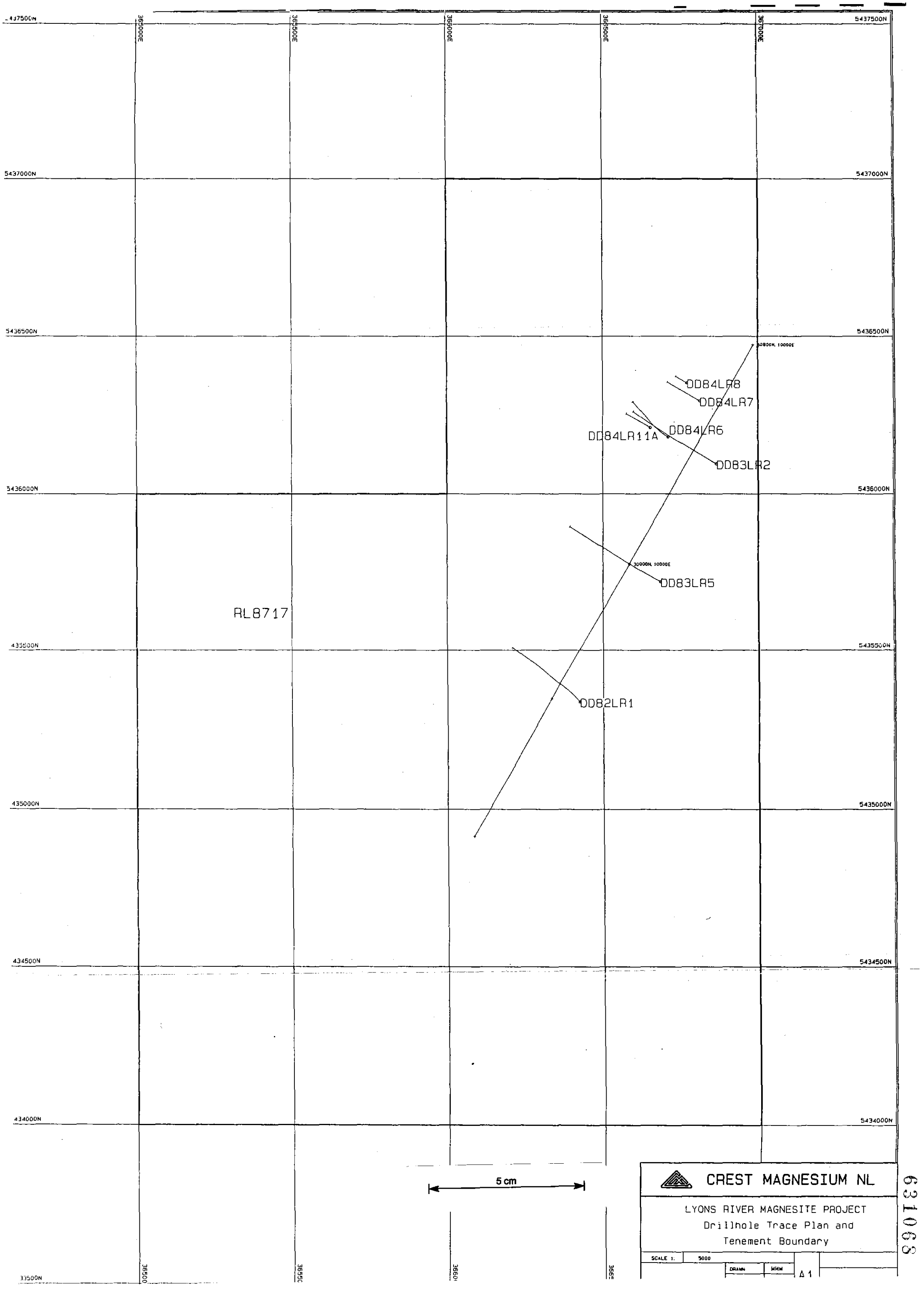
5 cm

CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Trace Plan, Tenement &
Proposed Site Plan

