WORK PROGRAM 2003-04

Australian Government

Geoscience Australia

Introduction

The coming year promises to be a productive and challenging one for our organisation.

As part of the 2003-04 Budget the Minister announced additional funding of $61million over the next four years to increase exploration investment in Australia's offshore waters.

Our ongoing challenge is to provide the geoscientific input to government management decisions relating to our mineral and energy resources, our quality of life, our biological diversity, our soil and water quality and quantity, our marine zone and its resources, and our air quality.

Our focus remains on our three major impact areas of the organisation:

For Onshore this will include the development of a suite of products on the mineral prospectivity of the Gawler Craton, Central Australia province and Eastern Goldfields of WA. We also need to develop a set of protocols for the identification of areas at greatest risk of natural hazards in response to the 2002 COAG Review [Natural Disasters in Australia: Reforming mitigation, relief and recovery arrangements].

Offshore, as part of the additional funding will complete Phase 1 of the petroleum seismic data remastering project and also complete two new surveys for petroleum prospectivity in offshore frontier zones. We will also deliver the technical case for Australia's submission to extend the national boundary under the UN Convention of the Law of the Sea. Our contribution to the CO2 CRC will develop technologies for assessing sites for CO2 and our work on the CRC Torres Straight will provide a better understanding of the area and the associated improvements in management practices where appropriate.

Spatial will increase on-line delivery of geoscientific and spatial information to clients. A major contribution to this will be to progress development of a seamless 1:250,000 scale topographic map of Australia.

We will continue to work closely with other Australian Government Agencies and state and territory governments through the National Geoscience Agreement and the Australian and New Zealand Land Information Council (ANZLIC).

Given the new challenges we have recently faced as a nation, such as, threats of terrorism and the impact of the SARS virus, our organisation is well placed to play a major role to provide a safer, more sustainable environment for the economic growth of our community.

Overview

Agency Context

The corporate outcome for *Geoscience Australia* is to achieve

"Enhanced potential for the Australian community to obtain economic, social and environmental benefits through the application of first class geoscientific research and information."

More specifically, *Geoscience Australia* aims to achieve
- Enhanced global attractiveness of Australia's offshore and onshore exploration investment opportunities;
- Improved resource management and environmental protection; and
- Safer communities and transportation.

Geoscience Australia's Vision is:

To be a world leader in generating and delivering national geoscience information and knowledge.

Geoscience Australia's mission is:
To serve the Australian nation by generating and delivering geoscience information and knowledge as required by the Commonwealth Government.

Geoscience Australia is committed to providing outstanding service to the Government and to the people of Australia. We do this by being responsive to the needs of the Government and our clients.

To succeed we have an open culture of mutual trust and respect in which we foster expertise and professionalism. We strive for excellence in all that we do.

We encourage innovation and teamwork by providing a stimulating and supportive environment that recognises the contribution of our people and their need for challenge and development.

We communicate our discoveries, knowledge and advice clearly and effectively to each other and to our stakeholders and clients.

We work within the Australian Public Service Values and Code of Conduct and behave with integrity in all that we do.

Geoscience Australia will measure progress in achieving its outcomes through the evaluation of the following performance information:

- Impact on the level of the global exploration market investing in Australia
  - Australia maintains or increases its market share
- Impact upon resource management, regional development and environmental protection
  - Improved understanding and management of the Australian landmass, external territories and maritime zone
- Impact upon Australia's sovereignty
  - Improved definition of Australia's sovereign interests in support of national defence, border protection and emergency response
- Impact of geomagnetism information and advice upon maritime transportation and aviation
  - Zero navigation errors caused by failure to properly update changes to geomagnetism standards
- Impact of geohazards information and advice upon communities
  - Reduced adverse impact of geohazards upon communities

Measures which identify the degree to which our outputs contribute to the corporate outcome are as follows:

- Exploration companies behaviour influenced by Geoscience Australia's research and information products

- Government agencies continue to commission Geoscience Australia to undertake marine-zone geoscience products
- Organisations concerned with land use, regional development and the environment use Geoscience Australia's spatial information products
- Percentage technical acceptance of Australia's claim under the UN Convention on Law of the Sea
- Government agencies use Geoscience Australia's advice and information products to support national interest activities such as defence, border protection and emergency response
- Geohazard assessments lead to update of relevant standards (eg building codes)
- Clients use Geoscience Australia's geohazard risk assessments as part of their decision-making processes

1 Petroleum and Marine Division

Petroleum and Marine Division Context

Introduction

The Petroleum and Marine Division (PMD) is responsible for the Offshore Output Group and addresses three goals within the National Research Priority: *An Environmentally Sustainable Australia*, namely:

- *Developing Deep Earth Resources* - Petroleum Promotion and Technical Advice,
- *Sustainable Use of Australia's Biodiversity* - Marine and Coastal Geoscience, and
- *Reducing and Capturing Emissions in Transport and Energy Generation* – Greenhouse Gas Advice.

The Division also undertake work required by government outside the scope of the National Research Priority namely:

- Provision of technical advice to government related to the administration of the petroleum industry in Australia, and
- Definition of Australia's offshore boundaries under the United Nations Convention of the Law of the Sea.

Petroleum

Government Context: Energy Policy is a current and significant policy debate in Australia and is likely to be ongoing. The International Energy Agency considers world dependence on fossil fuel will increase with substantial increase in international oil and, particularly, gas trade and associated investment and security issues.

Australia's gas and condensate reserves are at an all time high, but a large proportion of these reserves are stranded because of lack of access to markets. Australian crude oil reserves are decreasing and as a result Geoscience Australia has forecast a 50% decline in oil (crude oil and condensate) production over the next 10 years.

In response to a review of Geoscience Australia's petroleum program, the Government has decided to supplement Geoscience Australia's base funding on an ongoing basis to support the Petroleum and Marine Division's (PMD) core pre-competitive petroleum exploration program – providing new impetus for the search for oil resources. This supplementation totals $36M over the first four years.

The Government is also providing funding of $25M over the next 4 years to fund a scientific research program aimed at identifying new frontier areas for petroleum exploration in Australia's offshore basins to maximise the opportunity of discovering a new oil province. This program will collect and analyse relevant seismic and geochemical data to open up new frontier areas for petroleum acreage release. It will also ensure the preservation of deteriorating seismic data tapes held by Geoscience Australia.

Industry Context: There are now fewer domestic and international companies in the petroleum industry following extensive mergers and there is world-wide competition for exploration investment with companies seeking government concessions for deepwater exploration. In Australia, monetisation of the very large stranded gas reserves is a priority for the larger companies with large north western gas discoveries destined for Liquefied Natural Gas(LNG) export or possibly gas to liquids development in some cases. Gas supply in SE Australia will become an issue in a 10-20 year time frame, but there is likely to be a market response through more intensive exploration, pipeline development and access, and development of conventional reserves and coal seam methane.

Significant recent oil exploration success has largely been confined to the Carnarvon Basin with a few outliers such as the northern Perth Basin. There may be some potential in Gippsland which may be realised from a new round of exploration in that basin.

Although there has been an ongoing positive response to recent Australian acreage releases, work program bids by industry for new acreage have been minimalist and well commitments in primary work programs are rare. Greenfields exploration is seen as very risky and the recent deep water drilling campaign in the Bight and off north-western Australia has been unsuccessful. Untested areas in Australia are either remote and/or deep water and require materiality in terms of targets to justify exploration. Attracting new exploration to frontier areas is therefore a significant challenge.

Emerging resource management issues include: include Gippsland groundwater, CO2 sequestration nationally and internationally, retention lease management.

Marine and Coastal Geoscience Sub-Division

The Marine and Coastal Geoscience sub-division is reaching the culmination of many years work on Australia's case for 'legal extensions to the continental shelf" under the UN Convention on the Law of Sea with a current target date for submission of November 2004 subject to confirmation by Government. There will be a need to support consideration of Australia's case by the UN Commission on the Limits of the Continental Shelf for approximately 2-3 years after the submission.

The Oceans Policy will continue to be the main driver for the division's work in marine and environmental geoscience. The National Oceans Office will continue to be a key client for Regional Marine Planning along with National Parks which now has responsibility for management of Marine Protected Areas, and the Antarctic Division for issues concerning marine environmental management in the Australian Antarctic Territory and Southern Ocean. New management arrangements for Oceans Policy and particularly the formation of the Oceans Policy Science Advisory Group on which Geoscience Australia is represented will provide a robust framework for longer term marine science planning. The policy environment for Geoscience Australia's work in the Coastal Zone is more complex with a multi-layered client base ranging from local authorities, regional groups, State Governments and the Australian Government's National Land and Water Audit.

Cooperative Research Centres provide a key mechanism for delivering integrated science solutions for Natural Resource Management issues. The Division is participating in the Torres Strait extension to Reef CRC and the extension to the CRC for Coastal Zone, Estuary and Waterway Management. Both these CRC's will be considering their renewal options this financial year.

Marine geoscience research requires the capability to operate at sea. To this end Geoscience Australia is becoming a major user of the Marine National Facility *(RV Southern Surveyor)* operated by CSIRO and is contributing to the development of its capability.

Geoscience Australia is also working actively with the universities to strengthen capabilities in marine geoscience and develop partnerships to assist in delivery of PMD's marine and coastal program.

1.1 PETROLEUM AND REGIONAL GEOLOGY GROUP

Projects in this group undertake the regional studies to assess the geological risks of petroleum occurrence, and underpin assessment of petroleum potential and promotion of prospectivity.

Projects in this group address the intermediate outcome 'Enhanced global attractiveness of Australia's offshore and onshore exploration investment opportunities' and the national research priority –'An environmentally sustainable Australia' goal of 'developing deep earth resources.*'*

1.1.1 Australian Basins Information Management Systems (AusBIMS)

Outcome
Improved accessibility and knowledge relating to the petroleum geology and prospectivity of Australia's sedimentary basins.

