SAVANNA MINERAL RESOURCES PTY LTD
ACN 063 921 960

A wholly owned subsidiary of
MT GRACE RESOURCES NL
ACN 060 774 227

BATCHelor PROJECT
NORTHERN TERRITORY

E.L. 9501

ANNUAL REPORT
FOR PERIOD

13th September 1998 to 12th September 1999

3rd Year of Tenure

Volume 8 of 9

Supplement No. II

DevMin Resource Estimation
Volume 1 of 2
Text

Compiled by:
B J UREN
October 1999

Copies:
(1) Batchelor
(2) Perth
(3) Department of Mines & Energy

Annual Report EL9501 BJU0007
MT GRACE RESOURCES NL

BATCHelor MAGNESITE PROJECT
WINCHESTER PROSPECT

Volume 1 of 2

Geology and Resource Estimation

Text

April 1999

Prepared by

DevMin Consultants Pty Ltd

ACN 079 711 229
Disclaimer

This document has been prepared for Mt Grace Resources NL by DevMin Consultants Pty Ltd, based on data and assumptions as reported throughout the text and upon information and data supplied by others.

While DevMin Consultants Pty Ltd has taken all reasonable care to ensure that the facts and opinions expressed in this document are accurate, it does not accept any legal responsibility to any person, organisation or company for any loss or damage resulting from its use of the report however caused, and whether by breach of contract, negligence or otherwise.
# TABLE OF CONTENTS

1. SUMMARY ................................................................................................................................. 1

2. INTRODUCTION AND BACKGROUND INFORMATION ......................................................... 4
   2.1 PREAMBLE ............................................................................................................................. 4
   2.2 INTRODUCTION ..................................................................................................................... 4
   2.3 PHYSICAL GEOGRAPHY, CLIMATE & INFRASTRUCTURE .............................................. 4
   2.4 TENEMENTS ......................................................................................................................... 5
   2.5 PREVIOUS EXPLORATION FOR MAGNESITE ................................................................. 6

3. GEOLOGICAL SETTING ........................................................................................................... 7
   3.1 REGIONAL GEOLOGY & MINERALISATION ..................................................................... 7
   3.2 LOCAL GEOLOGY ................................................................................................................ 7
      3.2.1 Other Mineralisation at Winchester ............................................................................. 9

4. PHYSICAL & CHEMICAL DATA COLLECTION ....................................................................... 11
   4.1 MT GRACE EXPLORATION PROGRAMME 1998 – 1999 ................................................. 11
   4.2 SURVEY CONTROL ............................................................................................................. 11
   4.3 GRID & DATA SPACING & ORIENTATION ..................................................................... 12
   4.4 DRILLING .......................................................................................................................... 13
   4.5 SAMPLING ......................................................................................................................... 13
      4.5.1 Sampling Quality Control ......................................................................................... 14
      4.5.2 Sample Preparation ................................................................................................. 14
      4.5.3 Sample Storage ......................................................................................................... 15
   4.6 ANALYTICAL TECHNIQUES ......................................................................................... 15
      4.6.1 Acid Digest Technique ............................................................................................. 16
      4.6.2 XRF Technique ....................................................................................................... 16
      4.6.3 Comparison of Acid Soluble & XRF Techniques ..................................................... 17
      4.6.4 Analysis – Quality Control ..................................................................................... 17
      4.6.5 Base Metal, Precious Metal & Boreo Analyses ...................................................... 18
   4.7 MINERALOGICAL CALCULATIONS ............................................................................. 18
   4.8 BULK DENSITY ............................................................................................................... 20
   4.9 DATA RECORD, MANIPULATION & PRESENTATION .................................................. 21
   4.10 ACCEPTANCE OF INTERPRETATION & DATA .............................................................. 21

5. RESOURCE ESTIMATION ...................................................................................................... 23
   5.1 INTRODUCTION ............................................................................................................... 23
   5.2 DATA TRANSFER ............................................................................................................ 23
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>DATABASE</td>
<td>26</td>
</tr>
<tr>
<td>5.4</td>
<td>DATA VALIDATION</td>
<td>26</td>
</tr>
<tr>
<td>5.5</td>
<td>UNIVARIATE STATISTICS</td>
<td>26</td>
</tr>
<tr>
<td>5.6</td>
<td>BULK DENSITY</td>
<td>29</td>
</tr>
<tr>
<td>5.7</td>
<td>WIREFRAME SURFACES</td>
<td>29</td>
</tr>
<tr>
<td>5.7.1</td>
<td>Introduction</td>
<td>29</td>
</tr>
<tr>
<td>5.7.2</td>
<td>Topographic Surface</td>
<td>30</td>
</tr>
<tr>
<td>5.7.3</td>
<td>Base of Soil and Transported Cover</td>
<td>30</td>
</tr>
<tr>
<td>5.7.4</td>
<td>Base of Weathering</td>
<td>30</td>
</tr>
<tr>
<td>5.7.5</td>
<td>Lower Limit of Drill Information</td>
<td>30</td>
</tr>
<tr>
<td>5.8</td>
<td>BLOCK MODEL SET-UP</td>
<td>32</td>
</tr>
<tr>
<td>5.8.1</td>
<td>Volume Model Specifications and Limits</td>
<td>32</td>
</tr>
<tr>
<td>5.8.2</td>
<td>Geological Coding and Model Domains</td>
<td>32</td>
</tr>
<tr>
<td>5.9</td>
<td>GRADE INTERPOLATION</td>
<td>33</td>
</tr>
<tr>
<td>5.9.1</td>
<td>Introduction</td>
<td>33</td>
</tr>
<tr>
<td>5.9.2</td>
<td>Method</td>
<td>34</td>
</tr>
<tr>
<td>5.9.3</td>
<td>Metallurgical Codes</td>
<td>35</td>
</tr>
<tr>
<td>5.9.4</td>
<td>Resource Models</td>
<td>36</td>
</tr>
<tr>
<td>5.9.5</td>
<td>Resource Report and Classification</td>
<td>37</td>
</tr>
<tr>
<td>5.9.6</td>
<td>Model Check and Comparison with Manual Polygonal Estimate</td>
<td>42</td>
</tr>
<tr>
<td>6.</td>
<td>RECOMMENDATIONS</td>
<td>43</td>
</tr>
<tr>
<td>7.</td>
<td>CONCLUSION</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>REFERENCES</td>
<td>46</td>
</tr>
</tbody>
</table>
FIGURES

FIGURE 2.1 Location & Tenement Plan
FIGURE 2.2 Tenement & Regional Geological Map
FIGURE 5.1 Winchester Prospect Drill Traces, Section Lines & Boundary of resource area.
FIGURE 5.2 Magnesium as MgO, Distribution In All RC Samples From The Winchester Prospect.
FIGURE 5.3 Magnesium as MgO, Distribution For All RC Samples Logged as Lithology Magnesite.
FIGURE 5.4 Winchester Prospect Wireframe Surfaces
FIGURE 5.5 Block Model Section 23420E
FIGURE 5.6 Block Model Plan at 50mRL
FIGURE 5.7 Block Model 3-D View

TABLES

TABLE 2.1 Tenement Listing
TABLE 2.2 Sundance Gold Mine – Core Hole
TABLE 4.1 Downhole Surveys
TABLE 4.2 Drill Sample Weights
TABLE 4.7 Density Determinations
APPENDICES

APPENDIX 1
STATEMENT OF QUALIFICATIONS OF AUTHORS

APPENDIX 2
GEOLOGY PLANS & CROSS SECTIONS

Figure 3.1  Geological Map 1:10,000, Central Sheet
Figure 3.2  Winchester Drill hole Location Plan
Figure 3.3  Winchester RC Drill hole Cross Sections
Figure 3.4  Winchester RC Drill hole Cross Sections
Figure 3.5  Winchester RC Drill hole Cross Sections

Not presented in this copy of this Report. These plans are presented in accompanying Report titled “Winchester Prospect Geology & Resource Estimation” – March 1999 by B J Uren

APPENDIX 3
SAMPLING VALIDATION

Table 4.3  Comparison of Original & Field Resplit Assays
Table 4.4  Comparison of 3 in 10 with 10 in 10 Sampling
Plot 4.1  Field Resplits – LOI
Plot 4.2  Field Resplits – MgO
Plot 4.3  Field Resplits – Al₂O₃
Plot 4.4  Field Resplits – Fe₂O₃
Plot 4.5  Field Resplits – CaO

APPENDIX 4
ANALYTICAL VALIDATION

Table 4.5  Comparison of Classic v Scan v XRF Assays
Table 4.6  Comparison of Analabs & SGS Assays
Plot 4.6  Assaycorp Classic v Scan – MgO
Plot 4.7  Assaycorp Classic v Scan – Al₂O₃
Plot 4.8  Assaycorp Classic v Scan – Fe₂O₃
Plot 4.9  Assaycorp Classic v Scan – CaO
Plot 4.10 Assaycorp v Analabs – Insolubles
Plot 4.11 Assaycorp v Analabs – MgO
Plot 4.12 Assaycorp v Analabs – Al₂O₃
Plot 4.13 Assaycorp v Analabs – Fe₂O₃
Plot 4.14 Assaycorp v Analabs – CaO
APPENDIX 5  DOWNHOLE MINERALOGICAL HISTOGRAMS

Figure 4.1  Winchester RC Drill hole Histograms
Figure 4.2  Winchester RC Drill hole Histograms
Figure 4.3  Winchester RC Drill hole Histograms
Figure 4.4  Winchester RC Drill hole Histograms
Figure 4.5  Winchester RC Drill hole Histograms

Not presented in this copy of this Report. These plans are presented in accompanying Report titled "Winchester Prospect Geology & Resource Estimation" – March 1999 by B J Uren

APPENDIX 6  STATISTICAL PLOTS

APPENDIX 7  RESOURCE MODEL SECTIONS

APPENDIX 8  RESOURCE MODEL PLANS
1. SUMMARY

PROJECT DESCRIPTION & SETTING

The Batchelor Magnesite Project located 85 kms south of Darwin in the Northern Territory is 100% owned by Mt Grace Resources N.L. (Mt Grace) through a wholly owned subsidiary company. In 1997 the company identified the exceptional growth potential of magnesium metal prompting pursuit of a fast-track development strategy. This comprised a substantial exploration programme throughout 1998, culminating in the estimation of a magnesium resource at the Winchester Prospect in March 1999.

In January 1999, DevMin Consultants Pty Ltd (DevMin) was commissioned by Mt Grace to carry out an estimate of the magnesium resource at Winchester, together with an assessment of the current geological interpretation and quality of data used in the estimate process. This report presents the results of the study, which was carried out between February and April 1999.

Mt Grace holds tenements at Batchelor, which cover approximately 30 kilometres of a sedimentary geological succession known as the Coomalie Dolomite. This sequence which is Lower Proterozoic in age is an extensive stratigraphic unit about 500 m thick that drapes around the Archaean Rum Jungle and Waterhouse Domes. The unit contains extensive deposits of both magnesite and dolomite. The magnesite rocks are physically and chemically very distinct being medium to coarse grained and crystalline, whereas the dolomite, which occurs both stratigraphically above and below the magnesite, is fine grained with a sub-earthy lustre. The regional extent of magnesite development strongly suggests that primary and local control of magnesite is parallel to the bounding stratigraphy. The Coomalie Dolomite unit appears to be similar to the vast Precambrian carbonate unit, which hosts world-class magnesite deposits at Liaoning in Manchuria, NE China.

EXPLORATION ACTIVITIES & DATA VERIFICATION

Substantial exploration work for magnesite was carried out at Batchelor during 1998 including 137 RC holes for 11,340 m. Regional RC drilling for magnesite over a strike length of approximately 7.5 kms commenced in June 1998 and identified three zones of high grade magnesite (>40% MgO), free from caving and with shallow overburden. One of these, the Winchester Prospect, was further evaluated by closer spaced drilling at 80 m intervals on lines 50 m to 100 m apart. The Winchester resource is contained within an area of 350 m x 350 m on freehold land, and thus is not subject to native title claims.

The Winchester deposit is characterised by high-quality magnesite, shallow overburden (6 m - 7 m) and free from caving. High quality magnesite is defined as rock, which contains greater than 85% magnesite (equating to an MgO in magnesite content greater than 40.5%). Pure magnesite contains 47.8% MgO. The resource has been defined by 23 RC 60°N angled drill holes each intersecting high quality magnesite and drilled 80 m apart on a section spacing of mostly 50 m. However, two sections in the centre of the deposit are 70 m apart and the most westerly section is 100 m west from the previous section. Most of the drilling is limited to around 100 m measured downhole (approximately 90 m vertical depth) and the resource is open ended down dip.

Assays were routinely carried out by XRF (whole rock analysis) for detection of rock forming minerals on 3 samples from every 10 m of magnesite drilled. The simplicity of the mineralogy allows the estimation of the relative abundances of minerals in most samples. This, in turn, enables MgO in magnesite to be calculated and isolated from magnesium present in forms which are not commercially extractable, such as silicates (principally talc).

Validity of sub sampling routines, such as on site splits and selection of 3 in 10 samples have been checked by programmes of duplicate sampling and submission of all contiguous samples from selected
holes. Analytical precision and sample preparation is tested with internal pulp repeats and submission to a second laboratory. The analytical method together with the mineralogical calculations has been checked by comparison with assay results from acid digestible magnesite. Despite the small proportion of the total sample population used in these check procedures, DevMin considers the methods to be valid and that results are reproducible within the expected limits of error inherent in an Inferred Mineral resource estimate.

Bulk density testing is very limited, with just 4 determinations on core samples having been carried out. DevMin regards this as insufficient to fully reflect the likely density variations throughout the deposit. However, the risks involved are considered to be acceptable given the estimation error expected in an Inferred resource.

DevMin regards the geological interpretation and the chemical and mineralogical data as being acceptable for the estimation of Inferred resources. However, to upgrade the Inferred resource to Indicated or Measured status, additional drilling as well as a more rigorous quality control will be required.

RESOURCE ESTIMATE

The Winchester Prospect has been assessed to have an Inferred resource containing some 20.7 Mt of magnesite bearing rock under 3 m to 10 m of overburden to a maximum depth of 120 m below surface within an area of approximately 400 m x 300 m. The overall magnesium grade of the magnesite bearing rock is estimated as 43.9% MgO, of which 41.9% MgO is calculated as being present in magnesium carbonate (magnesite). The balance of the magnesium is contained within potentially acid insoluble minerals such as talc (acid insoluble component estimated as 9.1%). Dependent on the results of continuing metallurgical test work, it is estimated that at least 15 Mt of the resource is of a higher quality, with 42.8% MgO in magnesium carbonate and an acid insoluble component of 7.4%. A summary of the Inferred Mineral resource estimate is presented in Table 1.1

<table>
<thead>
<tr>
<th>Table 1.1 Inferred Mineral Resource Summary Winchester Prospect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element Data</strong></td>
</tr>
<tr>
<td>MgO %</td>
</tr>
<tr>
<td>Estimated High Quality</td>
</tr>
<tr>
<td>Estimated Low Quality</td>
</tr>
<tr>
<td>Total Resource</td>
</tr>
</tbody>
</table>

Notes on Table:
1. The subdivision into High Quality and Low Quality Magnesite is based solely on a subjective judgement of the mineralogy and test work data available to date.
2. Calculated mineralogy includes an estimate of the MgO present in magnesium carbonate.
3. Quantities of the resource in the High and Low Quality categories will vary as test work data comes to hand.