| Scale: 1: 5000 | Plan No. | Date: 10-Aug-99 |
|---|---|---|

631067


5437500N
5437000N
5436500N
5436000N
5435500N
5435000N
5434500N
5434000N
365000E
365500E
366000E
366500E
367000E
DD84LR8
DD84LR7
DD84LR6
DD84LR11A
DD83LR2
DD83LR5
DD82LR1
RL8717
5 cm
CREST MAGNESIUM NL
LYONS RIVER MAGNESITE PROJECT
Drillhole Trace Plan and
Tenement Boundary
SCALE 1: 5000
DRAWN MHM
A1
631063

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631069

# SECTIONAL TONNAGE REPORT FOR THE LYONS RIVER MAGNESITE PROJECT

**For Period**
**July to August 1999**

**Distribution:**

| | | |
|---|---|---|
| 1. | Wildfire Resources Pty Ltd | (1) |
| 2. | Crest Magnesium NL | (2) |

**Author:** M Wild
Wildfire Resources Pty Ltd
ACN 088 029 878

**August 1999**

# CONTENTS

## LIST OF TABLES



## LIST OF FIGURES



## LIST OF APPENDICES

# 1.0 INTRODUCTION

Wildfire Resources Pty Ltd was contracted to perform data capture and compilation into digital format for the Lyons River Magnesite Project in July 1999. Subsequent work included section generation and plotting and preliminary tonnage estimate for a pit design by Brian Speechly. This report details the process and results of this work.

# 2.0 DATA COLLECTION

## 2.1 SURVEYING

### 2.1.1 Local Grid and AMG Transformation Coordinates

A local grid was placed over the drillhole locations to more easily process the data in section. The northing axis of the local grid was oriented 30° east of the AMG north. A drillhole location plan with the local grid baseline is shown in Figure 1.

Local grid to AMG ties are given below:

| Mine Grid | | AMG | |
|---|---|---|---|
| 10 000E | 30 000N | 366 585E | 5 435 780N |
| 10 000E | 30 800N | 366 985E | 5436 472.82N |

### 2.1.2 Collar and Downhole Surveys

Drillhole collar positions were digitised from a photocopied map at a peculiar scale. Until collar positions are accurately surveyed, the positions used in this work must be considered estimated only. Collar RLs were estimated from an enlarged photocopy of the 1:25000 topographic map. Contours were only available for 10m intervals.

Downhole surveys were measured using an Eastman single-shot camera. Magnetic azimuths were recorded on the drill logs and some were converted to AMG. Where available, the recorded AMG azimuths were used, and where they were not recorded, a shift of +11.5° was used to convert magnetic azimuths to AMG.

