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**BMR PUBLICATIONS COMPACTUS
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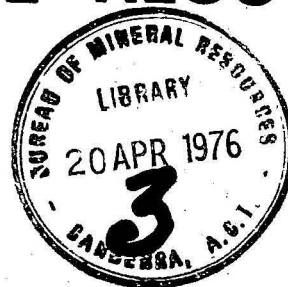
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1976 PROGRAM**



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BMR 1976 PROGRAM

Compiled by

I.G. Hone

INDEX

	<u>Page</u>
BMR OBJECTIVES	1
METALLIFEROUS - Introduction	3
Antarctica	3
Arunta Block	3
Bangemall Basin	4
Gawler Block	4
Geological Laboratories	4
Petrology	4
Geochemistry	4
Geochronology	5
Georgetown	5
Granites - Tanami	5
Irian Jaya	6
Lachlan Belt	6
McArthur Basin	6
Nicholson - Mount Isa Belt	6
Duchess	6
Lawn Hill	6
Mount Isa-Cloncurry	6
Westmoreland	7
Ore Genesis Investigations	7
Papua New Guinea	7
Pine Creek Block	7
Alligator Rivers	7
Rum Jungle	8
Tennant Creek Block	8
Volcanology and Ore Genesis (PNG)	8
Willyama Block	8
Yilgarn Block	8
SEDIMENTARY-Introduction	9
Browse Basin	9
Canning Basin	9
Carpentaria Basin	10
Coastal Studies and Heavy Mineral Sand Deposits	10
Galilee Basin	10
Georgina Basin	10
Ngalia Basin	11
Officer Basin	11
Offshore Permit Assessments	11
Palaeontology	11
Petroleum Studies	12
Pre-Eromanga Basins	12
Regional Basin Studies	12
Surat Basin	12
SW Queensland Geomorphology	12
Wiso Basin	13

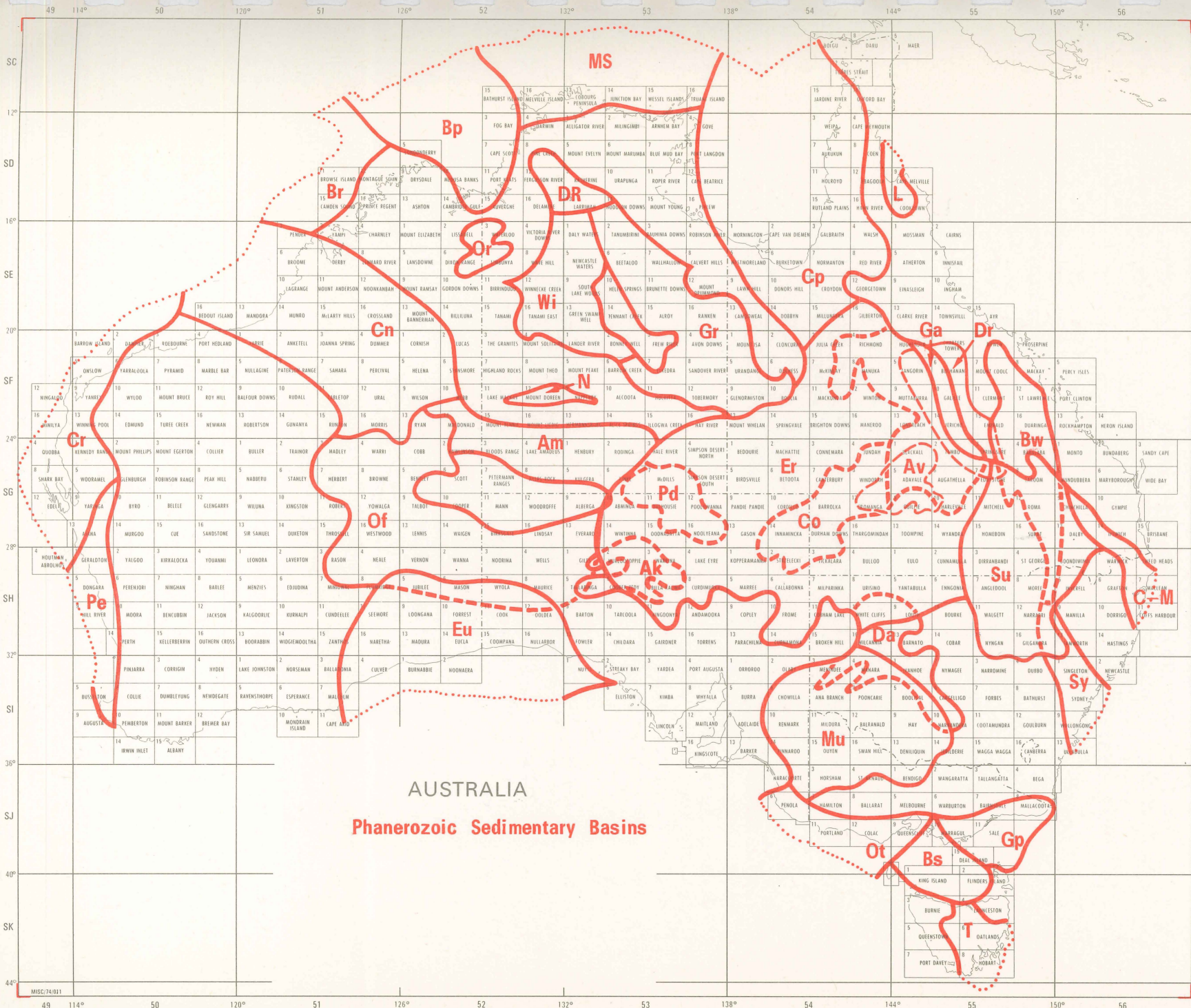
	<u>Page</u>
MARINE - Introduction	14
Continental Margins Survey	14
International Cooperative Projects	14
Marine Geology	14
Marine Geophysics	15
CRUSTAL AND BASIC EARTH	16
INVESTIGATIONS - Introduction	16
Calibration of Gravity Meters	16
Canberra Observatory Group	16
Geomagnetic Studies	16
Seismograph Stations	16
Seismological Data Processing	17
Strong Earth Motion Studies	17
Earth-Tides and Absolute Gravity Measurements	17
East Papua New Guinea Crustal Study	17
Geothermal Energy and Heat Flow Studies	17
Gosses Bluff	17
Gravity Map of Melanesia	18
Gravity Maps of Australia	18
Isogal Project and Calibrations	18
Macquarie Island Observatory	18
Mawson Observatory	18
Mundaring Observatory	18
Pilbara Crustal Survey Preview	19
Port Moresby Observatory	19
PNG Crustal Movement Project	19
Quarry Blast Recording	19
Regional Magnetic Surveys	19
Seismic Computer Systems Development	20
Stress Measurements	20
Toolangi Observatory	20
ENGINEERING - Introduction	21
Damsite and Reservoir Investigations	21
Major Buildings	21
Refuse Disposal, and Pollution Studies	22
Resources Studies	22
Sewerage Investigations	22
Soils Research	22
Transportation Studies	22
Urban and Regional Development Areas	22
Water Mains Investigations	23
HYDROLOGY - Introduction	24
Albury-Wodonga	24
Australian Capital Territory and Environs	24
Christmas Island	25
Great Artesian Basin	25

	<u>Page</u>
RESOURCES AND INDUSTRIES - Introduction	26
Mineral Economics Studies	26
Mining Engineering	26
Petroleum Economics	27
Petroleum (Submerged Lands) Act	27
TECHNOLOGICAL SUPPORT - Introduction	28
Airborne Systems, Techniques and Data Analysis	28
Engineering and Hydrology Systems Development	28
Magnetic and Electrical Equipment and Systems	28
Magneto-Telluric Investigations	29
Marine Systems Development	29
Observatory Systems and Maintenance	29
Regional Structural Survey Systems	29
Rock Measurements	29
Seismic Systems and Data Processing	30
TECHNICAL SERVICES - Introduction	31
Automatic Data Processing	31
Core and Cuttings Laboratory	31
Geological and Geophysical Services	31
Information Services	31
Library	32
Museum	32
Photogeology and Remote Sensing	32
Planning and Co-ordination	32
Publications and Editing	33
International Geological Congress	33
APPENDIX: PUBLICATIONS IN PROGRESS	

NOTES

The program does not list the preparation of BMR Records on the results of current projects; however, it can generally be assumed that Records will be prepared for most projects. A list of Records released on Open File is issued regularly by BMR.

The dates given in brackets after each field operation refer to time actually spent in the field. In most cases office work on the project continues to the end of the current year or early in the following year.



LEGEND

- Av Adavale
- Am Amadeus
- Ar Arckaringa
- Bs Bass
- Bp Bonaparte
- Bw Bowen
- Br Browse
- Cn Canning
- Cr Carnarvon
- Cp Carpentaria
- C-M Clarence - Moreton
- Co Cooper
- DR Daly River
- Da Darling
- Dr Drummond
- Er Eromanga
- Eu Eucla
- Ga Galilee
- Gr Georgina
- Gp Gippsland
- L Laura
- MS Money Shoal
- Mu Murray
- N Ngalia
- Of Officer
- Or Ord
- Ot Otway
- Pd Pedirka
- Pe Perth
- Su Surat
- Sy Sydney
- T Tasmania
- Wi Wiso

BMR OBJECTIVES

The work of BMR is designed to increase the available knowledge of the geology, geophysics and mineral resources of the Australian continental mass, including the continental margin and adjacent deep oceans. This knowledge is essential to an understanding of the generation, distribution, transport, and accumulation of minerals which, in turn, is essential for any assessment of reserves and potential resources. Without such assessments it is not possible to develop a meaningful policy of resource management. Thus the main thrust of the BMR program is towards discovery and assessment of the Nation's mineral resources, which include not only proven reserves but resources which are potentially the reserves of the future; in the field of mineral discovery, BMR's role is principally to provide fundamental data and ideas, and direct exploration groups to areas in which detailed prospecting has the best chances of success.