The resource block model was constructed incorporating the geological interpretation and a series of magnesite quality codes (based on assessed mineralogy) provided by Mt Grace. The block model uses a block size of 25 m x 20 m horizontally and 5 m vertically. Drill hole assay grades for magnesium, iron, aluminium, silica, calcium, titanium, manganese, potassium, phosphorous, sodium and LOI, were interpolated into the blocks using inverse distance squared weighting. Anisotropy, used in sample search and weighting, was oriented parallel to the regional dip. All preparation work and subsequent grade interpolation was carried out using processes available in the DATAMINE package of geology and mining software.
The block model resource estimate was checked against a manual polygonal estimate prepared by Mt Grace. The two results compare within 5% of each other in estimation of total tonnes and grade.

The block model resource estimate is classified as Inferred for a number of reasons. These include uncertainty about the presence of caves, surface irregularities beneath the soil cover, continuity in geological trends within the magnesite dolomite unit, and a number of metallurgical characteristics still to be determined.

RECOMMENDATIONS

Additional exploration work should be undertaken at the Winchester Prospect to assess in more detail the variation in magnesite quality within the unit, changes in the near surface weathering profile and test for the presence of caves and filled cavities. More bulk density determinations should be carried out, and a rigorous sample quality control programme is also recommended. A staged approach should be taken, testing in detail within the centre of the deposit. The amount of drilling recommended is approximately 1,200 m in 12 holes, comprising two diamond core holes and the rest drilled as RC. A programme of 36 shallow (20 m), vertical RC drills holes, on 20 m centres would be sufficient to test the depth of cover and extent of near surface weathering.

Once the work is complete, the scope of additional work required to upgrade the resource to Measured and Indicated can be determined. An upgrade to a Measured and Indicated Resource is necessary for work to commence on definitive mine planning and a full feasibility study on the project.

DevMin strongly recommends that a regional reconnaissance effort, including drilling, is maintained in the Batchelor region. Only 7 kms of the 30 kms of Coomalie Dolomite Mt Grace has under tenements has been tested. The likelihood of finding magnesite of the same quality as at Winchester elsewhere along strike is high, and may well constitute a much larger resource.

CONCLUSION

On the basis of the resource data and preliminary testwork results currently available, DevMin considers that there are no apparent reasons why the Winchester magnesite resource is not of sufficient grade and tonnage to sustain a technically and commercially viable magnesium metal production facility of world standing. The data currently available are of sufficient depth and reliability to justify further detailed resource definition together with detailed evaluation of processing options and associated engineering and costing studies. The size of the resource is limited only by the extent of drilling, within a relatively small area, of a very extensive magnesite unit and the resource has the potential to become a world class deposit.
2. INTRODUCTION AND BACKGROUND INFORMATION

2.1 PREAMBLE

This report presents the results of an estimate of the magnesite resource located at the Batchelor Magnesium Project, together with a review of its geology and the physical and chemical database, in order to assess the risk in using such data in resource estimation. DevMin was retained by Mt Grace to assess the data and undertake the resource estimate. The work, which was carried out between February and April 1999, included a site visit.

All factual information presented in this report has been taken from an internal report prepared by Mt Grace geologist, Bruce Uren (Uren 1999). Comments on these data are provided in the report in the course of the material being reviewed by DevMin.

2.2 INTRODUCTION

The Batchelor Magnesium Project (Batchelor) is owned 100% by Savanna Mineral Resources Pty Ltd (Savanna), a wholly owned subsidiary of Mt Grace. Mineral tenements at Batchelor, located 70 km SSE of Darwin in the Northern Territory of Australia, were acquired from the previous owners by Savanna in 1996 for their potential to host gold and base metal deposits (Figure 2.1). Late in 1997 the management perceived a potential rapid growth in the demand for magnesium metal, especially an increase in the usage in vehicles where improved fuel efficiencies are demanded by new U.S. regulations. Magnesium is considerably stronger and lighter than aluminium and its substitution for aluminium and steel can produce a weight, and thus fuel, saving in vehicles. As extensive areas of Coomalie Dolomite are covered by E.Ls 9501, 9253, 8020 and 9437 it was decided to explore for magnesite of appropriate quality for the production of magnesium metal (Figure 2.2).

The work to assess the magnesite began in early 1998 with a scoping study on magnesium prepared by John Canterford of Process Technologies Australia Pty Ltd (PTA) in March 1998. This was followed up with a compilation by Mt Grace staff of previous exploration data, and drilling of reconnaissance reverse circulation (RC) drill holes commenced on 30th May 1998. Drilling continued for most of the remainder of the dry season and finished on the 22nd November 1998 with a total of 137 holes for 11,339 m completed on the project. Following completion of reconnaissance drilling throughout the Central Batchelor tenements (EL’s 9501 & 9253), three areas offering potential for high grade magnesite (>40% MgO) free from caving and with shallow overburden were identified. One of these, the Winchester Prospect, was selected for substantial additional drilling (this deposit is immediately adjacent to the closed Sundance Gold Mine). A small amount of additional drilling was undertaken on the base metal/Au prospect in the project area (Sundance East).

Since the completion of drilling, Mt Grace geological staff have processed, interpreted and plotted the exploration data at Winchester and in April 1999, carried out a manual resource estimate using a polygonal estimation method constrained by both geology (structure and lithology) and mineralogy. In February and March 1999, DevMin reviewed the geological model, as well as the physical and chemical data collection procedures and results and undertook a site visit. A block model resource estimate was then developed by DevMin in April 1999. This latter exercise agreed to within 5% of the mineral resource inventory developed by Mt Grace.

2.3 PHYSICAL GEOGRAPHY, CLIMATE & INFRASTRUCTURE

The project is centred on the small town of Batchelor in the Northern Territory of Australia, with the Winchester Prospect located 4 km east of Batchelor adjacent to the Batchelor-Stuart Highway road (Figure 2.1). Batchelor is located 70 km SSE of Darwin, the capital of the Northern Territory.
Darwin has a population of 90,000 people, a deep water port and well developed infrastructure. Abundant reserves of oil and gas lie undeveloped offshore from Darwin in the Timor Sea.

The all weather Stuart Highway, which links Darwin to Alice Springs and Adelaide, passes through the project area. This highway provides connections via the Barkly Highway to the eastern states and via the Victoria Highway to Western Australia. The route of the proposed Alice Springs-Darwin railway passes through the project area although the commitment to build this railway has not yet been made. Also passing through the project area is the natural gas pipeline from the Amadeus Basin gas fields. The reserves of these gas fields, however, are nearing depletion and so are of no significance to the project. However, if one of the offshore gas fields were to be developed, then the pipeline may be able to be used with a reversed flow direction to the project.

The project area has a tropical climate with very distinct wet and dry seasons. The monsoonal wet season is from November to April and the vast majority of the annual rainfall of 1,250 mm falls in this period. The annual evaporation rate is 2,150 mm and the average number of thunder days is 70 per annum. Temperatures vary little diurnally or seasonally and rarely rise above 35°C or fall below 15°C. The wet season typically sees the project area influenced by 2 – 3 tropical cyclones. The intensity of these cyclones is greatly reduced after they have crossed the coast and moved inland toward the project area.

The topography of the area is dominated by ridges of sandstones, which are interbedded with siltstones. The latter are manifest as low undulating country. The areas of carbonate are generally in low, flat country. Drainage is dendritic culminating, in the east of the area, in the Adelaide River, which in turn enters the Arafura Sea east of Darwin. The western side of the area drains into the Finniss River, which enters the sea west of Darwin. Batchelor townsite is located on the divide between these two drainage systems. The Winchester Prospect is located E of the divide on a black soil plain across which the Coomalie Creek passes. During the wet season, this very flat black soil plain is typically covered with 50 mm of water.

**Comment**

DevMin personnel visited the site in February during the wet season. Coomalie Creek was flowing vigorously into the Winchester Prospect area, which acts as a soak or reservoir. Much of the central part of the prospect was covered by 50 mm to 100 mm of water. East and downstream of the prospect, water was confined to the well-defined channel. It is clear that if operations are carried out through the wet season, the Creek will have to be diverted before mining can commence, and a bund established to stop inflow of water into the pit. Alternatively, mining operations could be restricted to the dry season.

### 2.4 TENEMENTS

The Winchester Prospect is located on E.L. 9501 (Figure 2.1). This E.L. covers freehold land the majority of which is owned by the Stanley Corporation (W.A.) Pty Ltd (Stanley) which is controlled by Mt Grace’s chairman, Mr R G Stanley.

E.L. 9501 is now owned 100% by Savanna Mineral Resources Pty Ltd (a wholly owned subsidiary of Mt Grace) following a recent acquisition of the interest from previous joint venture partner, Giant’s Reef Mining N.L (Giant’s Reef).

A number of registered Aboriginal sacred sites are present within the tenements. The location of these is shown on the 1:10,000 Geological Map (Appendix 2, Figure 3.1). These sites are located over prominent outcrops of magnesite and are restricted to the immediate area of the outcrop. During the survey pick up of drill collars some corners of each site were located, which in combination with unlocated survey sketches supplied by the Aboriginal Areas Protection Authority (AAPA) allowed the accurate plotting of the sites. Only for site 5171-0087 was the survey data provided by AAPA not
able to fit the surveyor's corner pick up data. This is thought to be due to the presence of two
vintages of pegs at this site. At all other sites the corners were marked by white star iron pickets but
at site 5171-0087 there were also what were clearly more recent posts and plaques where old star iron
pickets could not be found. One of the sites, 5171-0108, is located at the NW extremity of the
resource area. Hole MRC-115 was terminated at a depth to ensure it did not impinge upon the site.
An application is currently being prepared for an Aboriginal Area Protection Authority certificate.

The status of current tenements for the Batchelor Project is detailed in Table 2.1.

Mt Grace has made a compilation of the tenement status of other areas prospective for magnesite in
the district and continues to monitor the availability of prospective ground. As a result of this, the
company has applied for additional substantial exploration tenements within the last twelve months.

**Comment**

The tenement information is provided as a matter of record only, and has not been independently
verified by DevMin.

### 2.5 PREVIOUS EXPLORATION FOR MAGNESITE

The first systematic drilling recorded on the Coomalie Dolomite was 74 shallow drill holes in the Rum
Jungle area drilled by the BMR in 1973 – 1974 as part of a regional mapping programme. The
location of those holes on Mt Grace's tenements are shown on the Geological Map (Appendix 2,
Figure 3.1).

Exploration for magnesite was undertaken by BHP in the area between Batchelor town and the Stuart
Highway during the period 1978 to 1982. The work comprised drilling mainly on the Celia Dolomite
which is outside the current Mt Grace tenements, with a few holes drilled on the Coomalie Dolomite
which is currently within E.L. 9501. BHP succeeded in delineating an area containing a possible 10
million tonnes of high density low silica magnesite in the Celia Dolomite following mapping, drilling,
flotation, calcining and sintering tests but relinquished the area in 1983 because of uncertainties of
both tenure and economic viability. Nicron Resources Ltd (eventually part of Normandy Mining
Limited) subsequently tested the magnesite horizon in the same area during the period 1990 to 1993
but found depth of cover variable and difficult to drill.

Of more relevance to the current study at Batchelor, a trial parcel of 28,000 t of magnesite from the
Coomalie Dolomite was mined and shipped to Norsk Hydro in Canada by Commercial Minerals, a
member of Normandy Group. This material was quarried from the Huandot prospect which is located
approximately 1 km W of the junction of the Batchelor Road with the Stuart Highway. Problems
were experienced in the floor of the pit due to subterranean caverns and contamination by muddy
overburden/weathering products which was found to be irregular in thickness and to enclose large
blocks of solid magnesite (Goulevitch - personal communication). Although the Huandot material was
of an acceptable grade, Norsk Hydro did not pursue the project due to concerns over ground
conditions and an easing of supply conditions from China.

An 80 m intersection of magnesite in the Coomalie Dolomite was drilled by Giant's Reef during
exploration under the Sundance gold mine which is located 700 m southwest of the Winchester
Prospect. This hole provides the only core available of magnesite in the Winchester area and was used
to determine a bulk density value for use in resource estimation. The analytical data for this
intersection are shown in Table 2.2 and were supplied to Giant's Reef by Norsk Hydro.
3. GEOLOGICAL SETTING

3.1 Regional Geology & Mineralisation

The Winchester Magnesite Prospect occurs in the Coomalie Dolomite unit of the Mt Partridge Group in the Lower Proterozoic Pine Creek Geosyncline. The geology of the district is shown on Figure 3.1 in Appendix 2. A more comprehensive description of the regional geology than is presented here is given by Uren (1999).

Archaean basement is exposed in the cores of the Rum Jungle and Waterhouse domes. The Lower Proterozoic sediments, which include the Coomalie Dolomite, dip gently to moderately off the domes and are dominated by siltstones and sandstones with lesser carbonate horizons. The rocks are gently folded about N-S oriented axes and the metamorphic grade is sub-greenschist facies. The sediments are intruded by sills of Zamu Dolerite and, well beyond the project area, by granitoids. The deformation post-dates the intrusion of the granitoids.

The Coomalie Dolomite is an extensive stratigraphic unit of about 500 m thickness which drapes around the Rum Jungle and Waterhouse Archaean Domes. It also occurs in the core of an anticline which is located NE of the Rum Jungle Dome. The presumed Archaean core of this anticline does not broach the surface. The domes have N-S elongate axes and are aligned in a NE, en echelon pattern. The Rum Jungle dome is cut by a major structure known as the Giant’s Reef fault which is roughly parallel to the alignment of the basement domes.

The Coomalie Dolomite is known to contain extensive magnesite as well as dolomite. The regional extent of the magnesite investigated to date suggests that it is strongly related to stratigraphy. Bone (1983) used fluid inclusion evidence to conclude that the magnesite has a primary sedimentary origin. The Coomalie appears to be similar to the vast “Precambrian” stratigraphic carbonate unit, which hosts the superbly pure and huge magnesite deposits of Liaoning in NE China (Manchuria). Dolomitisation (and so magnesitisation) remains one of the enigmas of geology as magnesium rich carbonates are not known to be currently forming.

Regionally, the Pine Creek Geosyncline has been economically productive. Significant deposits have been worked for U, Zn/Pb and Au whilst a significant Pb/Cu/Co/Ni prospect (Brown’s) is under feasibility study. The uranium, Pb/Zn and Pb/Cu/Co/Ni mineralisation occur at the same stratigraphic horizon, this being the Whites Formation (Black Shale)/Coomalie Dolomite contact. The magnesite under investigation is located in the Coomalie Dolomite.

Comment

It is clear that Mt Grace geological staff well understand the regional geology and have effectively demonstrated the regional setting of the Winchester magnesite resource at Batchelor. The company appears to be well placed to identify other areas, which are prospective for containing additional substantial magnesite resources. The regional extent of known magnesite provides a strong indication that stratigraphy is the primary control on the location of the magnesite.

3.2 Local Geology

The geology of the central Batchelor tenements is shown on the 1:10,000 geological map (Figure 3.1) and in geological sections Figures 3.3, 3.4 & 3.5 (Appendix 2). E.L.s 9501 and 9253 are the two E.L.s in the central tenements, which are prospective for magnesite. The contact of the Crater Formation and Coomalie Dolomite is very close to coincident with the Batchelor-Stuart Highway road, which is also the northern boundary between the E.L.s and the non-aboriginal freehold land. To the north, the Crater Formation outcrops on a low ridge, which slopes to the south onto the flood plain of
the Coomalie Creek also underlain by Coomalie Dolomite. To the south of Coomalie Creek, the country rises very gently over the Whites and Wildman Formations until the prominent ridge of the Acacia Gap Quartzite is reached. In the immediate area of Winchester, lithological strike is 070° and measured dips are between 35°S and 70°S. Average dip is around 60°S.