lyonsdrd.pf

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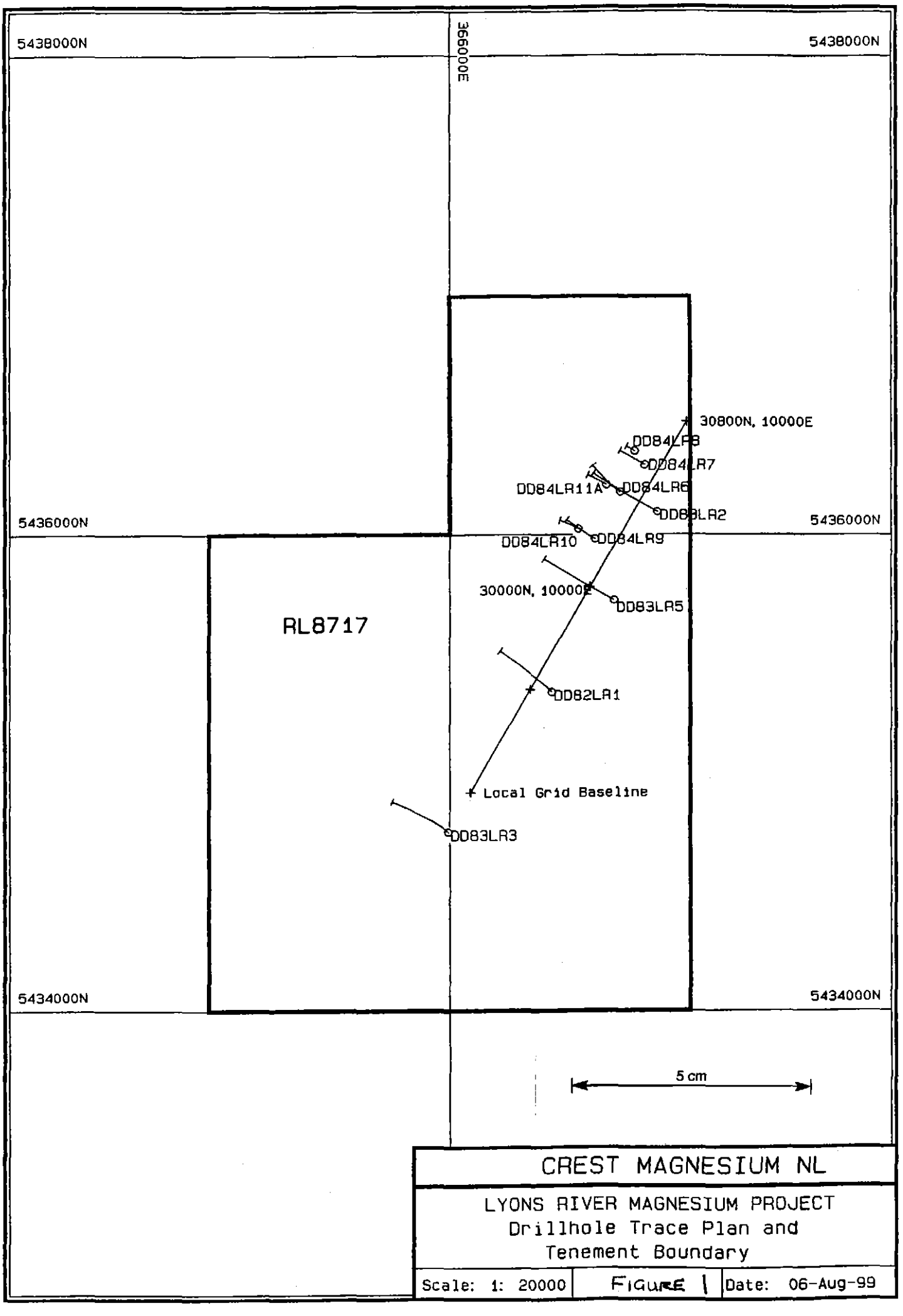


CREST MAGNESIUM NL

LYONS RIVER MAGNESIUM PROJECT
Drillhole Trace Plan and
Tenement Boundary

Scale: 1: 20000 | FIGURE 1 | Date: 06-Aug-99

## 2.2 DRILLING

### 2.2.1 Drillhole Location Plan

Refer Figure 1.

### 2.2.2 Drillhole Pattern

Three main drillhole section lines are spaced approximately 400m apart, with intermediate section lines at 150-200m spacings. Where more than one hole has been drilled on a section line, the holes are spaced up to 100m apart.

### 2.2.3 Drilling Methods

Details on drilling methods are available in the CRAE reports. All holes used in this report were drilled firstly with a tricone bit followed by diamond coring. The tricone-drilled portions were not sampled.

### 2.2.4 Effectiveness of Drilling

The drillholes on the main section lines that are approximately 400m apart were successful in testing the magnesite zone. The intermediate section lines have holes that have been drilled too far to the northwest, and seem to be mainly testing the footwall zone.

Further drilling is required to quantify the resource and upgrade it from an inferred category.

## 2.3 SAMPLING

### 2.3.1 Sampling Procedures

Details on sampling procedures, sample preparation and assaying are available in the CRAE reports.