Outputs

- A new Geographic Information System (GIS) of Australian basins to underpin advice, research and prospectivity (June 2004).
- A new database of Australian basins capturing information to underpin advice, research and petroleum prospectivity assessments (June 2004).

1.1.2 Eastern and Onshore Project

Outcome

An improved understanding of the regional and petroleum geology of the eastern offshore region of Australia, maximising opportunities for the discovery of a new oil province, and to underpin future regional marine planning and promotion of selected areas for petroleum exploration. Improved understanding of the petroleum potential of selected onshore basins by provision of specialist cooperation with States/NT.

Outputs

- Provision of scientific advice to government and other clients on the geoscience of eastern offshore Australia and onshore Australia areas for potential acreage release and regional planning purposes.
- Reports and papers on the geological framework of the Australian Marine Jurisdiction, offshore eastern Australia.
- Reports and papers on Ocean Drilling Program Leg 189.
- Proposal for a *Southern Surveyor* research cruise along the central eastern Australian Margin in 2004/05.
- *Southern Surveyor* research cruise 05/2004 to the Kenn Plateau, offshore eastern Australia.
- Proposal for a *Southern Surveyor* research cruise to the Mellish Rise in 2004/05.
- Selected studies of onshore basins for the purposes of underpinning advice to clients; geochemical and/or other joint studies with the States/NT.

1.1.3 North and Northwest Australia Region

Outcome

An improved understanding of the petroleum prospectivity and resource potential of the north and northwest offshore region of Australia to maximise opportunities for the discovery of new petroleum systems, to underpin promotion of selected areas for petroleum exploration, and to enhance understanding of petroleum potential and aspects of exploration risk.

Outputs

- Scientific advice on the petroleum potential of the NNW Australian region to government and industry for the annual acreage release process and promotion of exploration investment.
- A study of hydrocarbon seepage to underpin strategies for acquisition of tangible evidence of active petroleum systems in poorly explored areas offshore North and Northwest Australia - Ashmore Platform, Arafura Basin 2003/04.
- Assessment of the undiscovered hydrocarbon resources of the Browse and Carnarvon basins, offshore Australia.

1.1.4 Southern Australia Regional Project

Outcome

An improved understanding of the petroleum prospectivity and resource potential of the southern and southwestern offshore region of Australia to maximise opportunities for the discovery of a new oil province, to underpin promotion of selected areas for petroleum exploration, to enhance understanding of petroleum potential and aspects of exploration risk, and to underpin future marine planning.

Outputs

- Provision of scientific advice on the petroleum potential of offshore southern and southwestern Australia to government and industry for acreage release, promotion of exploration investment and for planning purposes.

- A new program of geological sampling and geophysical data acquisition in the Bremer Basin to underpin assessment of prospectivity, and petroleum promotion of frontier areas of offshore southwestern Australia.
- An investigation into the geology and potential hydrocarbon seepage along the southwest Australian margin in order to underpin strategies for future acquisition and interpretation programs.
- A new tectonostratigraphic framework for the Otway Basin to support existing exploration and production, and underpin future promotion of the area for petroleum exploration.
- Reports on source rock character and hydrocarbon family correlation to support existing exploration and production, and underpin future promotion of the area for petroleum exploration.
- Reports presenting new and revised age control correlations and palaeoenvironments for the Otway Basin to support existing exploration and production, and underpin future promotion of the area for petroleum exploration.
- A synthesis of the tectonostratigraphic evolution and petroleum geology of the southern margin basins of Australia, to underpin future promotion of the area for petroleum exploration, and to provide an understanding of potential economic values.

1.1.5 Basement and Crustal Studies

Outcome

Improved understanding of the role of crystalline basement in the formation and development of sedimentary basins in the Australian Marine Jurisdiction.

Outputs

- An evaluation of new regional data and review of previous studies of the Otway Basin basement character, crustal type and thickness to provide constraints for studies of basin evolution and regional petroleum geology.
- A prototype database of seismic velocity information applicable to converting seismic two-way times to depths.
- New regional grids and interpretations of crustal structure to underpin studies of Australia's regional setting and geological evolution.
- Scientific advice on sediment thickness, basin boundaries, crustal types and thickness, and heat flow in the Eastern and NNW regions for constraining studies of crustal evolution and regional petroleum geology.
- Scientific advice on the application of geophysical methods in evaluating the petroleum potential of offshore Australia.
- An improved definition of basement character and depth, and tectonic provinces in Otway Basin to provide constraints for regional petroleum geology studies.
- A report on tectonic provinces, and basement character and depth in the Bremer and Denmark Sub-basins region.
- An internally consistent seismic velocity data set for Southern Margin basins applicable to converting seismic two-way times to depths.

1.2 PETROLEUM PROMOTION AND SPECIALIST STUDIES GROUP

Projects in this group undertake formal assessments of petroleum potential, technical promotion of the annual acreage release round and specialist studies in geochemistry and biostratigraphy.

Projects in this group address the intermediate outcome 'Enhanced global attractiveness of Australia's offshore and onshore exploration investment opportunities' and the national research priority –'An environmentally sustainable Australia' goal of 'developing deep earth resources.'

1.2.1 Seeps and Signatures

Outcome

Improved understanding of the importance of natural hydrocarbon seeps for the exploration of offshore oil and gas. Development of best practice methods, for the detection and sampling of hydrocarbon seepage, through formation of strategic alliances with international groups already proficient in this field.

Outputs

- Educational Workshop on Satellite detection of hydrocarbon seepage
- Hydrocarbon Survey on the Ashmore Platform & Yampi Shelf and analysis of cruise data

1.2.2 Petroleum Promotion & Prospectivity Assessment

Outcome

Broad awareness and acceptance of the technical opportunities of the acreage offered by the Australian government for petroleum exploration investment, and coordination of the technical presentation to support the acreage release process under the Petroleum and Submerged Lands Act. The effective assessment of petroleum potential of offshore Australian basins to underpin advice on petroleum prospectivity for planning purposes.

Outputs:

- A report and seminars on the 2004 acreage release to the Australian and international petroleum industry
- Promotion of Australia as an attractive exploration destination at national and international petroleum conferences; and a report on market intelligence gained at these meetings.
- Report on improvements to the AUSTPLAY resource assessment software, with development of links to Oracle databases.
- A report on the resource assessment of Gippsland and Otway basins, jointly conducted with the Victorian Department of Natural Resources and Environment (NRE).

1.2.3 TIMESCALES — VCEMP (Virtual Centre of Economic Micropalaeontology & Palynology)

Outcome

Improved schemes for biostratigraphic correlation and improved resolution of the geological timescale, with particular emphasis on those parts of the stratigraphic column where economic resources are important.

Outputs

- Browns Creek Corehole
- Revision and definition of nannoplankton and foraminiferal zones of the North West Shelf
- Permian Triassic boundary biostratigraphy
- Revision of criteria used to link Australian biozones and bioevents with the International timescale

1.2.4 Geophysical Processing & Data Access

Outcome

Public access to Geoscience Australia's acquired seismic, navigation, bathymetry, potential field and related geoscience data.

This project also acts as the Secretariat to the National Marine Data Group.

Outputs

- The collection, processing and distribution of swath mapping products
- Geophysical products and Services
- Integration of Seismic & Navigation into Geoquest plus ongoing support of the application

- Non-Seismic Processing Products and Services
- Proposal for "Bathymetric Integration - Southern Ocean" from Australian Antarctic Division
- ANMDG – Secretariat role.

1.2.5 Australian Petroleum Cooperative Research Centre (APCRC) - Liquid hydrocarbons: from source to trap

Outcome
Consistent organic geochemistry protocols allow inter-laboratory integration of datasets, enabling a reduction in the geological uncertainty with respect to hydrocarbon charge.
Outputs
- Provision of final report for Program 5.

1.3 PETROLEUM AND GREENHOUSE GAS ADVICE GROUP

Projects in this group provide technical advice to government on the administration of the petroleum industry in Australia. The Group also contributes to the Cooperative Research Centre for Greenhouse Gas Technologies

Projects in this group address the intermediate outcome 'Improved resource management and environmental protection'.

The Cooperative Research Centre for Greenhouse Gas Technologies Project addresses the national research priority – 'An environmentally sustainable Australia goal of reducing and capturing emissions in transport and energy generation.' Other projects in this group do not address the national research priorities.

1.3.1 Cooperative Research Centre for Greenhouse Gas Technologies Project

Outcome
Develop technologies for assessing sites for CO2 storage as well as focussing on and verifying the geological storage potential of a number of sites in Australia.
Outputs
- Undertake geological and geophysical studies of sites to understand their potential storage for CO2.

1.3.2 Exploration and Environment Advice

Outcome
Improved scientific resource management and environmental protection by provision of scientific advice on petroleum exploration, environmental issues and other upstream petroleum matters.

Outputs
- Exploration advice
- Environmental advice
- Advice about the petroleum upstream industry

1.3.3 Petroleum Engineering and Identified Resources

Outcome
Advice about petroleum engineering issues and identified resources for agencies which administer the P(SL)A, Excise Tariff Act, Petroleum Resource Rent Tax Assessment Act, Trade Practices Act and the Joint Petroleum Development Area (JPDA).

Outputs
- Advice about petroleum engineering issues and identified resources for agencies which administer the P(SL)A, Excise Tariff Act, Petroleum Resource Rent Tax Assessment Act, Trade Practices Act and the Joint Petroleum Development Area (JPDA).
- Engineering and production geological reports on Australian Petroleum Accumulations.
- Contribution of identified petroleum resources, development, production, forecasts and sufficiency components to Oil and Gas Resources of Australia 2001 (OGRA).

