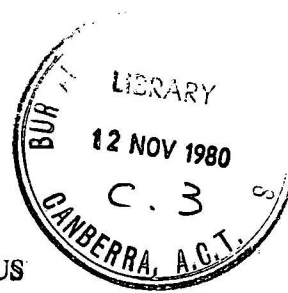


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RECORD

Record 1980/71

MINERAL RESOURCES BRANCH

SUMMARY OF ACTIVITIES FOR 1980

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Record 1980/71

MINERAL RESOURCES BRANCH
SUMMARY OF ACTIVITIES FOR 1980

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FOREWORD

J. Ward, Head of Branch

(Assistant Director, Mineral Resources)

As in recent years the work of the Mineral Resources Branch in 1980 followed two main inter-related lines: monitoring and analysis of the Australian mineral industry in the context of the world mineral industry, with the emphasis on mineral commodity studies; and assessment of Australia's national mineral resources. The work is done to enable BMR to disseminate information and provide authoritative advice to government and industry.

In line with the changing role for BMR the Branch is continuing to increase its emphasis on quantitative mineral resource assessments. Because of their economic importance most attention hitherto has been paid to resources of the major metals and coal. However, the Branch is now putting more emphasis on assessment of other commodities, especially refractory minerals, because industry interest in these is increasing and because the government's studies of the possibility of increasing the processing of raw materials in Australia require knowledge of the resources of the commodities being examined.

To date almost all resource assessment work has considered only identified resources. Systematic work on mineral potential and undiscovered resources will depend on the availability of specialists such as mineral deposit geologists and geomathematicians.

The Branch's work has shown that there is a pressing need to organise information related to resource assessment so that appropriate information can be retrieved readily when it is required. Studies into the establishment of a mineral deposits data base did not progress during the year but proposals were prepared for the study of the feasibility of establishing a national data base for geoscience information relating to coal resources.

With continuing staff ceilings and long recruitment lead times both sections were below strength throughout the year. At present only one position in the Mining Engineer Section is occupied. Many companies engaged in mine expansions and new developments are actively seeking mining engineers and BMR, despite repeated efforts, has not been able to recruit staff for the two vacant mining engineering positions.

A large amount of the Branch's work is a response to requests by our own and other departments and much of the work is done to strict deadlines. The increasing comprehensiveness and complexity of requests - and, consequently, of the reply - has exacerbated the effects of staff shortages and made it increasingly difficult to meet the deadlines. Another effect has been that little progress was made during the year with most of the Branch's programmed studies. Without additional manpower the Branch's ability to systematically analyse and draw conclusions from the large amount of information it holds is severely curtailed.

The reports which follow show that despite the problems it is experiencing the Branch's output during the year was considerable, although much of it was not readily apparent, going out either as intra-departmental or inter-departmental correspondence or incorporated into publications by the Department of National Development and Energy or other departments. My thanks for their efforts are due to all the staff involved.

MINERAL ECONOMICS SECTIONINTRODUCTION

The Section's two broad and inter-related functions, which it carries out more or less continuously, are to study the various sectors of the Australian mineral industry as well as to assess Australia's mineral reserves and resources. As a result of this work, by virtue of the information that it gathers and compiles, the Section is also able to respond to the many requests for information it receives from Government, the industry, and the public, as well as to publish information on a regular basis.

Although the Section's work concentrates on the Australian mineral industry and on Australia's mineral resources, the scope of its work, of necessity, also extends worldwide because of the industry's international character and its dependence on overseas markets for the sale of its products.

The Section's programmed mineral industry studies follow two main lines - commodity studies and special studies. On the basis of past experience about one-quarter of commodity specialists' time is spent on responding to requests for information, and this proportion is increasing. The requests come particularly from the Department of National Development & Energy, but also from other departments such as Trade & Resources, Industry & Commerce and Treasury, as well as from agencies such as the Industries Assistance Commission (IAC), the National Energy Advisory Committee (NEAC), National Energy Research Development & Demonstration Council (NERDDC), the Office of National Assessments (ONA) and a range of private-sector institutions including banks, the media, sharebroking houses, industry groups and, of course, companies in the industry.