Assays were data-entered into an Access database directly from the drill logs. Assays for MgO%, CaO%, $Fe_2O_3$%, $SiO_2$ and LOI were available

for all sampled intervals, while holes DD82LR1, DD83LR2 and DD83LR3 also had assays for $Al_2O_3$ and $SO_3$.

Laboratory assay reports were not available or were incomplete in the CRAE files supplied to Wildfire Resources Pty Ltd, so checking for transcription errors was not possible. All assays have been entered as written in the logs, with the exception of the below detection limit assays, which were entered as negative detection limit values eg.

-0.05% for <0.05%.

### 2.3.2 Sample Recovery

Core measurements were recorded in the logs but have not been data-entered or analysed in this work.

### 2.3.3 Sample and Assay Quality Control

No details were available on sample and assay quality control procedures, and since the drillhole density is sparse at this stage, it has been assumed that no quality control was performed. Further drilling and sampling should include this component.

### 2.3.4 *Data Density and Distribution*

Data density is sufficient to determine that an inferred category resource exists. Geological and grade continuity can be assumed but not verified with this low amount of data. Further drilling, sampling and geological interpretation are required to improve confidence in the resource.

## 2.4 LOGGING AND MAPPING PROCEDURES

In many cases the geologists logged descriptions which cannot be entered into the computer database without conversion to simple codes. The descriptions were converted to codes based on the earlier work done on the Arthur River Magnesite Project, with the addition of a few new codes for this project. At some stage a geologist more familiar with the project and rocktypes involved would be advised

to check the conversions, in particular those used to define the footwall rock sequence.

For the purpose of this investigation, the footwall was interpreted to be a very steeply dipping (~80°E) planar feature, with a sub-parallel hangingwall. Several holes cross into the footwall sequence but few cross the hangingwall/magnesite contact.

This interpretation is simplistic, reflecting the problem with the widespread nature of the data.

### 2.5 BULK DENSITY TESTWORK

No bulk density testwork was available for this investigation, so a density of 2.7g/cm$^3$ was used for all magnesite rock, based on testwork from the Arthur River Magnesium Project, which implied that 2.7 was a reasonable, but possibly conservative estimate of the density.

### 2.6 METALLURGICAL TESTWORK

No metallurgical testwork was available for this investigation.

### 2.7 GEOTECHNICAL DATA

The preliminary nature of this investigation excludes geotechnical analysis of the core. Future mining proposals should include appropriate geotechnical studies.

## 3.0 SECTIONAL TONNAGE ESTIMATION

### 3.1 SECTIONAL INTERPRETATION

A sectional interpretation on 3 sections was completed in August 1999. The sectional polygons followed a model of steeply dipping, sub-parallel mineralised zones bounded by barren footwall and hangingwall rocks. Some zones were modelled less steeply where adjacent drillhole intercepts supported such orientation. Polygons were trimmed against surface data measured from an enlarged photocopy of the 1:25000 topographic map where the contour interval was 10m.

## 3.2 CUT-OFF GRADES

Cut-off grades were applied to differentiate between high grade and low grade magnesite. These were as for the Arthur River Project and were applied as follows:

**High Grade Magnesite**

≥ 38% MgO

≤ 4% CaO

**Low Grade Magnesite**

≤ 38% MgO

≥ 4% CaO

## 3.3 POLYGON PARAMETERS

Polygons were interpreted on 3 sections (DD82LR1, DD83LR5 and DD83LR2) and were assigned high and low grade classification according to preliminary interpretation by John Wyatt. Subsequent grade calculation for polygons indicated that one or two polygons classified as high grade, did not in fact meet the high grade criteria, but were not far off. Due to time constraints and the preliminary nature of the investigation, these polygons were not re-classified. Further work however, should address this classification problem.

Polygons were interpreted to the base of the magnesite intercept on each section. This means that each section has a different base level for the bottom of the polygons i.e. not interpreted to the same RL. Whilst restricting tonnage estimate to a pit boundary, this does not present a problem, but should be kept in mind should the pit limits be removed and sectional tonnages estimated.

