RECORD 1980/25

BUREAU OF MINERAL RESOURCES

1980 PROGRAM

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Record 1980/25

BMR 1980 PROGRAM

Compiled by

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INTRODUCTION

The role of the Bureau of Mineral Resources, Geology and Geophysics is

(i) to develop an integrated, comprehensive, scientific understanding of the geology of the Australian continent, the Australian offshore area and the Australian Antarctic Territory, as a basis for minerals exploration; this to be done where appropriate in co-operation with State Geological Surveys and other relevant organisations and having regard to priorities for the search for minerals approved by the Minister for National Development and Energy;

(ii) to be the primary national source of geoscience data and to publish and provide information; and

(iii) to undertake mineral resource assessments in accordance with programs and priorities approved by the Minister for National Development and Energy with the advice of the BMR.

Note is taken of the geoscience research programs of other government institutions, universities and industry in arriving at the BMR program. Current BMR projects can be grouped into eight broad programs.

- reconnaissance surveys
- petroleum resource studies
- mineral resource studies
- Earth structure and physical properties
- equipment and systems R & D
- geotechnical services and hydrogeology
- information and reference collections
- foreign aid.

Specialist, technical and administrative services support the above programs.

This document provides a brief description of current BMR projects. The dates given in brackets after each field operation refer to the scheduled duration of the fieldwork. Reference is made to the Baas Becking Geobiological Research Laboratory which is a joint venture involving BMR and CSIRO scientists under the sponsorship of the Australian Mineral Industry Research Association, BMR and CSIRO.

RECONNAISSANCE SURVEYS PROGRAM

Reconnaissance surveys are designed to provide an initial understanding of the composition, structure and geological history of the Australian continent, the continental margin and Australian Antarctic Territory. They are also used to indicate resource potential and key areas requiring further research.

ONSHORE GEOLOGY

Antarctica

Collect geochronological samples in Enderby Land (Jan.-Feb.). Continue geochemical, petrological, and geochronological studies of rock samples from eastern Antarctica. Collect supplementary palaeomagnetic samples from mafic dykes in Enderby Land (Feb.-Mar.). Continue to carry out palaeomagnetic measurements on samples of mafic dykes and pegmatites collected in previous surveys.

Conduct semi-detailed field research in North Victoria Land, in conjunction with West German expedition (Jan.-Feb.).

Canning Basin, WA

Complete 1:250 000 scale geological maps and explanatory notes. Prepare 1:1 000 000 scale geological map of the basin and a comprehensive stratigraphic table. Joint project with Geological Survey of Western Australia.

Yilgarn Block, WA

Compile 1:250 000 scale Preliminary geological maps of the Sandstone and Youanmi Sheets. Joint project with Geological Survey of Western Australia.

AIRBORNE GEOPHYSICS

Adelaide Geosyncline, SA and Vic

Continue to process data from the 1978 survey which covered Renmark, Pinnaroo, Adelaide (eastern third), Barlow (eastern third), Naracoorte (northern three-quarters) and Horsham 1:250 000 Sheet areas.

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Albany-Fraser and Yilgarn Blocks, WA

Carry out airborne magnetic and radiometric survey of the Ravensthorpe, Collie, and Pemberton (one third) 1:250 000 Sheet areas (Jan.-Mar.).

Antarctica

Take airborne magnetic measurements in Enderby Land in conjunction with ice radar (Jan.-Mar.).

Canning Basin, WA

Carry out airborne magnetic and radiometric survey of Billiluna, Lucas, and Stansmore 1:250 000 Sheet areas (May-Aug.).

Darling Basin, NSW

Carry out airborne geophysical survey of Menindee, Manara, and Ivanhoe 1:250 000 Sheet areas (Sep.-Mar, 1981).

Lachlan Belt, NSW and Vic

Complete the data processing for the Mallacoota and Warburton 1:250 000 Sheet areas.

McArthur Basin, NT

Complete the data processing from the 1978 survey which covered the Mount Marumba, Blue Mud Bay, Milingimbi, Arnhem Bay, and parts of Junction Bay, Wessel Islands, Gove, Port Langdon, Cape Beatrice, and Roper River 1:250 000 Sheet areas.

