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S Y D N E Y.  
12th. May, 1942.

REPORT ON INVESTIGATION INTO THE APPLICATION  
FOR COMMONWEALTH GRANT  
BY NON-METALLICS LIMITED.

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CONDITIONS OF THE INVESTIGATION.

The relevant portions of letters from Non-Metallics Limited addressed to Mr. J.M. Newman, setting out the reasons for their Application for a Commonwealth Grant, and the details of the Company's position, are reproduced here. -

"Re: APPLICATION FOR COMMONWEALTH GRANT  
FOR INSTALLATION OF MINERAL MILLING  
PLANT.

"Non-Metallics Limited was registered in January 1939 for the purpose of Mining and Processing Industrial minerals such as Kaolin, Talc, Barytes, Diatomaceous Earth, Pigments etc. Various mineral areas were acquired and tested, certain of which are now in regular production. The necessary milling and processing plant was erected at GRANVILLE and for some months the works have been operating twenty-four hours daily on materials of which 90% are for Defence purposes. In recent months output has been 100% Defence work, due mainly to the greatly increased demand for materials for camouflage paints.

The Company's nominal capital is £50,000 of which £21,500 has been issued and subscribed. Increased demand, which would normally have necessitated additional plant installation, has, under the existing conditions made it impossible to meet more than 50% of Defence requirements in the paint, rubber and allied industries.

Industrial minerals for Defence Contracts are being consigned to all States and also New Zealand, and we list hereunder leading manufacturers to whom we are regular suppliers:--

Goodyear Tyre & Rubber Co.(Australia) Pty. Ltd.  
Dunlop Rubber Australia, Ltd.  
Advanx Tyre & Rubber Co. Pty. Ltd.  
Century Storage Battery Co.  
Eveready (Australia) Pty. Ltd.  
Ormonoid Roofing Ltd.  
Babco Products Ltd.  
Australian Paper Manufacturers Ltd.  
Australian Pulp & Paper Manufacturers Ltd. (Tas.)  
Cable Makers Pty. Ltd.  
Austral Industrial Products.  
Taubmans Ltd.  
Lewis Berger & Son, Pty. Ltd.  
B.A.L.M. Paints.  
Standard Paints.  
Mascot Smelting Company.

Campbells/

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".....Campbells Paints.  
Harbutts Paints.  
British Paints.  
Robertsons Paints Pty. Ltd.  
Kleeners Ltd.  
Hardie Trading Company.  
James Hardie & Co.

and others. Defence Contract Numbers for the above firms can be made available if required.

The initial plant lay-out provided for mechanical handling of materials wherever possible but this equipment was not installed pending the establishment of a market sufficient to justify same. Conditions have rapidly altered and the Grinding Units cannot be operated at full capacity with the class of labour now available for handling materials.

Mechanisation of handling of material will almost entirely remove labour difficulties. As it is no longer practicable to obtain the necessary capital by share issue we wish to apply for a grant, on such terms and conditions re security and interest as may be current, based on the estimates set out hereunder:---

1. RAILWAY SIDING:-

Single loop siding, length approximately  
416' complete with gates - £1,000.

2. PRIMARY CRUSHING PLANT AND SCREEN:-

|  |            |         |
|--|------------|---------|
| Discharging platform from railway trucks-<br>2" decking. | £ 45.      |         |
| Jaw Crusher 20" x 10" -                                  | 375.       |         |
| High Speed Rolls 24" x 12" face -                        | 450.       |         |
| Screen - double deck, vibrating, 6' x 3'.                | 195.       |         |
| Wiring, chutes and incidentals -                         | <u>230</u> | £1,295. |

3. STORAGE OF CRUDES AND CONVEYORS  
FROM PRIMARY CRUSHERS TO BINS:-

|   |             |         |
|---|-------------|---------|
| Comprising elevator taking rolls discharge<br>and delivering by conveyor to bins. |             |         |
| Elevator height 30' at £3.15.0 per foot<br>plus motor and starter -               | £ 170.      |         |
| Bins - capacity 600 tons at £3.10.0 per<br>ton -                                  | 2,100.      |         |
| Conveyor 65' x 16" width at £4 per foot -   | <u>260.</u> | £2,530. |