Grades for each polygon were calculated using the length-weighted average technique. No top-cuts or other data adjustments were made prior to grade calculation.

Polygons have been classified as inferred at this stage.

Sectional polygon interpretations are shown in Appendix I.

## 4.0 PIT DESIGN TONNAGE ESTIMATION

A preliminary pit design with haul road, waste dump and crusher layout was produced by Brian Speechly (Figure 2). The sectional polygons were trimmed to this pit design. Only two sections were included within the pit (DD83LR5 and DD83LR2).

Pit tonnages were estimated using the cross-sectional area of the polygons inside the pit boundary, a sectional thickness (extent) and the bulk density. The sectional extents assigned are detailed below:

| Section | Extent |
|---|---|
| DD83LR5 | 310m |
| DD83LR2 | 270m |

Pit tonnages estimated are in Table 1.

Subsequent to this work, Wildfire Resources Pty Ltd was requested to review the impact of the intermediate section with holes DD84LR9 and DD84LR10. A section was generated with composited grades (intervals above and below the cut-off grades) and the pit boundary. The only data available for this section which impacts the pit design occurs on the west side above the ramp. The composited grades in this section of the drillhole are compatible with the composited grades on the adjacent sections, indicating that there is only a minor net effect on the grade inside the pit. There is insufficient drilling data inside the rest of the pit on this section to make any further conclusions.

## 5.0 FURTHER WORK

Additional drilling is required to improve confidence in the resource estimate. Proper topographic control is required to enable surface modelling, and the old CRAE holes should be collar-surveyed to establish their correct positions and RLs.

TABLE 1

# LYONS RIVER MAGNESITE PROJECT

## Sectional Tonnage Estimate Inside Pit Design (B. Speechly) - August 1999

### HIGH GRADE MAGNESITE

| Section | | Volume | Tonnes | MgO% | CaO% | $Fe_2O_3$% | $SiO_2$% |
|---|---|---|---|---|---|---|---|
| LR5 | (30000N) | 2201797 | 5944852 | 38.97 | 3.23 | 0.64 | 11.85 |
| LR2 | (30400N) | 3652403 | 9861488 | 40.49 | 2.78 | 0.60 | 9.93 |
| **Sub-total** | | 5854200 | 15806340 | 39.92 | 2.95 | 0.62 | 10.65 |

### LOW GRADE MAGNESITE

| Section | | | | | | | |
|---|---|---|---|---|---|---|---|
| LR5 | (30000N) | 2258009 | 6096624 | 27.18 | 15.37 | 0.55 | 14.76 |
| LR2 | (30400N) | 1203727 | 3250062 | 29.93 | 10.54 | 0.83 | 17.56 |
| **Sub-total** | | 3461736 | 9346686 | 28.13 | 13.69 | 0.64 | 15.74 |
| **TOTAL** | | 9315936 | 25153026 | 35.54 | 6.94 | 0.63 | 12.54 |

lyonsdhq.pf

SURPAC SOFTWARE INTERNATIONAL. AUSTRALIA

366000E

365500E

367000E

5437000N

5436500N

5436000N

5435500N

Waste Dump

Truck Haulage

Drain

Fine Ore Pad

Crusher

ROM Pad

DD84LR8

DD84LR7

DD84LR11A

DD84LR6

DD82LR2

(Access Track

DD84LR10

DD84LR9

DD83LR5

Drain

DD82LR1

5 cm

CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Trace Plan, Tenement &
Proposed Site Plan

Scale: 1: 5000 | FIGURE 2 | Date: 10-Aug-99

03139

Appropriate sampling and assaying quality control procedures must be established in future drilling, and all holes should be downhole surveyed. The CRAE downhole surveying shows that there is deviation in the hole path, both in dip and azimuth.