MARINE GEOPHYSICS

Continental margins survey

Complete reports on Scott Plateau, Carnarvon Terrace and Ceduna Terrace.

Surveys using Division of National Mapping vessels

Continue to collect magnetic data over sedimentary basins on the continental shelf and on special cruises to Heard Island (Feb.-Mar.) and Macquarie Island (Jan.). This year the continental shelf surveys will be in the Timor/Arafura Sea (Oct.-Dec.) and the Great Barrier Reef (Mar.-May) regions.

International co-operative projects

Under the Australian-West German Science Agreement, participate in a survey of heavy-mineral sands on the eastern continental shelf using R.V. Sonne (Oct.Nov.). Interpretation and reporting of data collected during survey of Lord Howe Rise and Coral Sea margin.

Surveys using Department of Science vessels

Collect magnetic data during supply runs to and from Antarctica (Jan, Feb, Oct, Nov.).

MARINE GEOLOGY

Great Barrier Reef studies

Continue investigations into the sedimentology and stratigraphy of southern and central sections of the Great Barrier Reef (Mar.-Apr, Aug.-Sept.).

International co-operative projects

Complete reporting associated with the survey of the N.W. continental margin using R.V. Sonne. Participate in a survey of heavy-mineral sands on the eastern continental margin also using R.V. Sonne (Oct.-Nov.). Both these projects are co-operative efforts with West German scientists as part of the Australian-West German Science Agreement.

GRAVITY

Antarctica

Continuation of gravity survey in Enderby Land (Jan.-Feb.).

Australia-wide

Continue the recomputation of gravity survey data from BMR and other organisations to standard datum. Add these data to computer-based gravity repository. Produce free-air and Bouguer anomaly maps. Continue to interpret gravity maps to provide background for petroleum and mineral search.

PERIOD STUDIES

Cainozoic studies

Continue the Australia-wide study of the Oligocene Epoch. Complete the entering of existing data into the system developed in 1974.

Continue the study of Tertiary basins.

PETROLEUM RESOURCES PROGRAM

Petroleum resources research is directed at all aspects relating to origin, exploration and recovery of onshore and offshore resources with a view to assessing discovered and potential resources and encouraging further exploration. A continuous review of the exploration and development aspects of the petroleum industry is maintained for advice to the Government and for use in resource assessment.

BASIN REVIEW AND RESOURCE ASSESSMENT

Update assessment of undiscovered petroleum resources of Australia. Maintain assessment of inferred petroleum resources. Determine minimum economic reservoir size in selected areas. Continue studies on Capricorn Basin with processing of seismic data from BMR continental margin survey, interpretation of data, and assessment of petroleum resources.

Review results of company exploration in Exmouth Plateau.

PETROLEUM GEOCHEMISTRY AND PETROPHYSICS

Investigate and implement geochemical methods for assessing undiscovered petroleum resources. Conduct source rock studies associated with the Amadeus Basin, Central Eromanga Basin, Darling Basin and Georgina Basin projects.

Carry out conventional and special core analyses (porosity, permeability, density, fluid saturation, capillary pressure, and relative permeability of petroleum reservoir and other rocks).

Carry out investigations into the recovery of hydrocarbons from Australian reservoirs under various natural-drive mechanisms. Conduct laboratory testing of enhanced oil recovery processes on oil reservoirs in the Cooper Basin. In co-operation with Baas Becking Geobiological Research Laboratory carry out laboratory studies of enhanced recovery using micro-biological techniques.

Conduct drilling fluid investigations.

PETROLEUM AND RESERVOIR ENGINEERING

Develop methodology for evaluation of oil and gas discoveries. Carry out studies of oil and gas discoveries, and evaluate prospects of their development. Forecast production schedules of Australia's oil and gas fields. Estimate in-place and recoverable oil and gas reserves. Prepare and publish reports on the remaining reserves of crude oil, LPG, condensate, and natural gas in each field in Australia.