The Coomalie Dolomite is shown to be 400 m wide in the vicinity of the Winchester prospect but it appears to widen to the E of Winchester. To the west of the prospect, near Sundance, the Dolomite appears to have been disturbed by N-S oriented faulting giving an apparent thickening in the surface expression of the unit.

The Coomalie Dolomite comprises both dolomite and magnesite. The magnesite is coarse and medium grained and has well developed crystallinity whilst the dolomite is fine grained with a sub-earthy lustre. There is little difficulty in distinguishing these two rocks. However, during the drilling programme, it was found that in some cases rocks having a medium or coarse grained crystalline texture and thus visually identified and logged as magnesite, were subsequently shown to be dolomite by chemical assay. Generally there is a clear chemical distinction between dolomite and magnesite with almost no grading between the two. Dolomite has roughly equal concentrations of Ca and Mg whilst magnesite has about 0.5% Ca. The presence of Ca rich medium and coarse grained crystalline carbonate necessitated a revision of the nomenclature. Fine grained, sub earthy dolomite is referred to as "Dolomite A" and medium-coarse grained crystalline carbonate with significant Ca as "Dolomite B". Rocks with Ca contents midway between magnesite and Dolomite B could be affected by calcite veining - though these are rare. Magnesite outcrops as irregular, undercut, porous, solution weathered masses, which rise out of the black soil plain. Some of these are registered Aboriginal sacred sites. The Coomalie dolomite also occurs as sub outcrop with a flat surface. The outcrops of magnesite are massive (without internal structure such as bedding) and blocky (without a structural fabric). Some outcrops to the west of Sundance, however, do show well developed tubularstromotolites which have been selectively replaced by quartz. Elsewhere in outcrop, core from Sundance and boulders excavated from the Sundance pit show evidence of thin irregularly oriented quartz and carbonate veining. Quartz and tala also occur as large irregular knots.

Drilling has demonstrated that the coarser and more crystalline the magnesite so the more pure it is. The colour of the magnesite is highly variable and large blocks left around the Sundance pit show an irregular marbling texture defined by colour. Common colours are greys, white, red-brown (various hues), black and colourless. The colour seems to have little bearing on quality although a rigorous assessment has not been made. The colourless magnesite, however, does seem to be the best quality.

Little evidence is available to ascertain the relationship between dolomites A and B and magnesite. The drilling has been generally too wide spaced to make confident correlations and it has not normally penetrated the bounding stratigraphy to establish local dips with confidence. The small amount of local dip evidence is consistent with the regional dips recorded on the 1:100,000 geological map (Crick, 1987) in the Crater Formation and Acacia Gap Quartzite.

The magnesite generally appears to be thickest and most pure in the centre of the Coomalie Dolomite unit at Winchester. Dolomite "A" is located both at the top and bottom of the unit. The overlying black shale of the White's Formation seems to have a sharp contact with the Coomalie Dolomite but the black shale is calcareous and does have some minor dolomite beds.

The occurrence of caves and depth of overburden/weathering is unpredictable. The Winchester Prospect was selected for infill drilling because of the shallow cover, lack of caving and good quality magnesite encountered in holes MRC-50 to 53, which were drilled on an early reconnaissance traverse. Overburden comprising mainly black soil averages 6 m – 7 m in depth. The magnesite is weathered to depths of 1 m or 2 m below cover in the western half of the deposit but up to 10 m vertical depth in some portions of the eastern half. At the Huandot pit excavated by Normandy/Norsk Hydro, large pinacles of unweathered material "float" within very weathered material. There is no indication as to the extent that this feature occurs at Winchester. Caving was encountered in MRC-97,
which restricts the resource to the south-west. Caving does seem more prevalent on the bottom of the Coomalie Dolomite, and this may in part be due to the penetration of groundwater run off from the ridge of Crater Formation to the north, penetrating down bedding planes of the carbonates resulting in dissolution.

Comment

Determination of the overall form and variations of the magnesites and dolomites depends to a large extent on the correct mapping and logging of geological features. It is DevMin’s opinion that for the most part, recording and identification of these elements from outcrop, drill chips and drill core has been both systematic and meticulous. All work has been supervised by a single-supervising geologist allowing a high degree of uniformity in approach. A minor case of mis-identification of talc rich magnesite as dolomite by a contract geologist early on in the programme, has been corrected. Apart from this isolated case, it is DevMin’s opinion that lithologies plotted on plans and sections reasonably represent what was actually mapped and drilled.

The various carbonate units are interpreted as conformable to the orientation of the overlying Whites formation which reflects both the regional dip and limited dip information derived from the drilling, which at Winchester is 65°S 070°. This assumption of orientation, together with the stratigraphic notion of continuity, undoubtedly provides the greatest potential source of error in the resource estimate especially the relationship between the magnesite and dolomite “B”. However, it is DevMin’s opinion that such assumptions of orientation and continuity are reasonable, given the drill spacing, and provides an acceptable basis for resource estimation.

Inspection of the drill core drilled by Giant's Reef under the Sundance Pit shows that there is a very clear distinction between weathered and unweathered magnesite. Within the magnesite, there are lengthy runs of good material (50 m), but quartz and talc are developed throughout, although sometimes in minor amounts. These minerals are present both as masses and within fractures, although their occurrence is unpredictable. There is a great variation in magnesite grainsize and colour.

Depth of cover seems to be fairly shallow (6 m – 7m) and somewhat predictable, in contrast to depth of weathering. More drilling will need to be carried out to determine the variations expected in the surface area, and whether ‘floating’ unweathered material surrounded entirely by weathered magnesite, is present. Surface variations may present some risk to the mining operation in the early years.

There is a high possibility of caves existing between established drill holes and sections and this is another principal source of uncertainty in the resource estimate. No volume allowance has been made for this in the estimate of tonnage. However, because of the scale of the resource size, the major impact of caving will be on mine design and scheduling rather than on the contained volume of magnesite in the resource.

3.2.1 Other Mineralisation at Winchester

Minor gold has been discovered within the Coomalie dolomite close to the Winchester Prospect. At Sundance 17,800 t of material containing 10.7 g/t Au in oxide and sulphide form was mined and trucked away for treatment (Simpson, 1994). The material was dominantly small to large lumps and boulders, up to 5 m in size, of dark brown hard ferruginous and silicified haematite quartz breccia. One mushroom shaped body of massive sulphide and oxidised material was mined. It was 25 m in diameter and up to 8 m thick sitting on a stalk or pipe 7 m in diameter of similar material. This mineralisation contained up to 930 ppm Sn in the sulphide material.
Au bearing sulphide has been intersected in a similar stratigraphic position to the Sundance Gold Mine at the Sundance East Prospect. This is located 6 km to the east of Sundance. Intersections of 14 m @ 1.88 g/t Au and 12 m @ 2.98 g/t Au have been obtained but follow up drilling has failed to demonstrate any continuity.

On the SW margin of the Winchester resource, a hole intersected 7 m @ 2.56 g/t Au in association with minor disseminated pyrite within magnesite. Minor follow up drilling failed to intersect any similar mineralisation.

Significant Zn mineralisation has been intersected at the White Bomb Prospect which is located 3.5 km SE of Winchester in graphitic siltstones of the Wildman Formation, that is significantly higher in the stratigraphy than the Woodcutters deposit. The best intersection to date is 6 m @ 11.7% Zn. The mineralisation is apparently discontinuous.
4. PHYSICAL & CHEMICAL DATA COLLECTION

4.1 Mt Grace Exploration Programme 1998 – 1999

Following on from PTA being commissioned to undertake the scoping study on magnesium, a compilation of previous exploration data and a programme of reconnaissance RC drilling was planned in early 1998. The aim of the programme was to investigate prospective magnesite zones within Mt Grace’s existing tenements with a broad spaced reconnaissance drill pattern. Selected areas were then to be infilled with closer spaced drilling to provide sufficient data in order that a preliminary resource estimate could be made. Area selection for closing up the drill pattern was based on the following criteria:

- presence of good quality magnesite
- lack of caving
- presence of shallow overburden

This report details the work done on the only area where infill drilling has been undertaken – which is the Winchester Prospect.

Project reconnaissance RC drilling commenced on 30th May 1998 and continued for most of the remainder of the dry season, finishing on the 22nd November 1998 with a total of 137 holes for 11,339 m completed. A small amount of additional drilling was undertaken on the base metal Au prospect in the project area.

A manual, polygonal resource estimation was undertaken by Mt Grace in early 1999.

4.2 Survey Control

The drill collars of the Winchester Prospect, together with some sacred site marker pegs were surveyed in November 1998 by Mr K Schulz, a licensed surveyor of Earl James & Associates of Darwin. The survey was done using an RKT differential GPS system which gave an “expected precision” of ± 0.03 m horizontally and ± 0.05 m vertically and was located within the Australian Grid co-ordinate system using 3 Survey established benchmarks (Department of Lands, Survey & Mapping Division, NT). The results were presented using both AMG 66 and AMG 84 datum. The published topographic maps of the area use AMG 66. The GPS instrument was not obstructed by vegetation at the various stations allowing this method of survey to be effective and efficient. Two pairs of local benchmarks were established at the prospect to facilitate future surveys. One pair was located at Winchester and one pair near hole MRC-70. The benchmarks in each pair were positioned in view of each other to allow re-establishment of azimuth.

Six down hole surveys were performed using an Eastman camera down the inside of the RC rods. This did not allow for the measurement of an azimuth. The results are shown in Table 4.1.

<table>
<thead>
<tr>
<th>Hole No.</th>
<th>Depth</th>
<th>Dip</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRC-125</td>
<td>105 m</td>
<td>59.5°</td>
</tr>
<tr>
<td>MRC-126</td>
<td>99 m</td>
<td>58.1°</td>
</tr>
<tr>
<td>MRC-127</td>
<td>87 m</td>
<td>61.9°</td>
</tr>
<tr>
<td>MRC-128</td>
<td>45 m</td>
<td>60.5°</td>
</tr>
<tr>
<td>MRC-128</td>
<td>93 m</td>
<td>63.2°</td>
</tr>
<tr>
<td>MRC-129</td>
<td>93 m</td>
<td>61.3°</td>
</tr>
</tbody>
</table>
All of these holes were collared at 60° and these results show that there is minimal deviation in the vertical direction. Deviation in the horizontal plane is unknown, but the drillers reported no particular problems in this regard. Based on these two observations, horizontal deviation is regarded as likely to be minimal.

**Comment**

None of these survey data have been independently verified by DevMin. Given that the work was carried out by a reputable surveyor and the procedures monitored by Mt Grace’s geologist, it seems reasonable to assume that there is a low risk in accepting the data as presented, particularly for definition of an Inferred resource.

Definition of the tenement containing the Winchester resource (EL 9501) is by graticules based on latitude and longitude (AMG 66 datum), and is marked on a 1:50,000 topo-cadastral map. The northern boundary of the central Batchelor licences is limited by the Batchelor – Stuart Highway road. DevMin has confirmed the location of Winchester drilling with respect to the EL as marked on the map and to topo-cadastral features marked on the map. Survey data and map coordinates are reported to the same datum (AMG 66). Holes on two lines (72300 mE & 723200 mE) were checked by DevMin using a measuring tape, and were found to be in position along the line within 5 m. Relative position between lines was checked by pacing, and found to be within 10 m of the plotted position – a reasonable result given the estimation method. DevMin concludes that within the estimation errors given, the Winchester resource is contained within EL 9501 and the relative collar positions are as reported. The measured accuracy is within acceptable limits for the estimation of a resource.

Only 6 of the 137 holes drilled were surveyed downhole, and this proportion would not normally be regarded as adequate to fully represent the population of drill holes. However, given the minimal vertical deviation in the holes measured, plus lack of problems recorded by the drillers, it seems unlikely that this presents a substantial risk in positioning data. Given the widespread nature of the drilling (50 m x 80 m) and homogenous nature of the lithologies, minor errors in data positions due to downhole deviation will have a minimal impact on resource estimation at this early stage.

### 4.3 Grid & Data Spacing & Orientation

A total of 137 RC holes for 11,339 metres were drilled on 19 lines spaced from 50 m to 1 km apart with holes spaced at 80 m intervals along each line. Total drilling includes 8 holes drilled on 2 lines at Rum Jungle West. All holes in the Batchelor area are angled 60°N and most are drilled to around 100 m advance, approximately 90 m vertical depth (Figures 3.3, 3.4 & 3.5, Appendix 2).

The initial reconnaissance drilling at Batchelor was at 80 m intervals on 1 km spaced lines. The baseline for this grid was surveyed, but the cross lines, established by tape and compass, are crooked. Whilst this issue was known at the time of the initial drilling, it was deemed not necessary to reposition the holes for reconnaissance work. Line 723,400E (Hole MRC-48 to 54) within the Winchester resource area is thus actually located at 723,420E. Since all holes have subsequently been surveyed by differential GPS this initial grid error does not present a positioning problem.

As the reconnaissance drilling progressed, line spacing was progressively halved to 50 m in the Winchester area, where intersections gave the most encouraging results. Thus, the Winchester resource has a drill spacing on a nominal 80 m x 50 m grid (73200, 73250, 73300, 73350, 73420, 73470 mE – Figure 3.2, Appendix 2). The exception is between Sections 73350 and 73420 mE, where the spacing is 70 m. The infill lines were established by tape and compass from a sub baseline.

The drill-lines are orientated N-S perpendicular to local strike. Drill holes are angled 60°N against an interpreted local dip of 65°.
Comment

Bearing in mind the assumption of magnesite continuity parallel with stratigraphy, and lack of intricate variation in the drill intersected carbonate lithologies, the drill orientation seems reasonable and data spacing adequate for the definition of an Inferred resource. It is noted however, that the central part of the resource is defined by data on lines 70 m apart rather than 50 m spaced lines, which are on either side.

4.4 Drilling

Drilling was undertaken by the Stanley Drilling Co using truck mounted reverse circulation rigs. Two different rigs were used, each having an air capacity of 1,100 cfm @ 400 psi on the rig supplemented by an auxiliary compressor of similar capacity and a booster rated at 2,000 cfm @ 950 psi mounted on a separate truck. This large amount of high pressure air allowed the holes to be drilled without the influx of groundwater except where cavities were encountered. Consequently, the samples were always “dry” i.e. in powdery form. If water was returned from a water filled cavity, the drilling was interrupted whilst the cyclone was cleaned. If water was returned after a rod change air would be blown until the water return ceased and then drilling continued. The overburden and weathered carbonate were typically water saturated.

All holes were drilled with a face sampling hammer. Holes MRC-1 to 29 and 65 to 137 were drilled at a diameter of 4 7/8” whilst holes MRC-30 to 64 were drilled at a diameter of 5 1/4”. This reflected the different size of the rods on the two rigs. Holes were collared to the base of overburden (or weathered bedrock if present) with PVC casing sealed with foamit.

Drill penetration in magnesite at Winchester was very even with low levels of torque. The drillers reported that the magnesite felt unbroken. The blowdown sub was very rarely used except in areas of caving. The good quality magnesite at Winchester produced very little wear on bits. Average daily production at Winchester, where little time was lost between holes, was about 150m/day.

4.5 Sampling

Samples were collected every 1 m of drill penetration in a clear pre-numbered UV stabilised plastic bag directly after passing through a free standing cyclone. Every metre drilled was collected. Generally, sample size was very consistent and this is to be expected given the even nature of drilling, lack of fissures and caves and dry return.

