
TRADE AVAILABILITY

MINERALS AND METALS
OF NEW SOUTH WALES

SECOND EDITION



Department of
Minerals and Energy

TRADE AVAILABILITY

MINERALS

AND METALS

IN NEW SOUTH WALES

SECOND EDITION

COMPILED BY R S COOK

USING

INFORMATION CURRENT AT 1 JULY 1989

Department of Minerals and Energy

A MESSAGE

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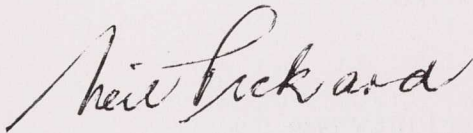
THE MINISTER FOR MINERALS AND ENERGY

I am pleased to commend this compilation of minerals and metals commodities in New South Wales to existing customers and potential clients of the New South Wales minerals industry.

This publication provides a ready reference to mineral commodities and products available from New South Wales mines and processing plants, producer contact information and levels of operational output.

This volume is not intended to be a complete coverage of the State's mineral production. Significant producers are included as well as details of their major products. Although some very small scale producers have been excluded, information on these may be obtained by contacting the Department of Minerals and Energy.

I am sure that this second edition of **Trade Availability** will be received as enthusiastically as the first which was distributed internationally. I anticipate that transactions between supplier and consumer will be expedited by using the information in this volume and hence will contribute to the expansion of the State's international and domestic minerals trade.

A handwritten signature in cursive script, reading "Neil Pickard".

The Hon Neil Pickard M P
Minister for Minerals and Energy

FOREWORD

This publication is an expanded and updated version of TRADE AVAILABILITY which first appeared in 1986. It provides a listing of the New South Wales non-coal mineral producers who are significant in their respective fields. It has been necessary to limit the coverage to the major producers since very small producers may not readily be able to satisfy immediate market requirements for minerals.

Most of the New South Wales' metallic mine and concentrate production has been covered and the significant processing operations have been included, in particular, the very large metals producers, such as the aluminium and iron and steel industries.

Some selection has been necessary in compiling the industrial minerals information. This is due to the wide variety of product specifications offered and the great number of small operations linked with the industry. The emphasis, therefore, has been to include indicative information to assist the consumer pursue negotiations with the respective producers.

The information contained in the data sheets was current at 1 June, 1989. Additional information on mines at or near production in New South Wales may be obtained through reference to the "METALLIC MINERALS MINE DOSSIER" or to the "INDUSTRIAL MINERALS MINE DOSSIER". Any further questions regarding the availability of minerals can be directed to the Economics Branch of the Department of Minerals and Energy, 8-18 Bent Street, Sydney, telephone (02) 240 4419.

Information regarding the very large coal industry in New South Wales should be sought from a current edition of the "NEW SOUTH WALES COAL INDUSTRY PROFILE".



G Rose

Director-General

Department of Minerals and Energy

Preface

To facilitate the successful marketing of the minerals and mineral products of New South Wales, the New South Wales Department of Minerals and Energy has prepared this publication to present a selective review of the production of, and trade in, minerals and metals produced in New South Wales. Included in this review are contact details of the producing companies and product specifications. It is intended that trade enquiries be directed straight to the listed producer(s).

The commodities are arranged alphabetically under the following classifications:-

- Gemstones
- Industrial Minerals
- Industrial Minerals Processors
- Metallic Mineral Concentrates and Metals
- Heavy Mineral Sands

The degree of detail in the information listed for each commodity represents a manageable balance between product diversity and product economic importance.

Where commodity groups have a large range of products, a representative selection of specifications has been included.

The list of producers is not exhaustive. All the significant metallic mineral producers and the major non-metallic mineral producers are listed, but those construction materials producers, serving local market only, are not covered.

There is no coverage of unexploited mineral deposits.

The map gives the locality of places referred to in the text. Because this volume is principally concerned with the producing companies, many significant sites not directly mentioned in the text are not included.

Information on mine ownership, production, reserves, location, and geology may be sought from the Department of Minerals and Energy's "METALLIC MINERALS MINE DOSSIER" and "INDUSTRIAL MINERALS MINE DOSSIER".

Detailed geological enquiries relating to industrial and metallic mineral resources should be directed to the Geological Survey Branch of the Department of Minerals and Energy.

Further information on the trade in minerals and metals produced in New South Wales, may be obtained by contacting:-

**Economics Branch
Department of Minerals and Energy
GPO Box 5288
SYDNEY NSW 2001
Australia**

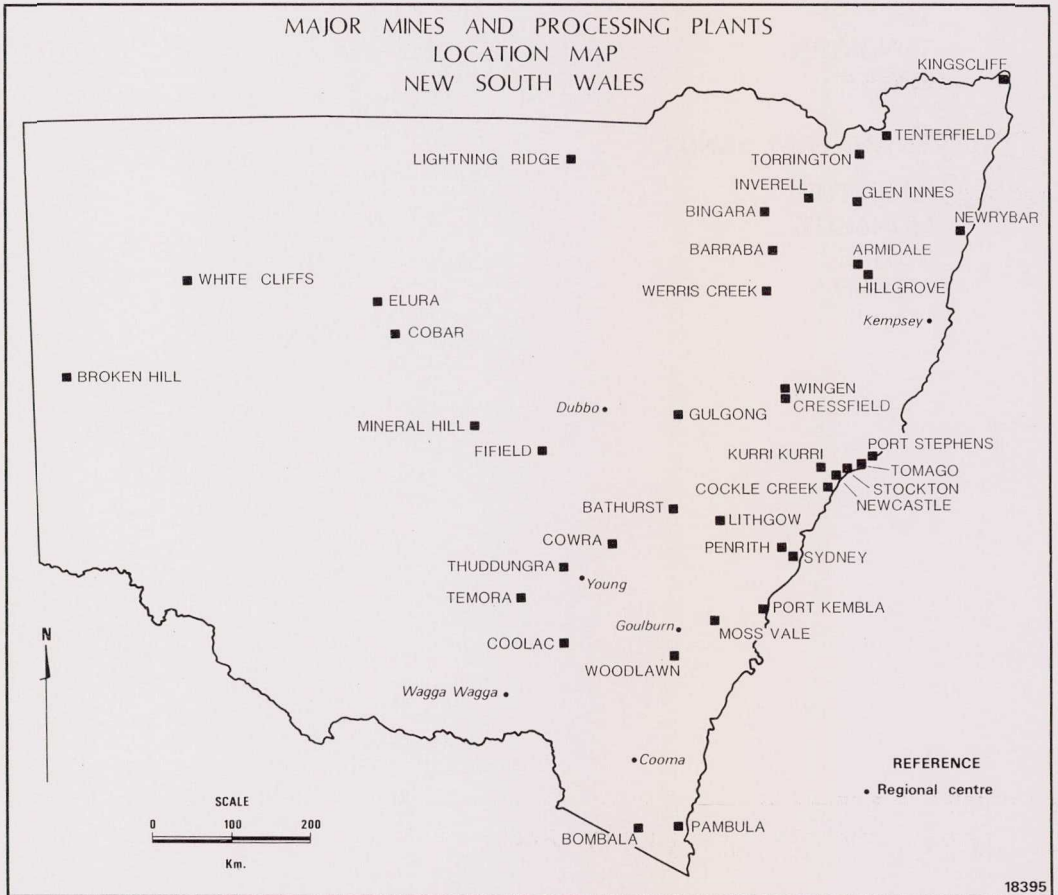
**Tel: (02) 240 4419 or
(02) 240 4237
Facsimile: (02) 233 7017
Telex: DEPMIN AA74875**

Both local telephone and facsimile numbers in this volume are prefixed by the appropriate STD area codes. For calls made from outside Australia, dial the ISD code prefix "61" followed by the STD code (initial "0" deleted) and the telephone or facsimile number.