PETROLEUM INDUSTRY

Review of industry

Carry out investigations and research into the economics of petroleum exploration, development, and production on land and offshore. Provide specialised technical advice and prepare statistics. Maintain well data card system and petroleum titles data system, and implement a computer-oriented data storage system. Prepare the Petroleum Newsletter and the Petroleum Exploration and Development Titles Map and Key, and report on drilling of wells in Australia.

Technical administration of legislation

Examine and advise on applications to carry out operations under the Petroleum (Submerged Lands) Act, follow the progress of operations, and examine final reports. Index, store, and make available as appropriate the data received under the Act. Maintain a register of all operations undertaken in offshore areas, and a register of relinquished and current offshore areas. Continue developing a computer-based file of offshore drilling and geophysical operations. Assess the petroleum prospectivity of relinquished offshore title areas and advise on their readvertising. Advise on regulations and directions pertaining to offshore areas.

OIL SHALE STUDIES

Toolebuc oil shale

In conjunction with CSIRO Fuel Geoscience Unit, study the nature, distribution, origin, and geophysical response of oil shale in the Toolebuc Formation (July-Oct.) - a NERDDC funded project.

Marine oil shale

In conjunction with CSIRO Fuel Geoscience Unit, determine the conditions of deposition of black shales in the Georgina Basin, the nature and origin of the organic matter, the trace metal contents, and source rock potential (July-Sept.).

BASIN STUDIES

Bowen Basin, Qld

Continue interpretation of data obtained during the 1979 seismic and gravity survey in the Denison Trough. Prepare report and appropriate publications. Project is a co-operative effort with Geological Survey of Queensland and Mines Administration Ltd.

Central Eromanga Basin, Qld

In co-operation with Geological Survey of Queensland and companies operating in the area, commence a multidisciplinary study of parts of the Eromanga Basin and underlying basins. Review geological and geophysical data in the western part of the basin. Carry out a seismic and gravity survey in the Cooper Basin-Warrabin Trough area (July-Nov.). Study the structure of the Cooper and Adavale Basins using magnetotelluric and seismic refraction techniques (Sept.-Oct.). Conduct a feasibility study into the use of geothermal measurements for studying oil maturation problems and basin development (Sept.-Oct.).

MINERAL RESOURCES PROGRAM

Mineral resources research is primarily directed at understanding the relation between mineral occurrences and their geological environment, knowledge fundamental to both mineral exploration and resource assessment. In addition a continuous review of all aspects of the mineral industry is maintained for advice to the Government and for use in mineral resource assessment.

PROVINCE STUDIES

Arunta Block, NT

Carry out geological field research in the Huckitta 1:250 000 Sheet area (July-Oct.). Continue isotopic age determinations. Complete palaeomagnetic measurements on samples from Lander beds and Stuart dykes.

Write Explanatory Notes for Alice Springs 1:250 000 Sheet. Prepare Records on Illogwa Creek 1:250 000 Sheet and MacDonnell Ranges, Anburla, Narwietooma, and Glen Helen 1:100 000 Sheets. Compile Glen Helen 1:100 000 Sheet and check drafting of Riddoch 1:100 000 Sheet.

Georgetown area, Qld

In co-operation with Geological Survey of Queensland, investigate the relations between base-metal deposits and stratigraphy in a section of the Einasleigh Metamorphics (July-Oct.). Carry out field research into the nature of the Inorunie Sandstone, Croydon Volcanics, Esmeralda Granite, and related copper, gold, and tin deposits (July-Oct.). Carry out a regional reconnaissance geochemical survey in the Croydon area (July-Oct.).

Prepare a Bulletin on work undertaken up until the end of 1979 in the central part of the Georgetown Inlier and a publication on the stratigraphy and structure of the Newcastle Range. Prepare data Record on the North Head/Forest Home region, and maps at appropriate scales of the Lyndhurst area. Continue isotopic age studies.