A weighing exercise was carried out on 18 samples following the drilling programme to determine the effectiveness of sample recovery, and these data are presented in Table 4.2. Note that as weighing took place after splitting, some allowance had to be made in order to estimate the original weight of sample collected. The results show that only 57% - 89% (mean 72%, average 75%) of the calculated sample weight was collected. This is surprisingly poor, given the good ground and sample conditions and may be attributed to any one or more of the following reasons:

- Incorrect bulk density used in volume to weight conversion (3 tonnes/m³ was used).
- Loss of fine sample dust in the cyclone and within the hole. The samples typically contained a high proportion of very fine material, and some undoubtedly would have been lost through the exhaust of the cyclone.
- Spillage during splitting, re-bagging and transporting to storage area prior to weighing.

Following collection of material from the cyclone, each 1 m interval drilled was passed through a 3 tier splitter to produce a 1/8 and a 7/8 split. The 7/8 split was poured back into the plastic bag and the 1/8 split placed into a prenumbered calico bag.
In order to reduce assay costs, samples were selected for assay. Given the apparent lack of intricate variation of the various carbonate types it was felt that 3 samples for each 10 m of drilling would provide adequate chemical and mineralogical definition of the interval. In each 10 m interval selected samples are at either end of the run (i.e. so adjacent runs would have adjacent samples), with a single sample in the middle of the interval. The aim was not only to provide representative sampling across an interval, but to also try to establish the variability.

4.5.1 Sampling Quality Control

In order to check the representivity of the 1/8 split, a suite of 37 samples was selected for field resplitting. The majority of these samples were from the Winchester Prospect. The original plastic sample bag was retrieved from the storage area or field, and its contents passed through a riffle splitter to produce a new sub-sample of approximately 3 kg. The new split was given a new sample number and dispatched to Analabs for preparation and analysis in the routine way. To check the internal consistency of this batch two samples were resplit twice and given new sample numbers. These were for MRC-51, 80 m -81 m and MRC-77, 100 m -101 m. The results are shown in Appendix 3, Table 4.3. X/Y plots of the data (Appendix 3, Plots 4.1 - 4.5), demonstrate that correlation is very good with virtually no bias and minimal scatter, with the exception of the sample interval 4 m -5m in MRC-50. Clearly, material from distinctly different samples was analysed. The source of this discrepancy has not been investigated.

To check whether 3 samples from each 10 m interval fairly reflects chemical and mineralogical content for the interval, the remaining 7 samples from the 10 not submitted for assay were later submitted from two complete holes, MRC-50 and 51. The data were compared in two ways. Firstly, results from 3 in 10 sampling were used to delineate mineralogically distinct entities in the same way as all other data were treated. The average of the samples within these intervals is compared with the average of 10 in 10 results for the same interval. These data are presented in Appendix 3, Table 4.4. The results show minimal differences for the six intervals so delineated for the major elements involved in determination of mineralogy (MgO, LOI, SiO₂). In the second approach to reviewing the data, mineralogical divisions based on 3 in 10 sampling are compared with those from 10 in 10 sampling. As may be expected, the detailed sampling enables better precision on boundaries, with the number of mineralogical intervals increasing from 6 to 10. The differences rest with Fe₂O₃ and Al₂O₃ contents, reflecting impurities rather than presence of dolomite or talc within the magnesite sequence. It is therefore concluded that 3 in 10 sampling provides adequate definition of the magnesite horizons.

4.5.2 Sample Preparation

All of the samples defining the Winchester resource have been prepared and analysed by XRF at Analabs' laboratory in Perth. The one-eighth field split, weighing approximately 3 kgs was despatched to Perth by road. Analabs' preparation procedure comprised drying and sub sampling 200 gms from the drill chips. This sub-sample was pulverised to a nominal 90% passing -75 μm in a zirconia bowl to prevent iron contamination of the sample. No checks were carried out to determine the validity of sub-sampling drill chips.

At Assaycorp, the one-eighth split was jaw crushed to ~5 mm followed by sub-sampling of a 500 g portion by riffle splitter and pulverising it in a LM-1 mixermill to ~100 μm. A 0.5 g sub sample of this pulp was taken for analysis. Again, no checks were carried out to determine validity of sampling 5 mm material.
4.5.3 Sample Storage

Careful attention has been paid to the storage of samples. Both pulp and coarse residue samples of good quality magnesite have been retrieved from the laboratory and stored at Stanley’s yard at Wanneroo, Western Australia. The 1/8 splits of samples not sent to the laboratory for analysis have been bagged and stored under cover on site at the Sundance mine. The bulk residues (i.e. the 7/8 remainder after the 1/8 split) of good quality material from Winchester, have also been stored at Sundance.

The bulk residues of lesser quality material at Winchester were not moved but kept at the drill site.

Comment

The re-splitting exercise on 37 samples has indicated that the 1/8 split provides a representative sub-sample of the 1 m interval, although this assessment is based on limited data. The 37 samples represent only 1.7% of the 2,143 submitted. The apparent poor sample return is of some concern and should be investigated. The only difference it would make is if there’s some winnowing or concentration of deleterious elements such as clays or talc minerals. Given the minor presence of these, the overall risk in incorrectly assessing the purity of magnesite is considered low.

The submission for assay of all samples from holes MRC-50 and 51 demonstrates that the 3 samples in 10 sampling scheme provides a fair indication of the chemical and mineral content of the 10 m interval.

Checking the validity of sub-sampling during sample preparation has not been attempted on a laboratory by laboratory basis. These errors are encompassed in the comparison of data from Assaycorp and Analabs. It is DevMin’s opinion that assumptions of the validity of the sub-sampling method present very little risk in accepting the assay results as being reproducible from field samples.

In summary, the samples produced are shown as a reasonable representation of the material drill tested, such that assays determined from these may be used for the estimation of Inferred resources. Classification of resources in the higher confidence categories may require additional quality control programmes.

Sample storage is satisfactory and retrieval of samples for additional testwork will not be difficult.

4.6 Analytical Techniques

To assess the content of magnesium metal available for extraction from a resource, two approaches may be adopted.

- In the first approach, it is assumed that only acid soluble magnesium (magnesite) will be extracted during mining and processing operation. In this case the resource can be assessed by submitting exploration samples for assay by acid extraction of the magnesium. A major drawback with this approach is that it does not chemically identify potentially deleterious elements (in commercial processing) such as silica and talc.

- In the second approach the resource is estimated on the basis of total magnesium present in the rock. The proportion that may be commercially extracted is then determined by metallurgical factors. In this case the assay technique (XRF) targets total magnesium in the sample together
with a number of other elements. In this way the presence of deleterious mineral species may be identified.

Assay by acid soluble digestion is both time consuming and expensive compared with XRF, although it does provide a reasonably accurate assessment of what is available for extraction, but not what deleterious mineral species are present. XRF assay for total content for a number of elements is cheaper and faster, but by itself does not provide information on what magnesium may be extracted.

Mt Grace has adopted a comprise method whereby it has undertaken XRF assay for total metal and selected element content, and from this it has calculated the proportions of mineral species present. This enables it to not only report total magnesium but also magnesite content, together with potentially deleterious minerals such as quartz and talc. It has also carried out assaying by both methods on a number of samples and these results are compared.

4.6.1 Acid Digest Technique

During the initial search for an effective method of analysing the samples, two acid digest techniques were trialled, using Assaycorp at Pine Creek with samples taken from reconnaissance drilling undertaken early in the programme in the Coomalie Dolomite close to Winchester.

In the first technique, a geochemical standard or “scan” technique was carried out by Assaycorp on 496 samples. This involved jaw crushing the sample to ~5 mm then sub-sampling a 500 g portion of the submitted sample by riffle splitter and pulverising it in a LM-1 mixer-mill to ~100 μm. A 0.5 g sub sample was then digested in 1:1 HCl which was brought to the boil and simmered for 20 minutes. An aliquot of the solution was analysed for Mg, Ca, Fe and Al by ICP-AES (inductively coupled plasma – atomic emission spectrometry).

In the second technique, a batch of 118 samples, for which the above “scan” technique had indicated high MgO grade, was analysed by Assaycorp using a more accurate method. This involved the dissolution of 5 g of similarly prepared material in concentrated HCl which was brought to the boil and simmered for 20 minutes. The insoluble residue was then filtered, dried and weighed. A pipetted aliquot of the magnesite solution was titrated using standard methods. The titre gave the total Mg and Ca content of the sample. The Mg content was calculated by deducting the Ca content determined either by EGTA titration or ICP-AES assay. This is referred to as the “classical titration” method. An aliquot of the magnesite solution was assayed for Ca, Fe, Al, Cd, Cr, Cu, K, Mn, Ni, P, Pb and Zn by ICP-AES using an internal standard reference procedure. Mg was also determined for quality control purposes. A separate aliquot was taken to determine silica by ICP-AES and similarly for Boron by ICP-MS.

The results of both methods (for the 118 samples assayed by classical method) are compared in Appendix 4, Table 4.5. X/Y plots of these data (Appendix 4, Plots 4.6 – 4.9) exhibit minor scatter but with a bias of between perhaps 10% and 20% for some grade ranges for MgO, Al₂O₃ and Fe₂O₃. The results for CaO show neither scatter nor bias.

4.6.2 XRF Technique

The routine method of analysis of samples has been by XRF using Analabs of Welshpool Western Australia. A total of 2,143 samples were submitted throughout the programme. The one-eighth field split was dispatched to Perth by road. Sample preparation comprised drying and sub-sampling by riffle splitter of a 200 g sample, which was pulverised to a nominal 90% passing -75 μm in a zirconia bowl to prevent iron contamination of the sample. Loss on ignition (L.O.I.) was determined after heating of the sample to 1000°C. A fused glass disc is prepared for presentation to an XRF instrument to determine concentration of “rock forming"
or “whole rock” elements. Base metals have been determined on some samples by AAS/ICP following digestion by HCL/HNO₃/perchloric acid, Au on a small number of samples by fire assay and AAS detection, and B on some samples by ICP-AES (Atomic Emission Spectrometry) following a sodium peroxide fusion.

Data was transmitted from the laboratory by fax, disc, email (latter part of 1998) and final hard copy. The data was entered into an Access database from which tables were printed to accompany drill logs.

4.6.3 Comparison of Acid Soluble & XRF Techniques

The batch of 118 samples analysed by both the Assaycorp “scan” and “classical titration” techniques were also analysed by Analabs using XRF. To compare these two sets of data, Assaycorp’s results for Mg, Ca, Al and Fe are reported as oxides, with insolubles reported separately. Analabs data was converted by calculation (see Section 4.7) to the various mineral species and thence to the oxide in that species. Insoluble elements were also calculated. However, 26 of the 118 samples have been eliminated from the data set because they exceeded the limitations of Fe₂O₃, CaO or Al₂O₃ concentrations required for mineralogical calculation.

The two sets of data are presented in Appendix 4, Table 4.5 and compared in a series of X/Y plots (Appendix 4, Plots 4.10 – 4.14).

Comment

The comparison of insolubles (Plot 4.10) as physically determined by the Assaycorp classic method against those calculated from the Analabs XRF data, shows excellent correlation below 30% insolubles. Above this level, Assaycorp’s classic method reports a slightly lower figure (<10% difference) than the calculated value. Plot 4.11 indicates excellent correlation between the two methods for MgO.

Plot 4.12 for Al₂O₃ shows a strong bias with Assaycorp under-reporting the XRF figure by around 25%. This may imply that some Al₂O₃, in form or mineral unknown, is not liberated by the HCl leach of the classic method. Plot 4.13 shows slightly higher XRF Fe₂O₃ values. This implies that while most of the Fe₂O₃ is soluble, a minor portion is not. It is therefore likely that the majority of the Fe₂O₃ is in carbonate. Plot 4.14 shows a slight bias to higher XRF CaO values, which perhaps suggests the minor presence of a CaO bearing mineral in the insoluble residue.

Overall, this comparative exercise appears to provide excellent support for the two analytical approaches and hence the validity of the mineral calculation exercises.

4.6.4 Analysis – Quality Control

In order to test variation in analysis (testing both chemical procedures and instrument calibration) between laboratories, the pulps from 13 samples were retrieved from storage and sent to SGS Laboratories in Perth for XRF fused disc analysis. The samples are from early reconnaissance exploration holes (not Winchester) and were previously analysed by Assaycorp using both the scan and classic method and by Analabs XRF. No preparation was required. The results are shown in Appendix 4, Table 4.6. Whilst no significant bias or scatter is evident in a comparison of the data for each element, the small data set precludes a definitive assessment.

To date, Analabs has not provided results of quality control data usually supplied with each batch of samples as a matter of routine.
4.6.5 Base Metal, Precious Metal & Boron Analyses

Boron is known to be a particularly deleterious element in the electrolytic refining of magnesium metal. Presence of 10 ppm boron in the electrolyte reduces electric current efficiency by 1%. Because of this, visually good quality magnesite was routinely analysed for boron and base metals early in the exploration programme. On the Winchester Prospect only holes MRC-49 to 54 have been analysed for these elements. The base metal and boron values are tabulated and presented on a dedicated sheet behind each relevant log.

Boron is a difficult element to determine and most laboratories have little experience with it. Boron was determined by Analabs with a detection limit of 20 ppm and also Assaycorp on the solution derived from the "classic" technique with a detection limit of 4 ppm. Assaycorp report values of up to 90 ppm, whereas Analabs report only 12 values above detection of 20 ppm from a batch of 118 samples tested. The comparison of these results indicates erratic and possibly spurious values, with an indicative precision of possibly greater than 50 ppm. Although precision is poor, the presence of boron >100 ppm is not indicated and concentrations below this level may be satisfactorily dealt with at the processing stage, albeit at some cost. The boron results from each laboratory are presented in Table 4.5 in Appendix 4.

The only significant intersection of sulphide on the project area to date was in hole MRC-54. This sulphide was analysed for Au and returned 7 m @ 2.56 g/t Au between 69 m - 76 m and 1 m @ 4.08 g/t Au between 89 m -90 m. Holes were drilled in an equivalent stratigraphic position 50 m either side of MRC-54 without intersecting any sulphide.

Comment on Analytical Results & Techniques

There has been insufficient quality control work undertaken for each analytical technique and perhaps a more substantial programme could be included as part of future plans to upgrade the resource. Analabs has notified Mt Grace that internal laboratory quality control procedures comprising duplicate sampling and replicate pulp analysis, together with submission of standards, have been undertaken as a matter of routine procedure. Mt Grace has yet to receive these data. Only 13 of the 2,143 samples submitted, representing just 0.6% have been checked at an alternative laboratory and anyway the dataset is too small from which to draw conclusions on reproduction of results. In addition, no external standards have been submitted, by which calibration errors could be monitored. However, the overall excellent correlation between the two different analytical techniques via mineralogical calculation, suggests that there are few inherent risks in the methods adopted. Although replication of results by this approach has been undertaken for only 92 samples (4.3% of total samples submitted), this is considered sufficient indication that the assay results and subsequent mineral calculations are acceptable for the estimation of an Inferred resource. A more rigorous quality control programme may be required to support Indicated or Measured resources.