4. CONVEYOR SYSTEM FROM BINS TO FINE  
GRINDING MILLS:-

|   |        |
|---|--------|
| Conveyor from bin discharge to elevator<br>65' x 16" at £4 per foot.          | £ 260. |
| Elevator to main conveyor 30' at £3.15.0<br>per foot plus motor and starter - | 170.   |

ITEM No. 4 - continued:-

|   |             |         |
|---|-------------|---------|
| Main conveyor to Tube Mills 85' x 16"<br>at £4 per foot -         | £ 340.      |         |
| Cross conveyor to No.1 Tube Mill 18'<br>x 16" at £4 per foot -    | 72.         |         |
| Steel conical bottomed hopper to No.1<br>Tube Mill 10' diameter - | 180.        |         |
| Housing of main conveyor, if above roof -                         | <u>200.</u> | £1,222. |

5. DRYING SECTION:-

One (1) Tyler-Harmor Dryer, complete  
with toothed drum breaker, feed  
and discharge elevators and burner:  
delivering kaolin, diatomite  
and bentonite to Raymond Mill -

ESTIMATE per Messrs. Gibson Battle  
& Co. -

|   |             |         |
|---|-------------|---------|
|   | £1,750.     |         |
| Completion of concrete flooring -                           | 92.         |         |
| Increased fuel - oil storage and delivery<br>pipe line -    | 125.        |         |
| Storage drying floor 55' square, concrete<br>(K on plan). - | <u>230.</u> | £2,197. |

6. INCREASED STORAGE ACCOMMODATION  
FOR PROCESSED MATERIALS:-  
(H on plan and excluding loading  
Conveyors:) :-

Lean-to construction, wood frame and  
fibrolite, outside wall brick to  
height of 6' concrete floor - front-  
age 110' depth 38' -

£1,150.

7. ROOFING OF BINS BREAKER SECTION  
AND DRYING FLOOR:-

Roofing to extend 6' beyond loading sid-  
ing - total area 10,150 square feet.  
Wood frame and fibrolite construc-  
tion -

£ 580.

8. PARTITIONING No.1 SECTION FROM  
SECTIONS No.2 and No.3 for  
THE PROCESSING OF OCHRES, OXIDES, ETC.  
Fibrolite construction, two doors -

£ 120.

TOTAL OF ITEMS (1) to (8) - £10,094.

ADD 10% for contingencies - 1,009.

£11,103.



## 9. MINE DEVELOPMENT.

The Company has title, or mining rights under agreement, to the following mineral leases :--

|              |   |                  |   |            |
|--------------|---|------------------|---|------------|
| Thuddungara  | - | New South Wales. | - | Magnesite. |
| Cudgegong    | - | New South Wales. | - | Dolomite.  |
| Kempfield    | - | New South Wales. | - | Barytes.   |
| Pambula      | - | New South Wales. | - | Talc.      |
| Pambula      | - | New South Wales. | - | Kaolin.    |
| Murwillumbah | - | New South Wales. | - | Silica.    |
| Gatton       | - | Queensland.      | - | Diatomite. |
| Queenstown   | - | Tasmania.        | - | Barytes.   |
| Launceston   | - | Tasmania.        | - | Ochre.     |
| Braidwood    | - | New South Wales. | - | Barytes.   |

Of these, the magnesite, talc, silica and Kempfield barytes areas are in regular and satisfactory production, and maintenance of output from said areas is a heavy charge on the Company's finances.

