Australian Government

Geoscience Australia

WORK PROGRAM 2009-10

Geospatial & Earth Monitoring Division

(Chief of Division - Dr Chris Pigram)

2009-10 Work Plan

GEM overview

GEM maps, monitors and models changes to the Earth and advises on how they affect Australian Society. GEM works to improve the safety of communities and the protection of Australia's critical infrastructure.

GEM combines its capabilities in geospatial information and knowledge management, research and mapping programs, earth observation capabilities and risk assessment, to bring together a comprehensive capability, able to respond flexibly to current and emerging government priorities.

Priorities for 09-10 are:

- Deliver the operational geoscience component of the Australian Tsunami Warning System.
- Coordinate the deployment of State and territory components of the Global Navigation Satellite System part of the AuScope National Collaborative Research Infrastructure Strategy program.
- Deliver the five-yearly Australian Geomagnetic Reference Field Model for the epoch 2010.
- Support AusAID's disaster risk reduction initiatives in the Australasian region by providing scientific tools and expertise to assist in quantifying natural hazard risks in Indonesia (as part of the new Australia-Indonesia Facility for Disaster Reduction in Jakarta) and the Philippines (for the Collective Strengthening of Community Awareness for Natural Disasters agencies).
- In partnership with the Attorney-General's Department, apply the Critical Infrastructure Protection Modelling & Analysis (CIPMA) capability to analyse tasks addressing interdependencies and failures for the Energy, Banking & Finance and Communications sectors, and develop Water and Transport sector capabilities.
- In partnership with the Department of Climate Change, provide technical assistance to inform climate change adaptation policy by producing a national hazard map for severe wind and risk-based case studies of climate change impacts to coastal communities.
- Develop a national exposure data framework for infrastructure, CBD buildings and decision support for incorporation into the National Exposure Information System (NEXIS).
- Develop a hydrodynamic hazard-modelling capability to include flood/storm surge and landslide/dam-break modelling in collaboration with State governments.
- Deliver the first National Dynamic Landcover Map to give the basic capability for whole-of-government, national scale monitoring of the environment from remote sensing satellites.
- Acquire and distribute remote sensing data over South East Asian countries for the Department of Climate Change and AusAID to deliver the International Forests & Carbon Initiative (IFCI).
- Provide aquatic Earth observation science for PMD and AusAID, in order to detect natural oil slicks from radar imagery and to extract depths from optical remote sensing data.
- Implement an Earth Observation Data Store (EODS) to enable delivery on external commitments (IFCI project) and to remove a fundamental blocker to increased through-put and productivity from the NEO Group.
- With DHS and the ABS, develop and implement a 'proof of concept' Commonwealth Spatial Data Integration (CSDI) technical pilot project to inform a second pass business case to be submitted to Government for consideration and implementation across the Commonwealth.

- Deliver the agreed program of geospatial data capture and delivery to the Defence Imagery and Geospatial Organisation (DIGO).
- Progressive development of a single "multi-scale" database from which digital and hard copy products of scales from 100K through to 10M will be generated. This work includes schema design, the roll-out of ESRI's "representations" technology and the ongoing maintenance of the flagship 250K topographic database.
- Through collaboration with all levels of government, complete large-scale mapping and revision of key fundamental topographic themes underpinning community safety, emergency management, climate change and economic development.
- For the Bureau of Meteorology (BoM), provide nationally consistent surface hydrology, catchment boundaries and DEM data and advice as key inputs into the ongoing development of the Australian Hydrological Geospatial Fabric.
- Deliver to the Department of Environment, Water, Heritage and the Arts an interim report for the interpretation and assessment of aquifer characteristics to help better manage urban and environmental water requirements in the Broken Hill region.
- Deliver to the National Water Commission a progress report on the development of a national framework for evaluating and managing palaeodrainage groundwater resources in Australia's arid and semi-arid zone.
- Provide technical advice to federal government in relation to the impacts of mining on groundwater resources.

Earth Monitoring Group

Group Leader: Barry Drummond)

The Earth Monitoring Group monitors and reports on earthquakes, tsunamis and the Earth's magnetic field. It contributes to international efforts to monitor nuclear tests, and provides capacity building to allow the Rabaul Volcanological Observatory in Papua New Guinea to monitor and warn citizens of volcanic eruptions. The Group also monitors the shape of the Earth in the region, and contributes to the development of geospatial reference systems.

Work is conducted through seven projects:

- The Australian Tsunami Warning System (ATWS)
- The Geomagnetism Project
- The Nuclear Monitoring Project
- The Rabaul Volcanological Observatory Twinning Project
- The National Geospatial Reference Systems Project
- The Geophysical Network Project
- The Earthquake Hazard Project

It reports to government, industry and the Australian people on these activities.

Australian Tsunami Warning System Project

1. **Project Description:** The ATWS project was established by an Australian Government decision in early 2005 as part of Australia's response to the devastating 24 December 2004 Indian Ocean earthquake and tsunami. From 2005 to 2009 the ATWS was in an implementation phase as the system was under construction and in 2009 the ATWS enters an operational phase. The ATWS is a multi agency project (Geoscience Australia (GA), the Bureau of Meteorology (BoM), Attorney-General's Department (AGD). GA's role in the ATWS is to detect and analyse earthquakes that pose a threat to Australian communities and infrastructure in Australia and overseas. When GA detects earthquakes that are considered to have the potential to cause a tsunami, the earthquake information is sent to the Bureau of Meteorology. The Bureau will then issue a tsunami warning to the public, emergency managers and the media based on the earthquake advice delivered by GA. To facilitate these roles, GA and BoM operate of the Joint Australian Tsunami Warning Centre (JATWC). Additionally the ATWS Project advises other stakeholders, such as the Attorney-General's Department, and the public of earthquakes in Australia and overseas that are likely to impact Australians or Australian interests.

2. **Project Outcome:** The policy objectives of the joint-agency Australian Tsunami Warning System (ATWS) project are:
    - To provide a comprehensive tsunami warning system for Australia.
    - To support international efforts to establish an Indian Ocean tsunami warning system.
    - To contribute to the facilitation of tsunami warnings for the South West Pacific.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☐
- Improved resource management and environmental protection ☐
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☐

- Frontier technologies for building and transforming Australian industries ☐
- Safeguarding Australia ☑
- This project does not contribute to the NRPs ☐

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Provision of Tsunami advice to Bureau of Meteorology (BoM)

6.1.1 Description: Tsunami advisories and warnings for Australia will be issued by the JATWC. For the purpose of advisories, GA will provide BoM with advice on earthquake origin time, location and magnitude.
In 2009/10, the following activities will be undertaken to enhance GA's input into the issuance of the advisories and warnings:
- continuing system and software development to enhance the quality, timeliness and reliability of advice to BoM;
- improved/additional data from enhanced Australian network and supplemented with additional international data including CTBTO seismic stations;
- continuing research into techniques to determine earthquake source parameters more accurately and rapidly.

6.1.2 Output Delivery Date:
Q1-Q4 ☑ Advice provided to Bureau of Meteorology throughout the year as earthquake events happen in the region

6.2 Output 2: Earthquake advisories to Attorney-General's Department (AGD)

6.2.1 Description: GA provides advice to AGD for promulgation to other Australian Government agencies on earthquakes that occur in Australia and the region, for use by emergency workers in the protection of Australian citizens and interests in Australia and overseas.

6.2.2 Output Delivery Date:
Q1-Q4 ☑ Information will be provided to AGD throughout the year as earthquakes occur

6.3 Output 3: Contributions to international activities to coordinate warning systems

6.3.1 Description: The following activities will be undertaken:
- Continuing to contribute to the activities of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System and the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System and associated working groups

• At the 2008 meeting of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and mitigation System Australia agreed to be a Regional Tsunami Watch Provider (RTWP) in the Indian Ocean. This coming year will be a transitional period where Australia will continue to demonstrate its capability by sensing out earthquake information that can cause tsunamis affecting other countries in the Indian Ocean region and benchmarking against agreed performance criteria. GA's existing systems will be enhanced to meet this expanded capability. If the decision that Australia becomes an RTWP is made this year then GA will move from transitional to operational status.

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6.3.2 Output Delivery Date:

Q1 ☐

Q2 ☑ Contribution to Australian national report to the Intergovernmental Oceanographic Commission for the PacificTsunami Warning and Mitigation System meeting.

Q3 ☑ Contribution to the Australian national report to the Intergovernmental Oceanographic Commission for the Indian Ocean Tsunami Warning and Mitigation System meeting.

Q4 ☐

7. Information Management Considerations

- Project will capture seismic data from Australian and overseas seismic stations and locate earthquakes in Australia and overseas.
- GA will provide BoM with advice on tsunamigenic earthquakes including information on origin time, location and depth, magnitude and focal mechanism.
- GA will provide AGD with advice for earthquakes with M>4 within Australia and earthquake with M>6 for overseas earthquakes.
- Project will maintain the Australian earthquake database within Oracle; development of the EarthMon database system will continue through 2009/10, and will include a metadata component to manage off-line storage of time series data..
- The main tool used for the analysis and dissemination of seismic data will be the Antelope suite of software. Web technology will be further developed and used to communicate earthquake information to the public and media.

8. Communications Strategies, including publication of Papers

Quarterly reporting to the ATWS tri-agency Operations Control Group describing the progress of the ATWS Project (includes BoM and AGD).

9. Risk Identification and Management Strategies

Project has prepared a risk management plan. It is documented in Pages 26 and 27, and Attachments F (Risk Identification), G (Risk Assessment) and H (Strategies Required to Address Prioritised Risks) of the ATWS Implementation Plan (TRIM Record D2006-56498). This plan is updated on a 6 month cycle.

Identified and emerging risks and risk treatment strategies are continuously reviewed and reported on in quarterly and monthly reports.

10. Workforce Planning/Succession Management

This is a relatively new project that has introduced 24/7 operations to the agency for the first time. The staffing level and profile are being continually reviewed and modified as we encounter unforseen issues. Regular meetings with staff keep them appraised of progress.

A competency based accreditation system is being developed for ATWS watch standers (i.e. duty seismologist shift workers). This system will ensure that watch standers are properly skilled up before being included on after hours shift rosters.

Geomagnetism Project

1. **Project Description:** The Geomagnetism Project addresses the national and international need for information on the behaviour of the geomagnetic field in the Australian region. This information is used for navigation, geophysical exploration, magnetic direction-finding, magnetic detection, space weather analysis, the mitigation of geomagnetic hazards, and related research into the nature of geomagnetic phenomena, Earth structures and solar-terrestrial physics. The data that underpin this information are obtained from Geoscience Australia's network of nine geomagnetic observatories and fifteen repeat stations in Australia, Antarctica and the southwest Pacific.

   The primary outputs of the Project are the Australian Geomagnetic Reference Field (AGRF) model, contributions to international models, time-series and magnetic-activity data, geomagnetic research, magnetometer and compass calibrations, and advice to researchers.

   In 2009/10 the new Gingin geomagnetic observatory in southern WA will become operational. It will operate in parallel with the Gnangara observatory for 12 months, after which it will replace Gnangara which is becoming adversely affected by the proximity of suburban Perth.

2. **Project Outcomes:**
   The main outcomes of the Project's geomagnetic-field monitoring work are
   - correct regional and global field models for navigation and research, by provision of accurate geomagnetic main-field and secular-variation data sets for the Australian region;
   - more-effective petroleum and mineral exploration and exploitation;
   - enhanced space weather forecasting and analysis;
   - mitigation of geomagnetic hazard to communities, infrastructure (GPS, communications, power lines, pipelines), and in space, caused by geomagnetic disturbances, and;
   - advances in solid-Earth geoscience and solar-terrestrial physics research.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Geomagnetic data

6.1.1 Description: Calibrated time-series data are acquired from the Geoscience Australia geomagnetic observatory network in Australia and Antarctica. Indices of geomagnetic activity are derived from these time series. These primary and derived data are provided to international data centres and agencies, space weather analysts, the resource exploration sector, and research institutions. They are used in navigation, magnetic-field modelling, resource exploration and exploitation, space weather monitoring and geoscience research. A new observatory near Gingin WA will be added to the network in 2009/10. It will ultimately replace the Gnangara observatory.

6.1.2 Output Delivery Date:

Q1-Q4 ☑ Data are delivered to Australian and international clients in a variety of formats and intervals throughout the year

6.2 Output 2: Australian Geomagnetic Reference Field model

6.2.1 Description: The Australian Geomagnetic Reference Field model maps the main magnetic field and its secular variation in the Australian region. The model is updated on a five-yearly cycle. Secular variation data from the observatory and repeat-station network are collected throughout the cycle to contribute to the model.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☑ New AGRF model released and takes effect from 1 January 2010
Q3 ☐
Q4 ☐

6.3 Output 3: Reports on geomagnetic research

6.3.1 Description: The Project conducts research that addresses matters of national interest related to geomagnetism, geo-electrical conductivity structure, and geo-electromagnetic induction. Results are presented at national and international conferences and in publications.

6.3.2 Output Delivery Date:

Q1 ☑ Paper presented at IAGA scientific assembly
Q2 ☐
Q3 ☑ Australian Geomagnetism Report published
Q4 ☐

6.4 Output 4: Advice to researchers

6.4.1 Description: The Project provides advice and assistance to Australian and international researchers studying aspects of geomagnetism in the Australian region.

6.4.2 Output Delivery Date:

Q1-Q4 ☑ Advice is given throughout the year in response to queries from other Government agencies, industry clients, research institutions, and overseas organisations

6.5 Output 5: Reports on the calibration of compasses, magnetometers and compass pads

6.5.1 Description: Compasses, magnetometers and compass pads are calibrated for the aviation, maritime, defence and research communities.

6.5.2 Output Delivery Date:

Q1-Q4 ☑ Compasses and magnetometers are calibrated within 10 working days of their receipt from clients and compass pad calibrations are completed within one month of receiving a request

7. Information Management Considerations

The Geomagnetism Project acquires near-real-time data from the nine observatories in the geomagnetic network. Data from the Canberra and Gnangara observatories are analysed for magnetic activity levels. All primary and derived data are written to an Oracle database.

Time-series data are provided from the Oracle database in near-real-time to Australian and international data repositories and other clients using an associated Java-based software system. These data are included on the Auxiliary List of the Australian Government's Office of Spatial Data Management in recognition of their contribution to global observing systems. Magnetic-activity data are provided to data repositories weekly and bi-weekly.

The Australian Geomagnetic Reference Field model, a mathematical model of the geomagnetic main field and its secular variation in the Australian region, is produced every five years. Australian data are included in the International Geomagnetic Reference Field, World Magnetic Model, and other international models of the geomagnetic field, also updated every five years.

The Project uses software developed in-house to acquire, process, analyse and distribute the data it collects.

8. Communications strategies, including publication of papers

Within GA management structure

- Project Leader attends weekly Project Leaders meetings chaired by the Earth Monitoring Group Leader
- Project Leader chairs weekly project meetings
- Project Leader contributes Geomagnetism input to weekly group report

With GA stakeholders and clients

- effective presence on the GA intranet
- contribute to weekly report of activities
- publish appropriate results/announcements

With external stakeholders and clients

- email contact with clients
- maintain and develop an effective presence on the GA internet site
- attend relevant national and international meetings
- publish papers and abstracts
- present conference papers and posters

- compile the annual Australian Geomagnetism Report
- media releases
- AusGeoNews articles

9. Risk Identification and Management Strategies

Human resources

The Geomagnetism Project is a small project. With only 5 staff its ability to maintain the delivery of its outputs is dependent on having a critical mass of suitably skilled and experienced staff.
Mitigation strategy: The Project's agreed outputs are reviewed annually to ensure that they remain achievable with the prevailing human, financial and technical resources.

Succession planning

Staff movements due to retirement or other mobility are always a possibility. Most staff have been with the Project for 10 - 20 years; succession planning is a critical issue.
Mitigation strategy: As opportunities arise, recruitment will form an important component of succession planning for the project.

Budgetary constraints

The high fixed to discretionary budget ratio limits options for making efficiency dividends.
Mitigation strategy: The Project has achieved efficiency gains through the development and implementation of a new data processing and analysis software system. Future efficiency gains may also be linked to new IM solutions, however these are expected to be incremental.
Additionally, solutions to automate absolute measurements of the magnetic field are being investigated internationally. A solution, possibly still 3-5 years away, is expected to offer long-term efficiencies in observatory operations that will more than offset the substantial capital costs likely to be involved in its implementation.

Legacy data

The project has significant historic data holdings for which final processing and submission to data repositories are yet to be completed.
Mitigation strategy: A strategy to address the legacy data issue is yet to be formalised. It may involve contracting someone to undertake the task.

10. Workforce Planning/Succession Management

Two pronounced trends have had a significant bearing on the current staffing structure of the Geomagnetism Project. The first is that the Project has attracted a core of dedicated staff that has remained with it for many years. Four of the current staff have a combined total of 68 years service to the Project. The second trend that has emerged in the last ten years has been the progressive reduction in staff number, from 9 in 1996 to 4 in 2005 and now 5.

The combined effect of these two trends is that the Project includes four relatively senior scientists (4 Level 5s and 1 Level 3) who are responsible for the mainly routine duties that are an essential part of geomagnetic observatory operations. Such duties under-utilise these scientists' capabilities and could be reallocated to make more-effective use of the scientists' substantial geomagnetic experience and expertise.

The current staffing formula will be restructured as a matter of priority as opportunities emerge. The Project has appointed a Technical Officer (Level 3) to take up some of the responsibility for routine operations under the supervision of a senior scientist. The appointment to this position will provide greater opportunity for senior scientists to take strategic responsibility for scientific and technical operations, information management, and permit the development a small geomagnetic research program within the Project.

Geophysical Network

1. **Project Description**: This project maintains and operates Australia's National Geophysical Network across Australia, the Antarctic region and in the Pacific and Indian Oceans. This provides real time seismic, infrasound, hydroacoustic and geomagnetic data which underpins the monitoring of both natural and other anthropogenic events that might constitute hazards to the Australian people.
   The data also contribute to the goals of the Australia Government through the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) and the Australian Tsunami Warning System (ATWS).

2. **Project Outcome:** Effective national and international capabilities in Earth monitoring as an input to risk assessment provided through other GEMD and regional collaborative projects for the Australian continent, the South East Asian and South West Pacific regions.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Seismic, geomagnetic, infrasound, hydroacoustic data and ancillary information

6.1.1 Description: The Geophysical Network (GN) project provides seismic, infrasound, hydroacoustic, geomagnetic data and information to other GEMD projects, various Australian Government agencies, State/Territory Governments and international seismological data centres and geomagnetic agencies via the Internet. The project also maintains the Australian primary and auxiliary seismic stations, infrasound and hydroacoustic monitoring stations on behalf of the International Monitoring System of the CTBTO in Vienna to support GA's nuclear monitoring capability. The project is responsible for the transmission of these data to GA for analysis and onto the International Data Centre of the CTBTO.

6.1.2 Output Delivery Date:

Q1-Q4 ☑ Continuous ongoing data delivery in near-real-time 24/7

7. Information Management Considerations

GN delivers seismic and geomagnetic data to data servers within GA where it is archived by the ATWS and Geomagnetism Projects for use by other projects. These data are included within the Auxiliary List of the Office of Spatial Data Management (OSDM) for use within Australia and overseas. The EarthMon Oracle database system assists in the management of station and derived seismic data. It will eventually include a metadata database to help manage off-line data storage.

8. Communications Strategies, including publication of Papers

GN conducts a weekly project meeting to discuss activities.
Other meetings: As required with stakeholders and clients.
E-mail notifications to stakeholders on issues/changes with respect to station and network issues.
Data latency and station state of health (SOH) information available on internal web pages. Station data quality plots available via external web pages.

9. Risk Identification and Management

Ageing staff profile.
High stakeholder expectation of project outcomes as awareness of the risk of earthquakes and hazards grows in clients and the community.
Mitigation strategy: Ongoing review of procedures and activities within the project have allowed for strategies to be developed to maintain the project in such a way that under current budgetary pressures it can continue to deliver real-time operational capability for mandated activities.

10. Workforce Planning/Succession Management

The project has included workforce planning issues within its forward program.
Mitigation strategy: Junior staff are being provided with opportunities to act in management roles. Technological solutions are being implemented to reduce the reliance on knowledge and expertise of the aging workforce. Project is seeking external funding opportunities to allow for backfilling of technical positions that may provide a workforce into the future once positions become vacant from retiring staff. The succession management plan will be severely constrained by budgetary issues.

National Geospatial Reference Systems Project

1. **Project Description:** This project aims to deliver a world class Geospatial Reference Systems for Australia. A National Geospatial Reference System (NGRS) provides the fundamental, national-scale, reference frame that establishes the spatial relationships on and outside of the Earth's surface and allows spatial information to be interrelated in the same frame. We maintain the NGRS by continually refining the accuracy of the International Terrestrial Reference Frame and by monitoring its connection to the NGRS. We also monitor deformation of the NGRS by undertaking crustal deformation measurements.

   We will advise and influence our clients in government, industry and the community through ANZLIC, the Spatial Sciences Institute and the Global Geodetic Observing System by undertaking innovative and targeted research, and provide national leadership and coordination**.** We aim to adopt world's best practice in all of our activities.

2. **Project Outcome:** Accurate and consistent National Reference Systems support a wide range of local, regional and national planning and developmental activities, including cadastral and engineering surveys, topographic mapping, mineral and petroleum exploration, hazard

monitoring, and navigation, as well as global monitoring of the atmosphere, oceans and coastal zones. In Australia this results in:

- Satisfied customers
- A Safer Australia
- Opportunities for emerging Industries
- Mitigation of global environmental change

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Data sets and value added products

6.1.1 Description: Quality assured geodetic data sets and value added products including data from the Australian Regional GPS Network (ARGN), the South Pacific Regional GNSS Network, Satellite Laser Ranging (SLR) stations, Very Long Baseline Interferometry (VLBI) data from the Australian VLBI array and geodetic gravity data from the AuScope program.

This output also includes Precision spatial measurements including Local Tie surveys and neo-tectonic deformation GNSS campaigns. These surveys are undertaken routinely and the results are delivered to the international community for use in reference frame combinations. Technical reports are also produced and made available through the GA library and web page.

6.1.2 Output Delivery Date:

Q1-Q4 ☑ The GNSS data are delivered to the international data centres via GA's FTP site primarily daily, although hourly, fifteen minute and real-time products are also produced. The SLR data are delivered daily to international data centres directly from the two observatories. The gravity data will be available from GA's web site.

6.2 Output 2: Analysis results distributed

6.2.1 Description: Integrated, versatile and quality assured regional and global reference systems including routine contributions to the International GNSS service (IGS), the International Laser Ranging Service (ILRS), and the International VLBI Service (IVS) for inclusion into the International Terrestrial Reference Frame (ITRF) definition. Targeted analysis of the South Pacific Regional GNSS Network data is undertaken for the IGS Tide Gauge project and delivery of reports to the Bureau of Meteorology and Ausaid.

This output includes coordination of the annual GPS campaign of the UNESCO Permanent Committee on GIS infrastructure in the Asia Pacific (PCGIAP) Working Group 1 on regional reference frames, and the subsequent analysis of the GNSS data and submission to the ITRF.

It also includes analysis of GNSS, SLR, VLBI, Absolute gravity and INSAR data for crustal deformation measurements.

The SLR and VLBI solutions are distributed weekly. The PCGIAP results are distributed annually.

6.2.2 Output Delivery Date:

Q1-Q3 ☑ SINEX files delivered weekly
Q4 ☑ SINEX files delivered weekly, PCGIAP solution included in IERS – ITRF densification activity

6.3 Output 3: Scientific Reports and Publications, including Journal papers and presentations at conferences

6.3.1 Description: A variety of research outputs are reported to the community via reports and publications. These vary from presentations to industry forums to papers in leading peer reviewed journals.

6.3.2 Output Delivery Date:

Q1 ☑ Titov, "Geodetic VLBI observations in Parkes 2004-2009" (with John Reynolds) submitted to Journal of Geodesy
Q2 ☑ Titov, "On the connection of the apparent proper motion and the VLBI structure of compact radio source" (with Hungarian collaborators) submitted to one of peer-reviewed astronomical magazines.
Q3 ☐
Q4 ☑ Dawson and Steed, ITRF to GDA transformations submitted to (Journal of Spatial Sciences); Dawson et al, InSAR

6.4 Output 4: Expert advice including the AUSPOS positioning service and astronomical enquiries

6.4.1 Description: Responsive, accessible, accurate and reliable expert analysis and advice services including legal traceability of position from GPS and delivery of the AUSPOS service. Delivery of advice on AUSPOS is continuous. Other advice is ad hoc but generally involves tens of enquiries per week.

This output includes the delivery of advice on the maintenance of the NGRS including the relationship of GDA94 to ITRF and other datums (including transformation parameters)

6.4.2 Output Delivery Date:

Q1 ☑ AusPos online service accessed by customers daily
Q2 ☑ AusPos online service accessed by customers daily; Delivery of certificates to Victoria under Regulation 13 of the National Measurements ACT (1960), as amended.
Q3 ☑ Auspos online service accessed by customers daily
Q4 ☑ Auspos online service accessed by customers daily

6.5 Output 5: Progress reports to AUSCOPE

6.5.1 Description: Management of the Geospatial component of the AUSCOPE initiative funded under NCRIS. It will also involve the collation of progress reports and financial reports from participating agencies. Quarterly reports to AUSCOPE will be produced.

6.5.2 Output Delivery Date:

Q1-Q4 ☑ Report to AUSCOPE

6.6 Output 6: Construction of the AuScope GNSS Array

6.6.1 Description: This output is based on the number of stations constructed under the Auscope GNSS network deployment project. Working collaboratively with the state governments, GA will construct 20 GNSS sites this year.

6.6.2 Output Delivery Date:

Q1-Q4 ☑ Sites constructed

7. Information Management Considerations

- The project will capture a numbers of data types. They include GNSS, VLBI, SLR and gravity data. We will also create Geoid Models. Other data like local monitoring surveys will also be captured. Value adding will occur on all data captured as well as some other data (like DORIS, and gravity field data) that is available from global data centres. The data will be stored internally in the GA NAS storage system. It will also be stored on the GA public FTP site for distribution.
- The project will release all data captured and results from the analysis undertaken.
- The project will use existing data distribution techniques like FTP and web pages to distribute its data. Softwares suites already in operation will continue to be used for product delivery. Enhancements to the Oracle based National Control point data base will continue to be made to allow greater user access to data and metadata via the web page. Oracle will not however store the GPS data itself.

8. Communications Strategies, including publication of Papers

- The NGRS project works very closely with a variety of committees both nationally and internationally. Communication of outcomes is generally either through these committees or via

scientific / technical reports. The primary National committee of relevance is the Intergovernmental Committee on Surveying and Mapping (ICSM).

- The South Pacific Sea Level and Climate Monitoring Project reports annually to the Bureau of Meteorology, who then reports to the project stakeholders in AUSAID and the South Pacific.
- The Geospatial component of AUSCOPE reports directly to AUSCOPE quarterly and AUSCOPE report to Department of Innovation, Industry, Science and Research (DIISR). The working groups under AUSCOPE Geospatial report to the Geospatial Steering Committee quarterly. GA supplies project management for the entire geospatial component of AUSCOPE.