CONTENTS

	PAGE
MAJOR MINES AND PROCESSING PLANTS LOCATION MAP	1
GEMSTONES	2
GARNET, NEPHRITE AND OTHER GEMS	3
OPAL	3
SAPPHIRE	3
RHODONITE	4
INDUSTRIAL MINERALS	5
BERYL	7
CALCIUM CARBONATE POWDERS	7
CLAYS	8
Bentonite	8
Calcined Flint Clay	9
Kaolin	9
Other Clays	10
DIATOMITE	10
DIMENSION STONE	11
Granite	11
Marble	12
Sandstone	12
Slate	13
FELDSPAR	13
GYPSUM	14
LIMESTONE	14
MANGANESE DIOXIDE	15
MAGNESITE	15
MAGNETITE	17
MICA	17
MULLITE	17
PEAT	18
PYROPHYLLITE	19
SERPENTINE	19
SILICA	20
Glass sand	20
Very high grade silica	20
ZEOLITE	21
INDUSTRIAL MINERALS PROCESSORS	23
CEMENT MANUFACTURERS	24
CLAY AND OTHER CERAMIC MANUFACTURERS	24
REFRACTORY MANUFACTURERS	25

	PAGE
METALLIC MINERAL CONCENTRATES AND METALS	26
ALUMINIUM	27
ANTIMONY	27
CADMIUM	28
COBALT	29
COPPER	29
GOLD	31
IRON AND STEEL	33
LEAD AND ZINC	34
SILVER	37
TIN	39
TUNGSTEN	39
ZINC	40
HEAVY MINERAL SANDS	41
ILMENITE	42
MONAZITE	43
RUTILE	44
ZIRCON	44



GEMSTONES

GARNET, NEPHRITE AND OTHER GEMS

Small quantities of garnet and nephrite are produced in New South Wales. For additional information on garnet, nephrite, rhodonite or other gems, please contact the Economics Branch of the Department of Mineral Resources (See Preface for telephone contacts).

OPAL

Australia is the only significant source of precious opal in the world with New South Wales accounting for about half of the national output. Opal mining is carried out at two New South Wales districts, Lightning Ridge and White Cliffs. Lightning Ridge is the principal source of the highly prized black opal.

Mining, cutting and polishing of opals are carried out by a large number of individual miners or groups of miners.

Trading in opals is largely performed by the mine operators at Lightning Ridge and White Cliffs, and by agents in major cities.

Reported value of opal production in the State in 1987-88 amounted to about \$43.6 million.

For additional information on opals please contact the Economics Branch of the Department of Mineral Resources (See Preface for telephone contacts).

Enquiries may also be directed to:

Company	Contact
The Australian Gem Industry Association Ltd GPO Box 102 SYDNEY NSW 2001	Federal President Tel: (02) 294 417 Fax: (02) 262 2388

SAPPHIRE

Australia is one of the major producers of gem quality sapphire in the world. New South Wales sapphire mines account for about half of the total Australian output. In 1987-88 New South Wales production was conservatively valued at about \$12.6 million. In contrast with opal mining, sapphire production is dominated by a small number of larger scale miners who produce about 90 per cent of the total State output.

Sapphires are recovered from alluvial and volcanoclastic deposits in the Inverell/Glen Innes area, located about 660 kilometres north of Sydney. Exploration for sapphires in their source rocks has been encouraged by improvements in the understanding of their origin as a direct result of pioneering studies by the Geological Survey Branch of the Department of Minerals and Energy. This exploration may lead to increased sapphire production, in particular, from in situ volcanoclastic sapphire deposits. High quality sapphires are usually processed locally but most of the lower grade sapphires are exported uncut to Thailand after purchase from the

miners. The upgrading of sapphires through faceting and heat treatment in New South Wales are investment opportunities of potentially great benefit.

Enquiries for sapphires may be directed to:

Company

T J and P V Nunan Pty Ltd
PO Box 653
INVERELL NSW 2360

Mr K J Aylward
38 Macquarie Street
GLEN INNES NSW 2370

The Australian Gem Industry Association
Ltd
GPO Box 102
SYDNEY NSW 2001

22 Veness Street
GLEN INNES NSW 2370

Contact

Mr D Laurence
General Manager, Operations
Telephone: (02) 929 5822

Mr K J Aylward
Telephone: (067) 321 711

Mr Mike Duncan
Federal President
Telephone: (02) 294 417

Mr R J and Mrs C A Cook
Telephone: (067) 321 342

RHODONITE

New South Wales produces rhodonite, which is used for ornaments, coffee tables, tiling, etc. It is mined at Halls Creek, near Armidale by S R Leaver and, since February 1988, by T J and P V Nunan Pty Ltd.

Production 1986-87

Rhodonite

Value at Mine

\$59 000

Enquiries on rhodonite may be directed to:

Company

Mr S R Leaver
9 Cambridge Street
TAMWORTH NSW 2340

T J and P V Nunan Pty Ltd
PO Box 653
INVERELL NSW 2360

Contact

Mr S R Leaver
Telephone: (067) 655 597

Mr D Laurence
General Manager, Operations
Telephone: (067) 223 484

INDUSTRIAL MINERALS

INDUSTRIAL MINERALS

New South Wales produces a wide range of industrial minerals both for local use and for export.

Construction Materials (gravels, crushed stone, and sand) are not considered here because of the large number of operations and the close links between production and domestic markets.

Instead, emphasis is given in this brochure to minerals which, either before or after processing, have properties that serve diverse technical applications or meet relatively exacting standards. Thus, glass making sand has been included since it has more critical specifications than construction sand.

The processing of these industrial minerals gives increased product diversity and so only an indicative range of mineral properties is given.

The availability of some bulk processed minerals in a final manufactured form, e.g. cement or refractory bricks, is considered in the section entitled "Non Metallic Mineral Processors".

BERYL

Beryl is produced as a by-product of feldspar mining at Broken Hill. See the Section entitled "Feldspar" for further information.

CALCIUM CARBONATE POWDERS

Omya Southern Pty Ltd produces a wide range of high-quality finely-ground calcium carbonate products. Some of the products are characterised by extremely fine particle sizes and high degrees of brightness.

Typical applications include fillers and extenders in paint, rubber and plastics, animal feed supplementation, abrasive blasting, coal mining, agriculture, welding, chemical neutralisation, paper filling, propants and synthetic marble.

The Omya-Carb range has a typical chemical analysis of:-

98.0% CaCO₃, 0.7% SiO₂, 0.07% Al₂O₃, 0.10% Fe₂O₃.

Typical physical specifications are in the following ranges.

Brightness (Dry)	(DOP)	Oil Absorption (g/100g)	DOP Absorption (g/100g)	Surface Area (m ² /g)
94-96	62-64	13-18	18-36	1.9-5.5

Product average particle sizes, in microns, are given in brackets, following the product name:-

Omya-carb 1 (1.6), Omya-carb 2 (2.7), Omya-carb 2T (2.7), Omya-carb 5 (5),
Omya-carb 10(10)

Omya 2T particles are treated to have hydrophobic surfaces for use in the plastics industry.

The Circal range of high brightness/high whiteness products has a typical chemical analysis of:-

98% CaCO₃, 0.20% SiO₂, 0.20% Al₂O₃, 0.05% Fe₂O₃ and acid insolubles of 0.5%.

Product average particle sizes, in microns, are given in brackets, following the product names:-

Circal 13/3 (2.7), Circal 13/30 (2.7), Circal 30/6 (6), Circal 60/12(12), Circal 150/20(20),
Circal 200/35(35), Circal Y(100), Marble R(110), Circal 1000(500).

Off-white powders are available with typical analysis of 97% CaCO₃, 1% MgCO₃, 0.7% SiO₂,
0.4% Al₂O₃ and 0.3% Fe₂O₃.

Company

Omya Southern Pty Ltd
 PO Box 1498
 NORTH SYDNEY NSW 2059

Contact

Mr D Scott
 Operations Manager
 Telephone: (063) 313 055
 Facsimile: (063) 316 283
 Telex: AA72336

Dr G W Stone
 Managing Director
 Telephone: (02) 959 4077
 Facsimile: (02) 929 0736
 Telex: AA26398

CLAYS**Bentonite**

New South Wales produced 11 338* tonnes of bentonite in 1987-88, up from 10 100* tonnes in 1986-87. All production comes from the Cressfield deposit operated by Commercial Minerals Limited. The total mineralized sequence at Cressfield is up to 35m thick, with individual seams of high natural quality having cation exchange capacities in the range 70-95 meq/100g. Current production capacity is about 12 000 tpa, with production being for both local and SE Asian markets.

The major end use for Cressfield bentonite is in the foundry industry, where it has successfully replaced imported Wyoming bentonite. The bentonite is supplied either in a pure form or blended with high quality Hunter Valley coal dust milled at the Carrington plant in Newcastle.

Bentonite is also produced for pelletising stockfeed and for oil drilling, civil engineering and dam sealing applications. Specialised grades for a wide range of industrial applications are supplied to domestic and export markets.

