ANNUAL REPORT FOR PERIOD 6 APRIL 1995
TO 5 APRIL 1996.
ERL 128. HUANDOT MAGNESITE DEPOSIT
PINE CREEK 1:250 000 SHEET SD52-8

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Report No. 20 290
REPORT NUMBER: 20 290

TITLE: ANNUAL REPORT FOR PERIOD 6 APRIL 1995 TO 5 APRIL 1996. ERL 128. HUANDOT MAGNESITE DEPOSIT PINE CREEK 1: 250 000 SHEET SD52-8

AUTHOR: S. G. POWELL

DATE: APRIL 1996

LOCATION MAP:

ABSTRACT

This report summarises all work carried out on Exploration Retention Licence 128 (Huandot) for the 12 months ended 5 April 1996. Work for the period concentrated on obtaining a 30 000 tonne bulk sample of magnesite for evaluation by Norsk Hydro Canada Inc.

A Notice of Intent (NOI) to conduct the bulk sampling exercise was lodged with the Northern Territory Department of Mines and Energy (NTDME). The NOI also formed part of an Application for a Mining Lease covering portion of ERL 128 lodged simultaneously.

Expenditure for the period totalled $2 088 234.
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1. INTRODUCTION

Exploration Retention Licence 128, previously held by Nicron Resources, was granted on 6 April 1995 for five years. Geological investigations by Nicron outlined an estimated magnesite resource totalling 5.8 million tonnes with <3% acid insoluble content.

Development of the deposit was limited by the lack of suitable markets for the coarse crystalline magnesite.

Following takeover of Nicron Resources by Posgold in early 1994, and subsequent sale of Nicron's assets to Normandy Poseidon Limited management of the Huanot magnesite project passed to Commercial Minerals Ltd (CML), a wholly owned subsidiary of Normandy Mining. Transfer and registration of ERL 128 from Nicron to CML was finalised on 5 May 1995.

Since July 1994 CML has been negotiating supply of Huanot magnesite to Norsk Hydro Canada Inc (Norsk). The magnesite is to be used as feedstock for production of magnesium metal at Norsk's Becancour plant in Quebec.

In order for Norsk to evaluate the suitability of Huanot magnesite, in their processing method, a 30 000 tonne bulk sample was mined, crushed, washed and shipped to Canada. The initial findings of the trial shipment were favourable and it is anticipated that Norsk will be prepared to enter into long term contracts for supply of up to 150 000tpa of magnesite. All costings associated with the bulk sampling campaign are included in this report.
2. LOCATION, ACCESS, MINERAL TENURE

ERL 128 is located approximately 75km south of Darwin and five kilometres south of Woodcutters Mine, (Fig. 1). Access is gained via the Stuart Highway, the Batchelor road and various unsealed property and mine tracks.

ERL 128 was originally part of Exploration Licence 6416 which was granted to Nicron Resources (and others) on 4 September 1989 for a period of 3 years.

In 1992 exploration concentrated on evaluating the magnesite resource and following encouraging results ERL 128 was applied for to enable a continuation of this evaluation.

Application for transfer of ERL 128 from Nicron to CML was finalised and registered 5 May 1995.

Application for a Mineral Lease covering approximately 113ha over part of ERL 128 (Fig. 2) was lodged with the NTDME on 5 May 1995.
3. GEOLOGICAL SETTING

3.1 Regional Geology

The Huandot magnesite deposit is located within the central region of the Pine Creek Geosyncline (PCG), adjacent to the Archaean Rum Jungle and Waterhouse basement complexes. PCG is an intra-cratonic sedimentary basin of Mesoproterozoic age forming part of the North Australian Orogenic Province. It is unconformably overlain by the Mesoproterozoic M'Artur River Basin to the east and by Victorian Basin sediments of Neoproterozoic age to the southwest.

Cambrian-Ordovician and Mesozoic basin sediments occur north, south and west of the PCG and include the Bathurst Terrace Basin, Daly Basin and Bonaparte Basin.

At least two regional metamorphic events are discernable.

- Pre 2500Ma metamorphic event affecting Archaean complexes.
- Palaeoproterozoic Top End Orogeny (1870 - 1800Ma) resulting in high grade regional metamorphism along the western margins of the PCG and low to medium grade regional metamorphism (greenschist facies) in the centre of the geosyncline, affecting the Huandot area.

During the peak of the Top End Orogeny and subsequently during granite intrusion, the Palaeoproterozoic sequences were deformed resulting in tight to isoclinal folding, faulting and shearing. Five periods of faulting and five periods of folding have been recognised throughout the PCG.

3.2 Detailed Geology

Basement in the Huandot area comprises schist, gneiss and banded iron formation which have been intruded by granite and granodiorite. Basement rocks are overlain unconformably by clastic and dolomite units of the Namoona Group and Mount Partridge Group, both of Mesoproterozoic age.

At Huandot, magnesite is hosted within Coomalie Dolomite, a member of the Mount Partridge Group. Coomalie Dolomite is about 600m thick, strikes north-south and dips easterly at 40° to 60°. The upper part (~150m) is comprised almost entirely of magnesite.
Outcrop is restricted to small, low exposures of white to grey, coarse to very coarse, crystalline magnesite marble (Appendix A, Plates 1 and 2).