1.3.4 Geological and geophysical Repositories

Outcome
To maintain and provide access to Petroleum Submerged Lands Act (PSLA) and internal Geoscience Australia (Geoscience Australia) collections.
To provide public access to petroleum exploration data and other geoscientific information acquired by Geoscience Australia or submitted under legislation, including seismic data and related reports, and reports from drilling and other sampling and analysis.
This includes the development of new standards and processes for the preservation and distribution of marine geoscience and exploration related data.
Outputs
- A collection of field and processed seismic data, with associated metadata, that is securely preserved and readily accessible for Geoscience Australia and external clients.
- An accessible database of processed navigation, bathymetry, gravity and magnetic data preserved on-line with full and standardised metadata.
- Publicly available products comprising grids and compilations of data prepared as standard products and special products.

1.3.5 Petroleum Information and Data Management

Outcome
Provision of comprehensive and accurate petroleum exploration data for Geoscience Australia projects and industry through management and population of petroleum databases. Databases include PEDIN, STRATDAT, RESFACS, ORGCHEM and DEVIANT. Also to capture and manage industry activity data, support the production of weekly, quarterly and annual reports and assist with responses to ministerial and industry queries.
Outputs
- Maintenance, population and delivery of the PMD petroleum databases (STRATDAT, RESFACS, ORGCHEM, PEDIN, DEVIANT)
- Capture and manage industry activity data and support the production of weekly, quarterly and annual reports. Also provide data to assist responses to ministerial and industry queries regarding petroleum exploration activity.

1.4 MARINE GEOSCIENCE AND COASTAL ENVIRONMENT GROUP

Projects in this group undertake studies of the bathymetry and character of the seabed to underpin regional marine planning, and evaluate estuarine health for coastal management purposes.

Project in this group address the intermediate outcome 'Improved resource management and environmental protection' and the national research priority –'An environmentally sustainable Australia' goal of 'Sustainable use of Australia's biodiversity'.

1.4.1 Geosciences for Coastal Waterway Management

Outcome

Effective management of eutrophication and water quality in Australian estuaries and coastal waterways.

Outputs

- A model of estuarine processes that will compute the nutrient status of an estuary for variables including catchment N loads, flushing and denitrification. The model will be a guide for coastal managers.
- A report describing the results of a field survey to St George's Basin, southeast NSW. The results will be interpreted with respect to carbon, nitrogen, oxygen and silicate recycling, eutrophication, water quality and the ecological condition.
- A report on sedimentation and nutrient mass accumulation rates, nutrient status and biogeochemical processes occurring in sediments of Australian estuaries and coastal waterways with implications for eutrophication, water quality and catchment erosion.
- A report on sediment and biogeochemical data collected from estuaries and coastal lakes of southwest Australia.

1.4.2 CRC for Coastal Zone, Estuary and Waterway Management

Outcome

Improved management of Australian estuaries and coastal waterways.

Increased awareness in the community and policy making organisations of estuarine and coastal marine issues.

Outputs

- Identifying the sources, sinks and pathways of sediments and contaminants in the Fitzroy Estuary and Keppel Bay to better inform those responsible for the management of the estuary, its catchment and the Great Barrier Reef Marine Park.
- A review of the published information on Australia's near-pristine estuaries, the GIS mapping of sedimentary environments and habitats of a selection of these estuaries and the analysis of this dataset to assess estuary geomorphology as an indicator of modification of the estuaries and their catchments.
- This project will add additional coastal datasets to OzEstuaries and develop software tools that can interrogate this data to enable decision makers to access, integrate and synthesise information.
- Coastal Water Habitat Mapping – Coastal Geomorphology and Classification Mapping seafloor morphology and sediments, which provide distinctive substrates for key biological communities, will provide important insights into the extent, character and diversity of these benthic habitats.

1.4.3 Antarctic Geoscience

Outcome

Maintenance of the Antarctic Treaty System, and enhancement of Australia's influence within the System; protection of the Antarctic environment; and improved understanding of the role of Antarctica in the global climate system.

Outputs

- Prepare maps of seabed character of the Kerguelen Plateau in key areas of the Heard and MacDonald Island EEZ as identified by biological research as a precursor to benthic habitat mapping and bioregionalization.
- Present papers on East Antarctic marine geology at the International Symposium on Antarctic Earth Sciences, Potsdam, September 2003.
- Report on Australian geoscience activities provided for Australian Antarctic Division and Antarctic Science Advisory Committee to ensure research is consistent with the ANARE Strategic Plan.
- Structure contours, bathymetry and sediment types maps in GIS format along with note explaining the geology of the region.

1.4.4 Seabed Mapping and Characterisation

Outcome

Improved understanding of the relationship between seabed geology, and benthic habitats to assist in regional marine planning, establishment of Marine Protected Areas and the management of Australian Marine Jurisdiction.

Outputs

- The preliminary analysis and documentation of results from Geoscience Australia survey 238 to the Gulf of Carpentaria via production of a post-cruise report.
- Coordination of Geoscience Australia's collaboration with US scientists in the MARGINS program in the Gulf of Papua on board the RV Melville in August-September.
- Presentation of scientific research on the sedimentology and late-Quaternary evolution of Torres Strait and Gulf of Papua undertaken during Geoscience Australia survey 234.
- Maps showing sediment mobility under the combined influence of waves and tides on the Australian continental shelf.
- Final draft report documenting the geomorphic features of the Australian Margin and presented to the National Oceans Office.
- A Geoscience Australia record in the form of a literature review on the sedimentology of the northern margin of Australia in support of the National Oceans Office regional marine planning program.
- Development of the MARS database and population with collated datasets in conjunction with National Ocean Office.
- Maps of sediment properties and distribution from sediments database and GEOMAT modelling for northern region and for whole of Australia's EEZ for National Oceans Office.
- Progress report to the National Oceans Office on collation and interpretation of marine sediments data.

1.4.5 CRC – Torres Strait

Outcome

A better understanding of the processes controlling water quality and seagrass health in Torres Strait, of the potential impacts of biophysical variability on selected fisheries (e.g. dugong and rock lobster) and associated improvements in management practices where appropriate.

Outputs

- Marine survey in Torres Strait aboard *RV Kirby*.
- Preliminary results from an integrated computer model of water circulation in northern Torres Strait generated.

1.5 LAW OF THE SEA PROJECTS

The two Law of the Sea Projects undertake studies to define the Australia's Marine Jurisdiction under the United Nations Convention on the Law of the Sea.

The Law of the Sea Projects address the intermediate outcome 'Improved resource management and environmental protection' they do not address the National Research Priorities.

1.5.1 Law of the Sea – Australia and its island territories

Outcome

Definition of the outer limit of the extended Continental Shelf around Australia and its island territories, and the submission of the particulars of the outer limit and supporting information to the UN Commission on the Limits of the Continental Shelf (CLCS). This project is conducted in association with the Department of Foreign Affairs and Trade and the Attorney General's Department.

Outputs

- Advice, reports and maps related to maritime boundary negotiations and Continental Shelf definition. Includes the geological framework report for the Exmouth Plateau region and Law of the Sea technical reports for Macquarie Ridge and Exmouth/Wallaby Plateaux.
- Participation in the deliberations of the UN Commission on the Limits of the Continental Shelf as a Commissioner, and associated activities.
- Submission package (GIS, supporting documentation and other materials, and presentations) to be lodged with the United Nations Commission on the Limits of the Continental Shelf for the nine areas of extended Continental Shelf around Australia and its island territories.

1.5.2 Australian Antarctic & Southern Ocean Profiling Project

Outcome

Increased knowledge of the bathymetry, seabed characteristics, and geology of the Southern Ocean adjacent to the Australian Antarctic Territory (AAT), to underpin definition of the outer limit of the extended Continental Shelf around the AAT. This will place Australia in a position to make a submission to the UN Commission on the Limits of the Continental Shelf, should it decide to do so, and will provide information in support of regional marine planning and environmental management under Australia's Oceans Policy.

The Department of Finance and Administration manages this project. Geoscience Australia carries out its component under a Service Level Agreement.

Outputs

- Submission package (GIS, supporting documentation and other materials, and presentations) to be lodged with the United Nations Commission on the Limits of the Continental Shelf for the area of extended Continental Shelf off the Australian Antarctic Territory.

2 Minerals and Geohazards Annual Work Program

Minerals and Geohazards Divisional Context

The onshore cluster of Geoscience Australia encompasses activities in relation to four areas:

1. Minerals Potential, Promotion and Technical Advice (MPPTA);
2. Geohazards;
3. Dryland Salinity; and
4. Groundwater Geoscience.

Minerals Potential, Promotion and Technical Advice (MPPTA)

National Research Priority
An Environmentally Sustainable Australia - Developing Deep Earth Resources

Work Activity Area: Minerals Potential, Promotion and Technical Advice (MPPTA)

Key Government Initiative or Decision: Commonwealth's Minerals and Petroleum Resources Policy Statement 1998; Spatial Data and Access Policy 2001.

Background
The Resources Policy requires the Australian Government to 'enhance Australia's international investment attractiveness for mineral and petroleum explorers through public investment in pre-competitive geoscientific surveys and analysis where the market does not yet provide such information and where community benefits outweigh public costs'. Therefore GA's immediate level outcome is enhanced global attractiveness of Australia's offshore and onshore exploration investment opportunities.;

Australia's largest export earner is minerals, contributing about $500 billion to Australia's wealth over the past 20 years. In 2002-3 Australia's minerals exports were worth $43.8 billion, and the minerals industry provided $4.5 billion in taxes, royalties and transport levies.

New and economically feasible mineral deposits must be found to maintain Australia's wealth as existing mines become exhausted. Geoscience Australia, through its Mineral Potential and Promotion work reduces exploration risk and encourages investment in Australia through targeted surveys and research to locate Australia's potential mineral areas.

Developments and Changes in the Minerals Exploration Industry
Most of Australia's discovered economic mineral deposits lie at or close to the surface. In recent time, the minerals exploration industry has undergone major restructuring centred on consolidation which has produced fundamental changes. This process has left a largely bimodal industry dominated by a small number of very large companies and a plethora of small companies (often referred to as the junior sector - in this context they are companies that do not have production).