9. Risk Identification and Management Strategies

- The NGRS project has risks associated with the contracts with EOSSS for the ongoing operation of the Yarragadee SLR station and the Mt Stromlo SLR station. EOSSS is a stock exchange listed company but still has risks associated with its ongoing viability. Mitigation strategy: GA's contracts with EOSSS have clauses that set out how defaults by Electro Optic Systems Space Systems will be managed, including allowing GA to exit the contracts.
- The AUSCOPE Geospatial project is contingent on DIISR continuing to commit funding to AuScope Ltd to be passed on to GA. Mitigation strategy: work with CEO of AuScope Ltd to ensure appropriate reports that satisfy DIISR requirements are provided thus protecting GA's interests.

10. Workforce Planning/Succession Management

Efforts are under way to transition junior staff into higher roles in response to some older staff members nearing retirement age. Experienced older staff are being encouraged to mentor junior staff in a variety of ways. Of primary interest is the depth of corporate knowledge that is held by staff who may retire within the next few years.

Nuclear Monitoring Project

1. **Project Description:** Australia signed the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in 1996 and ratified the Treaty in 1998. As part of the ratification process new legislation had to be enacted. The new laws are detailed in the "Comprehensive Nuclear-Test-Ban Treaty Act 1998". This Act requires the Australian government to fulfil its obligations before and after entry-into-force of the Treaty.

   To initiate the process, the Australian Government had earlier agreed to fund the development of a seismic network in Australia to monitor nuclear explosions worldwide. Subsequently, hydroacoustic and infrasound monitoring capacity has been added, and the capacity of the integrated network continues to be upgraded. The network is managed by Geoscience Australia on behalf of the Australian Government, represented by the Department of Foreign Affairs and Trade.

   Australia considers progress in nuclear disarmament and non-proliferation to be vital to international security. Australia is fully committed to realising a world free of nuclear weapons and sees entry-into-force of the CTBT as an important step to limit the further development and proliferation of nuclear weapons. Australia is actively working to achieve the earliest possible entry-into-force of the CTBT.

2. **Project Outcome:**

(i) Enhance Australia's national technical means to monitor nuclear explosions worldwide. As well as identifying a suspected nuclear explosion, location accuracy and the size of the blast are equally as important;
(ii) Support Australia's commitment to the establishment of the global verification system to monitor future compliance to the Comprehensive Nuclear-Test-Ban Treaty.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. Project Outputs:

6.1 Output 1: Technical Advice and Research Reports

6.1.1 Description:
(i) Provide technical advice and information to the Departments of Foreign Affairs and Trade, Prime Minister& Cabinet, Defence, Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), media and the public, to meet Australian national technical means requirements and obligations to the CTBT.
(ii) Develop enhanced discrimination procedures for Australia and the international community to improve Australia's capability to discriminate nuclear explosions. This involves research and development of applications in seismic, hydroacoustic and infrasound technologies.

6.1.2 Output Delivery Date:
Q1-Q4 ☑ Time frame determined by issues arising within DFAT, in the international arena, and including if and when other nations conduct nuclear tests

6.2 Output 2: Construction of Australian CTBT Monitoring Stations

6.2.1 Description: Installation of Australian CTBT monitoring stations to meet Australia's obligations in building a global verification system. Activities will revolve around planning, permissioning and construction of infrasound stations at

Cocos and Davis, Antarctica.

6.2.2 Output Delivery Date:
Q1-Q4 ☑ Timeframe in accordance with the build up of the global CTBT verification system and as funding becomes available.

6.3 Output 3: Seismic, hydroacoustic and infrasound data provided to CTBTO

6.3.1 Description: Provision of data to the CTBTO through operation of a National Data Centre on behalf on Australia's National Authority so that Australian national technical means requirements and obligations to the CTBT are met. The instruments that acquire the seismic hydroacoustic and infrasound are maintained and operated for the Nuclear Monitoring Project by GA's Geophysical Network Project.

6.3.2 Output Delivery Date:
Q1-Q4 ☑ Ongoing data delivery

7. Information Management Considerations
Ongoing operation, maintenance and upgrade of the Earth Monitoring Oracle database (EarthMon) in consultation with ISB will continue. Some nuclear monitoring data components need to have restricted access.

Hardening of the critical real-time elements of the nuclear monitoring alert system.

8. Communications Strategies, including publication of Papers
Provision of technical reports and analysis to the Departments of Foreign Affairs and Trade, Prime Minister & Cabinet, Defence, Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), media and the public through appropriate communication channels to meet Australia's National Technical Means requirements for monitoring nuclear explosions worldwide.

Publication of the results of seismo-acoustic research into nuclear verification technologies conducted using open sources through appropriate scientific journals and conferences.

9. Risk Identification and Management Strategies
Sudden changes in the level of external funding (e.g. significant cut in funds from DFAT due to budget restrictions within that Department). If this did occur, the project would reduce the level of research and monitoring efforts in infrasound and hydroacoustic monitoring.

10. Workforce Planning/Succession Management
To prepare for the future directions and desired capabilities of the Nuclear Monitoring Project, a number of workforce planning initiatives are currently being undertaken. These are:
(a) Training and mentoring of a number of staff to take on leadership and management roles within the project;
(b) Enhancement of the core research and technical advice activities of the project through both targeted training and/or exposure to client interaction.

Rabaul Volcanological Observatory Twinning Program

1. **Project Description:** The Rabaul Volcanological Observatory Project provides capacity building to develop the Rabaul Volcanological Observatory in Papua New Guinea to monitor

and warn citizens of volcanic eruptions. This phase of the project is a follow on from the Papua New Guinea – Australia Volcanological Service Support Project that was initiated following the 1994 eruption of Rabaul volcanoes.

The Project is funded by the Australian Agency for International Development (AusAID) and contributes to the Australian Government's foreign policy objectives in the region. The current phase of the program ended on 30 June 2008. With the agreement of GA, AusAID extended the program to 30 June 2009, and has now requested a further extension to the end of Calendar year 2009, at which time it expects to have received stakeholder sign-off on its new 4-year PNG National Disaster Management Plan which will provide an underpinning for a new 4-year phase of the Program.

2. **Project Outcome:** Reduce the impact of volcanic hazards on Papua New Guinean communities through the development of effective indigenous volcano monitoring capabilities.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs ☑

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Reports documenting improved capacity of RVO to monitor and mitigate volcanic hazards

6.1.1 Description: Reports to AusAID on the level of capacity improvement and engagement within the project, including evidence of on-going engagement by RVO with National Disaster Centre, NGO's, Provincial Disaster Committees and local communities.

6.1.2 Output Delivery Date:

Q1 ☑.Report to AusAID on the outcomes of the previous phase of the project ending June 2009.

Q2 ☑ Verbal evidence provided to AusAID at Project Coordination Committee (PCC) forum.

Written evidence provided to AusAID in November progress report and end of current program completion report.

Q3 ☐

Q4 ☐

6.2 Output 2: New Project Proposal

6.2.1 Description: Develop a new Twinning Program project proposal for submission to and consideration by AusAID that will initiate a longer-term extension (4-years) to the Program activities.

6.2.2 Output Delivery Date:

Q1 ☑ Submission of draft proposal to AusAID by the end of the September 2009.

Q2 ☑ Final Project proposal submitted to AusAID following review and adjustments to draft proposal following AusAID feedback.

Q3 ☑ If the proposal is accepted by AusAID, signing of new Record of Understanding between Geoscience Australia and AusAID.

Q4 ☐

7. Information Management Considerations

The Twinning program does not capture any of the Rabaul Volcanological Observatory data unless there is a specific request from AusAID to do so (eg. If a volcanic crisis was to occur) so at this stage there are no additional information management considerations required other than standard desk top applications within GA. Should AusAID ask GA to capture data (seismic data) they will be captured and held in the information managements system (EarthMon) developed by GAto support GA's Australian Tsunami Warning System, Nuclear Monitoring and Geophysical Networks projects.

8. Communication Strategies, including publication of Papers

The Twinning Program is accountable to AusAID for successful output completion. The Program is required to submit two written documents to AusAID as part its Communication Strategy. They are the May Progress report and the June Workplan document. In addition to this the program conducts a Project Coordination Committee (PCC) meeting annually in Rabaul with Project stakeholders. Minutes of this meeting are a requirement to achieve a milestone payment. Independently the Program conducts a Technical Advisory Group (TAG) meeting twice a year to prioritise its technical direction. The outcomes of the TAG meeting are reported to the PCC forum. This year the Program will be required to submit a Project Completion Report to AusAID for the period to December 2009?. There are also regular written and verbal exchanges during the year with the Programs stakeholders.

9. Risk Identification and Management Strategy

The Project is contingent on on-going funding from AusAID. This risk is mitigated by ensuring AusAID officers in the Australian Mission in Port Moresby are kept informed of any developments in the Project, by ensuring that the Project strives for and achieves its objectives, and by encouraging the senior staff at RVO to build trusted relations with AusAID in Port Moresby through meetings held independently of the influence of GA Project people.

Staff security in Papua New Guinea is a serious consideration for the Program. A written security plan has been developed and implemented within the Program to reduce the risk posed to GA staff. This includes travel in pairs and employing security guards in-country. Another risk to the Program

output delivery is unforseen volcanic crisis. This has occurred in the past. AusAID has built into the Program an emergency fund that can be accessed by the Program in such circumstances. When these situations occur AusAID is sympathetic to outputs that may not be delivered due to the extra work required to assist in the crisis situations.

10. Workforce Planning/Succession Management
This is a relatively small budget, externally funded project with specific staff resources identified within the Record of Understanding with AusAID. The Project conducts a visit to Rabaul every May or June where the work program for the next financial year is discussed extensively. As result of these discussions a Workplan document is produced and submitted to AusAID for approval. This document forms the basis of Program activities for the next financial year. Strong communication is conducted within the small Project team to ensure that each member of the team is aware of the programs activities and their status.

Earthquake Hazard Project

1. **Project Description:** The Project aims to define the level of earthquake hazard in Australia. This activity will provide all levels of government and the public with accurate and timely information on the level of hazard expected from earthquakes in Australia. A map of earthquake hazard is a key element of the Australian Earthquake Loading Standard, AS 1170.4.

2. **Project Outcome:** Stakeholders across government and the private sector are able to make informed decisions on how to manage the potential hazard from earthquakes in Australia.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☐
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: National Earthquake Hazard Assessments

6.1.1 Description: To provide all levels of the Australian government, industry and public with information on the hazard associated with earthquakes in Australia. This year's

work program is focused on completing the national neotectonic domains model report, analysing the results from the Flinders Ranges deployment and planning for the next generation earthquake hazard map. A workshop will be held with key stakeholders to consider the nature and content of the next generation earthquake hazard maps.

6.1.2 Output Delivery Date:

Q1 ☑ Report on an Australian earthquake domain model based on neotectonic features.

Q2 ☑ Report on earthquake recurrence for the Cadell Fault.
Report to the Australian Earthquake Engineering Society on future plans for the development of next generation of earthquake hazard maps.

Q3 □

Q4 ☑ Preliminary report on stress in the Flinders Ranges.

7. Information Management Considerations

The project uses a range of core data as key inputs to earthquake hazard model. The source data are a mix of spatial and time-varying datasets. In particular, the project develops products from:

- Elevation data – elevation data will be drawn initially from the Elevation SPOT database. Any additional data collected in this project will be added to the Elevation SPOT database
- Earthquake catalogues – these are in the Earthmon database
- Earthquake waveforms - these data are held offline pending the development of a time series archive system monitored through Earthmon.

The project will add value to:

- Earthquake catalogues
- Neotectonic database
- Palaeo-seismology data

The information products developed within the Earthquake Hazard Project will be in the form of presentations/briefings, scientific papers and reports to stakeholders (typically Professional Opinions). Further release of this information is subject to consultation with the relevant stakeholders.

The Earthquake Hazard Project uses a range of technologies and tools which are housed on network drives, Linux workstations and the Beowulf clusters.

Technologies and tools include

- GIS and data preparation (ArcGIS, GMT, Rivertools)
- Scientific Programming (Python, GNU Emacs, Exceed, Fortran, Matlab, Antelope, RedHat, message passing interface (MPI), Subversion revision control and integrated TRAC issue tracking)
- Visualisation, plotting and document preparation software (GMT, matplotlib, Adobe Photoshop & Illustrator, LaTeX).

8. Communications Strategies, including publication of Papers

The Project's communication strategy for 2009/2010 has several elements:

- Focussed discussions with Standards Australia on their needs for earthquake hazard information as input to the national building standard, and subsequently with stakeholders in the earthquake

hazard scientific community on how the Standards Australia needs can be met in the short, medium and long terms;
- Presentations at scientific conferences and relevant workshops; and
- Publications of reports in peer reviewed journal articles as a mechanism for quality controlling the scientific output of the project.

Scientific conferences have been targeted for key focus areas such as
- SSA 2010 (key international conference on seismology and earthquake hazard)
- AGU Chapman Conference on Giant Earthquakes and Tsunamis, Chile, 2010.
- IAG 2010 (international geomorphology conference relevant to palaeotsunami, neotectonics and landslide activities)
- AEES 2009 (Australian Earthquake Engineering Society conference), Newcastle.

9. Risk Identification and Management Strategies

Critical to the Project will be the availability of disk space for storing and analysing hazard modelling outputs. Additional disk space will be required for 09/10 FY and a needs analysis will be conducted to assess this requirement.

The Project's predominant risk is its ability to attract and retain key skill sets, as well as those identified in succession planning.

To provide credible modelling outputs, significant focus is being placed on the validation, publication and external review of models and methodologies.

Issue	Likelihood	Impact	Risk	Management
Loss of key staff. The Earthquake Hazard Project planning for 09/10 is based on current staffing levels.	Low	Major	Moderate	Give sense of direction and purpose to staff so they can see a future career path within the project; Collaborate with other EMG projects to find synergies and efficiencies.
Uncertainty surrounding requirements to support other possible external activities, such as Sydney Water, SA Government, Torrens Energy etc.	Very Likely	Major	Significant	Only take on extra work if it is relevant to our business and comes with additional resources.
Uncertainty surrounding requirements to support other possible internal	Low	Major	Significant	Group Leader to give protection to Project subject to the new need having a lower whole of agency

activities, such as CIPMA, NHIP, ATWS, etc.				priority
Significant cuts to operational funding. A number of outputs would be adversely impacted, both in 09/10 and subsequent financial years.	Low in 2009/2010 but unknown for subsequent years	Major	Significant	Seek funding from elsewhere within or external to GA. Strategic reduction of outputs.

10. Workforce Planning/Succession Management

Succession planning is being addressed through:

(a) The identification of key leadership potential within the Project and the provision of opportunities for these staff to take ownership and leadership of key deliverables.

(b) Developing the scientific and technical skills of staff by a combination of targeted training and benchmarking our working internationally by attending scientific conferences and publishing in peer review journals.

Additionally, participation in the GeoPLUS, GeoEssentials or other internal programs will be discussed with staff to ensure the availability of additional management skills within the Project**.**

NATIONAL MAPPING & INFORMATION GROUP

(Group Leader: Greg Scott)

The National Mapping & Information Group provides authoritative spatial data services, tools, solutions, and products to inform evidence-based decision making, government policy, industry development needs and community wellbeing.
This is delivered in the form of scaleable fundamental theme-based spatial data sets, web delivery services, and geospatial analytics for government departments, emergency managers, defence, and the public.

The Group also plays a lead role in coordinating national topographic and thematic mapping activities and standards, through the Intergovernmental Committee for Surveying and Mapping (ICSM) and other priority national coordination initiatives.

The National Mapping and Information Group comprises six Projects:

- Geographic Data Management and Products
- Defence Mapping
- Geographic Research and Data Acquisition
- National Landscape Information Infrastructure
- The Commonwealth Spatial Data Integration
- The Seismographic Paper Records Scanning

Geographic Data Management & Products

1. **Project Description:** As the responsible custodian, manage and maintain the National Topographic Database (NTDB) and develop digital and hard copy topographic spatial products to support government priorities, industry development and community needs.

2. **Project Outcome:** Government, industry and the community have ready access to authoritative national scale geographic information.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑

- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Maintenance and development of the National Topographic Database (NTDB).

6.1.1 Description:

- Maintenance of the 250K NTDB, population of the Multi-scale DB, population of the Holding Database with data from large scale mapping activities.
- Maintenance of the topographic database and digital product specifications.
- Quality validation of NTDB data.
- Administration of the NTDB management software (SDE) and user access to the NTDB.
- Application support for development of the NTDB.
- Advice to other areas of GA on SDE and spatial data management

6.1.2 Output Delivery Date:

Q1 ☑

- Schema version 1 complete for multi-scale DB
- Narrabri tile loaded in 250K NTDB

Q2 ☑

- Relevant 250K layers copied to Multi-scale DB
- Railway, Foot Tracks, Horizontal Control Points, Aviation and Spot Elevation layers loaded in Multi-scale DB
- Mt Lindesay tile loaded in Multi-scale DB
- 5 Mackay tiles loaded in Multi-scale DB

Q3 ☑

- 7 Bundaberg tiles loaded in Multi-scale DB
- Murwillumbah tiles loaded in Multi-scale DB
- 2 Argyle Downs tiles loaded in Multi-scale DB
- Qld contours work package data loaded in Multi-scale DB
- Beenleigh tiles loaded in Multi-scale DB
- Broad update of 250K data as part of AUSWIDE changes program

Q4 ☑

- NT/SA contours work package data loaded in Multi-scale DB
- Shoalwater tiles loaded in Multi-scale DB
- Francois Peron National Park 250K data loaded in NTDB
- Capricorn Coast data loaded in Multi-scale DB
- ACT 100K data loaded in Multi-scale DB

6.2 Output 2: Topographic and Thematic Map and Data Products

6.2.1 Description:

- Maintenance of the 1M World Aeronautical Chart data and maps and production of VNC maps in collaboration with AirServices Australia (externally funded)
- Management of transfer of air photo archive to National Archives
- Production of 250K maps as part of AUSWIDE update of 250K data
- Design 50K Raster Maps product

- Production of Carnarvon Gorge, Uluru and Kings Canyon customised maps
- Finalisation of 1M Global Map data for input into International Global Map Program
- Ad hoc support for Department of Prime Minister and Cabinet for thematic maps
- Enhancement of MapConnect for the delivery of spatial data and maps

6.2.2 Output Delivery Date:

Q1 ☑

- 250K maps as part of AUSWIDE update of 250K data
- Customised map for Dept of Infrastructure (Gary Gray) complete

Q2 ☑

- Updated Global Map product released
- ACT 100K map printed
- Carnarvon Gorge customised map printed

Q3 ☑

- Updated MapConnect released serving geology and 100K data

Q4 ☑

- Norfolk Island, Christmas and Cocos Islands maps printed
- Uluru and Kings Canyon 100K maps printed
- 22 WACs updated for AirServices Australia
- 11 VNC maps produced for AirServices Australia
- Air Photo archives transferred to Archives Australia

6.3 Output 3: Support to Philippine National Mapping and Resource Information Agency (NAMRIA)

6.3.1 Description: Support NAMRIA and other Agencies to develop Spatial Data Management and Production Skills

- Strengthen spatial data infrastructure development capability in NAMRIA in the Philippines ($250K full cost recovery from AusAID)

6.3.2 Output Delivery Date:

Q1 ☑

- Establish Project Steering Committee

Q2 ☑

- Provide technical assistance to NAMRIA in speeding up the validation process for the 50K topographic data tiles

Q3 ☑

Q4 ☑

- Collaboratively develop a strategy for implementing a NAMRIA-wide Spatial Data Infrastructure
- As a pilot project implement a basic spatial data infrastructure for a small selection of the 50K data tiles
- Project Review

7. Information Management Considerations

- Project involves capture of topographic vector data for digital and hardcopy products and capture of raster data from existing hardcopy maps, repromat, and digital data.

- A number of digital data products may be released relating to topographic data and maps from scales 100K through to 10M.
- All data is produced using ESRI ArcGIS 9.x software. Data may be managed in file geodatabases or ArcSDE.

8. Communications Strategies, including publication of Papers

- Communication strategies will include weekly AMM notes, fortnightly meetings of project section managers, and ongoing ad-hoc meetings.
- Conference papers and reports to ICSM and other committee processes as necessary
- Liaison with State jurisdictions on the development of topographic and related databases

9. Risk Identification and Management Strategies

- Loss of staff due to financial restraints will cause some tasks to be delayed or deferred to a later date. In the event that this occurs prioritisation of tasks will be undertaken.
- The project may be required to redirect resources into other projects and/or priorities. This is likely to affect the successful completion of one or more parts of the outputs described above. In the event that this occurs prioritisation of tasks will be undertaken.
- The AUSWIDE updates to the 250K NTDB and the development of the Multi-scale DB are seen as critically important in order to maintain the currency and relevance of our fundamental databases. These tasks will be given a high priority.

10. Workforce Planning/Succession Management

Certain areas remain highly specialised and thus vulnerable (eg SDE administration and web mapping application development). Older staff with corporate knowledge are passing on that knowledge, or will undertake one-off projects where such knowledge is required (eg the sorting of repromat in the Fyshwick store into groups for retention and destruction).

Defence Mapping

1. **Project Description:** Manage the production of geospatial data and map products for Australia and some offshore areas on behalf of Department of Defence - Defence Imagery and Geospatial Organisation (DIGO).

2. **Project Outcome:** DIGO and its Defence clients have access to geospatial data and map products that meet their requirements.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met □
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. Project Outputs:

6.1 Output 1: Deliver geospatial maps and data products to DIGO

6.1.1 Description:

- Deliver Orthophotos, DEMs, vector data and maps of priority areas to DIGO, in particular PNG 1:10K mapping according to DIGO timeframes.
- Deliver structured and attributed data derived from IGDS data for 1:50K map areas according to the program supplied by DIGO.
- If required, acquire air photography, satellite imagery and associated source data for the production of spatial data and map products according to DIGO timeframes.
- Respond to ad hoc requests from DIGO.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Project involves capture of topographic data including raw stereo photography, orthophotography, vector data and DEMs and print ready files for hardcopy products.
- Primary technologies to be used include ESRI personal geodatabases, raster data as JPEG2000 and Tiff files. Primary software is ESRI ArcGIS with PLTS/MPS military bundle. Other software includes ERDAS and Corel graphics suite

8. Communications Strategies, including publication of Papers

Monthly meetings with working contacts in DIGO supplemented by higher level 6 monthly Interagency Coordination Group (ICG) Meetings and quarterly Heads of Defence Geospatial Agency (HoDGA) meetings.

9. Risk Identification and Management Strategies

DIGO relationship breaks down. Impact: very high. Probability: low. Mitigation: continue to deliver program and build relations with DIGO at all levels.

Suppliers fail to deliver required quality or to timeframe. Impact: high. Probability: moderate. Mitigation: Balance workload between producers to spread risk. Continue to monitor progress and quality, and provide feedback to improve output. Investigate opportunities to enlarge panel.

10. Workforce Planning/Succession Management

In-sourcing of Defence Validation and Testing increased the pool of staff with exposure to defence specifications and formats. Certain areas remain highly specialised and thus vulnerable (eg air

photography acquisition/photogrammetry and MPS production). An active program of documenting these activities and training backup staff is in place. However, this is balanced against operational needs.

Geographic Research & Data Acquisition

1. **Project Description:** The capture, maintenance and provision of topographic data and related Spatial Data Infrastructure products to meet government priorities, emergency management mitigation and response, industry development and community needs. This is undertaken in collaboration with state and other Commonwealth agencies and industry partners through the National Topographic Information Coordination Initiative (NTICI).

2. **Project Outcome:** Government, industry and the community have access to fundamental spatial data via a program that meets their needs and reduces duplication in capture and maintenance.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Contribution to National Spatial Data Infrastructure Initiatives

6.1.1 Description:

- Contribution to ICSM initiatives, including planning, management and implementation of the Roads Working Group and NTICI, and contribution to the Imagery SIG.
- Contribution to OSDM initiatives, including the Coordinated Data Acquisition & Licensing Working Group & Indigenous Communities Working Group
- Liaison with key government bodies and industry stakeholder groups to incorporate requirements into collaborative mapping programs.

6.1.2 Output Delivery Date:
Q1 □

Q2 ☑

- Identification of areas requiring revision in 2010/11 based upon geographic research.

Q3 ☐

Q4 ☑

- Implementation of NTICI capture and revision program for 2010/11 including incorporation of requirements of key stakeholders from OSDM working groups.
- Coordination and implementation of ICSM Roads Working Group activities.
- Provision of geographic datasets and imagery to clients on as needs basis.

6.2 Output 2: Maintenance and Revision of Fundamental National Scale Topographic Data

6.2.1 Description:

- On-going maintenance of priority themes in conjunction with emergency management organisations, state land information agencies, Australian Government agencies and other GA projects, in particular those related to Australian government priorities of emergency management, community safety in remote areas, safer transportation, and sustainable use of mineral and water resources.

6.2.2 Output Delivery Date:

Q1 ☑

- Completion of data capture for ACT Region.
- Completion of data capture for Uluru and Watarrka, NT.
- Complete assessment of the need to revise 1:50,000 scale Defence data themes in northern Queensland including buildings, waterpoints, morphology, roads and barrier points. (Geofabric-related themes are not part of the scope of this project.)

Q2 ☑

- Complete investigation into how best to represent potentially sensitive information in public mapping datasets, particularly powerlines.
- Complete integration of Defence data with existing public mapping in the Townsville region Qld.
- Completion of 2009 geographic research/change detection for 250K NTDB maintenance.

Q3 ☑

- Completion of revision of farm dams in priority areas of the Murray-Darling Basin for the Murray-Darling Basin Authority.

Q4 ☑

- Completion of revision of infrastructure themes for priority areas in remote Australia.
- Completion of revision of buildings in priority areas of the eastern seaboard and south-western Western Australia for incorporation into NEXIS.

7. Information Management Considerations

- GDRA will revise and update information which will be input to products generated by the Geographic Data Management & Products project, other projects within GA, and state mapping agencies.

- Datasets may be maintained in-house or outsourced to NMIG's panel of mapping contractors.
- Satellite imagery and orthophotography will be a major source of information for this project and will require significant investments in storage. Existing delivery mechanisms will be used to serve imagery where possible.
- All data is produced using ESRI ArcGIS 9.3 software. Data may be managed in personal geodatabases or ArcSDE.