Silification has resulted in the formation of massive chert bodies, both capping and within the carbonate bodies, development of veins and boudinage of silica mainly along bedding planes and the formation of talc and chlorite resulting in both intragranular and intergranular impurities within the magnesite (Appendix A, Plate 3).

Magnesite is conformably overlain by carbonaceous siltstone of the Whites Formation, which forms a low ridge through the central part of the licence area.

The magnesite has developed an irregular karstic topography varying in thickness from 0 - 30m in depth. Laterised alluvial and eluvial sediment of Tertiary? age infills the karstic topography and obscures outcrop throughout most of the area.
4. PREVIOUS WORK

In the first year of ERL 128's tenure, Nicron completed

(a) 23 RAB holes (MSR 38-60) totalling 248m
(b) 35 diamond drillholes - each 30m deep spaced 25m apart in section lines 100m or 150m apart
(c) partial chemical analysis of all diamond drillcore

and
(d) a project scoping study including estimation of resources and a cost estimation for extraction

The results of this work are reported in Butler (1994).

Throughout the second year tenure, work included

(a) obtaining the necessary approvals for extracting a 30 000 tonne bulk sample of magnesite
(b) Cost determinations for quarrying, crushing and shipping the sample from Huandot to Becancour, Quebec, Canada.
(c) chemical analyses of various samples in an attempt to standardise analytical techniques prior to large scale mining
(d) petrological examination of six quarter core samples in order to determine the nature of contaminate minerals within the magnesite

The findings of the above analytical work are summarised in Barnes (1995).
5. WORK CARRIED OUT AND RESULTS

Work for the period has concentrated on mining, crushing and shipping of a 30 000 tonnes bulk sample in order for Norsk to evaluate the suitability of Huandot magnesite through their magnesium metal production plant.

5.1 Pre-Mining

The trial (bulk sampling) pit was centred on 3965E 1760N and was positioned due to previously available data which identified an area with magnesite containing <3% acid insoluble content and minimal overburden. A fire break was created and the area burnt off prior to the pit boundaries, access road and topography being surveyed.

5.2 Mining

Mining commenced in late August and was conducted over a period of approximately 7 weeks. Mining was carried out by Henry Walker P/L under the supervision of G Bradtke (CML Group Mining Engineer).

Excavation initially involved pre-stripping of approximately 20 000m$^3$ of clay/soil overburden and 37 000m$^3$ of clay contaminated magnesite. Berms, silt traps and roads were also constructed (Appendix A, Plates 4 - 6).

Low grade and clay contaminated magnesite (ROM3) was used for pad and road base prior to excavation of approximately 13 000m$^3$ of uncontaminated, first and second grade magnesite (ROM1, ROM2) (Appendix A, Plates 7 - 9).

The final quarry measured 75m x 75m x 16m and a total volume of 70 000m$^3$ was extracted (Fig. 3).

5.3 Crushing

ROM1 and ROM2 magnesite were crushed through a jaw crusher and screened to the specified granulometry of >90% -100mm+10mm. Approximately 30 000 tonnes of magnesite was recovered after crushing and screening (Appendix A, Plate 10).

It was necessary to wash the magnesite through a trommel screen in order to remove clay contaminates prior to shipping.

5.4 Shipping

Approximately 25 500 tonnes of magnesite was shipped to Norsk’s magnesium metal plant in Becancour Quebec, Canada for testing.
5.5 Analytical

A total of 181 samples were collected during the crushing and washing stages. These samples were despatched to CML's laboratory in Victoria where they were split and analysed for:

Total MgO, CaO, Fe₂O₃, acid soluble MgO CaO Fe₂O₃, acid insoluble content and reactive silica.

28 blast hole samples were also tested for the above elements as well as Al₂O₃ and SiO₂. However, it is not possible to report analytical results at present due to inconsistency of results received to date.

The average grade of the magnesite shipped to Canada, as reported by Norsk, is summarised in Table I below.