Barytes from the Braidwood lease is of high quality and requirements of this material are approximately fifty (50) tons weekly. The lode is considered the only one in New South Wales capable of producing a reasonable tonnage of first and second grade. Average width is six (6) feet and trenching has proved the strike over twelve (12) chains. Sinking has been carried to 78 feet and three levels have blocked out approximately 6,000 tons of ore. The lode maintains its width at bottom of shaft and there is a probable reserve of 40,000 tons in the undeveloped section of the lode to this depth (78ft). Present facilities preclude the mining of more than twenty (20) tons weekly and in addition provision should be made for washing, picking and screening at the mine. The estimated cost of bins, breaker, trommel and picking belt, together with power and pumping plant is £1200, and mine improvement, including portable compressor and jackhammers, £800. This equipment cannot be regarded as essential inasmuch as the mine can continue production at the present rate under the existing conditions. This, however, cannot be exceeded and should there be interference with sea transport from Port Adelaide, the position with regard to barytes supplies in New South Wales would immediately become serious. Should assistance be available, the Company is prepared to carry the development of this property to the production indicated.

Subsequent to the above estimate, the Company has exercised its option over this property, and speeding up of output is urgently required. -

Requirements are now of the order of One Hundred (100) tons weekly which is beyond the capacity of the horse-whim now being installed as a temporary measure. The tonnage development is sufficient to justify the equipment of this property with suitable HOISTING PLANT, and as previously explained, it is highly desirable that provision be made for washing and grading the ore prior to delivery on rail.

The estimated cost of installing a Vertical Boiler and Steam Winch for this capacity, secondhand, is - £ 285.

For the provision of bins, washing trommel, picking belt, elevator and bins for classifying ore, erected -

1,200.

For Compressor, secondhand, and two jack-hammers --

500.

£1,985.

10. RESERVE STOCKS OF CRUDE ORE.

The increasing difficulty of obtaining labour and transport in remote country districts, makes it imperative that stocks be held at the Works covering a three months production period. Substantial reserve stocks are already held, but on an increased output, reserve tonnage should be doubled, at an approximate rate of -

£3,000.

TOTAL OF ITEMS (1) to (10) -

£16,088.

Except where stated otherwise, the foregoing estimates are based on the installation of new plant units, which cost may be reducible if secondhand plant is available.

The plan delivered to Dr. N. Fisher shows diagrammatically the layout of the Company's plant. This layout provides readily for future extensions and gives greater storage space for the outlay involved. Plant extensions are shown in red. A fourth section "G" with a second Tube Mill and Air Classifier installation is also included. It is not proposed at the present time to instal this unit or building section, and consequently it is not covered in the estimates.

Provision of the Dryer, Primary Crushers and Mechanical Handling Systems as shown will increase plant capacity to approximately seven hundred (700) tons monthly. While there is reason to believe that the plant will operate at full capacity immediately following completion, the addition of another Tube Mill unit is not regarded as justifiable until market requirements demand same. Similarly, the Belt Conveyor to the loading bay and Belt Conveyor to loading docks, have been omitted from the estimates, as not being immediately essential ....."

- - -

The object of the investigation was to enquire into the necessity for the erection of the proposed additional plant, and into the general standing of the Company and to ascertain the sources of the supplies of the materials milled and the uses to which they are being put, particularly in regard to Defence requirements.

PROPERTY OF THE COMPANY.

In addition to the Milling plant at Granville, the Company's property includes the following leases :--

Lease/

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| Lease No.                     | Area.<br>Acres.Rds.Pchs. |   |    | Description                               | Location.   | Mineral Mined. |
|-------------------------------|--------------------------|---|----|---|---|----------------|
| P.M.L.2.                      | 4                        | 3 | 10 | Parish of Bribaree. County--of Monteagle. | 18 miles N.W of Young and 8 miles from Weedallion Siding. | Magnesite.     |
| P.M.L.3.                      | 9                        | 1 | 28 | " "                                       | " "   | "              |
| P.M.L.4.                      | 10                       | 2 | 15 | " "                                       | " "   | "              |
| M.L. Application 294 Pambula. | 3                        | 2 | 0  | Parish of Yowaka. County of Auckland.     | 7 miles S.W. of Pambula.                                  | Pyrophyllite.  |
| P.M.L.41.                     | 5                        | 0 | 0  | Parish of Jinglemoney. County of Murray.  | 6 miles West of Braidwood.                                | Barytes.       |
| M.L. 111.                     | 1                        | 0 | 0  | " "                                       | " "   | "              |

The Magnesite property is held under the name of Non Metallics Ltd. The Lessee of the Pambula Lease is L.V. Ellis as Trustees for Non-Metallics Ltd. The registered Lessee of both Barytes Leases is C.P. Callery.