Commodity studies of the Australian mineral industry are ongoing reviews of all aspects of mineral commodities, from exploration to final consumption; the spectrum includes production, transportation, processing and marketing. These studies, which on average accounted for 35 percent of commodity specialists' time in the 12-months ended 31 October 1980, generate the broad information base on which the Section relies to answer the many queries put to it, and from which it draws the information it publishes.

Normally commodity studies include the preparation of preliminary estimates of Australian resources of particular commodities, as well as revising such estimates each year; the results of such work are published on a routine basis. However, because of the increasing emphasis put on resource assessment because of BMR's evolving role, this work is being identified as a separate part of the Section's program.

Special studies of the Australian mineral industry focus on detail of a particular aspect of the industry generally, such as the industry's potential for further processing, or such studies review in detail particular aspects of a commodity. Detailed resource assessment studies of particular mineral commodities are a particular type of special studies, being identified as a separate part of the program. Special studies' other main distinguishing criteria is that such work is programmed. They therefore exclude the ad hoc work directed to the Section from outside BMR though such work, at times, requires very detailed and time consuming studies.

Officers of the Section, with assistance from the Australian Bureau of Statistics (ABS), are jointly the authors of the Australian Mineral

Industry Annual Review and the Australian Mineral Industry Quarterly; details of publications, and of papers published in the Quarterly or outside journals, as well as other releases such as Records, are listed separately in this summary. Because much of the Section's work depends on statistical data, it maintains a close working relationship with ABS, through the Statistical Officer (Mining), an ABS Officer outposted to the Section. By arrangement with ABS, the Section also carries out some small special statistical collections. The results of these collections are issued by BMR as statistical bulletins for mineral sands, copper-lead-zinc, tin (quarterly), and sulphur-sulphuric acid-superphosphate (annually); a prices bulletin is issued monthly. The Section also prepares a series of 14 Preliminary Annual Summaries providing preliminary but timely statistics and commentary on developments concerning the more important commodities.

COMMODITIES STUDIES OF THE AUSTRALIAN MINERAL INDUSTRY

The fundamental importance of commodity studies to the Section's work is indicated by the 42 percent of the whole Section's total staffed man-days in 1980 (year ended 31 October) charged to this work; of only commodity specialists' total staffed man-days, 28 percent was accounted for by this work. The wide coverage of commodity studies is indicated by the Annual Review's 62 commodity chapters, only three of which (petroleum, oil shale, and helium) are prepared outside the Section by other Branches.

Although the emphasis is on monitoring Australian developments, coverage is extended worldwide because the Australian industry is an integral part of the world industry and because Australia ranks so prominently among world suppliers of various mineral commodities, particularly bauxite, coal, iron ore, lead, mineral sands, nickel, tungsten and zinc, and as a potentially large supplier of uranium oxide.

Much of the information held in the Section has come from both government and industry sources, in Australia and overseas, as well as from many trade and technical journals, newsletters, and newspapers. The Section maintains a specialised library, outposted from BMR's main library, and has indexed and referenced its own material. Some bibliographic references, particularly those pertaining to the Australian industry, have been provided as input to the Australian Earth Sciences Information System (AESIS). The responsibility for much of this indexing and information management work has been allocated to a Science 1 position which has been unfilled for most of the year. As a consequence the Section's efficiency in retrieving information for its work has been impaired.

Commodity specialists also maintain personal contact with their counterparts in government and industry. This is achieved mainly through field visits to companies' operations as well as to States' mines departments and geological survey offices. The Section gratefully acknowledges the co-operation and goodwill given to it by these organisations. In an overseas visit of particular interest I. McLeod, as one of four BMR officers making up a party of 10 Australians, visited mines and related agencies in China for five weeks from early October to 6 November 1979; all delegation members contributed to a report on the visit. Aspects of the tour were also presented by I. McLeod and A. Renwick at BMR's Ninth Annual Symposium. Information is also exchanged with visitors to the Section, of which there were about 120 in 1980. Generally prominent among the range of callers are private company executives and scientists, representatives of foreign legations, and Australian government officers. In 1980 the list also included US Congressman R. Wilson and USBM Chief Scientist, T.A. Henrie.

Commodity specialists also participate in industry symposia, conferences, and courses, not only to keep up with latest developments, but also to make available the Section's expertise via discussion or the presentation of papers - details of participation are listed separately. The Section also provides a speaker each year to the government-sponsored Industrial Mobilisation Course.