**TABLE I**

**MAGNESITE SHIPMENT - AVERAGE OF 17 SAMPLES**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SPEC-100 (REV.11)</th>
<th>RECEIVED SHIPMENT - January 1996</th>
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<tr>
<td>MgO (%)</td>
<td>43.0 min.</td>
<td>44.8</td>
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<tr>
<td>CaO (%)</td>
<td>1.1 max.</td>
<td>0.49</td>
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<tr>
<td>Mn (ppm)</td>
<td>400 max.</td>
<td>238</td>
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<tr>
<td>Fe (ppm)</td>
<td>3300 max.</td>
<td>3746</td>
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<tr>
<td>Fe₂+ (ppm)</td>
<td></td>
<td>3290</td>
</tr>
<tr>
<td>Ni (ppm)</td>
<td>5 max.</td>
<td>4</td>
</tr>
<tr>
<td>Cu (ppm)</td>
<td>20 max.</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Zn (ppm)</td>
<td>35 max.</td>
<td>6</td>
</tr>
<tr>
<td>Al (ppm)</td>
<td>3000 max.</td>
<td>791</td>
</tr>
<tr>
<td>B (ppm)</td>
<td>45 max.</td>
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</tr>
<tr>
<td>SiO₂ (ppm)</td>
<td>2000 max.</td>
<td>3111</td>
</tr>
<tr>
<td>P (ppm)</td>
<td>300 max.</td>
<td>115</td>
</tr>
<tr>
<td>S (ppm)</td>
<td>25 max.</td>
<td>31</td>
</tr>
<tr>
<td>Pb (ppm)</td>
<td>9 max.</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Cr (ppm)</td>
<td>40 max.</td>
<td>59</td>
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<tr>
<td>Cd (ppm)</td>
<td>0.2 max.</td>
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<tr>
<td>Insoluble (%)</td>
<td>2.6 max.</td>
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<tr>
<td>Reactive silica (mL)</td>
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<tr>
<td>Reactivity (kg/m2.h)</td>
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Results as reported by Norsk
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<td>727 714 E</td>
<td>B561 200 N</td>
<td></td>
</tr>
<tr>
<td>729 181 E</td>
<td>B561 909 N</td>
<td></td>
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<td>B560 209 N</td>
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<td>728 416 E</td>
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<td>728 416 E</td>
<td>B561014 N</td>
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<td>728 316 E</td>
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<td>728 316 E</td>
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<td>727 917 E</td>
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<td>727 917 E</td>
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<td></td>
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<tr>
<td>727 713 E</td>
<td>B561820 N</td>
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Margins: Art (Draw)

Surveyor: [Signature]
Date: 25/5/96
6. EXPENDITURE

HUANDOT PROJECT - ERL 128

6 April 1995 - 5 April 1996

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Mining/processing and transport of magnesite to Darwin Port</td>
<td>$1,869,300</td>
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<tr>
<td>Motor Vehicle Hire/Fuel</td>
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<td>Salaries/Wages</td>
<td>$54,600</td>
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<tr>
<td>Consultancy Fees</td>
<td>$32,900</td>
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<tr>
<td>Travel and Accommodation</td>
<td>$49,100</td>
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<tr>
<td>Tenement costs</td>
<td>$4,034</td>
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<tr>
<td>Compensation to Landowner</td>
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<tr>
<td>Laboratory Expenses</td>
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<tr>
<td>Exchange Loss</td>
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</tr>
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<td>Administration</td>
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<tr>
<td>Miscellaneous</td>
<td>$6,100</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$2,088,234</strong></td>
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</tbody>
</table>
7. PROPOSED FUTURE WORK PROGRAM

If Huandot magnesite is suitable for magnesium metal production, Norsk have expressed interest in signing long term supply contracts for up to 100,000 tonnes per annum.

CML have anticipated favourable results from the trial shipment and will embark on a drilling program to define a magnesite resource in the region of 1.5 to 2 million tonne. Based on this drilling program, detailed development plans for a quarry production of 100,000 to 150,000 tonnes of magnesite per annum can be prepared.

The drilling program will be conducted in four stages, each stage will be subject to results obtained from previous stages of drilling and will require approximately 8,000m of RC drilling. It is proposed to carry out this drilling program during the 1996 dry season. Estimated expenditure is $450,000.
8. REFERENCES


9. BIBLIOGRAPHIC DATA-SHEET

REPORT NUMBER: 20 290

REPORT TITLE  Annual Report For Period 6 April 1995 to 5 April 1996. ERL 128. Huandot Magnesite Deposit PINE CREEK 1:250 000 SHEET SD52-8

PROSPECT NAME(S) Huandot Magnesite

TENEMENT NUMBER ERL 128

OWNER/JV PARTNERS: Commercial Minerals Limited

COMMODITY(IES) Magnesite

TECTONIC UNIT(S) Pine Creek Geosyncline Rum Jungle Complex

STRATIGRAPHIC UNIT Mount Partridge Group Namoona Group Celia Dolomite Crater Formation Coomalie Dolomite White Formation

1:250 000 MAP SHEET(S): DARWIN SD52-4 PINE CREEK SD52-8

1:100 000 MAP SHEET(S): Noonamah 5172 Batchelor 5171

KEYWORDS Industrial Minerals Magnesite Chemical Testing Petrology
APPENDIX A

Photographs of 1995 Bulk Sampling Program
Plate 1. White coarse crystalline magnesite marble.

Plate 2. White and grey crystalline magnesite marble.
Plate 3. Magnesite with talc and smectite impurities.

Plate 4. Pre-strip of karstic clay infill.
Plate 5. Excavation of ROM3 magnesite and karstic clay infill.

Plate 6. silt trap.
Plate 7. ROM3 magnesite fines used for road base.

Plate 8. Preparation for blasting of ROM1 and ROM2 magnesite.
Plate 9. ROM1 and ROM2 magnesite after blasting.

Plate 10. ROM2 (foreground) and ROM1 (background) stockpiles awaiting crushing - crushed magnesite (middle right) prior to washing.