Accordingly the program can be divided into the following broad objectives:

1. Systematic regional geological and geophysical investigations to provide a broad understanding of the composition, structure, subdivisional units and tectonic history of geological provinces, both on the Australian continent and offshore on the continental margin, and to indicate key areas worthy of more detailed study and those to which the efforts of detailed prospecting organizations can be directed. Data from regional surveys are usually published as standard 1:250 000 scale maps.
2. Semi-detailed studies to study the relations between mineral occurrences and the geological environment in which they occur. The results of such studies generally extend the concepts for mineral associations, mineral occurrences and ore genesis which in time can lead to further discoveries by prospecting organizations; in addition they provide basic data required for any assessment of potential mineral resources. These are integrated studies involving systematic geological mapping (usually at 1:100 000 scale), compilation of data on all known mineral deposits in the area being investigated, soil, rock, and stream geochemical analyses, detailed ground and airborne geophysical surveys to map buried geological structures and to develop techniques for detecting mineral deposits, and laboratory studies into the age, composition, lateral and vertical variation, and genesis of the country rock and associated ore minerals.
3. Resource assessments including a continuing review of the mineral industry, to serve three purposes (i) to provide a realistic assessment of petroleum and ore reserves and sub-economic resources in Australia, which, when combined with projected consumption trends, indicate priorities for mineral search; (ii) to

provide a guide to Australia's potential resources; and (iii) to indicate areas with good potential for further mineral discovery or areas requiring further study to overcome current deficiencies in knowledge.

4. Long term basic research into the earth sciences, particularly in geophysics, ore genesis and palaeontology, to add to the fund of basic knowledge about the Earth, which may lead to the formulation of new geological concepts and ultimately lead to the discovery of new resources. BMR is the Australian body responsible for the collection of geomagnetic, seismological and regional gravity data, and for the establishment of internationally defined reference standards for the measurement of the Earth's gravity field in Australia.

5. Specialist engineering geology and geophysics services for other Commonwealth Government Departments. In the main these are geotechnical studies on hydrological, soil mechanics and engineering geological aspects related to urban development and major construction projects undertaken by the Commonwealth Government.

METALLIFEROUS AREAS

INTRODUCTION

As part of the continuing program of systematic coverage of Australia, regional airborne magnetic and radiometric surveys will be made in the Arunta Block, southeastern NSW and southwestern Western Australia. Similar surveys conducted in previous years are being processed and interpreted. Reporting on reconnaissance geological mapping in the Granites-Tanami area, Papua New Guinea and McArthur Basin will continue and further field work will be undertaken in Antarctica.

Semi-detailed ground surveys in the Nicholson-Mt Isa Belt, Georgetown Block, Lachlan Belt, McArthur Basin, Arunta Block and Pine Creek Block are being made to increase the geological/geophysical knowledge and understanding of the regions, to investigate the controls and distribution of mineralization and to produce semi-detailed maps at 1:100 000 scale for selected areas. Laboratory studies relating to mineralization in the Hodgkinson Belt and the Northern Territory will be completed.

Basic research into the genesis of ore minerals and volcanology will continue.

PROJECTS

Antarctica

Undertake reconnaissance mapping in Enderby Land. Remeasure the gravity traverse from Mawson to the Enderby Land glaciological base and make gravity measurements in East Enderby Land (Jan-Mar). Complete the study of the petrology and geochemistry of rocks and minerals from the Mawson coast and Prince Charles Mountains. Prepare publications on previous work in the Prince Charles Mountains and Mawson coast (see Appendix).

Arunta Block, NT

Geologically map the northern part of the MacDonnell Ranges 1:100 000 Sheet area and conduct field checks in the Aileron 1:100 000 Sheet area (July-Sept). Continue isotopic dating investigations of the rock units of the Arunta Complex.

Study in detail mineral deposits, especially copper and scheelite deposits, in the Mount Sainthill-Jervois district and collect geochemical samples for a preliminary orientation study.

Undertake airborne magnetic and radiometric surveys of Mt Peake, Mt Doreen, Napperby, Lake Mackay and Hermannsburg (part) 1:250 000 Sheet areas, and Burt 1:100 000 Sheet area (July-Oct).

Prepare publications on previous field work (see Appendix).

Bangemall Basin, WA (joint project with CSIRO)

Undertake an airborne magnetic and radiometric survey over the Archaean/Lower Proterozoic unconformity in the Stanley 1:250 000 Sheet area (Nov).

Gawler Block, SA

Prepare an operational report on the airborne magnetic and radiometric survey conducted in 1975.

Geological Laboratories

These provide a general laboratory petrological, geochemical and age-dating support for BMR projects and carry out related research and prepare reports on results.

Petrology

As part of the International Geological Correlation Program on Archaean Igneous Geochemistry, continue trace element characterization studies of Archaean volcanic rocks of the Warrawoona Succession, Pilbara, WA.

Continue studying Australian alkaline ultramafic rocks.

Other investigations relate mainly to semi-detailed geological studies in the Arunta Block, Nicholson-Mount Isa Belt, Pine Creek Block, PNG and Antarctica.

Establish a thin section reference collection.

Geochemistry

Analyze rock and stream sediment samples from the Tennant Creek Block, Georgetown Block, Nicholson-Mount Isa Belt and the Pine Creek Block in support of semi-detailed geological studies.

Participate in pollution studies as part of the IDC Subcommittee on Water Pollution.

Geochronology

Conduct investigations on vein deposits and mineralized and non-mineralized bodies of greisen in the Herberton-Mount Garnet area in the Hodgkinson Belt.

Finalize the investigation of the Cambrian/Precambrian boundary in western Tasmania and determine the age of mineralization.

Other investigations relate mainly to semi-detailed geological studies in the Tennant Creek Block, Arunta Block, Pine Creek Block and the McArthur River Basin.

Commence establishing zircon mineral separation and U-Pb analysis facilities.

Continue age dating and uranium isotope disequilibrium studies on material from SA coastal study and elsewhere.

Georgetown, Qld (joint project with Geol. Survey of Qld)

Carry out ground geophysical surveys to investigate the significance of sulphide mineralisation located in 1975 in the Jubilee Plunger and Mt Turner prospects; carry out field studies to assist interpretation of airborne geophysical data of Forsayth 1:100 000 Sheet area (Aug-Oct).

Continue geological mapping of the North Head and Forest Home 1:100 000 Sheet areas and conduct geological checkwork in the Gilberton Sheet area. Continue the investigations of the nature and genesis of the gold deposits of the Etheridge Goldfield. Complete geological mapping of the Newcastle Range Volcanics in the Galloway 1:100 000 Sheet area (June-July). Prepare publications on previous field work (see Appendix).

Make geochemical surveys in the Gilberton and Georgetown 1:100 000 Sheet areas and conduct follow-up geochemical surveys in the North Head and Forsayth 1:100 000 Sheet areas (June-Oct).

Continue geochronological investigations of the rock units in the Georgetown Inlier.

Granites-Tanami, WA, NT (in conjunction with Geol. Survey of WA)

Complete publications on the geology of the area from previous field work (see Appendix).

Irian Jaya (project subject to formal agreement between the Australian and Indonesian Governments)

Compile all information on the geology of Irian Jaya and commence interpretation of aerial photographs. Carry out some geological reconnaissance using logistics provided by Army survey teams.

Lachlan Belt, NSW, Vic

Geologically map the Canberra 1:100 000 Sheet area (Jan-Dec); some stratigraphic drilling will be done in the ACT.

Make aeromagnetic surveys of Bega and Ulladulla, 1:250 000 Sheet areas. Prepare reports and publications on previous field work in NSW (see Appendix).

McArthur Basin, NT

Finalize isotopic studies of glauconite from Elcho Island.

Prepare publications on the evolution and geology of the McArthur Basin and on results of dating of rocks from the Basin (see Appendix).

Nicholson-Mount Isa Belt, Qld (joint projects with Geol. Survey of Qld)

Duchess (Qld)

Photo-interpret and carry out geological mapping in the Duchess, Oban, Malbon and Mount Angelay 1:100 000 Sheet areas (June-Oct). Prepare publications on previous field work (see Appendix).

Lawn Hill

Compile geological information, photo-interpret and then geologically map Bowthorn, Lawn Hill and parts of Mussellbrook 1:100 000 Sheet areas (June-Sept).

Photointerpret parts of Gregory Downs, Riversleigh, Carrara, and Mitchebo 1:100 000 Sheet areas.

Mount Isa - Cloncurry

Photo-interpret and make follow-up field checks of Alsace, Mammoth Mines and part of Coolullah 1:100 000 Sheet areas (Sept).

Continue petrological, geochemical, and geochronological studies of a selection of volcanics, granites and other rocks including the Argylla Formation, Kalkadoon Granite, and Leichhardt Metamorphics. Conduct geochemical investigations of core from Cloncurry No. 5 drill hole.