Chemical and physical properties of standard grades of foundry bentonite are as follows:

Chemical Analyses (%)

	Product	
	P1	SM23
SiO ₂	61.0	64.0
Al ₂ O ₃	18.0	17.0
Fe ₂ O ₃	5.5	4.0
CaO	1.7	0.6
MgO	1.6	2.1
Na ₂ O	3.0	2.8
Loss on ignition	7.0	7.7
H ₂ O (1100)	10.0	10.0

* Revised from previous published information.

Physical Properties

	Product	
	P1	SM23
Cation exchange capacity	75	75 meq/100g
Swelling volume	33	30 ml/2g
pH	10	10
Bulk density		
- loose	600	600 kg/m ³
- compacted	1 200	1 200 kg/m ³

Company

Commercial Minerals Limited
Level 14
99 Bathurst St
SYDNEY NSW 2000

Contact

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

Calcined Flint Clay

A unique and naturally calcined flint clay deposit is mined at Wingen in the Upper Hunter Valley of New South Wales. Underlying coal has been ignited, calcining the flint clay to produce a material suitable for use in refractory manufacture. The calcined flint clay comprises approximately 60% mullite, 35% cristobalite and traces of tridymite and rutile. Typical chemical analysis is 42% Al₂O₃; 51% SiO₂; 2.25% Fe₂O₃; 2.3% TiO₂ and 1.1% loss on ignition. The pyrometric cone equivalent (PCE) or refractoriness of calcined flint clay is an Orton Cone of 32-33, equivalent to 1 717-1 743°C.

Production of calcined clay is about 10 000 tonnes per annum in a variety of coarse and milled size ranges, principally for the manufacture of refractory bricks, castables, gunning mixtures, mortars and cements.

Company

Commercial Minerals Limited
Level 14
99 Bathurst Street
SYDNEY NSW 2000

Contact

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

Kaolin

The main sources of high quality kaolin in New South Wales are the Tertiary transported and residual clay deposits in the Gulgong area. The clays produced are suitable for the manufacture of ceramic whiteware, fillers and refractories. A number of grades of kaolin are produced by Commercial Minerals Ltd through selective mining and wet or dry milling.

Products available include ball and china clays, some of which are characterised by exceptionally white firing.

Applications include use in ceramic, refractory and catalyst manufacture and as fillers in paints, plastics, building and horticultural products, sealants and adhesives.

Typical product chemical analyses are as follows.

	Chemical Analyses %			
	Product			
	BBR	HR1	HT2	MM2
SiO ₂	55.10	49.60	52.60	51.10
Al ₂ O ₃	30.00	34.30	32.20	30.90
Fe ₂ O ₃	0.53	1.11	0.91	1.86
TiO ₂	0.92	1.12	1.71	2.14
Na ₂ O	0.32	0.18	0.29	0.21
K ₂ O	0.48	0.11	0.16	0.05
CaO	0.07	0.40	0.05	0.01
MgO	0.50	0.40	0.46	0.65
Loss on ignition	11.50	12.80	11.70	12.90

Company

Commercial Minerals Limited
Level 14
99 Bathurst St
SYDNEY NSW 2000

Contact

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

Other Clays

New South Wales produces large quantities (more than 2.7 million tonnes in 1987-88) of clay for brick making and similar applications. Because of the large number of producers, their integration into local markets, and the high relative cost of transport for low unit value materials, details of other clay producers are not included here. For further information on clays suitable for these uses, contact the Economics Branch, Department of Minerals and Energy (See Preface for contact numbers).

DIATOMITE

Major resources of freshwater diatomite occur near Barraba. Production is carried out by Australian Diatomite Pty Ltd, with 1987-88 output totalling 9 235 tonnes. Calcined diatomite products are available for a range of applications, including industrial absorbents, and refractory manufacture.

Studies by the Geological Survey Branch and the Mineral Resources Development Laboratory, of the Department of Minerals and Energy, indicate that New South Wales diatomites have potential for use in highly specialised applications such as in food filtration.

Typical specifications are as follows:

Composition of Calcined Diatomite

Major Components %	Minimum %	Maximum %
SiO ₂	65	80
Al ₂ O ₃	14	18
Other Components	Typical Analysis (%)	
Fe ₂ O ₃	3.0 to 4.0	
TiO ₂	0.65 to 0.85	
P ₂ O ₅	0.04 to 0.08	
MnO	0.04 to 0.06	
CaO	1.6 to 2.2	
K ₂ O	0.9 to 11.0	

Physical Properties

Apparent density	0.40 to 0.50 g/ml
Water Absorption	50 to 130% (by weight)
Oil Absorption	65 to 100% (by weight)

Company

Australian Diatomite Mining Pty Ltd
Suite 44
2 O'Connell Street
PARRAMATTA NSW 2150

Contact

Mr R Perrett
General Manager
Telephone: (02) 633 9844
Facsimile: (02) 633 9776
Telex: AA75350

DIMENSION STONE

New South Wales produces a wide range of quality granite, marble, sandstone and slate dimension stones possessing durability and aesthetic appeal for building and decorating. Significant producers are listed under the heading of the type of dimension stone sold.

Granite

Medium to coarse-grained red, pink, grey and black granites are produced in several locations.

Company

C J & J R Morris Pty Ltd
(trading as Central West Granite Supplies)
PO Box 515
TUMUT NSW 2720

Contact

Mr C Morris
Managing Director
Telephone: (069) 473 170
(068) 592 301

Martins Granite Quarries
Pty Ltd
PO Box 627
UNLEY SA 5061

Mr Q Blunden
State Manager
W H Martin Pty Ltd
Telephone: (08) 272 3400
Facsimile: (08) 352 2918

Melocco Pty Ltd
PO Box 375
ALEXANDRIA NSW 2015

Mr K Hurst
General Manager
Telephone: (02) 519 9333
Facsimile: (02) 516 1318
Telex: AA22596

Marble

Marble is produced in cream and blue/grey by Melocco Pty Ltd. Smaller producers extend the range of available colours and textures.

Company

Melocco Pty Ltd
PO Box 375
ALEXANDRIA NSW 2015

Contact

Mr K Hurst
General Manager
Telephone: (02) 519 9333
Facsimile: (02) 516 1318
Telex: AA22596

Sandstone

Sandstone is the most commonly used building stone in New South Wales. Attractive grey, yellow and variegated, banded sandstones are available.

Company

Central Coast Sawn-Stone Quarries Pty Ltd
PO Box 1293
GOSFORD SOUTH NSW 2250

Contact

Mr R Gough
Managing Director
Telephone: (043) 401 412
Facsimile: (043) 401 822

Gosford Quarries Pty Ltd
300 Johnston Street
ANNANDALE NSW 2038

Mr G Barker
Sales Manager
Telephone: (02) 810 7555
Facsimile: (02) 810 1669

Ingleside Quarries
PO BOX 36
KENTHURST NSW 2154

Mrs C Lloyd
Owner
Telephone: (02) 652 2157

Melocco Pty Ltd
PO Box 375
ALEXANDRIA NSW 2015

Mr K Hurst
General Manager
Telephone: (02) 519 9333
Facsimile: (02) 516 1318
Telex: AA22596

Mt White Quarries
RMB 1165 Pacific Highway
MT WHITE NSW 2251

Mr J E Crowther
Owner
Telephone: (043) 701 157

Bundanoon Sandstone Quarries
PO Box 155
BEVERLY HILLS NSW 2209

Mr M D Finlayson or Mr P Geary
Directors of Vapuci Pty Ltd
Telephone: (02) 398 6446
Facsimile: (02) 398 1309

Slate

Intermittent production of slate occurs in NSW.

Company

Mr G A Bennett
184 Mayne Street
GULGONG NSW 2852

Sabre Resources Ltd
GPO Box 2706
SYDNEY NSW 2001

Contact

Mr G A Bennett
Owner
Telephone: (063) 741 034

Mr A Border
Exploration Manager
Telephone: (02) 223 1800
Facsimile: (02) 235 1436
Telex: AA176025

FELDSPAR

Feldspar production and processing capacity at Broken Hill by Consolidated Feldspar Ltd is 30 000 tonnes a year of refined sodium and potassium feldspar products, together with lesser quantities of mica, beryl and silica by-products. Typical chemical analyses of the processed sodium and potassium products are:

	Sodium Feldspar %	Potassium Feldspar %
SiO ₂	67.2	65.8
Al ₂	20.0	18.0
Fe ₂	0.10	0.10 to 0.25
CaO	0.80	0.04
MgO	Bld*	<0.01
Na ₂ O	10.7	3.63
K ₂ O	0.10	11.7
TiO ₂	0.03	0.06
Loss on ignition	0.04	0.38

* Below level of detection

Unprocessed sodium and potassium feldspars are currently available. Production during 1987-88 amounted to 103 tonnes. In addition, Commercial Minerals Ltd produced 360 tonnes of feldspar from its mines at Broken Hill.

