

1977/49  
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BMR PUBLICATIONS COMPACTUS  
(LENDING SECTION)

DEPARTMENT OF  
NATIONAL RESOURCES

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BUREAU OF MINERAL RESOURCES,  
GEOLOGY AND GEOPHYSICS

RECORD 1977/49

1977



SUMMARY OF ACTIVITIES  
OPERATIONS BRANCH

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BMR  
Record  
1977/49  
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RECORD 1977/49

1977

SUMMARY OF ACTIVITIES  
OPERATIONS BRANCH

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## PUBLICATION AND INFORMATION SECTION

Head of Section : A. Renwick

K.M. Kennedy continued to act as Head of Section until A. Renwick resumed duty on 11 July. Since then, A. Renwick has acted as Assistant Director Operations on several occasions, during which W.H. Oldham has assumed control of the Section.

The publication program was sustained throughout the year, although there are now some edited texts ready for the printer which are being stockpiled until funds for printing become available.

The distribution of publications on an exchange or official use basis was reviewed in conformity with new guidelines prepared by BMR in co-operation with AGPS.

Submissions were made to the IDC on Pricing Policy for Government Publications, and to the Joint Parliamentary Committee on Publications Enquiry into AGPS. Verbal evidence was also given to the latter Committee.

Advances were made in the field of micrographics but much more development work remains to be done.

Indexing of information sources was extended, using both computer based and card systems.

### Publication Sub-section

Supervisors : H.L. Higginson, W.H. Oldham

All positions remained filled in 1977, with A.G.L. Paine seconded to the Sub-section. Editors mainly continued with their same areas and disciplines of responsibility, but minor changes were necessitated by workloads.

The interruption to normal editing caused by the IGC in 1976 was largely overcome in 1977, despite a substantial increase in the number of papers for external journals. At the end of October 1977 there were 5 Bulletins and 2 Explanatory Notes awaiting editing.

The shortage of cash and commitment money for publications in 1976-77 caused a significant stockpile of manuscripts ready for printing in the first half of the financial year. This has led to the large number of publications now in the various stages of printing. This, in turn, will cause some manuscripts ready for printing to be stockpiled during 1977-78.



The 'Guide to Authors in BMR' was issued in April. The guide is in loose-leaf form to enable additions and amendments to be made easily. It was compiled by J.F. Truswell, with contributions from other members of the Publication and Information Section. A limited number of copies has been distributed outside the Bureau, mainly to geological surveys involved in joint studies with BMR.

The BMR Journal of Australian Geology and Geophysics continued to be issued each quarter, with J.F. Truswell as the editor. Sales of the journal are still rising, and currently about 700 copies of each issue are sold.

Three issues of the computer printout of BMR maps and manuscripts were made by the end of September. Improvements were made to the layout, mainly by standardising abbreviations. Delays between dates of compilation and issue reduced the value of the printout, but they are being overcome.

I.M. Hodgson took over the role of microfiche printing co-ordinator during the year. Unexpected problems arose with fiches for Bulletins and Reports, mainly in illustrations, title pages, and title strips, but some fiches have now been issued.

One unusual activity was a substantial involvement in editing the BMR Field Manual and the revised General Instructions compiled by B.M. Williams.

The Sub-section prepared a \$430 000 printing program for maps and manuscripts in 1977-78, for submission to the Minister for his approval. However, this has been pruned by about \$60 000 and Branch Heads have prepared priority lists for printing.

A.G.L. Paine and Mineral Resources Branch have reviewed the style and layout of the AMI annual and quarterly reviews, especially with a view to reducing printing costs. Discussions have been held with the AGPS design team and the BMR illustrator about both the AMI and the BMR annual report.

Members of the Sub-section represented the Branch at meetings of the Publications Review Committee, the Maps Committee, and the BMR Atlas Committee; they also attended meetings with the Australian Government Publishing Service (AGPS).

#### Information Sub-section

Supervisor : E.P. Shelley

#### Staff

P.A. Smith continued on special duties with the BMR Technical and Drafting Grades Review Team until 31 August. From 1 September he was seconded to the Planning and Co-ordination Section. Mrs L. Walraven continued with the Sub-section as Geologist Class 2 and acted vice Mrs M. Bartlett as Geologist Class 3 during the latter's absence on leave and furlough from 20 June to 21 October.

Miss V. Passmore joined the Sub-section on higher duties vice Mrs Walraven from 11 July to 21 October. Mrs E. Young was on furlough from 21 February to 15 July; Mr P. Hohnen acted in her position.

Miss E. Perceval (clerical assistant) was attached to the Sub-section on a part-time basis until July. No regular clerical support has been available since then. A review of procedures in August resulted in the task of maintaining the numerous mailing lists being taken over by the Publications Processing and Distribution Sub-section.

### General Services

Much of the group effort was directed towards the continuous flow of enquiries from Government industry, and the public. Enquiries range from requests for project material from school children to complex technical questions from industry. The former can be simply answered by sending BMR pamphlets. The latter may require considerable research and effort to obtain the desired information.

The Sub-section co-ordinated BMR contributions to various publications including the A.A.E.C. Annual Report and the Newsletter of the NSW Committee for the Co-ordination of Government Geological Programs. The group also revised articles for the Australian Information Service, provided updated material for the Minister's Background Brief, and completed various questionnaires and returns on BMR activities.

A summary of BMR geological and geophysical information in the Pine Creek Geosyncline was compiled in expectation of a demand for this information following announcement of the Government's uranium policy.

Media releases were prepared on various activities, data releases, and publications.

Since mid-July, a watching brief has been kept on U.N. activities in the earthsciences and mineral resources areas relevant to BMR. This will enable officers attending ESCAP, CCOP and UNESCO meetings to be fully briefed on BMR's and Australia's position.

### Information Systems

A computerised index for BMR slides and photographs (PHODX) was developed during the first half of the year. A small trial data base was successfully interrogated although further development is required to the output programs. PHODX has been set up on the HP-2100 computer using the Hewlett Packard IMAGE data base management system.

A subject/area card index to BMR Records was commenced in August. All Records have been indexed by subject and 1:250 000 map sheet. This card index will form the basis of a more comprehensive computer index to Records and BMR publications. Specifications for this index are being prepared.

In addition, open file Records are also indexed for inclusion in AESIS (Australian Earth Sciences Information System) which is operated by the Australian Mineral Foundation. BMR provided \$5000 for AESIS computing costs in 1976/77, and a further \$5000 has been provided for 1977/78.

A highlight of the year was the issue of the first microfiche Records and Reports. The program of putting previous Records onto microfiche did not advance very far owing to work priorities within the Sub-section. The long-awaited period contract for the provision of microfilm services was let in May and this has speeded up various trial jobs and information storage and retrieval projects.

Funds provided in 1976/77 for purchase of microfilm equipment were severely cut, however it was possible to obtain 10 Bell & Howell SR-900 single lens microfiche readers which were delivered early in the year. Further funds were provided in 1977/78 and the following units were purchased: 10 SR-900 dual lens readers (including one with a dual carriage and one with a roll film attachment), 7 GAF 78-10 single lens COM readers, an OP-10 microfiche duplicator, and a 'Spacemaster' reader/printer. Further purchases of readers are proposed for 1978/79 and subsequent years as part of a program to make readers readily accessible to all BMR staff.

Developments relevant to national scientific and technical information systems were kept under review during the year. The Sub-section continued to provide consultancy services for BMR groups requiring advice on information storage and retrieval and the use of microfilm.

### Publications

Amendment sheets for Part 1 of the List of Publications were issued during the year. Proposals are in hand for a new format for the List of Publications which will enable it to be issued more regularly.

Two new brochures - 'The Geological and Geophysical Activities of BMR in Australia and Antarctica' - were issued in July. These brochures replace the former 'Pictorial Index of Activities' which became uneconomic to produce. It is planned to issue the next edition of these brochures in January 1978 and subsequently at yearly intervals.

Part 7 of the List of Records, a revised list of authors of Records, and a list of papers by BMR officers in external journals were compiled during the second half of the year. It is proposed to issue all of these as microfiche.

Two of the brochures in the schoolchild-oriented series were revised and reprinted. Lack of funds has prevented further reprinting and alternative methods of production are being studied.

The 'List of Coming Events' and one supplement were compiled and distributed within BMR and to some other organisations and individuals.

Distribution of BMR Records and oversight of the Open File system continued throughout the year.

### Symposium and Lectures

The 6th BMR Symposium was held on 3-4 May and was attended by 160 persons from industry, tertiary institutions, and State surveys. Seventeen papers were given by BMR officers and a panel discussion was held on the topic 'What maps are needed now?'. The Harold Raggatt Award for the best paper was awarded to J. Mutter ('The margin south of Australia and the problem of initial rifting'). E.P. Shelley gave a paper on 'Access to BMR information' on the second day of the Symposium.