Georgina Basin, NT and Qld

Continue the sedimentological and stratigraphic studies of the Upper Proterozoic/Cambrian units along the southern margin of the basin. Continue the petrological studies of the Ninmaroo Formation. Palaeontological support

includes the study of Devonian thelodonts and fish faunas, Ordovician conodonts, and Upper Proterozoic/Cambrian microfloral stratigraphy. Continue palaeomagnetic studies. The project is in co-operation with Geological Survey of Queensland.

Lachlan Belt, ACT and NSW

Write up results of geological field work in the Araluen 1:100 000 Sheet area and prepare map. Compile maps and analyse data from the geochemical survey of the Araluen 1:100 000 Sheet area. Continue geology of the Canberra 1:100 000 Sheet area.

Interpret data obtained during the geophysical investigations in the Lachlan Belt. Prepare reports as required.

McArthur Basin, NT

Continue the study of the stratigraphic, sedimentological, and tectonic evolution of the McArthur Basin and its application to the genesis of an exploration for base-metal deposits.

Interpret data collected during previous field seasons. Compile a 1:1 000 000 geological map of the basin, a 1:1 000 000 Bouguer anomaly map of the basin, and a 1:100 000 Special map of Abner Range. Revise Bauhinia Downs, Wallhallow, and Mount Young 1:250 000 Sheets. Continue palaeomagnetic studies. Complete sedimentological studies of Tawallah Group and lower McArthur Group units, and sedimentological and biostratigraphic studies of upper McArthur Group units. Carry out laboratory studies of the Eastern Creek lead-barium and Beetle Springs lead deposits. Interpret data from 1978 and 1979 gravity surveys.

Commence a regional structural analysis based on airborne, gravity, seismic, magnetotelluric, and geological data.

Nicholson-Mount Isa Belt, Qld

In co-operation with Geological Survey of Queensland, continue studies of Nicholson-Mount Isa Belt. Continue preparation of 1:100 000 and 1:250 000 series maps, map commentaries, and data records. Prepare publications including a Bulletin covering the geology of the entire Mount Isa Inlier. Continue geochronological studies of the region and geochemical studies around Mammoth Mines.

Pine Creek, NT

Complete field research of Pine Creek 1:1 000 000 Sheet (June-Sept.). Commence field research in the Ranford Hill area and on the Litchfield Complex (June-Sept.).

Prepare Record on Mary River and Point Stuart 1:100 000 Sheet areas. Commence Bulletin on Alligator Rivers Uranium Field. Prepare Map Commentaries and Explanatory Notes as required. Continue palaeomagnetic geochronological and regional geochemical studies. The project is a joint venture with Geological Survey of the Northern Territory.

MINERAL DEPOSIT STUDIES

Alkaline ultramafic rocks

Continue the geochemical and geochronological study of alkaline ultramafic rocks throughout Australia.

Permian coals of eastern Australia

In conjunction with CSIRO, study the relation between geological history of various sedimentary basins in eastern Australia and the properties of Permian coals within the basins - a NERDDC funded project.

Pilbara, WA

In co-operation with Geological Survey of Western Australia, continue trace-element characterisation studies of Archaean volcanic rocks. Undertake field investigations in mineralised areas (May-Aug.).

Pine Creek, NT

Continue geobotanical and soil geochemical studies over Ranger No. 1 orebody. Continue the study of uranium mineralisation in ore-zones. Continue the geochemical study of metasediments in the Pine Creek Geosyncline.

Spencer Gulf, SA

As part of the Baas Becking Geobiological Research Laboratory program, continue studies on sedimentation in Spencer Gulf. Project includes the study of factors influencing carbonate deposition, production of primary organic matter, and the formation, transport, and fixation of base metals.

Stuart Shelf and Adelaide Geosyncline, SA

As part of the Baas Becking Geobiological Research Laboratory program, continue the mineralogical, petrological, and geochemical studies of stratabound copper deposits to provide information necessary for the consideration of metallogenesis. Project is in collaboration with mining companies operating in the areas and the South Australian Department of Mines and Energy.

Volcanology and ore genesis, PNG

Continue to write reports on geology, petrology, mineralogy, and trace-element geochemistry of volcanoes in Papua New Guinea.