Company

Consolidated Feldspar Ltd
1 Booth Street
Annandale NSW 2038

Commercial Minerals Limited
Level 14
99 Bathurst St
SYDNEY NSW 2000

Contact

Mr E Bouverie
Director
Telephone: (02) 552 1236 or (02) 660 7705
Facsimile: (02) 552 1963

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA 122351

GYPSUM

New South Wales has large resources of gypsum located in the western regions of the State. Production in 1987-88 amounted to 22 093 tonnes of washed gypsum consumed in the manufacture of cement and 9 720 tonnes of crude gypsum used as a soil conditioner.

Company

CSR Ltd
Gypsum Products Group
PO Box 90
SMITHFIELD NSW 2060

Contact

Mr R White
Sales Manager
Telephone: (02) 609 9633
Facsimile: (02) 725 3926

LIMESTONE

Besides specialty calcium carbonate powders (separately entered), limestone is mined by cement producers for use in the manufacture of cement (see CEMENT MANUFACTURERS), as a flux for local iron and steel manufacture (Blue Circle Southern Cement Ltd), in the production of calcined (quick) and hydrated limes (Blue Circle Southern Cement Ltd and David Mitchell Melcann Pty Ltd) and for chemical production and agricultural uses (David Mitchell Melcann Pty Ltd and Omya-Southern Pty Ltd).

David Mitchell Melcann Pty Ltd produces a range of limestone grades, with particles down to about 75 microns diameter, suitable for use in coal dusting, agriculture and stock feeds. Finer powders are produced by Omya-Southern Pty Ltd and by Commercial Minerals Ltd (see CALCIUM CARBONATE POWDERS).

Company

Blue Circle Southern Cement Ltd
GPO Box 1571
SYDNEY NSW 2060

Contact

Mr J Bain
Manager, NSW Sales
Telephone: (02) 929 0200
Facsimile: (02) 954 3347
Telex: AA22466

Commercial Minerals Limited
Level 14
99 Bathurst St
SYDNEY NSW 2000

Mr A Sonego
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

David Mitchell Melcann Pty Ltd
PO Box 468
TAMWORTH NSW 2340

Mr P F Little
Sales Coordinator
Telephone: (067) 69 5501
Facsimile: (067) 69 5707

Omya Southern Pty Ltd
PO Box 1498
NORTH SYDNEY NSW 2059

Mr D Scott
Operations Manager
Telephone: (063) 313 055
Facsimile: (063) 316 283
Telex: AA72336
Dr G W Stone
Managing Director
Telephone: (02) 959 4077
Facsimile: (02) 929 0736
Telex: AA26398

MANGANESE DIOXIDE

The Australian Manganese Company Pty Ltd is planning to start producing electrolytic manganese dioxide at Mayfield, near Newcastle, suitable for use in the manufacture of alkaline dry-cell batteries at the start of 1990. The plant is designed to produce about 10% of the world's requirements for electrolytic manganese dioxide.

Company

Australian Manganese Company Pty Ltd
PO Box 249
MAYFIELD NSW 2304

Contact

Mr A R Taylor
Operations Manager
Telephone: (049) 41 1500
Facsimile: (049) 60 2075
Telex: AA28346

MAGNESITE

Both magnesite mining operations in New South Wales, at Thuddungra, near Young, and Fifield, are owned and operated by Devex Ltd. Reserves of high quality nodular magnesite at both locations are sufficient to support operations for many years.

The mines produced 47 484 tonnes of raw magnesite in 1987-88.

On-site calcination is conducted at both Thuddungra and Fifield.

Thuddungra

While current plant capacity is 13 000 tonnes a year of magnesia products, this is to be substantially increased in late 1988 with the installation of an automated kiln. The caustic-calcined (chemically reactive) magnesia product is used mainly in veterinary and chemical operations. Other uses include water purification, pharmaceutical products, ceramics and glass.

Typical product specifications are:-

Chemical Analyses

		Product	
		XLM 96%	PEXU 98%
Mgo (fully ingited basis)	min	96.0	98.0
CaO	max	1.70	1.0
SiO ₂	max	2.00	0.8
Fe ₂ O ₃	max	0.40	0.15
Al ₂ O ₃	max	0.40	0.15
B ₂ O ₃	max	0.0036	0.0036
Boron	max	12 ppm	12 ppm
Loss on ignition	max	3.5	3.5
Iodine No.	min	30	20

Physical Properties

Tap Density	0.65 g/cc	1.1 g/cc
pH	10.5	10.5
Sizing	99.5% passing 45 micron	0.1% above 4mm 0.1% below 0.5mm

Fifield

A high temperature shaft kiln uses the Fifield magnesite to produce dead-burned (non-reactive) magnesia attractive to manufacturers of refractories, welding electrodes, electrical insulation and ceramics. Plant capacity is 10,000 tonnes a year of magnesia products.

Typical product properties are:-

Chemical Analyses

		Product		
		98	96	90
MgO (fully ingited basis)	min	98.00	96.00	90.0
CaO	max	0.90	1.20	5.0
SiO ₂	max	0.50	1.70	2.0
Fe ₂ O ₃	max	0.10	0.40	2.5
Al ₂ O ₃	max	0.12	0.40	0.90
B ₂ O ₃	max	0.0036	0.0036	N/A
Boron	max	15 ppm	15 ppm	N/A
Loss on ignition		0.2	0.2	0.5

Physical Properties

		Product		
		98	96	90
Bulk Density (kg/m ³)	min	3280	3300	3150
Moisture%	max	0.2	0.2	0.5

Company

Devex Ltd
PO Box 4509
SYDNEY NSW 2001

Contact

Mr J Campbell
Sales Manager
Telephone: (02) 290 2033
Facsimile: (02) 290 3337
Telex: 176844
Cables: SOMI, SYDNEY

MAGNETITE

Doral Resources N L, through Doral Magnetite Pty Ltd, mines magnetite at Tallawang, near Gulgong. The mine can produce up to 50,000 tonnes of magnetite product a year.

Three grades of magnetite powder are prepared:

Fine - 85% to 90% less than 53 micron.

Superfine - 92% to 95% less than 53 micron.

Ultrafine - 95% to 98% less than 53 micron.

The magnetite is used in heavy media washing plants in the coal industry, in ferro-cement or cement colouring and in counterweights.

Company

Doral Magnetite N L
PO Box 209
GULGONG NSW 2852

Contact

Mr P Grant
Senior Sales & Marketing Manager
Telephone: (02) 833 1902

MICA

Mica is produced as a by-product of feldspar mining at Broken Hill.

See "Feldspar" for further information.

MULLITE

The silixite deposits located at Torrington, New South Wales, represent the largest known resource of topaz in the world. Calcination of the topaz yields a high quality mullite (+70% Al_2O_3) with superior refractory properties.

Australia Wide Industries Ltd, and the project manager, Pacific Copper Ltd, have a joint venture pilot plant program allowing the testing of bulk samples of mullite in industrial applications.

The high quality of the mullite is illustrated by the following typical specifications.

Mullite - typical specifications

$Al_2O_3 > 71.2\%$; $Fe_2O_3 < 0.11\%$; $CaO+MgO < 0.5\%$; Apparent Porosity $< 1\%$;
Density 2.8-2.9 g/cc.

Mullite derived from topaz is stable to temperatures above 1 800^o C and maintains good load-bearing strength to high temperatures (creep resistance). It has a low coefficient of thermal expansion and is chemically inert.

Company

Australia Wide Industries Ltd
Level 3
468 St Kilda Road
MELBOURNE VIC 3004

Pacific Copper Ltd
Level 14
The Capital Centre
255 Pitt Street
SYDNEY NSW 2000

Contact

Mr E Eshuys
General Manager, Exploration
Telephone: (03) 820 0133
Facsimile: (03) 820 0720
Telex: AA154508

Mr P Gibb
Managing Director
Telephone: (02) 264 5055
Facsimile: (02) 221 3157
Telex: AA178118

PEAT

A high fibre peat is available from the Killarney mine located near Bombala in southeast New South Wales. The product is free from nematodes, plant pathogens and weed contaminants and has physical and chemical characteristics which make it suitable for soil conditioning and horticultural applications. Processing is designed to eliminate mineral and fine organic residues and hence maintain the structural integrity of the peat. Dried, milled peat is pressed and baled for sale (bale size - compressed volume 250 litres, weight 62 kg).