Covering the development period, an option for the lease was held by Non-Metallics Ltd. which option was exercised on March 31st. 1942. A transfer is now being effected in favour of General Mining & Investment Company Ltd. as nominee of Non-Metallics Ltd.

#### MILLING PLANT.

The factory at Granville has been examined, particularly in connection with the proposed Plant Extension. A plan prepared by Executives of Non-Metallics Ltd. is submitted herewith showing the Company's present installations and the proposed extensions. Reference should be made to their revised estimates set out above which do not at present include the second Ball Mill, or the Belt Conveyor for loading, which have been included in the plan for the sake of completeness.

Capacity of the plant varies according to the hardness and other physical properties of the material being milled, but the outputs of the various machines, are as follows:-

|                   |                         |
|-------------------|-------------------------|
| Tube Mill -       | 12 to 12 cwts per hour. |
| Raymond Grinder - | 8 to 30 " " "           |
| 2 Van Gelder      |                         |
| Duplex Grinders - | 4 to 9 " " " each.      |

Maximum Output, according to the Company's estimate, working three shifts daily, six days per week, is 400 tons per month. This has not yet been realised, the best output being 325 tons in March. The proposed alterations are aimed to increase this to 700 tons per month. The Manager states that the Company would show a good working profit on 400 tons per month and correspondingly better returns for higher tonnages.



As a result of my investigations, I am convinced that the proposed extensions will be effective in materially increasing output, and will in particular solve to a great extent the problem of adequate labour, which is the limiting factor in much of the present operations.

Four men are now employed on each shift with six extra labourers on the day shift, and a Factory Manager. With the new plant, the object of increasing production would be achieved with the same, or possibly less labour, and the provision of a Railway Siding would avoid the necessity for transporting raw materials by motor truck from Granville Railway Station.

#### TALC LEASES.

Examinations were made of the talc leases at Pambula, also one at Cobargo, concerning which the Company have an agreement with the owner, of the Braidwood barytes mine, and of the Thuddungara magnesite deposits. (The term talc is used here in the commercial sense. All the occurrences mentioned actually consist of pyrophyllite, which differs from the mineral talc in that it is a hydrous silicate of aluminium instead of magnesium. It is slightly harder than talc, but its physical properties are so very similar that the commercial uses of the two are identical).

The Cobargo pyrophyllite occurrence consists of a lode averaging 4ft. wide and dipping very steeply to the North. It is opened up by a shallow cut on the side of the main road, the Princes Highway, two miles south of Cobargo and 16 miles from the port of Bermagui, where limited shipping facilities exist. The pyrophyllite is spotted in character but grinds to a satisfactory white color. The lode is somewhat irregular, giving off small apophyses. The walls consist of aplitic granite.

At Pambula two formations, a few hundred yards apart, have been opened up, one on the Company's lease and one on leases held by S.R. & F.H. Cole, who also hold the Cobargo lease. The areas are situated 7 miles west of Pambula and 12 miles from the port of Merimbula, where shipping arrangements are slightly better than those at Bermagui. Access is by road, the last mile or so over fairly rough country.

Method of occurrence here is as a constituent in quartzitic talc-schist. A solid lens about 7ft. wide and dipping nearly vertically to the west has produced a fairly pure grade talc. This has been mined on the surface only by a cut into the hillside, bounded by fairly definite walls of quartzite on both sides. Other smaller lenses lie adjacent.