Lachlan Belt, NSW

Write a report on the geophysical investigation in the Cobar area.

Geobiological laboratory studies

As part of the Baas Becking Geobiological Research Laboratory program, continue laboratory studies into the toxicity of heavy metals to sulphate-reducing bacteria, into the movement and fixation of copper in organic and sulphide-rich sediments, and into the simulation of sedimentary systems.

MINERAL ECONOMICS

Study all aspects of the Australian mineral industry in context of world industry. Compile, interpret, and publish statistics on production, trade, and consumption for all mineral commodities. Complete a review of the Australian mineral industry in 1979. Complete a study of the refractory mineral industry and the secondary zinc industry in Australia. Review part and future trends in the Australian aluminium industry.

MINERAL RESOURCE ASSESSMENT

Compile resource totals of major mineral commodities and a summary of changes in economic resources. Complete an assessment of Australian chromite, tin, and uranium resources.

MINING ENGINEERING

Study the cost structure and economics of the mineral industry and produce an annual cost schedule for typical mines. Provide preliminary capital and operating costs for various sizes of open-pit mines. Expand the cost system to underground mining. Study critical mining costs (labour, replacement parts, explosives, power, etc.) and incorporate them into an estimating program that shows how the total cost would change with small variations in critical item cost.

Maintain schedules of State mining royalties and Federal charges and levees.

Design and formulate a computer program for geostatistical analysis of samples for ore reserve calculations.

EARTH STRUCTURE AND PHYSICAL PROPERTIES PROGRAM

This program involves research into structure, physical properties, composition and dynamics of the Earth's crust and mantle in the Australian region. It provides key information on large-scale geological structures and tectonic processes with which mineral, petroleum, and energy resources may be associated. It also provides information for establishing earthquake risk and basic data for navigation.

CRUSTAL STUDIES

Central Eromanga Basin, Qld

Study the structure of the Cooper and Adavale Basins and the underlying basement using seismic refraction and magnetotelluric techniques (Sept.-Oct.).

McArthur Basin, NT

Interpret 1979 seismic data along two lines east and west of the Emu Fault.

S.E. Australia, NSW

Continue with the determination of the crustal structure beneath south-east Australia. Interpret seismic recordings from shot sources at Dartmouth, Marulan, and Gundary Plains for Lachlan Fold Belt, and from shot sources at Marulan, Singleton, and Newcastle for Sydney Basin.

Pilbara, WA

Continue with the interpretation of seismic and gravity data.

Tennant Creek-Mt Isa-Townsville, NT and Qld

Interpret data from seismic stations along 1200 km line, in conjunction with ANU and University of Queensland.

Regional stress

In co-operation with CSIRO make and interpret stress measurements in seismically active areas east of Perth (Feb.-March). Record Dalton/Gunning, NSW, earthquakes to determine regional stress directions (March-April).

GEOTHERMAL STUDIES

Central Eromanga Basin, Qld

Investigate the feasibility of using geothermal measurements for studying oil maturation problems and basin development. Undertake geothermal traverses using 20 x 100 m holes to study heat flow anomalies (Sept.-Oct.).

Theoretical studies

Continue theoretical modelling. Study geothermal energy systems in France (June-Aug.).

GEOMAGNETISM AND SEISMOLOGY

Geomagnetism

Operate and maintain standard magnetic observatories and distribute preliminary data. Digitise magnetograms from analog observatories; produce mean values and yearbooks. Maintain and develop Australian geomagnetic standards. Develop and maintain magnetic data programs and files. Prepare magnetic charts and models. Conduct first-order survey in Papua New Guinea.

Seismology

Operate and maintain a network of seismic stations throughout Australia and at Mawson and Macquarie Island. Some stations are operated jointly with other institutions. Analyse seismograms, determine regional hypocentres, and advise on earthquakes and seismicity.

EQUIPMENT AND SYSTEMS R & D PROGRAM

This program involves the upgrading and development of equipment and systems for use in BMR operations. It consists of the improvement of geophysical and remote-sensing techniques used in delineating concealed geological structures and mineral deposits, and the development of data acquisition and processing systems.