8. Communications Strategies, including publication of Papers

- Weekly internal progress meetings
- Half-monthly reports from panel on progress of outsourced work
- Ongoing liaison and reports to state and Commonwealth clients as agreed in project planning.
- External Liaison and reporting through the Permanent Committee on Topographic Information and other stakeholders
- Biannual reports to ICSM through the Roads Working Group and the Permanent Committee on Topographic Information
- Presentation of papers at industry conferences and workshops

9. Risk Identification and Management Strategies

- Work program may be affected by changes in priorities or agreements made after 1 July 2009 with other government departments, or by withdrawal or modification of the amount of external funding (eg by the Bureau of Meteorology, the Queensland Department of Emergency Services or the Murray-Darling Basin Commission). Any such changes will need to be agreed to by the Group Leader and possibly the Chief of Division particularly where they will affect traffic light reports or have significant impacts on budget.
- All major projects will be undertaken using GA Project Management guidelines.
- Delays in delivery and poor quality outputs of outsourced work, which may result in payment delays; managed by regular communication with contractors, enforcement of conditions/penalties in panel deeds, and provision of feedback. The further boosting of the panel will also reduce risk of not enough contractors to provide competitive rates and/or ability to deliver work program by spreading the workload.
- Delays and incompleteness of supply of datasets or requirements from stakeholders; managed by ongoing communication at PL and operator level with equivalents in stakeholder organisations.
- Outsourced work being delivered to expectations but at reduced cost; the work program has been designed for a 2 year program so if the panel delivers early or under budget, new work will be brought forward. This also relies on ongoing communication and monitoring of internal workloads.

10. Workforce Planning/Succession Management

- The project's age profile is diverse as is the complexity of the work it undertakes. This provides existing staff with development opportunities at higher levels for short-term absences as well as minimises the impact of expected staff retirements in the next 5 years. Where possible opportunities for higher duties will be incorporated into PPRs and merit advancement planning.
- The project will continue to use the temporary employment register to fill vacancies in the order of 6 months, generally using recent graduates from tertiary institutions in Canberra.

National Landscape Information Infrastructure

1. **Project Description:** The National Landscape Information Infrastructure project provides a conduit for liaison with key government bodies and industry stakeholder groups on the prioritisation, coordination and implementation several key national spatial data infrastructure initiatives. These include: contributing to the development and implementation of the National Elevation Data Framework; and the development of the Australian Hydrological Geospatial Fabric (Geofabric), in collaboration with the Bureau of Meteorology, CSIRO, and the ANU. The Project also provides strategic advice and technical support to ICSM, and GA and Divisional projects including Geodesy, Groundwater, Risk Research and Land Cover initiatives.

2. **Project Outcome:** Government, industry and the community have access to fundamental spatial data and information required to deliver safe, sustainable and prosperous communities.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia ☑

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Coordination of National Spatial Data Infrastructure Initiatives

6.1.1 Description:

- Provision of Secretariat for the Intergovernmental Committee on Surveying and Mapping (ICSM) as well as advice and promotion of 'best practice' standards and guidelines for topographic and related mapping and data generation, maintenance, and dissemination within the ambit of ICSM.
- Membership on ICSM Permanent Committees and Working Groups, and in particular the Permanent Committee on Topographic Information that oversights NTICI and the Roads Working Group and the Elevation Working Group.
- Liaison with key government bodies and industry stakeholder groups on matters of prioritisation and national coordination of spatial data infrastructure and landscape monitoring projects.
- Advise on initiatives that aim to raise the awareness of government, industry and the community to the benefits of spatial data infrastructure.
- Participate in Commonwealth and State Technical Committees associated with the development and maintenance of the Australian Spatial Data Infrastructure. In

particular, the OSDM Common Framework Data, National Committee for Land Use and Management and related land cover technical committees, and BoM Water Committees.
- Contribute to development of Land Cover and Landscape monitoring capabilities and initiatives being developed through NEOG.

6.1.2 Output Delivery Date:

Q1 ☑ Complete Australian Government survey on Common Framework data requirements.
Q2 ☑
Q3 ☑
Q4 ☑ On-going support, advice and coordination for national committees and working groups.

6.2 Output 2: Australian Hydrological Geospatial Fabric.

6.1.1 Description:

- The Australian Hydrological Geospatial Fabric (Geofabric) is being developed as the geospatial framework to underpin the Australian Water Resources Information System (AWRIS) and the Australian Governments new water accounting commitments under the Water Act (2007).
- Development and implementation of the Geofabric is being done in collaboration with the Bureau of Meteorology, CSIRO, ANU and State jurisdictions.
- The initiative aims to provide a single consistent, national geospatial framework for hydrological features. It has a 10-year life span and will deliver products in phases, with phase 1 being completed in late 2009.

6.2.2 Output Delivery Date:

Q1 ☑ Complete and release of AusHydro Version 1.0. The AusHydro database provides a seamless surface hydrology layer with directed flow paths at 1:250,000 scale.
Q2 ☑
- Complete the 1 second Shuttle Radar Topogaphic Mission (SRTM) bare earth Digital Elevation Model (DEM). Final QA/QC and release is managed by the NEDF Project.
- Complete and release Version 1.0 of the new National Catchments and Reporting Units.
- Complete of Phase 1 Project Reports

Q3 ☑
Q4 ☑ Complete work plan that addresses further investment in national datasets, and incorporation of larger scale datasets in a staged approach on a catchment by catchment basis.

6.3 Output 3: National Elevation Data Framework

6.3.1 Description:

- Leading and managing the development and maintenance of national elevation datasets as the national custodian of elevation

- Providing technical and strategic support to the NEDF Steering Committee and UDEM Project in relation to governance; acquisition; technical standards, industry development, and access, distribution and use arrangements.
- Coordination of data capture in relation to high resolution elevation data
- Provision of strategic, technical and contractual support relating to elevation data acquisition projects being undertaken by GA and other Commonwealth agencies to ensure optimal investment, management, discovery and access
- Ongoing maintenance associated with the GA Single Point of Truth (SPOT) Elevation process, including management of data ingest, discovery and dissemination.

6.3.2 Output Delivery Date:

Q1 ☑ Complete and release the 2009 National Elevation Data Audit

Q2 ☑

- Complete and release Version 2 of the National Elevation Data Capture Guidelines by the ICSM Elevation Working Group.
- Complete the acquisition of Lidar for 9000sqkm on the Lower Darling on behalf of the Groundwater Group in support of the Broken Hill Managed Aquifer Project.
- Release and management of the 1 second Shuttle Radar Topogaphic Mission (SRTM) bare earth Digital Elevation Model (DEM).
- Implementation of the UDEM Data Portal and visualisation system in GA, and ingestion of key elevation datasets over priority areas.

Q3 ☑

Q4 ☑

- Coordination and implementation of the ICSM Elevation Data Working Group activities
- Complete and release the 2010 National Elevation Data Audit.
- Provision of elevation and related data to clients on an as needs basis.
- Ingest of key national elevation datasets into the UDEM Portal as a prototype for NEDF implementation.

7. Information Management Considerations

- The major focus of this project is the establishment of institutional arrangements and development of technical capabilities within GA and the Australian Government through partnerships with state jurisdictions. The National Service Improvement Framework will be used as the basis for development of institutional and governance arrangements. Internal and external review and committee processes, and extensive stakeholder assessment and liaison will also be implemented to ensure on-going activities meet user requirements.
- Implementation of a Single Point of Truth Elevation Database will require significant investment in storage and dissemination capacity. Storage on behalf of DCC will be funded by DCC.
- The project will require access to the full suite of ESRI GIS, ERDAS image processing capabilities, and additional LP360 Lidar software.

8. Communications Strategies, including publication of Papers

- Internal communication strategies will include weekly AMM notes, fortnightly meetings of project section managers, and ongoing ad-hoc meetings.
- External communications plan to be developed with ANZLIC.

- Conference and journal papers will be prepared following pilot studies and workshops
- Working Group made up of representatives from within GEMD and other divisions as appropriate to be set up for National Landscape Observation and Monitoring with relevant communication strategies.

9. Risk Identification and Management Strategies

- All major projects will be undertaken using GA Project Scope and Project Plan guidelines.
- Potential duplication of liaison activities with other projects specifically in NMIG will require management via appropriate communications strategies
- National DEM project being coordinated under the auspices of ANZLIC and state jurisdictions and will involve a large number of stakeholders. Project implementation will therefore at times be reliant on external parties. Extensive liaison will be undertaken to ensure third-party buy-in and delivery against agreed milestones.
- Given the "demonstrator" nature of this project in the short-term, a strong focus on identifying user requirements and outputs will maximise chance of delivering relevant outcomes.

10. Workforce Planning/Succession Management

This project requires the development of new skills in the processing and interpretation of remotely-sensed data and application of this information to digital elevation modelling and monitoring change in the landscape. This will require training of existing staff in new methodologies and potential engagement of new staff with specialist skills on a project basis.

Commonwealth Spatial Data Integration

1. **Project Description:** The Commonwealth Spatial Data Integration (CSDI) pilot program will facilitate the integration and sharing of spatially enabled Australian government authoritative social information, to support social inclusion initiatives. This program establishes a common geospatial technology framework with accompanying business rules, to promote cross-portfolio information sharing.

   The CSDI Program will be led by the Department of Human Services, in partnership with Geoscience Australia and the Australian Bureau of Statistics (ABS); and in consultation with Australian Government Information Management Office (AGIMO). The program aims to:

   - Provide an interim geospatial analytics capability (known as GIST) with health and welfare location based statistics to agencies participating in social inclusion initiatives,
   - Manage the broader integration of spatial, demographic, health, social, economic and other datasets from various government sources to establish a comprehensive evidence base to support the social inclusion agenda
   - Develop an overall strategy and governance for the provision, management and sharing of statistical information sourced from Commonwealth Agencies; and
   - Develop the conceptual and technical framework required to implement Commonwealth spatial data integration.

2. **Project Outcome:** The key objective of this program is to develop an evidence base to support the Australian Government's strategic priorities to address social inequity and to improve opportunities for individuals, families and communities to participate in the economy and society. This evidence base will strengthen the Government's ability to deliver its social inclusion agenda and broad social reform through cross agency and jurisdictional sharing of

spatial and statistical information required to support social inclusion policy framework and location specific programs.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Development and implementation of a technical pilot to demonstrate Commonwealth Spatial Data Integration.

6.1.1 Description: Development and implementation of a proof of concept technical pilot that will demonstrate key elements of the technical infrastructure for the full CSDI network. This will involve setting up core ICT infrastructure, technology, and governance arrangements at GA, DHS, with the option of a 3rd Agency to test the spatial enablement of selected 'social' datasets and the sharing of these datasets between agencies for analysis on a common geospatial framework.

6.1.2 Output Delivery Date:

Q1 ☑ Implementation and testing of 1st stage CSDI technical pilot involving GA and DHS.
Q2 ☑ Successful completion of Gateway Review.
Implementation and testing of 2nd stage CSDI technical pilot involving GA and DHS.
Q3 ☑ Demonstration of technical pilot capability to key stakeholders
Q4 ☑ Maintenance of CSDI technical pilot infrastructure and project closure documentation completed.

6.2 Output 2: Participation in the second pass business case for full Commonwealth implementation of the CSDI.

6.2.1 Description: Provision of the design; principles and frameworks for engagement; implementation and governance arrangements for the CSDI network as input into the

second pass business case for submission to government for the full CSDI network by DHS. Establish, chair, and coordinate the input from key Commonwealth Agencies involved on the CSDI Sub-Working Group – Technical, to inform the second pass business case.

6.2.2 Output Delivery Date:

Q1 ☑ Establish and chair CSDI Sub-Working Group - Technical
Q2 ☐ Completion of input into first draft of second pass business case.
Q3 ☑ Completion of input into final draft of second pass business case and new policy proposal submitted to government – lead agency DHS.
Q4 ☐

7. Information Management Considerations

The preferred solution for the technical pilot will involve two collaborative arrangements with PSMA and Landgate. PSMA has been engaged to provide an address validation and geocoding solution based upon the developing LYNX Search Framework (LSF). The LSF will be implemented at GA to deliver secure geocoding web services. Landgate has been engaged through an intergovernmental MoU to develop and implement a limited version of Landgate's Shared Land Information Platform Enabling Framework (SLIP-EF) at GA. This implementation will involve a building a CSDI 'hub' at GA with a CSDI 'node' at DHS. Capacity has been allowed for installing a third node at another agency however due to various factors including available time may instead be implemented as a virtual node on the 'hub' infrastructure at GA. The project is working very closely with ISB to ensure that all considerations are taken into account and that the appropriate solutions are implemented within GA's IT environment.

8. Communications Strategies, including publication of Papers

Internal communication will comprise of weekly updates reported to Group Leader for inclusion in the Group Report to the Division and project meetings as required.

External communication will comprise of reports to:

- CSDI Pilot Steering Committee meetings – as needed
- CSDI Working Group meetings – responses to tabled papers
- CSDI Information Policy & Governance Sub-Working Group – responses to tabled papers
- CSDI Technical Sub Working Group – Chair, coordinate, and collate technical requirements.
- CSDI Program Management meetings (ad-hoc) – provide verbal project progress
- CSDI Program Fortnightly Reporting – Provide fortnightly written reports detailing progress, risks, issues, and comments.

The presentation of papers will be developed for applicable forums following the completion of the technical pilot and approved by the Steering Committee (TBC).

9. Risk Identification and Management Strategies

The project risks have been documented in a risk log located at TRIM:D2009:64381. The top risks in the risk log are reviewed on a fortnightly basis for inclusion in the project progress reports to the CSDI Program Management Office.

The HIGH and EXTREME risks identified to date are listed in the table below.

Risk ID	Risk Event	Source How can this occur?	Treatment	Residual Exposure

1	Schedule blowout	Due to complexity of implementation environment, particularly installing ICT infrastructure, schedule may extend duration beyond schedule tolerance.	Seek early engagement with relevant ICT staff in DHS and GA to maximise available time in schedule to resolve any issues.	Possible/Major High
2	Inadequate support from ICT/security staff	Given the relatively short timeframe for the project and tight schedule, if adequate support isn't received from ICT/security staff, the project's schedule will be adversely impacted.	Seek early engagement with relevant ICT staff in DHS and GA to maximise available time in schedule to resolve any issues.	Possible/Major High
3	Access and stakeholder engagement	If adequate user requirements aren't gathered the evaluation results will be spurious and benefits not realised.	Request access to the relevant people in DHS/CSP in order to gain the required information for the user requirements.	Possible/Major High
4	GA ICT resource pool	Most but not all ICT skills are already present in GA, however there is a limited scope for their redeployment outside core operational areas.	Seek early engagement with relevant ICT staff in GA to allow enough time for assignment of suitable staff to project and enable alternative arrangements to be made to ensure core operational areas are not adversely affected by loss of staff.	Possible/Major High
5	Staff turnaround	Given the relatively short timeframe for the project and tight schedule, departure of key staff would result in disruption and will likely have an adverse impact on schedule.	Ensure there is knowledge sharing between project team members and detailed project documentation is kept to ensure that all knowledge on the project is maintained regardless if key staff departed.	Possible/Major High
6	Staff absences	Given the relatively short timeframe for the project and tight schedule, the absence of key staff may result in disruption and could adversely impact on the schedule.	Ensure there is knowledge sharing between project team members and detailed project documentation is kept to ensure that all knowledge on the project is maintained regardless of staff absences.	Possible/Major High
7	Delays in decision making	Given the relatively short timeframe for the project and tight schedule, any delays in making decisions which are required to progress the project would adversely impact on the schedule.	Ensure all stakeholders and Project Board members are aware of the tight schedule and what their responsibilities are for decision making in the project.	Possible/Major High
8	Failure to satisfy user requirements	Development of a system which does not meet the program's objectives.	Ensure the user requirements from stakeholders are clearly articulated early on and detailed testing of the system against these requirements will ensure that they are met.	Possible/Major High
9	Data protocols and security provisions	Non-agreement by parties on data sharing protocols and governance, and the level of data security measures mandated by relevant stakeholders, may make CSDI unworkable.	The use of MoUs between stakeholders and GA will ensure all parties are aware of their responsibilities in providing datasets and how the datasets will be utilised.	Possible/Major High
10	System failure or inadequate performance	The use of SLIP technology is already proven, however the integration with GIST is not and any system failures or performance issues resulting from integrating GIST with SLIP would adversely impact on the schedule.	Early testing of GIST by Landgate will enable any potential issues to be identified and solutions developed prior to the implementation of the SLIP technology.	Possible/Major High
11	Failure to complete project in specified timeframe	Unforeseen difficulties in implementation could impact on the schedule and result in the project not being completed in the specified timeframe. This would also impact on the Gateway Review Process.	The Project Manager will undertake close monitoring of the project schedule and be proactive in resolving any issues that arise to attempt to avoid any blowout of the agreed schedule.	Possible/Major High

12	Failure of user acceptance testing	Testing of the system identifies unforeseen issues which have an adverse impact on the schedule and/or inadequate testing is undertaken.	Factor in enough time in the schedule to undertake testing and use test plans and reports to ensure all aspects of the system are adequately tested and any issues identified.	Possible/Major High

10. Workforce Planning/Succession Management

This project will be completed by June 2010. As such the project team will remain at a small number and draw upon available expertise within Geoscience Australia to manage the development and implementation of the technical pilot.

The nucleus of the project team will consist of:

1. Project Leader – to June10
2. Project Manager – to June10
3. Solutions Architect/Technical Manager – to Dec09
4. Administrative/Technical Support – to Dec09

The following specialist skills will be sourced on a needs basis either internally or through external providers:

- Network Engineer
- Solutions Architect
- Applications Developer
- Web designer
- Business Analyst
- IT Security Analyst
- Contracts

Following the successful implementation of the technical pilot a more detailed analysis of resources will be undertaken based upon the wider business requirements gathering process for the second pass business case to expand the CSDI Program to the rest of Australian Government.

Seismographic Paper Records Scanning

1. **Project Description:** The Seismographic Paper Records Scanning project is focused on the conversion of Geoscience Australia's collection of seismographic paper records into a digital archive. The collection is derived from a number of agencies who have taken measurements at various locations around Australia over approximately 100 years. This project will allow these unique records to be more easily accessible and preserved for future analysis.
   The purpose of this project is to set up and implement a program to scan and capture these records into a digital raster archive. Each record in the collection will have supporting metadata for easy retrieval by future users. This archive will ensure the information is available as a historical library but also for future research purposes. Careful handling of these records is mandatory because if a record is damaged or lost it cannot be replaced.

2. **Project Outcome:** Geoscience Australia to have access to a digital raster archive of seismographic paper records. This archive in future years may be made available to Government, industry and the community.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met □
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. Project Outputs:

6.1 Output 1: Deliver scanned raster images of seismographic paper records for permanent storage.

6.1.1 Description:

- Deliver scanned raster images of seismographic paper records for permanent storage.
- Conduct Quality Assurance on scanned raster images.
- Deliver an associated meta-data information for each raster file record to be incorporated into PIMS and Earthmon as appropriate.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑ Delivery of scanned raster images of seismographic paper records and associated metadata of non-damaged records and non-smoked paper records.

7. Information Management Considerations

- Primary technologies to be used include raster data as JPEG and Tiff files. Primary software is Corel graphics suite and Microsoft Access.
- Project involves the creation of significant number of small raster images and therefore storage and data structure/retrieval issues may require significant investment.

8. Communications Strategies, including publication of Papers

- Internal communication will comprise of weekly updates reported to Group Leader for inclusion in the Group Report to the Division and project meetings as required.

- Additionally meetings with internal GEMD staff representing both NMIG and GEM interests in this project to ensure all requirements are met. Monthly progress status reports to be included in this process.

9. Risk Identification and Management Strategies

Full staff recruitment is required for this project. Impact: High. Probability: moderate. Mitigation: Begin recruitment process as early as possible, work with HR to ensure speedy resolution of employment processes.

Data storage issues required to be addressed. Impact: Medium. Probability: Low. Mitigation: Work with GEMD DIM to ensure all avenues are investigated for long term storage at best available cost. Short term solutions are being acted upon.

Metadata entry will be unable to keep pace with scanning process. Impact: Low. Probability: Moderate. Mitigation: Work processes and work flow methodologies to be tailored to minimise the misalignment of these activities. Regular monitoring of the progress of both activities to be conducted throughout project and issues addressed within acceptable timeframes.

Delays caused by work area set-ups. Impact: Low. Probability: Low. Mitigation: Work with Skilled engineering and service provides to ensure minimum disruption.

Delays caused by scanner breakdowns Impact: High. Probability: moderate. Mitigation: Discussions have occurred with both the defence project of NMIG and PGGA area of PMD for possible access to their scanners on an availability basis.

10. Workforce Planning/Succession Management

This program is initially for a single year. Succession management has not been addressed in the current project scope. If project develops into a long term function of NMIG this need will have to be addressed.

National Earth Observation Group

(Group Leader: Adam Lewis)

The National Earth Observation Group (NEO) provides advice on National Earth Observation from Space (EOS) and information to decision makers in the environment, community safety and elsewhere to address national issues, leading to increased prosperity for the Australian community. NEO operates ground stations, manages long-term archives of Earth observation data, and applies leading-edge processing and scientific analysis to extract and deliver information. NEO provides services to the Australian Government and the public, and distributes satellite data through its distribution network.

2009-10 projects and activities fall under:

- Science and Strategy
- Business Development
- Operations
- CRC-SI

NEO will extend capabilities to deliver spatial information from Earth observation, focusing on environmental and community safety decision makers.

NEO Strategic priorities for 2009/10

1. National planning, coordination and advice for remote sensing for partners in Australian Government, including continuing work for the government response to the Earth Observation from Space (EOS) component of the Senate inquiry into space, science and industry, input to drafting of the Joint Academies Plan and input to PM&C 'policy concept paper' on Australian Space Policy.
2. Support to key Australian Government partners, including the Department of Climate Change and others, through
   - Ground station establishment and operation
   - Capabilities for processing and management of EOS data and other datasets in support of global carbon monitoring systems
3. Delivery and development of science-based Earth observation methods, information products, around Land cover and aquatic remote sensing for depth and natural oil seep detection. Relationships include NCRIS TERN and IMOS, the Bureau of Rural Sciences (BRS) and the CSIRO.
4. Implementation of an Earth Observation Data Store (EODS) as a critical operational capability and a key element of the NEO Strategic Plan.
5. Increased provision of data from EOS (especially Landsat, ALOS and IRS-P6) to Australian government agencies and partners, with a specific focus on the Department of Climate Change and large-scale operational users of Landsat, e.g. Queensland Government, through increased system capabilities and efficiency.
6. Emergency response support in the event of floods and natural disasters, through application of protocols developed in 2007/8, and through Sentinel.

Science and Strategy Project

1. **Project Description:** Develop strategic directions and National strategies for EOS; Set priorities for development of operational services; Provide nationally recognised scientific advice and leadership; Develop and test science-based methods for calibrating and correcting EOS data. Development and delivery of innovative analysis techniques for EOS data for

national and international applications eg global carbon monitoring; provide data and systems specifications to operational support.

2. **Project Outcome:** Strategic leadership for EOS science, capability in time-series data analysis, best practice methodologies for extracting information from EOS data, pre-processing methods for surface reflectance products, evaluation and application of data from new EOS missions and national facility for field spectrometers to support EOS sensor calibration and validation. Enabling global carbon accounting framework.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☐

6. **Project Outputs:**

6.1 Output 1: Influence and contribute to the development of National Earth observation strategies and policies

6.1.1 Description: Provide advice and input to Australian Government EOS policies, strategies and plans. Participate in interdepartmental, national and key international meetings including DIISR Space Policy Unit.

6.1.1 Output Delivery Date:

Q1 ☑ Contribute to DIISR plans and committees in regard to Australian space policy, science and research.
Q2 ☐
Q3 ☑ Input to planning processes toward a sustained program for Australian land imaging / public-good Earth observation.
Q4 ☑ Represent GA on the Australian Government Space Forum

6.2 Output 2: SE Asia Satellite Data for IFCI (International Forest Carbon Initiative, Department of Climate Change

6.2.1 Description: This output is fully funded by the DCC under the National Service Improvement Framework and is expected to run over a period of 23 months (from February 2009). Services to be supplied by GA includes data acquisition from regional and global archives, data management, technical advice and systems development to enable DCC to deliver, on behalf of AusAID, training and facilities for extending the NCAS (National Carbon Accounting System) framework to selected participating countries in South East Asia, Africa and other regions as part of the International Forest Carbon Initiative.

6.2.1 Output Delivery Date:

Q1 ☑ Landsat data covering Indonesia for year 2007; data supply agreement with the Thai ground station.
Q2 ☑ Landsat data covering Indonesia for additional 4-5 years; first annual report delivered.
Q3 ☑ Non-Landsat data to complete coverage of Indonesia for 2007 year.
Q4 ☑ Non-Landsat data completing Indonesia coverage for total of 6 years.

6.3 Output 3: National dynamic Land cover map based on MODIS imagery

6.3.1 Description: Completion and delivery of the first nation-wide land cover map at the MODIS scale; and extending the methodology to produce a dynamic change detection module at MODIS scales.

6.3.1 Output Delivery Date:

Q1 ☑ Public release of Dynamic Land Cover Map Version 1.0 (DLCM-1) and accompanying report.
Q2 ☐
Q3 ☑ Incorporation of new data to produce the DLCM-2 dataset.
Q4 ☑ Delivery of draft 'change detection' modules, in anticipation of NEIS / SOE capability requirements.

6.4 Output 4: Landsat NBAR processing and dynamic Land cover mapping system

6.4.1 Description: Through collaboration with other parties, this project will process over 100 Landsat scenes to NBAR level (nadir-viewed, bottom of atmosphere reflectance). It will demonstrate the application of these time series in an area of national significance. It will lead to operational processes for NBAR processing.

6.4.2 Output Delivery Date:

Q1 ☐ Documented procedures for NBAR processing of Landsat imagery to inform systems development (client: Bus Dev team).
Q2 ☐
Q3 ☑ Over 100 NBAR images processed in areas of national significance
Q4 ☑ Over 200 NBAR images (total) processed in areas of national significance

6.5 Output 5: Aquatic Earth observation services for PMD and AusAID

6.5.1 Description: This output builds capability in remote sensing-based high resolution shallow-water bathymetry, funded by DCC/AusAID. This output also provides

expert advice on open ocean water quality parameters. This output provides support for remote sensing data access through international science proposals, builds capability in advanced SAR and optical data analysis for the off-shore energy security program funded by the PMD.

6.5.2 Output Delivery Date:

Q1 ☑ Prototype for semi-automated Definiens processing of SAR data Complete planning and acquisition of SAR data for remote eastern frontiers
Q2 ☑ GBR bathymetry pilot study using ALOS
Q3 ☑ Initial bathymetry outputs for ICCAI vulnerability assessment study areas
Q4 ☑ Complete data evaluation, report results of data evaluation / application to science data providers (DLR, CSA and ESA)
Integrate bathymetry outputs into broader hazard/risk assessment framework.
Operational implementation of second generation rule sets.

6.6 Output 6: Report on additional and future sources of hot-spots, including Geostationary Satellite Sensors

6.6.1 Description: A collaboration with research agencies and the BoM with the aim to identify bushfire hot-spots from current and future geostationary weather satellites.

6.6.2 Output Delivery Date:

Q1 ☐
Q2 ☑ A review of the state-of-play on the extraction of hotspots from current and future Geo-satellites (see D2209-93618))
Q3 ☑ A plan for augmentation of Sentinel hotspots using data from current and future Geostationary satellites
Q4 ☐

7. Information Management Considerations

A number of key deliverables from the Science and Strategy Project depend on the availability and efficiency of data processing, storage and delivery systems. An ongoing review of IM requirements is needed to ensure that systems capacity is commensurate with volume processing and delivery of time-series outputs.