Prepare publications on previous field work (see Appendix).

Westmoreland

Conduct a follow-up geochemical survey around the Una May anomaly in the Seigal 1:100 000 Sheet area (Sept). Geochemically analyse samples collected in 1975.

Prepare publications on previous geologic mapping (see Appendix).

Ore Genesis Investigations

Complete studying mineralization in the Golden Dyke Formation in the Rum Jungle and Brocks Creek areas, NT.

Investigate the mineralogy and petrology of samples from the Georgina Basin. Commence investigation of selected mineral deposits in the Adelaide Geosyncline.

Conduct experiments on the deposition of base metals and gangue minerals from low temperature solutions, the effects of organic matter on transport and deposition of base metals, and into the deposition of magnesium and calcium carbonates.

Papua New Guinea

Prepare publications on previous field work in the North Sepik and Kikori areas and in New Britain (see Appendix).

Pine Creek Block, NT

Alligator Rivers

Geologically map Mundogie SE and NW 1:100 000 Sheet area (July-Sept). Stratigraphic drilling will also be done (June-Sept).

Conduct regional electromagnetic surveys to outline stratigraphy and structure to assist geological mapping in the Mary River, Kapalga, McKinlay River and Mundogie 1:100 000 Sheet areas southeast of Darwin (Aug-Oct).

Study the petrology and geochemistry of rocks in the Katherine-Darwin and Alligator Rivers area to determine their relationship to one another and to mineralization.

Complete and report on an exploratory geochemical study of the Cullen Granite and the relationship of the granite and adjacent mineralization.

Prepare publications on previous field work (see Appendix).

Rum Jungle

Complete mapping of Batchelor and northern half of Tipperary 1:100 000 Sheet areas (July-Sept).

Conduct isotope dating of the Rum Jungle and Waterhouse Complexes and the other granitic rocks, and complete ore genesis studies.

Prepare publications on previous field work.

Tennant Creek Block, NT

Finalize dating of rock units in the Warramunga Belt. Prepare a publication on the geochemistry of the Tennant Creek Mineral Field (see Appendix).

Volcanology and Ore Genesis (PNG)

Continue investigations of Cainozoic Volcanics in conjunction with ANU, and prepare publications on volcanic geology, petrology and geochemistry.

Willyama Block

Broken Hill, NSW

Complete reports on the airborne magnetic and radiometric survey conducted in 1975.

Yilgarn Block, WA

Make an airborne magnetic and radiometric survey of the Hyden, Newdegate and Dumbleyung 1:250 000 Sheet areas (Sept-Nov).

SEDIMENTARY

INTRODUCTION

As part of the continuing program of systematic coverage of Australia, reconnaissance geological mapping will be conducted in the Canning Basin; completion reports on similar mapping are being prepared for the Officer, Carpentaria, Wiso and Ngalia Basins. Systematic reconnaissance aeromagnetic coverage of the Officer Basin will be completed.

Investigations of specific geological problems include the following: a seismic survey in the Galilee Basin which may lead to an upgrading of the petroleum prospectiveness of the area; laboratory studies of the genesis and characteristics of Australian petroleum accumulations; a study of geomorphology, chemical weathering and Cainozoic tectonics in southwestern Queensland; a study of the methods of detection and delineation of heavy mineral sands deposits; and investigations of the geological history of the Georgina Basin to assist in exploration for hydrocarbons, phosphate and base metals.

Systematic reviews and syntheses of all available information from a number of sedimentary areas will be made to assess their geology and resources on a regional basis; areas include the Browse, Canning, pre-Eromanga and Great Artesian Basins, nine coastal basins in southern and eastern Australia, and offshore petroleum title areas.

Long term taxonomic research of Australian fossils will continue.

PROJECTS

Browse Basin, WA

Conduct a detailed study of all available data on this basin, with emphasis on petroleum potential and new ideas of importance to petroleum exploration in the area.

Carry out source rock geochemistry studies.

Canning Basin, WA

Geologically map Mount Anderson and Derby 1:250 000 Sheet areas (June-Sept). This is a joint project with the WA Geol. Survey. Prepare publications on previous field work.

Carry out sedimentological, source and reservoir rock studies.

Complete detailed study of all available data on the basin; prepare publications on results including report on petroleum prospectivity.

Carpentaria Basin, Qld

Interpret the 1973/74 airborne survey.

Prepare publications on previous field work (see Appendix).

Coastal Studies and Heavy Mineral Sand Deposits

Prepare publications on eustasy studies carried out in southeastern South Australia.

Conduct experiments on precipitation and diagenesis of carbonates.

In conjunction with CSIRO, conduct case-history type geophysical surveys over heavy mineral sand deposits at Stradbroke Island and the Jerusalem Creek area to provide a data base to develop equipment and methods for onshore and offshore prospecting (Oct-Dec).

Prepare bibliographies on Australian coastal geology and heavy mineral sands deposits.

Galilee Basin, Qld

Make seismic reflection/refraction and semi-detailed gravity surveys to investigate whether or not the Permian in the Lovelle Depression extends southward into the Cooper Basin; also investigate the western margin of the basin near Hughenden and investigate the extent of (possible) Devonian sediments underlying Permian sediments at the northeastern margin of the basin (June-Nov).

Georgina Basin, Qld, NT

Carry out shallow stratigraphic drilling west of Marion Downs in support of the continuing investigations of Lower Palaeozoic carbonate sequences, Late Cambrian trilobite biostratigraphy, Ordovician conodonts and stromatolite biostratigraphy of the basin (July-Oct). Review previous seismic survey results.

Ngalia Basin, NT

Prepare publications on previous field work (see Appendix).

Officer Basin, WA, SA

Make detailed magnetotelluric traverses over the Musgrave Block where it overlies the northern extremities of the Officer Basin in SA to investigate the structure of the Musgrave Block and the thickness and structure of the sediments beneath it (Mar-April); this survey will be done in cooperation with SA Geol. Survey, Macquarie University, and possibly Shell Oil Co.

Continue supervising the aeromagnetic contract survey of the Browne, Bentley, Scott, Robert, Yowalga, Talbot, Cooper, Neale, Vernon, Wanna, Jubilee, Throssel, Westwood, Lennis, Waigen, and Mason 1:250 000 Sheet areas.

Prepare publications on previous geological mapping (see Appendix).

Offshore Permit Assessments

Assess petroleum prospectiveness of title areas and recommend further work and expenditure programs; review programs is necessary. Advise on application to vary conditions of the Titles.

Palaeontology

Provide palaeontological support for field projects and carry out systematic studies of Australian fossils. Projects include studies of Tertiary foraminifera from PNG; larger foraminifera and planktonic foraminifera from NW Cape, NW Shelf, Victoria and Capricorn Basin; Lower Carboniferous and Permian ostracods; stromatolites and associated microfossils from the Amadeus, Georgina, McArthur and Nabberu Basins, and sedimentary phosphorites associated with Precambrian stromatolites; conodonts from the Carnarvon Basin and eastern Australia; Tertiary vertebrates from Qld, SA and NT; Cambrian trilobites from northern and central Australia and Antarctica; Silurian brachiopods from near Canberra; Australian and PNG Mesozoic molluscs; Australian and Antarctic Devonian fish.

Petroleum Studies

Continue research into the processes of petroleum generation in Australia, including the diagenesis of organic matter in relation to oil and gas occurrences in the Amadeus Basin, source rock studies in the Browse and Canning Basins, WA, study of organic matter in Proterozoic sediments of McArthur Basin, and the composition of heavy oil associated with oil shale and phosphorite from Qld and NT.

Carry out porosity, permeability, density, fluid saturation, capillary pressure and relative permeability investigations of petroleum reservoir rock samples obtained from wells drilled under the Petroleum (Submerged Lands) Act, and from BMR field parties, State Mines Departments, and private sources.

Conduct thermodynamic studies of hydrocarbons from Australian petroleum accumulations.

Carry out laboratory investigations into the recovery of hydrocarbons from Australian reservoirs under various natural drive mechanisms to assist in the evaluation of recoverable petroleum reserves.

Pre-Eromanga Basins, Qld, NSW, SA

Continue to review existing geophysical data of basins underlying the Eromanga Basin to determine their limits and to distinguish between overlapping basins; recommend further surveys and studies for areas in which geological/geophysical information is deficient.

Regional Basin Studies

Carry out regional basin studies on the Bremer, Eucla, Poldia, Duntroon, Otway, Bass, Gippsland, Sydney and Clarence-Moreton Basins.

Southwest Queensland Geomorphology

Complete the study of the relationship of geomorphology and deep weathering profiles to Cainozoic structural movements and deposition; investigate the mode of opal formation.

Surat Basin, Qld

Complete reporting on the Roma Shelf seismic survey.

Wiso Basin, NT

Re-process and review results of the seismic survey in the Lander Trough.

Prepare publications on previous geological mapping; prepare a synthesis of the geology and geophysics of the southern half of the basin (see Appendix).

MARINE

INTRODUCTION

Offshore activities of the BMR consist of basic surveys to provide a better understanding of Australia's continental margin and its mineral potential. Systematic reconnaissance offshore geological surveys are being conducted to study the physical and chemical processes controlling the accumulation of sediments and minerals. Data from previous reconnaissance marine geophysical surveys are being processed and analysed to obtain details of structures within the first few thousand metres depth of sediments on the continental slope and margin, and to establish regional tectonic trends and basement variations. Data acquisition and processing systems will be developed for future systematic reconnaissance surveys.