This consolidation has led to a major rethink of exploration strategies both in terms of targets and the mechanism by which exploration is promulgated.

The large companies are focussed on the discovery of very large deposits. This is driven by the size of the company and the observation that around 60-70% of the value in mineral deposits worldwide is held by the top 10% of deposits. The search is for the next tranche of world class deposits. World class deposits supporting long-lived mining operations, underpin the minerals industry contribution to the Australian economy.

Industry consolidation and the focus on risk reduction in exploration has seen many of the large companies reduce their own exploration programs in favour of using the junior sector as their exploration arm through strategic alliances and joint ventures.

Furthermore, the history of mineral exploration demonstrates that for most provinces the so-called early movers find the big deposits.

These changes to the industry and this historic pattern of discovery suggests that the greatest potential for future world class discoveries in Australia lay in its under explored provinces that are largely concealed by regolith or thin basin sediments or at depth in known mineralised provinces.

The challenge for GA is to assist the industry to find significant deposits buried beneath the surface in these frontier and concealed environments. To do this we will, in partnership with the States/NT, provide data and develop concepts and methods that allow industry to explore effectively in areas with potential for concealed deposits.

GA's work in the provision of pre-competitive information for the minerals exploration industry is carried out in partnership with the States/NT under the National Geoscience Agreement (NGA) which defines the roles and functions of the Commonwealth and the States/NT.

In addition, where it helps GA realise its mandate, it participates in Cooperative Research Centres (CRC's) and cooperates with universities and other agencies in specific research projects. GA is a core partner in the CRC for Landscape, Environment and Mineral Exploration and the Predictive Mineral Discovery CRC.

Geohazards Sub-Division Context

The Geohazards sub-division generates public-benefit information and knowledge that underpins well-informed decisions on safety and the well-being of the community. It operates under the GA intermediate outcome of 'Safer Communities and Infrastructure'. The work of the Division covers geophysical hazard monitoring and alerts (earthquakes, tsunamis, geomagnetic storms), geodetic positioning, vulnerability of the built environment (including lifelines), collection and management of fundamental spatially referenced information on hazard, vulnerability, and risk, assessment of risk from natural hazards, and economic loss assessment.

Sudden-impact natural hazards (such as floods and earthquakes) account for more than $1.1 billion damage annually. Responsibility for the safety, security and sustainability of Australian people and the communities in which they live, is embedded strongly in all three levels of government in Australia. The Australian Government traditionally has provided natural-disaster *relief and recovery* funding through the National Disaster Relief Arrangements (NDRA), but disaster-*mitigation* policy has received much greater attention by the Australian Government and States/Territories in recent years. This change has been encapsulated in the 2002 report of a COAG Review that focuses on reform of disaster-mitigation, relief and recovery arrangements in Australia.

Geoscience Australia is identified as a key Commonwealth scientific agency by the COAG Review, providing science and research support to national disaster-mitigation efforts and hazard alerts. Application of spatial information and risk-assessment methodologies in urban environments is especially relevant to GA disaster-mitigation studies which are undertaken in partnership with State/Territory agencies. The Department of Transport and Regional Services (DoTRS) is responding to the COAG Review recommendations through a Disaster Mitigation Australia Package (DMAP) that was announced in the recent Budget. DMAP includes a new national approach to risk assessment and national disaster-mitigation strategies. GA has been invited to participate in this new approach.

Geodesy in GA currently has a national responsibility for determining changes in the shape, size, position, and orientation of the Earth in space and assessing the significance of these changes in the Australian context. Its function is to make accurate measurements of these parameters for (1) the development and maintenance of the fundamental national positioning (geospatial) infrastructure in Australia, including positioning infrastructure for navigation (for example, GPS), and (2) monitoring of global change, including climate change (e.g. sea-level rise) and tectonic movements of, and within, the Australian continent. GA currently contributes to

positioning infrastructure by providing data and solutions for definition of the International Terrestrial Reference Frame (ITRF) which is used for the Geocentric Datum of Australia. Development of new international space platforms for geomagnetic-field measurement and the detailed measurement of gravity has the potential to change the way in which geodesy is carried out in national geodetic surveys world-wide. These influences and the resultant expansion into new scientific endeavours are expected to impact significantly on geodetic and other areas of geoscience in GA in the medium term.

Critical Infrastructure Protection (CIP) and Counter Terrorism (CT) are important, contemporary, national-security issues being addressed by several newly formed Commonwealth and State/Territory councils, committees, and working groups. Establishment of these groups is a response to the 2001 World Trade Centre terrorist attacks and to the October 2002 Bali bombings, as Australia adjusts to a new world order and to the need to prepare for possible further terrorist attacks. The Protective Securities Coordination Centre (PSCC, Attorney General's Department) is responsible for managing Commonwealth responses to CIP/CT matters. These include science, engineering, and technology (SET) programs being developed in the CIP/CT context. GA has an acknowledged role in this new arena through its use of spatial information, visualisation techniques, and risk analysis. 'Safeguarding Australia' (including CIP) is one of the four National Research Priorities. (GA also has been identified as the agency that will provide evidence of GPS outages. This currently is undertaken by examination of post-processing records from its GPS network and incurs delays. This integrity monitoring therefore will be developed to provide near real-time status of GPS at selected sites.)

Australia is a signatory to the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and is obliged under the CTBT Act (1998) to undertake several tasks before the Treaty comes into effect. GA undertakes operation of seismographs of the Australian component of the CTBT International Monitoring System (IMS), including the Australian Antarctic Territory, as well as installation and operation of hydroacoustic (shock waves in the ocean) and infrasound (shock waves in the atmosphere) stations. GA is accountable to DFAT who are responsible for the development and implementation of Australian CTBT policy. GA continues to be responsible for reporting and provision of information to DFAT, PM&C, Defence, and the CTBT Organisation (CTBTO,Vienna). GA is expected to become involved in promoting, through approved DFAT arrangements, strengthening of IMS capability in the southwest Pacific region over the next few years.

GA has national responsibility in the Commonwealth for monitoring earthquakes in the Australian region, including the southwest Pacific, operating the Australian National Seismograph Network, as set out for example in the COAG Review report,. GA provides a 24/7 earthquake-alert service to Emergency Management Australia (EMA, Attorney General's Department) for both Australian and regional earthquakes, and uses recorded data to assess national earthquake-hazard levels, particularly in the urban areas of Australia. GA, EMA, and the Bureau of Meteorology support the Australian Tsunami Alert Service (ATAS).

GA also has national responsibility for monitoring the geomagnetic field in the Australian region, providing data to (1) the Ionospheric Prediction Service's (IPS, part of DoITR) Radio and Space Service, and (2) world data centres and international programs to complement similar data from the global network of geomagnetic observatories (IPS is the Commonwealth agency carrying primary responsibility for providing radio communications and space weather information to the Australian the Ionospheric Prediction Service (IPS) for space-weather warnings).

A key emerging issue in the field of Earth monitoring in general is the inexorable 'globalisation' of geophysical and geodetic monitoring systems and, therefore, the increasing inter-dependence of national monitoring capabilities with the development international infrastructures. Increasingly sophisticated space platforms, widespread use of the Internet for data transmission, the international Test-Ban Treaty monitoring system, and other international agreements at the political level, are amongst the drivers of these trends towards globalisation. This dependence has been accepted for many years in geodesy and geomagnetism - where data is provided to international data centres for production of the ITRF and International Geomagnetic Reference Framework (IGRF) – but increasingly the trend is affecting also the monitoring of earthquakes and tsunamis. Furthermore, the impact of the recent (July 2003), international, Ministerial-level, *Earth Observation Summit* hosted by the US State Department in Washington D.C, is likely to impact on the way in which Australia will contribute to the work of the newly established *Group on Earth Observations (*GEO). This represents an international effort towards a comprehensive, coordinated and sustained Earth observation system. Increasing 'regionalisation' of Earth monitoring in the Australian region, including southeast Asian and southwest Pacific countries, is inevitable.

2.1 Geochemistry and Metallogeny Group

Projects in this group undertake specialist studies in geochemistry and metallogeny with an emphasis on regional to district scale parameters that enhance an understanding of the controls on the distribution in space and time of Australian Ore deposits and facilitate the development of empirical exploration models. The work of this group in part contributes to the pmd*CRC.

2.1.1 Australian Metallogeny Project:

Outcome
Improved understanding of Australian Mineral Deposits, with emphasis on their relationship in space and time to regional petrographic and tectonic features of the Australian Crust.

Outputs

- Digital databases of Granites and their host rocks from North Queensland
- Presentation of papers and reports on granites of Australia
- Develop user requirements for a knowledge database of ingredients and expressions for major Australian Mineral Systems.
- Reports on Australian lode gold mineral systems

2.1.2 Minerals Geochemistry Research and Development Project:

Outcome
Improved understanding of the geochemistry of the Australian continent through the development of appropriate analytical techniques

Outputs

- Analytical services to Onshore projects.

2.2 Geoscience Australia Earth Monitoring Group

This group monitors the horizontal motion of the Australian landmass and contributes data to the global scientific community's effort to monitor the earth's hanging shape and motion. This understanding of the earth and its movement helps with a range of projects such as improving satellite orbits. The data also provides a uniform, accurate basis for all spatial data in Australia and its offshore territories.

To deliver this program, Geoscience Australia operates a network of 15 Global Positioning System (GPS) base stations, Satellite Laser Ranging (SLR) facilities, and undertakes the associated processing and delivery of space geodesy observations.