8. Communications Strategies, including publication of Papers

The NEO Communications Strategy will provide the framework for engagement with stakeholders. Key messages from the Science and Strategy outputs will be communicated through GA Seminars, peer-reviewed publications and through stakeholder workshops.

9. Risk Identification and Management Strategies

Key deliverables for the IFCI project are reliant on high throughput capability of systems. Mitigation: Phase augmentation of throughput capacity to match project requirements and manage stakeholder expectations through early notice.

Risk of delays to providing deliverables due to staff movement or unforseen workloads (emergency response etc). Mitigation: Prioritise based on agreed deliverables, seek additional resources for unforseen workloads.

10. Workforce Planning/Succession Management

Resources for training need to be ensured to meet specific project requirements.

Business Development

1. **Project Description:** Builds relationships with Australian Government stakeholders and develops the necessary operational capabilities (data processing, data archive, serving of data, systems for scientific analysis of data) to needed to meet the expectations of those stakeholders. Operationalise new services. Manage projects necessary to achieve change.

2. **Project Outcome:** Geoscience Australia is able to lock into new relationships with key Australian government clients (e.g., DEWHA), to strengthen relationships with the Department of Climate Change through more sophisticated analysis, and to operationalise it's scientific analysis methods for Land cover.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☐
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia ☑
- This project does not contribute to the NRPs ☐

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☐

6. **Project Outputs:**

6.1 Output 1: Earth Observation Data Store (EODS)

6.1.1 Description: Implement an Earth Observation Data Store (EODS) as a critical operational capability and a key element of the NEO Group Strategic Plan. The EODS system will provide storage, discovery and access to key datasets required by key NEO stakeholders.

6.1.1 Output Delivery Date:

Q1 ☑ Complete detailed documentation for EODS functionality, including metadata/cataloguing rules; Operationalise appropriate storage tier (HSM/Robotics), ready for Operations to transfer existing datasets

Q2 ☑ Interface with processing systems to allow storing of standard products automatically into EODS; Develop EODS interface to meet the requirements of internal NEO clients (Science Team)

Q3 ☑ Explore requirements for external client interfaces to integrate with EODS; Explore requirements of other sections in GA to use EODS (e.g. NMI)
Q4 ☑ Develop EODS interface necessary to meet the requirements of the Online Services Concept prototype (below)

6.2 Output 2: Improved stakeholder relationships with key clients in the Australian Government

6.2.1 Description: Build and maintain relationships with priority agencies such as Department of Climate Change, Murray Darling Basin Authority (MDBA), Defence Imagery and Geospatial Organisation (DIGO), Department of Environment, Water, Heritage and Arts (DEWHA), Bureau of Rural Sciences (BRS), Australian Customs and Border Protection Service, Broader Earth observation and spatial community. These agencies are essential for GA to maximise the impact of its Earth observation investments and activities.

6.2.1 Output Delivery Date:
Q1 ☑ Completed Business strategy and Communications strategy
Q2 ☑ Completed Stakeholder Relationship Management strategy to support design of Client Relationship Management System; MOUs signed with 2 new agencies
Q3 ☐
Q4 ☐

6.3 Output 3: Online service concept

6.3.1 Description: Develop a concept for a single point of access for Earth observation online services. This concept will include delivery of Earth observation information and data to external clients, including emergency management information (fires, floods etc), Land cover information, and online discovery, ordering and delivery of Earth observation data.
Review existing catalogue, sentinel, all online; investigate "Google" type technology

6.3.1 Output Delivery Date:
Q1 ☑ Develop scope document
Q2 ☑ Develop detailed design document
Q3 ☐
Q4 ☑ Prototype Online Services Concept

6.4 Output 4: LPGS

6.4.1 Description: Prepare to implement the USGS Landsat processing system within GA, aiming to remove the requirement for future MDA software maintenance.

6.4.2 Output Delivery Date:
Q1 ☑ Project scoped; technology requirements fully understood
Q2 ☑ Initial implementation on GA host computers
Q3 ☑ Complete plan for integration of LPGS into NEO operations
Q4 ☑ LPGS ready for implementation in NEO operational production systems in Q1 FY 2011

6.5 Output 5: System architecture review and transition plan (~200k)

6.5.1 Description: A complete, technically detailed and accepted plan for transition to efficient high-throughput processing systems necessary for NEO to meet government stakeholder expectations in the 5-year outlook.

6.5.2 Output Delivery Date:

Q1 ☑ An agreed, high-level understanding of future architecture guided by very high-level requirements for production systems and the science team.
Q2 ☐
Q3 ☐
Q4 ☑ Detailed road-map is in place and guiding actions

6.6 Output 6: Management information and planning systems – GIS based

6.6.1 Description: Implementation of a number of GIS information products necessary to improve the management, planning and communication of NEO work.

6.6.2 Output Delivery Date:

Q1 ☐
Q2 ☑ Analysis of information flows and implementation of key spatial datasets.
Q3 ☑ Ability to generate a GIS-based 'data received' management report.
Q4 ☑ Ability to generate a GIS-based 'data provided' report.

7. Information Management Considerations

Business Development outputs are heavily reliant on mass storage systems, particularly the implementation of the new GA mass storage solution. Additionally, this project is heavily reliant on up to date technologies including online services.

8. Communications Strategies, including publication of Papers

The DCC relationship is to be managed according to relevant parts of the GA-AGO Collaborative Head Agreement. New communications strategy (to be developed in Q1) will define how NEO will interact with key Stakeholders (as listed above).

9. Risk Identification and Management Strategies

The corporate HSM system is essential for the implementation of EODS. ***Mitigation:*** Use IBM tape library to store the data and interface with discovery/delivery systems.

Considering GA's current economical situation, there is a risk of reduced staff and resources to perform the outputs identified above. ***Mitigation:*** Prioritise and adjust outputs based on core business requirements.

Tasks of external projects (such as the International Forest Carbon Initiative project, funded by Department of Climate Change) will have an impact on staff and resources available to complete outputs identified above. Staff may need to be moved to work on the external project. ***Mitigation:*** Acquire additional staff and rearrange staff allocation to ensure all new work and existing outputs are completed

10. Workforce Planning/Succession Management

Active consideration must be given to staff selection for work funded externally based on specialist skill sets. Resources for training of new staff must also be considered.
Active approaches must be used to ensure specialist knowledge is transferred amongst staff to reduce reliance on individual staff members.

Operations

1. **Project Description:** Acquires, public-good EOS data for stakeholders. Maintains an archive of processed and raw data. Enables access to processed data. Operates information services for external and internal clients.

2. **Project Outcome:** Geoscience Australia is able to provide cost-effective, timely, relevant, and on-going remote sensing data and information in support of Australian Government programs and the community.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Operate ground stations to acquire and archive Earth observation data

6.1.1 Description: The Alice Springs data acquisition facility operates on a 24/7 basis to capture remotely sensed satellite data from a variety of satellites including Landsat-5, Landsat-7, ALOS, IRS-P6, Aqua, Terra, Radarsat-1 and ERS. These data are captured in Alice Springs and written to tape which is then archived, and processed to imagery in Canberra. This output is delivered through continually maintained infrastructure managed by skilled and qualified engineers and technicians. GA also operates facilities in Hobart on behalf of the TERSS consortium which functions similarly to those at Alice Springs. Scheduling of acquisitions is performed to maximise the utility of the data collected from the available resources.

6.1.2 Output Delivery Date:

Q1-Q4 ☑ Continuous output including preventative maintenance
Review and update business continuity plans

6.2 Output 2: Produce and deliver Earth observation products and services

6.2.1 Description: Raw data are processed into imagery either on demand (Landsat, ALOS, Radarsat, ERS-2) or on receipt (IRS-P6, Aqua, Terra). Raw data are maintained in an archive with progressively greater volumes of pre-processed imagery also being archived. Implementation of the Earth Observation Data Store (EODS) is an essential component of being able to efficiently store and retrieve processed data and is necessary to support the goals of the Science and Strategy project. Stakeholder management and client services, including regular communications is effected by this project as is a continual review of the assurance of data sources.

6.2.2 Output Delivery Date:

Q1 ☑ Imagery produced according to stakeholder priority list
Commence transcription of archive to IBM media
Q2-3 ☑ Imagery produced according to stakeholder priority list
Q4 ☑ Imagery produced according to stakeholder priority list
Commence processing Landsat data to imagery upon receipt

6.3 Output 3: Improve efficacy of production systems

6.3.1 Description: Existing production systems are primarily geared towards the production of imagery to specific customer specification on demand. There is an urgent need to move this to the production of imagery to standard parameters for further processing to a consistent, repeatable and scientifically meaningful level for analysis. This will require a major review of production system processes to effect.

6.3.2 Output Delivery Date:

Q1 ☑ Identify and review existing procedures, protocols and data collection practices.
Review existing processing systems, specifically software licences; identify and implement savings
Q2 ☑ Eliminate duplicated or inefficient work practices.
Q3 ☑ Categorise all legacy products into standard or customised. Reduce significantly the number of customised products offered and implement separate production systems for them.
Q4 ☑ Review new work practices

6.4 Output 4: Implement International Forest Carbon Initiative (IFCI) ground station

6.4.1 Description: Geoscience Australia will work with the Department of Climate Change to deliver the expansion of national infrastructure required for the International Forest Carbon Initiative. This program is funded by DCC. Timing of outputs is contingent on DCC sign-off and coordination.

6.4.1 Output Delivery Date:

Q1 ☑ RFT issued
Q2 ☑ Tender evaluations complete; Purchasing initiated
Q3 ☑ Purchasing complete
Q4 ☑ Installation and commissioning of new ground stations

6.5 Output 5: National ground control point and PRISM coverage

6.5.1 Description: A national coverage of PRISM imagery, accurate to pixel or sub-pixel level (2.5m), produced through new field-gathered GCPs and PRISM scenes ortho-rectified using the Barista software. This coverage will provide a fundamental data layer for accurate spatial information at a national scale and will replace ageing Landsat GCPs.

6.5.2 Output Delivery Date:
Q1 ☑ Detailed plan / methodology in place
Q2 ☑ Contracts awarded and field work commenced
Q3 ☑ PRISM scene processing commenced
Q4 ☑ Coverage completed

7. Information Management Considerations

Outputs are heavily reliant on the availability of appropriately priced mass storage systems with sufficient capacity and performance.
The project is heavily reliant on a wide range of technologies, tools and systems, including a range of operating systems, image processing, scheduling, antenna control and archive management processes.
Review of hardware architecture and implementation of new technologies to provide greater utilisation of available resources, particularly local disc storage, is necessary to implement a range of process improvement initiatives.

8. Communications Strategies, including publication of Papers

DCC relationships to be managed according to relevant parts of the GA-AGO CHA.
TERSS facilities managed under the TERSS Board of which GA is a member.
IMOS support activities managed through IMOS arrangements.

9. Risk Identification and Management Strategies

Implementation of a new hardware architecture (as identified in §5 above) is necessary but this is subject to capital funding approval being obtained.
Production throughput and maintenance are heavily reliant upon there being sufficient personnel available and further staff losses without replacement will compromise the delivery of many outputs.
The IFCI antenna is critically dependent upon formal approval from DCC. Delays in obtaining information or approval will compromise the delivery of this output.

10. Workforce Planning/Succession Management

Careful planning is necessary to ensure that available resources are utilised effectively to cover all requirements. Continued staff development and cross-training is also required.

CRC-Spatial Information

1. **Project Description:** This project manages Geoscience Australia's relationship with the CRC-SI and participates in the CRC through input and in-kind contributions, particularly in:
   - Geodesy / Auscope;
   - Methods for ortho-rectification of remotely sensed imagery;
   - Methods for the extraction of information from time-series of remotely sensed data.
   - Other projects developed in CRC-SI Ver 2 in which GA is a participant.

2. **Project Outcome:** CRC outputs directly support GA programs in Geodesy, National Earth observation and National Mapping. The relationship between GA and the CRC-SI involves significant administration of agreements and reporting to the CRC. GA's commitments to CRC programmes and projects come from several parts of the agency, and these must be accounted through this activity to produce the output. In line with the project outcome, the project will administer Geoscience Australia's relationship with the CRC-SI, to ensure that GA meets it's commitments to the CRC-SI

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☐
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☐

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☐
- Safeguarding Australia ☑
- This project does not contribute to the NRPs ☐

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☐

6. **Project Outputs:**

6.1 Output 1: As a participating member of the CRC-SI, Geoscience Australia supports the governance and reporting requirements of the CRC-SI. The GA executive is provided with advice as required on CRC-SI activities at GA.

6.1.1 Description: As part of the governance of the CRC-SI, Geoscience Australia as a participant organisation is required to approve changes to the participating agencies, Project Agreements, & report on Project activity within GA.

6.1.2 Output Delivery Date:
Q1-Q4 ☑ Reporting requirements met; monthly reports to Chief, GEMD

7. Information Management Considerations

Information management considerations are addressed in the relevant information management plans for those projects contributing to the CRC-SI.

8. Communications Strategies, including publication of Papers

- Communications within GA to ensure that all parties engaging with the CRC are 'singing from the same song-sheet'
- Effective communications with the CRC management on relevant issues

9. Risk Identification and Management Strategies

GA falls short of projected in-kind contributions
Mitigation: Internal reporting will be provided to the Chief, GEMD providing early awareness of variations from planned contributions.

10. Workforce Planning/Succession Management

Engagement with the CRC is at several levels within GEMD with built-in redundancy.
Participation in some CRC projects has reduced while others have increased ensuring that a range of staff in GA are familiar with the CRC from GL level to technical staff.

Risk & Impact Analysis Group

(Group Leader: John Schneider)

The Risk & Impact Analysis Group's (RIAG) key role is to develop knowledge of the risk from natural and human-caused hazards for input to policy and operational decision makers for the mitigation of risk to communities in Australia and the Australasian region. RIAG achieves this through the development of computational methods, models and decision support tools for use in assessing the impact and risk posed by hazards. RIAG contributes to the National Research Priority of Safeguarding Australia by providing an improved understanding of the vulnerability of the built environment in Australia, including critical infrastructure. RIAG is also addressing the National Research Priority for an Environmentally Sustainable Australia through new work in the assessment of coastal vulnerability to climate change.

RIAG comprises four projects:

1. The Critical Infrastructure Project
2. The Engineering, Economics and Exposure Project
3. The Natural Hazard Impacts Project
4. The Climate Change Project

Critical Infrastructure Protection (CIP)

1. **Project Description:** The Critical Infrastructure Project provides the technical resources and capacity in support of the Attorney-General's Critical Infrastructure Protection Modelling and Analysis (CIPMA) Program. This national initiative in Critical Infrastructure Protection (CIP) is undertaken within a geospatial data and modelling framework. The project focuses on research related to modelling critical infrastructure networks and systems from an "all hazards" perspective using real data and knowledge provided by the owners of critical infrastructure. The project also has a major role in liaising with sectors of the Trusted Information Sharing Network (TISN) for Critical Infrastructure Protection, notably the Energy, Communications, Water, Banking & Finance and Transport Infrastructure Assurance Advisory Groups (IAAGs).

   The objective of the CIPMA Program is to deliver strategic decision support metrics for government and business in CIP, counter-terrorism and emergency management, especially with regard to prevention, preparedness and planning, and recovery.

   The CI Project is responsible for:

   - the overall technical lead for the development of the CIPMA capability,
   - housing and maintaining the capability in a secure environment,
   - housing and managing ASNET secure communications,
   - engaging and liaising with industry experts,
   - scenario analysis and delivery of tasking requirements for business and government,
   - sourcing and managing infrastructure data,
   - modelling infrastructure systems,
   - developing a decision support framework,
   - developing an effective data information architecture, and
   - developing appropriate outputs and visualisation capabilities.

   There are two sources of funding for the CI project:

   1. AGD Budget funding, and

2. Cost recovery under a protocol.

The second area of revenue is associated with work for companies or government agencies that have not provided data and technical inputs to the CIPMA capability.

2. Project Outcome: This project will enable GA to deliver:

- A national integrated CIP modelling simulation and analysis capability to examine the primary dependencies and interdependencies between energy, banking & finance, communications, water and transport critical infrastructure.
- Enhanced understanding of critical infrastructure relationships, dependencies and vulnerabilities.
- Tasking outputs based on external demand presented through the AGD Tasking Application process. These will provide strategic and operational support to decision makers involved in CIP, counter terrorism and emergency management.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia □
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: An operational CIPMA Program providing reports and other products for Industry and Government tasking applicants.

6.1.1 Description: An operational CIPMA capability that is open to limited tasking by industry and Government to model and analyse system behaviour, consequences of CI failure and interdependencies across priority infrastructure sectors. This work is based on 3 Tasking rounds a year or the emergence of urgent tasking demands.

6.1.2 Output Delivery Date:
Q1-Q4 ☑ As prioritised in Task Log

6.2 Output 2: Continuing development of the CIPMA capability as the number of priority sectors increases.

6.2.1 Description: Continued development and enhancement of the CIPMA capability requires the expansion of data holdings and models. Some of this capability expansion will occur as part of specific tasks, however, continued maintenance of the data and the models is needed to ensure past capability continues to be available. Expansion of the CIPMA capability with the development and integration of water infrastructure including potable and waste systems and transport sector will be required over the next several years. The timing of these developments is conditional on the demands imposed on GA's CIPMA resources by the Tasking deliverables.

6.2.2 Output Delivery Date:

Q1 ☑ Development of water sector: model and data collection
Q2 ☑ Development of transport sector: industry engagement & consultation
Q3 ☐
Q4 ☑ Annual review of data and systems modelling, capability enhancement and development

7. Information Management Considerations

The project is capturing infrastructure networks and systems that describe the electricity, gas, liquid fuels, telecommunications, broadcasting, water, banking & finance and transport sectors. The source data is typically a mix of spatial and non-spatial data types which are combined into feature datasets and classes within geodatabases for spatial and network analysis as well as visualisation of simulations. More detailed information concerning the project's IM plan can be found at TRIM ref:D2007-38176.

The information products produced within the operational capability of the CIPMA Program will be in the form of reports, presentations or situational awareness briefings. The release of this information is subject to AGD tasking and dissemination protocols.

Geospatial datasets and information provided by industry may only be released on the "authority to release" from industry data owners.

The CIPMA Program is being developed using a range of technologies and tools which are housed on a separate network within the CIP secure room.

- ESRI – SDE Oracle (Cipdev, Cipprod, Ciptrans), ArcInfo, ArcEditor, ArcView, various extensions and customised applications
- Vensim, MatLab/Simulink software- system dynamics modelling software
- Custom Java integration applications (CSIRO developed)
- Python
- C
- Visio
- TERM - economic modelling software
- ArcCensus - ESRI based demographic tool and data

The capability also uses a number of outputs from modelling packages and databases in other areas of the Risk and Impacts Analysis Group such as EQRM, ANUGA, and NEXIS for event modelling, impact, and exposure analysis.

8. Communications Strategies, including publication of Papers

The Critical Infrastructure Project reports progress on the development of the CIPMA capability directly to AGD. The project, in conjunction with AGD, also reports progress to the Multi-Agency Team (MAT) which comprises representatives from relevant Australian Government Agencies. The MAT acts as an advisory body to the development of the CIPMA capability.

Updates are also provided, on a minimum bi-annual basis, to the following:

- Critical Infrastructure Advisory Council (CIAC)
- priority sector IAAGs – Energy, Communications, Banking and Finance, Water, and Transport
- Business Government Advisory Group (BGAG) on National Security
- National Committee for Critical Infrastructure Protection (NCCIP)
- CIPMA Executive Committee

A strong and trusted relationship with Industry underpins the success of this project. This continues to be achieved by ensuring that we understand the sensitivities of the information that industry provides and that appropriate security mechanisms are in place to ensure confidentiality. As such, information such as reports or papers, is classified appropriately by AGD using the PSM as a guide and subject to AGD dissemination protocols.

More detailed information concerning the project communications strategy has been documented in:

- CIPMA Communications Strategy
- CIPMA Tasking and Dissemination Protocols

The Critical Infrastructure Project will continue to have annual technical workshops with the US Department of Energy National Laboratories (Los Alamos and Sandia) and the National Infrastructure Simulation and Analysis Centre (NISAC), to enhance the rigour of the modelling approaches and methodologies being undertaken in the CIPMA Program.

9. Risk Identification and Management Strategies

The Critical Infrastructure Project is developing and delivering an operational CIPMA capability in collaboration with AGD. Therefore the risks identified relate directly to the CIPMA Program.

The major risks associated with this Project are:

Issue	Likelihood	Impact	Risk	Management
Failure to effectively engage senior decision makers in the CIPMA program.	Possible	Major	Low	Provide ongoing reporting and feedback to senior decision makers. Briefings to CIAC and TISN IAAG's every 6 months.
Inability to technically deliver a CIPMA capability that meets stakeholder needs within the necessary timeframe.	Possible	Moderate	Low	Implement the agreed Task Management Flow process based on PRINCE 2 project

				management
Failure of AGD to deliver agreed project management support to the CIPMA Program.	Possible	Moderate	Low	GA and AGD executive also formally meet every 6 months to discuss the current relationship and work program.
Inability to meet scheduled tasking deadlines due to jurisdictional/stakeholder induced delays.	Likely	Moderate	Moderate	Manage deadlines under the Task Management Flow process and Stage all industry data inputs
Significant problems in recruiting and retaining suitably qualified and skilled staff for the CIPMA Program.	Likely	Major	High	Maintain staff skill levels and identify potential resource skill shortages early to prevent delays.
Accidental or deliberate disclosure of sensitive CIPMA Program information.	Unlikely	Major	Low	Actively manage the IM security and review procedures to ensure compliance
Failure to maintain appropriate information and physical security controls around the CIPMA Program.	Unlikely	Major	Low	Regular monitoring, review and updating of security procedures.
Failure to provide the appropriate level of credible modelling, analysis, and decision support information to stakeholders through the tasking process.	Unlikely	Major	Low	Continue to undertake regular consultation with all stakeholders, business and government user community as well as exchange of ideas and methodology with risk impact assessment experts.
Inability to be tasked by Government in the event of an emergency or	Likely	Major	High	Continue to maintain, develop and enhance the

national security event.				technical CIPMA capability underpinning the operational functions
Misuse, theft or damage of assets and equipment used in the CIPMA Program.	Unlikely	Moderate	Low	Actively manage the physical security and implement mechanisms to log the movement of assets

Mitigation strategies for the above risks include:

a. Provide ongoing reporting and feedback to senior decision makers. This is achieved formally via briefings to each of the individual IAAG's and CIAC of the TISN at least every 6 months. GA and AGD executive also formally meet every 6 months to discuss the current relationship and work program.
b. Continue to undertake regular consultation and provide feedback to all stakeholders in the business and government user community. In so doing, manage stakeholder expectations.
c. Within the CIPMA program, use regular GA/AGD management meetings and MAT meetings as mechanisms to update and inform staff of requirements, roles and expectations.
d. Maintain staff skill levels and review and identify potential resource skill shortages early to prevent delays. Also ensure staff possess appropriate knowledge of key facets of the work program and overall aim of the project.

10. Workforce Planning/Succession Management

The CI Project has expanded significantly from an original team of six to 24 in 2008/09. As this expansion has taken place the project has attempted to establish a strategy to enable succession management of the roles and responsibilities currently undertaken in the management of the overall project as well as at the management level of the sector, modelling, GIS, and system development areas as well as the tasking management.

The strategy however is currently constrained by two points:

1. As discussed in the Risks section, recruiting and retaining suitably qualified staff based upon external funding (and therefore non-ongoing employment status) has been, and continues to be, a problematic issue with regard to certain specialist skills.
2. The new funding arrangements have meant a continuing reduction in real terms to the project given the fixed level of funding from AGD, the constraints on staffing funded by GA and progressive increments in salary costs. This is being managed through a redefinition of role profiles in light of the balance between tasking and capability development.

With these two points in mind the workforce planning and succession management consists of a balance of priorities, funding, and current recruitment reality.

Project staff numbers for the 2009-10 are as follows:

Staff Status	Ongoing	Non-Ongoing	Contract	Total
Current	8.85	6.7	2	17.55
Vacant	1.0	6.7	-	7.7
Total	9.85	13.4	2	25.25

Note:

- The budget constraint precludes the engagement of staff to most of the vacant positions.
- Included in these are 7.7 FTE in the Engineering, Economics, Exposure Project funded through the CIPMA program.
- These numbers do not include at least 6 FTE which form part of the co-contribution to the program from other areas of RIAG (E3P, NHIP, Climate Change or Resource) and ISB (IT, Database, ESRI support). The quantum of resources required from the RIAG projects depends on the nature of the tasking demands placed on the CI Project.

Engineering, Economics and Exposure Project

1. **Project Description:** The project develops for other RIAG projects and external stakeholders an understanding of what assets and people are exposed to severe events, how vulnerable they are to the hazard and what are the consequences of exposure. To this end the project develops engineering and economic vulnerability models for the built environment that are representative of buildings, critical infrastructure and the economic activity associated with them. In parallel, the project is also developing a national definition of infrastructure and demographic exposure. This is being achieved through the integration of the specific information held within jurisdictions and the confidential datasets collated by the Critical Infrastructure Project. The research scope for exposure and vulnerability includes the broad and diverse range of infrastructure found in the Australian built environment and those of key neighbouring countries in our region. This is applied in the scenario modelling and risk studies of the Natural Hazard Impacts (NHI), Climate Change (CC) and Critical Infrastructure (CI) Projects. The provision of guidance on tasking scenarios developed in the CI Project and the development of loss assessment tools for the Australian Reinsurance Pool Corporation is also a key activity. Tools are also being developed to identify engineering factors influencing vulnerability and the evaluation of cost effective mitigation strategies for regulators, government and industry, particularly in the context of climate change.

2. **Project Outcome:** Stakeholders are able to make reliably informed decisions to manage the risk from natural hazards and malevolent acts. Impacts of natural hazards on critical infrastructure are reliably assessed as key inputs into utility system behaviour and the evaluation of attendant economic losses. Finite mitigation resources are more effectively deployed to achieve the greatest benefit to Australian communities. Significantly, climate change related effects are captured quantitatively to inform mitigation policy.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☐
- Safeguarding Australia ☑
- This project does not contribute to the NRPs ☐

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Development of the National Exposure Information System (NEXIS)

6.1.1 Description: Delivery of an "operational" capability for generating national residential, business, institutions and emergency use exposure information for Australia derived from and consistent with nationally available datasets. Upgrade of these capabilities through specific exposure information sourced from the jurisdictions. Scope and develop an approach to integrate critical infrastructure asset data within a secure environment.

6.1.2 Output Delivery Date:

Q1 ☑ Development of infrastructure exposure framework and database
Q2 ☑ Development of integration framework for CBD building survey activity
Q3 ☐
Q4 ☑ Development of NEXIS Decision Support Framework
Development of tool for storing and extracting 3D CBD building geometry within NEXIS
Provision of expert advice on the development of an exposure information system for Philippine cities.