In addition, Arthur Yates and Co Ltd operate a peat mine in Wingecarribee Swamp at Burrawang, near Moss Vale. Production capacity is 20,000 m³ per annum, equivalent to 8,860 tonnes per annum. The peat is belt filtered for water removal prior to air drying.

Production in 1987-88 was 4 667 tonnes.

Company

Amgrow Pty Ltd
PO Box 1085
PENRITH NSW 2750

Arthur Yates & Co Ltd
PO Box 72
REVESBY NSW 2212

Contact

Mr A McNally
Managing Director
Telephone: (047) 29 0596
Facsimile: (047) 29 0634

Mr G Lewis
General Manager - Operations
Telephone: (02) 771 2911
Facsimile: (02) 774 5659
Telex: AA121223

PYROPHYLLITE

High quality pyrophyllite is mined by Commercial Minerals Ltd from a large deposit at Pambula. The product is used for the manufacture of refractory bricks and kiln furniture. Ceramic grade pyrophyllite is also available. High grade pyrophyllite contains 65.8% SiO₂, 28.2% Al₂O₃ and 4.95% H₂O. Production in 1987-88 amounted to 4 880 tonnes.

Industrial Minerals Australia Pty Ltd also produced 49 tonnes of pyrophyllite in 1987-88.

Company

Commercial Minerals Limited
Level 14
99 Bathurst St
SYDNEY NSW 2000

Industrial Minerals Australia Pty Ltd
Level 4
154 Pacific Hwy
NORTH SYDNEY NSW 2060

Contact

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

Mr E Kreutzer
Operations Director
Telephone: (02) 959 5788
Facsimile: (02) 959 5801
Telex: AA74369

SERPENTINE

Somerset Mining Pty Ltd, operates a serpentine mine at Coolac with a capacity to produce 60,000 tonnes a year. Product is in two sizings, less than 5mm or in the range 60mm to 40mm, and is currently used as a flux in steel smelting although agricultural applications are possible.

Production during 1987-88 was 39 665 tonnes.

Company

Somerset Mining Pty Ltd
 PO Box 41
 WATSONS BAY NSW 2030

Contact

Dr E Ambler
 Telephone: (02) 337 5769
 Facsimile: (02) 337 1333

SILICA**Glass sand**

New South Wales has significant industrial sand deposits for domestic use, mined by a large number of companies. Higher-grade sands suitable for glass manufacture are mainly produced from coastal deposits at Anna Bay and Tanilba Bay near Port Stephens and from deposits near Penrith and Botany near Sydney. In addition, the extensive friable sandstone resources of Newnes Plateau have potential for upgrading to glass making standards.

The Industrial Minerals Division of ACI International Ltd is a major producer of glass manufacturing sand. Hooker Corporation Ltd is planning to produce glass manufacturing grade sand from a mine at Stockton with reserves of at least two million tonnes of clear-glass grade sand and an additional ten million tonnes of coloured-glass grade sand. Anticipated annual production is about 200,000 tonnes. P B White Minerals Pty Ltd also produce from sites near Sydney and Newcastle.

Very high-grade silica

Very high-grade silica deposits occur at Bolivia (south of Tenterfield) and at Cowra. The silica from these deposits is suitable for the production of silicon, ferrosilicon or high-grade glasses.

The Bolivia deposit is mined by Tenterfield Silica Pty Ltd. Large hydrothermal pipes of exceptional purity produce a typical analysis of SiO₂ 99.95% and Al₂O₃ 0.03%. By blending with other materials, Tenterfield Silica Pty Ltd produces a range of furnace linings.

The Cowra area has two deposits of high purity quartz with reserves of 1 million and 1.1 million tonnes, one of which is in production. Typical analysis is:

SiO ₂	99.75%;	Fe ₂ O ₃	0.042%;
P ₂ O ₅	0.004%;	TiO ₂	0.007%;
Al ₂ O ₃	0.09%;	MgO	0.001%;
CaO	0.007%;	Na ₂ O	0.002%;
K ₂ O	0.004%;	Loss on ignition	0.008%;

Pebble size distribution is approximately:

- 50mm to +25mm, 7-10%;
- 25mm to +15.3mm, 15-18%;
- 15.3mm to +7.7mm, 16%;
- 7.7mm to +5.4mm, 6%;
- 5.4mm, 48%.

Hooker Resources, a division of Hooker Corporation Ltd produces up to 144,000 tonnes a year of quartzite at Marangaroo near Lithgow for the steel and construction industries.

Company	Contact
ACI Industrial Minerals Division ACI Ltd 813 South Dowling St WATERLOO NSW 2017	Mr A Echt Manager Telephone: (02) 698 4989 Facsimile: (02) 698 9796
T J Bryant Pty Ltd PO Box 156 COWRA NSW 2794	Mr T Bryant Owner-Manager Telephone: (063) 42 1200 (063) 42 1374 (AH) Facsimile: (063) 42 2354
Industrial Sands and Minerals Hooker Resources Ltd GPO Box 2724 SYDNEY NSW 2001	Mr R F Heile Divisional General Manager Telephone: (02) 239 2624 Facsimile: (02) 239 2600
Tenterfield Silica Pty Ltd Wallangarra Road Sunnyside TENTERFIELD NSW 2372	Mr D McCarthy Director Telephone: (067) 36 1988 Facsimile: (067) 36 1385
P B White Minerals Pty Ltd Suite 2 6 West Street PYMBLE NSW 2073	Mr A J Pallier Company Secretary Telephone: (02) 498 5852 Facsimile: (02) 498 7791

ZEOLITE

Recent exploration around Bingara and Werris Creek, following a research programme conducted by the Geological Survey Branch of the Department of Minerals and Energy, has indicated substantial resources of natural zeolite minerals concentrated in tuffs. Zeolites are complex aluminosilicate minerals widespread in acid to intermediate pyroclastic rocks. The properties of zeolites useful in agricultural and industrial applications arise because the very open crystal structures of zeolites enable the absorption, and subsequent controlled release, of ions and compounds

A deposit at Escott, near Werris Creek, being developed by a joint venture between Mount Gipps Ltd and J M Stephen Pty Ltd, has sufficient reserves for at least 10 years production at a maximum rate of 30 000 tonnes a year. Processing of the mineral involves milling the zeolite-rich host rock to customer specifications.

Trials using the deposit's main zeolite mineral, clinoptilolite, have indicated that animal growth rates can be improved through the application of this zeolite as a food additive, and that soils and potting mixes may be improved by increasing the cation exchange capacity of the planting

media with the inclusion of milled zeolites. Zeolites may be beneficially used in the absorption of odours, in the processing of water by the removal of impurities such as ammonia or heavy metals, flocculating colloidal suspensions and by assisting in controlling water hardness. Other uses for zeolites include fillers and for storing heat through the energy involved in absorption/desorption.

Typical product specifications are listed below.

Appearance:	light pink, powder (product Z3) or chips (product Z3-2.7)
Composition:	Clinoptilolite, minor quartz, clay, mica
Formula:	$(Ca,Mg,Na,K)_x(Al_6Si_{30}O_{72})_{20}H_2O$
Slurry pH:	7.6
Ammonia Gas Absorption:	160 m.eq./100g
Loss on ignition:	12.5 (800°C for 2 hours)
Cation exchange capacity:	Na 12 K 4 Ca 85 Mg 18 Total 119m.eq./100g
Density	Bulk 1.6 g/cc
Particle Diameter:	Sizes can be supplied according to customer requirements

Company

Mount Gipps Limited
32 Lusher Road
CROYDEN VIC 3136

Contact

Mr D Choy
Telephone: (03) 725 6400
Facsimile: (03) 725 6988

INDUSTRIAL MINERALS PROCESSORS

CEMENT MANUFACTURERS**Company**

Australian Cement Ltd
PO Box 491
NORTH SYDNEY NSW 2059

Blue Circle Southern Cement Ltd
GPO Box 1571
SYDNEY NSW 2060

Contact

Mr A Chapman
Sales Manager
Telephone: (02) 92 4161
Facsimile: (02) 925 0150

Mr J Bain
Manager, NSW Sales
Telephone: (02) 929 0200
Facsimile: (02) 954 3347
Telex: AA22466

CLAY AND OTHER CERAMIC MANUFACTURERS**Company**

Central Lime Ltd
(Ceramics business name Central Ceramics)
PO Box 61
SPIT JUNCTION NSW 2088