631082

9800E

10000E

10200E

400RL

400RL

DD82LR1

Lyons River 210mRL

200RL

200RL

75.0m@27.02, 16.38, 0.69, 13.93

169.3m@40.47, 4.79, 1.71, 5.07

Footwall rocks

29.6m@23.31, 17.75, 1.95, 18.85

0RL

72.8m@40.74, 5.06, 2.38, 3.31

0RL

5 cm

GEOLOGICAL LEGEND ASSAY ORDER

MgO% CaO% Fe2O3% SiO2%

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock
- Conglomerate
- Basalt Float

9800E

10000E

# CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Section LR1
Grades, Mineralised zones, Large Pit

| Scale: 1: 2000 | Plan No. | Date: 19-Jan-00 |
|---|---|---|

631083

9800E

10000E

10200E

400RL

400RL

DD83LR5

Hangingwall rocks

Lyons River 210mRL

38.8m@25.94, 19.49, 0.38, 10.85

200RL

200RL

61.8m@38.85, 3.10, 0.60, 12.41

26.8m@25.39, 15.32, 0.25, 18.46

6.6m@43.53, 1.24, 0.45, 5.36

35.4m@30.01, 12.00, 0.98, 14.26

Footwall rocks

73.5m@37.32, 4.70, 0.89, 12.59

12.5m@21.80, 21.27, 1.97, 12.78

60.8m@39.43, 5.26, 0.37, 7.26

27.8m@30.07, 15.25, 3.17, 5.67

162.4

0RL

0RL

5 cm

GEOLOGICAL LEGEND ASSAY ORDER

MgO% CaO% Fe2O3% SiO2%

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock
- Conglomerate
- Basalt Float

9800E

10000E

# CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Section LR5
Grades, Mineralised zones, Large Pit

| Scale: 1: 2000 | Plan No. | Date: 19-Jan-00 |
|---|---|---|

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631084

9800E

10000E

10200E

400RL

DD84LR11A

DD84LR6

DD83LR2

63.0m@31.44, 7.99, 0.77, 19.13

89.0m@39.93, 2.13, 0.39, 12.43

23.5m@42.64, 1.26, 1.55, 7.07

40.0m@22.98, 22.10, 0.97, 11.32

17.5m@29.61, 11.40, 0.34, 17.40

25.7m@42.46, 1.48, 0.61, 7.91

50.0m@40.48, 4.48, 1.78, 6.19

44.3m@28.49, 12.46, 1.58, 15.81

128.2

223.0

Lyons River 210mRL

200RL

158.0m@41.72, 4.68, 0.81, 3.49

Footwall rocks

416.5

5 cm

0RL

GEOLOGICAL LEGEND ASSAY ORDER

MgO% CaO% Fe2O3% SiO2%

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock
- Conglomerate
- Basalt Float

CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Section LR2, 6, 11A
Grades, Mineralised zones, Large Pit

| Scale: 1: 2000 | Plan No. | Date: 19-Jan-00 |
|---|---|---|

631085

9800E

10000E

10200E

400RL

400RL

DDB4LR10

DDB4LR9

No sample

No sample

7.0m@21.91, 28.52, 0.42, 3.51

6.0m@40.53, 3.48, 2.36, 5.97

40.0m@32.99, 6.39, 0.54, 19.12

51.0m@28.90, 15.12, 1.93, 11.28

10.9m@40.77, 1.22, 0.77, 11.71

5.1m@30.95, 10.61, 0.90, 14.85

14.9m@40.36, 2.48, 0.88, 10.11

31.1m@18.41, 24.37, 1.40, 15.90

9.0m@24.91, 19.20, 1.40, 12.20

3.3m@42.00, 2.19, 1.59, 5.98

No sample

8.8m@41.07, 3.43, 4.15, 1.95

138.0

Lyons River 210mRL

200RL

48.1m@32.60, 9.34, 1.96, 12.69

200RL

209.0

Footwall rock

5 cm

0RL

0RL

GEOLOGICAL LEGEND

- Alluvium
- Magnesite
- Dolerite
- HW Hanging Wall
- FW Footwall
- Ferruginous clays
- Cavity
- Siliceous rock
- Conglomerate
- Basalt Float
- Siltstone
- Sandstone