6.2 Output 2: Development of Vulnerability Models for Building Structures

6.2.1 Description: Develop vulnerability models for buildings used for a range of purposes including those that house critical infrastructure assets. Natural hazards of interest include severe wind, earthquake and tsunami.

6.2.2 Output Delivery Date:

Q1 ☑ Develop national suite of heuristic residential wind vulnerability curves
Q2 ☑ Development of initial suite of earthquake vulnerability models for buildings in the Philippines
Q3 ☑ Development of initial suite of wind vulnerability models for buildings in the Philippines
Q4 ☑ Completion of the engineering survey of three state capital cities.

6.3 Output 3: Critical Infrastructure Vulnerability Model Development and System Dynamic Model Development Support

6.3.1 Description: Develop and adapt preliminary earthquake vulnerability models for electricity, telecommunications, water and transport sector assets for use in developing the CIPMA Decision Support module. The development of refined loss models for the ARPC and the support of CIPMA tasking. The provision of

engineering support to the development of interdependent utility system dynamic models.

6.3.2 Output Delivery Date:

Q1 ☑ Develop first national catalogue of communication tower assets and the vulnerability assignment to each category.
Q2 ☑ Develop preliminary earthquake vulnerability models for key telephone exchange types.
Q3 ☑ Development of a blast and plume vulnerability schema for CBD buildings Engineering wind vulnerability model development and application to Darwin task.
Q4 ☑ Mapping of vulnerability schema to the Melbourne and Sydney CBDs

6.4 Output 4: Economic Vulnerability Model Development

6.4.1 Description: The Economics component of the E3 project provides support to other RIAG projects (CIP, CC, NHI) and develops economic models to assess the impact of all hazards including the evaluation of casualty costs, indirect losses and economy wide effects. These modelling and analytical tools also support analysis and decision making in terms of mitigation, loss amplification, business resilience and policy settings.

6.4.2 Output Delivery Date:

Q1 ☐
Q2 ☑ Preliminary casualty cost model
Q3 ☑ Economic modelling of cyclone impact on Darwin electricity task
Q4 ☑ Banking and Finance internet failure task

7. Information Management Considerations

The IM associated with critical infrastructure data used by the E3 project is addressed by the CIP. In addition to this sensitive data, built environment data will be utilised by NEXIS to produce building exposure catalogues. Further, infrastructure damage data will be captured through post-disaster survey activity.

The project will utilise several fundamental datasets for input into NEXIS. The spatial datasets sourced from PSMA, Local Governments and the ABS will be captured and maintained by the National Mapping and Information Group. Insurance portfolio data supplied by the Australian Reinsurance Pool Corporation will also be integrated. The non-spatial datasets including Cityscope, Sensis, Jurisdictional VG Data, LGA data, GA Disaster Surveys and ABS will be maintained by the E3 Project.

The project will also periodically capture specific natural hazard related building and critical infrastructure damage information and, where possible, associated claim data sourced from the insurance industry. This data may also be supplemented by other data supplied by the local SES, LGA's, large property owners such as Government housing departments and the utility industry.

The E3 program is being developed using a range of technologies and tools including those listed below:-

- Oracle (SDEdev, SDEprod, SDEdist)
- Phython, .Net, FME

- Java, Web Interface
- Matlab, Vensim, PowerWorld, Strand7
- ESRI – SDE, ArcInfo, ArcEditor, ArcView, ArcObject, ArcPad, ArcIMS, various extensions
- CData - MapInfo based demographic tool and data

8. Communications Strategies, including publication of Papers

The communication strategies associated with critical infrastructure vulnerability and exposure definition align with those for the CIP, GRP and CC Projects. Built environment exposure data generated by NEXIS will be delivered at building level to other GA projects via a network hot-link. External dissemination will be at an aggregated level only and will be delivered via the web to external agencies.

Post event data dissemination will be via presentations, workshops and journal papers in a manner consistent with the confidentiality associated with the base data supplied by external collaborators and in accord with the provisions of state and federal privacy legislation. Project participation in other expert committees and working groups, such as the wind loadings standard committee, provide other opportunities to present project outcomes.

9. Risk Identification and Management Strategies

Several risks are associated with NEXIS database, vulnerability model, sector model and economic model development:

- Effective engagement of industry as part of infrastructure asset information gathering and model validation.
- Effective engagement of the custodians of specific built environment exposure data required for advancing NEXIS. This is a particular risk in the regional program where data quality and access may prove to be very problematic.
- The continuity of the commercially available fundamental datasets that underpin NEXIS.
- Recruitment, retention and development of staff skills to align with the current and changing needs of the project and GA's current recruitment policy. The ongoing inability to recruit a lead infrastructure engineer could potentially impact ability to advance utility system modelling both as to vulnerability and system dynamic behaviour. Recent changes to the leadership of the CI Project have lead to reduced leadership of the economics program and the long term resolution of this involves risks to the project.
- Deliberate or inadvertent disclosure of sensitive stakeholder supplied data derived both in the development of NEXIS and in facilitating the contributions of external infrastructure vulnerability experts leading to a loss of trust.
- Inadequate resourcing of the engagement of external experts to provide necessary inputs into model development.

The ranking of these risks and the proposed management strategy is summarised in the table below:

Issue	Likelihood	Impact	Risk	Management
Difficulties in infrastructure asset information gathering and model validation.	Likely	Medium	Significant	Effective engagemen of industry and stakeholders. Implementation of ta management process.

Sourcing specific built environment exposure data required for advancing NEXIS.	Likely	Medium	Significant	Effective engagemen of data custodians an stakeholders.
Recruitment, retention and development of staff skills to align with the current and changing needs of the project and GA's current recruitment strategy.	Likely	Major	Very Significant	Secure approval from GA to recruit engineers externally. Promote GA as employer of choice. Draw upon expert panels to fill gaps. Engage expertise through engineering consultancies.
Deliberate or inadvertent disclosure of sensitive stakeholder supplied data derived both in the development of NEXIS and in facilitating the contributions of external infrastructure vulnerability experts leading to a loss of trust.	Possible	Major	Significant	Secure facility in GA and adherence by all staff to procedures handling the data.
Inadequate resourcing of the engagement of external experts to provide necessary inputs into model development.	Likely	Medium	Significant	Source external funding or get approval from the management for mission critical mode development.
Reduced leadership of the economics program.	Very Likely	Major	Severe	Resolve the issue of CIP - Project leader recruitment ASAP.

10. Workforce Planning/Succession Management

The E3 Project will need to grow in staff to meet deliverables. Some of these may be sourced within the agency but many will need to be recruited externally. Approval of current additional staff requirements has been obtained from GA and recruitment processes are advanced to secure these staff resources.

With this addition the project will comprise 9 ongoing GA staff and 13 long term contract staff. Engineering positions in particular have proven difficult to fill.

Natural Hazard Impacts Project

1. **Project Description:** The Project aims to define the natural hazard risk in Australia and the region from a range of natural hazards including earthquake, tsunami, landslide, storm surge, volcanic eruptions and flood. This activity will provide risk assessment models, methods and tools to support a range of risk mitigation options including emergency response, recovery and preparedness, building regulation, land-use planning and insurance.

   This Project also coordinates, and is a key provider of, Geoscience Australia's technical expertise and advice to AusAID. Development of natural hazard risk information is the key focus of support to AusAID, in line with the AusAID's Disaster Risk Reduction policy.

2. **Project Outcomes:** Stakeholders in the Australian Government, State Government, Local Government and the private sector are able to make informed decisions to manage the potential risk from natural hazards.

   Our regional neighbours are able to sustainably develop their capacity to undertake natural hazard risk assessments and in turn make informed decisions to manage these risks.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☐
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs ☑

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

   6.1 Output 1: Natural Hazard Risk Modelling

   6.1.1 Description: Contributions to key Australian and State Government initiatives surrounding the development of risk modelling tools and capabilities for local scale hydrological and earthquake hazards. The 09/10 FY program will entail the collaborative development of a flood model with Tweed City Council and debris flow/dam break model with Mineral Resources Tasmania. Preliminary work on coupled flood storm surge modelling for Bunbury will be undertaken in conjunction with WA Department for Planning and Infrastructure. A tsunami impact assessment for Mandurah (WA) will also be developed for FESA, and palaeo-tsunami studies

for north-west WA will be completed. EQRM development will continue and support initiatives such as the Global Earthquake Model (GEM) initiative and earthquake hazard mapping.

6.1.2 Output Delivery Date:

Q1 □
Q2 ☑ Tsunami impact assessments for one WA community.
Q3 ☑ Preliminary storm surge inundation model for Bunbury.
Submission for peer review of a paper on Palaeotsunami studies in north-west WA.
Q4 ☑ Preliminary validation/model comparison of flood hazard in Tweed City Council using ANUGA.
Pilot integrated debris flow and dam break model.
EQRM has improved functionality.
Improved interoperable landslide database available online.

6.2 Output 2: Australia-Indonesia Facility for Disaster Reduction (AIFDR)

6.2.1 Description: Support AusAID to establish and implement the AIFDR with a specific focus on providing scientific tools and expertise to quantify hazards in Indonesia and the region, and for the computation of risk based on exposure and vulnerability. In the 09/10 FY GA will provide 2 FTEs of technical support to the AIFDR risk and vulnerability work stream for the development of fundamental natural hazard risk models and information.

6.2.2 Output Delivery Date:

Q1 □
Q2 □
Q3 ☑ A volcanic ash hazard model is validated against historic eruptions in Indonesia and the Philippines.
Q4 ☑ Workshops are held on available methodologies and data for the development of exposure information and building damage models. An Options Paper on the development of exposure information is provided to AIFDR.
A work plan for the risk and vulnerability work stream for FY10/11 is developed, which includes the steps required to develop an ash-fall impact model.

6.3 Output 3: Strengthening Natural Hazard Risk Assessment Capacity in the Philippines

6.3.1 Description: Support AusAID's disaster risk reduction goals in the Philippines by developing long-term partnerships between Government of Philippines (GoP) technical agencies, AusAID and Geoscience Australia in order to better understand, and in the longer term reduce the risk from natural hazards in the Philippines. The second year of this three-year program, funded by AusAID's Disaster Risk Reduction program, will be focused on supporting the GoP to conduct a pilot earthquake risk assessment project, improve their mapping capability and improve their access to exposure and vulnerability information.

6.3.2 Output Delivery Date:

Q1 ☑ Review of ground motion prediction techniques and site class models for the Philippines.

Q2 ☐

Q3 ☑ Workshops with the GoP and Philippine engineering community has resulted in the identification of appropriate damage models for earthquake and severe wind.

Q4 ☑ A strategy is provided to AusAID and the GoP mapping agency and that outlines how a Spatial Data Infrastructure could be implemented in the GoP mapping agency.
A project plan for developing the GoP capacity to undertake severe wind impact modelling has been submitted to AusAID.

7. Information Management Considerations

The Project is using core data that are key inputs to hazard and risk models of a range of natural hazards. The source data is a mix of spatial and time-varying datasets. In particular, the project develops products from:

- Elevation, bathymetry and coastline data
- National Exposure Information System (NEXIS) data
- Vulnerability models
- Tide gauge data
- Earthquake hazard information from the Earthquake Hazard Project in Earth Monitoring

The project will add value to:

- Palaeo-tsunami data
- Landslide interoperable database
- Flood database
- Bathymetry and Elevation SPOTs

The information products developed within the Natural Hazard Impacts Project will be in the form of presentations/briefings, progress and final reports to stakeholders, typically through Professional Opinions. Further release of this information is subject to consultation with the relevant stakeholders.

Data products developed for external clients include (public release to be determined):

- A tsunami impact assessment (including maximum inundation depth and maximum flow speed maps) for one WA community (FESA)
- A storm surge inundation assessment (maximum inundation depth and maximum flow speed maps) for Bunbury (DPI WA)
- A pilot debris flow/dam break model in the Hobart region (TAS MRT)
- A preliminary validation/model comparison of flood hazard in the Tweed (Tweed City Council)
- A validated volcanic ash hazard model (AIFDR)
- Maintenance of ANUGA and EQRM as open-source software.

The Natural Hazard Impacts Project maintains the responsibility for management of Natural Hazards Online (NHO). NHO is a series of Internet web pages (accessed from GA's homepage) that provide information on natural hazards and their impacts, and also highlight GA's work in this area. The Project is responsible for reviewing, and as necessary updating, the content of these web pages. In addition, public enquires through Natural Hazards Online are directed to identified staff within the RIAG.

The Natural Hazard Impacts Project uses a range of technologies and tools which are housed on network drives, Linux workstations and the Beowulf clusters.

Technologies and tools include

- GIS and data preparation (ArcGIS, GMT, QGIS, FlederMaus, ERMapper, Intrepid, Rivertools)
- Scientific Programming (Python, Eclipse Integrated Development Environment, GNU Emacs, Exceed, Fortran, Matlab, Antelope, RedHat, Debian Linux, Interactive Data Language (IDL), message passing interface (MPI), Subversion revision control and integrated TRAC issue tracking)
- Visualisation, plotting and document preparation software (GMT, matplotlib, FlederMaus, OpenSceneGraph, OGRE, Adobe Photoshop and Illustrator, LaTeX).

In addition, the Project has developed a metadata system for the tsunami risk modelling activity that allows the Project to identify model inputs, supporting metadata, model assumptions and processes for any model output. With ANUGA and EQRM as open-source release software, the project has also developed a system to minimise the risk of releasing data within the software that we do not have the appropriate licence to do so. Both these systems serve as a necessary risk management exercise.

Critical to the Project will be the availability of disk space for storing and analysing risk modelling outputs. Additional disk space will be required for 09/10 FY and a needs analysis will be conducted to assess this requirement.

Total disk space requirement for the 09/10 FY will be assessed but will require procurement of at least 5 Tb.

A key area that is being investigated, and hopefully implemented, in FY09/10 is a video-conferencing facility to enable cost-effective communication with GA staff located at the AIFDR in Jakarta, AusAID staff located overseas, and other overseas stakeholders.

8. Communications Strategies, including publication of Papers

The Project's communication strategy is based around four key mechanisms, specifically:

- Presentations and regular meetings with key stakeholders including State and Territory Emergency Management Agencies, Australian Government Agencies such as AusAID and AGD, and National Co-ordination groups such as Technical Risk Assessment Advisory Committee (TRAAC), National Risk Assessment Advisory Group (NRAAG) and National Flood Risk Advisory Group (NFRAG);
- Presentations at scientific conferences and relevant workshops; and
- Publications of reports and refereed journal articles.
- Regular reporting of work to AusAID and other Government Partners (eg. the Governments of Indonesia and the Philippines) in both written reports and participation in Project Steering Committees. Regular, informal communication via e-mail phone and in the future video-conferencing will also be fundamental to the Project's long-term success.

The Project is planning to prepare and submit articles to reputable journals this financial year outlining advances in natural hazard risk assessment models and associated results in Australia. These publications are one of the key mechanisms for testing and ensuring the quality and credibility of the Project and GA.

A strong and trusted relationship with our stakeholders underpins the success of this project. This continues to be achieved by ensuring that we understand the constraints of the input data (often supplied by the stakeholder) and the sensitivities associated with our model outputs. Consultation with our stakeholders will occur before dissemination of outputs resulting from collaborative arrangements.

Scientific conferences have been targeted for key focus areas such as

- AOGS 09 (international conference for application of geosciences in the region)
- IAG 09 (international geomorphology conference relevant to palaeotsunami and landslide activities)

9. Risk Identification and Management Strategies

The Project's predominant risk is its ability to attract and retain key skill sets, in particular IM and software engineering skills, as well as those identified in succession planning.

The outputs are also predicated on the success of the Project in effectively engaging with a range of stakeholders and delivering against their needs within the necessary timeframe. Delivery of these outputs is critically reliant on:

- retention and attraction of key skill sets;
- ability to provide appropriate level of credible modelling and analysis information to stakeholders;
- technical aspects such as access to sufficient disk space and support of IT infrastructure, such as the Linux Beowulf clusters; and
- ability to adequately maintain and develop our models to meet emerging demands and changing computing environments.

To provide credible modelling outputs, significant focus is being placed on the validation, publication and external review of models and methodologies.

The major risks associated with this Project are:

Issue	Likelihood	Impact	Risk	Management
Non-availability of appropriate staff. The Natural Hazard Impacts Project planning for 09/10 is based on current staffing levels with the addition of two graduates and a modeller to backfill for staff transferred to AIFDR.	Very Likely	Major	Significant	If identified graduates are not available to NHIP in Feb 10, then recruit suitable staff; collaborative development of work programs with other GA projects to ensure realistic, manageable workloads; dual sign off of work plans for staff shared between projects.
Uncertainty surrounding requirements to support other possible external	Very Likely	Major	Significant	Definition of level of commitment at the earliest possible time; re-negotiation of project outputs as

activities, such as GEM1, Sydney Water, SA Government, etc.				required.
Significant cuts to operational funding related to the capability development of hydrodynamic and earthquake risk models. Credibility in flood and debris flow/dam break modelling particularly affected if this funding is removed.	Low	Major	Significant	Seek funding from elsewhere within or external to GA. Strategic reduction of outputs.
Availability of appropriate staff from other projects such as Climate Change, and Engineering, Economics and Exposure projects, and National Mapping and Information Group.	Likely	Major	Significant	Collaborative development of work programs with other RIAG and NMIG projects to ensure realistic, manageable workloads and appropriate distribution of skill sets.
Ability of technical agencies in the Indonesia and the Philippines to allocate sufficient resources to ensure delivery of outputs	Possible	Major	Significant	The availability of resources has been a key consideration during work plan development.
Availability of key data sets necessary to assess risk (e.g. exposure)	Likely	Major	Significant	Key data sets will be identified at the earliest opportunity to allow for necessary data collection.

10. Workforce Planning/Succession Management

Succession planning is being addressed through the identification of key leadership potential within the Project and the provision of opportunities for these staff to take ownership and leadership of key deliverables. Additionally, participation in the GeoPLUS program will be discussed with Project staff to ensure the availability of additional PL skills within the Project**.** In addition, given GA's commitment to provide four staff to the AIFDR in Jakarta until 2014, it is necessary to ensure that staff within GA have the appropriate skill sets to ensure that GA can fulfil its obligation.

An immediate priority for the AusAID work is to formalise relationships with AusAID and work with AusAID to define the scale of future expansion and begin the recruitment/identification of appropriate staff as required.

Climate Change Project (CCP)

1. **Project Description:** This project aims to define the impact (damage caused, economic costs) and long-term risk from extreme climatic phenomena (eg, severe winds, sea level rise, storm surge, flooding and bushfire) on infrastructure, community assets and the environment. Current and future climate impact/risk are considered. The primary focus for the CCP is on Australia, although the impact/risk of climate change issues in neighbouring regions (SE Asia, South Pacific) is also considered.

   This knowledge will be applied to planning and policy through strategic partnerships with external agencies (Department of Climate Change (DCC), AusAID, Bushfire CRC, Attorney-General's Department (AGD), Tasmanian Government and the Commonwealth Environment Research Funds (CERF) project with the Antarctic Climate & Ecosystems CRC (ACECRC). The project will be 60% externally funded in 2009-10.

2. **Project Outcome:** Stakeholders across government and the private sector are able to make informed decisions (planning and policy) to manage the risk from climatic hazards and evaluate the cost/benefit of climate change adaptation policy.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection □
- Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia ☑
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

   6.1 Output 1: Wind hazard and risk

   6.1.1 Description: Provide all levels of government and the public with information on the hazard associated with severe wind in the Australian region. This research will

inform revision of Standards Australia's wind loadings committee and feed into the review of the Australian Building Codes Board (ABCB) building code regions (w.r.t. wind loading). It is also a base-level dataset for the National Coastal Vulnerability Assessment (NCVA) being undertaken by GA on behalf of the DCC.

This year's work program is focused on completing a national hazard map (current climate) that combines the output from the GA-developed cyclonic hazard and synoptic hazard models. Work on a pilot study addressing climate change hazard and risk will be completed by considering the island of Tasmania through the ACECRC "Climate Futures Tasmania" CERF project.

6.1.2 Output Delivery Date:

Q1 ☐

Q2 ☑ Journal paper on future cyclonic wind gust hazard in the Australian region.

Q3 ☐

Q4 ☑ Deliver Australian severe wind gust hazard map (for stakeholder consumption only).

6.2 Output 2: Bushfire Risk (Theme 1 of the proposed Bushfire CRC)

6.2.1 Description: On Saturday February 7th 2009, Victoria experienced Australia's worst bushfires in recorded history resulting in over 2000 homes lost and massive loss of life. GA is involved in the post-event impact assessment with regards to buildings (infrastructure) and planning (i.e. wind loading standard; building code). In addition, GA is strategically placed to play a leadership role in the new (proposed) Bushfire Environment & Society CRC in the area of Bushfire Risk.

6.2.2 Output Delivery Date:

Q1 ☑ Contribute to the Black Saturday Royal Commission datasets and interim report on the 2009 Victorian fires.

Q2 ☐

Q3 ☑ Finalise documentation for the Bushfire CRC rebid based on the interim findings of the Royal Commission into the 2009 Victorian fires

Q4 ☑ Finalise datasets and reporting with regards to the Royal Commission into the 2009 Victorian fires.

6.3 Output 3: Coastal Vulnerability Assessment

6.3.1 Description: GA is playing a leading role in the DCC's National Coastal Vulnerability Assessment (NCVA). In this year the project will locally quantify and map coastal vulnerability and risk to infrastructure, as part of phase 2 of the NCVA. Comprehensive assessments are planned for three communities identified as being sensitive to potential impacts of climate change. It will also improve fundamental coastal datasets required for such vulnerability and risk assessments.

6.3.2 Output Delivery Date:

Q1 ☐

Q2 ☑ Delivery of the National shoreline geomorphic and sensitivity maps (Smartline) on the OzCoasts website (media release).

Q3 ☑ Delivery of spatial mapping of coastal developments in some rapidly growing communities identified as being at risk.
Provide technical support to the DCC for a ministerial summit on climate change and adaption.

Q4 ☑ Delivery of infill coastal zone mapping for the Newcastle to Wollongong region, identified in an earlier geomorphic data-gap analysis.
Provide comprehensive NCVA phase 2 assessment results to the DCC.

6.4 Output 4: Offshore Hazard/Vulnerability Assessment (activities outside Australia)

6.4.1 Description: GA is participating in the $20M "Pacific Climate Change Science Program" (PCCSP), funded by DCC and AusAid, which aims to improve the future climate change projections in the Pacific region, in particular in the field of tropical cyclone hazard. This will support the National Adaptation Strategy Assistance Program (NASAP), also being funded by the DCC and AusAid.

6.4.2 Output Delivery Date:

Q1 ☑ Agree project plan with consortium partners for PCCSP.
Q2 ☐
Q3 ☐
Q4 ☑ Annual report on progress on GA's contribution to the PCCSP.

7. Information Management Considerations

The project is using core data that are key inputs to hazard and risk models of a range of climatic natural hazards. The source data is a mix of spatial and time-varying datasets. In particular, the project develops products from:

- Elevation, bathymetry and coastline data
- Coastal geomorphology
- National Exposure Information System (NEXIS) data
- Vulnerability models
- Remote sensing imagery and aerial photography
- Vegetation data
- Wind observations
- Cyclone catalogues
- Modelled wind fields
- Modelled storm surge fields
- Tide gauge data
- Atmospheric climate models (gridded and reanalysed data)
- Radar imagery of storms and cyclones

The project will add value to:

- Cyclone catalogues
- Synthetic cyclone catalogues
- Climate data (gridded or reanalysed data)
- Climate scenarios (modelled data; Australian Region)
- Wind data (observations and modelled data)
- Sea-level rise scenarios
- Coastal vulnerability assessments
- Impacts from climate and climate change

The CCP uses a range of technologies and tools which are housed on network drives, Linux workstations and the Beowulf cluster.

Technologies and tools include

- GIS and data preparation (ArcGIS, ERMapper, Intrepid, eCognition)
- Scientific Programming (Python, GNU Emacs, Exceed, Fortran, Matlab, RedHat Linux, Debian Linux, Interactive Data Language (IDL), message passing interface (MPI), Subversion revision control and integrated TRAC issue tracking)
- Visualisation, plotting and document preparation software (GMT, matplotlib, OpenSceneGraph, OGRE, Houdini, Adobe Photoshop Illustrator and LaTeX).

8. Communications Strategies, including publication of Papers

The Project's communication strategy is based around three key mechanisms, specifically:

- Presentations and regular meetings with key clients and stakeholders.
- Presentations at scientific conferences and relevant workshops.
- Publications of reports and refereed journal articles.

The Project will apply these mechanisms as appropriate, with a focus on the following three sectors:

1) Clients (government departments / agencies)

Progress reports will be developed for the activities funded by external sources, as required through technical user group meetings. The DCC projects will require significant engagement (as the DCC is a new developing department with a high turnover of staff). as well as with a range of State Government agencies around the nation.

A strong and trusted relationship with our clients underpins the success of this project. This continues to be achieved by ensuring that we understand the constraints of the input data (often supplied by the client or other stakeholder) and the sensitivities associated with our model outputs. Consultation with our clients will occur before dissemination of outputs resulting from collaborative arrangements.

2) Stakeholders

Communication with key stakeholders will be facilitated through meetings and presentations as opportunities arise. These stakeholders include: the DCC, CSIRO, the Bushfire CRC, State and Territory EMAs, other Australian Government Agencies such as ABCB, Bureau of Rural Sciences (BRS), and national co-ordination groups such the National Risk Assessment Advisory Group (NRAAG), the Queensland Tropical Cyclone Consultative Committee (QTCCC) and Griffiths University National Adaption Research Programme (NARP).

The Project aims to explore the idea of rolling out the methodology used for the Tasmanian wind hazard/risk study to other Australian states, in particular to South Australia and Queensland who have already shown interest.

3) Professional (private and academic sectors)

The Project is planning to prepare and submit approximately three articles to reputable journals this financial year outlining advances in natural hazard risk assessment models, climate change enhancement of risk and associated results. These activities will enhance the professional credibility of the Project and GA.

Publication for a number of national and international conferences are also planned. A number of scientific conferences are being targeted for key focus areas. Attendance will be subject to funding and also requirements associated with the externally funded workload. A selection of the conferences & meetings being considered are:

- 3rd Australasian Hazards Management Conference, Melbourne.
- Australian Disasters Conference – Surviving Future Risks (EMA; Canberra).
- AWES (Australasian wind engineering conference; Canberra 2010.
  GA has taken the lead role in organising the conference.
- Australian Meteorological and Oceanographic Society (AMOS) Conference, Canberra
  GA is represented on the organising committee.
- 18th World IMACS Congress and MODSIM09 International Congress on Modelling and Simulation, Cairns, Australia.
  CCP is organising a general session on natural hazards and climate change.
- 18th New South Wales Coastal Conference, Ballina.
- National Climate Change Adaption Research Facility Conference, Griffith University, Gold Coast.
- OZRI & APUC 2010 – annual national GIS conference, Gold Coast.