2.2.1 Nuclear Monitoring Project

Outcome
Enhanced national technical means to monitor nuclear explosions and support Australia's commitment to the establishment of the global verification system to monitor future compliance to the Comprehensive Nuclear Test-Ban Treaty.
Outputs

- Technical advice and information provided to the Departments of Foreign Affairs and Trade, Prime Minister and Cabinet, and Defence, and the Comprehensive Test Ban Treaty Organisation (CTBTO), and the media, to meet Australian national technical requirements and obligations to the Comprehensive Nuclear-Test-Ban Treaty (CTBT).
- Undertake research to improve techniques for the discrimination of explosions using data in the fields of seismology, hydroacoustics and infrasound.
- Installation of CTBTO monitoring stations in Australia to meet Australia's obligations in building a global CTBT verification system.

- Report to the CTBTO on improved methodologies to characterise signals recorded on the CTBT hydroacoustic system.
- Provision of data to the CTBTO through the operation of a National Data Centre on behalf of Australia's National Authority to meet Australian national technical requirements and obligations to the CTBT.

2.2.2 Rabaul Volcanological Observatory Twinning Program Project

Outcome

The outcome of the project is to provide a reliable early warning to national and local authorities responsible for the safety of communities, helping minimize/prevent loss of life and economic disruption, in order to achieve this goal and for the Twinning program to receive continuous support from AusAID. Completion of Record of Understanding with AusAID.

Outputs

- Assist PNG with volcano monitoring, volcanic hazard assessment, to develop an infrastructure at the Rabaul Volcanological Observatory.
- Assist PNG with volcano monitoring, volcanic hazard assessment, to develop an infrastructure at the Rabaul Volcanological Observatory.

2.2.3 Geodesy and Geomagnetism Project

Outcome

Definition and densification of the global terrestrial and celestrial reference frames, and a better understanding of fundamental process of earth rotation, polar motion, the earth's gravity field, geomagnetic field, and related temporal variations.

Outputs

- Improved national, regional and global frameworks for geodesy.
- An upgraded national framework for geomagnetics.

2.2.4 Geodetic Operations Project

Outcome

An improved globally related geodetic framework as the basis for compatible Geospatial information in Australia and its territories.

Output

- An accurate and accessible geodetic infrastructure across Australia and its territories for science, public use and industry applications.

2.2.5 Geophysical Network

Outcome

Effective national capabilities in geophysical risk assessment provided through associated geohazards projects, and geophysical data underpinning mineral exploration

Output

- Seismic, geomagnetic, infrasound and hydroacoustic data, models and information for the Commonwealth Government, States/Territories and International seismological and geomagnetic agencies, through the operation of an integrated national geophysical network and databases

2.3 Mineral Provinces Group

Projects in this group are designed to provide pre-competitive geoscience information to promote exploration opportunities and are primarily focused on key Australian mineral provinces. The projects are carried out under a number of banners, including the National Geoscience Agreement (NGA), Predictive Mineral Discovery Cooperative Research Centre (pmd*CRC) and AMIRA International.

2.3.1 Predictive Mineral Discovery Cooperative Research Centre - Yilgarn

Outcome
A fundamental shift in mineral exploration practice and cost-effectiveness through improved understanding of mineralising processes and a 4D understanding of the evolution of mineralised terranes.
Outputs

- Unpublished PowerPoint reports to industry sponsors based on presentations at formal pmd*CRC meetings.

2.3.2 Predictive Mineral Discovery Cooperative Research Centre (Research Integration) Project

Outcome
A fundamental shift in mineral exploration practice and cost-effectiveness through improved understanding of mineralising processes and a 4D understanding of the evolution of mineralised terranes.
Outputs

- Advice given to pmd*CRC stakeholders on a regular basis through formal meetings (e.g. Executive Research Committee), informally and, as requested.

2.3.3 Predictive Mineral Discovery Cooperative Research Centre - Mt Isa Project

Outcome
A fundamental shift in mineral exploration practice and cost-effectiveness through improved understanding of mineralising processes and a 4D understanding of the evolution of mineralised terranes.
Outputs

- Unpublished PowerPoint reports to industry sponsors based on presentations at formal pmd*CRC meetings.

2.3.4 Predictive Mineral Discovery Cooperative Research Centre (pmd*CRC)

Outcome
A fundamental shift in mineral exploration practice and cost-effectiveness, through improved understanding of mineralising processes and a 4D understanding of the evolution of mineralised terranes.
Outputs

- Reports on the results of mineral system-related research.
- Advice given to pmd*CRC stakeholders on a regular basis through formal meetings (e.g. Executive Research Committee), and informally, as requested

2.3.5 *Predictive Mineral Discovery Cooperative Research Centre - Knowledge, Information and Data Integration Project*

Outcome
Improved mineral exploration practice and cost-effectiveness through improved online access to data information and knowledge relevant to the understanding of mineralising processes.
Outputs

- Web enabled fluid inclusion database.
- Web enabled thermodynamic database.
- Research into national and international trends in GRID technologies, workshop on GRID technologies in Australia, conference presentations and papers.

2.3.6 Fluid Flow Modelling in the Mt Isa and McArthur Basins (AMIRA International P552)

Outcome
Enhanced exploration strategies for, and the promotion of, the Mt Isa and McArthur basins through a better understanding of the geochemical and physical characteristics, timing, origin, reactivity and flow history of fluids in the basins.
Outputs

- AMIRA International Project P552 year 3 final report containing the integrated results of detailed research activities in this project to be delivered to AMIRA and then forwarded to sponsors.

2.4 National Projects Group

Projects in this group are generally national in nature. They include national maps and databases and the Australian National Seismic Imaging Resource.

2.4.1 National Mineral Databases Project

Outcome
Improved accessibility for national geoscience data.
Outputs

- Updated and enhanced databases, including priority development of:
    - improved web browser access to the Division's databases for the extraction and visualisation of data development of the Geological Provinces and Events database
    - migration of databases into the Corporate Data Model and Oracle 9i
    - access to mineral occurrence data via the Geoscience Portal, in conjunction with the State and NT surveys
    - development and maintenance of the Division's databases

2.4.2 National Geological Maps Project

Outcome
Improved understanding of the geology of Australia and promotion of Australia for mineral and petroleum exploration investment.
Outputs

- Population of the national Geological Provinces database, and delivery via the internet.
- The eastern part of a seamless digital geological map of Australia at 1:1,000,000 scale.

2.4.3 Geophysical acquisition, processing and databases Project

Outcome
Enhanced exploration strategies and promotion of mineral exploration opportunities in Australia, and improved environmental management.
Outputs

- An updated gravity point-located dataset from the National Gravity Database
- Archived airborne geophysical and gravity data available over the Internet.
- Information about the National Airborne Geophysics Database, National Gravity Database and geophysical surveys on the Internet.

- New airborne geophysical and gravity data sets as required by clients.
- Updated values at selected gravity base station sites.
- Report on geoelectric sections from the Riverland, Tintinara East regions and description of methodology of constrained inversion software.
- Progress report on radioelement baseline mapping (IAEA consultancy).
- Reports on application of portable gamma-ray spectrometry to environmental studies.
- Develop back-calibration methodology for older airborne gamma-ray surveys. Collaborate with States/NT in implementation of methodology.
- Conduct a GA workshop on the application of the gamma-ray spectrometric method to radioelement mapping.
- Data Acquisition: Airborne geophysical datasets from the Robinson Range & Belele area.
- Data Acquisition: Airborne geophysical datasets from the Goomalling area.

2.4.4 Australian National Seismic Imaging Resource (ANSIR) Project

Outcome
Enhancement of Australia's scientific and industrial competitiveness by keeping Australia at the leading edge of key technological developments in the field of seismic imaging.
Outputs

- Data release for L157 Batten Trough Seismic, NT November 2003.
- Data processing for L158 Narromine High Resolution Seismic, NSW
- Operations Report for L160 Multicomponent seismic, Narrabri NSW, April 2003.
- Operations Report for L162 Paleochannel seismic, West Wyalong, NSW, June-July 2003.
- WA Broad Band Seismic Tomography field support, 2003-04.
- Supply of ANSIR legacy data sets to clients.
- Support to the ANSIR MNRF.
- Extension of Seismic Survey meta-data Database to include tables containing ancillary data that will link with online maps.
- Data acquisition of L163 Gawler Seismic Survey.
- Data acquisition of L164 Curnamona Seismic Survey.
- Data acquisition of approved ANSIR seismic datasets from August 2003 and February 2004 rounds of calls for project proposals.
- Data recovery of BMR/AGSO/GA legacy datasets from obsolete media.
- A report on the activities of ANSIR for the year 2002/2003 for the ANSIR Board and MNRF Secretariat of the Department of Education, Science and Training.
- A report to the ANSIR Board outlining the work program for ANSIR for the financial year 2004/2005.
- A compilation of data along a transect across central Australia for the International Geological Correlation Project of UNESCO, for release by UNESCO on the World Wide Web. To be provided to UNESCO by December 2003.

2.4.5 Inversion Methodology Project

Outcome
Improved usage of inversion methods across Minerals and Geohazards Division.
Outputs

- A collaborative project has been initiated that will combine surface geological control, stratigraphic information, physical property information, ground gravity, airborne gravity gradiometry, 3D geological modelling software and 3D geophysical modelling software to produce a geological model of the Broken Hill area.
- The procedures for using the UBC MAG3D and GRAV3D in concert with GOCAD geological models will be further refined and documented.
- Many of the inversion procedures planned to be used require large amounts of computer resources. The 3D gravity and magnetic inversion programs are examples. A report will be prepared describing efforts to deploy these programs in a distributed computing environment.

- UBC inversion software produces smooth volume distributions of density or susceptibility. A method of producing discrete 3D units is to map the positions of maximum gradients in the volume, similar to the worming in 2D. Research will be conducted into 3D gradient detection methods, and the validity of 3D body results.
- In-house worming has been developed using a combination of commercial and publicly available software and in-house software development. For routine use, it is being incorporated into the commercial Intrepid geophysical processing system. Enhancements will include further development of directional analysis and investigation into methods of providing complementary source depth estimates.