PROJECTS

Continental Margins Survey

Analyse and report on results of the contract marine geophysical survey of the Australian continental margin; the survey produced reconnaissance seismic, gravity, magnetic and bathymetric data on the nature of extent of the continental margin. Interpretative reports currently scheduled include Exmouth Plateau, Ceduna Terrace, Carnarvon Terrace, plate tectonics of the Tasman Sea, magnetic lineations in the Bismarck Sea, offshore Otway Basin, Wallaby Plateau, and a study of seamounts. Geophysical data will be presented as 1:1 000 000 scale maps.

International Cooperative Projects

Participate in the Woods Hole Oceanographic Institution survey of the Banda Arc (Timor Trough) and Argo Abyssal Plain (Sept-Nov).

Participate in the Lamont-Doherty Geological Observatory survey of the Southern Ocean mid-ocean ridges, southern Australian continental margin, Wharton Basin, and possibly Coral Sea Basin (Jan-Mar, July-Sept).

Marine Geology

Carry out a marine geological reconnaissance survey of the West Australian shelf from Geraldton to Cape Leeuwin (Sept-Dec).

Undertake reconnaissance surveys of manganese nodules on the ocean floor (as ship-time becomes available).

Continue detailed study of shelf morphology as part of investigations into offshore heavy mineral sands.

Prepare publications on previous surveys (see Appendix).

Marine Geophysics

Organise and support magnetic surveys on Division of National Mapping bathymetric surveys. Review existing magnetic data over marine areas.

Acquire and test on-line seismic equipment. Develop techniques, systems and computer programs for data processing using two HP2100 computers.

Compile a data bank of all marine data in the Australian area.

CRUSTAL AND BASIC EARTH INVESTIGATIONS

INTRODUCTION

Most of the basic investigations undertaken by BMR relate to the structure of the Earth and the stresses and movements currently operative, the gravity and magnetic fields of the Earth, and heat flow.

BMR is responsible for the collection of geomagnetic and seismological data in Australia and its Territories; it is further responsible for the provision of basic regional gravity data and the establishment of internationally defined reference standards for the measurement of the Earth's gravity field in Australia. Much of this work is carried out in co-operation with Australian universities and international organisations. The information is used in magnetic and gravity surveys carried out for mineral search, in navigation charts, and for establishing earthquake risk.

PROJECTS

Calibration of Gravity Meters

Use the Soviet tilt apparatus to calibrate all available gravity meters in Australia. Outside organizations are invited to bring their meters to BMR for evacuation and calibration.

Canberra Observatory Group

Geomagnetic Studies

Maintain the Australian Geomagnetic Standards. Digitize and analyse magnetograms. Operate, test and evaluate magnetic observatory equipment.

The new magnetic observatory in east Kowen Forest should be commissioned late this year.

Seismograph Stations

Maintain and calibrate seismographs at Alice Springs (NT), Manton (NT), Cooney (NSW), Giles (WA) and Kowen (ACT). Select a site for, and install a SP vertical seismograph at Mount Isa or Cloncurry.

Seismological Data Processing

Prepare phase and epicentral data tapes for the International Seismological Centre and produce monthly phase and time sorted bulletins. Maintain regional earthquake data files and prepare seismicity maps. Locate regional earthquakes. Analyse seismograms from Alice Springs, NT, and Cooney, NSW.

Strong Earth Motion Studies

Maintain a network of accelerographs, prepare earthquake risk maps and study techniques of seismic zoning. Carry out field studies of felt or damaging earthquakes and also of ground accelerations near large explosions. Prepare an atlas of isoseismal maps. Investigate regional earthquakes and regional travel times.

Earth-Tides and Absolute Gravity Measurements

Measure the intensity of earth tides at eight sites in Australia (in co-operation with the International Centre for Earth Tides and Australian Organizations). Interpret and report on results of measurements of deflections of the vertical caused by earth tides. Study earth tide measurements and analysis of results in other countries including France, Belgium and USSR.

Make absolute gravity measurements using Soviet portable apparatus at six sites in Australasia (Oct-Dec) in co-operation with USSR Academy of Science.

East Papua New Guinea Crustal Study

Interpret seismic, gravity and high-level aeromagnetic data to investigate crustal structure in eastern PNG.

Geothermal Energy and Heat Flow Studies

Review geothermal and heat flow investigations in Australia and overseas and formulate survey proposals. Build up a data bank of geothermal heat flow information. Formulate computer models of geothermal energy sources.

Gosses Bluff, NT

Complete the publication on the joint geological and geophysical investigations (see Appendix).

Gravity Map of Melanesia

Compile and produce a 1:5 000 000 gravity map of the area bounded by latitudes 0° , 16° and longitudes 140° E, 164° E.

Gravity Maps of Australia

Continue updating the computer based data bank of gravity survey data. Produce free-air and Bouguer anomaly maps for areas in which data are finalized. Assess the present regional gravity survey coverage and make field observations in Vic, NSW and Qld to fill in gaps and to tie-in existing surveys (Nov).

Continue interpreting the gravity anomaly map of Australia.

Prepare publications on previous field work (see Appendix).

Isogal Project and Calibrations

Conduct follow-up work at base stations along the Australian Claibration Line.

Macquarie Island Observatory

Record and analyse geomagnetic and seismic observations and resite seismometer.

Mawson Observatory

Record and analyse geomagnetic and seismic observations.

Mundaring Observatory, WA

Continue recording, analysing and reporting on geomagnetic, seismic and ionospheric observations obtained at Mundaring and Gnangara and train personnel for Antarctic projects. Continue the normal program of SP recording at Kalgoorlie, Meekatharra, Marble Bar and Swan View and upgrade seismographs at Kalgoorlie and Marble Bar. Select a site near Gascoyne Junction for a SP seismograph. Operate the USGS Seismological Research observatory at Narrogin.

Operate accelerographs at Meckering and Kununurra and make field recordings of felt or damaging earthquakes and aftershocks. Study micro-earthquakes and wave

attenuation in the SW seismic zone. Make accelerograph and refraction recordings of large explosions. Study P-wave residuals and travel-times.

Pilbara Crustal Survey Preview

Write preview report on proposal to study the structure of the crust in the Pilbara region.

Port Moresby Observatory, PNG (This observatory will be transferred to the PNG Government this year).

Record, analyse and report on geomagnetic and seismic observations made at the observatory. Continue the normal program of SP recording at Wabag, Lae, Momote, Talasea, Kavieng, Kobuan, Vanimo and Madang to study regional seismicity.

Evaluate and advise on intensity and acceleration results, regional hypocentres and earthquake risk (this includes work for PNG Advisory Committee on seismology and earthquake engineering). Maintain accelerographs at Port Moresby, Lae, Musa Damsite, Ramu Damsite, Wewak, Rabaul, Kandrian, Madang, Frieda River and Star Mountains. Make field studies of important earthquakes and record aftershocks. Carry out studies on the focal mechanism of events, tsunamis and submarine slides.

PNG Crustal Movement Project

In co-operation with Division of National Mapping, analyse surveys made in 1975 across the Markham Valley and St Georges Channel.

Quarry Blast Recording

Record quarry blasts in southeast Australia to provide a data base for investigating crustal structure. The crustal structure beneath the Snowy Mountains will be examined using data from blasts near the Dartmouth Dam.

Regional Magnetic Surveys

Conduct fill-in third order surveys in Yorke Peninsula, SA (Aug). Analyse previously obtained first-order and third-order magnetic survey data. Make third-order magnetic survey observations in Enderby Land, Antarctica (Jan-Mar, Dec).

Occupy first-order magnetic stations at the coast and at selected stations inland as part of studying the secular variation of the Earth's magnetic field. Record magnetic data along airborne traverses between the stations.

Seismic Computer Systems Development

Adapt overseas computer programs to crustal models for the Australian region.

Create a data library on a HP2100 computer system and store on it retrieval, signal processing and plotting programs.

Stress Measurements

In collaboration with CSIRO, measure the stress field in SA.

Toolangi Observatory (Vic)

Record, analyse and report on geomagnetic and seismic observations and continue normal SP recording at Bellfield, Norfolk Island and Stephens Creek (NSW). Re-site visual recording seismograph to Leongatha, southeast of Melbourne.

Standardize magnetometers used in Antarctica and train personnel destined for Antarctica in their use.

Operate the accelerograph in the Botanic Gardens and carry out field studies on felt or damaging earthquakes.

ENGINEERING

INTRODUCTION

Engineering investigations are being conducted on behalf of the Departments of Construction; Environment, Housing and Community Development; the Capital Territory; and the National Capital Development Commission. Projects include geotechnical investigations of sites for reservoirs, dams, major buildings and refuse disposal, and surveys of routes of tunnels, sewers, pipelines and roads. Complementing this work is the compilation of engineering geological maps of Canberra and investigation of soils properties.

PROJECTS

Damsite and Reservoir Investigations

Geologically appraise, and conduct geophysical investigations of, alternative damsites and treatment plant sites for the Tennant Dam.

Make preliminary geological appraisals of three possible damsites for urban water supply in the ACT at Ginns Gap, Melrose Valley and Dunns Creek, and of possible major water supply schemes for Canberra's future needs at Brindabella, Mullion, Springfield, Billililingra and Welcome Reef Tunnel.