Commercial Minerals Ltd
Level 14
99 Bathurst St
SYDNEY NSW 2000

Montoro Resources Ltd
PO Box 1031
CHATSWOOD NSW 2067

Wallahah Minerals Pty Ltd
21 Plymouth Ave
NORTH ROCKS NSW 2151

Contact

Mr B Smith
General Manager
Telephone: (02) 960 1841
Facsimile: (02) 960 4775

Mr A Sonogo
Business Development Manager
Telephone: (02) 261 5233
Facsimile: (02) 261 1502
Telex: AA122351

Mr I Cullen
Sales Representative
Telephone: (02) 411 8966
Facsimile: (02) 419 2207
Telex: AA178585 AITILE

Mr R Druitt
Managing Director
Telephone: (02) 872 5033
Facsimile: (02) 871 2249
Telex: AA73870

REFRACTORY MANUFACTURERS

Company

Australian Industrial Refractories Ltd
 PO Box 154
 MAYFIELD NSW 2304

Clay and Ceramic Products Pty Ltd
 20 Herbert Street
 ARTARMON NSW 2064

Heat Containment Industries Pty Ltd
 65 Bourke Road
 ALEXANDRIA NSW 2015

K C Industries Pty Ltd
 PO Box 77
 CROYDON NSW 2132

Fosbel/Foseco Inc.
 PO Box 113
 REVESBY NSW 2212

Contact

Mr M Moffat
 Estimator
 Telephone: (049) 68 0477
 Facsimile: (049) 67 2287
 Telex: AA28111

Mr R Griffiths
 Managing Director
 Telephone: (02) 439 7444
 Facsimile: (02) 439 7497

Mrs S Tinney
 Telephone: (02) 669 5711
 (008) 024862
 Facsimile: (02) 669 3182

Mr J A Cooper
 Managing Director
 Telephone: (02) 797 9844
 Facsimile: (02) 798 8640

Telephone: (02) 771 3111
 Facsimile: (02) 771 3442

**METALLIC MINERAL CONCENTRATES
AND METALS**

ALUMINIUM

Production

New South Wales does not produce either bauxite suitable for aluminium production, or alumina. Alumina is imported into the State to supply the two aluminium smelters.

Smelters

Two smelters, at Kurri Kurri and Tomago, both in the Hunter Valley near Newcastle, produce aluminium metal from alumina obtained outside the State.

The smelter at **Kurri Kurri**, operated by Alcan Australia Ltd, commenced production of metal in 1967. Present production capacity is 150,000 tonnes per annum. Alcan Australia Ltd supplies its own semi-fabrication plants, to produce a range of products including plate, sheet, extrusions and foil, and other Australian fabricators. Over half the smelter production is exported to international markets.

The smelter at **Tomago**, operated by the Tomago Aluminium Company Pty Ltd, first produced metal in September, 1983. The smelter, which has a capacity of 230 000 tonnes per annum, has a cast house capable of producing mould, tee and alloy ingot, slab billet and wire rod. Production is directed at the export market.

Company

Alcan Australia Ltd
GPO Box 4130
SYDNEY NSW 2001

Tomago Aluminium Co Pty Ltd
PO Box 3895
SYDNEY NSW 2001

Contact

Mr A Smith
Corporate Relations Officer
Telephone: (02) 287 1411
Facsimile: (02) 261 4770
Telex: AA120281

Mr P W Trimble
Finance Manager
Telephone: (02) 220 6900
Facsimile: (02) 290 2197
Telex: AA70878

ANTIMONY

Antimony is contained in antimony and antimony-gold concentrates from the Hillgrove Mine near Armidale, and in lead and lead-zinc concentrates from various base metal mines, especially those from Broken Hill.

The small but economically significant antimony content of the lead and lead-zinc concentrates is recovered during refining of the lead and zinc metals. Further information on companies involved in production of antimony as a by-product of lead and zinc mining may be obtained from the section titled "Lead and Zinc".

Production 1987-88

Antimony content in:-	tonnes
Antimony concentrates	808
Lead concentrates	338
Total	1 146

Company

New England Antimony Mines NL
 Post Office
 HILLGROVE via ARMIDALE NSW 2350

Contact

Mr P Bradley
 General Manager
 Telephone: (067) 781 154
 Facsimile: (067) 781 1191

See also "Lead and Zinc" producers.

CADMIUM

Lead-zinc mining in New South Wales yields cadmium as a by-product. Concentrates, particularly zinc concentrates, contained 952 tonnes of cadmium in 1987-88. Information on lead-zinc production is contained in the section entitled "Lead and Zinc".

Production 1987-88

Cadmium content in:-	tonnes
Lead concentrates - newly won ore	37
Lead concentrates - slime dumps	24
Zinc concentrates - newly won ore	838
Zinc concentrates - slime dump	53
Total	952

Producers

See "Lead and Zinc" producers.

Refinery

A zinc smelter with an annual capacity of 400 tonnes of refined cadmium is operated at Cockle Creek by Pasminco Ltd.

Sales of the smelter's cadmium product are conducted directly by Pasminco Ltd.

Company

Pasminco Ltd
Private Bag 2111
NORTH SYDNEY NSW 2059

Contact

Mr T Shard
General Manager, Sales
Telephone: (02) 957 7400
Facsimile: (02) 957 7448
Telex: AA26433

COBALT

Concentrates produced from lead-zinc ores mined at Broken Hill contain cobalt. Information on the scale of the associated lead-zinc production is contained in the section entitled "Lead and Zinc".

Production 1987-88

Cobalt content in:-	tonnes
Zinc concentrates - newly won ore	74
Total production	74

Refinery

An electrolytic zinc refinery is operated in Tasmania by Pasminco Ltd using, in part, zinc concentrates from Broken Hill containing cobalt. The refinery produces cobalt as cobalt dioxide.

Company

Pasminco Ltd
Private Bag 2111
NORTH SYDNEY NSW 2059

Contact

Mr T Shard
General Manager, Sales
Telephone: (02) 957 7400
Facsimile: (02) 957 7448
Telex: AA26433

COPPER

The bulk of the State's copper production is from the CSA mine near Cobar, operated by Enterprise Mining Pty Ltd and marketed through Enterprise Metals Pty Ltd, and the Woodlawn Mine near Goulburn, controlled by Denehurst Ltd.

Smaller quantities of copper are also contained in concentrates produced by the lead-zinc mines at Broken Hill, the Elura lead-zinc mine owned by Pasminco Ltd, and the Mineral Hill gold-copper mine operated by Triako Resources Ltd. Information on contact names and addresses for the lead-zinc producers is contained in the section entitled "Lead and Zinc".

Production 1987-88

Copper content in:	tonnes
Copper concentrates	24 928
Gold concentrates	180
Lead concentrates - newly won ore	3 657
Lead-zinc concentrates - low grade	334
Silver concentrates	339
Zinc concentrates - newly won ore	1 713
Zinc concentrates - slime dumps	227
Total	31 378

Smelter/Refinery

Enterprise Metals Pty Ltd markets the copper metal produced by the copper refinery operated by the Electrolytic Refining & Smelting Company of Australia Ltd at Port Kembla. The company is a custom smelter and producer of electrolytic copper. Upon completion of extensive alterations to the plant, the smelter and refinery should be able to produce 80 000 tonnes of copper a year, together with various by-products such as gold and silver and 175 000 tonnes of sulphuric acid per annum.

Company

Denehurst Ltd
961 Glenhuntley Rd
SOUTH CAULFIELD VIC 3162

Electrolytic Refining and Smelting
Company of Australia Ltd
PO Box 42
PORT KEMBLA NSW 2505

Enterprise Metals Pty Ltd
Private Bag 2111
NORTH SYDNEY NSW 2059

Triako Resources Ltd
6th Floor
140 Queen St
MELBOURNE VIC 3000

Contact

Mr M Taylor
Executive Chairman/Director
Telephone: (03) 211 6311
Facsimile: (03) 572 2602
Telex: 154976

Mr R Jones
General Manager
Telephone: (042) 74 0251
Facsimile: (042) 76 1155
Telex: AA29020

Mr A W G Collier
General Manager, Commercial
Telephone: (02) 957 7400
Facsimile: (02) 957 7448
Telex: AA 26433

Mr G A Buckett
Executive Director
Telephone: (03) 670 5800
Facsimile: (03) 670 0304

GOLD

Gold is produced in New South Wales both as a principal product and as a by-product of other mining, particularly copper and lead-zinc mining. Companies producing copper or lead and zinc, either as concentrates or as smelted or refined metals, are listed in the Section titled "Copper" and "Lead and Zinc" respectively. Companies producing these metals may produce gold as a by-product.