9. Risk Identification and Management Strategies

The Project's predominant risk is its ability to attract and retain key skill sets, in particular computational modelling, GIS, economic assessment, IM and software engineering skills as well as those identified in succession planning.

A significant proportion of the CCP is funded by external sources, with most outputs predicated on the availability of external funding. The long-term viability of the project depends on securing consistent (ongoing) funding, predominantly through partnership with the DCC. The Project will endeavour to strengthen the relationship with the growing DCC, with the aim of securing longer-term (3 to 5 year) contracts. The Project will also explore opportunities from a few other key government departments, research organisations, and the industrial sector, as opportunities arise. These organisations are likely to include: the Department of Environment, Water, Heritage and the Arts; State governments, through State Emergency Service (SES) agencies; the Bushfire CRC consortium; CSIRO; and the Insurance Australia Group.

The outputs are also predicated on the success of the Project in effectively engaging with a range of stakeholders and delivering against their needs within the necessary timeframe. The risk analysis of the issues that may affect the delivery of these outputs is shown in the table below.

Issue	Likelihood	Impact	Risk	Management
Retention and attraction of key skill sets. The Climate Change Project will need to recruit new staff to achieve contracted outcomes.	Likely	Major	Significant	Collaborative development of work programs with other RIAG & PMD projects to ensure realistic, manageable workloads. Internal recruitment and retraining of GA staff. Contracting staff, internally where

				feasible, and externally otherwise.
Ability to provide appropriate level of credible modelling and analysis information to stakeholders.	Unlikely	Major	Moderate	Liaise with technical experts outside of the Project. Have reports / results peer reviewed.
Provision and access to required datasets	Unlikely	Moderate	Low	Involve stakeholders on negotiations with data providers. Ensure contracts have escape clauses.
Technical aspects such as access to sufficient disk space and support of IT infrastructure, such as the Linux Beowulf clusters.	Unlikely	Moderate	Low	Consult with ISB and GEMIM to assure that these resources are in place.

10. Workforce Planning/Succession Management

Succession planning is being addressed through the identification of key leadership potential within the Project and the provision of opportunities for these staff to take ownership and leadership of key deliverables. The current succession management is focussed around the key activity areas with the following constraints identified;

- External funding sources lasting only one or two years which result in the inability of the Project to expand to provide complete succession cover of staff specialities and skills.
- Attraction and retention of key skill sets based on availability of external funding.

The CCP team currently consists of 13 FTE's (FY 08/09) and is required to grow to at least 16.5 FTE to deliver the contracted commitments for FY 09/10.
However, CCP staff (FY 09/10) are mainly funded through 12-month externally funded positions, with one FTE funded by a two-year externally funded contract. A further increase in staff will be required if additional external contracts are awarded (a number are currently under consideration).

Core skill sets specifically identified as concerns surround the development of stakeholder outputs from climate model datasets, computational modelling, vulnerability analysis and economic assessment as well as the development of terrain multipliers which are currently filled by non-ongoing staff.

The Project aims to develop the technical capacity and capability to be able to meet the growing demands for technical assistance to government in addressing climate change risk and adaption issues. This may be achieved through three mechanisms:

- Recruit quality graduate / junior scientists to provide a sound technical basis, which will then enable existing staff members to develop and progress through greater responsibility and management opportunities.
- Recruit/second staff with key skills and experiences from other groups within GA.
- Recruit experienced staff from external sources.

It is likely that a combination of these options will need to be applied. However, regardless of the approach adopted, the ability to grow the Project's capacity is totally dependent on securing the necessary funding.

Groundwater Group

(Group Leader: Matt Hayne)

The key role of the Groundwater Group is to extend and enhance the Australian Government's capability to address groundwater policy development and program administration. It will do this by applying geoscientific expertise to the mapping and understanding of Australia's groundwater systems and their impacts upon the management of broader environmental and natural resource assets.

The Group, through peak body funding, undertakes a number of applied research activities of national significance. Activities are principally carried out with multi-agency teams including relevant Federal, State agencies, and the private sector as required.

The Groundwater Group comprises 3 projects, each with a number of activities:

1. Groundwater Geoscience Project

- Identifying and Assessing Palaeovalley Groundwater Resources. This activity will deliver a national approach to understanding the capacity, quality, quantity and dynamics of groundwater resources in Australia's palaeovalley aquifers in arid and semi-arid environments.
- Sustainable Management of Coastal Groundwater Resources. This activity aims to demonstrate an integrated approach to understanding, monitoring and managing groundwater resources in coastal dune sand aquifers.
- Partner in the ARC/NWC Centre for Groundwater Research and Training Centre. GA's contribution will be directed towards facilitation capacity building in the technical space.

2. Aquifer Systems and Water Quality Mapping Project

- Broken Hill Managed Aquifer Recharge Phase II. This activity will provide an assessment of the suitability of aquifers in the Darling Floodplain for developing an integrated water supply strategy for Broken Hill while allowing for environmental flows to be returned to the Murray Darling system from Menindee Lakes.
- Ord Valley AEM Interpretation Project. This activity utilises AEM data to map salinity hazard and aquifer systems, and will provide map-based products to underpin irrigation development in Ord Stage 2.
- Northern Territory Coastal Plain. This pilot project partners with GA's Onshore Energy Security Program to acquire AEM and related hydrogeological data to assess seawater intrusion in coastal plain aquifers.
- Recharge-Discharge Mapping. This activity (joint with CSIRO) will develop nationally consistent methods for mapping groundwater recharge and discharge in data-poor areas.
- Irrigation Hot spots project. GA staff are panel members for this project. In particular, GA is providing on-going advice on mapping and assessment methods for mapping water losses from irrigation systems, and may be asked to tender for particular AEM mapping contracts for irrigation scheme modernisation.

3. Groundwater Advice and Information

- Groundwater Advice. This activity includes advice to Commonwealth agencies including the Department of Resources, Energy and Tourism (RET) and Department of Environment, Water, Heritage and the Arts (DEWHA), on groundwater-related implications of Departmental policy making.

- Review of National Groundwater Quality Guidelines. This activity will ascertain the relevance and need for revision of the existing National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia.

Groundwater Geoscience Project

1. **Project Description:** The project will develop and apply GA's geoscientific expertise to improving understanding of groundwater resource sustainability and management.

   The project will involve externally-funded sub-projects carried out in multi-agency teams involving DEWHA, RET, BOM, relevant State agencies, and the private sector as required. Clients are principally Australian Government agencies.

   The project also contributes to other initiatives within GA including the provision of groundwater expertise into GA's Domestic Carbon Capture and Storage – Regulatory project.

2. **Project Outcome:** Stakeholders across government and the private sector are able to make informed decisions in order to manage groundwater resources more effectively.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Identifying and Assessing Palaeovalley Groundwater Resources

6.1.1 Description: Through a series of regional studies, coordinate and develop a national framework for evaluating and managing palaeodrainage groundwater resources in Australia's arid and semi-arid zone.

6.1.2 Output Delivery Date:
Q1 ☑ Milestone 4 report (July)
Q2 □

Q3 ☑ Progress report on initial field investigations (March)
Q4 □

6.2 Output 2: Sustainable Management of Coastal Groundwater Resources.

6.2.1 Description: Using the Macleay Coastal Sands on the New South Wales north coast as a case study, demonstrate an integrated approach to understanding, monitoring and managing groundwater resources in coastal dune sand aquifers, including assessing seawater intrusion, groundwater dependent ecosystems (GDEs) and acid sulfate soils.

6.2.2 Output Delivery Date:
Q1 □
Q2 ☑ Mid project report (December)
Q3 □
Q4 ☑ Report on GDE monitoring (June)

6.3 Output 3: Groundwater Research and Training

6.3.1 Description: GA is a partner in the ARC/NWC Co-funded Centre for Groundwater Research and Training (CGRT). The Centre, led by Flinders University and involving a consortium of 20 organisations, aims to enhance the knowledge and understanding of our national groundwater resources, through targeted research and training programs. A particular focus for GA participation is activities within the Innovative Characterisation of Aquifers and Aquitards Program within the Centre, as this aligns with GA's interest and capacity in developing geological understandings of groundwater systems. This includes advances in 3-D geological modelling, geophysical and remote sensing approaches and evaluation of hydraulic properties. Participation in the CGRT will provide the opportunity to link with groundwater researchers across Australia and the embedding of postgraduate students within GA projects.

6.3.2 Output Delivery Date:
Q1 □
Q2 ☑ Document scope of GA participation
Q3 □
Q4 □

7. Information Management Considerations

Output 1: Identifying and Assessing Palaeovalley Groundwater Resources
This output will integrate and synthesise existing data from the water resources and exploration sectors. Much of this information already exists in disparate forms, and will be augmented as appropriate with strategic field investigations such as geophysics and drilling programs in identified priority areas. The output will produce summary reports, maps and databases.

Output 2: Sustainable Management of Coastal Groundwater Resources.
This output will extend existing information for the Macleay Sands study area by drilling, hydrological monitoring and sampling programs. Time-series remote sensing will be trialled as a method of monitoring catchment conditions. Project partners will develop a groundwater flow and solute transport numerical model.

8. Communications Strategies, including publication of Papers

Output 1: Identifying and Assessing Palaeovalley Groundwater Resources
This output involves a multi-jurisdictional partnership and is funded by the National Water Commission (NWC). It requires extensive communication and consultation activities and will be supported by a Project Steering Committee, Technical Committee and consultative committees as relevant. In this phase of the project, formal publications will consist of readily accessible brochures to introduce the project to non-specialists, and a synthesis of existing understanding of palaeodrainage groundwater resources and relevant conceptual models.

***Output 2*:** Sustainable Management of Coastal Groundwater Resources.
This output is a multi-partner project being funded by the National Water Commission (NWC). A Steering Committee has been established and a project brochure developed and made available to stakeholders.

9. Risk Identification and Management Strategies

Funding for this Project is based entirely on external revenue, and hence the most immediate and pressing concerns for the Project relate to recruitment and staff retention. Deliverables and timeframes are paramount to the success of the Project and its ability to meet these very much relies on workforce planning issues and a commitment from senior management to providing a flexible recruitment strategy. Other key management strategies include ensuring that team members have sufficient challenges to ensure rewarding career progression; nurturing positive team dynamics through team building and social activities; ensuring a diversity of experienced and junior staff across the project team so that skills can be grown in-house. A further risk to the project lies in the availability of geophysical and hydrogeological contractors to undertake field investigations. This will be minimised through teaming with the OEMD program to ensure synergies, and partnering with State agencies that can provide field support and personnel to undertake field work.

10. Workforce Planning/Succession Management

The relative small size of the Project makes it vulnerable to staff mobility; however, the team is built with the objective of being able to manage succession in the longer term. This includes ensuring diversity of skills and experience levels.

Aquifer Systems and Water Quality Mapping

1. **Project Description:** The project will develop and apply geoscience systems approaches to the mapping and characterisation of Australia's groundwater resources, and will include the 3D mapping of aquifer systems, the assessment of aquifers for managed aquifer recharge, assessment of the brackish groundwater resource, as well as mapping and assessing salinity hazards and broader environmental threats within the context of the broader climate change debate. The project will also provide geoscientific support for the Commonwealth's groundwater and natural resource management policy development and program administration, and also play a lead role in knowledge transfer activities.

   The project will involve a number of externally-funded sub-projects carried out independently, and in multi-agency teams including CSIRO's Water for a Healthy Country (WfHC) Flagship Program, relevant State agencies, and the private sector as required. Clients are principally the Federal Government (eg DEWHA, NWC).

2. **Project Outcome:** An improved geoscientific basis for groundwater resource assessment, and integrated groundwater management solutions for communities and the irrigation sector, and to

underpin salinity and broader natural resource management at the Commonwealth and cross-jurisdictional level.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

11. 6. Project Outputs:

6.1 Output 1: Broken Hill Managed Aquifer Recharge Phase II

6.1.1 Description: This project will provide an assessment of the suitability of aquifers in the Darling Floodplain for developing an integrated water supply strategy for Broken Hill while allowing for environmental flows to be returned to the Murray Darling system from Menindee Lakes. Products will include GIS-based maps and reports.

6.1.2 Output Delivery Date:
Q1-Q2 ☑ Steering committee meetings
Q3-Q4 ☑ Progress report to DEWHA

6.2 Output 2: Ord Valley AEM Interpretation Project

6.2.1 Description: This project utilises AEM data to map salinity hazard and aquifer systems, and will provide map-based products to underpin irrigation development in Ord Stage 2. Products will include GIS-based maps and reports.

6.2.2 Output Delivery Date:
Q1 □
Q2 ☑ Provision of products
Q3 □
Q4 □

6.3 Output 3: Northern Territory Coastal Plain

6.3.1 Description: Northern Territory Coastal Plain: mapping seawater intrusion in coastal plain aquifers using AEM data. This pilot project partners with GA's Onshore Energy Security Program to acquire AEM and related hydrogeological data to assess seawater intrusion in coastal plain aquifers. Products will include GIS-based maps and reports.

6.3.2 Output Delivery Date:

Q1 □
Q2 □
Q3 ☑ Steering committee meeting
Q4 ☑ Report to NWC

6.4 Output 4: Recharge-discharge mapping

6.4.1 Description: The project "A consistent approach to groundwater recharge and discharge determination in data-poor areas" is undertaken jointly with CSIRO. It will develop nationally consistent methods for mapping groundwater recharge and discharge in data-poor areas. Products will include GIS-based maps and reports.

6.4.2 Output Delivery Date:

Q1 □
Q2 □
Q3 ☑ Report to NWC
Q4 □

6.5 Output 5: Irrigation hot spots

6.5.1 Description: GA staff are panel members for this project To date, GA's main role has been to provide on-going advice on mapping and assessment methods for mapping water losses from irrigation systems, although this role may evolve to project level activities in 2009-2010.

6.5.2 Output Delivery Date:

Q1-Q4 ☑ Provision of information on a needs basis

7. Information Management Considerations

(i) The project will entail acquisition of new airborne geophysics, analysis of multi-spectral satellite remote sensing data, field mapping, and borehole and ground geophysics, as well as acquisition of new hydrogeological data to complement existing datasets.

(ii) The project will also involve the integration of these datasets to produce maps, GIS products, models and reports.

(iii) The project team contains personnel with considerable expertise in the management of these datasets and outputs, and will continue to build upon this strength through further development of personnel.

(iv) The need for enhanced data storage requirements has been identified in Capital Bids.

(v) The Broken Hill Managed Aquifer Recharge, Ord Valley AEM and NT Coastal Plain outputs will involve collating, integrating and reconciling available data and mapping, and will also entail the acquisition of substantial new datasets and the production of new maps and GIS datasets. These outputs will also produce relational databases.

8. Communications Strategies, including publication of Papers

Output 1*: *Broken Hill Managed Aquifer Recharge Phase II

This project is managed by the Department of Environment, Heritage and the Arts (DEWHA). The project commenced in 2009, and in 2009-10 the project will involve the acquisition of AEM and LiDAR surveys as well as drilling and ground geophysics and laboratory analysis. Acquistion of these datasets will involve close liaison with relevant Federal and State agencies and local community groups including indigenous communities, and a communication strategy for the project will be developed and implemented.

The project will involve the integration and interpretation of complex geoscientific datasets and will include geophysical data inversion and modelling, interpretation, and product development. Formal publications will consist of scientific and technical reports, map and GIS-based products, and summary material for non-specialists. Scientific papers will be produced after completion of final reporting obligations.

Output 2*: *Ord Valley AEM Interpretation Project

This project is managed by the Ord Irrigation Cooperative (OIC), and is funded by the National Action Plan for Salinity and Water Quality (NAPSWQ). The project requires extensive communication and consultation activities between collaborating parties (GA, CSIRO WfHC, WA Dept. of Water, Brolga Environments, OIC, Rangelands NRM Group), as well as with airborne geophysics and drilling contractors and private irrigators. The project is overseen by the Ord Valley AEM Mapping Project Steering Committee.

The project commenced in 2007, and in 2009-10 the project will finalise the integration and interpretation of AEM, LiDAR, borehole and ground geophysical data, as well as regolith and hydrogeological data. The project requires geophysical data inversion and modelling, interpretation, and product development. Formal publications will consist of scientific and technical reports, map and GIS-based products, and summary material for non-specialists. Scientific papers will be produced after completion of final reporting obligations. Knowledge transfer workshops for key stakeholder groups will be held in Kununurra and with key State and Federal agencies in Canberra and Perth.

Output 3*: *Northern Territory Coastal Plain

The "Northern Territory Coastal Plain: mapping seawater intrusion in coastal plain aquifers using AEM data" project is funded by the National Water Commission (NWC), and is jointly undertaken with the groundwater group in the Northern Territory Resources, Environment and Sports Department (NRETAS), in partnership with GA's Onshore Energy Security Program. The project has acquired AEM, borehole geophysical and related hydrogeological data to assess seawater intrusion in coastal plain aquifers. Products will include GIS-based maps and reports, and project activities will also include knowledge transfer workshops and exchange visits with NRETAS staff.

Output 4*: *Recharge-discharge mapping

The project "A consistent approach to groundwater recharge and discharge determination in data-poor areas" is funded by NWC, and is carried out in partnership with the CSIRO. The project is managed through a Steering Committee comprising Federal and State representatives, and is being carried out in two phases (a feasibility study followed by case studies). This project involves extensive consultation with a wide range of stakeholders, and aims to develop nationally consistent methods for mapping groundwater recharge and discharge in data-poor areas. Products will include guidelines and a report outlining the mapping methodologies, knowledge transfer workshops and GIS-based maps and reports of the case studies.

Output 5*: *Irrigation hot spots
GA staff are members of the panel for this project. To date, GA's main role has been to provide on-going advice on mapping and assessment methods for mapping water losses from irrigation systems, although this role may evolve to project level activities in 2009-2010.

9. Risk Identification and Management Strategies
The principal risks to the project are: (1) timeliness of the delivery of the airborne geophysical data, (2) the availability of drilling rigs and contractors, (3) delays in new data acquisition due to adverse weather conditions, (4) availability, recruitment and retention of key staff within GA, and (5) delivery of key project components by collaborating groups, including CSIRO, State agencies and private sector contributors.

Central to success in minimising these risks is the development of appropriately worded and detailed contracts and work plans that provide an appropriate framework for effective project management and focussed delivery against contractual obligations. Also central to this is development of an effective communication strategy that maximises the cooperation between parties and ensures proper coordination of activities, provides early warning of potential problems, and provides clarity in contractual responsibilities.

The principal in-house threat to delivery is acquisition and retention of key personnel, and this is being addressed though the advertisement of contract positions as external funding is identified. The lack of internal geophysics staff resources remains a continued high risk to success of the projects, with this issue necessitating partnerships with other agencies, notably CSIRO. Other partnerships are being forged with university groups (eg, Aarhus University) to overcome the skills gaps.

10. Workforce Planning/Succession Management
The project team (at the time of writing) comprises a core of 6 on-going staff and 1 non on-going position. In addition, sub-projects will involve staff from OEMD and from other projects in the Groundwater Group. It is also planned to expand the expertise and experience profile as new external funding is identified. A high priority is the acquisition of AEM geophysicists. The relatively small size of the project team, and the high demand for the expertise in the team both within other Divisions in GA and external in other agencies and in the private sector, will require careful management of staff resources. The age profile of the team suggests the increasing need for succession planning in this area, with the need for a longer term mentoring of junior staff to ensure the range of expertise in the team is maintained within the organisation.

Groundwater Advice and Information

1. **Project Description:** The project provides the Australian Government with expert geoscientific information and recommendations in support of groundwater policy development and program administration regarding groundwater resources and environmental and mining impacts.

   The project provides services directly to the Department of Resources, Energy and Tourism and is part funded by the Department of Environment, Water, Heritage and the Arts.

2. **Project Outcome:** Improved decision making across government agencies regarding Australia's groundwater resources and industry and environmental impacts.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Groundwater Advice

6.1.1 Description: Provision of technical and strategic advice as requested by DEWHA, RET and other Commonwealth agencies relating to groundwater issues**.**

6.1.2 Output Delivery Date:
Q1-Q4 ☑ Provision of technical and strategic advice

6.2 Output 2: Review of National Groundwater Quality Guidelines

6.2.1 Description: This activity will ascertain the relevance and need for revision of the existing National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia.

6.2.2 Output Delivery Date:
Q1 ☑ Provision of review reports and recommendations
Q2 ☑ Provision of final report and scoping document
Q3 □
Q4 □

7. Information Management Considerations

The Groundwater Advice output will integrate and synthesise a range of existing information and data from the water resources and exploration sectors, as relevant to specific requests from client agencies. Information management is not likely to be a significant consideration in the delivery of this output.

8. Communications Strategies, including publication of Papers

***Output 1*:** Groundwater advice
The communications products of this output will be dependent on the nature of requests from client agencies, but are likely to include formal comments on proposals from mining and other industry proponents, and on strategic planning material provided by DEWHA and RET. Any communications outputs are likely to be in the form of GA Minutes or Professional Opinions.

Output 2: Review of National Groundwater Quality Guidelines
The communications products of this output will consist of a literature review report, regulatory review report and end user analysis report, and a final report presenting recommendations and scoping of further work required.

9. Risk Identification and Management Strategies
Deliverables and responsive timeframes are critical to the success of this project; and hence two team members are available to meet a part time and intermittent workload on a highly responsive basis. Whilst maintaining this ability to be responsive, there is also the need to ensure that team members have sufficient challenges to ensure rewarding career progression. Efforts are hence also being focussed towards seeking funding for additional strategically relevant projects that enable engagement on longer term issues and a greater range of work experiences.

10. Workforce Planning/Succession Management
The project team will comprise a core of 2 on-going senior staff specialists. The project team will expand its expertise and experience profile as new external funding is identified. The age profile of the team suggests the increasing need for succession planning in this area, with the need for a longer term mentoring of junior staff to ensure the range of expertise in the team is maintained within the organisation.

Onshore Energy & Minerals Division

2009–10 Work Plan

Overview

OEMD is a multi-disciplinary division dedicated to providing pre-competitive geoscience information in support of and to facilitate onshore energy and mineral exploration in Australia. This is achieved through integrated programs of data gathering and assessment, conducted at national and regional scale, and commonly in collaboration with the states and Northern Territory geoscience agencies. Use is made of the latest geophysical imaging, research and mapping techniques to enhance the chances of mineral discovery and reduce the risks involved with exploration. The division also operates a state-of-the-art Sensitive High Resolution Ion Microprobe, which provides geochronology data to assist with mineral exploration and studies into the geological evolution of Australia.

When required OEMD undertakes activities of national strategic importance such as the five-year Onshore Energy Security Programme (OESP). Many of the division's current activities are captured under this program, which is scheduled to cease in mid-2011.

OEMD coordinates domestic and international mineral exploration promotion events in partnership with state and Northern Territory counterpart geological surveys and departments. It also advises the Australian Government on mineral resources, mining and land use. This work is integral to decisions in regard to multiple and sequential land use, and to an informed understanding of the

nation's known mineral endowment, the sustainable development of mineral resources, and levels of exploration activity.

Priorities for 2009-10 are

- ongoing implementation of the OESP, including acquisition and interpretation of geophysical datasets, national projects, regional geology investigations and integrated commodity studies;
- release of a new edition of the Magnetic Anomaly Map of Australia, a product of the OESP;
- release of a new edition of the Map of Australia Operating Mines and the first Map of Australian Gold Mineralising Events;
- provision of technical advice to the Government on minerals-related issues, particularly in relation to petroleum, uranium, thorium, geothermal energy, and including assessments of onshore energy resources as input to the Australian Energy Resources Assessment, a companion report to the Energy White Paper; and
- continuation of the international program of coordinated technical promotion of Australia's mineral prospectivity in partnership with the states and Northern Territory (Team Australia)

This plan captures and sets out the activities in the division, which includes all outputs delivered by projects.

OEMD INFORMATION SERVICES
(Bruce Kilgour)

1. Project Description:

OEMD Information Services develops client focussed information management solutions that assist OEMD projects in the development, management and delivery of divisional workplan outputs. It manages the following capabilities:

- ICT project management
- web publishing
- business analysis
- database and application development

2. Project Outcomes:

- To improve the decision making ability of internal and external clients, based on timely information delivered via quality, client-focussed information systems and web pages.
- To enable OEMD custodians to sustainably manage Geoscience Australia's information assets and supporting collection, management, delivery and usage systems.
- To ensure strategic and tactical alignment of OEMD business with agency ICT strategy and service provision.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection
- Safer communities and infrastructure

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries
- Safeguarding Australia
- This project does not contribute to the NRPs

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: OEMD Information Management operational support

6.1.1 Description:

Support OEMD projects to effectively generate and deliver their 2009-10 Workplan outputs as indicated in Appendix A (Services 1-4).

6.1.2 Output Delivery Date

Q1 ☑
Q2 ☑

Q3 ☑
Q4 ☑

6.2 Output 2: OEMD Information Management priority projects

6.2.1 Description:

Develop and deliver priority IM projects in partnership with OEMD business areas as indicated in Appendix A (Service 5).

6.2.2 Output Delivery Date

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

As a service provider, OEMD Information Services does not create IM deliverables of its own. OEMD Information Services works in partnership with divisional business areas under the direction of OEMD management to deliver the operational and strategic goals of Geoscience Australia. The IM services and support to the division to be provided by this project are detailed in Appendix A.

8. Communications Strategies, including publication of Papers

OEMD Information Services has a Communications Strategy which set out how it communicates its role with internal clients. In addition, overviews of priority projects and links to their key documents are published internally via the OEMD IM intranet pages.

9. Risk Identification and Management Strategies

The main risk factor to the delivery of the OEMD IM projects and services is recruiting and retaining of skilled ICT staff. This is managed through on-going comprehensive workforce planning. Where skilled staff cannot be recruited in an ongoing or non-ongoing capacity, contractor support may be considered.

The OEMD IM projects and services are managed such that work is organised into relatively short projects. A team within OEMD Information Services supports output delivery.

10. Workforce Planning / Succession Management

OEMD Information Services has a comprehensive workforce plan in place for the ongoing development and training of staff. This is supported by a prioritised training, conference and travel budget. A number of OEMD Information Services staff completed GA's GeoEssentials and GeoPlus programmes to address effective succession management.

All staff have an agreed development plan consistent with their career aspirations and the needs of the Division.

Appendix A - OEMD Information Management Support 2009-10

The following tables show the information management support to be provided to OEMD projects for 2009-10.

Colour code shows expected demand: red (high demand), yellow (moderate) and green (low).