Investigate four stormwater pond sites at Tuggeranong.

Provide geological services during the construction of the Googong Dam and ancillary works.

Undertake geological mapping and seismic refraction surveys at Wanniasa 1 and 3 sites and geological mapping at Gungahlin, South Taylor 1, Stranger, Lanyon, Tuggeranong Hill 1, 2 and 3, and Tharwa 1 and 2 sites.

Major Buildings, ACT

Conduct site investigations, map excavations, and provide geological advice as required for major buildings including the High Court, Parliament House, Canberra City, and Woden, Belconnen and Tuggeranong town centres.

Refuse Disposal and Pollution Studies

Investigate eight possible landfill sites for refuse disposal in Tuggeranong. Conduct hydrogeological investigations of operating landfill sites for refuse disposal at Pialligo and Belconnen West and establish a leachate monitoring system.

Resources Studies for Land-Use Planning

Evaluate potential resources of sand and gravel, rock aggregate and brick shale in the ACT and environs. Investigate construction materials for Government instrumentalities and others, and investigate sand reserves in potential urban areas, East Basin (Dairy Flat) and Tuggeranong.

Sewerage Investigations

Provide geological and geophysical services and make general assessments for Department of Construction and NCDC on the Ginninderra sewer tunnel, North and South Molonglo outfall sewer, Lanyon trunk sewer, Molonglo Valley interceptor sewer, West Murrumbidgee sewer and Jerrabomberra Valley sewer.

Soils Research

Make a soils map of the Gundaroo - Sutton area, conduct research in the Canberra area into defining a soil stratigraphy and into the mineralogy, genesis and engineering properties of swelling clays.

Transportation Studies

Conduct preliminary geological and geophysical investigations of rapid transit routes for Canberra. Conduct route evaluations of City West and City East distributors. Geologically appraise excavation and foundation conditions of Murrumbidgee Park Drive, Molonglo Parkway interchange bridge, Belconnen road network and other roadworks.

Investigate potential airport sites for Canberra.

Urban and Regional Development Areas

Complete the publication on the Darwin East urban development study.

Conduct geotechnical investigations and evaluate foundation conditions at the Woden town centre and at Gungahlin.

Compile an engineering geological map of Canberra City and compile foundation data. Compile a series of 1:10 000 engineering geological maps of the ACT and a 1:50 000 geological map of Canberra.

Map excavations in development areas of Canberra and map the geology and soils of the Majura Valley.

Water Mains Investigations

Map the geology of and make seismic surveys of pipeline routes including Tuggeranong junction to Tuggeranong Hill offtake and Campbell to Hackett.

HYDROLOGY

INTRODUCTION

Hydrological investigations are being made for clients mentioned in the Engineering section and others as detailed below.

Research into the Great Artesian Basin will continue and fractured rock aquifers and groundwater inflows into tunnels will be investigated. Geophysical groundwater surveys will be conducted at Albury-Wodonga and Christmas Island, and specific hydrological problems will be investigated in Canberra suburbs, Lake George and Jervis Bay.

PROJECTS

Albury-Wodonga

Conduct a geophysical study of sand and gravel on the floodplains south of the airport and northeast and east of Huon Hill (Jan-Mar). Requested by Albury-Wodonga Commission.

As part of a pollution study set up a control traverse to investigate changes of water conductivity with time.

Australian Capital Territory and Environs

Maintain, monitor and analyse data from observation bores in the ACT and environs, and Jervis Bay. Monitor the level and quality of water in Lake George, and leakage from Lake Windemere, Jervis Bay.

Investigate the hydraulic characteristics of fractured rock aquifers in the ACT, groundwater inflows into tunnels and the effects of dewatering and concreting, groundwater at Duntroon to see if reclaimed water can be re-used, aquifer characteristics at Belconnen, and the hydrogeology of part of the Yass River catchment at Kowen Forest.

Monitor piezometers near Lanyon and Isabella Plains to assess the effectiveness of drainage works. Investigate groundwater seepage problems in West Murrumbidgee suburbs and drainage problem areas in Gungahlin.

Conduct an experimental resistivity, EM, magnetic and gravity survey in the Wee Jasper Caves area in preparation for the survey at Christmas Island.

Christmas Island

Conduct a groundwater survey at Christmas Island at the request of the British Phosphate Commission (April-June).

Great Artesian Basin, Qld, NSW, SA, NT

Log water bores. Continue analysing hydrogeological data of the basin and refine the mathematical model of its hydraulic and groundwater characteristics. The Australian Water Resources Council nominated BMR as the co-ordinating body for the project which is drawing on information held by BMR and relevant State Water Authorities and Mines Departments.

RESOURCES AND INDUSTRY

INTRODUCTION

Studies will be made on Australia's resources of nickel, copper, tungsten, molybdenum, petroleum, and coal suitable for hydrogenation, and on the phosphate, secondary aluminium, iron ore and iron oxide industries. Results and conclusions will be reported in the Australian Mineral Industry publication series and the Petroleum Newsletter. Mining, mineral processing and mineral consumption will be studied and trends evaluated, and the use of computers for data storage and retrieval and for mining feasibility studies will be investigated.

PROJECTS

Mineral Economics Studies

Study all aspects of the Australian and the global mining industry. Compile, interpret and publish statistics on production, trade and consumption. Carry out special studies to assess Australian resources of nickel, copper, tungsten, molybdenum, and coal suitable for hydrogenation, and review the phosphate, secondary aluminium, iron ore and iron oxide industries. These studies contribute towards departmental advice and to the BMR publication 'Australian Mineral Industry Review'.

Complete an assessment of the contribution made by mining and mineral processing industries to the national economy in 1976.

Complete an assessment of Australian equity in the domestic mineral industry and complete long range mineral production and consumption patterns for Australia.

Finalise a review of geoscience information systems in Australia with emphasis on mineral economics and mining, and investigate the use of ADP for storage and presentation of raw price and currency exchange data.

Mining Engineering

Participate in Conference of Chief Inspectors of Mines and derived working groups, and in Standards Association committees and subcommittees.

Assist in assessments of Australia's copper, molybdenum and coal resources and update information on Australian mining costs.

Examine and report on the operations of tin mines to provide tin quota data.

Commence establishing a computer program for mining feasibility studies.

Petroleum Economics

Conduct investigations and research into the economics of petroleum exploration, development and production on land and offshore; provide specialized technical advice and prepare statistics. Maintain well data card and petroleum titles data systems. Prepare the Petroleum Newsletter, Petroleum Exploration and Development Titles Map, and Record of Wells and Metres Drilled.

Make initial evaluations of petroleum discoveries and estimate petroleum reserves in Australia. Conduct studies to assess Australia's petroleum resources (in conjunction with Petroleum Industry, State Mines Departments, and other scientific and technical organisations). Evaluate the extent of gas reserves in the Cooper Basin and determine the hydrocarbon reserves in the Bonaparte Gulf Basin.

Investigate oil shale resources.

Petroleum (Submerged Lands) Act

Examine and advise on applications to carry out operations, follow the progress of operations and examine final reports. Maintain a register of all operations undertaken in offshore areas. Develop a computer-based file of offshore drilling and geophysical operations.

Prepare directions and inspect and report on operations on behalf of the Department of Northern Territory and the Government of Papua New Guinea.

TECHNOLOGICAL SUPPORT

INTRODUCTION

Technological Support projects generally involve upgrading and developing geophysical systems and techniques. New equipment is constructed or bought, tested and modified, and existing equipment is modified to provide greater reliability and better data-generating capabilities.

PROJECTS

Airborne Systems, Techniques and Data Analysis

Install new and upgraded equipment in the Twin Otter aircraft including computer, D-A converters, doppler digitizer, timer, radiometric scalers, camera intervalometer and magnetic compensator.

Construct a MFS7 fluxgate magnetometer.

Engineering and Hydrology Systems Development

Install and test computer-controlled seismic refraction-reflection equipment and integrate a data acquisition system for seismic refraction work. Develop a non-explosive energy source technique for engineering investigations in built-up areas.

Develop a continuous recording magnetometer for ground surveys to give 'magnetic signatures' of near-surface rocks in addition to deeper data.

Construct a down-hole gamma-ray spectrometer.

Construct a trailer-mounted bore pump flow test unit for hydrological studies.

Magnetic and Electrical Equipment and Systems

In co-operation with CSIRO, develop improved instrumentation and interpretation techniques for down-hole electromagnetic methods. Analogue and mathematical modelling will be done by CSIRO with BMR participation. BMR will sample geological noise characteristics for inclusion in the modelling work from holes at Woodlawn, Captains Flat, Cobar, Bathurst and Kowen Forest.

Develop an improved transient electromagnetic (TEM) system to detect artillery shells under maghemite. Conduct field trials at Holsworthy, NSW (June).

Redesign a recording micro-barometer.

Magneto-Telluric Investigations

Prepare the magneto-telluric system for a survey in the northeastern Officer Basin.

Marine Systems Development

Continue the development of the shallow marine seismic profiling system.

For the prototype marine data acquisition system, design and construct amplifier/filter, timing control, digital interface and shot relay units, D/A converters and trigger pulse generators, and integrate the system for future surveys.