A workshop on the Pine Creek Geosyncline was held on 5 May and was attended by 120 persons.

A program has been drawn up for the 7th Symposium to be held on 2-3 May 1978. Two half-day workshops are proposed for 4 May.

The Sub-section organised the in-house Tuesday morning lecture series which was held from January to April and November to December.

### Displays and Visits

The foyer displays were changed in July to feature PNG volcanoes and the Gravity Map of Australia. The three wall case displays from the 25th I.G.C. were installed in the north and B-block foyers. These currently feature uranium, tektites, and Antarctica. A display was mounted at the Academy of Science during the BMR Symposium and featured aspects of some of the talks that were given and material to support the panel discussion.

A collection of BMR maps was sent to the National Museum of Wales for an exhibition of geoscience mapping.

Plans are in hand for a BMR exhibit at the 2nd Circum-Pacific Energy and Mineral Resources Conference in Hawaii in mid-1978.

The Sub-section supervised a number of school visits to BMR during the year and visited several schools and tertiary institutions to provide career advice.

An itinerary was arranged for the Minister for National Resources, Rt. Hon. J.D. Anthony, when he visited BMR on 11 March.

Publications released during period 1/10/76 to 30/9/77

Bulletins

- 162. PAGE, R.W. - Geochronology of igneous and metamorphic rocks in the New Guinea highlands.
- 163. MARSHALL, J.F. - Marine geology of the Capricorn Channel area.
- 164. DENHAM, D. - Seismicity and earthquake risk in eastern Australia.
- 168. SWEET, I.P. - The Precambrian geology of the Victoria River Region, Northern Territory.
- 173. PARKINSON, W.D.\* - Analysis of the geomagnetic diurnal variation during the International Geophysical Year.
- 176. JOPLIN, G.A.\* - Indexes to the analyses of calcium and magnesium carbonate rocks and of other sedimentary rocks rich in either calcium, magnesium, or phosphorus.
- 183. MAYNE, S.J. - Australian platform-cover correlation charts - Adelaidean to Recent.

Reports

- 183. BRANSON, J.C., MOSS, F.J., & TAYLOR, F.J. - Deep crustal reflection seismic test survey, Mildura, Victoria and Broken Hill, New South Wales, 1968.
- 196. Geological Branch, Summary of Activities, 1976.
- 197. McKIRDY, D.M. & HORVATH, Z. - An integrated scheme for the laboratory analysis of oil, natural gas, and petroleum source rocks. (Microfiche).

Australian Mineral Industry Reviews

Australian Mineral Industry 1975 Review

Australian Mineral Industry Quarterly Review: Vol. 28, No. 4;  
Vol. 29, Nos. 1, 2, 3/4.

BMR Journal

Vol. 1, No. 4; Vol. 2, Nos. 1, 2, 3.

Petroleum Newsletters

Nos. 66, 67, 68/69.



Mineral Resources Report

No. 7 Australian tin deposits, compiled by J.A. Ingram.

1:250 000 Geological Maps and Explanatory Notes

BLAKE, D.H. - Webb, W.A. (SF/52-10)  
 BLAKE, D.H., PASSMORE, V.L. & MUHLING, P.C.\*\* - Billiluna, W.A. (SE/52-14)  
 BLAKE, D.H. & YEATES, A.N. - Stansmore, W.A. (SF/52-6)  
 BUNTING, J.A.\*\* & BOEGLI, J.C.\*\* - Minigwal, W.A. (SH/51-7)  
 BUNTING, J.A.\*\* & VAN DE GRAAF, W.J.E.\*\* - Cundeelee, W.A. (SH/51-11)  
 GRIMES, K.\*\* - Holroyd, Qld (SD/54-11)  
 GRIMES, K.G.\*\* & WHITAKER, W.G.\*\* - Walsh, Qld (SE/54-4)  
 GOWER, C.F.\*\* & BOEGLI, J.C.\*\* - Rason, W.A. (SH/51-3)  
 GOWER, C.F.\*\* & BUNTING, J.A.\*\* - Lake Johnston W.A. (SI/51-1)  
 HODGSON, I.M. - The Granites, N.T. (SF/52-3)  
 KENNEWELL, P.J. - Yowalga, W.A. (SG/51-12)  
 KENNEWELL, P.J. - Wanna, W.A. (SH/52-2)  
 MUHLING, P.C.\*\* & LOW, G.H.\*\* - Yalgoo, W.A. (SH/50-2)  
 ROBINSON, G.P., JAQUES, A.L. & BROWN, G.M. - Madang, PNG (SB/55-6)  
 SMART, J. - Weipa, Qld (SD/54-3)  
 SMART, J. - Aurukun, Qld (SD/54-7)  
 SMART, J. & BAIN, J.H.C. - Red River, Qld (SE/54-8)  
 STEWART, A.J. - Mount Theo, N.T. (SF/52-8)  
 THOM, R.\*\* & BARNES, R.G.\*\* - Leonora, W.A. (SH/51-1)  
 THOM, R., LIPPLE, S.L.\*\* & SANDERS, C.C.\*\* - Ravensthorpe, W.A. (SI/51-5)  
 VAN DE GRAAF, W.J.E.\*\* - Vernon, W.A. (SH/52-1)  
 WILLIAMS, I.R., GOWER, C.F.\*\* & THOM, R.\*\* - Edjudina, W.A. (SI/51-6)  
 WILLMOTT, W.F.\*\* & POWELL, B.S.\* - Torres Strait-Boigu-Daru, Qld (SG/54-11/12, SC/54-7 and SC54-8)  
 WHITAKER, W.G.\*\* & GIBSON, D.L. - Ebagoola, Qld (SD/54-12)  
 WHITAKER, W.G.\*\* & GIBSON, D.L. - Coen, Qld (SD/54-8)  
 YEATES, A.N. - Helena, W.A. (SF/52-5)

Preliminary Geological Maps

1:100 000

Burt, N.T.  
 Cahill, N.T.  
 Field Island, N.T.  
 Gilruth, N.T.

Kennedy Gap, Qld  
 Laughlen, N.T.  
 Seigal, N.T.

1:250 000

Georgetown, Qld  
 Morris, W.A.  
 Percival, W.A.  
 Runton, W.A.  
 Ryan, W.A.

Sahara, W.A.  
 Sepik, PNG  
 Tabletop, W.A.  
 Ural, W.A.  
 Wilson, W.A.

1:1 000 000

Carpentaria, Karumba, and part Laura Basins, Qld

\* indicates author is a former member of BMR staff

\*\* indicates author has never been a member of BMR staff

Other Geological Maps

Geology of Australia 1:10 000 000

1:250 000 Total Magnetic Intensity MapsCape Melville, Qld  
Cooktown, Qld  
Ebagoola, QldHann River, Qld  
Holroyd, Qld  
Rutland Plains, Qld1:500 000 Bouguer Gravity MapsAna Branch, N.S.W.  
Bairnsdale, Vic  
Ballarat, Vic  
Balranald, N.S.W.  
Bathurst, N.S.W.  
Bega, N.S.W.  
Cook, S.A.  
Coompana, S.A.  
Cornish, W.A.  
Forbes, N.S.W.  
Helena, W.A.  
Horsham, Vic  
Lucas, W.A.  
Mallacoota, Vic/N.S.W.  
Mildura, Vic/N.S.W.  
Narromine, N.S.W.Nymagee, N.S.W.  
Nullabor, S.A.  
Ooldea, S.A.  
Ouyen, Vic  
Pinnaroo, S.A.  
Queenscliff, Vic  
Stansmore, W.A.  
Sale, Vic  
St Arnaud, Vic  
Swan Hill, Vic/N.S.W.  
Sydney, N.S.W.  
Tallangatta, Vic/N.S.W.  
Wagga Wagga, N.S.W.  
Wollongong, N.S.W.  
Warragul, VicRecords issued on open file during period  
1/10/76 to 30/9/77

- 1974/122 (Microfiche No. MF6). SHACKLETON, M.S.\* - Stream sediment geochemical survey, Brindabella 1:100 000 Sheet area.
- 1975/2. DERR, D. - The effects of finite magnetometer bandwidth on a point source aeromagnetic anomaly.
- 1975/78. NICHOLAS, E. - Summary of oil search activities in Australia and Papua New Guinea during 1973.
- 1975/79. STUART-SMITH, P.G. & HONE, I.G. - Shallow stratigraphic drilling in the Cahill and Jim Jim 1:100 000 Sheet areas, Alligator Rivers region, N.T. 1974.
- 1975/87. DARBY, F.\* - Bouguer anomalies of the Surat and Dalby 1:250 000 Sheet areas, Queensland, and their geological interpretation.
- 1975/88. SWEET, I.P. & SLATER, P.J.\*\* - Precambrian geology of the Westmoreland region northern Australia, Part I: Regional setting and cover rocks.
- 1975/92. GARDINER, J. - Heavy-mineral sands along the east coast of Australia.
- 1975/95. NICHOLAS, E. - Summary of oil search activities in Australia and Papua New Guinea during 1974.
- 1975/102. PAGE, R.W. & MAHON, M.W.\* - Isotopic age relationships of Precambrian rocks in the Granites-Tanami region, Northern Territory and Western Australia.