4.7 Mineralogical Calculations

The determination of loss on ignition (L.O.I) and all whole rock elements allows the calculation of the concentration of mineral species where the rock is constituted of MgO, SiO₂ and carbonate (as quantified by L.O.I). This is the case in good quality magnesite in which the three mineral species present are magnesite, talc & quartz. It is important to identify these mineral species, magnesite for the grade and talc and quartz as potentially deleterious to commercial processing. The mineralogical calculations from raw assay data are performed in the following way:
LOI is deemed to represent the total carbonate content of magnesite so the amount of magnesite present is determined by:

\[
\frac{LOI}{0.524} = \alpha
\]

The amount of magnesium oxide present in the form of magnesite is calculated by:

\[
\alpha \times 0.476 = \beta
\]

The amount of magnesium oxide present in a form other than magnesite (i.e. talc) is calculated by

\[
\text{Total MgO} - \beta = \gamma
\]

The amount of talc present in the rock is calculated by

\[
\frac{\gamma}{0.317} = \delta
\]

The amount of silica present in the talc is

\[
\delta \times 0.635 = \varepsilon
\]

and finally the amount of free quartz is then calculated by:

\[
\text{Total SiO}_2 - \varepsilon
\]

For the above procedure to be valid the concentrations of elements which could be present in the form of carbonate (Fe & Ca) must be low, otherwise the assumption that all carbonate is magnesite is not true. Also elevated Al\textsubscript{2}O\textsubscript{3} indicates the presence of a mineral species other than magnesite, talc, and quartz. Chlorite is the most likely mineral in these circumstances. The presence of significant chlorite would render the calculated abundances of magnesite, quartz and talc invalid. Consequently, where CaO is greater than \(-1\%\); Fe\textsubscript{2}O\textsubscript{3} is greater than 2%; or Al\textsubscript{2}O\textsubscript{3} is greater than \(-1\%\) the calculations have been designated “invalid”. The presence of minor CaO and Fe\textsubscript{2}O\textsubscript{3}, which are probably in the form of carbonate, will tend to cause the calculated abundance of magnesite to be slightly overstated, and the calculated abundances of talc and quartz to be understated. It should also be appreciated that LOI is not strictly equivalent to carbonate content. For instance if there are hydrated minerals present these may be dehydrated. It is entirely possible that the “talc” is in fact chlorite and/or pyrophyllite, which will likely dehydrate. It is therefore considered that these calculated abundances of mineral species have an accuracy of approximately 2%-3% absolute. Summation of the abundances of calculated mineral species typically gives 97%-98% which substantiates this. The sum of talc and quartz contents is designated “insolubles”. Mineralogical estimates for all drill holes are presented as a series of downhole histograms in Appendix 5, Figures 4.1 – 4.5.

**Comment**

The validity of the methodology is confirmed by the excellent correlation between both insolubles and extractable MgO, calculated using the above method and determined by Assaycorp’s “classical titration”. These two sets of data, compared in Plot 4.10, Appendix 4, show that calculated insolubles are around 4% less than those determined by the classical method. This minor difference is explained by the fact that LOI is not strictly equivalent to carbonate content in that any of the hydrated minerals, such as talc, are prone to dehydration. Thus LOI will be greater than that expected from just the loss of CO\textsubscript{2} alone in high talc samples. Consequently carbonate content will be overstated and insolubles understated.
It is noted that the atomic weights used in the calculations are taken from an old edition of Dana’s textbook on mineralogy. Elemental and molecular ratios based on current atomic weights are compared with those used in the Mt Grace exercise as follows:

<table>
<thead>
<tr>
<th></th>
<th>Mt Grace</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of CO₂ in MgCO₃</td>
<td>0.524</td>
<td>0.522</td>
</tr>
<tr>
<td>% of Mg₂O in MgCO₃</td>
<td>0.476</td>
<td>0.478</td>
</tr>
<tr>
<td>% of MgO in talc</td>
<td>0.317</td>
<td>0.319</td>
</tr>
<tr>
<td>% of SiO₂ in talc</td>
<td>0.635</td>
<td>0.634</td>
</tr>
</tbody>
</table>

Using the current figures results in 0.04% more magnesite, 7.3% less talc and 13.1% more quartz relative to the amounts calculated by Mt Grace. Total insolubles remain much the same – 5.3% less than Assaycorp’s classical titration compared with 3.9% less in the existing database. These results are considered to be within the expected experimental error for the method.

4.8 Bulk Density

Four pieces of magnesite were selected for the determination of bulk density. The only core available of magnesite was from hole SND-1 which Giant Reef drilled. This core is stored behind the sea container at Sundance. The core is physically and chemically similar to magnesite found at Winchester. Four lengths of core between 0.4 m and 0.6 m were selected which visually had a variety of mineralogical compositions. The core had very few or no natural fractures and had very minor unconnected pores or no porosity.

The samples were dispatched to Analabs in Perth for determination of bulk density by weighing in air and water. Following these determinations the samples were prepared and analysed by XRF using the same procedures as the routine RC samples.

The results are presented as Table 4.7.

Table 4.7

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>From (m)</th>
<th>To (m)</th>
<th>MgCO₃</th>
<th>Mg₂O in carbonate</th>
<th>Talc in rock</th>
<th>Quartz</th>
<th>Total Insolubles</th>
<th>S G</th>
</tr>
</thead>
<tbody>
<tr>
<td>7846</td>
<td>50.40</td>
<td>50.80</td>
<td>92.54</td>
<td>44.05</td>
<td>4.64</td>
<td>1.87</td>
<td>6.51</td>
<td>2.98</td>
</tr>
<tr>
<td>7847</td>
<td>54.65</td>
<td>55.15</td>
<td>97.46</td>
<td>46.39</td>
<td>0.50</td>
<td>1.12</td>
<td>1.62</td>
<td>2.99</td>
</tr>
<tr>
<td>7848</td>
<td>74.00</td>
<td>74.40</td>
<td>89.41</td>
<td>42.56</td>
<td>8.52</td>
<td>1.07</td>
<td>9.59</td>
<td>3.00</td>
</tr>
<tr>
<td>7849</td>
<td>130.80</td>
<td>131.40</td>
<td>86.26</td>
<td>41.06</td>
<td>1.86</td>
<td>10.08</td>
<td>11.94</td>
<td>2.96</td>
</tr>
</tbody>
</table>

The density results, assumed to reflect bulk density, are remarkably consistent despite differing mineralogical compositions and compare with the mineralogical specific gravity given for magnesite as 3.0 – 3.2. A figure of 3.0 tonnes/m³ has been used for the volume-tonnage conversion factor in the resource estimation process.

Comment

The core remaining on site has been examined by DevMin. It is evident that the magnesite is massive with very few cracks, and no apparent porosity. There does not appear to be any reason why special precautions should have to be taken with the core (i.e. sealing the core) and the determination technique outlined above should provide a reliable result. Given that the four results, which average
2.98, are close to the established density of magnesite, and the material seems compact and massive, then the tonnage factor of 3 appears reasonable to use for the estimation of an Inferred resource. The risks associated with the use of an inappropriate bulk density for magnesite are in any case regarded as minimal.

Nonetheless, four samples is not considered representative of the deposit as a whole and variation may be expected to exist throughout the Winchester resource. Further work on the resource, particularly upgrading it to a higher classification such as Indicated or Measured, will require additional bulk density measurements to be made which will better reflect strike, cross-strike and depth.

4.9 Data Record, Manipulation & Presentation

All drill holes were supervised by a geologist on site who logged the holes as they were drilled and if deemed necessary, modified the final depth. Each sample was washed through a kitchen sieve thus facilitating inspection of the coarser fragments. The description and sample numbers were written directly onto the drill-log in the field. The logs are at a scale of 1:250 to facilitate easy sketching of cross sections. All comments, sketches, assays and calculated mineral content pertaining to a single hole are contained within a discreet file for each hole.

Small chip trays are used to store two sets of samples for each metre of drilling. One set is of washed chips and the other of raw or “dust” samples. The latter is kept as the colour of the raw sample was often different to that of the washed chips and it was thought possible that the colour of the raw sample may be related to the purity of the magnesite. This has not been rigorously investigated but no obvious correlation exists.

The analytical data is stored in an Access database in the Perth Office and manipulated using Mapinfo and Excel. The raw analytical data was printed out for each hole. The mineralogical calculations are done in the Access computer programme, transferred to the Excel computer programme, as well as printed out for each hole. These have been edited to eliminate invalid calculations. The data sheets are filed behind the log of the hole and the calculated data transcribed to the log.

The data was then used to plot histograms of each hole to allow characterisation of intervals. This was done in Mapinfo. These histograms are presented as Figures 4.1 – 4.5 in Appendix 5. Cross sections of the Winchester Prospect were drawn at 1:500 scale and printed out on three sheets (Appendix 2, Figures 3.3 – 3.5). These form the basis of the geological interpretation and the sectional resource estimate.

Comment

Data recording from the field and subsequent data input from analysis and calculation is both systematic and meticulous. DevMin has checked mineralogical calculations on a suite of 118 samples, and has found no discrepancies, other than those attributable to the use of current atomic weights. All plotted data is checked by the project geologist at Mt Grace. DevMin is reasonably assured that representation of data in file or plotted on paper accurately reflects the data recorded from the field or as supplied from the laboratory.

4.10 ACCEPTANCE OF INTERPRETATION & DATA

DevMin has reviewed and considered all aspects of the geological interpretation and data generation and finds that:

- the assumption that magnesite is developed parallel to the regional dip is reasonable, although not proven, at the current data spacing;
- analytical data are an accurate reflection of what is present in the resource;
• estimates of the proportions of magnesite and deleterious elements are adequately defined, and

• reasonable steps have been taken to identify all deleterious elements or mineral species and these have been satisfactorily quantified.

Taken together, these attributes constitute a reasonable basis on which to estimate Inferred resources for the deposit.

Risks inherent in acceptance of these data and interpretation, such as are likely to impinge upon the integrity of the resource, are few. The main ones are identified as follows.

• Magnesite may not be developed as stratigraphic units but in discrete masses, with lower grade material or dolomite in between. This may affect mine scheduling and whether the deposit is amenable to bulk mining or requires in pit grade control.

• Presence of caves or other cavities between drill holes. This is unlikely to impinge significantly upon the resource although it may affect mine scheduling.

• Weathering of near surface material, and irregularity of hard rock surface.

• Bulk densities may be less than that currently assumed due to the presence of fractures and vughs. Overall effect on tonnage however is likely to be minimal.
5. RESOURCE ESTIMATION

5.1 Introduction
Resource estimation for the Winchester Prospect was undertaken with two objectives:

1. Estimation of tonnes and grade of magnesium carbonate with an indication of the breakdown of the resource quantities into various metallurgical quality categories;

2. Production of a block model suitable for input into mine optimisation, design and production software.

Work on the resource estimation was started in early February 1999 and was completed in late March 1999. All resource estimation work was carried out by Raymond Dudley of DevMin, using DATAMINE Software.

5.2 Data Transfer
The drill hole and other digital information, for the Winchester Prospect, is maintained in an Access database by Mt Grace personnel and report tables in ASCII format are produced by running customised SQL commands.

For this resource estimate reverse circulation drill hole collar, locations, surveys and assay records were extracted from the Access database (Table 5.1) and the data transformed as ‘tab’ delimited files for import to DATAMINE.

<table>
<thead>
<tr>
<th>Access Database</th>
<th>Access Tables</th>
<th>Query</th>
<th>Comments</th>
<th>Output File</th>
<th>Conversions etc</th>
<th>DATAMINE Input File</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savannah ndh</td>
<td>Ba_Collar</td>
<td>Ba_MRC_Collar</td>
<td>Extracts all RC Drill Holes for the Batchelor Project</td>
<td>Ba_MRC_Collar.xls</td>
<td>Adjust AMG coords to local coords</td>
<td>Ba_MRC_Collar.csv</td>
</tr>
<tr>
<td></td>
<td>Ba_DH_Assay</td>
<td>Ba_DH_Analabs_XRF_Assay</td>
<td>Extracts all RC Drill Holes in the Savannah database &amp; XRF Analabs assays</td>
<td>Ba_DH_Analabs_XRF.tab</td>
<td>None</td>
<td>Ba_DH_Analabs_XRF.tab</td>
</tr>
<tr>
<td></td>
<td>MRC_Summary_</td>
<td>MRC_Summary_Logs</td>
<td>Summary Lithological Information for downhole intervals in holes with prefix MRC</td>
<td>MRC_Summary_Logs.txt</td>
<td>Insert field NEWLITH as abbreviated code for geology</td>
<td>wggeo.pm</td>
</tr>
<tr>
<td></td>
<td>Log</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Magnesite-Qual</td>
<td>MAGNESITE QUALITY INTERVALS-UPDATE.XLS</td>
<td>From To intervals with descriptive mineralogical text</td>
<td>MAGNESITE QUALITY INTERVALS-UPDATE.XLS</td>
<td>Reduce new quality codes to 8 character field names</td>
<td>MAGNESITE QUALITY INTERVALS-UPDATE.pm</td>
</tr>
<tr>
<td></td>
<td>Quality-Inte</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vals -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WINCHESTER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROSPECT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Before import to DATAMINE, database files for collars and geological information was edited in Excel to reduce field lengths and insert codes for later plotting. Main edits and additions to the database files included:

- abbreviated geological codes (Table 5.2);
- modification of AMG grid coordinates by subtraction of 8,500,000 and 700,000 from the north and cast coordinates respectively. The purpose of the subtraction of the constants, was to reduce the number of significant figures to eight or less, as this causes a precision problem in DATAMINE (16 bit precision); and
• reduction in number of characters in the quality code field to eight for processing in DATAMINE. The codes are converted back to full number of characters on output to reports.

Table 5.2
Abbreviated Geological Codes – NEWLITH Field

<table>
<thead>
<tr>
<th>Lithology</th>
<th>NEWLITH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>Cvr</td>
</tr>
<tr>
<td>Magnesite</td>
<td>Mag</td>
</tr>
<tr>
<td>Weathered Magnesite</td>
<td>Winag</td>
</tr>
<tr>
<td>Magnesite + Pyrite</td>
<td>PyMag</td>
</tr>
<tr>
<td>Haematitic Magnesite</td>
<td>Hmag</td>
</tr>
<tr>
<td>Magnesite &amp; Shale</td>
<td>MagShale</td>
</tr>
<tr>
<td>Cave Infill</td>
<td>Cvlnfl</td>
</tr>
<tr>
<td>Dolomite “A”</td>
<td>DolA</td>
</tr>
<tr>
<td>Dolomite “B”</td>
<td>DolB</td>
</tr>
<tr>
<td>Weathered Dolomite “B”</td>
<td>WdolB</td>
</tr>
<tr>
<td>Shale</td>
<td>Shale</td>
</tr>
<tr>
<td>Whites Fm</td>
<td>WhitsFm</td>
</tr>
<tr>
<td>Schist</td>
<td>Schist</td>
</tr>
<tr>
<td>Siltstone</td>
<td>Slt</td>
</tr>
</tbody>
</table>

The Access database of assays has various values preceded by a ‘-‘ sign indicating data below the detection limit for a particular element. On import to DATAMINE all values preceded by a ‘-‘ were converted to the code TR for trace. In addition, the assay data file in Access contains a complete listing of all 1 metre intervals in the drill holes, but only one in every three in ten samples was submitted for assay (Section 4.5). Hence, there are numerous intervals with a sample number, but no assay values and these intervals have been allocated a code of ‘-‘ in the DATAMINE database.

Assay values imported to DATAMINE are exclusively Analabs XRF data given as oxides for the elements Mg, Fe, Si, Al, Ti, Mn, Ca, K, P, S, Na and LOI (Loss on Ignition) and B.

Geology data imported to the DATAMINE database includes the descriptive lithological information and the abbreviated lithology code (NEWLITH, Table 5.2).