IM Service	Geophysics			Energy Mineral Systems					
	Continental Geophysics	**Seismic Acquisition and Processing**	**AEM Acquisition and Interpretation**	**Onshore Energy Geodynamic Framework**	**Onshore Petroleum**	**Geothermal Energy**	**Geochemistry Laboratory**	**Uranium**	**NGSA**
1. Maintenance of OEMD applications, databases and websites	Airborne Geophysical Surveys (ARGUS), Gravity (including AFGN) databases and entry apps ARGUS search, AFGN (via National GIS) (6.3), and GADDS web applications (6.1) Liase with ISB to ensure project has continued access to Beowulf & CONDOR HPC & key scientific software.	SAP web pages Seismic survey database (SEISMIC) and data entry apps (6.3)	AEM web pages	Field Geology Sites and Samples database and entry apps TSEP web application and Wizard entry web forms	n/a	Geothermal web pages (6.4)	Geochemical Analyses database (OZCHEM), data entry applications. Geochemistry web pages.	Uranium web pages	NGSA web pages (6.1, 6.2, 6.3)
2. Web publishing and product releases	5th Edition Magnetics dataset release (6.1)	Update seismic survey web delivery page and OESP survey dataset/report web releases (6.3)	Paterson AEM report (6.1) Pine CK AEM data (6.2) Pine Ck Report (6.3)	Interp Seismic datasets release (6.1) 3D Maps (6.2), TSE Report (6.3) Data/publications (6.5)	Interp reflection Seismic datasets release (6.1)	Geothermal web pages (6.4) Geothermal reports, maps, datasets (6.2)	6 monthly interim Geochemistry dataset releases	Reports (6.1, 6.4) 3D/2D Maps & Datasets (6.2, 6.3)	NGSA web pages (6.1, 6.2, 6.3)
3. Data Custodian Support	Storing and cataloguing Geophysical datasets (6.1)	Storing and cataloguing Seismic survey datasets for web release (6.3)	Storing and cataloguing AEM datasets (6.2)	Bulk loading of field site and sample data for OEMD field parties.	n/a	Storing and cataloguing of Geothermal datasets (6.2)	Field geology site/sample and Geochem data cleansing/extraction Assisting with GSWA data entry (6.1)	Storing and cataloguing datasets (6.2,6.3) Bulk loading of field site and sample data for field parties	Bulk loading of field site and sample data
4. IM advice									
5. New IM Solutions (Projects)	Redevelop AFGN database, entry apps and web delivery (6.3) GADDS web delivery improvements (6.1) Rock properties information system plan (6.6)	Finish & launch new seismic survey web delivery page with 6 OESP surveys (data & reports) (6.3)	n/a	n/a	n/a	Geothermal information system plan (6.3)	RAGING SPOT project upgrading data mgt & delivery of Geochemistry data (6.3)	n/a	n/a
Additional comments				*Field Geology sites/surveys database requires redevelopment.*					

Table 1 – 2009-10 OEMD IM Support for the Geophysics & Energy Mineral Systems Groups

High demand | Moderate demand | Low demand

IM Service	Mineral Promotion & Geochronology		National Projects, Resources and Advice			OEMD Management
	Mineral Exploration and Promotion	Geochronology Laboratory	34th International Geology Congress	Mineral Resources	Nat Maps, Energy Advice	
1. Maintenance of OEMD applications, databases and websites	Mineral promotion web pages	Geochronology database OZCHRON, data entry applications and recent reports web application. Geochronology web pages	n/a	Mineral Deposits & Occurrences databases and entry apps (OZMIN, MINLOC) (6.1), Australian Mines Atlas hosted website www.australianminesatlas.gov.au & application (6.3), Chief Inspector of Mines hosted website www.ga.gov.au/ccim (6.4).	Provinces, Events, Strat Units (6.4) and Regolith Units databases and entry apps, Surficial Geology Geodatabase. ProvExplorer & Stratnames search web applications (6.6)	OEMD web pages on the GA website & hosted website: www.pmdcrc.com.au Corporate ORACLE version upgrade requires updates & testing of OEMD's 183 data entry forms and reports. Action OEMD SMT application audit decisions.
2. Web publishing and product releases	Minerals monthly email alerts Mineral Promotion maps & reports (6.3)	6 monthly interim SHRIMP dataset releases (6.2)	n/a	AIMR annual release (6.1)	Surficial Geology of Australia dataset releases (6.4i)	OEMD web pages on the GA website, particularly OESP related. Hosted website www.pmdcrc.com.au
3. Data Custodian Support	n/a	Field geology site/sample and SHRIMP data cleansing/extraction (6.2)	n/a	AIMR related bulk updates to OZMIN	Bulk updating of Provinces, Events & Strat units data (6.4, 6.5)	Management of confidential data and expiry with OEMD custodians
4. IM advice			n/a			ICT Taskforce, CTAG, NPPs, ICT Review (Gershon), GGIC, OEMD Workplans, Capital bids, website stats
5. New IM Solutions (Projects)	n/a	RAGING SPOT project upgrading data mgt & delivery of Geochronology data (6.4)	n/a	n/a	Finish improvements to Stratigraphic Units database & web delivery (6.6)	Website redevelopment & OEMD web migration IM project reporting & mid year-review
Additional comments				*Indian Ocean Territories hosted websites (2), Renewable/Non-renewable energy hosted websites (3) and supporting applications/databases maintained by MR staff*		*Pmdcrc website to be supported until 2013*

Table 2 – 2009-10 OEMD IM Support for the Mineral Promotion & Geochronology and National Projects, Resources and Advice Groups

High demand | Moderate demand | Low demand

OEMD IM Services and Descriptions

OEMD Information Services aim to enable OEMD projects and custodians to:

- Efficiently manage and deliver to clients annual Workplan outputs
- Sustainably steward the national data collections for which the division is custodian

to a 'best practice' standard ensuring reliability, quality and sustainability of solutions provided.

OEMD IS liaises and collaborates with Corporate Branch, ISB and the other business divisions to deliver these services effectively and efficiently.

IM Services for OEMD

1. ***Maintenance of OEMD applications, databases and websites***
2. ***Web publishing and product releases***
3. ***Data Custodian support***
4. ***Provision of Information Management Advice***
5. ***Development and delivery of new IM solutions***

Service descriptions

1. ***Maintenance of OEMD applications, databases and websites***

   Respond to requests to fix faults and make minor enhancements to OEMD databases, applications and websites, based on OEMD SMT priority. This includes developing, scheduling and coordinating with ISB and Corporate Communications for website and application upgrades. Requests for major enhancements are serviced as new IM projects.

   Respond to scheduled upgrades of corporate ICT infrastructure impacting on OEMD database, application and websites.

2. ***Web publishing and product releases***

   This service ranges from minor to major releases such as Ministerial launches and comprises two aspects:

   2.1 Web publishing: Respond to requests to create new, modify or retire GA web pages. This includes editorial and presentation advice for web content, technical mark up of content, coordinating approvals, and organising public release on the GA website. A key example is coordinating for the Minerals Promotion area the Minerals monthly email alerts.

   2.2 Web product releases: Respond to requests to release products, packaged with appropriate IP, licencing and discoverability/access via the GA website. Product formats include multimedia, maps, publications and datasets etc.

3. ***Data Custodian support***

   Respond to requests to improve dataset quality, integrity and access, including provision of appropriate storage space for project work. The service comprises three aspects:

   3.1 Access and entry of data: Respond to requests to provide secure access, enter, cleanse, update or extract data stored in GA data repositories.

   3.2 Allocation of data storage: Coordinating OEMD project storage allocation and provisioning for OEMD projects.

   3.3 Release of datasets : Respond to requests to store new source and output datasets corporately, including metadata cataloguing for discovery and access (done in conjunction with Service No. 2 for web releases)

4. ***Provision of Information Management Advice***

   Advice on how best to release information and results via the GA website.

   Advice on how best to manage data in GA for its entire life-cycle.

   Advice to assist developing sound business solutions utilising ICT cost effectively. This includes assisting projects/custodians to develop initial ideas for IM improvements and solutions into project briefs (business case, scope, estimated costs, benefits and risks).

   Advice to business on, coordination, alignment and quality control of ICT service delivery into Divisions.

5. ***Development and delivery of new IM solutions***

   Partnering with OEMD custodians to develop and deliver IM solutions that improve Geoscience Australia's capability to store, manage, deliver and use datasets the agency stewards. (IM projects are approved and resourced by OEMD SMT during the budget cycle and can be revised during the mid year budget review process).

   This service includes:

   a. Planning and managing the project
   b. Eliciting client requirements
   c. Utilising requirements to design and iteratively develop sustainable production-level client focussed solutions
   d. Migrating or populating data into new solutions (Service No. 3.1)
   e. Testing and deploying solutions internally or externally via the web. This can be done in conjunction with a website release (Service No. 2)
   f. Assist custodians to maintain applications, databases, data and web pages (Service No. 1 and 3)

MINERAL PROMOTION & GEOCHRONOLOGY LABORATORY
(Lynton Jaques)

Mineral Exploration Promotion Project
(PL Mike Huleatt)

1. Project Description

The project aims to encourage increased investment in mineral exploration and discovery of mineral resources in Australia by increasing the awareness of mineral exploration opportunities and by increasing the awareness of the availability of pre-competitive geoscience. Project activities include technical presentations and exhibitions at selected major national and international mineral exploration and mining technical conferences, and targeted release of scientific reports, maps and datasets that highlight Australia's mineral resources and potential. The international promotion and much of that in Australia is conducted in partnership with the State and Northern Territory geological surveys and coordinated through the Chief Government Geologist's Conference (CGGC) under the auspices of the Ministerial Conference of Mineral and Petroleum Resources (MCMPR). The technical information and products are disseminated to Australian and international mining and exploration companies through the Internet, technical journals and magazines, as digital products, and/or as hard copy as appropriate.

2. Project Outcome

Increased global awareness of mineral exploration opportunities in Australia.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: International Mineral Exploration Promotion Events

6.1.1 Description: Coordinated technical promotions and mineral exploration investment seminars by Geoscience Australia in partnership with the State and NT geological surveys and mines departments.

6.1.2 Output Delivery Date:
Q1 ☑ Australian Governments Mineral Exploration Promotion Plan for 2009-10

Q2 ☑ China Mining 2009 Tianjin, China, Fourth Australian Mineral Exploration Investment Seminar, Beijing, October 2009; Second Australian Mineral Exploration Investment Seminar in India, October 2009, First Australian Mineral Exploration Investment Seminar in Seoul, Korea, October 2009.

Q3 ☑ Sixth Australian Mineral Exploration Investment Seminar, Tokyo, February, 2010; Prospectors and Developers Association of Canada International Convention, Trade Show and Investors Exchange in Toronto, Canada March 2010

Q4 ☑ Report to CGGC on outcomes of 2009-10 Australian Governments' mineral exploration promotional program.

6.2 Output 2: Domestic Mineral Exploration Promotion Events

6.2.1 Description: Technical presentations; coordinated technical promotions by Geoscience Australia in partnership with participating State and NT geological surveys.

6.2.2 Output Delivery Date:

Q1 ☑ Diggers & Dealers Mining Forum August 2009, Kalgoorlie.

Q2 ☑ Mining 2009 Resources Convention, October 2009, Brisbane

Q3 ☐

Q4 ☑ AMEC National Mining Congress May 2010, Perth

6.3 Output 3: Mineral exploration promotional outputs

6.3.1 Description: Compile and revise maps of Australian mineral deposits and mineral resources; technical reports, briefings, reviews, presentations, research papers, and syntheses of Australian mineral resources, mineral resource potential, and exploration trends and outcomes. Compile and distribute Minerals Alert email newsletter.

6.3.2 Output Delivery Date:

Q1 ☑ Australian coal, and phosphate resource maps (1:10 million); Minerals Alert

Q2 ☑ Australian Au, Fe, Mn and U resource maps (1:10 million); Minerals Alert; Report on Precambrian mafic ultramafic events in Australia: Event chronology, geological setting and mineral potential

Q3 ☑ Review of mineral exploration in Australia in 2009; Australian Cu, Ni, Zn-Pb, resource maps (1:10 million); Minerals Alert

Q4 ☑ Australian Operating Mines (1:10 million) Australian Mineral Deposits map (1:5 million); Minerals Alert

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Output 1: Trade show promotional displays, presentations, reports

Output 2: Trade show promotional displays, presentations, reports

Output 3: Online and hardcopy maps, reviews and papers.

9. Risk Identification and Management Strategies

- Potential reduced availability of graphics and visualisation staff resources.
- Require fully functional Ozmin database – failure of the database would require time consuming manual data analysis/compilation.

- Uncertain availability of GIS Promotions Officer (contractor filling in for officer on maternity leave) – lack of GIS support will mean that map outputs and graphics/visualisation material for poster displays cannot be produced.

10. Workforce Planning/Succession Management

Transition arrangements are now in place for planned effective, gradual transition of responsibility for promotional events over the next two years. Evaluation of arrangements to be undertaken by Group Leader and Chief OEMD.

All staff to have an agreed development plan consistent with their career aspirations and the Division's needs.

Geochronology Laboratory
(PL Keith Sircombe)

1. Project Description

Determine the ages of rocks and geological events using GA's U-Pb Sensitive High Resolution Ion Microprobe (SHRIMP) and Ar-Ar analytical techniques in support of GA and State and Northern Territory geoscience programs under the National Geoscience Agreement.

2. Project Outcome

Enhanced mineral exploration strategies through a better understanding of the ages of geological events, leading to the provision of an improved chronologic framework of Australia to assist resource exploration.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries
- Safeguarding Australia
- This project does not contribute to the NRPs

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: Processed mineral samples

6.1.1 Description: Process up to 200 rock samples per annum to separate mineral grains, and prepare and document samples so that they are suitable for geochronology using SHRIMP and Ar-Ar techniques.

6.1.2 Output Delivery Date: Ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: SHRIMP U-Pb age determinations

6.2.1 Description: Maintain an in-house facility housing the GA SHRIMP-II ion probe and scanning electron microscope for the production of state-of-the-art

U-Pb isotopic ages of minerals aiming for up to 200 production days per annum. Manage joint use of the facility on the behalf of GA and licensee, Australian Scientific Instruments. Manage and develop relations with State and Territory NGA partners. Provide an annual report on the operational aspects of the SHRIMP laboratory.

6.2.2 Output Delivery Date: ongoing
Q1 ☐
Q2 ☐
Q3 ☑ Annual Report
Q4 ☐

6.3 Output 3: New geochronological procedures, applications and standards

6.3.1 Description: Develop and report on new and improved analytical procedures, applications and standards that enhance the acquisition, quality and information management of the geochronological data. Annual summary report on laboratory information management systems development.

6.3.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☑
Q4 ☑

6.4 Output 4: New GA geochronology data management systems

6.4.1 Description: Provide expert and user advice to IM development specialists regarding the development of new systems for managing geochronological data from SHRIMP Laboratory (part of the RAGING SPOT project). The focus is on developing tools to improve the delivery of geochronology data to clients. Provide leadership and advice to national-scale data infrastructure projects via groups such at the Geochronology Working Group.

6.4.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Results from the laboratory will be published in GA and State/NT reports and scientific papers, and included in scientific presentations to industry clients and other stakeholders throughout the year, as determined by project

workplans.

9. Risk Identification and Management Strategies

Excessive SHRIMP instrument downtime due to limited or absent technical capability leading to loss of productivity. Manage through ongoing training of staff, assistance from Australian Scientific Instruments and work schedule prioritization.

10. Workforce Planning/Succession Management

All staff to have an agreed development plan consistent with their career aspirations and Division needs. Need to monitor workloads and delegate leadership/management tasks to ensure continuing development of corporate knowledge within team.

NATIONAL PROJECTS, RESOURCES & ADVICE GROUP
(Ian Lambert)

National Mineral Resources Project
(PL Aden McKay)

1. Project Description

This project encompasses assessment of national mineral and solid fuel resources, development of the on-line Australian Mines Atlas and assistance in provision of authoritative scientific/technical advice in support of policies and decisions on minerals, energy and land use issues.

2. Project Outcome

Informed decision-making for mineral resource management, land use planning and environmental protection

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: National assessment of mineral resources

6.1.1 Description:

(a) Publication of annual commodity summaries for Australia's Identified Mineral Resources (AIMR) 2009

(b) Updating of Geoscience Australia's Mineral Deposits database (OZMIN), Mineral Occurrence database and publication of resource assessments for AIMR 2010 (Table 1)

6.1.2 Output Delivery Date:

Q1
Q2 ☑ (a)
Q3 □

Q4 ☑ (b)

6.2 Output 2: Australian representation at Joint OECD/NEA-IAEA Uranium Group and contribution to the publication *'Uranium 2009, Resources, Production & Demand' (Red Book)*

6.2.1 Description:
(a) Update response to OECD/NEA–IAEA *Red Book Questionnaire 2009*
(b) Review draft of 'Uranium 2009, Resources, Production & Demand'
(c) Update Australia's data on uranium deposits for the IAEA database (UDEPO)
(d) Participation in and reports for meetings of Uranium Group as Australian delegate and Vice Chair

6.2.2 Output Delivery Date:
Q1 ☑ (a)
Q2 ☑ (b, d)
Q3 □
Q4 ☑ (c, d)

6.3 Output 3: *Australian Mines Atlas (AusMA)*

6.3.1 Description: Update and maintain AusMA, which is now core to online presentation of *Australia's Identified Mineral Resources*, and is a popular site for seeking information on Australia's minerals sector with a diverse range of users from government agencies and the wider community.

6.3.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.4 Output 4: Australian Government representation on the Ministerial Council of Mineral and Petroleum Resources' Subcommittee of Chief Inspectors of Mines (SCIM)

6.4.1 Description:
(a) Represent the Commonwealth at SCIM annual meeting
(b) Finalise actions and communiqué from the meeting and update the SCIM's website

6.4.2 Output Delivery Date:
Q1 □
Q2 ☑ (a) and (b)
Q3 □
Q4 □

6.5 Output 5: Indian Ocean Territories GIS for Attorney-General's Dept.

6.5.1 Description: With funding from client agency:
(a) Integration of new data sets and reports.
(b) Delivery to clients and stakeholders of up-to-date versions of both the Christmas Island GIS and the Cocos Island GIS.
(c) Support to clients and stakeholders in using the GIS.

6.5.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑ (a), (b) & (c) are ongoing.

6.6 Output 6: Web maps for Department of Environment, Water, Heritage and the Arts (DEWHA) and Office of Renewable Energy Regulator (ORER)

6.6.1 Description: With funding from client agencies, update existing online web maps of electricity generating stations (fossil fuels and renewable) as requested by DEWHA.

6.6.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.7 Output 7: Release of uranium exploration reports from Australian Atomic Energy Commission records.

6.7.1 Description: Prepare digital versions (pdf format) of uranium exploration reports, maps and data previously submitted by exploration companies under the *Atomic Energy Act 1953* to the then Australian Atomic Energy Commission between the 1950s to early 1990s. The CD's are released through the State/Northern Territory Geological Surveys.
(a) Store completed disk compilations in GA Corporate Data Store for long-term storage and accessibility of these old uranium exploration reports.

6.7.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑ (a)

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Output 6.1: AIMR online publication, OEMD email alert, AusGeo News article, updated resources data available from OZMIN
Output 6.2: "Red Book 2009" Australian draft chapter, online IAEA database of global uranium deposits (UDEPO)
Output 6.3: Website – australianminesatlas.gov.au with Google Earth capability
Output 6.4: Meeting record, online communiqué
Output 6.5: System with user documentation (hardcopy & CD) & web sample
Output 6.6: Websites and webmaps with current data available
Output 6.7: disks with pdf version of reports available via Corporate Data Store

9. Risk Identification and Management Strategies

Risk of delay in completing some project outputs arises when a major (unplanned) advice request is received during the year.
Risk of not completing outputs on time because of reduced budget allocation

10. Workforce Planning/Succession Management

All staff to have an agreed development plan consistent with their career aspirations and Division needs.

National Advice, Maps and Data Standards Project
(PL Leesa Carson)

1. Project Description:

The project aims to:

- provide timely authoritative scientific and technical advice to the Australian Government and industry to assist the development and growth of a sustainable mineral and energy resources sector.
- build a seamless digital synthesis of Australian geology and set standards for compilation of national scale digital datasets including surface and solid geology, regolith, provinces, and the Australian stratigraphic lexicon.
- develop standards for interoperable geoscientific digital data transfer between Geoscience Australia and its clients.

2. Project Outcome

- Better knowledge of minerals and energy resource management, land use planning and environmental protection to inform decision-makers in the minerals and energy resources sector.
- Enhanced potential for the Australian community to obtain economic, social and environmental benefits through the efficient delivery of seamlessly joined, standardised, digital geological information of the continent.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met □
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1. Output 1: Advice

6.1.1 Description: Timely provision of high quality authoritative, independent scientific and technical advice on mineral and energy resources; exploration and mining, associated environment matters, land use, industry developments and technologies to the Department of Resources, Energy and Tourism, Department of Environment, Water and the Arts, Department of Prime Minister and Cabinet and other external agencies.

6.1.2 Output Delivery Date: ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Quarterly uranium reports

6.2.1 Description: Prepare quarterly reports summarising the current status of advanced uranium projects and industry developments to bring together essential information to facilitate quick and accurate responses to the Department of Resources, Energy and Tourism and the Minister.

6.2.2 Output Delivery Date: ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.3 Output 3: Energy resources assessment

6.3.1 Description: Coordinating geoscientific and geotechnical onshore energy resources inputs to the Australian Energy Resources Assessment, a companion report to the Energy White Paper

6.3.2 Output Delivery Date:

Q1 □
Q2 ☑
Q3 □
Q4 □

6.4 Output 4: National scale digital geological map datasets.

6.4.1 Description:

(i) Produce updated edition of 1:1 million scale Surface Geology of Australia datasets, incorporate new mapping and correcting identified errors.
(ii) Update the 250K geological maps website on the Geoscience Portal, by scanning and geolocating recent 250K geological maps.
(iii) Maintain WMS/WFS OneGeology web service of 1:2.5M and 1:1M scale geology data.
(iv) Ongoing collation of national digital regolith and soils datasets, testing of the new regolith geo-database, updating and moving all regolith-related lookup tables to the GA corporate data model for GA-wide application
(v) Scope and develop a pilot GIS/geodatabase of a selection of Australian continental provinces and the underlying crustal elements, to inform continent-scale tectonic appraisal of energy resources.

6.4.2 Output Delivery Date:

Q1 ☑ (scope geodatabase design for provinces, crustal elements, solid geology)

Q2 ☑ (scanned 250K maps; crustal elements/provinces geodatabase structure completed)

Q3 ☑ (updated 1:1M edition geology;)

Q4 ☑ (ongoing maintenance, solid geology, provinces; regolith geo-database; compilation of pilot GIS - crustal elements & provinces)

6.5 Output 5: Australian Stratigraphic Units Database

6.5.1 Description: Continue to populate the Australian Stratigraphic Units Database to provide an authoritative and current lexicon of Australian geological units to support geoscientific and resource analysis of the Australian continent and marine territories.

6.5.2 Output Delivery Date: ongoing

Q1 □

Q2 □

Q3 □

Q4 ☑

6.6 Output 6: Data Standards Development

6.6.1 Description: Chair the GeoSciML Model Development task group of the IUGS Interoperability Working Group. Provide expert advice to GA projects in data modelling (eg, geochemistry, geochronology, groundwater, solid geology) and update GA GIS data dictionaries to reflect standards developments.

6.6.2 Output Delivery Date: ongoing

Q1 □

Q2 □

Q3 □

Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Output 1: Briefs, input to RET briefs, reports

Output 2: Quarterly reports to RET

Output 3: Technical input to RET

Output 4-7: Project web pages, Minerals email alerts, GA What's New, AusGeo News articles.

9. Risk Identification and Management Strategies

The amount of work and time required for preparation of technical advice is difficult to quantify due to the inherent ad hoc nature of the activity. Project officers respond to requests for advice from RET and other Government agencies as issues arise, and staff from Mineral Resources project will be called on for inputs as appropriate.

Significant:

- Geological staff for work on the Australian Stratigraphic Units and Provinces Database will need to be sourced from other projects, as arranged by Senior management Team.
- Reduction in OEMD GIS staff (ie, non-ongoing contracts and resignations) may threaten outputs such as the Solid Geology geodatabase, updates to 1:1 million geology, and scanning of 1:250K maps.

10. Workforce Planning/Succession Management

All staff to have an agreed development plan consistent with their career aspirations and Division needs.

34th International Geological Congress Project (UNDER EXECUTIVE)
(PL Paul Kay)

1. Project Description

Establish the contractual, marketing and logistical framework for the 34th International Geological Congress (AUSTRALIA 2012), to be held in Brisbane 2-10 August 2012.

2. Project Outcome

A higher international profile and enhanced reputation for the region's geoscientific strengths and resource-based industries.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure ☑

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries
- Safeguarding Australia
- This project does not contribute to the NRPs □

5. Key Performance Information:

- The cost effective establishment of programs supporting the AUSTRALIA 2012, in particular the contractual, marketing and logistical framework supporting the Congress.

6 Project Outputs

6.1 Output 1: AUSTRALIA 2012, International Geological Congress (IGC) Preparation

6.1.1 Description: Organisation of and preparations for 34th IGC, particularly establishing the legal, financial and administrative framework for the event.

6.1.2 Output Delivery Date: ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

International and national promotions at major geoscience meetings; articles and presentations.

9. Risk Identification and Management Strategies

Australia's reputation in the field of Geoscience faces a risk if AUSTRALIA 2012 is not successful. While the resources industry would not face a similar risk, a successful AUSTRALIA 2012 will increase future investment in Australia's resources sector. Adequate personnel budgetary resourcing for AUSTRALIA 2012 will be essential in managing these risks.

10. Workforce Planning/Succession Management

All staff to have an agreed development plan consistent with their career aspirations and Division needs.

ENERGY MINERAL SYSTEMS GROUP
(Andy Barnicoat)

Geothermal Energy Project
(OESP, PL: Anthony Budd)

1. Project Description

Provide pre-competitive geoscience information including compilations of existing data, new data collections, and interpreted products, in formats useful to the geothermal industry and decision makers.

External stakeholders of this Project include: the Minister and Department of Resources, Energy and Tourism; Australian geothermal industry organisations and companies including those represented by the Australian Geothermal Energy Association; all State and Northern Territory geological surveys; the DEWHA and possibly DCC; and participants in the Australian Geothermal Energy Group (AGEG) which includes government, industry and academia.

Internal stakeholders include other projects within the OEMD and OESP including Minerals and Energy Advice, the groundwater project in GEMD, and the education and communications sections.

2. Project Outcome

Increased exploration and development activity in this type of renewable energy system as a result of better geoscience information lowering risk to geothermal explorers and funding and decision making agencies.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: Acquisition of new geothermal data

6.1.1 Description: Undertake measurements of thermal conductivity of rock samples, temperature in drill holes, and geochemical analyses specifically from buried granites and sediments. Wherever possible link thermal

conductivity to Stratigraphic Index. Pursue partnerships with State and Territory surveys and companies for access to drill holes. Report on new heat flow measurements.

6.1.2 Output Delivery Date: ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Reports, maps and datasets to assist geothermal exploration

6.2.1 Description: Produce new data and interpretations that will assist geothermal explorers. This work includes: 3D modelling; heat flow results and interpretations; thematic maps; and derivation of the key components of geothermal systems in Australia from first principles – similar to the pmd*CRC 5 Questions approach. Employ this method to evaluate the geothermal potential of regions utilising existing datasets, contributing to (Geothermal Industry Development Framework) GIDF goals.