Observatory Systems and Maintenance

Maintain, test and construct equipment for seismic and magnetic observatories. Projects include constructing data acquisition systems for use with proton magnetometers in Antarctica, integrating the control unit for a mini-computer-based magnetogram digitiser, constructing power supplies, amplifier/filters and general purpose clocks, and integrating the telemetered seismic recording station for Mount Isa.

Regional Structural Survey Systems

Continue developing the Akai Automatic Seismic Tape Recording and Playback Systems. Investigate tape transport problems of the Precision Instrument Tape Recording System, and depending on the outcome of a feasibility study, make additions to the Telseis telemetry system to enable its use for regional structural surveys.

Rock Measurements

Develop heat conductivity measurement equipment, static elastic moduli measurement equipment, gamma-ray spectrometry equipment and equipment to measure sound velocities in unconsolidated sediments. Make palaeomagnetic and various physical rock property measurements.

Seismic Systems and Data Processing

Test and integrate seismic digital recording system with existing ancillary equipment; prepare computer programs for processing digital seismic data through BMR Hewlett-Packard mini-computers and the CSIRO Cyber 76. Produce seismic record section, Laser Scanning, digital and other processing as required.

TECHNICAL SERVICES

INTRODUCTION

Ancillary services for all BMR projects are provided by the ADP, Drafting, Editing, Information, Photogeology and Planning Groups; in addition, comprehensive rock, mineral and palaeontological museums, stratigraphic and technical data indexes, and an extensive library are maintained.

PROJECTS

Automatic Data Processing

Provide ADP facilities and advice to BMR activities. Present projects include: pilot programs for information storage and retrieval systems, integration of laboratory instruments with mini-computers for on-line data acquisition and processing, and computer assisted cartography applications.

Core and Cuttings Laboratory

Receive, catalogue, and store core and cuttings; provide facilities for examination and testing of samples.

Geological and Geophysical Services

Provide drafting services for BMR publications and reports.

Provide map compilation and editing services for BMR publications. Current compilation projects include the 1:2 500 000 Geological Map of Australia, the 1:5 000 000 Geological Map of Australia for the Atlas of Australian Resources, and several maps at 1:10 000 000 scale for the BMR Atlas of Maps.

Prepare and revise Mineral Reports; maintain indexes and technical data files for use by BMR personnel; maintain the Central Register of Stratigraphic Names.

Information Services

Prepare and disseminate information concerning BMR to government, industry, the public, and the news media; answer queries from Ministers, Parliament, other Authorities and public as required.

Prepare the BMR Annual Report, Pictorial Index of Activities, List of Maps, List of Geoscience Events, List of Consultants, and Open File Circulars for distribution; organise the annual BMR Symposium and other various lectures and displays for universities and schools. Co-ordinate, index and maintain the BMR 35-mm slide collection.

Continue feasibility studies on an information storage and retrieval system for BMR. Provide specialist advice on and co-ordinate storage of technical material. Participate in the revision of the national geoscience thesaurus and provide advice on its use (in co-operation with AMF and Australian Geoscience Information Association and other bodies).

Library

Maintain and operate a comprehensive library for use by BMR personnel and visitors.

Museum

Maintain and operate a comprehensive museum of geological material; provide informational and educational services to the public and teaching organizations. Arrange exchange or purchase of desirable specimens.

Photogeology and Remote Sensing

Provide photogeological advice to field parties doing interpretation. Prepare and give an AMF photointerpretation course.

Compare RAAF/CSIRO multiband air photography with conventional colour and panchromatic photography in the Mount Isa area.

Review possible participation in the Landsat C project.

Planning and Co-ordination

Review and investigate short and long term program proposals in terms of priorities, manpower requirements, financial resources, cost effectiveness, and co-ordination of interrelated projects.

Publications and Editing

Edit BMR publications and papers for scientific journals including BMR Journal; the first issue of this new quarterly Australian geological and geophysical journal is due for release in March 1976.

International Geological Congress

Provide Secretariat and session leaders for the 25th International Geological Congress (Sydney, 16-25 August 1976); conduct IGC field excursions to Amadeus, Bowen, Georgina and Kimberley Basins, and the Arunta and Nicholson-Mount Isa Blocks.

APPENDIX

PUBLICATIONS IN PROGRESS

Authors: Superscripts after an author's name indicate the following:

1. Formerly with BMR
2. With, or formerly with, State Geological Survey
3. With, or formerly with, university or other institution.

METALLIFEROUS

<u>Project</u>	<u>Title</u> (Publication)	<u>Author</u>
Antarctica	Geology of the Prince Charles Mountains, Antarctica (Bulletin)	Tingey, R.J. England, R.N. Sheraton, J.W.
	Prince Charles Mountains (1:500 000 map 1st ed.)	Tingey, R.J.
	Stinear Nunataks, Crohn Massif, Beaver Lake, Mount Hicks, Fisher Massif, Mount Creswell, Mawson Escarpment North, Mawson Escarpment South, Mount Menzies, Cumpston Massif, Wilson Bluff, Mount Twigg, Scullin Monolith (1:250 000 maps 1st ed.)	Tingey, R.J.
Arunta Block, NT	Geology of the Reynolds Range area and adjoining parts of the Arunta Block (Bulletin)	Steward, A.J. Offe, L.A. Warren, R.G. Glikson, A.Y.
	Geological report on 1:100 000 scale mapping of the southwestern Arunta Block, Alice Springs 1:250 000 Sheet area, NT. (Bulletin)	Shaw, R.D. Langworthy, A.P. Offe, L.A. Stewart, A.J. Warren, R.G.
	Petrographic and geochemical study of the Ringwood evaporites deposit, NT. (Report No. 186)	Stewart, A.J.
	Burt (1:100 000 map Prelim. ed.)	Langworthy, A.P.
	Alice Springs (" " ")	Offe, L.A.
	Laughlen (" " ")	Shaw, R.D. Langworthy, A.P.
	Undoolya (" " ")	Shaw, R.D. Offe, L.A.
	Riddoch (" " ")	Stewart, A.J.
	Fergusson Range (" " ")	Shaw, R.D. Stewart, A.J.

METALLIFEROUS

<u>Project</u>	<u>Title</u> (Publication)	<u>Author</u>
Arunta Block, NT (cont.)	Reynolds Range (1:100 000 map Prelim. ed.)	Stewart, A.J. Offe, L.A.
	Tea Tree (" " ")	Stewart, A.J. Offe, L.A. Glikson, A.Y.
	Aileron (" " ")	Glikson, A.Y. Warren, R.G.
Granites-Tanami	Geology of the Granites-Tanami area, NT and WA (Bulletin)	Blake, D.H. Hodgson, I.M. Muhling, P.A. ²
	Granites-Tanami (1:500 000 map 1st ed.)	Hodgson, I.M.
	Highland Rocks, The Granites (1:250 000 maps 1st ed.)	Hodgson, I.M.
	Lucas (1:250 000 map 2nd ed.)	Crowe, R.W.A. ² Muhling, P.C. ²
	Billiluna (" " ")	Muhling, P.C. ² Passmore, V.L. Blake, D.H.
Kimberley Block	Kimberley Region North (1:500 000 map 1st ed.)	Plumb, K.A.
	Kimberley Region West (" " ")	Derrick, G.M.
Lachlan Belt	Tottenham detailed aeromagnetic survey, NSW, 1971 (Report No.182)	Rees, J.E. Taylor, R.J. ¹
	Brindabella, Tantangera (1:100 000 maps 1st ed.)	Owen, M. Wyborn, D.

METALLIFEROUS

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
McArthur Basin	Geology of the Carpentaria Proterozoic Province: Arnhem Land, NT. (Bulletin)	Plumb, K.A.
	Evolution of the McArthur Basin, NT. (")	Roberts, H.G. ¹
	Report on results on dating of rocks from the McArthur Basin	Plumb, K.A. Webb, A.W. ³
Nicholson-Mount Isa Belt		
Duchess	Duchess (1:100 000 map Prelim. ed.)	Bultitude, R.J.
Mount Isa-Cloncurry	Geology of the Prospector 1:100 000 Sheet area, Qld. (Bulletin)	Wilson, I.H. ² Derrick, G.M.
	Geology of the Marraba 1:100 000 Sheet area (Bulletin)	Derrick, G.M. Wilson, I.H. ² Hill, R.M. Mitchell, J.E.
	Geology of the Mary Kathleen 1:100 000 Sheet area (Bulletin No.182)	Derrick, G.M. Wilson, I.H. ² Hill, R.M. Glikson, A.Y. Mitchell, J.E.
	Geology and geochemistry of Proterozoic volcanics (Report)	Glikson, A.Y. Derrick, G.M.
	Geology of the Mount Isa 1:100 000 Sheet area, northwest Queensland (Report)	Hill, R.M. Wilson, I.H. ² Derrick, G.M.
	Cloncurry (1:250 000 map 2nd ed.)	Wilson, I.H. Grimes, K. ² Hill, R.M.
	Cloncurry, Kennedy Gap, Quamby (1:100 000 maps 1st ed.)	Derrick, G.M. Hill, R.M. Wilson, I.H. ²

METALLIFEROUS

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Westmoreland	Seigal, Hedley's Creek (1:100 000 maps 1st ed.)	Sweet, I.P. Mitchell, J.E. Gardner, C.M.
Papua New Guinea	Geochronology of igneous and metamorphic rocks in the New Guinea Highlands (Bulletin No.162)	Page, R.W.
	Geology of the North Sepik region (Bulletin)	Hutchison, D.S. Norvick, M.S. 1
	Volcanoes of the Papua New Guinea Highlands (Bulletin)	Mackenzie, D.E.
	Geology of New Britain, PNG (Bulletin)	Ryburn, R.S. Hohnen, P.D.
	Volcanoes of New Britain, PNG (")	Hohnen, P.D.
	Geology and petrology of the Tabar, Lihir Tanga, and Feni Islands off New Ireland, PNG. (Bulletin)	Johnson, R.W. Wallace, D.A. Ellis, D.J. 2 Crick, I.H.
	South Bismarck Sea Volcanoes: Distribution and major element chemistry: catalogue of geology and petrology (Bulletin)	Johnson, R.W.
	Trace element geochemistry, geology of South Bismarck Sea volcanoes (Bulletin)	Johnson, R.W.
	Geological synthesis, PNG (")	Dow, D.B.
	Geology of the southeast Papuan mainland (Bulletin No.165)	Smith, I.E. 1 Davies, H.L. Belford, D.J.
	Geology of New Zealand, PNG (Bulletin No.176)	Hohnen, P.D.
	Stratigraphic tables, Papua New Guinea (Report No. 193)	Skwarko, S.K.