Magnesite quality data, derived mainly from interpretation of the drill assay information, was imported as a series of codes, as well as longer descriptive records summarising the expected mineralogical make-up of the samples. An initial set of quality codes were imported (OLD_QCD), but these were subsequently revised during the resource estimation process and a new set of codes (NEW_QCD) imported (Table 5.3).
Table 5.3
Magnesite Unit Quality Codes

<table>
<thead>
<tr>
<th>Quality Code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTHQ</td>
<td>High talc (high MgO) and high quartz (high SiO₂)</td>
</tr>
<tr>
<td>HTHQ-Ca</td>
<td>High talc (high MgO) and high quartz (high SiO₂) with elevated calcium (CaO)</td>
</tr>
<tr>
<td>HTLQ</td>
<td>High talc (high MgO) and low quartz (SiO₂)</td>
</tr>
<tr>
<td>HTLQ-Fe</td>
<td>High talc (high MgO) and low quartz (SiO₂) with elevated iron (Fe₂O₃)</td>
</tr>
<tr>
<td>LTHQ</td>
<td>Low talc (low MgO) and high quartz (SiO₂)</td>
</tr>
<tr>
<td>LTHQ-Ca</td>
<td>Low talc (low MgO) and high quartz (SiO₂) with elevated calcium (CaO)</td>
</tr>
<tr>
<td>LTLQ</td>
<td>Low talc and low quartz</td>
</tr>
<tr>
<td>LTLQ-AI</td>
<td>Low talc and low quartz with elevated aluminium (Al₂O₃)</td>
</tr>
<tr>
<td>LTLQ-Fe</td>
<td>Low talc and low quartz with elevated iron (Fe₂O₃)</td>
</tr>
<tr>
<td>LTMQ</td>
<td>Low talc moderate quartz</td>
</tr>
<tr>
<td>Ilq-fe-nv</td>
<td>Low talc low quartz, but mineralogical calculation not valid due to high iron</td>
</tr>
<tr>
<td>Itmq-caul-nv</td>
<td>Low talc and moderate quartz, but mineralogical calculation not valid due to high calcium and aluminium</td>
</tr>
<tr>
<td>MTHQ-AI</td>
<td>Moderate talc and high quartz, with elevated aluminium (Al₂O₃)</td>
</tr>
<tr>
<td>MTHQ-Fe</td>
<td>Moderate talc and high quartz, with elevated iron (Fe₂O₃)</td>
</tr>
<tr>
<td>MTLQ</td>
<td>Moderate talc moderate (MgO) and low quartz low (SiO₂)</td>
</tr>
<tr>
<td>MTLQ-AI</td>
<td>Moderate talc and low quartz with elevated aluminium (Al₂O₃)</td>
</tr>
<tr>
<td>MTLQ-Fe</td>
<td>Moderate talc and low quartz, with elevated iron (Fe₂O₃)</td>
</tr>
<tr>
<td>MMTQ</td>
<td>Moderate talc and moderate quartz</td>
</tr>
<tr>
<td>Mthq-al-nv</td>
<td>Moderate talc and high quartz, but mineralogical calculation not valid due to high aluminium</td>
</tr>
<tr>
<td>Mtlq-al-nv</td>
<td>Moderate talc and low quartz, but mineralogical calculation not valid due to high aluminium</td>
</tr>
<tr>
<td>Mtq-fe-nv</td>
<td>Moderate talc and low quartz, but mineralogical calculation not valid due to high iron</td>
</tr>
<tr>
<td>Mtm-al-nv</td>
<td>Moderate talc and moderate quartz, but mineralogical calculation not valid due to high aluminium</td>
</tr>
<tr>
<td>Htlq-al-nv</td>
<td>High talc and low quartz, but mineralogical calculation not valid due to high aluminium</td>
</tr>
<tr>
<td>Other</td>
<td>Drill intervals within magnesite unit not classified</td>
</tr>
</tbody>
</table>

The Access database contains all records for the complete drilling programme throughout Mt Grace’s tenements in the Batchelor area. On transfer the database was restricted to RC holes, lying within the Winchester Prospect, an area of approximately 750 m x 500 m (Table 5.4).

Table 5.4
Winchester Prospect – Area Definition

<table>
<thead>
<tr>
<th>AMG</th>
<th>AMG mN</th>
<th>AMG mE</th>
<th>North</th>
<th>East</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8,557,000</td>
<td>723,000</td>
<td>57,000</td>
<td>23,000</td>
</tr>
<tr>
<td></td>
<td>8,556,250</td>
<td>723,000</td>
<td>56,250</td>
<td>23,000</td>
</tr>
<tr>
<td></td>
<td>8,556,250</td>
<td>723,500</td>
<td>56,250</td>
<td>23,500</td>
</tr>
<tr>
<td></td>
<td>8,557,000</td>
<td>723,500</td>
<td>57,000</td>
<td>23,500</td>
</tr>
</tbody>
</table>
5.3 Database

The Winchester Prospect database consists of 46 RC holes (MRC048-MRC054 and MRC094 to MRC137), varying in depth from 36 m to 150 m. All holes have surveyed collar positions and were drilled at between 59° and 60° to the north. Total metres drilled were 4,480 m.

The RC holes, (Section 4.5), were sampled over 1 m intervals and there are 1,263 sampled intervals submitted for assay in the database.

Drill hole collars vary in elevation from 72.85 m to 78.43 m, with a mean elevation of 75.73 m. The drill hole spacing is approximately 100 m between sections in 3 lines on the west side of the prospect, decreasing to 50 m between sections in six lines in the central and eastern part of the prospect. Spacing between holes on section lines averages 50 m (Figure 5.1).

De-surveyed drill hole files were set-up in DATAMINE that included all imported assay data and merged geological and quality code information.

5.4 Data Validation

Checks on the validity of drill data were made mainly to determine if values were outside expected ranges with respect to assay values and hole depths. Check plots were generated and drill hole traces were examined in the DATAMINE graphics software, Guide. No errors were detected in any of the drill hole positions or general layout of the assay and geology data.

A minor problem was encountered in an early version of the database, where consecutive zero values existed in all grade fields, but where entries should have been blank (white space) for no assay. Zero values would normally be read as zero and would be included in a statistical calculation as samples with zero grades. The zero entries were removed in later versions of the database.

5.5 Univariate Statistics

Univariate statistics were calculated on the 1 m assay intervals for all holes in the Winchester Prospect. The total database was examined, followed by subsets of the data, based on Lithology codes (Tables 5.5 and 5.6 and Figures 5.2 and 5.3).

<table>
<thead>
<tr>
<th>Table 5.5</th>
<th>Summary Statistics all RC Drill Samples, Winchester Prospect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Samples</strong></td>
<td>MgO%</td>
</tr>
<tr>
<td>1,263</td>
<td>1,263</td>
</tr>
<tr>
<td><strong>Number of Samples &gt; TR</strong></td>
<td>1,263</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>3.04</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>47.54</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>41.02</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>7.6</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td>57.72</td>
</tr>
<tr>
<td><strong>Coefficient of Variation</strong></td>
<td>0.2</td>
</tr>
</tbody>
</table>
### Table 5.6
Summary Statistics for all rock coded as Magnesite, Winchester Prospect

<table>
<thead>
<tr>
<th></th>
<th>MgO%</th>
<th>CaO%</th>
<th>Al₂O₃%</th>
<th>SiO₂%</th>
<th>TiO₂%</th>
<th>Fe₂O₃%</th>
<th>MnO%</th>
<th>K₂O%</th>
<th>FeO%</th>
<th>SO₃%</th>
<th>Na₂O%</th>
<th>LO%</th>
<th>Bppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Samples</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>975</td>
<td>145</td>
</tr>
<tr>
<td>Number of Samples &gt; TR</td>
<td>975</td>
<td>975</td>
<td>969</td>
<td>974</td>
<td>747</td>
<td>975</td>
<td>974</td>
<td>1.62</td>
<td>835</td>
<td>973</td>
<td>974</td>
<td>975</td>
<td>57</td>
</tr>
<tr>
<td>Minimum</td>
<td>21.54</td>
<td>0.14</td>
<td>TR</td>
<td>TR</td>
<td>TR</td>
<td>0.29</td>
<td>TR</td>
<td>TR</td>
<td>TR</td>
<td>TR</td>
<td>TR</td>
<td>TR</td>
<td>11.38</td>
</tr>
<tr>
<td>Maximum</td>
<td>47.34</td>
<td>13.7</td>
<td>10.2</td>
<td>52.0</td>
<td>1.66</td>
<td>49.80</td>
<td>0.35</td>
<td>1.02</td>
<td>0.64</td>
<td>1.57</td>
<td>0.17</td>
<td>51.74</td>
<td>115</td>
</tr>
<tr>
<td>Mean</td>
<td>43.9</td>
<td>0.6</td>
<td>0.8</td>
<td>6.9</td>
<td>0.04</td>
<td>1.56</td>
<td>0.18</td>
<td>0.01</td>
<td>0.04</td>
<td>0.05</td>
<td>0.11</td>
<td>45.96</td>
<td>20</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.78</td>
<td>0.6</td>
<td>0.9</td>
<td>6.5</td>
<td>0.08</td>
<td>2.20</td>
<td>0.07</td>
<td>0.09</td>
<td>0.05</td>
<td>0.10</td>
<td>0.02</td>
<td>4.86</td>
<td>29</td>
</tr>
<tr>
<td>Variance</td>
<td>7.73</td>
<td>0.4</td>
<td>0.7</td>
<td>42.5</td>
<td>0.01</td>
<td>4.84</td>
<td>0.01</td>
<td>0.01</td>
<td>0.03</td>
<td>0.01</td>
<td>0.03</td>
<td>23.58</td>
<td>827</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>0.1</td>
<td>1.2</td>
<td>1.0</td>
<td>1.0</td>
<td>2.0</td>
<td>1.4</td>
<td>0.4</td>
<td>9.0</td>
<td>1.3</td>
<td>2.0</td>
<td>0.2</td>
<td>0.1</td>
<td>1.4</td>
</tr>
</tbody>
</table>

A complete set of statistical plots is given in Appendix 6.

Distributions of magnesium and other elements unconstrained by lithology (Figure 5.2), show a broad range of values that cluster into groups determined mainly by rock type. That is, elements such as calcium show a distinct bimodal distribution that correlates with the occurrence of magnesite and dolomite lithologies. High aluminium values are coincident with shale units.

![Histogram](image.png)

**Figure 5.2**: Magnesium as MgO, distribution in all RC samples from the Winchester Prospect.
Figure 5.3: Magnesium as MgO, distribution for all RC samples logged as lithology Magnesite.

When constrained by lithology, element grades are both negatively skewed (MgO) and positively skewed (CaO, SiO₂). That is, for MgO, high values cluster towards the upper end of the histogram plot (Figure 5.3), whereas the reverse is true for other elements (Appendix 6).

Given the skewed nature of the element distributions, there is a possibility that without a grade cut, mean grades across the deposit could be over or under estimated. Sample statistics for the magnesite unit (Table 5.5), in the case of magnesium, have a low coefficient of variation and the standard deviation is well below half the mean grade. Hence, the arithmetic mean is considered an adequate estimate of the mean magnesium grade, without the need for grade cut.

Other significant elements such as iron, aluminium and calcium have higher coefficients of variation and standard deviations of similar magnitude to their mean values. Examination of log-probability plots does indicate the presence of outliers (Appendix 6), but given the amount of information available at present, it is difficult to determine what is an appropriate top cut to apply. For the project at this stage, it was decided to apply a top cut of three standard deviations above the mean value (Table 5.7). However, there is still some degree of risk in estimation of mean values for these elements.
Table 5.7
Top cuts applied in grade estimation for the Magnesite Unit

<table>
<thead>
<tr>
<th>Element</th>
<th>Maximum Value Uncut</th>
<th>Maximum Value Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>MgO%</td>
<td>47.3</td>
<td>47.3</td>
</tr>
<tr>
<td>CaO%</td>
<td>13.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Al₂O₃%</td>
<td>10.2</td>
<td>9.0</td>
</tr>
<tr>
<td>SiO₂%</td>
<td>52.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Fe₂O₃%</td>
<td>49.8</td>
<td>19.0</td>
</tr>
</tbody>
</table>

A further investigation into top cuts is required, once more drill data is available and a more rigorous analysis can be made.

5.6 Bulk Density

An average value of 3.0 tonnes/m³ has been used for the magnesite unit based on limited data available for samples in the Batchelor region (Section 4.8). This value is consistent with the range of between 3.0 tonnes/m³ to 3.2 tonnes/m³ of bulk density for magnesium carbonate given in published tables of data.

Other rock units, such as the shales and dolomites, have no established bulk density values and published data of 2.6 tonne/m³ and 2.4 tonne/m³ respectively are recommended for adoption at this stage of the project’s development (Table 5.8).

Weathered magnesite and other weathered rock units are estimated to have a dry bulk density of 1.8 tonnes/m³, but will contain significant moisture of the order of 10% to 15%. Overburden clays and soils are typically water saturated and for tonnage estimation purposes should be allocated bulk densities of 1.2 tonne/m³ and a moisture content of up to 40% (Table 5.8).

Table 5.8
Bulk Density Estimates

<table>
<thead>
<tr>
<th>Material</th>
<th>Dry Bulk Density %</th>
<th>Moisture %</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesite</td>
<td>3.0</td>
<td>5</td>
<td>Limited measurements</td>
</tr>
<tr>
<td>Shale</td>
<td>2.4</td>
<td>5</td>
<td>No measurements – published data</td>
</tr>
<tr>
<td>Dolomite</td>
<td>2.6</td>
<td>5</td>
<td>„</td>
</tr>
<tr>
<td>Weathered Magnesite, Dolomite etc</td>
<td>1.8</td>
<td>10-15</td>
<td>Estimate</td>
</tr>
<tr>
<td>Overburden soils and clays</td>
<td>1.2</td>
<td>40</td>
<td>Estimate</td>
</tr>
</tbody>
</table>

5.7 Wireframe Surfaces

5.7.1 Introduction

To build a block model for grade interpolation purposes, wireframe surfaces were generated that represented the topographic surface, base of soil and transported cover surfaces and the base of weathering and lower limit of drill information.
5.7.2 Topographic Surface

For the topography a wireframe surface was generated from a triangulation of the drill hole collars. The prospect area is essentially flat and no appreciable distortion of the topography is envisaged using drill collar data. To ensure complete coverage of the prospect area, the triangulation was extended approximately 100 m horizontally outwards from drill collar positions around the edge of the prospect area.

5.7.3 Base of Soil and Transported Cover

Depth of cover in all Winchester Prospect drill logs was identified and a triangulated surface linking the points generated, in a similar manner to the topographic surface and extended around the edge of the prospect.

5.7.4 Base of Weathering

To model the base of soil and transported cover, the base of weathering was defined by a series of points in the drill holes. A triangulated surface was generated and extended around the edge of the prospect.

5.7.5 Lower Limit of Drill Information

The geological interpretation of the magnesite unit implies that it extends down dip for a considerable distance. However, for the purpose of resource estimation, it was decided to limit the down dip extension to a surface formed from the end of hole positions. That is, end of hole positions were configured as points and triangulated in a similar manner to other surfaces, with an extension around the edge of the prospect. A 3-dimensional view of all wireframe surfaces is given in Figure 5.4.
Figure 5.4 - Winchester Prospect Wireframe Surfaces

Winchester Prospect looking from the south-east to the north-west, showing the topographic (green) surface, base of cover (brown), base of weathering (yellow) and surface formed between the base of drill hole points (blue)
5.8 Block Model Set-up

5.8.1 Volume Model Specifications and Limits

A three-dimensional (3-d) block model was created between the base of cover wireframe and the surface linking the end of hole positions. In building the block model, limitations of software to be used in subsequent mine planning work (no sub-cells, or partial block outlines) and the large spacing of drill holes, had to be taken into account. A mining bench height of 5 m was also envisaged.