2.5 National Resources and Land Use Advice Group

Projects in this group are generally national in character. They include the provision of technical advice and participation in the Cooperative Research Centre for Landscape Environment and Mineral Exploration.

2.5.1 Mineral Resources and Advice Project

Outcome
Informed decision-making and improved resource management.
Outputs

- Authoritative, scientific and technical advice on: known and potential mineral resources; exploration and discovery (including offshore programs in Commonwealth waters, and uranium as required under the Atomic Energy Act); mining (including under the Environment Protection & Biodiversity Conservation Act); processing; land access and use; environment protection; metals and the environment (including waste management); and sustainable development.
- Assessments for 2003 of national mineral resources.
- Information and analyses for Australia's contribution to OECD/NEA and IAEA publication on Uranium Resources Production and Demand.
- Australian Government representation on Joint OECD/NEA-IAEA Uranium Group and associated duties as Vice Chair of the Group, including reports on uranium developments in Australia and resource classification issues.
- Australian Government representation on the Ministerial Council on Mineral and Petroleum Resources Subcommittee of Chief Inspectors Mines, and responsibility for preparation of reports from the Subcommittee in relation to National Mine Safety Policy Framework.
- Energy Infrastructure GIS webmap and site for the Energy and Environment Division, Department of Industry, Tourism and Resources.
- CDs, manuals and webmaps of the Christmas Island and Cocos (Keeling) Island geographic information systems and client support in accord with MOUs.
- Updated web-based maps of renewable energy and fossil fuel power stations for the Australian Greenhouse Office (Renewable Energy and Energy Markets Programs) and Office of Renewable Energy Regulator.
- Stage 2 (new developments, themes and enhancements) of the Atlas of Australia's Mineral Resources, Mines and Processing Centres.
- Revision of geoprovince scale mineral potential GIS (OZPOT) in consultation with States/NT and incorporation into the Atlas of Australia's Mineral Resources, Mines and Processing Centres.
- Information and analyses as required in relation to the Minerals Exploration Action Agenda.

2.5.2 National Resources and Land Use Advice Management Project

Outcome
An Australian bid for the 34th International Geological Congress (IGC), based on Brisbane.
Outputs

- Preparation and presentation of the Australian bid.

2.5.3 Applications of Regolith Geoscience (CRC for Landscape Environment and Mineral Exploration, CRCLEME

Outcome
Greater understanding of the three- and four-dimensional evolution of the Australian landscape, leading to better methods of mineral exploration, and a better appreciation of the geological aspects of environmental problems in Australia.
Outputs

- Reports and data on the results of regolith-related research as applied to mineral exploration and environmental problems.
- Reports and data on the results of salinity mapping in the National Action Plan for Salinity and Water Quality.
- Workshop on Medical Geology, 1-4 December 2003.
- An international Geoindicators Workshop will be run at GA from 24-26 November 2003.

2.5.4 Land Use Advice Project:

Outcome
Informed decision-making in relation to land use planning and natural resource management.
Outputs

- Multi-disciplinary information system that delivers an enhanced understanding of natural systems and mineral potential through interpreting and integrating available data sets (including geology, magnetics, radiometrics, regolith, soils, salinity hazard, groundwater, land use, environmental features and mineral occurrences) for the upper Burdekin and Fitzroy catchments, Queensland, and makes recommendations for further studies to address specific issues. In collaboration with Queensland Department of Natural Resources and Mines and CRCLEME.
- Pilot scale geochemical survey in the Riverina region, with a report on an appropriate methodology for low density geochemical surveys for the whole Murray-Darling Basin, evaluating the potential benefits of such regional geochemical data for identifying trends related to animal, plant or human health, and mineral potential. In collaboration with CRCLEME.
- Internal report on opportunities for GA to show national leadership in groundwater hydrology.

2.6 Regional Studies Group

Projects in this group are primarily carried out under the National Geoscience Agreement (NGA) or through AMIRA International the Australian minerals industry research association. They are designed to provide pre-competitive geoscience information to promote exploration opportunities and include regional studies and specialist services.

2.6.1 North Australia Project (NAP) Mineral Promotion Project

Outcome
Increased exploration activity in and the promotion of the Northern Territory for mineral exploration.
Outputs

- A series of reports to promote the potential of the Arunta Region for Ni-Cu, Cu-Zn-Pb and Au.
- A series of reports and web-based visual products to promote the Au potential of the Tanami Region.
- A series of presentations presenting project results to the Mineral Open House, the Australian Geological Convention and the AGES symposium.

2.6.2 Geochronology Laboratories Project

Outcome
Improved efficiencies in mineral exploration through a better understanding of the ages of rocks that host Australia's mineral wealth and the fluid migration events that resulted in their formation.
Outputs

- Report on a comparison of new and current standards for U-Pb geochronology.
- Report on Pb migration mechanisms in zircon crystals.
- Process rock samples to separate mineral grains suitable for dating the age of rocks and fluid flow events using SHRIMP and Ar/Ar techniques.
- Geoscience Australia Data Record composed of a collection of individual reports that detail the analytical results of SHRIMP and Ar/Ar data collection sessions on a sample by sample basis.

2.6.3 Gawler Mineral Promotion Project

Outcome
Enhanced mineral exploration strategies and the promotion of the Gawler Craton for mineral exploration.
Outputs

- Regional framework for discovery of economic mineralisation in the Olympic Cu-Au province, including a three-dimensional crustal model, digital datasets, and publications on regional geology, tectonics and metallogeny.
- Reports and digital datasets on increasing the effectiveness of exploration in the central Gawler gold province, including compilation of geophysical, geological and geochemical datasets.
- Seismic reflection data acquisition across key structures in the Gawler Craton and/or Olary Domain of South Australia to define the crustal architecture within these prospective mineral provinces.

2.6.4 National Geological Events Synthesis Project

Outcome
Improved understanding of the timing, origin and links between geological events that impacted northern and central Australia during the resource-rich Palaeoproterozoic and early Mesoproterozoic.
Outputs

- A preliminary Event Chart documenting accommodation, igneous, tectonic, metamorphic and fluid migration events during the interval 1900Ma to 1500Ma.
- User requirements for Events Data Model.

2.6.5 TASMAP: Understanding Major Geological Elements and Minerals

Outcome
Enhanced exploration strategies and promotion of Tasmania through a better understanding of the tectonic evolution of the region.
Outputs

- Report on the crystallisation ages and the age distribution of inherited zircons for Palaeozoic granites and volcanics from Tasmania, the South Tasman Rise, east Tasman Plateau and Northern Victoria Land.
- Joint MRT/GA publication summarising the results of the project.
- Report on the crystallisation ages and the age distribution of inherited zircons for Palaeozoic granites and volcanics from Tasmania, the South Tasman Rise, east Tasman Plateau and Northern Victoria Land.

2.6.6 Western Australia pilot Project

Outcome
Initial scoping reports for potential new NGA projects in Paterson and Yilgarn available for assessment.
Outputs
Scoping reports for potential new NGA projects in the SW Yilgarn and Paterson Provinces
Internal reports.

2.7 Minerals Promotion Group

This group (of only one project) promotes mineral exploration opportunities to the national and international exploration industry.

2.7.1 Minerals Promotion Project

Outcome
Increased global awareness of mineral exploration opportunities in Australia.
Outputs

- A coordinated Australian Governments' technical promotion at Prospectors and Developers Association of Canada's (PDAC) Annual Convention and Trade Show, Toronto March 7-10, 2004 for the Chief Government Geologists Subcommittee (CGGC) of the Ministerial Council on Mineral and Petroleum Resources.
- A coordinated Australian Governments' technical promotion at Mining 2003, Brisbane, October 28-30, 2003 for the Chief Government Geologists Subcommittee (CGGC) of the Ministerial Council on Mineral and Petroleum Resources.
- A Geoscience Australia technical promotion at the NewGen Gold Conference, Perth 24-25 November 2003.
- A technical promotion at the World Mining Congress, London, 2-4 December 2004.
- A review of mineral exploration in Australia for the year 2003.
- A technical promotion at the Resource Information Unit's 2004 Explorers Conference, Perth 24-25 February 2004.
- Report on the mineral exploration promotional program at PDAC for the CGGC.
- A paper examining issues relating to the level of base metal resources in Australia and exploration for them.
- One-day seminars in Brisbane (18 November) and Perth (4 December) at which the results of Geoscience Australia's minerals programs will be presented to the exploration industry.

2.8 Risk Research Group

Projects in this group focus on developing risk assessments and methodologies, data collection techniques, and information management and analysis.

2.8.1 Earthquake Hazard and Neotectonics Project

Outcome
Reduced social and economic costs of the effects of earthquakes.
Outputs

- Advice and seismic information to government agencies and other clients, of potentially damaging earthquakes and tsunamigenic events in the Australian region.
- Improve Australian earthquake hazard assessment by developing a model for earthquake occurrence in Australia based on neotectonic and palaeoseismological research.
- Provide ground motion and earthquake source models for Australian earthquake hazard assessment.
- Physical upgrade of the Rabaul network in line with contractual obligations to AusAID.

2.8.2 Risk Assessment Methods Project

Outcome
This project will produce a series of products that define the national threat from a range of rapid onset natural and anthropogenic hazards.
Outputs

- Development of rapid onset hazard models.
- This output aims to define the frequency, magnitude and spatial extent of a range of natural and anthropogenic hazards. Outputs include: 1) Earthquake hazard model development 2) Fluid dynamic modelling 3) Wollongong landslide risk assessment, and 4) Development of national hazard maps.
- Vulnerability Modelling.

- This project aims to assess the susceptibility of buildings, infrastructure, lifelines and people to a range of natural hazards. Using empirical data following natural hazard events, impact-damage or disruption relationships can be established. This output includes: 1) Social vulnerability modelling, 2) Economic model development, and 3) Structural vulnerability model development.
- Development of Decision Support Tools.
- The development of decision support tools allows decision makers new and innovative risk visualisation techniques that help enable informed and appropriate planning activities.