SPECIAL STUDIES OF THE AUSTRALIAN MINERAL INDUSTRY

The Section's capacity to carry out programmed special studies was, as in the previous year, severely limited by its commitment to respond immediately to the many ad hoc enquiries put to it from sources outside BMR, but particularly from its own Department; such work is detailed separately. In 1980, opportunities were further restricted by staff turnover, staff ceilings, and other constraints. A study of the various methodologies of resource assessment and development of methods for assessing inferred reserves was set back by the loss of a specialist geostatistician, Dr J. Cottle, who resigned in May 1978. Nevertheless, a detailed tin resource assessment is presently being carried out by Mr Perkin with assistance from Mining Engineering and ADP Sections. Computational aspects of the assessment are complete and show that identified economic tin resources at 30 June 1980 were only slightly greater than preliminary estimates made previously and published in AMIQ 32(4). Results of the detailed assessment are, in the first instance, to be reported as a BMR internal report. R. Pratt also continued with a detailed assessment, begun in 1979, of Australia's identified chromite resources. Although all data for this work is now gathered, it remains for this information to be analysed and compiled. However, early indications are that Australian identified resources of chemical and metallurgical grade chromite are appreciably greater than hitherto believed. The results of this work will be reported initially as an internal report and subsequently in the Quarterly.

The whole Section contributed to a paper 'Australian mineral export forecasts to 2000' published in Resources Policy, June 1980. With mineral exports now accounting for about 35 percent of Australia's total export earnings, the paper presented forecasts of exports for 14 commodities (black coal, iron ore, bauxite, alumina, aluminium, copper, lead, zinc, nickel, tin, manganese, ilmenite concentrates, rutile concentrates and zircon concentrates) which account for over 90 percent of earnings from mineral exports. The paper concluded that notwithstanding the uncertainty about mineral sands and tin reserves, Australia's mineral resource base is adequate to meet forecast exports as well as domestic demand for the ensuing 20 years.

AD HOC SERVICES

Man-power statistics confirm that an increasing proportion of commodity specialists' time has had to be diverted away from commodity and special studies to dealing with the many enquiries and more formal requests for professional assistance directed to the Section. In 1980 (12 months ended 31 October) 29 percent of commodity specialists' time was spent on unprogrammed ad-hoc work originating outside BMR. The increased demand for data and information pertaining to the mineral industry reflected not only a requirement for more detailed and considered responses but also a widening range of sources of inquiries. Although much of the ad-hoc work emanates from BMR's own Department of National Development & Energy, practically every department, but particularly Trade & Resources, Industry & Commerce, and Treasury (Foreign Investment Review Board - FIRB), made some call on the Section's resources, as is the case each year. As well as government departments, government instrumentalities such as Industries

Assistance Commission (IAC), Office of National Assessments (ONA), Trade Practices Commission (TPC), Australian Industry Development Corporation (AIDC), Export Development Grants Board, as well as National Energy Advisory Committee (NEAC) and National Energy Research Development and Demonstration Council (NERDDC) also made calls on the Section. Other regular users of the Section's expertise include foreign legations, financial institutions - including sharebroking establishments - many companies operating in the industry, as well as schools, the media and private citizens. Although many queries are answered orally, thus requiring little preparation, others require detailed and time-consuming preparation and written presentation. The substance and nature of enquiries has invariably tended to reflect levels and directions of government policy emphasis and commercial activity and in 1980 such emphasis was directed mainly to the commodities coal, aluminium, gold, diamonds, and refractories.

The Section also prepares papers, briefing notes, and other material required for various commissions of enquiry and Australian and international commodity groups such as UNCTAD Committee on Tungsten, International Lead & Zinc Study Group, International Bauxite Association, the International Tin Council, and CIPEC (Conseil Inter-gouvernemental des Pays Exportateurs de Cuivre). During the year under review various officers also provided input to the Senate Standing Committee on National Resources (Thomas Committee), a Joint Parliamentary Committee on Foreign Affairs and Defence - Sub Committee on Southern Africa, a World Energy Conference paper on solid fossil fuels, and the Law of the Sea Conference, and on exports of strategic minerals to USSR.