\* indicates author is a former member of BMR staff

\*\* indicates author has never been a member of BMR staff

- 1975/127. DUFF, B.A.\* - Factors in the deposition and mineralization of a black shale, west of Mary Kathleen, Queensland.
- 1975/155. WYATT, B.W. - Aeromagnetic survey of Perenjori, Ninghan, Bencubbin and Moora 1:250 000 Sheet areas, W.A. 1972.
- 1975/162. HUTCHISON, D.S.\* - Basement geology of the North Sepik region, Papua New Guinea.
- 1975/164. ROSSITER, A.G. - An orientation geochemical survey in the Georgetown area, North Queensland.
- 1975/169. UNGEMACH, P.\*\* - Great Artesian Basin Groundwater Project - Explanatory note on digital model package, Great Artesian Basin Simulation Model (GABSIM).
- 1975/175. HILL, R.M., WILSON, I.H.\*\* & DERRICK, G.M. - Geology of the Mount Isa 1:100 000 Sheet area, northwest Queensland.
- 1975/177. FINLAYSON, D.M. - East Papua crustal survey, October-December 1973 : operational report.
- 1975/180. PETKOVIC, P. - Geophysical results from the southwest continental margins of Australia.
- 1976/2. DOWNIE, D.H., LAMBOURN, S.S.\*, & OLSEN, J.E. - Airborne magnetic and radiometric survey, Bendigo, Wangaratta and Tallangatta, Victoria, 1972.
- 1976/3. PETTIFER, G.R., SMART, J., McDOWELL, M.I.\*, HORSFALL, C.L.\*, & GIBSON, D.L., appendix by IDNURM, M. - Cape York Peninsula geophysical and geological groundwater investigation, Queensland 1974.
- 1976/5. AUDIBERT, M.\*\* - Progress report on the Great Artesian Basin hydrogeological study 1972-1974.
- 1976/12. JONGSMA, D. - A review of marine geophysical investigations over the Lord Howe Rise and Norfolk Ridge.
- 1976/15. SEERS, K.J. - Notes on interfacing electronic equipment with special reference to the 1977 marine data acquisition system.
- 1976/16. SMART, J. - Auger drilling of beach ridge complexes, western Cape York Peninsula, 1973.
- 1976/18. WHITE, M.E.\*\* & YEATES, A.N. - Plant fossils from the northeastern part of the Canning Basin, Western Australia.
- 1976/24. CROWE, R.W.A.\*\* & TOWNER, R.R. - Permian depositional history of the Noonkanbah 1:250 000 Sheet area, W.A.
- 1976/33. SKWARKO, S. - Stratigraphic tables, Papua New Guinea.
- 1976/34. MITCHELL, J. - Precambrian geology of the Westmoreland region, Northern Australia. Part II : The Clifffdale Volcanics.
- 1976/36. JONGSMA, D. - A review of the geology and geophysics of Macquarie Island and the Macquarie Ridge complex.
- 1976/37. JONGSMA, D. - A review of the geology and geophysics of Christmas Island and the Christmas Rise.
- 1976/38. JONGSMA, D. - A review of the geology and geophysics of Cocos Island and Cocos Rise.
- 1976/39. JONGSMA, D. - A review of the geology and geophysics of the Queensland Plateau.
- 1976/40. JONGSMA, D. - A review of the geology and geophysics of the area around Mellish, Frederick, Kenn and Wreck Reefs and Cato Island.
- 1976/41. JONGSMA, D. - A review of the geology and geophysics of the Marion Plateau.
- 1976/42. GARDINER, J.E. - Heavy-mineral deposits along the coast of Victoria, Tasmania, and South Australia.

\* indicates author is a former member of BMR staff

\*\* indicates author has never been a member of BMR staff



- 1976/45. WALSH, J.J. - Annual report, Macquarie Island, 1974.
- 1976/48. GREGSON, P.J. & SMITH, R.S. - Mundaring geophysical observatory annual report 1975.
- 1976/49. FEEKEN, E.H.J. - The geological map as a public utility - how useful can a geological map be?
- 1976/50. TAYLOR, R.J.\* - Arltunga detailed aeromagnetic and radiometric survey, N.T. 1972.
- 1976/52. YOUNG, G.A. - Drill-hole logging and transient electromagnetic test surveys, Woodlawn deposit, New South Wales, 1973.
- 1976/53. BENNETT, D.G., GOLDSMITH, R.C. & POLAK, E.J. - Foundation investigations at Murrumbidgee bridge site no. 3 A.C.T., 1975 : engineering geology and seismic refraction survey.
- 1976/56. MCGREGOR, P.J. & RIPPER, I.D. - Notes on earthquake magnitude scales.
- 1976/57. DRAPER, J.J. - Progress report on Georgina Basin geochemistry-results of 1974 field season.
- 1976/58. PINCHIN, J. - Velocity analysis of two seismic sections across the Queensland Trough.
- 1976/59. WILLCOX, J.B. - Structure of the Bismarck Sea.
- 1976/61. PETTIFER, G.R. & TAYLOR, F.J. - Wewak geophysical survey for groundwater, PNG 1973.
- 1976/62. ABELL, R.S. - A groundwater investigation in Norfolk Island.
- 1976/63. BAIN, J.H.C., OVERSBY, B.S., WITHNALL, I.W.\*\* & BAKER, E.M.\*\* - Gilberton 1:100 000 geological Sheet: preliminary field compilation data sheets.
- 1976/64. JACOBSON, G. - Preliminary investigation of groundwater resources, Cocos (Keeling) Island, Indian Ocean, 1975.
- 1976/65. TILBURY, L.A. & WHITWORTH, R. - A guide to production of shot-point location using a digitizing table and computer.
- 1976/69. FURSTNER, J.M.M.\* - Googong pipeline investigation 1975-76: expected ground conditions for excavation.
- 1976/71. BENNETT, D.G. & JACOBSON, G. - Defence Force Academy site, Duntroon, A.C.T.: Investigation of subsurface, 1975.
- 1976/73. WATTS, M.D.\* & BROWN, F.W. - Gravity survey along seismic traverses in the northwestern part of the Eromanga Basin, Queensland, 1967.
- 1976/75. PETRUSHEVSKI, E. (compiler) - Wells and metres drilled for petroleum and development in Australia in 1975.
- 1976/78 (Microfiche No. MF7). ABELL, R.S. - A bibliography of groundwater recharge in Australia.
- 1976/82 (Microfiche No. MF4). MAYO, W.\* & LONG, K.\* - Documentation of BMR Geological Branch computer programs.
- 1976/83. MCGREGOR, P. - The adjustment and use of the proton vector magnetometer.
- 1976/84. TILBURY, L.A. - "Vema" cruise 33, Leg 1, over the southeast Indian Ridge, 17 November to 17 December 1975: observer's report.
- 1976/85. JONGSMA, D. - "Vema" cruise 33, Leg 2, in the southeastern Indian Ocean, 21 December 1975 to 17 January 1976: observer's report.
- 1976/86. PETKOVIC, P.\* - "Vema" cruise 33, Leg 4, over the Naturaliste Fracture zone, 23 February to 15 March 1976: observer's report.