Production

Total production of gold in 1987-88 was 5,224 kg, of which 569 kg came from copper and lead-zinc-silver mining and the remainder, 4 655 kg, was produced as a principal product. A listing of significant mines producing gold as a principal product is given below.

Company (or major partner)	Production 1987-88 (kg)
BHP Gold Mines Ltd	691
Climax Mining Ltd	523
Cluff Minerals (Australia) Pty Ltd	202
Epoch Mining NL	149
Lachlan Valley Gold Mines Pty Ltd	202
Mount Carrington Mines Ltd (initial production)	0
New England Antimony Mines Ltd	223
Paragon Resources NL	1 612
Ranger Exploration NL	906
T J and P V Nunan	57
Total of major producers output	4 565

Company

BHP Gold Mines Ltd
GPO Box 86A
MELBOURNE VIC 3001

Climax Mining Ltd
PO Box R204
Royal Exchange
SYDNEY NSW 2000

Cluff Minerals (Australia) Pty Ltd
PO Box 908
NORTH SYDNEY NSW 2059

Contact

Mr A Linke
Manager Gold Operations
Telephone: (03) 609 3333
Facsimile: (03) 609 3071

Mr E Overton
Exploration Manager
Telephone: (02) 277 7031
Facsimile: (02) 251 2410
Telex: AA71999

Mr R G Adamson
Managing Director
Telephone: (02) 957 2644
Facsimile: (02) 929 6716

Mt Carrington Mines Ltd
C/- Post Office
DRAKE NSW 2470

New England Antimony Mines Ltd
HILLGROVE via ARMIDALE NSW 2350

Paragon Resources NL
GPO Box 670
NEDLANDS WA 6009

Ranger Exploration NL
PO Box 169
APPLECROSS WA 6153

Triako Resources Ltd
6th Floor
140 Queen St
MELBOURNE VIC 3000

RGC (NSW) Ltd
For sales, contact
Tennant Trading Ltd
Goldfields House
1 Alfred St
SYDNEY NSW 2000

Gold Refiners

Fine Metals Corporation Ltd (FMC) produces gold with a purity of 99.99% using proprietary technology (the 'REFSYS' system). FMC brand 99.99% gold is accepted in international markets as "good delivery of gold", along with similar gold produced by Deak International Pty Ltd and Johnson Matthey Ltd. Gold produced through smelting and refining of copper concentrates by the Electrolytic Refining and Smelting Company of Australia Ltd is marketed by Enterprise Metals Pty Ltd.

Company

Chemgold Refinery Pty Ltd
PO Box 3
BROADWAY NSW 2007

Mr D Heath
Interim Resident Manager
Telephone: (067) 37 6614
Facsimile: (067) 37 6642

Mr P Bradley
General Manager
Telephone: (067) 78 1154
Facsimile: (067) 78 1191

Mr S J Lewis
Managing Director
Telephone: (09) 389 1311
Facsimile: (09) 386 6904

Mr J Christie
Company Secretary
Telephone: (09) 364 8355
Facsimile: (09) 364 3804

Mr G A Buckett
Executive Director
Telephone: (03) 670 5800
Facsimile: (03) 670 0304

Mr M Lee
Group Business Manager
Telephone: (02) 20512
Facsimile: (02) 235 0603
Telex: AA120373

Contact

Mr W Sher
Managing Director
Telephone: (02) 698 8500
Facsimile: (02) 698 3130

Enterprise Metals Pty Ltd
Private Bag 2111
NORTH SYDNEY NSW 2059

Mr A W G Collier
General Manager, Commercial
Telephone: (02) 957 7400
Facsimile: (02) 957 7448
Telex: AA26433

Electrolytic Refining and Smelting
Company of Australia Ltd
PO Box 42
PORT KEMBLA NSW 2505

Mr J Garaty
General Manager
Telephone: (042) 74 0251
Facsimile: (042) 76 1155
Telex: AA29020

Deak International Pty Ltd
339 Settlement Road
THOMAS TOWN VIC 3074

Marketing Director
Telephone: (03) 456 211
Facsimile: (03) 466 4932

Fine Metals Corporation Ltd
31 Smith Street
MARRICKVILLE NSW 2204

Dr L Jayaweera
Director
Telephone: (02) 517 1188
Facsimile: (02) 519 9468
Telex AA 20149

Johnson Matthey Ltd
PO Box 165
KOGARAH NSW 2217

Mr R Best
Marketing Manager
Refining and Chemicals Division
Telephone: (02) 587 8022
Facsimile: (02) 588 1559
Telex: AA24281

Pacific Precious Metals Ltd
PO Box 238
ALEXANDRIA NSW 2015

Mr M Pede
Commercial Manager
Telephone: (02) 699 7866
Facsimile: (02) 699 8752

IRON AND STEEL

Production

Iron ore is imported from other States in Australia. New South Wales produces coal and limestone used in iron and steel making.

Major steelworks are located at Newcastle and Port Kembla in New South Wales. Both steelworks are owned by The BHP Co Ltd. All raw steel is continuously cast, improving steel quality and production performance. Steel making capacity at the Port Kembla and Newcastle operations is 3.8 million and 1.9 million tonnes per annum respectively.

A considerable amount of steel, especially steel alloys and manufactured steel products, is exported.

The BHP Co Ltd has placed all steel manufacturing and processing operations under control of its operating unit, the BHP Steel International Group. BHP Steel International also controls all BHP coal operations in NSW, an International Trading Division and Australian Industrial Refractories as well as the following semi-autonomous divisions related to steel manufacture.

Division	Contact
BHP Steel International Group BHP House GPO Box 86A MELBOURNE VIC 3001	Telephone: (03) 609 3333 Facsimile: (03) 609 3015 Telex: AA30408
Rod & Bar Products Division PO Box 196B NEWCASTLE NSW 2300	Telephone: (049) 69 0411 Facsimile: (049) 69 0419 Telex: AA28006 DX7874
Slab & Plate Products Division PO Box 1854 WOLLONGONG NSW 2500	Telephone: (042) 74 5011 Facsimile: (042) 75 1235 Telex: AA29015
Coated Products Division GPO Box 196 SYDNEY NSW 2001	Telephone: (02) 239 4444 Facsimile: (02) 239 4458 Telex: AA20355
Wire Products Division PO Box R240 Royal Exchange SYDNEY NSW 2000	Telephone: (02) 27 5792 Facsimile: (02) 251 1989 Telex: AA121787
Collieries Division PO Box 481 NEWCASTLE NSW 2300	Telephone: (049) 26 3211 Facsimile: (049) 26 3006 Telex: AA28560

LEAD AND ZINC

Lead and zinc are produced from the Broken Hill mines, the CSA mine and the Elura mine, both near Cobar, and the Woodlawn mine near Goulburn. Some retreatment of tailings at these mines contribute to the production total. The wide range of metallurgical properties of the various ores results in a range of concentrate grades suitable for electrolytic or pyrometallurgical smelting and refining. The largest producer of lead and zinc concentrates is Pasmaico Ltd, a company formed in 1988 through the merger of the lead and zinc interests of CRA Ltd and North Broken Hill Peko Ltd. Its operations include mines at Broken Hill and the Elura mine. However, CRA Ltd continue to operate the copper-rich CSA mine through its subsidiary, Enterprise Mining Pty Ltd.

Pasmaico Ltd conducts international sales directly but sales within Australia are performed independently by North Broken Hill Peko Ltd, and Enterprise Metals Pty Ltd.

Woodlawn Mine produces underground primary ores but is considering retreatment of tailings from its previous operations in addition to its normal mining operations. Denehurst Ltd, operator of the Woodlawn mine, has developed techniques for processing these tailings.

Minerals Mining and Metallurgy Ltd mines and processes tailings at Broken Hill.

All the lead and zinc deposits have other metals such as cadmium, copper, gold, and silver associated. Further information on these by-products may be sought in the relevant sections of this volume.