During the year, a considerable amount of the Section's time was taken up in preparing contributions to various (Australia/Japan, Australia/Korea, Commonwealth/State) Joint Study Groups on Raw Materials Processing. Early in the year the Departments of National Development & Energy, Trade & Resources, and Industry & Commerce, published two volumes:

- General Resource Position and Related Government Policies, and
- Profiles of Selected Commodities

of a presentation entitled "Potential for Raw Material Processing in Australia". Profiles of selected commodities comprised printed separates Mineral sands, Copper, Tin, Lead, Zinc, Tungsten, Nickel, Iron and steel, Ferrosilicon, Ferromanganese, Wool processing, Fish processing, and Cement, all except the last three of which were extensively revised in the Section before publication. These published reports were used extensively, and indeed specifically prepared for a Raw Material Standing Committee meeting in Korea. Interest in Australian mineral resources, in this case with emphasis on industrial minerals - specifically refractory materials - together with Australia's growing competitiveness in the field of energy-intensive mineral processing, has also led to the formation of a Commonwealth Liaison Group on Raw Material Processing for serving two (Australia/Japan and Australia/Korea) Joint Study Groups on Raw Materials Processing. The Commonwealth Liaison Group, responding to Japan's interest in Australia as a possible supply source of refractory materials, but in particular refractory grade bauxite, chromite, fire clay and magnesite, requested the Section's assistance in preparing a draft report, presently being circulated for comment, entitled "Australian refractories industry - Potential for expansion". As part of this report the Section was requested to prepare estimates of Australia's resources of refractory materials particularly refractory-grade bauxite, chromite, fire clay and magnesite. Given the Australian industrial minerals' industry structure and modus operandi - compared to the highly capitalised, export oriented metals

sector (and coal) the industrial minerals sector comprises a greater number of smaller operators, all tied mainly to domestic markets - as well as these minerals' hitherto lower priority ranking for calls on the Section's resources, relatively little information was readily available. This necessitated additional work, some of which, in view of the Section's stretched resources, was purchased from AMDEL on a client basis. In view of the clear indications of a broad-based development of Australia's mineral industry in the decade ahead, the Section's future program includes preparing preliminary estimates of Australia's resources of its lesser-known industrial minerals.

The Section also prepares forecasts - on mineral export income for Department of Trade & Resources and on employment prospects in the industry for Department of Employment & Youth Affairs. Interest in this sort of information seems to be increasing as three additional enquirers, Department of Industry & Commerce, Bureau of Agricultural Economics and the South African Embassy, also requested forecasts of mineral exports.

OTHER WORK

Microfilming of the Section's holding of company Annual Reports is now complete except for current year reports; generally speaking, the series in stock for most companies was from about the mid 1960's or later. In exchange for a copy of the Section's set of microfilmed reports from mining companies, the Section has also acquired, from the Australian Graduate School of Management, a set of microfilmed reports of industrial companies.

Work is also proceeding on compiling historical metal prices for computer plotting and manipulation. Presently daily prices back to 1972 are on magnetic tape. Earlier prices will probably be taken for monthly periods and added to the series. The completed series will provide a useful basis for statistical analyses of commodity price and market trends.

STAFF

Staffing at 31 October 1980 was as follows:-

Science 5 (Mineral Economist)	I. McLeod
Science 4 (Mineral Economist)	D. Perkin
Science 4 (Mineral Economist)	A. Driessen
Science 3 (Mineral Economist)	A. Gourlay
Science 3 (Mineral Economist)	vacant
Science 2 (Mineral Economist)	R. Pratt
Science 2 (Mineral Economist)	N. Knight
Science 2 (Mineral Economist)	M. Huleatt
Science 2 (Mineral Economist)	C. Mock
Science 1 (Geologist)	vacant
Clerk Class 4	S. Westerhuis
Clerk Class 4	S. Styles
Clerk Class 2/3	R. Weber
Clerical Assistant Grade 4	M. Santosuosso.

G. Hillier retired in November 1979 and was replaced by M. Huleatt in April 1980. K. Patterson resigned from BMR in April 1980 and was replaced by C. Mock in September 1980.

R. Pratt is acting in the vacant Science 3 position.

A Clerk Class 8 continues to be outposted to the Section from ABS, as Statistical Officer (Mining); the position was held by L. Wright throughout the year.