\* indicates author is a former member of BMR staff

\*\* indicates author has never been a member of BMR staff

- 1976/87. STAGG, H.M.J. - "Vema" cruise, Leg 3, over the magnetic quiet zone south of Australia, 20 January to 19 February 1976; observer's report.
- 1976/77. BENNETT, D.G. & POLAK, E.J. - West Murrumbidgee geophysical survey, 1975.
- 1976/89. COLWELL, J.B. - Heavy minerals in the late Cainozoic sediments of southeastern South Australia.
- 1976/90. GEOLOGICAL BRANCH - Geological Branch summary of activities, 1976.
- 1976/91. GEOPHYSICAL BRANCH - Geophysical Branch summary of activities, 1976.
- 1976/92. MINERAL RESOURCES BRANCH - Mineral Resources Branch summary of activities, 1976.
- 1976/93. OPERATIONS BRANCH - Operations Branch summary of activities, 1976.
- 1976/94. PETROLEUM EXPLORATION BRANCH - Petroleum Exploration Branch summary of activities, 1.11.75 to 31.10.76.
- 1976/95. TOWNER, R.R., CROWE, R.W.\*\* & YEATES, A.N. - Notes on the geology of the southern part of the Canning Basin.
- 1976/97. MOORE, R.F. - Graphic presentation of magneti-telluric data.
- 1976/98. ROSSITER, A.G. & ARMSTRONG, K.J. - Soil sampling at the Big Reef and Two Micks gold mines, Forsayth, north Queensland.
- 1976/99. HONE, I.G. - Transient electromagnetic survey, Elura prospect, Cobar, New South Wales, 1974.
- 1976/100. POLAK, E.J. - Christmas Island (Indian Ocean) geophysical survey for groundwater, 1973.
- 1976/101. CRICK, I.H. - Shallow stratigraphic drilling in the Burnside Granite area, Batchelor 1:100 000 Sheet, N.T. 1975.
- 1976/102. RAMSAY, D.C. - Wodonga sand and gravel survey, Victoria, 1975-6.
- 1976/105. HORSFALL, C.L. - Tennant dam sites nos 2, 3: seismic investigations A.C.T. 1975/76.
- 1976/106. GOLDSMITH, R.C.M. - Murrumbidgee Park Drive, Tuggeranong A.C.T. geological investigation, 1976.
- 1976/107. WILLCOX, J.B. & EXON, N.F. - Depth and thickness maps for sedimentary sequences under the Exmouth Plateau.
- 1977/1. PETTIFER, G.R. & POLAK, E.J. - Kiewa River and Snowden's area (Murray Valley) geophysical survey for sand and gravel, Victoria, 1976.
- 1977/2. ZADOROZNYJ, I. & GUNN, P.J.\*\* - Melbourne area gravity survey, 1975.
- 1977/3. NOAKES, L.C. & WARD, J. - Mineral resources of Australia, 1977.
- 1977/4. WILSON, I.H.\*\*, DERRICK, G.M., HILL, R.M., DUFF, B.A.\*, NOON, T.A.\*\* & ELLIS, D.J. - Geology of Prospector 1:100 000 Sheet area, (6857), Queensland.
- 1977/5. FITZSIMMONS, D.B. - Chemical analytical results from rocks of the Golden Dyke Formation, Rum Jungle, N.T.
- 1977/6. HOHNEN, P.D. (compiler) - 6th BMR Symposium, Canberra, 3-5 May 1977. Abstracts.
- 1977/7. GREGSON, P.J. - Mundaring geophysical observatory annual report, 1976.

\* indicates author is a former member of BMR staff

\*\* indicates author has never been a member of BMR staff

- 1977/8. MOORE, R.F. - Screening and averaging magneto-telluric data.  
 1977/10. HONE, I. (compiler) - Bureau of Mineral Resources 1977 program.  
 1977/11. BENNETT, D.G. & RAMSAY, D.C. - Kingswood ammunition dump vibration tests, NSW, 1976.  
 1977/12. RAMSAY, D.C. - Seismic refraction survey in the area of the Belconnen Town centre, A.C.T., 1975.  
 1977/17. MURRAY, A.S. - Guide to the use and operation of Program CONTOR.

Data released through Government Printer  
copy service (1/10/76 to 30/9/77)

Arunta Block airborne geophysical survey - 36 maps.  
 Cootamundra 1:250 000 Sheet area airborne geophysical survey - 7 maps.  
 Darwin-Pine Creek region airborne geophysical surveys - 56 maps.  
 Duchess 1:250 000 Sheet area airborne geophysical survey - 7 maps.  
 Earthquake Risk Map of Australia - 1 map.  
 Magnetic Declination Map for the epoch 1975.0 - 1 map.  
 Officer Basin airborne geophysical survey - 6 maps.  
 Plumridge and Cundeelee 1:250 000 Sheet areas airborne geophysical survey - 4 maps.  
 Port Augusta 1:250 000 Sheet area airborne geophysical survey - 6 maps.  
 Westmoreland 1:250 000 Sheet area airborne geophysical survey - 1 map.  
 Yilgarn Block airborne geophysical survey - 7 maps.  
 1:26 000 geological compilation sheets for the Undoolya  
 1:100 000 Sheet area - 9 sheets.  
 1:1 000 000 total magnetic intensity contours - 47 maps.

LIBRARY

Librarian-in-charge : M.A. Thompson

Performance Statistics (November 1976 to October 1977)

Loans:	10 978	A fall of only 1% on last years figure in spite of the Library being closed one day each week for 9 months of the year.
Reference Searches:Total	510	This figure is for period November 1976 to mid-August 1977, when service was suspended.
for BMR officers:	305	
for others	205	

13.

Recall notices issued: 349

Serials Circulation: 4 590

Circulation suspended for 3 months  
On resumption and re-registration,  
demand for this service decreased  
considerably.

Inter-library loans:

Requested from BMR: 2 748

A rise of almost 25% on last year's  
figure.

Requested by BMR: 624

A fall of 8% on last year's figure

Accessioning:

Books 359

A rise of 36% on last year's  
figure.

Binding 112

A fall of 55%. Staff not available  
to prepare many volumes for  
binding.

Cataloguing (new and revisions):

Books, pamphlets and maps 1 030

A fall of 18% on last year's  
figures due to the time devoted by  
Mrs Murnieks this year to re-  
organization of monograph shelves  
and subject and author-title  
catalogues.

Serials 280

A fall of nearly 20% on last year's  
figures due to Mrs Thompson's dual  
role of Librarian-in-Charge and  
Serial Librarian.

Visitors to Library: 274

In spite of the closure of Library  
on Tuesdays from 1 February 1977,  
there was a rise of almost 10% in  
the number of visitors, compared  
with 1975/76 figures. (Some  
visitors call several times during  
the month but are counted only  
once for purposes of Library  
statistics.)

Staff

The position of Serial Librarian was filled on  
17 October with the transfer of Mr L. Leitch from the Australian  
Archives Office.

Miss Sue Attwood (Librarian Class 1) left BMR on  
12 August. She had been on the library staff since the end of  
1969, first as Monograph Cataloguer then as Reference Librarian.

The Librarian-in-Charge attended the 19th Biennial Conference of the Library Association of Australia in Hobart from 24-31 August 1977.

In September the two Library Officers, Mrs M. Murnieks and Miss M. Pearce, commenced an informal course of in-service training one half-day a week at the Public Service Inspector's Office.

### General

This year, like 1976, was one of reduced services owing to shortages of staff and funds. For over two months there was only one Librarian, the Librarian-in-Charge, and, as she was already cataloguing urgent serials, she was unable to undertake any reference searches. Reference services were therefore suspended from 15 August 1977 until the Reference Librarian position is filled.

From 1 November 1976 to 31 January 1977, no serials were circulated to BMR staff owing to a shortage of clerical staff. On 1 February circulation was resumed, and all readers were asked to re-register for automatic routing of journals; the number of titles permitted was reduced from five to three. This reduced the volume of circulation which was further reduced because many readers, accustomed to doing without circulation, had built up a new pattern of library use. They came to the Library more frequently and borrowed journals as soon as they came off display.

The most important cut in services was the closing of the Library on Tuesdays from 1 February. Approval was granted for this measure to enable the Librarian-in-charge to catalogue urgently needed serials and to provide time for other Library staff to carry out related tasks which are difficult to undertake when the Library is open. Urgent requests from BMR staff and visitors are, of course, attended to on these days. This arrangement has enabled library services to be maintained at a more satisfactory standard than was previously possible with the depleted staff.

The annual stocktake commenced on 8 November 1976 and was completed in 2½ weeks. Instead of a full stocktake, only 10% of accessionable items listed in the Accessions Register was checked; only one book was missing.

In March a new subject catalogue was commenced using descriptors from the 'Australian Thesaurus of Earth Sciences and Related Terms' instead of Library of Congress Subject Headings.

The arrival of the new catalogue cabinet in June enabled both "old" and "new" subject catalogues to be accommodated adjacent to one another. The re-arrangement of cards was one of the tasks that could only be carried out on Tuesdays when the Library was closed. The Serial Catalogue, and "old" and "new" subject catalogues are now "rodded in" making misplaced and missing cards a thing of the past. It is hoped that the Author-Title catalogue will soon be similarly secured.



The latest edition of Encyclopaedia Britannica was purchased in June to replace the Library's 1959 edition.