METALLIFEROUS

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Papua New Guinea (cont.)	Catalogue of Tsunamis, Papua New Guinea (Report No.180)	Everingham, I.B.
	Geology of Papua New Guinea (1:2 500 000 map 1st ed.)	D'Addario, G.W. Dow, D.B.
	New Britain (1:500 000 map)	Mackenzie, D.E. Ryburn, R.J.
	Ambunti, Wabag, May River (1:250 000 maps 1st ed.)	Hutchison, D.S. Davies, H.L.
	Vanimo, Wewak, Sepik, Aitape (" " ")	Norvick, M.S. ¹ Hutchison, D.S.
	Cape Raoult, Arawe (" " ")	Ryburn R.J.
	Port Moresby, Kalo, Aroa, Kikori (" " ")	Pieters, P.E.
Pine Creek Block Alligator Rivers	Geology of the Alligator Rivers Uranium Field, NT. (Bulletin)	Needham, R.S. Smart, P.G. Stuart-Smith, P.G.
	Goomadeer, Gilruth (1:100 000 maps Prelim. ed)	Needham, R.S.
	Cahill, Jim Jim (" " ")	Needham, R.S. Smart, P.G. ¹
	Wellington Range, Oenpelli, Howship (" " ")	Needham, R.S. Smart, P.G. ¹ Watchman, A.L. ¹
	Field Island (" " ")	Needham, R.S. Watchman, A.L. ¹
	Kapalga (" " ")	Stuart Smith, P.G. Smart, P.G. ¹

METALLIFEROUS

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Rum Jungle	Geology of the Rum Jungle Special Sheet area (Report) Rum Jungle Special (1:100 000 map Prelim. ed.)	Johnson, K. ¹
	Batchelor (1:100 000 map Prelim. ed.)	Crick, I.H.
Tennant Creek Block	Geochemistry of the Tennant Creek Mineral Field (Bulletin)	Smith, S.E. Haldane, A.D.
	Geochronology of the Tennant Creek Mineral Field (Bulletin)	Black, L.P.
	Tennant Creek (1:250 000 map Prelim. ed.)	Dodson, R.G.
Victoria River	Precambrian geology of the Victoria River region (Bulletin No.168)	Sweet, I.P.
Yilgarn Block	Aeromagnetic survey of Perenjori, Ninghan, Bencubbin and eastern part of Moora 1:250 000 Sheet areas, WA, 1973 (Report)	Wyatt, B.W.
Geochemistry	Geochemistry and petrology of acid igneous rocks of northwest Queensland (Bulletin)	Sheraton, J.W. Labonne, B. ¹
Miscellaneous	Bibliography of the Lower Proterozoic in South Australia (Report No.196)	Jago, J. ³
	Catalogue of isotopic age determinations carried out on Australian rocks, 1966-1970 (Report)	Page, R.W. ¹ Bennett, R. Bladon, G.M.
	Geology and petrology of the Antrim Plateau Volcanics (Bulletin)	Bultitude, R.J.

SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Amadeus Basin	Amadeus Basin airborne magnetic and radiometric survey, N.T. 1965 (Report No. 187)	Young, G.A. Shelley, E.P.
Bonaparte Gulf	Cenomanian spores and pollen grains from Bathurst Island, N.T. (Bulletin No. 151)	Burger, D.
	Geology of the Bathurst and Melville Islands (Bulletin No. 177)	Hughes, R.J.
Canning Basin	Conodont biostratigraphy of the Upper Devonian reef complex of the Canning Basin, W.A. (Bulletin No. 158)	Druce, E.C.
	The Late Devonian and Early Carboniferous geology of the Lennard Shelf, Canning Basin, W.A. (Bulletin)	Druce, E.C. Radke, B.M. Nicoll, R.S.
	Upper Devonian Conodonts from the Oscar and Napier Ranges, Canning Basin, W.A. (Bulletin)	Nicoll, R.S.
	Upper Devonian and Lower Carboniferous conodonts from the Canning Basin, W.A. (Bulletin)	Nicoll, R.S. Druce, E.C.
	Geochemistry of the Fairfield Group, Canning Basin, W.A. (Report)	Druce, E.C. Radke, B.M.
Mount Bannerman	(1:250 000 map 1st ed.)	Yeates, A.N. ² Muhling, P. ²
Noonkanbah	(" " ")	Towner, R. Crowe, R. ²
Helena, Lucas	(" " ")	Yeates, A.N.
Cornish	(" " ")	Crowe, R. ²
Dummer	(" " ")	Wyborn, L.A. ¹

A-7

SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Canning Basin (cont'd)	Tabletop, Percival, Sahara (1:250 000 map Prelim. ed.)	Yeates, A.N.
	Ural, Wilson, Ryan (" " " ")	Towner, R.
	Morris, Runton (" " " ")	Crowe, R. ²
Carpentaria Basin	Geology of the Carpentaria Basin (Bulletin)	Doutch, H.F.
		Smart, J. ²
		Grimes, K. ²
	Cape Weymouth, Coen, Croydon, Ebagoola (1:250 000 map 1st ed.)	Doutch, H.F.
	Hann River, Holroyd, Walsh (" " " ")	Grimes, K. ²
	Aurukun, Jardine River, Red River, Weipa(" " " ")	Smart, J.
Coastal Studies and Heavy Mineral Sands	Southern Carpentaria (1:1 000 000 map 1st ed.)	Doutch, H.F.
		Smart, J.
	Northern Carpentaria (1:1 000 000 map Prelim. ed.)	Smart, J.
	Sedimentology and Holocene history of a tropical estuary, Broad Sound, Queensland (Bulletin No. 170)	Cook, P.J.
		Mayo, W. ¹
	Geochemistry of Broad Sound (Bulletin)	Cook, P.J.
		Mayo, W. ¹
	Mathematical techniques used to study estuarine sediments at Broad Sound, Qld (Bulletin)	Mayo, W. ¹
	Sedimentology and geochemistry of a temperate estuary, Mallacoota Inlet, Victoria (Bulletin)	Reinson, G.E. ³
	A bibliography of Australian heavy mineral sands (Report)	Gardiner, J.

A-6

SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Eromanga Basin	Notes on the geology of the northern part of the Eromanga Basin (Bulletin No. 167A)	Senior, B.R. Harrison, P.L. Mond, A.
	Notes on the geology of the central part of the Eromanga Basin (Bulletin No. 167B)	Senior, B.R.
	Notes on the geology of the northwestern part of the Eromanga Basin (Bulletin No. 167C)	Mond, A. Harrison, P.L.
	Sediments and geochemistry of Lake Frome, S.A.	Draper, J.J. Jensen, A.R.
	Northern Eromanga Basin (1:1 000 000 map 1st ed.)	Senior, B.R.
	Northwestern Eromanga Basin (" " " ")	Mond, A.
Eucla Basin	Airborne Survey, Eucla Basin, S.A. 1970/73 (Bulletin)	Lambourn, S.S.
Ngalia Basin	Ngalia Basin, N.T. (Bulletin)	Wells, A.T. Moss, F.J.
	Ngalia Basin seismic survey N.T., 1967-1969 (Report)	Moss, F.J. Jones, P.

SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Officer Basin	Geology of the Officer Basin, W.A. (Bulletin)	Jackson, M.J. Van de Graaff, W.J.E. ²
	Evaporite exploration, Amadeus and Officer Basins (Bulletin)	Wells, A.T. Kennewell, P.J.
	Officer Basin seismic, gravity, magnetic and radiometric survey, W.A., 1972 (Report)	Harrison, P.L. Zadoroznyj, I. Mathur, S.P.
	Minigwal, Rason (1:250 000 maps 1st ed.)	Boegli, J.C. ²
	Cundeelee, Vernon (" " " ")	Van de Graaff, W.J.E. ²
	Madley, Wanna, Westwood, Yowalga (" " " ")	Kennewell, P.J.
Palaeontological Studies	Browne, Lennis, Neale, Robert, Kingston, Waigen, Throssel (" " " ")	Jackson, M.J.
	Studies of larger foraminifera from Oligo-Miocene sediments from NW Western Australia (Bulletin)	Chaproniere, G.C.H.
	Late Cambrian trilobites from the Chatsworth area, western Queensland (Bulletin)	Shergold, J.H.
	Correlation chart for the Permian of Australia (Bulletin No. 156B)	Dickins, J.M.
	Correlation chart for the Triassic of Australia (Bulletin No. 156C)	Banks, M.R. ³
	Cymbric Vale Fauna of N.S.W. and Early Precambrian biostratigraphy (Bulletin No. 159)	Opik, A.A.
	Early Cretaceous plant microfossils from Queensland, Australia	Burger, D.
	Palynological observations in the Officer Basin, Western Australia (Bulletin No. 160)	Kemp, E.M.