Much larger production has come from adjoining leases held by Cole Bros., by quarrying into an extensive formation of talc schist. Though containing a fairly high proportion of quartz, largely in the form of veins and nodules, reasonably pure talc can be selected. Dips are steep and indeterminate and considerable faulting is in evidence, one fault in particular across the quarry dividing poorer grade talc from less impure material. In all the Pambula workings, the talc is somewhat stained by oxidised iron and only second and third grade material has so far been obtainable. This oxidation should cease in depth but there is no evidence to what depth the zone of oxidation here extends. It is quite safe to state that large tonnages of second and third grade talc are readily obtainable near the surface at low cost in the Pambula area.

#### BARYTES LEASES.

The Braidwood barytes lode lies 6 miles west from Braidwood, 38 miles by road from Tarago, the nearest railway station, and one mile from the Shoalhaven River.

The lode, which is close by the roadside in flat country, has been opened up by costeans on the surface and by a shaft, with drives along the lode on two levels, one 25ft. in depth, the other at the bottom of the shaft, 55ft. from the surface. Both levels follow the lode 30ft. to the east and some 70-80ft. west. The dip is steep to the north. The lode in the underground workings is strong and consistent with an average width of at least 6ft. On the bottom level at the east end it appears to play out into weathered country rock, and at the west end of the upper level, the lode narrows to less than 3ft. This pinching is not reflected in the lower level. Also the upper level, east end, shows no sign of the playing out of the lode exhibited 30ft. lower down, which, together with the surface exposures, suggest that the lode may pitch to the west. On the surface, costeans expose another lode 2ft. wide, converging from the south to meet the main lode, while further costeans to the west have exposed barytes outcrops along the strike for some 600ft. These exposures, though incomplete, are of less width than the lode in the underground workings, and it is possible that barytes may not be continuous over the whole length but may occur as two or more elongated lenses. Country rock is sheared and difficult to determine in the limited exposures in the underground workings. Quartz schist outcrops on the surface near the costeans at the west end, and a large igneous intrusion exists immediately to the east of the leases.

Impurities in the barytes are a little iron staining, a certain amount of galena and blende, nearly always occurring in aggregations which can be readily picked out, and clay and pug seams along cracks, fractures and fissures. A certain amount of first grade and a high proportion of second grade can be selected. Tonnage blocked out by underground workings, allowing 10 cubic feet per ton for ore in situ, is 3600, with probability of many times this tonnage being exposed along the strike and in depth.

#### MAGNESITE LEASES.

The Thuddungara magnesite deposit held by Non-Metallies Ltd. occupies the floor of a shallow depression 18 miles by road north west of Young and 8 miles from Woodallion Railway Siding, whence the magnesite is trucked. Magnesite has been proved by pitting over an area of some 12 acres and the bottom has only been exposed towards the margins where the deposit, which is in the form of a large lens, shelves up to the surface. The total depth of magnesite in the central portion has not yet been established, the deepest pits reaching only 26ft. It is covered by 3-5ft. of dark brown soil. The magnesite occurs as a series of irregular imbricating veins, seams and nodular accumulations, in what appears to be a very decomposed diorite. It is being mined by quarrying, and on a visual estimate of the exposed faces at least one-third consists of magnesite. Probably half of this has to be discarded, so that about one-sixth of the total volume is recovered. Tonnage estimated by the Company, on a moderately conservative basis, is 70,000 to 18ft. depth, and probably further tonnage will be realised below this depth. The total quantity mined to date is 2300 tons.

The magnesite often has a nodular, vaguely concentric structure, particularly the larger pieces. Principal impurity is silica, usually in the form of chalcedony, which generally forms a filling inside cavities or seams in the magnesite. Smaller pieces tend to have a higher proportion of silica impurity and the pure magnesite is obtained by selection.

The magnesite is not being milled at the Company's factory but is sold in the crude state. Over 100 tons per week is at present being supplied, and a considerable demand exists for still greater production.