On 12 July the Librarian-in-Charge visited the Australian Mineral Foundation in Adelaide at the invitation of the Director of AMF. She discussed with Mr Lee Parkin and Mr Des Tellis the use BMR Library is now making of the new Thesaurus.

### ADP APPLICATIONS SECTION

Head of Section : A.J. Barlow

#### General

The ADP Applications Section continued to provide services to computer users within BMR. Service functions include data entry, CSIRO network node operation, finance control, laboratory data acquisition computer operation, and assistance to the joint ANU-BMR geochronology projects.

The CSIRO computer network has continued to be the main computing facility used by BMR officers although a significant amount of processing is also carried out on the in-house laboratory acquisition computer to conserve funds. There are now seven remote terminals connected to the CSIRO network and eight general purpose terminals as well as five data acquisition control terminals connected to the in-house system.

The CSIRO system has undergone major changes during the year. The most noteworthy was the removal in July of the "front-end" Control Data 3600 computer. Terminal nodes are now connected directly through PDP 11 minicomputers to the Cyber 76. This has resulted in an increase in reliability of the system as a whole; down-time appears to average only about two hours per week. However some of the facilities provided by the 3600 were not immediately available on the Cyber 76 and this caused some inconvenience. The additional facilities are slowly becoming available.

#### Finance

Further increases in CSIRO computer charges and equipment maintenance charges have increased costs associated with computer data processing. The annual budget for computer operation including computer charges, maintenance, consumable stores, etc is \$430 000 in 1977-78, \$70 000 less than was spent in 1976-77. Effort is being made to economise where possible and for the latter half of 1977, expenditure is approximately pro-rata although some sections have exceeded their allocation. A new feature of the present CSIRO system allows jobs to run overnight while the computer is unattended at one quarter of the normal cost. This is contributing to a substantial saving of cost on large batch jobs.

### Staff

During the year two data processing operators and one clerical assistant left the section. These positions have not been filled, owing to staff ceilings, but some relief has been obtained through alternative arrangements which provide a data processing operator and part-time clerical assistance. A CS01 has been seconded to the Geological Branch to assist and advise on Branch computing needs.

### Projects

The main projects undertaken or continued by the section are:

1. Implementation of further systems for information storage and retrieval.
2. Use of the PROSPER package for financial modelling of mine costs.
3. Assistance to the joint ANU-BMR geochronology project, viz. computer-based acquisition and processing for the ion microprobe and upgrade of both hardware and software operating system for mass-spectrometer data acquisition.
4. Automated Cartography project.
5. Conversion of 2-D electromagnetic modelling programs from Univac to Cyber 76 computer.

### Information Storage & Retrieval

A decision has now been made to use the INFOL and IMAGE data-base packages for future information storage and retrieval systems. The former is available on the CSIRO Cyber 76 network and the latter on the in-house Hewlett Packard computer. Several new systems have been implemented on a trial basis using the IMAGE package. These are mostly small systems and include, magnetic tape index, photo-slide index, library loans, airborne survey index. One large system, an index of palaeontological specimens, has been attempted. Data input to all systems has so far been limited but there appear to be no major problems.

Generalized key-to-disc data input programs have been written which considerably simplify the data entry process particularly where repeated fields of information are frequent.

"INFOL" has mainly been used for updating previously existing data bases including the Georgina Basin field data system and museum mineral collection data. It is also used for two new systems including BMR finance control.

### Automated Cartography

This project was commenced late in the year with a request to see whether computer aided annotation of contour maps already produced by computer and plotter was feasible. Preliminary investigation has shown that as a first step the presently used contour programs should be standardized as far as possible and properly documented. Work in 1977 was limited to these two areas but it is expected that further applications will be developed in 1978.

### Georgina Basin Project

The Georgina Basin Project storage and retrieval system was started in April 1974 and now comprises 3329 sets of field observations and related data totalling 4.7 million characters. In addition to the field observations, 791 whole-rock analyses, 191 sets of faunal determinations, 149 detailed carbonate petrographic reports and 90 biostratigraphic analyses are available.

The file, an INFOL 2 system, is a pooling of the information from geoscientist's field notebooks and information on drill-core samples. Laboratory analyses are added as they become available. Each geoscientist receives a hard copy of the data he collected and each has access to any information on the file.

Input to the system is in free-field format with some standardization of data entry in a few fields or parts of fields. Output reports may be obtained through the automatic report generator or they may be optionally formatted. All or part of the file may be obtained on microfiche.

Input/output procedures are documented for the new CSIRO operating system and the system is in routine operation. Procedures are also established for obtaining plotted output from the file and for obtaining data from the file for statistical analyses.

### Reference Minerals Collection Index

The Reference Minerals Collection Index storage and retrieval system was started in 1973. At the end of 1974 the file contained information on about 2200 specimens. The project then stopped due to lack of clerical support.

With the purchase and cataloguing of the Latz collection, the system was again required and the project revived. At the same time, data-entry equipment and Data Preparation Officers became available so that historical data are now entered directly from the official register of mineral specimens rather than having to be transcribed to coding forms.



The Reference Minerals Collection Index is also an INFOL 2 system. It now contains information on 5485 mineral specimens; the file size is 3.5 million characters.

Input/output procedures are documented and the system is in routine operation. Special purpose programs have been written to calculate the number of different types of minerals in the collection and list them in alphabetical order, and to calculate the total value of the collection. Over 15 000 specimens remain to be indexed.

### Costing and Analysis of Mining Projects

A generalized model for feasibility studies of open-pit mines is being written in ICL System 4 PROSPER 2 language, a high level control language for cash flow forecasting, financial analysis and risk simulation. The package and operating facilities are being made available to us by the Department of Business and Consumer Affairs.

The model, which is still in development and testing, is for a specific tin mine producing 1 500 000 tonnes of ore per year, but it is generalized to handle mines with mill feed rates of less than 120 tonnes per day to 10 000 tonnes per day.

The model, when provided with basic mining and financing information, and metallurgical and location data, will calculate equipment requirements and provide detailed schedules of inflated and uninflated allowable and depreciable costs of: exploration; a camp for construction workers; mining; concentrator and support facilities; civil engineering; power supply; workshops; store and inventory; a town; and finally the total capital cost including interest (if any) and working capital, and a cumulative total for each year. The model also calculates the revenue for the mine. With this information available it is relatively straightforward, in PROSPER, to perform financial analysis and risk simulation.

### The Laboratory Data Acquisition & Processing System

The Hewlett Packard 2100A & 2108A computer system used for in-house acquisition and processing systems has continued to provide a valuable service to BMR users.

The system has been upgarded by the provision of an additional 50 M-byte disc, interfacing of Cassette magnetic tape recorder, increase of memory in the 2108 computer to 80K words (160K bytes) and the addition of more general purpose terminals. The operating system software has also been upgraded to RTE3 to take advantage of the additional memory.

Interfacing of the electron probe was completed and improvement made to the sedimentation tube acquisition sub-system. The Direct Reading Optical Spectrograph was not used significantly during 1977 but the Varian atomic absorption spectrometer has been used substantially. Two systems remain to be interfaced; they are the crustal seismic playback system and the X-ray diffraction equipment. It is expected that both of these will be completed early in 1978. The interactive graphics display unit to be used in conjunction with the automated cartography project was also successfully interfaced.

### Geological Branch Projects

The CS01 from the ADP Group spent most of the year assisting and supervising Geological Branch computer users.

One task has been to tidy up the Beach Sand bibliography file. It was originally set up under the SURFAUST system but this was unsuitable and the file was converted to run using the INFOL package. The file consists of some 4000 references about half of which needed correction. It is aimed to produce a hard copy or microfiche output from the file.

A suite of routines were developed for annotation of geochemical maps using specialized symbols. A module was incorporated to allow comments to be included. The routines have been used in the production of geochemical maps.

Programs were also written around a number of curve fitting techniques for various users. Both polynomial and power regression models are fitted to the data. Although the project is not complete it is capable of quickly establishing whether an acceptable fit can be obtained for a given data set.

Existing programs are being maintained. The Geological Branch has established a file of user programs and copies have been supplied to outside institutions.

### PLANNING AND CO-ORDINATION SECTION

Head of Section : K.M. Kennedy

#### Staff

During the year, the Section's normal establishment of four professional officers was supplemented by a temporary position created to service the BMR Review Committee. R.B. Aronsen was acting head of the Section until 8/7/77 when K.M. Kennedy rejoined the Section after an extended period as acting head of the Publication and Information Section. P.A. Smith transferred to the Section to assist in the implementation of recommendations made by the BMR Technical and Drafting Grades Review Team which concluded its investigations on 31/8/77.