J. Gilmore resigned from BMR in January and was replaced by S. Styles; the vacated Clerk Class 2/3 was filled by R. Weber, whose vacated position was then filled, in August, by M. Santosuosso, formerly of the Department of the Capital Territory.

Even though several positions were filled early in the year, two Mineral Economist positions in effect remained vacant throughout the year.

SYMPOSIA, CONFERENCES, LECTURES, COURSES

Details of Section officers' participation and attendance during the year ended 31 October 1980 are shown below:

Lectures to meetings and conferences

- . AMF residential course 'Exploration Management', Adelaide, 2-18 March 1980. D. Perkin was invited to assist the course director, Professor Rex Davis, in the presentation of his course. Mr Perkin delivered a paper on exploration strategy entitled 'Commodity targets'; in addition, D. Perkin and J. Erskine (formerly of BMR's Mining Engineering Section) prepared detailed notes for a paper 'Incentives and disincentives in exploration and development of Australia's petroleum resources', delivered at the course by J. Carter, Department of National Development & Energy.
- . Industrial Mobilisation Course, sponsored by the Department of Defence. This course was held in Sydney 3-4 March 1980, in Brisbane, July 1980, and in Melbourne, 4 August 1980. A paper on the mineral resources of Australia was presented at the Sydney session by I. McLeod and at the Brisbane and Melbourne sessions by J. Ward.
- . International Training Course in Exploration and Mining of Mineral Sands, conducted by WAIT-AID Ltd, in conjunction with the Australian Development Assistance Bureau, Perth, March 1980. J. Ward, a member of the co-ordinating committee, opened the course and delivered two papers: "The Australian mineral sands industry and its resources."
- . BMR Symposium, Canberra, 29-30 April 1980. A. Driessen delivered a paper on mineral export forecasts to the year 2000 (also presented earlier at BMR Tuesday lecture series).
- . BMR Symposium, Canberra, 29-30 April 1980. I. McLeod delivered a paper on mining practice in China, based on his recent visit to that country. (Also presented earlier at BMR Tuesday lecture series).
- . Secondary school teachers' inservice training course "Mining and Australia's mineral resources", conducted by Earth Resources Foundation, University of Sydney, 11-17 May 1980. I. McLeod presented a paper entitled "Minerals in NSW and Australia".

- . Reserve Bank Overseas Trade Course, Sydney, 20 May 1980. I. McLeod delivered a paper called "Australia's energy and other natural resources - 1980 and beyond".
- . BMR Tuesday lecture series, 27 November 1979. D. Perkin gave a talk entitled "Economic significance of models of uranium ore genesis".

Attendance at conferences

- . Fourth Geological Convention, organised by Geological Society of Australia, Hobart, 9-18 January 1980 (D. Perkin).
- . AMIC Annual Symposium, Canberra, 19 May 1980 (I. McLeod).
- . ANZAAS Conference, Adelaide, 13-16 May 1980 (I. McLeod).
- . Australian Coal Association Conference, Surfers' Paradise, 13-17 April 1980 (M. Huleatt).
- . "National energy policy and its impact on public administration", senior management conference sponsored by the Public Service Board, Canberra, 26 June 1980 (D. Perkin).
- . 'Progress in Coal Geology', GSA conference, Sydney, 26-28 August 1980 (M. Huleatt).
- . Science, Technology and Government, senior management conference sponsored by the Public Service board, Canberra, 23 September 1980 (I. McLeod).
- . 17th Session CCOP, Bangkok, Thailand, 4-17 November 1980; J. Ward attended as special advisor to the committee.

Attendance at training courses, workshops

- . "Geological environments and structural control of ore deposits", given by Tim Hopwood in BMR, 7-18 November 1979 (D. Perkin).
- . "The nature, origin, and exploitation of marine manganese nodules, and metalliferous sediments", Workshop conducted by Monash University, Melbourne, 27-30 November 1979 (A. Driessen).
- . "The role of statistics in labour market planning and policy formation", 1-day seminar, 27 February 1980, ANU, Canberra (A. Driessen).
- . AMF course "Mineral/commodity economics", Adelaide, 23 June-7 July 1980 (N. Knight).
- . "Resource Economics", conducted by Australian Graduate School of Management, University of NSW, Sydney, 15-17 July 1980 (D. Perkin).
- . "Regional mineral resource appraisal", presented by Esso distinguished lecturer, Dr F. P. Agteberg, at Earth Resources Foundation, Sydney, 11-15 August 1980 (D. Perkin).
- . "Technological and economic forecasting, Australian Institute of Management workshop, Sydney, 26 September 1980 (A. Driessen).