SEDIMENTARY

Project

Title (Publication)

Author

Cambrian and Ordovician rostroconch molluscs from northern
Australia (Bulletin No. 171)

Gilbert-Tomlinson, J.
Shergold, J.N.
Pojeta, J.³

Mid Cambrian Agnostacea (Bulletin No. 172)

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Opik, A.A.

Australian Ordovician pelecypod molluscs (Bulletin No. 174)

Gilbert-Tomlinson, J.
Pojeta, J.³

Dolichometopid trilobites (Bulletin No. 175)

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Opik, A.A.

Check list of Ostracoda recorded from Australia and Papua New Guinea
(1845-1973) (Report No. 195)

De Deckker, J.³
Pojeta, J.

Bothriolepid antiarchs from Victoria Land, Antarctica (Bulletin)

Young, G.C.

Relationship of Murchisonia and Ptychompholina Upper Palaeozoic
Gastropoda (Crespin Commemorative Volume) (Bulletin)

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The genus Triplasia (Foraminiferida) from the Miocene of Papua New
Guinea (Crespin Commemorative Volume) (Bulletin)

Belford, D.J.

Microfossils of fungal origin from Tertiary sediments on the Ninetyeast
Ridge, Indian Ocean (Bulletin)

Kemp, E.M.

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McKirdy, D.M.
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Exon, N.F.

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Qld (Bulletin)

Burger, D.

SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Surat Basin (cont'd)	Wireline logging of water bores in the Surat Basin, 1960 to 1974 (Report No. 188)	Exon, N.F. Morrissey, J.
	Surat Basin (1:1 000 000 map)	Exon, N.F.
Wiso Basin	Geology of the southern part of the Wiso Basin (Report)	Kennewell, P. Huleatt, M.B.
	Winnecke Creek, South Lake Woods (1:250 000 maps, 1st ed.)	Kennewell, P. Huleatt, M.B.

METALLIFEROUS AND SEDIMENTARY

Airborne Maps of Australia	Magnetic: Alcoota, Alligator River, Ballarat, Bendigo, Canberra, Cape Melville, Cloncurry, Cobourg Peninsula, Cooktown, Cundeelee, Ebagoola, Georgetown, Hann River, Holroyd, Melville Island, Minigwal, Mount Evelyn, Plumridge, Rason, Red River, Rutland Plains, St Arnaud, Tallangatta, Wagga Wagga, Wangaratta, Westmoreland (1:250 000 maps, 1st ed.) Broken Hill, Lincoln-Maitland, Port Augusta, Rason (1:250 000 maps, Prelim. ed.) Magnetic and radiometric: Cootamundra, Duchess (1:250 000 maps, Prelim. ed.) Radiometric: Ballarat, Broken Hill, Cooktown, Ebagoola, Hann River, Holroyd, Lincoln-Maitland, Port Augusta, Rutland Plains, St Arnaud, Wagga Wagga, Whyalla Magnetic Map of Australia (1:2 500 000 map, Prelim. ed.)
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METALLIFEROUS AND SEDIMENTARY

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Geologic Maps of Australia	Australia (NE, NW, SE, SW sheets), Northern Territory Geology, Northern Territory Cainozoic Geology, (1:2 500 000)	D'Addario, G.W.
	BMR Atlas of Maps (1:10 000 000)	D'Addario, G.W. Palfreyman, W.D. Bultitude, J.M.

MARINE

Continental Margins Survey	The Queensland Plateau (Bulletin No. 179)	Mutter, J.C.
	Regional geology of the Exmouth Plateau (Bulletin)	Willcox, J.B. Exon, N.F.
	The Great Australian Bight: regional interpretation of the gravity and magnetic fields and seismic profiles (Report)	Willcox, J.B.
	Regional geology of the Carnarvon Terrace (Report)	Symonds, P.A.
	Regional geology of the Ceduna Terrace (Report)	Exon, N.F. Stagg, H.M.J.
	Naturaliste Plateau: sediment distribution and structure (Report)	Cameron, P.J. Petkovic, P.
Marine Geology	Marine geology of the Capricorn Channel area (Bulletin No. 163)	Marshall, J.F.
	Marine geology of the continental shelf of southeastern Australia (Bulletin)	Davies, P.J.
	Marine geology of the Tasmanian shelf (Bulletin)	Davies, P.J.
	Marine geology of the central N.S.W. shelf (Bulletin)	Marshall, J.F. Jones, H.A.

CRUSTAL AND BASIC EARTH INVESTIGATIONS

<u>Project</u>	<u>Title (Publication)</u>	<u>Author</u>
Geomagnetic Studies	Analysis of the diurnal variation of the earth's magnetic field (Bulletin No. 173)	Parkinson, W.D. ¹
Gosses Bluff	Gosses Bluff gravity survey, 1968-69 (Report)	Barlow, B.C. Van Son, J.H.
	Gosses Bluff geological and geophysical studies (Bulletin)	Moss, F.J.
Gravity Maps of Australia	Reconnaissance gravity survey of the southwest of Western Australia, 1969 (Report No. 197)	Fraser, A.R.
	Reconnaissance gravity survey of the northwest of Western Australia, 1969 (Report No. 198)	Fraser, A.R.
	Reconnaissance gravity survey of central Western Australia, 1971-72 (Report No. 199)	Fraser, A.R.
	Reconnaissance helicopter gravity survey of southwest of South Australia, 1970 (Report No. 200)	Pettifer, G.R. Fraser, A.R.
	BMR ADP gravity data storage and retrieval system (Report)	Murray, A.S.
	Tasmania: SJ55-14, 15, SK55-1, 2, 3, 5, 6, 7, 9, 10, 11, 14, 15 (1:250 000 1st ed. Bouguer anomaly maps)	
	NSW/Vic/SA: Ana Branch, Bairnsdale, Ballarat, Balranald, Bathurst, Bega, Bendigo, Broken Hill, Cargelligo, Cobham Lake, Colac, Deniliquin, Forbes, Hamilton, Horsham, Ivanhoe, Jerilderie, Mallacoota, Manara, Melbourne, Menindee, Mildura, Milparinka, Narrandera, Narromine, Nymagee, Ouyen, Pinaroo, Pooncarie, Portland, Queenscliff, Renmark, St Arnaud, Sale, Swan Hill, Sydney, Tallangatta, Urisino, Wagga, Wangaratta, Warburton, Warragul, White Cliffs, Wilcannia, Wollongong (1:250 000 1st ed. Bouguer anomaly maps).	

CRUSTAL AND BASIC EARTH INVESTIGATIONS (cont'd)

WA/NT: Alligator River, Arnhem Bay, Ashton, Auvergne, Bathurst Island, Birrindudu, Blue Mud Bay, Cambridge Gulf, Camden Sound, Cape Beatrice, Cape Scott, Charnley, Cobourg Peninsula, Darwin, Delamere, Dixon Range, Drysdale, Fergusson River, Fog Bay, Gordon Downs, Grove, Highland Rocks, Hodgson Downs, Junction Bay, Katherine, Lake Mackay, Lansdowne, Larrimah, Lennard River, Limbunya, Lissadell, Londonderry, Melville Island, Medusa Banks, Milingimbi, Montague Sound, Mount Doreen, Mount Elizabeth, Mount Evelyn, Mount Marumba, Mount Ramsay, Mount Theo, Mount Young, Noonkanbah, Pellew, Pine Creek, Port Keats, Port Langdon, Prince Regent, Roper River, The Granites, Truant Island, Urapunga, Victoria River Downs, Waterloo, Wessel Islands, Yampi (1:250 000 1st ed. Bouguer anomaly map)

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Isogal Project

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Barlow, B.C.

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Mathur, S.P.
Moss, F.J.
Branson, J.C.

PNG Crustal
Studies

An analysis of strong-motion accelerograms from Yonki, Papua New Guinea, 1967-72 (Report No. 184)

Denham, D.

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Ripper, I.D.

Seismicity of the New Guinea/Solomon Islands region, 1969 (Report)

Everingham, I.B.

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Denham, D.

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Miscellaneous

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Mathur, S.P.
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Branson, J.C.

ENGINEERING

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Title (Publication)

Author

Urban and Regional Development Areas

Engineering geology of the proposed Darwin East urban development
area, N.T.

Vandenbroek, P.H.

Coppins Crossing, Central Canberra (1:10 000 engineering geology maps)

Henderson, G.A.M.

Canberra (1:50 000 map)

Henderson, G. A. M.
Jacobson, G.

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Burton, G. ¹

RESOURCES AND INDUSTRY

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1974	1975
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Australian Mineral Industry Quarterly Vol. 28 No. 1

77	77	77	77	77	77	2
77	77	77	77	77	77	3
77	77	77	77	77	77	4

TECHNOLOGICAL SUPPORT

Airborne Systems, Techniques and Data Analysis

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VH-BMG (Report No. 185)

Downie, D.N.