### Program

The BMR program for 1977/79 was finalised and distributed in March 1977; notification of the proposed program was forwarded to all State Mines Departments for concurrence. An abridged 1977 program was produced as a BMR Record and made available to the public through open file centres and the BMR Symposium. A summary of the 1977 program was prepared for inclusion in 'BMR 77'.

Supervisors' meetings for the 1978-80 program were conducted during 17-21 October, following which a draft program was prepared for the Director's meeting in early December.

A committee to examine BMR activities in oil shale had its first meeting during August and involved members of the Section.

### Reports

A major statement on the role of BMR was prepared and submitted to the BMR Review Committee. Also prepared for the Review was a background paper on BMR involvement in foreign aid, and a submission by K.M. Kennedy (with the endorsement of other members of the Section) on the 'role of planning, co-ordination and review of BMR'.

Statements were prepared for the Senate Committee investigating water resources; the Committee of Enquiry into Education and Training (set up by the Department of Education); the Independent Inquiry into CSIRO; and the UN Conference on Science and Technology (to be held in Seoul, 1978). Comments on recommendations made by the Royal Commission on Australian Government Administration were made to the PSB.

Assistance was given to ASTEC on the formulation and distribution of questionnaires relating to the 'Earth' category of the ASTEC 'Overview Report on Science and Technology in Australia, 1977'. Based on the replies received, a position paper was drafted for the overview report.

### Organisation

K.M. Kennedy, together with L.W. Williams and A.R. Jensen visited the Australian Atomic Energy Commission to investigate their form of program management. Information was also assembled on various alternative organisational models as a prelude to the formulation of reorganisation proposals for BMR.

### Training

The Section co-ordinated the training of various Colombo Plan and UNDP Fellows, and Trainee Technical Officers within BMR. Assistance was given to the Australian Development Assistance Bureau in organising the International Training Course in Minerals Exploration which commenced on 5/9/77.

Miscellaneous

Maintenance and modification of the project costing system continued; the POR register maintained by the Finance Section was converted to a computer-based system and was integrated with the project costing system.

The 1977 helicopter period contract was monitored and tender specifications for future contracts were modified to remove ambiguities and to tighten penalty clauses. Procedures for monitoring foreign research vessels in Australian waters were reviewed.

BMR Review

R. Thieme provided secretariat services for the BMR Review Committee throughout the year. The terms of reference of the Committee were to examine what the objectives of BMR should be and what priorities should be attached to these objectives. Members of the Committee were R.N. Townsend (Chairman, Deputy Secretary of the Department), L.W. Parkin (consultant), G.W.B. Moffatt (PSB) and L.C. Noakes (Director of BMR). The Committee received about 70 submissions and visited all State capital cities for discussions with State Mines Departments and representatives from industry and universities. The Committee's report was in preparation in late 1977.

CARTOGRAPHY SECTION

Chief Cartographer (Production) : P.A. Boekenstein  
Chief Cartographer (Resources) : M.E. Nancarrow

Staff and General

In June 1977 the three BMR drawing offices were combined to form the BMR Cartography Section attached to the Operations Branch. Matrix organisation is being implemented on an experimental basis with P.A. Boekenstein as Chief Cartographer (Production) and M.E. Nancarrow as Chief Cartographer (Resources), the latter being responsible for manpower management. The two Assistant Chief Cartographers, R. Inglis and H.F. Hennig, assist mainly in production management.

In November 1976, to ease the serious space shortage in the BMR building, several drafting groups and the plan filing system were moved to the STCC Building at Queanbeyan. This move created administrative and production problems which have necessitated the Assistant Chief Cartographers being located at Queanbeyan on rotation.

At 31 October 1977 the staff of the Cartography Section consisted of 69 draftsmen, 1 graphic designer, 1 technical officer, 14 drafting assistants, 3 photographers, 1 assistant (printing), and 3 clerical assistants.

P.A. Boekenstein, M.E. Nancarrow, W. Pearson and I. O'Donnell attended a symposium on education for Cartographic Technicians which was held at Canberra on 16-17 September 1977.

H. Hennig visited two contractors in Sydney and Melbourne to solve technical problems in drafting and printing. E. Feeken visited a printing contractor in Melbourne to supervise the final printing of the Marraba 1:100 000 scale map. J. Mason visited a printing contractor in Hobart for training in the preparation of screenmasters and lithographic printing methods. A. Parvey and T. Kimber made a total of 7 visits to Adelaide to inspect and check progress of airborne geophysical flight path data recovery contracts.

Four draftsmen accompanied geological parties on field surveys: T. Brown, Pine Creek; J. Stirzaker, Lawn Hill; G. Young, Duchess; P. Blythe, Georgetown.

Production (November 1976 to October 1977)

1. <u>Geological Maps</u>	<u>1:100 000</u>	<u>1:250 000</u>	<u>Other Scales</u>
Photoscale compilation in progress	14	3	
Photoscale compilation completed	6	2	
Preliminary Edition:			
Compilation by BMR, in progress	21	3	7
Compilation by BMR, completed (ready for printing)	4	1	8
Printed	6	8	2
1st or 2nd Edition:			
Fair drawing in progress: BMR Contract*	1	11	5
Fair drawing completed: BMR Contract*		17	1 2
Printing in progress**	1	3	19
Printing completed**	2	31	4
Reprinting in progress**		1	

Notes:

\* Contract drafting stages: Specifications prepared - 15 maps; contractor recommended - 13 maps; first proof checked - 23 maps; second proof checked - 22 maps; printing contracts recommended - 16 maps.

\*\* Printing stages: specifications prepared - 20 maps; printing contracts recommended - 16 maps; colour designs and colour guides - 44 maps; performance supervised as required, screenmasters and dyeproofs checked - 21 maps; machine proofs checked - 34 maps; printed maps checked - 33 maps.

The above statistics include:

- (a) 4 x 1:10 000 000 maps for BMR Earth Science Atlas
- (b) 1 x 1:100 000 map (Forsayth) of the Geochemical Series, scribed on flatbed plotter
- (c) Geomorphological map of Officer Basin, ready for preliminary edition printing.

2. <u>Geophysical Maps</u>	<u>1:250 000</u>	<u>1:500 000</u>	<u>Other Scales</u>
Pre-survey compilation	16		
Flight path recovery	22		
Preliminary releases, magnetic and radiometric	145		
Published TMI maps	4		
TMI contours (1:1 000 000 series)			37
Airborne surveys coverage maps			2
Gravity series maps		56	
Gravity map of Melanesia			1
3. <u>Text figures, diagrams etc. completed</u>			
Records and miscellaneous (includes AMI)			1720
Reports			176
BMR Journal			230
Explanatory Notes			22
Bulletins			371
Outside Publication			170
Transparent slides for lectures etc			570
4. <u>Geological and Geophysical activities of BMR</u>			
Broadsheet Brochures 1 and 2 printed June 1977.			



ADMINISTRATIVE SECTION

Administrative Officer : B.M. Williams

Staff

Resignations and transfers of clerical staff, coupled with stringent staff ceilings, has resulted in two clerk vacancies, five clerical assistant vacancies and five typist vacancies as at 31 October. This has meant continuous changes in staff to meet priorities, greater use of staff on extended higher duties performance, some delays in dealing with administrative matters, increased complaints, and to a degree a reduction in efficiency and morale within the Administrative Section.

BMR staff changes for the period 1 October 1976 to 30 September 1977 were:

	<u>Joined</u>	<u>Left</u>	<u>Difference</u>
Professional	5	13	- 8
Technical/Drafting	3	23	-20
Clerical	10	23	-13
	<u>18</u>	<u>59</u>	<u>-41</u>

General

The Administrative Officer returned to duty in December 1976 after extended sick leave and was immediately placed on 'Special Duties' for six months to undertake the following tasks:

- (a) Review of Finance Sub-section, preparation of forms for the preparation of Draft Estimates with relevant procedure statement.
- (b) Review of all existing BMR General Instructions (137) with the view to replacement by a new updated set.
- (c) Review of all existing BMR Staff Circulars (814) with the view to replacement by a new updated set.
- (d) Preparation of a BMR Field Manual, taking into account any relevant General Instructions and Staff Circulars.

Action in regard to (a) was completed on 22.12.76 and the revised procedures and new forms were used to prepare 1977-78 Draft Estimates.

An examination of both BMR General Instructions and Staff Circulars was completed by the end of January 1977 and drafts of updated replacement documents were ready for editorial review by mid-February 1977.

Of the 137 existing BMR General Instructions, 62 were cancelled and the balance are now incorporated into 19 new BMR Instructions due for issue as a new series in November 1977.