MINING ENGINEERING SECTION

The Mining Engineering Section is a small mining research and advisory group. The mining engineers provide information and advice to Government, e.g. on mine feasibility and profitability, methods of mining, recommendations for development programs, and requests for mining assistance. The Section also provides assistance to the mineral resource assessment groups of BMR in their compilation of economic and subeconomic mineral resources, by calculating capital and operating costs of mining projects. In co-operation with the State mines departments, the Section participates in the compilation of a standard mine-operating Code of Practice. A schedule of State mining royalties and Australian Government mining tax provisions is kept up-to-date, together with State mining legislation amendments. In 1980 the Section further extended the use of computers in mine studies.

STAFF

Occupied positions (as at 31 October 1980)

Engineer Class 5 ... E.G. Timoney

Mr Erskine, Engineer Class III age retired in July of this year.

New duty statements were written for two class III Mining Engineers.

- (i) To reflect the changes of duties that had taken place over the past years within the existing position No. 1215.
- (ii) To outline the duties for a new engineers position No. 1758.

Both duty statements were approved by the Public Service Board.

CONFERENCE OF STATE MINING ENGINEERS

The Conference was held at the South Australian Department of Mines & Energy, Adelaide, from 31/3/80 to 3/4/80. Aspects of mine operation and mine safety were discussed, including refiring of missed holes in large pillar blasts, and high speed development ends.

E. Timoney acted as secretary to the conference, and compiled minutes of the meeting for distribution to all States and to the Australian Minerals & Energy Council (AMEC).

VISITS TO MINES

Mr Timoney visited Queensland and examined the underground workings at Mt Isa Mines and their hoisting and stope fill station. The open pit and treatment plant at Mary Kathleen were visited, together with the underground development and pilot cement copper plant at Gunpowder. He also visited Sydney, Melbourne, Adelaide, and Perth, contacting State mines departments and geological surveys together with the major suppliers of crushed rock, sand, and gravel, to gather information for a construction materials resource and reserve assessment. Mr Timoney also visited the BHP mining office, the Iron Knob and Iron Baron mines at Whyalla together with the Wallaroo Copper mine at Burra, and the Mintaro slate mine.

Mr Erksine visited the two operating underground mines at Peko Mines Ltd, and the Nobles Nob gold mine open pit at Tennant Creek. He also visited for four uranium operations (Ranger, Nabarlek, Jabiluka and Koongarra) in the Alligator River area, NT.

GOOGONG DAM PROJECT

While the 'Project Executive Board' is still extant, it did not meet during the year.

GENERAL ASSISTANCE TO GOVERNMENT DEPARTMENTS

Advice was given to:

- . Department of Transport re the affect of possible airport sites on Sydney's clay and coal reserves.
- . The Department of National Development & Energy and the Northern Territory Treasury on mineral royalties.
- . The CSIRO on cut and fill stoping in Australia.
- . The NSW Department of Mines on TiO_2 production.
- . The Department of Industry and Commerce, on cost figures for capital items to include in their mine econometric model.
- . The Prime Minister's Department on asbestos recovery.
- . The Department of Trade & Resources on mine legislation, and cost and benefits of smelting and refining in Australia.
- . The Industries Assistance Commission on crushing, grinding and mineral separation.

Australian Development Assistance Agency

Mr Erskine assisted this Agency in a meeting with a Burmese mining delegation of senior mining engineers and geologists about the viability of a very large low grade gold prospect on one of their offshore islands. The prospect appears to warrant the expenditure required to prove or disprove the deposit.

Australian Atomic Energy Commission

Contact was maintained with the two mining engineers at the AAEC in Sydney in discussion and correspondence about uranium costs and problems.

Bureau of Industry Economics

Further input and checking was done on iron ore and uranium mining cost and mining methods for the B.I.E. project on the effects of mining investment on the Australian manufacturing industries.

RESOURCE ASSESSMENT

Geostatistics for ore reserve calculation

Due to other commitments regretablely no progress was made on this subject.

Mining cost assessment

Mr Timoney expanded the multipurpose mine assessment computer program to show mine construction period, and calculate Present Value for each year of mine life.