A block size of 25 m (half the drill hole spacing along strike) in the East (X) and 20 m (one quarter the drill hole spacing areas strike) in the North (Y) directions were selected. Full details of the block model prototype are given in Table 5.9.

<table>
<thead>
<tr>
<th></th>
<th>Model Origin</th>
<th>Block Size (m)</th>
<th>Number of Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>X (East)</td>
<td>22800</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Y (North)</td>
<td>56180</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>Z (RL)</td>
<td>-60</td>
<td>5</td>
<td>28</td>
</tr>
</tbody>
</table>

5.8.2 Geological Coding and Model Domains

The geological interpretation of the Winchester Prospect is limited to a broad understanding of the contacts between various rock types and any internal variation within the magnesite is mainly subjective interpretation. In other words, apart from assuming a broad correlation with the regional dip, dolomite and talc-quartz alteration distribution within the magnesite is uncertain at this stage. Some infill drilling will be required to resolve this, or at least provide more data for correlation. Hence geological coding of blocks in the model was not optimised to fit precisely within geological boundaries as drawn on the interpreted geological sections for the prospect.

Geological contacts as interpreted by the Mt Grace geologist on 1:500 scale sections, were digitised on screen plots of the drill holes viewed in Guide. Each rock unit was digitised as an enclosed perimeter and these were projected orthogonally to the section plane, half way to adjacent sections. The two end sections at the east and west ends of the prospect were projected 25 m from the drill line. No attempt was made at this stage to link geology from one section to the next to form a complete three-dimensional interpretation of the geology.

Attributes were added to the digitised string data that identified the section and lithological codes to use. By using the DATAMINE process “Selper”, it was then possible to code model blocks, falling inside a perimeter, with a section and lithology code. The coded blocks were then added back over a base model and an output model with geology codes generated. Essentially the output model from this process is not unlike a simple polygonal model with areas projected half way from one section to the next.

The lack of optimisation in fitting the model blocks to the geological contacts becomes apparent in some of the narrower geological units. The geological coding is dependent on a block centroid falling inside the perimeter and a narrow, 65° dipping unit may only intersect one or two block centroids. Visual inspections were made of the block coding and volumes represented by the blocks compared to the original geology outline. Satisfactory (less than
10%) results were obtained, although the block outline was often very different to the geology perimeter.

A model with blocks between the base of weathering and the base of cover was added back over the model with the rock geological codes. This process updated all blocks in the weathered zone with a code of 'Wthd' in the NEWLITH field and was used as a means of restricting grade interpolation to fresh rock only.

A complete list of all rock codes present in the geological model is given in Table 5.10.

Table 5.10
Resource Block Model – Geological Codes in field NEWLITH

<table>
<thead>
<tr>
<th>NEWLITH</th>
<th>LITHOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cvr</td>
<td>Cover - clays and soils</td>
</tr>
<tr>
<td>Wthd</td>
<td>Weathered bedrock</td>
</tr>
<tr>
<td>Mag</td>
<td>Magnesite</td>
</tr>
<tr>
<td>Wmag</td>
<td>Weathered Magnesite</td>
</tr>
<tr>
<td></td>
<td>(Deep intercept around cave in MRC137)</td>
</tr>
<tr>
<td>PyMag</td>
<td>Magnesite + Pyrite</td>
</tr>
<tr>
<td>Hmag</td>
<td>Haematitic Magnesite</td>
</tr>
<tr>
<td>MagShale</td>
<td>Magnesite &amp; Shale</td>
</tr>
<tr>
<td>CvInfl</td>
<td>Cave Infill</td>
</tr>
<tr>
<td>DolA</td>
<td>Dolomite &quot;A&quot;</td>
</tr>
<tr>
<td>DolB</td>
<td>Dolomite &quot;B&quot;</td>
</tr>
<tr>
<td>Shale</td>
<td>Shale</td>
</tr>
<tr>
<td>WhtsFm</td>
<td>Whites Fm</td>
</tr>
<tr>
<td>Schist</td>
<td>Schist</td>
</tr>
<tr>
<td>Slt</td>
<td>Siltstone</td>
</tr>
</tbody>
</table>

5.9 Grade Interpolation

5.9.1 Introduction

At this stage of the project drill spacings are relatively wide spaced and there is limited information available on the sub-surface geology. Regional mapping indicates that the Coomalie Dolomite is a unit with mixed lithologies of dolomite, magnesite and occasional shales. Indications of an average dip of the dolomite unit of about 65°S are mainly present in underlying and overlying sandstone units. Drill hole information is restricted to RC holes and no bedding and other structural data is obtainable from the drill cuttings.

The geological interpretation of the drill hole data indicates that there is variable alteration of the dolomite to magnesite, but the drill spacing is not close enough to determine the pattern of alteration. That is, if the alteration is either conformable with bedding, or crosscuts, the dolomite unit.
In building the resource model and interpolating grade information, the approach has been to follow a simple interpretation of rock units (Section 5.8) and repeat this with the grade trends. As additional information becomes available, it should be possible to refine the grade interpretation, reduce block sizes and examine the continuity of the element data in a more rigorous manner.

The grade model was built in two stages:

**Stage 1**

A general interpolation of 11 elements into all Winchester Prospect model blocks controlled by lithology. That is, blocks coded as magnesite were interpolated using drill samples coded as magnesite.

**Stage 2**

Model grade interpolation that was specifically organised within the Resource Area of Winchester Prospect, with the magnesite unit broken down into metallurgical and mineralogical groupings.

A final model was constructed that combined the detailed metallurgical information with the general grade model. At this stage overburden (cover) and the weathered zone was added to the block model. No grade interpolation was carried out in either the cover or weathered zones.

5.9.2 *Method*

The grade interpolation method used was inverse distance squared weighting of sample assay grades, run using the DATAMINE process “Estima”. The “Estima” process enables a considerable degree of control over the estimation process sample selection and anisotropy. Parameters used to set-up the “Estima” process for the Winchester Prospect are summarised in Tables 5.11a and 5.11b.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25</td>
<td>40</td>
<td>10</td>
<td>-65</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Search Volume Factor 2</td>
<td>Minimum No Samples Search Vol1</td>
<td>Maximum No Samples Search Vol2</td>
<td>Search Volume Factor 3</td>
<td>Minimum No Samples Search Vol 3</td>
<td>Maximum No Samples Search Vol 3</td>
<td>Maximum No Samples per Key Field BHID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
### Table 5.11b

**Grade Estimation Parameters**

<table>
<thead>
<tr>
<th>Zonal Control Field</th>
<th>Element from Sample file for Interpolation</th>
<th>Element Interpolated Name in Block</th>
<th>Search Volume Ref No</th>
<th>Power for Use in Interpolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mag</td>
<td>MGO</td>
<td>MGO</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>FE2O3</td>
<td>FE2O3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>AL2O3</td>
<td>AL2O3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>SIO2</td>
<td>SIO2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>CAO</td>
<td>CAO</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>LOI</td>
<td>LOI</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>TIO2</td>
<td>TIO2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>MNO</td>
<td>MNO</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>K2O</td>
<td>K2O</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>P2O5</td>
<td>P2O5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mag</td>
<td>NA2O</td>
<td>NA2O</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Essential features of the interpolation parameters used were:

- a search ellipse oriented parallel to the regional dip of 65°S;
- search ellipse radius 25 m along strike, 40 m down dip and 10 m across dip;
- minimum and maximum sample number control dependent on the search volume used;
- control on the maximum number of samples (3) used from any one drill hole;
- zonal control restricting grade interpolation to samples identified by lithology in drill holes and model blocks (total of 10 rock lithology types and 11 elements); and
- 11 element interpolation repeated for 9 Zone Lithology fields MagShale, PyMag, Hmag, Schist, Shale, Slt, WhtsFm, DolA, DolB

### 5.9.3 Metallurgical Codes

Twenty-four subdivisions of the magnesite unit have been made based on the calculated mineralogy (Section 5.2). Whether all twenty-four subdivisions will remain after test work is completed is not certain at this stage. Consequently allowance has been made for inclusion of all subdivisions in the resource model, and the option has been built into the macro's used to generate the resource model, to vary (in particular reduce) the number of metallurgical codes.

In preparation for the interpolation work, metallurgical codes were compiled down each drill hole by Mt Grace, and each metallurgical zone is shown as a polygonal area on drill cross sections. That is, each zone was treated as a distinct area with sharp contacts.

For the block model, rather than take a polygonal approach, it was decided to allocate the metallurgical codes to blocks using an indicator procedure. For each of the 24 codes, 24 runs were made through the model allocating a value of 1 to each code in sequence, setting all other...
codes to 0. The 1 and 0 values were then interpolated into the model blocks using identical parameters to those described in Section 5.10.2, and the indicator – a number between 0 and 1 stored in the block for the particular code being run. At the end of the run, all indicator values for each block were normalised to a sum of 1.

A second pass was then made through the model, to interpolate grades for the 11 elements, for each metallurgical code. Essentially blocks carrying an indicator greater than zero, for each code in turn, were extracted, a grade interpolated and a metal fraction calculated based on the indicator value. This metal fraction was added to metal fractions from succeeding runs, to produce a final average grade for each block. Individual grades for each indicator are not retained, so it is not possible at this stage, to do anything more than allocate the average grade to each indicator fraction.

5.9.4 Resource Models

Mt Grace has delineated an area within the Winchester Prospect as having favourable ground conditions (lack of apparent caves, sinkholes etc) for mining. Therefore, detailed resource modelling was restricted to within this area (red outline in Figure 5.1), and limited to the full evaluation of the 24 metallurgical codes, whilst a base model was constructed for the entire Winchester Prospect.

In Figures 5.5 and 5.6 typical section and plan views of the block model are plotted and in Figure 5.7, a 3-d view of the block model is presented.

All reporting of tonnes and grades for the resource is restricted to the Resource Area (Figure 5.1), however grade and tonnage data information could be generated outside the resource area, should there be a need to extend any planned open pit.
Figure 5.7 – Block Model 3-d view

Winchester Prospect looking from the east to west, showing the topographic (green) surface, base of cover (brown), base of weathering (brown), surface formed between the base of drill hole points (blue) and the resource block model. The model is cut away in the foreground to show magnesium grade distribution at the east end of the deposit. Red blocks are >45% MgO. Colours through brown to green are grades of between 40% MgO and <30% MgO. White blocks are weathered magnesite. Block dimensions are 20 m x 25 m x 5 m.

5.9.5 Resource Report and Classification

The resource estimated within the Resource Area (Figure 5.1) is listed in Tables 5.12 and 5.13. Table 5.12 presents a detailed breakdown of the magnesite resource within the Resource Area and Table 5.13 provides tonnage and grade data for other lithologies within the Resource Area.
## Table 5.12
Resource within Metallurgical Zones (Inferred)

<table>
<thead>
<tr>
<th>Metallurgical Quality Code</th>
<th>Elemental Values</th>
<th>Calculated Mineralogical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MgO%</td>
<td>Fe₂O₃%</td>
</tr>
<tr>
<td>HTHQ</td>
<td>39.35</td>
<td>0.93</td>
</tr>
<tr>
<td>HTHQ-Ca</td>
<td>39.10</td>
<td>1.09</td>
</tr>
<tr>
<td>HTHQ-Fe</td>
<td>42.54</td>
<td>1.16</td>
</tr>
<tr>
<td>HTHQ-Fe</td>
<td>42.54</td>
<td>1.16</td>
</tr>
<tr>
<td>httq-al-nv</td>
<td>43.10</td>
<td>1.35</td>
</tr>
<tr>
<td>httq-nv</td>
<td>45.00</td>
<td>1.24</td>
</tr>
<tr>
<td>ltmq-caal-nv</td>
<td>43.34</td>
<td>0.89</td>
</tr>
<tr>
<td>MTHQ-Al</td>
<td>41.53</td>
<td>1.14</td>
</tr>
<tr>
<td>MTHQ-Fe</td>
<td>32.40</td>
<td>2.04</td>
</tr>
<tr>
<td>MTLQ</td>
<td>44.43</td>
<td>1.36</td>
</tr>
<tr>
<td>MTLQ-Al</td>
<td>44.14</td>
<td>1.52</td>
</tr>
<tr>
<td>MTLQ-Fe</td>
<td>45.24</td>
<td>1.65</td>
</tr>
<tr>
<td>MTMQ</td>
<td>42.91</td>
<td>1.64</td>
</tr>
<tr>
<td>mthq-al-nv</td>
<td>39.54</td>
<td>0.81</td>
</tr>
<tr>
<td>mthq-nv</td>
<td>44.26</td>
<td>0.75</td>
</tr>
<tr>
<td>mthq-fe-nv</td>
<td>41.06</td>
<td>8.12</td>
</tr>
<tr>
<td>mthq-al-nv</td>
<td>43.09</td>
<td>1.53</td>
</tr>
<tr>
<td>Other</td>
<td>43.14</td>
<td>2.27</td>
</tr>
</tbody>
</table>

| Total Magnesite Resource | 43.90 | 1.50   | 0.75   | 6.81  | 0.52  | 0.03   | 0.18  | 0.01  | 0.04  | 0.10  | 46.10 | 20,708,000 | 6,902,000 | 88.0 | 41.9 | 6.4 | 2.8 | 9.1 |

DevMin final Rept to Mt Grace.doc
Resource Estimation
DevMin Consultants Pty Ltd
Rev B
### Table 5.13
Total Inferred Resource, all rock types within the Resource Area

<table>
<thead>
<tr>
<th>Lithology</th>
<th>MgO %</th>
<th>Fe₂O₃ %</th>
<th>Al₂O₃ %</th>
<th>SiO₂ %</th>
<th>CaO %</th>
<th>TiO₂ %</th>
<th>MnO %</th>
<th>K₂O %</th>
<th>P₂O₅ %</th>
<th>Na₂O %</th>
<th>LOI %</th>
<th>Tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesite</td>
<td>43.90</td>
<td>1.50</td>
<td>0.75</td>
<td>6.81</td>
<td>0.52</td>
<td>0.03</td>
<td>0.18</td>
<td>0.01</td>
<td>0.04</td>
<td>0.10</td>
<td></td>
<td>46.10</td>
</tr>
<tr>
<td>Dolomite B</td>
<td>36.62</td>
<td>1.17</td>
<td>1.22</td>
<td>10.49</td>
<td>15.95</td>
<td>0.06</td>
<td>0.33</td>
<td>0.01</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td>49.42</td>
</tr>
<tr>
<td>Hematitic</td>
<td>40.25</td>
<td>8.51</td>
<td>1.23</td>
<td>10.80</td>
<td>0.43</td>
<td>0.09</td>
<td>0.15</td>
<td>0.00</td>
<td>0.06</td>
<td>0.10</td>
<td></td>
<td>38.44</td>
</tr>
<tr>
<td>Magnesite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42.83</td>
<td>1.52</td>
<td>0.82</td>
<td>7.37</td>
<td>2.71</td>
<td>0.04</td>
<td>0.20</td>
<td>0.01</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td>46.50</td>
</tr>
</tbody>
</table>

Exactly which combination of metallurgical types might be more favourable for mining and processing is subjective at this stage. In Table 5.14, a summary of potential favourable metallurgical types indicates there is available at least 15 Mt of resource with a magnesium carbonate content of nearly 90%.