Production 1987-88

Lead content in:-	tonnes
Lead concentrates- newly won ore	185 473
Lead concentrates- low grade	14 108
Other metal concentrates	24 372
Total	223 953

Zinc content in:-	tonnes
Zinc concentrates - newly won ore	334 913
Zinc concentrates - low grade	407
Zinc concentrate - from tailings	8 497
Other metal concentrates	29 703
Total	373 520

Production by company, 1987-88	Lead (tonnes)	Zinc (tonnes)
Denehurst Ltd		
Metal content in:-		
Lead concentrate	11 703	5 310
Zinc concentrate	2 494	38 455
Copper concentrate	1 290	1 191
Enterprise Mining Pty Ltd		
Metal content in:-		
Lead concentrate	1 043	530
Zinc concentrate	658	17 366
Copper concentrate	716	2 465

Minerals Mining and Metallurgy Ltd**Metal content in:-**

Lead concentrate	492	31
Lead-Zinc concentrate	3 937	5 366
Zinc slime - reprocessed tailings	5043	8497

Pasminco Ltd**Metal content in:-**

Lead concentrate	185 817	14 611
Zinc concentrate	8 986	279 092

Refinery

Pasminco Ltd operates a major smelting and refining facility at Cockle Creek to produce zinc metal and zinc alloys, lead bullion and cadmium metal. The smelter is based on the Imperial Smelting Process. Operations include sintering, an Imperial Smelting Furnace, reflux refining of zinc and sulphuric acid production. Copper sulphate is also produced from copper-rich lead drosses removed during the processing.

Approximately 75% of the zinc metal sold is 98.5% grade while the balance comprises higher grades and alloys. About 60% of the zinc metal and most of the cadmium is exported.

Sulphuric acid is sold for use in the manufacture of fertiliser.

While Pasminco Ltd is the operator of the smelter and conducts international sales, sales of its products in Australia are made independently by CRA Limited, through its subsidiary Enterprise Metals Pty Ltd and by North Broken Hill Peko Ltd.

Refinery capacity

	tonnes per annum
Cadmium metal	400
Copper sulphate	5 000
Lead bullion	40 000
Sulphuric acid	170 000
Zinc metal	75 000

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SILVER

Silver produced in New South Wales is principally associated with base metal concentrates produced by the poly-metallic deposits at Elura and CSA near Cobar, Woodlawn near Goulburn and Broken Hill (see the Section entitled "Lead and Zinc" for additional information). The Elura mine also produces a silver concentrate.

In addition to the above, Paragon Resources N L produces a silver by-product from its Temora gold mine, at a rate of about 1,800 kg of silver a year.

Production 1987-88

Silver content in:-	kg
Copper concentrates	19 634
Gold (all sources)	4 089
Lead - concentrates from newly won ores	264 899
Lead-zinc concentrates - newly won ores	9 375
Silver (also ores) concentrates etc	73 219
Zinc - newly won ores	38 525
Zinc - slimes - reprocessed tailings	18 382
Total	428 123

Refining

Pasminco Ltd refines silver bearing metals and drosses outside New South Wales. Pasminco Ltd directly markets its products internationally, but uses North Broken Hill Peko Ltd and Enterprise Metals Pty Ltd to independently market its products within Australia.

The Electrolytic Refining and Smelting Company of Australia Ltd operates a major copper smelting and refining works at Port Kembla, NSW. The company is a custom copper smelter and produces electrolytic copper, refined gold and refined silver from plant that is currently being upgraded to manufacture 80 000 tonnes of copper a year. The output of silver depends on the silver grade of the feedstock.

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TIN

Disturbed markets and resultant low commodity prices over the last few years resulted in the cessation of production from most tin mines in New South Wales and the cessation of operation of the tin smelter.

Total production in New South Wales in 1987/88 was 3 tonnes, compared with 249 in 1986-87.

Because production is currently from very small operations, information on present tin production should be sought by contacting the Economics Branch of the Department of Minerals and Energy at the contact number listed in the Preface.

TUNGSTEN

New South Wales is an insignificant tungsten producer. However, tungsten is contained in a silixite deposit at Torrington (see "Mullite" in the section on "Industrial Minerals") that has been developed to pilot plant stage for its topaz content. Implementation of production and processing plans for this silixite deposit could result in an annual production of about 400 tonnes of tungstic oxide (WO_3).

Company

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ZINC

Because of the co-production of lead with zinc, information on zinc should be sought under the heading "LEAD AND ZINC"

HEAVY MINERAL SANDS

HEAVY MINERAL SANDS

Heavy mineral sands are recovered from unconsolidated coastal dune and beach deposits. Mining currently takes place at Kingscliff in the north of the State, and at Hawks Nest, Viney Creek and Tomago near Newcastle using cutter-suction floating dredges and wet/dry separation processing.

The miners, Mineral Deposits Ltd, R Z Mines (Newcastle) Pty Ltd and Currumbin Minerals Pty Ltd, typically treat sands containing 1% to 2% heavy minerals to produce concentrates containing 15% to 20% ilmenite, 0.2% monazite, 20% to 30% rutile and 40% to 45% zircon as well as 5% to 25% other minerals. Further treatment yields ilmenite, monazite, rutile and zircon concentrates.

In addition to the above producers, Australmin Holdings Ltd is planning to produce heavy mineral sands from a deposit at Newrybar in early 1990.

ILMENITE

The 0.1% to 0.5% chromite (Cr_2O_3) content of the ilmenite produced in New South Wales currently prevents its upgrading to rutile. Consequently, ilmenite is mainly used for local sand blasting purposes or for blastfurnace feed.

Only 2% of the ilmenite sold in the State is exported.

Production 1987-88

Production statistics for ilmenite in New South Wales record sales. The mineral is otherwise stockpiled indefinitely.

Ilmenite Concentrate - Sales

Producer	Tonnes	Av. Grade (%)
Mineral Deposits Limited	6 117	45
RZ Mines (Newcastle) Pty Ltd	9 510	47
Total	15 627	

Company

Contact

Ilmenite producing companies and contacts are listed under "Zircon".

MONAZITE

Monazite is recovered in NSW as a co-product of heavy mineral sand mining and typically contains 55-58% rare earth oxides, 6-7% ThO_2 , 4-8% ZrO_2 , 0.1-0.5% U_3O_8 , 27-28% P_2O_5 and 0.5-5% others.

The percentage of the individual rare earth metals contained in the rare earth component of monazite range as follows:

Cerium	44-45%	Gadolinium	1.8-2/3%
Yttrium	1.8-2.3%	Terbium	0.2-0.5%
Erbium	0.1-0.4%	Neodymium	15-15.5%
Lanthanum	16.5-17%	Samarium	2.3-2.8%
Ytterbium	0.1-0.4%	Dysprosium	0.5-0.9%
Praseodymium	3.5-4%	Holmium	0.1-0.4%

All monazite sold in the State was exported.

Production 1987-88

"Production" statistics for monazite in New South Wales record sales. The mineral is otherwise stockpiled indefinitely.

Monazite Concentrate - Sales

Producer	Tonnes	Av. Grade (%)
Mineral Deposits Limited	316	90
RZ Mines (Newcastle) Pty Ltd	608	90
Total	924	

Company **Contact**

Monazite produce companies and contacts are listed under "Zircon".

RUTILE

Rutile is produced in various sand sizes and as a flour.

Specifications for rutile are a minimum 96.0% TiO₂, and maxima of 1.0% ZrO₂ and 0.05% Fe₂O₃. In 1986/87, 94% of the State's production was exported.

Production 1987-88 (concentrates)

Producer	Tonnes	Av. Grade (%)
Mineral Deposits Ltd	22 640	95.0
RZ Mines (Newcastle) Pty Ltd	30 561	95.6
Currumbin Minerals Pty Ltd	1 980	96.0
Total	55 181	

Company **Contact**

Rutile produce companies and contacts are listed under "Zircon".

ZIRCON

The zircon produced in New South Wales is of the highest quality. The ZrO₂ and impurity contents determine the grades for chemical purposes. The main chemical grade specifications are:

Premium

Min. 66% ZrO₂; Max. 0.05% Fe₂O₃; Max. 0.10% TiO₂; Max 0.30% Al₂O₃.

Standard

Min. 65% ZrO₂; Max. 0.30% Fe₂O₃; Max. 0.30% TiO₂; Max. 0.40% Al₂O₃

RZ Mines (Newcastle) Pty Ltd produces premium and standard grades. Its Premium "A" product typically contains 0.025% Fe₂O₃ and 0.08% TiO₂.

While all companies produce a range of particle sizes, RZ Mines (Newcastle) Pty Ltd and Currumbin Minerals Ltd also produce zircon flour (5 micron to 50 micron).

Production 1987-88

Producer	Concentrate	Av. Grade (%) (tonnes)
Mineral Deposits Ltd	17 420	99
RZ Mines (Newcastle) Pty Ltd	29 651	99
Currumbin Minerals Pty Ltd	3 318	99
Total	50 389	

Company

Australmin Holdings Ltd
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Currumbin Minerals Ltd
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Mineral Deposits Ltd
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RZ Mines (Newcastle) Pty Ltd
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