2.8.3 Cities and Critical Infrastructure Project

Outcome

Increased awareness and improved capability of communities to manage the risks from a range of natural hazards.

Outputs

- Cities Project Perth. Assess the risk to metropolitan Perth from natural hazards (earthquakes, floods, severe winds, landslides and coastal erosion) for WA and Commonwealth partners including Fire and Emergency Services Authority, Department for Planning and Infrastructure and the Bureau of Meteorology. Includes the delivery of preliminary results for earthquake risk assessment, flood and wind hazard assessment, coastal erosion and landslide susceptibility, and related spatial datasets including a comprehensive building database for metropolitan Perth.
- Geomatics. National spatial information collection, integration, management, visualisation and delivery methods, for risk and consequence assessment for natural hazards and national security. Includes integration and analysis of datasets for Cities Project Perth, for national risk assessment and model development studies associated with the DOTARS DMAP program, and for national and local/regional critical infrastructure impact and consequence assessment activities. Also includes pre- and post-disaster field data acquisition, developing an IM strategy, and EMSINA representation.
- Counter Terrorism and Critical Infrastructure Protection. Provide advice and leadership in developing models and methods based around spatial data analysis and risk modelling to address emergency management and national security issues with regard to Counter Terrorism and Critical Infrastructure Protection. Develop demonstrator Critical Infrastructure spatial databases. Explore opportunities to develop pilot studies that assess the impacts on infrastructure and the consequences for the community from a range of natural and other hazards.

3 CIMA Annual Work Program

CIMA Group Context

At its meeting of 22 January 2002 the Executive Board agreed to the recommendations of the Information Management Review Addendum. This included ratification of an earlier decision to establish a Corporate Information Management and Access group (CIMA). It was agreed that CIMA would be responsible for:

" governance of and access to corporate information, the development of IM strategy/policy, and reporting of performance metrics to the Board."

CIMA was formed in February 2002 by bringing together around 50 staff from the Minerals and National Mapping divisions. Functional areas included Library, Records Management, Sales and Distribution, Web Development, Database Administration and Database Development.

Initial efforts within CIMA focused on creation of a coherent operational team and revised management structures to reflect new priorities and expectations. There were a significant number of staff departures at this time but we were able to successfully recruit to fill these positions during 2002. The result is a balanced and capable team which is well placed to face the challenges ahead.

A major focus of the 2002/03 CIMA Work Plan was to integrate services that were previously split across the Symonston/Bruce divide. These services included intranet and internet, records management, library, and product distribution. This integration has proceeded well and is now substantially complete, culminating in the relocation of Bruce-based CIMA staff to Symonston in June 2003. Care has been taken to draw on best practice at both sites when integrating functions, rather than simply adopting one or other of the existing models. This has resulted in some excellent outcomes – for example, the new Internet site design has won high praise from external stakeholders.

During the early months of 2003 CIMA developed an Information Management Strategic Plan which was endorsed by the Executive Board in May. This sets the scene for a number of important information management initiatives and includes improved information management governance arrangements.

3.1.1 CIMA Management

Outcome
GA has an IM Strategy that is widely accepted is being implemented and is up-to-date.
Outputs

- Implementation of IM Plan initiatives scheduled for 2003/04.
- Implementation of Stage 1 Enterprise Architecture in Geoscience Australia.
- First Revision of IM Strategic Plan.

3.1.2 Library

Outcome
CIMA provides a Library Service that is relevant, efficient, and satisfies client needs.
Outputs

- CIMA provides a library service that is relevant, efficient and satisfies client needs.
- Library Catalogue Upgraded.
- Australian Geoscience Literary Index implemented Library Journal Collection Reviewed.
- Digitise *BMR Record* (Pilot).
- Review of Preservation of and Access to GA's analogue information collections.
- Provision of High Quality Library services.

3.1.3 Records Management

Outcome
CIMA provides a Records Management Service that is relevant, efficient, and satisfies client needs.
Outputs

- Next Generation EDMS implemented (TRIM Context).
- NMD Staff trained in EDMS.
- General Disposal Authority implemented for source records.
- DIRKS (Designing & Implementing Recordkeeping Systems) Stage 3 Completed.
- Provision of High Quality Records Management Services.

3.1.4 Sales & Distribution, Symonston

Outcome
Delivery of high quality product distribution and support services and improvement in service levels.
Outputs

- Appropriate Services Delivered to Public and Account Customers.
- Effective Contract Management.
- Implement Process Improvements.
- CIMA Quality Management System Certified to ISO 9001:2000.
- Improved Offline Data Management Integration and Enhancement to Intellectual Property Management Practices.
- Staff Development – Product/Service Awareness.
- Re-engineer Service Delivery Processes.

3.1.5 Sales & Distribution, Fyshwick

Outcome
CIMA delivers timely and efficient map warehousing and distribution services.
Outputs

- Improved efficiency of map distribution operations.

3.1.6 Sales & Distribution Services for DIGO

Outcome
Maintain quality and extend scope of distribution services to DIGO.
Outputs

- Maintain efficient Map Distribution Services.
- Establish Digital Data SLA.

3.1.7 Corporate Data and Web – Projects

Outcome
Advancement of GA IM Strategic Plan.
Outputs

- Product Distribution Support System – Replacement of Landmark.
- Product Distribution Support System – Implementation of Oracle iStore.
- Design of GA Corporate Data Storage and Delivery Architecture.
- Closer Engagement with National and International Standards.
- ASDD Rebuild.

- Metadata Audit.
- Spatial Data Interoperability Policy Development.
- Data Release Process Upgrade.

3.1.8 Corporate Database Development

Outcome
GA Corporate RDBMS Environment delivers GA Information Architecture consistent with IM Strategic Plan.
Outputs

- Develop Licences Database.
- Develop Images Database.
- Progress Corporate Data Model.

3.1.9 Database Administration

Outcome
GA RDBMS infrastructure continues to meet corporate business requirements.
Outputs

- Provide ORACLE Server Support.
- Implement Secure External Database Queries.
- Upgrade to Oracle 9iAS.
- Implement Database Hardware and Software Upgrades.
- Improve Performance of Database Backups.

3.1.10 Corporate Web Development

Outcome
GA Internet and Intranet infrastructure continues to meet corporate business requirements.
*Output*s

- Internet Maintenance.
- Intranet Maintenance.
- Hosted Web Sites Maintenance.
- Internet Content editorial.
- Content Management Systems Review.
- Review Website Security.
- Improve On-Line GIS Systems.
- New ways of Database Query
- HREOC Accessibility / NOIE Guidelines Plan.
- On-line Data Delivery Systems Improved.
- Streamline Web Authoring Business Process.

4 NMD Annual Work Program

National Mapping Division Context

National Mapping Division (NMD) delivers geographic information products and services to the Government and the people of Australia.

These products and services are delivered in accordance with decisions of the Australian government, some dating back to the early 1900's.

NMD products and services utilise information that spans the continent, the exclusive economic zone, and the external territories of Australia. They include:

- Topographic maps and data;
- Digital elevation data;
- Administrative boundary data (for example, maritime boundaries);
- Thematic maps and data;
- Satellite imagery and aerial photography;
- Posters and images of Australia, and map guides; and
- Customised mapping, GIS application development and visualisation services.

Products carry well-known brand names like NATMAP, GEODATA and ACRES.

Full details of all products can be found in the Geoscience Australia product catalogue at http://www.ga.gov.au/nmd/products/docs/catalogue_2002.pdf

NMD products and services are used in a broad range of human activity. These include:

- Defence and emergency management;
- Resource development, agricultural assessment and environmental management;
- Infrastructure and investment planning;
- Navigation and recreation; and
- Decision-making in all areas of activity.

NMD customers include all levels of government in Australia, business and the general public. NMD also services the needs of other Geoscience Australia Divisions.

NMD is structured in four Groups:

- Mapping and maritime boundaries;
- ACRES;
- Product management; and
- Geospatial applications and visualisation.

NMD employs 117 APS staff, has 85 contract employees working on-site, manages a number of service delivery contracts with the private sector, and has an annual budget of $22.468 million.

NMD activities contribute to two of the three Geoscience Australia intermediate outcomes in the 2003-2004 Agency Budget Statement. These intermediate outcomes are:

- Improved resource management and environmental protection; and
- Safer communities and transportation.

4.1 Mapping and Maritime Boundaries

Outcome
Enhanced potential for the Australian Community to obtain economic, social and environmental benefits through access to national scale topographic information and improved resource management and environmental protection as well as safer communities and transportation.
Outputs

- National topographic mapping, including the 250K program.
- Seamless database of topographic data based on GEODATA TOPO-250K Series 2.
- 1:1 million program.
- Research and development projects.
- Small-scale program.
- Map printing and reprinting.
- National coverage of 20 metre contours.
- Imagery evaluation (in conjunction with ACRES).
- National public land program (2003 version).
- National gazetteer.
- Defence (DIGO) onshore topographic map and digital data production.
- Provision of national marine boundary information and associated products to support decision-making by government, industry and the Australian community.
- Maps, geodetic advice, computations and related assistance on Australia's submission to the United Nations Commission on the Limits of the Continental Shelf (CLCS), including work within Australia's Antarctic Territory (AASOP Project).

4.2 Product Management

Outcome
Enhanced potential for the Australian Community to obtain economic, social and environmental benefits through awareness and access to spatial information products.
Outputs

- Product strategies, releases and maintenance and new product releases.
- Product upgrades.
- Product maintenance.
- Product promotion.
- Market development and channel management.
- Quality accreditation.
- Coordination.
- Information management.

4.2.1 ACRES

Outcome
Enhanced potential for the Australian Community to obtain economic, social and environmental benefits through access to satellite data and associated products.
Outputs

- National satellite remote sensing program.
- Remote sensing data acquisition.
- Continual improvements to ACRES systems.
- Supply of high quality remote sensing products to customers.
- Maintain national archive of data.
- Remote sensing applications development.
- New product development.