The resource is classified as Inferred at this stage of the project’s development, for several reasons:

- drill hole spacing is relatively wide and it is not possible to establish geological trends, such as the distribution of magnesite and interlayered dolomite;
- dip and strike directions for the magnesite unit have been assumed to be parallel to the regional dip (but may ultimately differ);
- a limited number of bulk density measurements are available for confirmation of the tonnage factor used; and
- the final resource is dependent on an assessment of the metallurgical data and criteria for the various categories of magnesite.
<table>
<thead>
<tr>
<th>Metallurgical Quality Code</th>
<th>MgO%</th>
<th>Fe₂O₃%</th>
<th>Al₂O₃%</th>
<th>SiO₂%</th>
<th>CaO%</th>
<th>TiO₂%</th>
<th>MnO%</th>
<th>K₂O%</th>
<th>P₂O₅%</th>
<th>Na₂O%</th>
<th>LOI%</th>
<th>Tonnes</th>
<th>Magnesite %</th>
<th>%MgO in CO₃</th>
<th>Talc%</th>
<th>Free Quartz</th>
<th>Total Insolubles</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTLQ</td>
<td>45.30</td>
<td>1.23</td>
<td>0.56</td>
<td>3.83</td>
<td>0.47</td>
<td>0.02</td>
<td>0.20</td>
<td>0.003</td>
<td>0.024</td>
<td>0.11</td>
<td>48.38</td>
<td>5,816,133</td>
<td>92.3</td>
<td>44.0</td>
<td>4.3</td>
<td>1.1</td>
<td>5.4</td>
</tr>
<tr>
<td>LTMQ</td>
<td>43.92</td>
<td>1.35</td>
<td>0.61</td>
<td>5.54</td>
<td>0.56</td>
<td>0.03</td>
<td>0.20</td>
<td>0.035</td>
<td>0.043</td>
<td>0.10</td>
<td>47.56</td>
<td>2,720,812</td>
<td>90.8</td>
<td>43.2</td>
<td>2.3</td>
<td>4.1</td>
<td>6.4</td>
</tr>
<tr>
<td>LTLQ-Al</td>
<td>43.84</td>
<td>1.31</td>
<td>1.18</td>
<td>4.99</td>
<td>0.38</td>
<td>0.05</td>
<td>0.19</td>
<td>0.003</td>
<td>0.035</td>
<td>0.10</td>
<td>46.51</td>
<td>546,886</td>
<td>88.8</td>
<td>42.2</td>
<td>5.0</td>
<td>1.8</td>
<td>6.8</td>
</tr>
<tr>
<td>LTLQ-Fe</td>
<td>44.38</td>
<td>2.21</td>
<td>0.65</td>
<td>4.56</td>
<td>0.52</td>
<td>0.02</td>
<td>0.21</td>
<td>0.000</td>
<td>0.046</td>
<td>0.11</td>
<td>47.31</td>
<td>715,904</td>
<td>90.3</td>
<td>43.0</td>
<td>4.4</td>
<td>1.8</td>
<td>6.2</td>
</tr>
<tr>
<td>MTLQ</td>
<td>44.43</td>
<td>1.36</td>
<td>0.65</td>
<td>7.32</td>
<td>0.44</td>
<td>0.02</td>
<td>0.18</td>
<td>0.004</td>
<td>0.036</td>
<td>0.11</td>
<td>45.54</td>
<td>1,768,964</td>
<td>86.9</td>
<td>41.4</td>
<td>9.7</td>
<td>1.2</td>
<td>10.9</td>
</tr>
<tr>
<td>MTMQ</td>
<td>42.91</td>
<td>1.64</td>
<td>0.80</td>
<td>8.90</td>
<td>0.60</td>
<td>0.04</td>
<td>0.16</td>
<td>0.001</td>
<td>0.079</td>
<td>0.10</td>
<td>44.57</td>
<td>1,331,972</td>
<td>85.1</td>
<td>40.5</td>
<td>7.6</td>
<td>4.1</td>
<td>11.7</td>
</tr>
<tr>
<td>MTLQ-Al</td>
<td>44.14</td>
<td>1.52</td>
<td>1.09</td>
<td>7.09</td>
<td>0.54</td>
<td>0.05</td>
<td>0.18</td>
<td>0.001</td>
<td>0.066</td>
<td>0.10</td>
<td>45.21</td>
<td>1,343,136</td>
<td>86.3</td>
<td>41.1</td>
<td>9.7</td>
<td>0.9</td>
<td>10.6</td>
</tr>
<tr>
<td>MTLQ-Fe</td>
<td>45.24</td>
<td>1.65</td>
<td>0.68</td>
<td>4.32</td>
<td>0.43</td>
<td>0.03</td>
<td>0.20</td>
<td>0.000</td>
<td>0.035</td>
<td>0.10</td>
<td>47.44</td>
<td>710,232</td>
<td>90.5</td>
<td>43.1</td>
<td>6.8</td>
<td>0.0</td>
<td>6.8</td>
</tr>
<tr>
<td>Total Magnesite Resource</td>
<td>44.53</td>
<td>1.40</td>
<td>0.68</td>
<td>5.40</td>
<td>0.50</td>
<td>0.03</td>
<td>0.19</td>
<td>0.01</td>
<td>0.04</td>
<td>0.10</td>
<td>47.11</td>
<td>14,954,000</td>
<td>89.9</td>
<td>42.8</td>
<td>5.5</td>
<td>1.9</td>
<td>7.4</td>
</tr>
</tbody>
</table>
5.9.6 Model Check and Comparison with Manual Polygonal Estimate

Mt Grace has independently made a polygonal end area resource estimate for the Winchester Prospect (Uren, 1999). The block model results are compared with the polygonal data in Table 5.15. The total for all sections is similar - allowing for the fact that the outline definition used in the polygonal model is different – inwardly tapered edges instead of vertical edges in the block model. In addition, for the manual model, various blocks were rejected because they were considered not suitable for mining.

On a section by section basis, results of the two methods of estimation are similar with the exception of Sections 23,420E and 23,350E, where the block model centroids are not precisely in step with the change in section intervals. Hence section 23,420E in the block model is 10 m wider towards 23,350E and 23,350E is 10 m shorter, which accounts for the larger tonnage on one section and a smaller tonnage on the other.

The estimate of grade is similar, given the slightly different methods used to generate the metallurgical quality data for each section area and model blocks, hence weighting to arrive at an overall average will be subject to some variability.

### Table 5.15
Comparison Polygonal and Block Model Resource Estimates

<table>
<thead>
<tr>
<th>SECTION</th>
<th>TOTAL TONNAGE ON SECTION</th>
<th>MgO % in the form of MAGNESITE</th>
<th>TALC %</th>
<th>QUARTZ %</th>
<th>TOTAL INSOLUBLES %</th>
<th>Al₂O₃ %</th>
<th>Fe₂O₃ %</th>
<th>MnO %</th>
<th>CaO %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygonal Model 23100 E</td>
<td>456,525</td>
<td>43.2</td>
<td>6.7</td>
<td>0.2</td>
<td>6.9</td>
<td>0.50</td>
<td>1.44</td>
<td>0.26</td>
<td>0.45</td>
</tr>
<tr>
<td>Block Model 23100 E</td>
<td>349,000</td>
<td>43.0</td>
<td>7.2</td>
<td>0.2</td>
<td>7.4</td>
<td>0.52</td>
<td>1.52</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23200 E</td>
<td>1,468,800</td>
<td>41.0</td>
<td>6.6</td>
<td>3.4</td>
<td>10.0</td>
<td>1.10</td>
<td>1.40</td>
<td>0.20</td>
<td>0.50</td>
</tr>
<tr>
<td>Block Model 23200 E</td>
<td>1,899,000</td>
<td>41.7</td>
<td>6.3</td>
<td>3.3</td>
<td>9.6</td>
<td>0.96</td>
<td>1.32</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23250 E</td>
<td>1,908,450</td>
<td>41.1</td>
<td>8.2</td>
<td>1.4</td>
<td>9.6</td>
<td>0.79</td>
<td>1.90</td>
<td>0.17</td>
<td>0.45</td>
</tr>
<tr>
<td>Block Model 23250 E</td>
<td>1,829,000</td>
<td>42.4</td>
<td>8.0</td>
<td>1.4</td>
<td>9.4</td>
<td>0.96</td>
<td>1.32</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23300 E</td>
<td>2,539,350</td>
<td>42.2</td>
<td>6.7</td>
<td>1.9</td>
<td>8.7</td>
<td>0.74</td>
<td>1.50</td>
<td>0.19</td>
<td>0.44</td>
</tr>
<tr>
<td>Block Model 23300 E</td>
<td>2,641,000</td>
<td>42.3</td>
<td>6.6</td>
<td>1.7</td>
<td>8.3</td>
<td>0.71</td>
<td>1.46</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23350 E</td>
<td>3,375,900</td>
<td>42.1</td>
<td>5.9</td>
<td>2.4</td>
<td>8.3</td>
<td>0.85</td>
<td>1.35</td>
<td>0.19</td>
<td>0.51</td>
</tr>
<tr>
<td>Block Model 23350 E</td>
<td>2,851,000</td>
<td>42.6</td>
<td>5.6</td>
<td>2.3</td>
<td>7.9</td>
<td>0.82</td>
<td>1.31</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23420 E</td>
<td>4,691,160</td>
<td>42.7</td>
<td>3.8</td>
<td>3.7</td>
<td>7.6</td>
<td>0.65</td>
<td>1.37</td>
<td>0.19</td>
<td>0.62</td>
</tr>
<tr>
<td>Block Model 23420 E</td>
<td>5,663,000</td>
<td>42.2</td>
<td>3.2</td>
<td>3.2</td>
<td>6.4</td>
<td>0.65</td>
<td>1.40</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model 23470 E</td>
<td>2,819,250</td>
<td>41.9</td>
<td>6.1</td>
<td>2.7</td>
<td>8.8</td>
<td>0.75</td>
<td>1.45</td>
<td>0.18</td>
<td>0.54</td>
</tr>
<tr>
<td>Block Model 23470 E</td>
<td>2,978,000</td>
<td>41.7</td>
<td>7.0</td>
<td>2.9</td>
<td>9.9</td>
<td>0.60</td>
<td>1.35</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Polygonal Model Total</td>
<td>17,259,435</td>
<td>41.9</td>
<td>6.1</td>
<td>2.7</td>
<td>8.8</td>
<td>0.75</td>
<td>1.45</td>
<td>0.18</td>
<td>0.54</td>
</tr>
<tr>
<td>Block Model Total</td>
<td>18,210,000</td>
<td>42.2</td>
<td>5.4</td>
<td>2.5</td>
<td>8.0</td>
<td>0.73</td>
<td>1.34</td>
<td>0.51</td>
<td></td>
</tr>
</tbody>
</table>
6. RECOMMENDATIONS

It is recommended that additional exploration work be carried out at the Winchester Prospect with the aim of upgrading the resource status to the Indicated or Measured categories. At the same time, a reconnaissance drilling programme should be maintained throughout those parts of Mt Grace's other tenements underlain by the magnesite horizon, as there is the possibility that a larger and more coherent magnesite resource of similar quality to Winchester is present elsewhere in the same horizon.

Work to upgrade the status of the Winchester resource should target the following areas:

- Assess the variability of magnesite within the dolomite horizon.
- Assess the variability of cover and near surface weathering material.
- Examine for the presence of small caves or cavities.
- Extend the determination of bulk densities to fully represent depth, strike and cross strike.
- Expand the quality control programme.

Further, rather than embark on a major drilling programme to infill drill the whole prospect, it is recommended that a staged approach be adopted commencing with a small programme to determine variability of the above attributes. Once this information is available, the scope of additional work required to upgrade the resource to Measured or Indicated status can be better determined.

Two sections, 723420E and 723470E, are selected for more intense drilling to test variability. Section 723420E is at the centre of the deposit and is characterised by intercepts of massive magnesite. Section 723470E has intercepts of both magnesite and dolomite. The 80 m hole spacing should be closed to 40 m with 60°N angled RC drilling to 100 m advance. Two of these holes should be core drilled rather than RC to allow physical examination of the intact material, and to provide material for additional bulk density testing. Two additional holes drilled south rather than north will also help to test variability. The recommended holes are listed in Table 6.1.

<table>
<thead>
<tr>
<th>Line</th>
<th>Northing</th>
<th>Length</th>
<th>Orientation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>723420E</td>
<td>8556486</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556566</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556646</td>
<td>150</td>
<td>60°N</td>
<td>HQ Core</td>
</tr>
<tr>
<td></td>
<td>8556700</td>
<td>150</td>
<td>60°S</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556726</td>
<td>115</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556806</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td>723470E</td>
<td>8556524</td>
<td>100</td>
<td>60°N</td>
<td>HQ Core</td>
</tr>
<tr>
<td></td>
<td>8556604</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556680</td>
<td>100</td>
<td>60°S</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556684</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
<tr>
<td></td>
<td>8556764</td>
<td>100</td>
<td>60°N</td>
<td>RC</td>
</tr>
</tbody>
</table>

To test variability in depth of cover and weathering, a programme of 36 short (20 m) vertical RC holes is recommended. These should be drilled on six lines of 6 holes each. Each set of 3 lines should be spaced at 20 m apart on and either side of lines 723420E and 723470E over a cross strike of 100 m centred 8556600N and 8556560N, respectively.
Although no specific concerns over data generation have been highlighted to date, it is recommended that a more rigorous quality control programme be implemented, at least in the first stage. This programme should encompass the following work:

1. Test 10% field duplicates to monitor validity of riffle splitting.
2. Test 10% sub-sample duplicates to monitor validity of sub-sampling jaw crushed or drill chip material during sample preparation.
3. Test 10% pulp duplicates submitted for repeat analysis to monitor analytical error (precision). This is usually done as part of the internal laboratory procedures.
4. Test 10% pulp duplicates in a second laboratory to check XRF analytical techniques and instrument calibration.
5. Submission of “standards” with each batch to both primary and secondary laboratories to monitor precision. The targets here are the deleterious elements, so a selection of high talc and quartz magnesites is probably appropriate. Submission of blanks is probably not necessary in this project, unless there are perceived problems with sample handling.
6. Submit 10% duplicate sampling for classical titration to determine acid digestible MgO. If these duplicates are taken from the field splits the check will encompass all sampling, analytical and mineralogical calculation errors.
7. Submission of all drilled samples for analysis from two holes – one from each section. This is to check the validity of the 3 in 10 sampling procedure.

This is a small programme and 10% duplicate sampling for quality control is justified in this scoping study stage. Once the precision and errors inherent in the methods used are satisfactorily established for the estimation of Measured and Indicated resources, it may prove valid to reduce duplicate sampling to 5% in future programmes.

The results of the programme outlined above should be assessed before a decision is taken on the requirements for establishing either Measured or Indicated resources at Winchester.

DevMin also strongly recommends that the regional reconnaissance effort, including drilling, be maintained according to the budget available. Prior to the focus on Winchester, only 7 kms of the 30 kms of Coonamie Dolomite Mt Grace has under tenement has been tested. The likelihood of finding magnesite of the same quality as at Winchester elsewhere along strike is high, and may well constitute a much larger resource. First pass reconnaissance drilling should be on lines no greater than 1 km apart along strike. However, it should be borne in mind that the strike length of a potential resource, even one larger than Winchester, could be in the range 300 m – 500 m.
CONCLUSION

On the basis of the resource data and preliminary testwork results currently available, DevMin considers that there are no apparent reasons why the Winchester magnesite resource is not of sufficient grade and tonnage to sustain a technically and commercially viable magnesium metal production facility of world standing. The data currently available are of sufficient depth and reliability to justify further detailed resource definition together with detailed evaluation of processing options and associated engineering and costing studies. The size of the resource is limited only by the extent of drilling, within a relatively small area, of a very extensive magnesite unit and the resource has the potential to become a world class deposit.

R J Dudley

PN Fillis
REFERENCES