Assessment of Australian tin resources

Mr Erskine assisted Mr Perkin, Mineral Economist, with an Australia wide tin survey. He (Mr Erskine) outlined a chart of tonnage, capital cost, and operating cost for different mine annual tonnage throughput. He then undertook the economic classification for each deposit. He also graphed the cut off grade vs viable grades for the different mine types above.

Assessment of Australian chromite resources

Mr Erskine also collaborated with Mr Pratt, Mineral Economist, in a survey of Australian resources of chromite, outlining the economic grades of each deposit for its resource classification.

SYMPOSIA, CONFERENCES, COURSES, LECTURES

Mr Timoney prepared and delivered three one-hour lectures on mining law to geology students at the Reid College of Technical and Further Education. He also prepared and delivered a paper on 'Current and Future Reserves of Construction Material in Australia' to the Australian Institute of Quarrying. This paper was extremely time consuming and necessitated visits to Melbourne, Sydney, Adelaide and Perth. With the aid of the ADP Section computer programs were developed which calculated and plotted the regression lines and analysed the production data.

Mr Erskine delivered a lecture 'The effects of the new uncertainties on mining feasibility studies' at the BMR Tuesday lecture series. He also delivered a lecture 'The Effect on Ore Reserves of Uncertainties in Prices and Cost' at the Aust. I.M.M. Sydney Branch symposium on 'The Statement and Estimation of Ore Reserves'. He also wrote an article on ore reserves for the BMR Yearbook.

AUSTRALIAN MINERAL INDUSTRY ANNUAL REVIEW

The Section writes the following parts of the AMI Annual Review:

State mining royalties

Government assistance to the mining industry

Mining legislation (income tax & Federal Government levies)

Foreign investment policy.

VISITORS AND ENQUIRIES

During the year the mining engineers received many visitors and handled many enquiries from mining companies, individuals, Government Departments, Universities and other agencies, on a wide variety of subjects associated with mining techniques, mineral resources, underground support, mining equipment, mining feasibility calculations, etc. For example:

The Swedish Trade Commission requested information on mining operations in Australia between 10 000 and 100 000 tonnes per year.

A major Australian non metallics firm requested information on metal prices, royalties, and Australian sand reserves.

A senior exploration geologist called re method of calculating ore reserves from random drill holes.

A consulting mining engineer called for information on dredges.

A geologist called to discuss simplified methods of assessing economical potential of an ore body at early stage of exploration.

A state mines department officer called and discussed costs and approach to large scale underground operations.

A query on end of mine design and rehabilitation was answered.

A query on diamond drilling equipment and drilling costs per metre in Australia was answered.

A consulting mining engineer called for advice on narrow vein type mining, contract rates, estimates of production per man shift.

There are still many enquiries made by members of the public about State mining laws. All such enquirers were generally referred to the relevant State mines departments. Enquiries were also received about metal detectors, and what suggestions we might have for the use of them. Our suggestions can only be that fossickers clear their right to prospect an area with the mines department, once they have chosen areas to prospect which have a history of gold production.

PUBLICATIONS IN 1980

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WARD, J., in press - The Australian mineral sands industry: its development and future; and

WARD, J., in press - The Australian mineral sands industry and its resources. Both papers presented at International Training Course in Exploration and Mining of Mineral Sands, conducted by WAIT-AID Ltd, in conjunction with the Australian Development Assistance Bureau, Perth, March 1980.

MOCK, C.M., in press - Chapter 2. Outline of industry. 1. Outline of Australian mineral industry; and

DRIESSEN, A., in press - Chapter 10. Sulphur. Both in

WOODCOCK, J.T. (editor), Mining and Metallurgical Practices in Australasia. Maurice Mawby Memorial Volume. Australasian Institute of Mining and Metallurgy.

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- . 'Australian identified mineral resources, 1979'. Author - Mineral Economics Section, BMR (Volume 32, No. 4, 149-153).
- . 'Deep-sea manganese nodules in the Australian region - a review', by H.A. Jones* (Volume 33, No. 1, 10-23).

McLEOD, I.R., 1980 - Xihuashan wolfram mine In The Australian Geological Delegation to China, Bureau of Mineral Resources, Canberra (in press).

* Geological Branch