ASSAY ORDER

MgO% CaO% Fe2O3% SiO2%

9800E

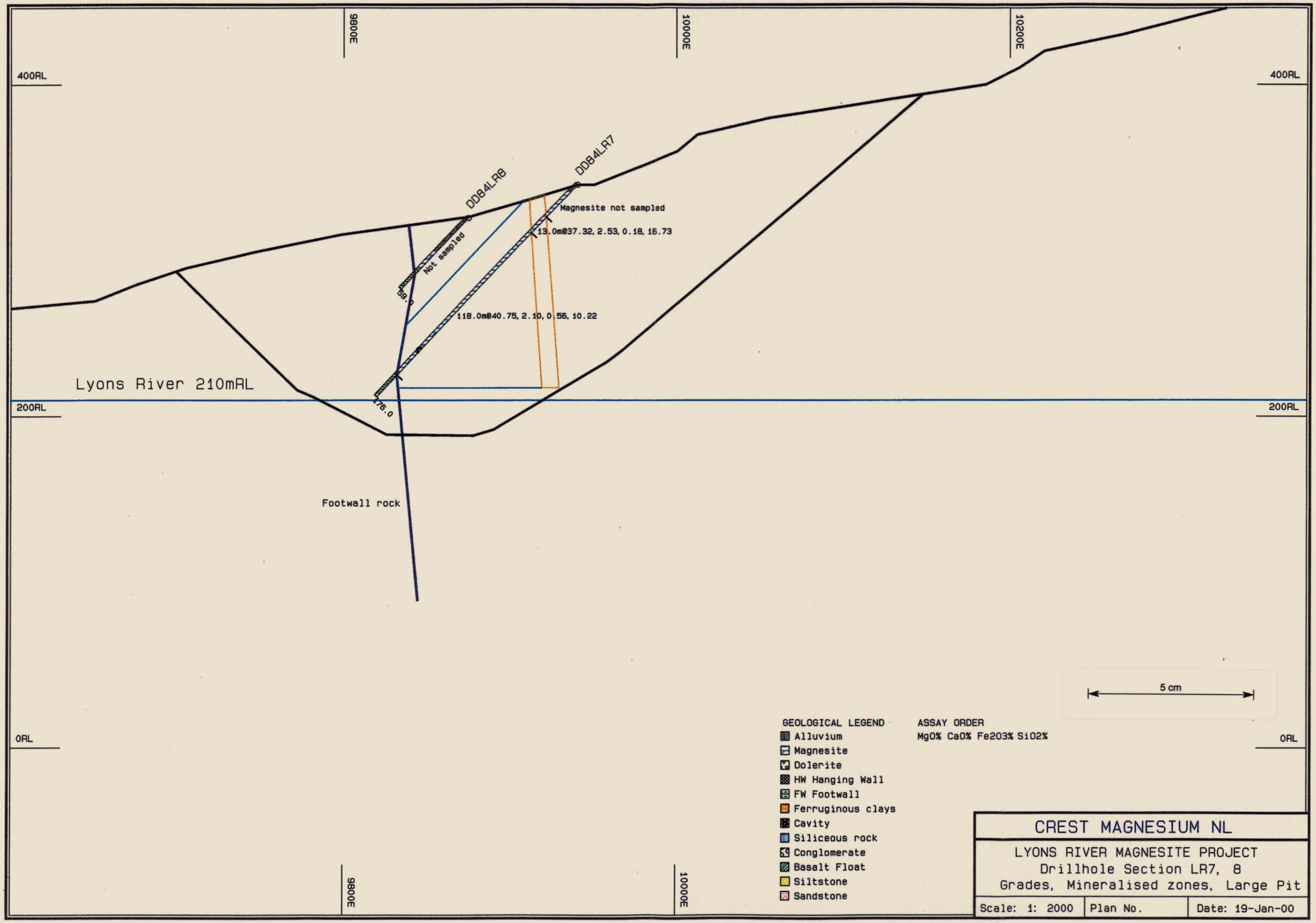
10000E

CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Section LR9, 10
Composite Grades, Large Pit