- Research and development of remote sensing applications.
- Provide a bureau information service for industry and government.

4.3 Geospatial Applications and Visualisation

Outcome

Enhanced potential for the Australian Community to obtain economic, social and environmental benefits through the production and presentation of geoscience information, research and knowledge, in partnership with Geoscience Australia projects.

Outputs

- Services to Divisions.
- GIS, design and visualisation.

Corporate Initiatives and Priorities

The Corporate operating environment is largely determined by the same environmental factors that drive the scientific directions. Corporate's job is to provide the infrastructure and resources for that main job, so that it can be done smarter and cheaper wherever possible.

There are other stresses and policy directions affecting all the APS that will shape Corporate's response to the organisation's strategy.

There will be a greater centralisation in government of things previously decentralised and devolved to agencies. The Government's review of the budget process has seen this with cash management being recentralised in DoFA. New reporting rules for this financial year have virtually removed the distinction between material agencies and GA. Financial performance, position and cash flows will be reported monthly to the DoFA and ITR.

The tight interpretation of FMA Regulations 10 and 13 may cause planning difficulties.

The impending Australia-United States Free Trade Agreement could have a substantial impact upon government purchasing procedures. It could take longer, be more bureaucratic and cost us more to do our job, but Australian firms will gain access to the US government procurement market. This has still a way to go before acceptance, but the government procurement direction is clear.

The main people issues brought out in the Management Advisory Committee's paper "Organisational Renewal" had been foreseen by Geoscience Australia management several years ago and action has been taken to remedy many of them. Our graduate program will continue to attract and train the best in the geosciences, but there are fewer potential graduates out there doing study in areas the divisions want. The impending retirement of many *baby-boomers* over the next 7-10 years will need special care to ensure knowledge transfer takes place to the next generation in an orderly fashion. We may need flexible employment options to keep some people at work beyond their planned retirement date.

Our IT challenge, with outsourcing out of the way, remains substantial. We must focus on providing an IT infrastructure that gives us timely value for money solutions. We must update our infrastructure and help deliver the Information Management strategic plan. There will be strong pressure from the science areas for leading edge experimentation in IT. This could be risky and costly and will need careful management to satisfy the need.

In communications, the challenge to sell our wares to our key stakeholders will continue. Most of all 2003-2004 will be a year of consolidation.

Key Outputs for 2003-04

The key priorities for 2003-2004 will be:

- Moving NMD safely and securely into the Symonston building;
- Building our IT capability
- Fully integrating NMD and CIMA onto Oracle Financials
- Enhancing our policy capability

Table 3.1: Budgeted Departmental Statement of Financial Performance
for the period ended 30 June

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
REVENUE					
Revenues from ordinary activities					
Revenues from government	88,788	95,767	100,421	104,115	107,790
Goods and services	12,449	11,412	11,676	11,921	12,195
Interest	300				
Dividends					
Revenue from sales of assets					
Reversals of previous asset write-downs					
Net foreign exchange gains					
Correction of fundamental error					
Other	3,000				
Revenues from ordinary activities	104,537	107,179	112,097	116,036	119,985
EXPENSE					
Expenses from ordinary activities (excluding borrowing costs expense)					
Employees	41,184	43,037	44,975	46,998	49,113
Suppliers	52,084	57,270	61,932	64,037	65,606
Grants					
Subsidies					
Depreciation and amortisation	5,533	6,872	5,190	5,001	5,266
Write-down of assets	3,000				
Value of assets sold					
Net foreign exchange losses					
Correction of fundamental error					
Other					
Expenses from ordinary activities (excluding borrowing costs expense)	101,801	107,179	112,097	116,036	119,985
Borrowing costs expense					
Share of net profits/losses of associates and joint ventures accounted for using the equity method					
Correction of fundamental error					
Operating surplus or deficit from ordinary activities					
Gain or loss on extraordinary items					
Correction of fundamental error					
Net surplus or deficit					
Capital User Charge Paid *	2,736				
Net surplus or deficit after CUC	-	-	-	-	-

*The Capital User Charge has been abolished from 1 July 2003.

Table 3.1: Budgeted Departmental Statement of Financial Performance
***for the period ended 30 June* (continued)**

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
Outside equity interests in net surplus or deficit					
Net surplus or deficit attributable to the Commonwealth	-	-	-	-	-
Net credit (debit) to asset revaluation reserve					
Net exchange difference recognised as a direct debit (credit) to equity					
Adjustments arising from Standards recognised as direct debit (credit) to equity					
Initial adjustments from transitional UIG consensus view recognised as direct debit (credit) to equity					
Total revenues, expenses and valuation adjustments attributable to members of the parent entity and recognised directly in equity	-	-	-	-	-

Table 3.2: Budgeted Departmental Statement of Financial Position

as at 30 June

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
ASSETS					
Financial assets					
Cash	18,045	18,594	19,123	19,896	20,850
Receivables	925	946	968	968	968
Investments accounted for under the equity method					
Other investments					
Accrued revenues	500	500	500	500	500
Other					
Total financial assets	**19,470**	**20,040**	**20,591**	**21,364**	**22,318**
Non-financial assets					
Land and buildings	5,123	5,718	5,790	5,557	5,168
Infrastructure, plant and equipment	14,367	15,519	14,580	14,920	15,833
Heritage and cultural assets					
Inventories	330	330	330	330	330
Intangibles	1,647	857	1,036	1,408	1,248
Other	1,690	1,725	1,762	1,762	1,762
Total non-financial assets	**23,157**	**24,149**	**23,498**	**23,977**	**24,341**
Total assets	**42,627**	**44,189**	**44,089**	**45,341**	**46,659**
LIABILITIES					
Interest bearing liabilities					
Loans					
Leases					
Deposits					
Overdraft					
Other					
Total Interest bearing liabilities					
Provisions					
Employees	15,974	17,287	17,227	18,479	19,797
Other	199	199	199	199	199
Total Provisions	**16,173**	**17,486**	**17,426**	**18,678**	**19,996**
Payables					
Suppliers	1,583	1,832	1,792	1,792	1,792
Grants					
Dividends					
Borrowing Costs					
Other					
Total Payables	**1,583**	**1,832**	**1,792**	**1,792**	**1,792**
Total liabilities	**17,756**	**19,318**	**19,218**	**20,470**	**21,788**

Table 3.2: Budgeted Departmental Statement of Financial Position *as at 30 June* (continued)

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
EQUITY					
Parent entity interest					
Contributed equity	3,180	3,180	3,180	3,180	3,180
Reserves	532	532	532	532	532
Statutory funds					
Retained surpluses or accumulated deficits	21,159	21,159	21,159	21,159	21,159
Total parent entity interest	24,871	24,871	24,871	24,871	24,871
Outside equity interest					
Contributed equity					
Reserves					
Retained surpluses or accumulated deficits					
Total outside equity interest	-	-	-	-	-
Total equity	**24,871**	**24,871**	**24,871**	**24,871**	**24,871**
Total assets and liabilities by maturity					
Current assets	21,490	22,096	22,684	23,456	24,410
Non-current assets	21,137	22,093	21,405	21,885	22,249
Current liabilities	8,342	9,116	8,192	8,575	8,980
Non-current liabilities	9,414	10,202	11,026	11,895	12,808

Table 3.3: Budgeted Departmental Statement of Cash Flows
for the period ended 30 June

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
OPERATING ACTIVITIES					
Cash received					
Goods and Services	12,241	11,391	11,653	11,921	12,195
Appropriations	89,051	95,767	100,421	104,115	107,790
Interest	300				
Dividends					
Other	3,000				
Extraordinary items					
Total cash received	104,592	107,158	112,074	116,036	119,985
Cash used					
Employees	40,376	41,723	45,036	45,746	47,795
Suppliers	53,299	57,055	62,010	64,037	65,606
Grants					
Borrowing costs					
Other					
Extraordinary items					
Total cash used	93,675	98,778	107,046	109,783	113,401
Net cash from/(used by) operating activities	10,917	8,380	5,028	6,253	6,584
INVESTING ACTIVITIES					
Cash received					
Proceeds from sales of property, plant and equipment					
Proceeds from sales of financial instruments					
Bills of exchange and promissory notes					
Repayments of loans made					
Other					
Extraordinary items					
Total cash received	-	-	-	-	-
Cash used					
Purchase of property, plant and equipment	6,298	7,830	4,500	5,480	5,630
Purchase of financial Instruments					
Bills of exchange and promissory notes					
Loans made					
Other					
Extraordinary items					
Total cash used	6,298	7,830	4,500	5,480	5,630
Net cash from/(used by) investing activities	(6,298)	(7,830)	(4,500)	(5,480)	(5,630)

Table 3.3: Budgeted Departmental Statement of Cash Flows
for the period ended 30 June **(continued)**

	Estimated actual 2002-03 $'000	Budget estimate 2003-04 $'000	Forward estimate 2004-05 $'000	Forward estimate 2005-06 $'000	Forward estimate 2006-07 $'000
FINANCING ACTIVITIES					
Cash received					
Appropriations - contributed equity					
Proceeds from issuing financial instruments					
Proceeds from loans					
Other					
Extraordinary items					
Total cash received	-	-	-	-	-
Cash used					
Repayments of debt					
Capital use charge paid	2,736				
Dividends paid					
Other					
Extraordinary items					
Total cash used	2,736	-	-	-	-
Net cash from / (used by) financing activities	(2,736)	-	-	-	-
Net increase/(decrease) in cash held	1,883	550	528	773	954
Cash at the beginning of the reporting period	16,162	18,045	18,595	19,123	19,896
Effect of exchange rate movements on cash at the beginning of reporting period					
Cash at the end of the reporting period	18,045	18,595	19,123	19,896	20,850