Magnetic methods

Upgrade and install carborne magnetometer and data acquisition system.

Investigate availability of three-component fluxgate magnetometer for boreholes.

EM methods

Complete calibration of signal processing electronics, documentation, and testing of prototype of omni-directional down-hole probe.

Complete feasibility study on the development of an induction logger for slim holes.

Electrical methods

Develop and test a laboratory/small-scale field complex resistivity system.

Airborne systems

Install, interface and test multi-channel analyser, digital-to-analog converter, additional crystal, barometic altimeter, and external air thermometer for radiometric work.

Replace cassette recorder of data acquisition system with 9-track tape.

Upgrade MFS7 fluxgate magnetometers.

Seismic systems

Construct and test prototype of a light-weight seismic recording system.

Produce an improved playback system.

Marine systems

Continue to upgrade and develop field acquisition systems with the progressive integration of software for use on ships carrying out BMR geophysical work.

Continue the development of a combined land/marine seismic processing system (NERDDC project).

Continue work on the development of marine data acquisition system.

Geomagnetic and seismological systems

Design and construct spare detector heads for MNJ2 magnetometer used with PVM system, Canberra Observatory.

Continue the development of prototype servo-nulling of La Cour variograph to record X and Y at Canberra Observatory.

Landsat systems

Develop application of digital Landsat analysis to BMR field research.

GEOTECHNICAL SERVICES AND HYDROGEOLOGY PROGRAM

The main emphasis of this program is directed towards regional hydrogeological studies which provide the basis for water resource assessment and management. BMR has some commitments in geology, geophysics, and groundwater hydrology for engineering design, land use, and urban development projects undertaken by Commonwealth Government agencies.

HYDROGEOLOGY

ACT and environs, ACT and NSW

Prepare paper summarising investigations into Canberra City hydrocarbon pollution. Monitor remedial work. Prepare paper summarising investigations into waste disposal in landfill sites. Compile 1:100 000 hydrogeological map of ACT and prepare Explanatory Notes. Prepare papers on upper Yass River catchment. Continue to monitor water-levels in Lake George. Develop a model and prepare a paper on the hydrogeology of Jervis Bay.

Alligator Rivers, NT

Continue groundwater investigations in the Alligator Rivers area (May-Oct.). The project is funded by the Office of the Supervising Scientist. Work includes field geology, borehole logging, aquifer testing, drawdown pump testing, slug testing, and dye tests.

Begargo Creek salinity studies, NSW

Conduct a basin salinity study in the Begargo Creek area. Determine the Cainozoic geology, soil stratigraphy, hydrogeology, and soil and groundwater salinities of the basin. (March-April). This is a collaborative project with CSIRO.

Goulburn River valley, Vic

Complete the report on the groundwater survey of the area.

Great Artesian Basin, Qld, NT, NSW and SA

Continue investigations into the hydrogeology of the Great Artesian Basin. With AAEC, prepare a paper on isotope hydrology. Update and maintain GABHYD model. Prepare paper on model calibration.

Murray Basin, NSW, Vic and SA

Continue geological and hydrogeological investigations. Prepare a basin-wide synthesis of geological and hydrogeological data. Identify aquifer systems. Design a groundwater data storage and retrieval system.

Carbonate rock terrain

Conduct an office study into the hydrology and palaeohydrology of carbonate rock terrains in Australia.

ENGINEERING GEOLOGY AND GEOPHYSICS

Surveys within ACT

Provide geoscience surveys as required for dams, sewers, roadworks, major government buildings, refuse disposal areas, and urban development. Continue the preparation of engineering geology maps and explanatory notes.

Telecom tunnel, Melbourne, Vic

Provide geological services during the construction of the Telecom tunnel.

Disposal of radioactive waste

In conjunction with AAEC, continue to maintain an awareness in developments overseas in the disposal of radioactive waste in geological environments.

OVERSEAS AID PROGRAM

BMR provides geoscience expertise to Australian foreign aid commitments through the Department of Foreign Affairs.