The 814 existing BMR Staff Circulars as at September 1977 are also to be replaced with a new updated series. Approximately 125 Staff Circulars had information worthy or re-issue. Of these, 95 were incorporated into the new BMR Field Manual and the balance have been consolidated into four new BMR Staff Circulars due for issue in November 1977.

The BMR Field Manual was commenced in mid-February 1977 and completed ready for printing by mid-June 1977. It was distributed in late August 1977. The manual comprises a total of 268 pages.

The departmental stocktake of BMR furniture and office machines which was made in 1976 was not finalised until the latter part of 1977 owing to staff shortages. The final submission for write-offs has been prepared.

The draft of the updated booklet 'Rules Governing the Use of Motor Vehicles' was examined by BMR and comments made to Central Office who are preparing to re-issue it.

### Finance

The level of commitment funds and cash for 1976-77 was, in real terms, less than those provided in 1975-76. Financial management proved to be a difficult task in 1976-77. The total BMR expenditure in 1976-77 was 0.55% underspent.

Cash for 1977-78 is at the same level as that spent in 1976-77. In real terms this is a further reduction for 1977-78. In addition, BMR is required to absorb a substantial increase in expenditure for work submitted to AMDEL which could be as much as \$100 000.

Because of the large carry forwards from 1976-77 of unpaid commitments, there will be a reduced amount of cash available for the 1977-78 program. This means that new commitments, in many cases, will have to be deferred to a date much later than in past years to ensure expenditure is contained within the available cash funds.



Additional Estimates were sought and obtained in 1976-77 for:

Office Requisites \$12 000 and Incidentals \$11 000

A Treasurer's Advance was sought and obtained in 1976-77 for:

Postage Telegrams & Telephones \$7 000

Computer Services \$25 300

Final Estimates for 1977-78 and actual expenditure for 1976-77 are listed in Table 2.

The manual POR Commitment Control Register introduced in July 1976 was found to be useful. The Register was converted to a computer-based system in July 1977 and was extended to include information on travel expenditure.

#### Works Program

Funds for Works Programs have also been reduced for the current year. An example of the magnitude of cuts can be shown in the Furniture and Fittings item. BMR's proposed program, which included items deferred from the previous year due to lack of funds, amounted to \$304 000 and funds of \$27 000 were eventually provided. Table 3 lists the funds provided for the Works Program.

Six new buildings are under construction at East Kowen. They are expected to be completed by December 1977. Five are for the Observatories Sub-section and the other is for the Rock Measurement group.

BMR requested the Darwin Reconstruction Commission to restore the Woods Street office and Laboratory, and the Winnellie Store. The former was not included in the program while the latter has been restored. Action has been taken in respect of the Woods Street Office to ensure that restoration is completed.

TABLE 1.  
BREAKDOWN OF BMR EXPENDITURE AND EFFORT FOR 1976/77  
(Derivation: BMR Costing System for 1976/77)

BRANCH/SECTION/GROUP	TOTAL EXPENDITURE		TOTAL MANPOWER*	
	\$	%	Man-years	%
GEOLOGICAL BRANCH	3 314 000	27.4	157.1	25.0
Sedimentary	679 000	5.6	23.5	3.8
Photogeology	39 000	0.3	2.1	0.3
Palaeontology	360 000	3.0	22.0	3.5
Marine Geology	196 000	1.6	10.0	1.6
Metalliferous	734 000	6.1	30.8	4.9
Darwin Group	85 000	0.7	4.9	0.8
Petrology	161 000	0.3	5.9	0.9
Geochemistry	249 000	2.1	14.9	2.4
Geochronology	89 000	0.7	4.3	0.7
Geobiology	87 000	0.7	4.0	0.6
Engineering Geology	236 000	2.0	14.1	2.3
Photographic	48 000	0.4	3.3	0.5
Map Compilation	74 000	0.6	4.6	0.7
Museum	42 000	0.3	3.4	0.5
Mineral Reports	43 000	0.4	4.3	0.7
Undifferentiated	192 000	1.6	5.0	0.8
GEOPHYSICAL BRANCH	3 885 000	32.5	185.0	29.8
Metalliferous (Canberra)	249 000	2.1	14.1	2.3
Metalliferous (Darwin)	20 000	0.2	1.0	0.2
Airborne (Aircraft)	499 000	4.2	5.4	0.9
Airborne (Contracts & Reductions)	209 000	1.7	8.5	1.4
Observatories	463 000	3.9	24.4	3.9
Regional Gravity	143 000	1.2	6.9	1.1
Regional Structural	165 000	1.4	8.6	1.4

Gravity	25 000	0.2	1.4	0.2
Seismic	525 000	4.4	22.1	3.5
Marine	562 000	4.7	25.5	4.1
Geophysical Laboratories	697 000	5.8	49.1	7.9
Engineering Geophysics	181 000	1.5	12.5	2.0
Undifferentiated	147 000	1.2	5.5	0.9
<b>MINERAL RESOURCES BRANCH</b>	<b>328 000</b>	<b>2.7</b>	<b>16.9</b>	<b>2.7</b>
Mining Engineering	42 000	0.3	2.0	0.3
Mineral Economics	286 000	2.4	14.9	2.4
<b>PETROLEUM EXPLORATION BRANCH</b>	<b>1 114 000</b>	<b>9.3</b>	<b>60.8</b>	<b>9.7</b>
Basin Studies	266 000	2.2	16.5	2.6
Petroleum Technology (Office)	140 000	1.2	8.1	1.3
Petroleum Technology (Labs)	95 000	0.8	5.1	0.8
Subsidy, (P(SL)A	105 000	0.9	7.8	1.2
Core & Cuttings Laboratory	46 000	0.4	4.8	0.8
Drilling	435 000	3.6	17.5	2.8
Undifferentiated	27 000	0.2	1.0	0.2
<b>OPERATIONS BRANCH</b>	<b>2 692 000</b>	<b>22.4</b>	<b>201.2</b>	<b>32.2</b>
Planning & Co-ordination	80 000	0.7	4.7	0.7
Information	104 000	0.9	6.2	1.0
Editing	129 000	1.1	6.6	1.1
ADP	511 000	4.2	13.0	2.1
Drafting (amalgamated)	1 074 000	8.9	91.2	14.6
Library	86 000	0.7	8.0	1.3
Administration	661 000	5.5	est.70	11.2
Undifferentiated	47 000	0.4	1.5	0.2
<b>BMR UNDIFFERENTIATED</b>	<b>689 000</b>	<b>5.7</b>	<b>4.0</b>	<b>0.6</b>
<b>TOTALS</b>	<b>12 022 000</b>	<b>100</b>	<b>625.0</b>	<b>100</b>

\* Manpower includes wages hands

TABLE 2Expenditure for 1976/77 and Final Estimate for 1977/78

Item	Description	Actual Expenditure 1976/77	Final Estimate 1977/78
432-1-01	Salaries & Allowances	7 868 418	7 989 000
02	Overtime	127 027	135 000
		7 995 445	8 124 000
432-2-01	Travel and Subsistence	422 687	415 000
02	Office Requisites	163 564	118 000
03	Postage, Telephones, Telegrams	238 638	230 000
04	Office Services	38 872	35 000
05	Printing of Maps and Publications	319 365	375 000
06	Vehicles	593 609	600 000
07	Aircraft	294 991	311 000
08	General Stores	428 211	458 000
09	Contract Services	681 455	731 000
10	Freight and Cartage	57 820	60 000
11	Repairs and Maintenance	50 339	54 000
12	Computer Services	500 227	430 000
13	Incidental and Other	66 244	70 000
	Total Administrative	3 856 022	3 887 000
432-3-01	Riverview College	6 000	-
883-1-01	Plant and Equipment	533 090	467 000
	Total BMR	12 390 557	12 478 000

TABLE 3Works Programs 1977/78

Proposal (\$)	Program (\$)			
	BMR	DAS	BMR	DAS
Repairs & Maintenance	25 000	208 500	17 200	108 000 (a)
Major New Works	435 500	360 000	102 000	24 000 (a)
Minor New Works	30 500	142 990	15 000	5 000 (a)
Furniture & Fittings	304 285	-	27 000	-

Papua New Guinea (Controlled by Overseas Property Bureau, D.A.S.)

Repairs & Maintenance	-	2 500	-	2 500
Major New Works	-	-	-	-
Minor New Works	-	6 000	-	6 000
Furniture & Fittings	-	11 500	-	8 000

(a) In view of disputes between D.A.S. and N.C.D.C. there are problems with funds being released from Department of Finance. Only essential recurring or known problem areas (eg health) are being attended to at this date.