Details for deliveries for April were received later and are very similar to those for March, except that the proportion used in Defence or essential services is slightly higher. Consequently, it seems clear that more than 70% of the Company's output, though not 90-100% as claimed in their letter, is used in essential requirements. Very nearly half the total deliveries for March and April went to paint manufacturers, by far the greater proportion of it for use in camouflage paints. This demand, as well as that of practically all the consumers of Non-Metallics' output, is likely to continue as long as the war lasts, and enquiries are being received for other materials which the Company is not now in a position to supply.

#### RIVAL COMPANIES.

Other concerns in Sydney which handle, to a greater or lesser extent, the same materials as Non-Metallics Ltd. are Minerals Pty. Ltd., Austral Rock Milling Pty. Ltd. and McLeod & Company. The principal of these is Minerals Pty. Ltd. a well established Company with an output of some 250 tons per week, and branches in Melbourne and Adelaide. Their production includes pigments and other materials not at present handled by Non-Metallics Ltd. This Company reports that so far they have been able to meet the current demand on their products, though in some cases they have not been able to supply sufficient quantities to enable their consumers to build up reserve stocks. They are prepared to extend their plant to meet any increased demand which may arise and they have the ground and the capital to make these extensions. Their proposals, however, involve building a new factory and permission to spend more than £1000. has been refused. They experience no particular difficulty in obtaining stocks of crude material.

McLeod & Company advise that they are working at fairly full capacity. They handle ochres, manganese, etc. in addition to barytes and talc, and they also report that they have no difficulty in obtaining raw materials.

Austral Rock Milling Company work mainly on ceramic materials, clays, quartz and felspar, and process comparatively little talc or barytes. Their Manager advises that some difficulty is experienced in obtaining adequate supplies of felspar, while the mining of clays is sometimes restricted by scarcity of labour in the country districts where these deposits occur. He also advises that this Company could materially increase their output if the demand were forthcoming, by working more than one shift.

Enquiries amongst the various customers of Non-Metallics Ltd. particularly those claiming to be occupied with Defence work, elicited the response in most cases that they had no difficulty in obtaining adequate supplies of such minerals as kaolin, talc and barytes, though one or two said that although they had not been actually held up for these supplies, they were not finding them particularly easy to obtain. This latter condition applies mainly to Companies like Columbia Gramophone, not engaged on Defence or otherwise essential work.

From the foregoing, it is obvious that an increased output by Non-Metallics Ltd. is not absolutely vital to the war effort, as the present and probable future demands for essential materials handled by them can be met by existing plant in Sydney. As a check on this, an attempt was made to estimate the amount of filling materials, such as barytes and kaolin, being consumed in paints, which constitute one of the chief uses for these products. From figures obtained from the Department of the Interior and from the Camouflage Paint Committee, it appears that 5000 tons would represent the maximum of these materials likely to be consumed per year. This demand can easily be met by the existing processing plants; in fact, it can be accounted for by much less

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than half the total production (250 tons per week) of Minerals Pty. Ltd. and Non-Metallics Ltd. (70-80 tons per week).

CONCLUSION.

To summarise, Non-Metallics Ltd. hold valuable properties at Braidwood and Thuddungara, and to a lesser extent at Pambula, and their claim that the installation of additional plant at their factory will increase their output and eliminate labour difficulties is substantiated. Their output is more than 70% for Defence work or essential requirements. On the other hand, there is no hold-up in supplies of the materials they produce to the consumers who are working on defence contracts, and probable future demands can be met by the facilities now existing in Sydney. Hence it is difficult to see why the Commonwealth Government should provide a grant to one processing firm while other firms are able to increase their output or are prepared themselves to finance additional plant to meet any extra demand. On the other hand as this Firm, Non-Metallics Ltd. is handling such a high proportion of essential materials and the installation of extra plant is justified by the orders being received, it is suggested that they be granted permission to obtain capital for improvements by Share Issue or such other means at their command.

H.H. Fisher.

H.H. FISHER. D.Sc.