OVERSEAS FIELD SURVEYS

Irian Jaya, Indonesia

In conjunction with the Indonesian Geological Survey, undertake systematic reconnaissance geological mapping supported by geochemical and geophysical surveys to provide basic information on the geology and mineral resource potential of Irian Jaya.

Map the geology of Enarotali and Waghate 1:250 000 Sheet areas (June-Oct.). Conduct a gravity and ground magnetic survey of Steenkool, Kaimana, Pailau Ratewa, Enarotali, and Waghete 1:250 000 Sheet areas (Aug.-Sept.). Compile geological data obtained in previous field seasons for seven 1:250 000 scale maps. Complete computation of 1978-79 gravity and magnetic data; prepare and interpret maps. Compute gravity and magnetic data from 1980 survey. Continue palaeontological support.

An important component of the project is the training of Indonesian personel in geological and geophysical methods.

EXPERT ADVISORS

Advice to committees

Provide special advisory service to CCOP.

ESCAP projects

Continue the preparation of correlation diagrams and notes for the ESCAP Stratigraphic Atlas project.

Petroleum operations

Advise on, inspect, and report on onshore and offshore operations as required on behalf of the governments of Papua New Guinea and Fiji.

TRAINING

Provide in-house training to students under the Columbo Plan, UNDP, and similar schemes.

INFORMATION AND REFERENCE COLLECTIONS

Information is disseminated to the public and industry through the BMR series of publications, 'open file' system of unpublished data, reference collections, data indexes, interlibrary loan service, and the production of national maps summarising existing knowledge. Petrological, mineralogical, and palaeontological reference collections are maintained for use by BMR and other organisations.

INFORMATION SYSTEMS

Information services

Provide a range of information services to Government, industry and the public, including the production of lists, catalogues, and brochures, as appropriate. Provide an information service to BMR staff including specialist advice on information storage and retrieval systems. Develop and maintain information systems to facilitate storage and retrieval of BMR-generated bibliographic and numeric data. Conduct a program of public relations and publicity activities. Maintain liaison with national and international geoscience information systems and services including AESIS. Organise lectures and BMR Symposium.

Library

Maintain and operate a comprehensive library for use by BMR personnel and visitors. Participate in studies concerning BMR and national geoscience information systems.

Stratigraphic Index

Maintain a register of stratigraphic names and definitions. Issue bi-monthly lists of variations and annual list of deletions to State Geological Surveys and other interested organisations.

NATIONAL MAPS

Atlas of Australian Resources

Continue with compilation of maps for this atlas. Maps include geology of Australia, surface rocks, major structural elements, and mineral deposits of Australia.

BMR Earth Science Atlas

Continue with compilation of maps which include mineral occurrences, tectonic evolution, metamorphic rocks, and coal occurrences.

International co-operative projects

Check final draft of metamorphic map of Australia for CGMW. Check compilations as supplied by organisers for Circum-Pacific Map Project.

REFERENCE COLLECTIONS

Core and Cuttings Laboratory

Receive, catalogue, and store drill core and cuttings. Provide facilities for examination and testing of samples.

Museum

Maintain and operate a comprehensive museum of geological material. Provide information and educational services to the public, government, and teaching organisations. Arrange acquisition of desirable specimens.

Palaeontological collections

Collect samples for and curate BMR and ESCAP fossil collections.

SPECIALISTS AND SUPPORTING SERVICES

These exist primarily to provide support for the scientific programs of EMR previously described. Specialists and technical service staff are an integral part of field and laboratory projects; however, for convenience of identifying their level of activity, they are listed separately below.

SPECIALISTS	Palaeontology
	Remote sensing
	Geochemistry
	Geochronology
	Palaeomagnetics
	Petrology
TECHNICAL SERVICES	ADP applications
	Editing
	Drafting
	Drilling
	Bore logging
	Mechanical engineering
	Electronic engineering
	Plant and equipment procurement
MANAGEMENT AND ADMINISTRATION	Executive
	Planning and review
	Administrative services