| Scale: 1: 2000 | Plan No. | Date: 19-Jan-00 |
|---|---|---|

631086




CREST MAGNESIUM NL

LYONS RIVER MAGNESITE PROJECT
Drillhole Section LR7, 8
Grades, Mineralised zones, Large Pit

| Scale: 1: 2000 | Plan No. | Date: 19-Jan-00 |
|---|---|---|

631087

## TABLE 1

**LYONS RIVER MAGNESITE PROJECT**

Sectional In-Pit Resource Estimate - January 2000

**Based on sections through holes LR1; LR5; LR9,10; LR2,6,11A; and LR7,8**
inside nominal pit to approximately 75m depth (135mRL)

| MATERIAL TYPE | STRINGS | VOLUME | TONNES | MgO% | CaO% | Fe2O3% | SiO2% |
|---|---|---|---|---|---|---|---|
| **High Grade (>42% MgO)** | | | | | | | |
| Hard crystalline magnesite | 50 | 5833062 | 15749266 | 43.15 | 2.44 | 1.19 | 4.23 |
| Fe stained hard magnesite | 90 | ) not modelled | | | | | |
| Broken hard magnesite | 100 | ) not modelled | | | | | |
| Subtotal | | 5833062 | 15749266 | 43.15 | 2.44 | 1.19 | 4.23 |
| **Low Grade (38-42% MgO)** | | | | | | | |
| Hard crystalline magnesite LG | 51 | 8599148 | 23217700 | 39.02 | 3.02 | 0.89 | 12.05 |
| Hard crystalline high CaO | 61 | 5381481 | 14529999 | 39.86 | 5.10 | 0.69 | 6.70 |
| Fe stained hard magnesite LG | 91 | ) not modelled | | | | | |
| Broken hard magnesite LG | 101 | ) not modelled | | | | | |
| Subtotal | | 13980629 | 37747699 | 39.35 | 3.82 | 0.81 | 9.99 |
| **Other Magnesite Mineralisation** | | | | | | | |
| Cavernous decomposed magnesite | 110 | ) not modelled | | | | | |
| High grade clay magnesite | 70 | ) not modelled | | | | | |
| Low grade clay magnesite | 80 | ) not modelled | | | | | |
| Hard crystalline high CaO (waste) | 60 | 12686143 | 34252586 | 28.01 | 13.72 | 1.21 | 14.40 |
| Subtotal | | 12686143 | 34252586 | 28.01 | 13.72 | 1.21 | 14.40 |
| **Waste Rock** | | | | | | | |
| Overburden | 10 | | Not estimated | | | | |
| FW Rock | 20 | | Not estimated | | | | |
| HW Rock | 40 | | Not estimated | | | | |
| Dolerite | 30 | | Not estimated | | | | |
| Unknown, not sampled | 120 | 940652 | 2539760 | | | | |
| Subtotal | | 940652 | 2539760 | | | | |
| **Summary** | | | | | | | |
| **Total desirable resource**** | | 19813691 | **53496965** | **40.47** | **3.42** | **0.92** | **8.29** |
| Undesirable rock (excluding overburden and adjacent rock) | | 13626795 | 36792346 | | | | |

**Notes**

1. Estimate based on widespread drilling data, using CRA data at face value, no validation attempted
2. Sectional interpretation to base of nominal, large pit at 135mRL
3. Section 30170N (LR9,10) included this run, not previously included
4. Surface modelling not well controlled, based on coarse contour data
5. Material, possibly magnesite, unsampled but within pit limits has been classed as unknown (String 120)
6. No overburden or waste is included in these figures
7. Figures should be treated with caution, preliminary status only (inferred at best)

** Includes 14.5Mt of high CaO% magnesite (5.1% CaO)