STAFF OF THE BUREAU OF MINERAL RESOURCESSTAFF LIST AT 31 OCTOBER 1977

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COMPUTER SYSTEMS OFFICER  
GRADE 3J.T. Brown, B.Sc.  
D.N. Downie, B.Sc.

\* Acting in that position

COMPUTER SYSTEMS OFFICER  
GRADE 2

A. Luyendyk  
F.D. Newman, B.Sc.

COMPUTER SYSTEMS OFFICER  
GRADE 1

R.H. MacDuff

SENIOR COMPUTER OPERATOR  
GRADE 1

W. de Courcey-Browne

CHIEF DRAFTSMAN GRADE 2

P.A. Boekenstein  
M.E. Nancarrow

CHIEF DRAFTSMAN GRADE 1

F.W.H. Hennig  
R. Inglis

SUPERVISING DRAFTSMAN

L. Bonazzi  
I. Chertok  
A. Crowder  
E.H. Feeken  
W. Gerula  
G. Lamberts  
K. Matveev  
R.J. Molloy  
R. Sandford

SENIOR DRAFTSMAN

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D.E. Brentnall  
R.D. Cooper  
I.G. Cravino  
J.M. Fetherston  
L. Kerec  
A. Mikolajczak  
M. Moffat  
A. Parvey  
J.F. Roberts  
A. Rudka  
R. Swoboda

DRAFTSMAN GRADE 2

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J.M. Bultitude  
S. Daric  
P.H. Fuchs  
L. Hollands  
A. Jaensch  
T. Kimber  
P. Kersulis  
N. Kozin  
I. Lamberts  
D. Lawry  
G. Matveev  
J.N. Mason  
A.J. Maxwell  
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J.M. Mifsud  
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SENIOR PHOTOGRAPHER GRADE 2	J. Zawartko
SENIOR PHOTOGRAPHER GRADE 1	M. Walewicz
PHOTOGRAPHER	L.P.C. Piggott

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MINERAL ECONOMIST CLASS 4	B.G. Elliott, B.Sc.(Hons), A.R.S.M. L. Ranford, B.Sc.(Hons), F.G.A.A., M.Aus.I.M.M., M.S.E.G.
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\*\* On temporary transfer from Central Office

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TECHNICAL ASSISTANT GRADE 2	J.P. Staunton
TECHNICAL ASSISTANT GRADE 1	D.B. Pryce
CLERICAL ASSISTANT GRADE 4	W.I. Turner
ROTARY DRILLING SUPERVISOR GRADE 2	L.T.J. Hodgins
ROTARY DRILLING SUPERVISOR GRADE 1	B.G. Findlay
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ROTARY DRILLER GRADE 1	K. Reine K. Huth L. Keast E. Lodwick T. Shanahan
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 M. Owen, B.Sc.(Hons), Ph.D.  
 P.E. Pieters, D. Geol.  
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 J.D. Reid  
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 R.W. Davis

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 N.C. Hyett

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Grad.A.A.I.P., M.Inst.P.  
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M.I.E.A.  
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A.M.Aus.I.M.M.  
R. Wells, B.A.  
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J.P. Cull, B.Sc.(Hons), Ph.D.  
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P.L. Harrison, B.Sc.(Hons)  
P.J. Hill, B.Sc.  
A.P. Hogan\*, B.Sc.(Hons)  
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M.W. McMullan, B.Sc.  
R.F. Moore, B.A.(Geoph.)  
A.S. Murray, B.Sc.(Hons), Grad.A.I.P.  
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\* Acting in that position



GEOPHYSICIST CLASS 2 (Cont'd)	A. Mutton*, B.Sc.(Hons) R.D. Ogilvy, M.Sc. E.P. Paull, B.Sc.(Hons) G.R. Pettifer, B.Sc., Grad.Dip. (App. Geoph.) I.D. Ripper, B.Sc.(Hons), M.A.I.P. N. Sampath, M.Sc., Ph.D. P.A. Symonds, B.Sc.(Hons) F.J. Taylor, B.Sc.(Hons) L.A. Tilbury*, B.Sc.(Hons) S. Waterlander, Dip.Eng. P. Wellman, M.Sc., Ph.D. P.G. Wilkes, B.Sc. B. Wyatt, B.Sc.(Hons) I. Zadoroznyj, B.Sc.(Hons)
ENGINEER CLASS 2	D.B. Stewart, Ph.D., M.E., B.E., A.S.T.C., M.I.E.(Aus.)
GEOPHYSICIST CLASS 1	J.A. Bauer, B.App.Sc. D.G. Bennett, B.Sc.(Hons) F. Brassil, B.A.Dip.Geoscience R. Cobcroft, B.Sc., Grad.Dip.Appl. Geoph. C.D.N. Collins, B.Sc.(Hons) B.J. Drummond, B.Sc. B.A. Gaull, B.Sc. J.W. Giddings, B.Sc.(Hons), Ph.D. P.R. Gidley, B.Sc.(Hons) I.G. Hone, B.Sc.(Hons) G.D. Karner, B.Sc.(Hons) H. McCracken, B.Sc.(Hons) J. Petkovic, B.Sc. D.G. Ramsey, M.Sc., Grad.Dip.App. Geoph. D. Robson, B.Sc. D. Schmidt, B.Sc.(Hons), Dip.Geoph. M.J. Sexton, B.Sc.(Hons) S. Sheard, B.Sc.(Hons) J. Silich, B.Sc.(Hons) H.W. Stagg, B.App.Sc.(Hons) J. Van Son, Dip.Geophys. K. Wake-Dyster, B.Sc.(Hons) P.M. Davies J.K. Grace*
SENIOR TECHNICAL OFFICER GRADE 2	
SENIOR TECHNICAL OFFICER GRADE 1	W. Burhop D. Coutts, A.A.I.S.T.  L.T. Winters A. Zeithofer, Sen.Aff. I.R.E.E., Dip. B.I.E.T.

\* Acting in that position

## TECHNICAL OFFICER GRADE 2

R. Curtis-Nuthall  
 R. Dulski  
 J.W. Eurell  
 D. Gardner\*  
 G.A. Green  
 W. Greenwood  
 R.B. Grigg  
 E. Hassel  
 G.S. Jennings  
 K. Jurello  
 A.S. Scherl, I.R.E.E. (Aff.)  
 J. Williams  
 G. Woad

## DRAFTSMAN GRADE 2

R. Gan  
 G.W. Thom

## TECHNICAL OFFICER GRADE 1

W. Gunner\*  
 B.J. Page  
 D. Park\*  
 C.J. Rochford\*  
 D.O. Stevens  
 G.H.Y. Thomas  
 M.H. Tratt

## TECHNICAL ASSISTANT GRADE 2

H.R. Allison  
 M. Amar  
 N.A. Ashmore  
 E.C. Chudyk\*  
 L.S. D'Arcy  
 R. Eaton  
 P. Fowler  
 D.H. Francis  
 W. Harkness  
 A. Kores\*  
 G. Lockwood\*  
 E.C. McIntosh  
 L. Miller  
 S. Prokin  
 H.G. Reith  
 J.F. Salib  
 E. Smilek\*  
 R. Westmore  
 S.J. Wilcox

## CLERK CLASS 5

P.J. O'Rourke

## CLERK CLASS 4

O. Terron  
 F.N. Michail

## CLERICAL ASSISTANT GRADE 3

I. Perkovic  
 Y.M. Moiler

## COMPUTING ASSISTANT

U. Hammerling

\* Acting in that position

FIELD ASSISTANT

R.D.E. Cherry  
L.O. Rickardsson

MAINTENANCE MECHANIC

D.K. McIntyre

ASSISTANT GRADE 1

T. Creaser

Officers under Contract to Geological Survey of Papua  
New Guinea at 31 October 1977

<u>Name</u>	<u>BMR Designation</u>
R.A. Almond	Geophysicist Class 2
G.K. Anderson	Geologist Class 1
R.J.S. Cooke	Geophysicist Class 3
H.L. Davies	Geologist Class 3
V. Dent	Geophysicist Class 1
G.D. Knight	Draftsman Grade 2
G. Pettifer	Geophysicist Class 2
C.J. Pigram	Geologist Class 1
P.M.T. Ryan	Technical Class 2

Officers on Study Leave at 31 October 1977

E. Druce	Public Service Board, Barton
D.J. Ellis	University of Tasmania
A.L. Jacques	University of Tasmania
B.M. Radke	Rennsselaer Polytechnic, New York
B.R. Spies	Macquarie University, Sydney
A.N. Yeates	University of New England, Armidale

Officers on Extended Leave Without Pay

H.F. Douth	ESCAP, Bangkok
D.B. Dow	United Nation Project