6.2.2 Output Delivery Date:

Q1 □
Q2 ☑ Austherm (map, grid and database) at AGEC 2009
Geothermal Play Systems method report - possibly for release at AGEC 2009 conference (Nov 10-13)
Q3 □
Q4 ☑ Updated granite-sediment map
Broad Cooper Basin area thermal model
Regional assessments utilising Geothermal Play Systems method including in collaboration with the Onshore Energy Geodynamic Framework Project (ongoing)

6.3 Output 3: Geothermal data capture and storage system

6.3.1 Description: Capture and store field and lab-based data generated by this project. Utilise existing Access database for storage and delivery of lab and field results as an interim IM solution to development of corporate database.

Plan an enterprise information system for the capture, management and web delivery of geothermal data.

6.3.2 Output Delivery Date:

Q1 ☑ A business plan for development of corporate database
Q2 □
Q3 □
Q4 □

6.4 Output 4: Advice and Promotion

6.4.1 Description: Provide advice as required, especially to Government including technical input to the Geothermal Drilling Program.

Participate in the Organising and Technical Committees for the Australian Geothermal Energy Conference (AGEC) in Brisbane November 10-13 2009, and the 2010 AGEC (if applicable). Participate on the AGEC Bid Committee for a joint Australia/New Zealand bid to host the World Geothermal Congress (WGC) in Melbourne in 2015, and serve on the organising Committee if the bid is successful. Conduct "Team Australia" activities as opportunities arise e.g. the Geothermal Resources Council (GRC) conference in Reno October 4-7 2009, the New Zealand Geothermal Association (NZGA) Workshop in Auckland November 16-18 2009, and the WGC in Bali April 25-30 2010.

Update information and presentation of geothermal project web page in line with project progress and work-plan changes. Provide information for promotional and educational purposes.

Assist Mineral and Energy Advice project with regard to Energy White Paper and other policy issues.

6.4.2 Output Delivery Date:

Q1 ☐
Q2 ☑ GRC 2009, AGEC 2009, NZGA 2009
Q3 ☑ Geothermal project web page update
Q4 ☑ WGC 2010, other ongoing

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

In general, outputs will be as PDF maps (e.g. any updates to the map of temperature at 5 km depth), as GIS datasets (e.g. grid of temperatures at 5 km depth), GA Records (e.g. heat flow measurements and collations of thermal gradients and conductivity measurements, Proceedings of the Australian Geothermal Energy Conference), and flat files of heat flow data downloadable from the GA website.

Participate in the Society for Geology Applied to Mineral Deposits (SGA) conference (Townsville, August 17-20 2009), Geothermal Resource Council (Reno, October 2009,), Australian Geothermal Energy Conference (Brisbane, November 2009), New Zealand Geothermal Association Workshop (Auckland, November 2009) and World Geothermal Congress (Bali, April 2010) .

Update and maintain Geothermal Energy Project webpage.

Continue contributions to the Australian Geothermal Energy Group and its Technical Interest Groups.

9. Risk Identification and Management Strategies

The Geothermal Energy Project expects to have some risk exposure in the event of budgetary restrictions. This could impact the project's work program, potential loss of key staff, an unexpected increase in workload (especially in providing advice to RET and the Geothermal Drilling Program) and underestimation of the planned workload given the available resources. The mitigation strategies proposed to deal with these risks include: wherever possible, ensure that more than one person is abreast of each issue; and depending on the degree of impact, to adjust delivery dates for outputs or seek additional staff.

For field work: adhere to procedures in the GA Field Manual including for communication (including use of OmniStar system in field vehicle); ensure all staff are properly trained; and ensure all equipment is properly maintained and suitable for the purpose for which it is being used.

10. Workforce Planning/Succession Management

All staff to have an agreed development plans consistent with their career aspirations and Division needs. Additionally, the project has been successful in filling graduate project rotations, and aims to continue providing suitable graduate rotation projects to raise awareness of, and generate interest in, the work of the geothermal project with the graduates and more broadly within GA.

Uranium Project
(OESP, PL Roger Skirrow)

1 Project Description: This project will acquire and interpret pre-competitive geoscience information related to the distribution of uranium across the Australian continent to identify prospectivity and promote the results to industry.

2. Project Outcome: Increased investment in exploration for uranium within Australia via an enhanced understanding of the distribution of uranium resources the factors controlling their distribution.

3. Project Link(s) to Intermediate-level Agency Outcomes:
- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:
- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:
- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Geochronology methods for dating uranium mineral systems in Australia

6.1.1 Description: Reports on new-to-GA methodologies for dating uranium mineralisation and related processes, and application to basin-related uranium systems case studies in the Northern Territory and South Australia.

6.1.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Predictive maps of uranium potential: Magmatic-related, IOCGU, and surface-related uranium systems of Australia.

6.2.1 Description: Continental-scale digital maps and datasets highlighting regions with potential for magmatic-related, U-bearing IOCG, and surface-related

uranium mineral systems, utilising new data from the OESP including the AWAGS radiometric data.

6.2.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.3 Output 3: Report and digital data on potential of the Eromanga Basin for uranium mineral systems

6.3.1 Description: Report on assessment of the Mesozoic Eromanga Basin of eastern Australia for undiscovered uranium mineral systems, and three-dimensional digital maps of geological and geochemical controls on potential mineralisation.

6.3.2 Output Delivery Date:
Q1 □
Q2 □
Q3 ☑
Q4 □

6.4 Output 4: Report on transport and deposition of uranium in hydrothermal systems

6.4.1 Description: Report summarising available thermodynamic data for aqueous uranium species, and information on the solubility and speciation of uranium in hydrothermal systems, with implications for the conditions favouring transport and deposition of uranium.

6.4.2 Output Delivery Date:
Q1 □
Q2 ☑
Q3 □
Q4 □

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Results will be disseminated by means of:

- Output 1: GA Records and draft papers for publication;
- Output 2: Digital maps and datasets delivered online and at appropriate conferences.

- Output 3: GA Record, papers, and oral presentations and computer displays at SGA conference (Townsville) and/or other appropriate conferences; digital 2D and 3D models and datasets delivered online.
- Output 4: GA Record delivered online
- AusGeo News articles where appropriate
- Minerals Email Alerts

9. Risk Identification and Management Strategies

The most significant risk is in contractual arrangements with CSIRO and access to CSIRO staff and modelling software (Output 3). Minor risk is associated with delivery of Output 2 relating to access to data held by State and NT geoscience agencies. Some risk is present in Output 1, in gaining access to field sites and in receiving analytical results from internal and external laboratories.

10. Workforce Planning/Succession Management

The project will use existing OEMD workforce plans. All staff to have an agreed development plan consistent with their career aspirations and Division needs.

Geochemistry Laboratories
(PL Terry Mernagh)

1. Project Description:
Onshore Energy and Minerals Division's inorganic chemistry and mineralogy laboratory providing whole rock, mineral, fluid inclusion and other geochemical and mineralogical data for OEMD, other GA divisions, NGA partners and other partners as required.

2. Project Outcome:
Geochemical and XRD mineralogical data for GA and external clients.
Increasing pre-competitive Australian geoscience by improved understanding of the geochemistry of the Australian continent through provision of high quality geochemistry data and development of appropriate analytical techniques.

3. Project Link(s) to Intermediate-level Agency Outcomes:
- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:
- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:
- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Geochemical analysis

6.1.1 Description: Undertake and provide quality geochemical analysis (by X-Ray Fluorescence, Inductively Coupled Plasma-Mass Spectrometry, wet-chemistry and other techniques), as required, of submitted samples (rock, soil, water, vegetation, oil samples). Where necessary, chiefly for rock samples, the output also requires sample preparation (rock crushing, milling & grinding) for submitted rock samples.

6.1.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑ Ongoing, output, undertaken as samples submitted.

6.2 Output 2: Mineralogical and other determinations

6.2.1 Description: Undertake and provide mineralogical information (determination of mineral species and other mineralogical characteristics), by X-Ray Diffraction analysis, for submitted rocks and mineral samples. Provide access to, and assistance with, Laser Raman analysis, PIMA analysis, fluid inclusion analysis, and microscope use. Includes providing access and assistance to GA equipment, as required, by GA and collaborative external clients

6.2.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑ Ongoing output, undertaken as samples submitted

6.3 Output 3: Information management system for GA's geochemical data which uses a redefined storage model (database) and improves accessibility to data for both internal and external clients.

6.3.1 Description: Continue development of a redefined storage model (database) to improve accessibility to data for both internal and external clients. Work has already commenced on the implementation of the Radiogenic Geochronology and Inorganic Geochemistry (RAGING) SPOT. This is an information system, aligned to Geochronology and Geochemistry dataflow processes, that will comprise:

- A collection system which, where possible, automates transfer of analyses results from instruments directly into GA corporate databases.
- A management system which uses a redefined storage model (database) for geochronology and geochemical analytical data which is flexible and adaptable for future science needs.
- Automated delivery systems for providing geochronological and geochemical data

6.3.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

7. Information Management Considerations (see IM template)

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

- Data are made available internally via GA's OZCHEM database and related tables.

- Data are made available externally through releases of the OZCHEM database, via GA's website, on a state/territory basis.
- Data referenced or included in published papers and GA documents are available, on a state/territory basis, via web delivery.
- Laboratory capabilities and developments are also highlighted on the GA internet website.

9. Risk Identification and Management Strategies

- Major machine malfunctions could lead to backing up of samples; a maintenance contact covers the XRF and the ICPMS is under warranty; in any cases of major delays, external laboratories may provide short-term alternative capabilities.
- IM developments are dependent on the retention of appropriately skilled staff.

10. Workforce planning/succession management

Training of Level 3 Technician in XRF, LA-ICPMS, FeO determinations. All staff to have an agreed development plan consistent with their career aspirations and Division needs.

National Geochemical Survey of Australia Project
(OESP, PL Patrice de Caritat)

1. Project Description

This project will acquire a new, internally consistent and state-of-the-art geochemical dataset for surface and near-surface materials collected over the whole continent using ultra-low density sampling principles. The project will deliver a national geochemical atlas, report(s) on implications for onshore energy, ground truthing of airborne radiometrics, and geochemical data.

2. Project Outcome

Identification of prospective geochemical provinces for energy and mineral commodities, increased investment by the exploration industry in targeted areas.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met □
- Project budget met □
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Data collection for the national geochemical survey

6.1.1 Description: Coordinate State/NT geoscience agencies, external laboratories, and internal laboratories and database administration to ensure the data collection phase of the project is completed. Regular updates on progress will be provided via the web, Minerals Alerts and AusGeo News.

6.1.2 Output Delivery Date:

Q1 ☑ Last NGSA sample received
Q2 □
Q3 ☑ Sample preparation completed
Q4 ☑ Sample analysis nearing completion

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of papers

- Presentation of progress and preliminary results at various conferences, along with publication of abstracts and/or papers. AusGeo News and Minerals Alert contributions provided as required.
- Regular updates to NGSA website to reflect project progress.

9. Risk Identification and Management Strategies

Sample collection is formalised through National Geoscience Agreements, sample preparation is formalised through a Memorandum of Understanding with Pal/Sed Laboratory. Complete dataset delivery is contingent on all sites being accessible for sampling in time (moderate risk, minor consequences), and on resources for sample preparation and analysis being maintained at required level (minor risk, moderate consequences).

10 Workforce Planning/Succession Management

The project employs 2 scientific staff (1.75 FTEs) in OEMD, and 4 technical staff (4 FTEs) in PMD (until Dec 09). All staff to have an agreed Individual Work Plan, including learning and development opportunities, consistent with their career aspirations and Divisional requirements.

Onshore Energy Geodynamic Framework Project
(OESP, PL Narelle Neumann)

1. Project Description

This project will acquire, process and interpret pre-competitive geoscience information related to energy resources in selected provinces and basins across Australia to identify prospectivity and promote new data and results to industry, in partnership with state and territory geological surveys.

2. Project Outcome

Increased investment in exploration for onshore energy-related resources, including geothermal, uranium, thorium and hydrocarbons, in selected provinces and basins across Australia, to improve discovery rates for onshore energy-related resources.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1 Output 1: Interpretation and release of seismic and MT data

6.1.1 Description: Seismic and Magnetotelluric (MT) data from the OESP seismic surveys in South Australia, interpreted and released into the public domain (in collaboration with Seismic Acquisition & Processing Project).

6.1.2 Output Delivery Date:

Q1 □
Q2 ☑ Broken Hill Exploration Initiative Conference, September-October 2009
Q3 □
Q4 ☑ SAREIC Conference, May 2010

6.2 Output 2: 3D geological and geophysical maps

6.2.1 Description: 3D geological and geophysical maps of selected areas, including the Curnamona and Gawler provinces, and intervening younger basins, based on seismic, geological, potential field and magnetotelluric data.

6.2.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: Geodynamic synthesis in a time-space framework

6.3.1 Description: Geodynamic synthesis in a time-space framework for the Gawler and Curnamona provinces in South Australia, and selected overlying basins, and development of time-space products and accompanying report.

6.3.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.4 Output 4: Assessment of energy systems potential (particularly for geothermal and uranium systems) of selected regions

6.4.1 Description: Assessment of geothermal and uranium potential of the Curnamona and Gawler provinces, and intervening younger basins, including the development of predictive map products and accompanying reports (in collaboration with the Geothermal and Uranium Projects).

6.4.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.5 Output 5: Acquisition, interpretation and publication of other data

6.5.1 Description: Acquisition and interpretation of other data (e.g. sedimentology, geochronology, geochemistry data) to support interpretations of the new Onshore Energy Security Program (OESP) geophysical data, and publication of key results, including material coming out of confidentiality.

6.5.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of papers

- Project data and information available via web and updated on regular basis (quarterly or as outputs become available)
- Industry-focused workshops for delivery of major scientific results (e.g. seismic and MT interpretations)
- Presentations & posters at national and international scientific meetings
- Publication of reports, GA Records & scientific papers (in national & international journals)
- Key results/products notified through GA Minerals Email Alert and/or AusGeoNews

9. Risk Identification and Management Strategies

- Seismic and/or MT data acquisition is delayed or disrupted because of weather problems, or lack of access to a suitable commercial seismic crew, or lack of sufficient funding
- Possible loss of available staff with key specialist skills

10. Workforce Planning/Succession Management

- Formulate Professional Development Plans for all staff as part of Performance Agreements, to be mutually agreed between team member and Project Leader, in consultation with the Group Leader.
- Ensure growth opportunities for each team member (a training component to be included wherever appropriate, e.g., PhD/Masters training and/or appropriate courses for specialist skills, and the GeoEssentials, GeoPlus, GeoNext programme for leadership development).
- Develop engaging and inspiring Cadet and Graduate projects to assist in Output delivery and future staff members for ongoing career development and succession management.
- All staff to have an agreed development plan consistent with their career aspirations and OEMD needs.

Onshore Petroleum Project
(OESP, PL Russell Korsch)

1. Project Description:

The project involves the acquisition, interpretation and integration of geophysical, geological and geochemical data sets that relate to under-explored onshore petroleum provinces. The project will utilise methodologies that have been applied in both the mineral and hydrocarbon exploration sectors and the work is carried out in close cooperation with relevant State geological/energy departments.

2. Project Outcome:

An improved understanding of the hydrocarbon prospectivity and untapped energy resource potential of basins in onshore Australia. The focus will lie in older Paleozoic and Neoproterozoic basins, but will include Late Palaeozoic basins. A key result area is to maximise opportunities for discovering new hydrocarbon resources and to minimise the risk to explorers with current or future interests in these provinces. The results will also be used to support the various State organisations in their efforts to select areas for exploration acreage release. Ultimately, the results of this project will profoundly contribute to Australia's onshore energy security.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Onshore data acquisition

6.1.1 Description: Desk-top study of Kidson Sub-basin (Canning Basin), Western Australia, in preparation for acquisition of geophysical data, in order to delineate structural linkages between basement and basins, and geological controls on the presence and operation of hydrocarbon systems.

6.1.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Interpretation and release of seismic reflection data

6.2.1 Description: Relevant OESP seismic data from the Arrowie and Officer Basins in South Australia, collected during the 2008 Onshore Energy Security Program, interpreted and released into the public domain.

6.2.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

6.3 Output 3: Assessment of hydrocarbon prospectivity in selected onshore sedimentary basins

6.3.1 Description: Assessment of hydrocarbon prospectivity undertaken in key onshore sedimentary basins where new data have been collected as part of the Onshore Energy Security Program.

6.3.2 Output Delivery Date:
Q1 □
Q2 □
Q3 □
Q4 ☑

7. Information Management Considerations:

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers:

- Meetings with industry clients, State government representatives and other stakeholders
- Presentations & posters at national and international scientific meetings, e.g. Good Oil September 2009, APPEA May 2010.
- Scientific papers, e.g. GA Records, journal papers.
- Project data and information available via web and updated on regular basis (quarterly or as outputs become available)
- Publication of reports, GA Records & scientific papers (in national & international journals)
- Key results/products notified through GA email alert and/or AusGeoNews

9. **Risk Identification and Management Strategies:**
   - **a.** Reliance on efficient communication and cooperation with State government organisations: is currently working well and requires continued planning.
   - **b.** Possible land access issues related to Native Title: requires patience and realisation that long lead-in times are part of the planning process.
   - **c.** Dependence on seismic contractor's data acquisition schedules: very restrictive, but current contractor provides excellent work. Seismic data acquisition is delayed or disrupted because of weather problems, lack of sufficient funding, or lack of access to a suitable commercial seismic crew
   - **d.** Possible loss of available staff with key specialist skills

10. **Workforce Planning/Succession Management:**
   - **a.** Formulate Professional Development Plans for staff as part of Performance Agreements, to be mutually agreed between team member and Project Leader, in consultation with the Group Leader.
   - **b.** Ensure growth opportunities for each team member (a training component to be included wherever appropriate, e.g., PhD/Masters training and/or appropriate courses for specialist skills, and the GeoEssentials, GeoPlus, GeoNext programme for leadership development).
   - **c.** Develop engaging and inspiring Cadet and Graduate projects to assist in Output delivery and possible future staff members for ongoing career development and succession management.
   - **d.** All staff to have an agreed development plan consistent with their career aspirations and OEMD needs.

GEOPHYSICS
(Ned Stolz)

Continental Geophysics 2009-10
(Core & OESP, PL Murray Richardson)

1. Project Description

The Continental Geophysics project engages in the acquisition, processing, archiving, enhancement, presentation and interpretation of pre-competitive geophysical data, and the development of new computational methods that can be applied to these data. The project also manages geophysical surveys on behalf of State and Territory geological surveys.

2. Project Outcome

New insights into Australia's onshore energy and mineral potential, which contribute significantly to the Onshore Energy Security Program. Enhanced exploration strategies, promotion of mineral exploration opportunities and improved environmental management in Australia.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1. Output 1: Updates to National Geophysical Databases

6.1.1 Description: Updated datasets from the National Geophysical Databases. Datasets available via the Geophysical Archive Data Delivery System (GADDS) and the Airborne Surveys website (where appropriate).

Magnetic data in the National Airborne Geophysical Database will be corrected for long spatial wavelength variations calculated from the AWAGS results.

Publication of the 5th Edition of the Magnetic Anomaly Map of Australia

6.1.2 Output Delivery Date: Ongoing

Q1 □
Q2 □
Q3 ☑ Publication of the 5th Edition of the Magnetic Anomaly Map of Aust.
Q4 □

6.2. Output 2: New geophysical datasets

6.2.1 Description: Acquire new OESP geophysical datasets, including airborne electromagnetics, aeromagnetics, ground gravity and airborne radiometrics

6.2.2 Output Delivery Date: Ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.3 Output 3: Updates to the Australian Fundamental Gravity Network (AFGN)

6.3.1 Description: The AFGN provides the datum and scale for gravity surveys conducted in Australia. Selected sites will have values for absolute gravity recorded to ensure that gravity surveys planned for 2009/10 can be tied to the AFGN datum using sites recently checked by GA.

6.3.2 Output Delivery Date: Ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.4 Output 4: NGA geophysical data acquisition project management

6.4.1 Description: Management of data acquisition for the States/NT under the NGA. Supervise geophysical acquisition by managing the procurement process and ensuring the contractor(s) adhere to the technical specifications required by GA – i.e. survey flight plans are accurate, weekly progress reports are delivered on time, raw and processed data are checked, data are archived and supplied to the States/NT and released to the public.

Collate and QA\QC open-file company gravity data held by the States and Territories and enter into the Australian National Gravity Database

Output Delivery Date: Ongoing

Q1 □
Q2 □
Q3 □
Q4 ☑

6.5 Output 5: Reports on computational methods and geophysical processing

6.5.1 Description: Report on the development and application of computational methods for processing data, compiling continental-scale images, inverting data, and building 3D geology models.

Report on collaboration with State, territory and industry partners to develop the Geomodeller software.

6.5.2 Output Delivery Date: Ongoing

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.6 Output 6: Development of a Rock Properties Database

6.6.1 Description: A plan and scope for establishing a rock-properties database which will be a national repository for rock-properties information. The plan will include a set of specifications for the database. Collaborate with OEMD IS to advance the plan in accordance with available resources.

6.6.2 Output Delivery Date: Ongoing

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

Promotion of project outputs by GA records, published maps and via oral and poster presentations at GA and State/Territory events and presentations at other national and international mineral exploration conferences as appropriate. Submission of Papers to ASEG and SEG for publication. Publication of Papers in other scientific journals as appropriate.

9. Risk Identification and Management Strategies

The major risk to the delivery of project outputs is the availability of contractors to perform the required work. A secondary risk is the time taken by contractors to complete the survey work and supply the data to GA in an acceptable form. The project has limited means available to reduce these risks. To manage risk the Continental Geophysics Project will conduct a risk assessment in early 2009/10 to identify risk minimisation strategies. The risk assessment will be conducted in accordance with GA's Risk Management Plan as developed in 2006.

With regard to the proposed AEM data acquisition under the OESP, a secondary risk is the timely establishment of flying priorities in forward years. A more rigorous approach to planning will address this issue.

Further, the creation of the Deeds of Standing Offer for acquisition, processing and supply of (i) airborne magnetic/radiometric/elevation data; (ii) ground gravity data and (iii) airborne EM data, have significantly reduced the element of risk with respect to the timing and delays in commencement of geophysical data acquisition.

10. Workforce Planning/Succession Management

The Continental Geophysics Project strategies for workforce planning and succession management are as defined in GA's Workforce Planning Process.

The project has ten staff. Currently 70% of staff have more than 22 years service at GA and thus, a vast amount of knowledge in their area of scientific expertise. The potential loss of key staff has to be noted and action will be required to secure understudies for these staff to ensure the ongoing ability of the Continental Geophysics project to provide geophysical support to the OEMD division.

All staff to have an agreed development plan consistent with their career aspirations and the needs of the Division.

Seismic Acquisition & Processing
(OESP, PL Jenny Maher)

1. Project Description

The key objectives of the Seismic Acquisition & Processing Project are to:

- manage and deliver the seismic and magnetotelluric (MT) data acquisition and processing component of the OESP
- operate the GA component of ANSIR (National Research Facility for Earth Sounding) in conjunction with the ANU and Adelaide University by acquiring seismic and MT datasets as approved by ANSIR for its clients
- process seismic and MT data sets as per agreements with external stakeholders including AuScope, NGA partners, and other research projects
- maintain and develop legacy onshore seismic datasets. Respond to client requests for seismic and ancillary data.

2. Project Outcome

New insights into Australia's onshore energy and mineral potential, which contribute significantly to the Onshore Energy Security Program. Australia is at the leading edge of key technological developments in the field of imaging of the Earth's crust using seismic techniques.

3. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries ☑
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs

6.1. Output 1: Seismic and MT data acquisition

6.1.1 Description: Acquisition of seismic and MT data sets for the OESP, NGA partners, ANSIR and AuScope, planned in conjunction with the Geodynamics Framework Project.

6.1.2 Output Delivery Date:
Q1 ☑ OESP Georgina Basin – Arunta Inlier Survey (376km)
Q2 ☑ AuScope/ANSIR Southern Delamarian Survey (~200km), NGA Ararat

Survey (~ 60km)
Q3 □
Q4 ☑ OESP Canning Basin Survey (~ 400km)

6.2. Output 2: Seismic and MT data processing

6.2.1 Description: Processing of seismic and MT data from surveys acquired for the OESP, NGA partners, ANSIR and AuScope. Supply of technical information, seismic images and MT models as inputs into geophysical and geological interpretation workshops conducted with the Geodynamics Framework Project.

6.2.2 Output Delivery Date:
Q1 □
Q2 ☑ OESP Gawler-Curnamona-Arrowie Survey and Curnamona-Gawler Link Survey
Q3 □
Q4 ☑ OESP Gawler-Officer-Musgrave-Amadeus Survey

6.3 Output 3: Seismic data management and delivery

6.3.1 Description: Management, recovery and delivery of onshore seismic data in the custodianship of GA. Commence development and implement delivery of seismic datasets via the internet.

6.3.2 Output Delivery Date:
Q1 □
Q2 ☑ OESP processed seismic data deliverable over the internet
Q3 □
Q4 □

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of papers

Communication around survey activities and the release of data sets will be through presentations and brochures at conferences, articles in industry magazines (such as Preview), via the project web page and through AusGeo News articles and the Minerals Alert.

Developments in seismic and MT data acquisition and processing methodologies will be disseminated by means of publication of papers, abstracts and conference presentations as appropriate.

9. Risk Identification and Management Strategies

Timing of field data acquisition programs will be contingent upon forward planning at a divisional level, contractor availability, land access, weather,

accurate budget projections and the availability of sufficient experienced staff resources. Strategies to mitigate the risk include staff training, adequate advanced survey planning and field activity scheduling, project milestone identification and timely financial tracking of projects.

10. Workforce Planning/Succession Management

To deliver the SAP outputs the project will maintain a strategic business plan monitoring survey programs and processing workloads to ensure the delivery of the outputs.

All staff to have an agreed professional development plan consistent with their career aspirations and Division needs. Additionally training activities and growth opportunities will be made available to ensure development of management/leadership skills and geophysical knowledge within the team.

AEM Acquisition and Interpretation Project
(OESP, PL Alan Whitaker)

1. Project Description:
Acquire, process and interpret airborne electromagnetic data for the Onshore Energy Security Program in selected areas of Australia.

2. Project Outcome:
Increased investment in exploration for onshore energy-related resources, including geothermal, uranium, thorium and hydrocarbons, in selected provinces and basins across Australia, to improve discovery rates for onshore energy-related resources.

3. Project Link(s) to Intermediate-level Agency Outcomes: [tick one]

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. Project Link(s) to National Research Priority (NRP) Goals: [tick one]

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. Key Performance Information: [tick one]

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1. Output 1: Paterson Project (WA) – AEM Interpretation Record

6.1.1 Description: Produce a GA record documenting the results of interpretation of the AEM data. Interpret AEM data and integrate results of other studies including solid geology, bore hole data and landscape evolution. Collaborate with the groundwater group, and support their studies on implications for palaeo-valley groundwater resources in the region. Document the inferred implications for exploration for uranium and other commodities incorporating results from collaboration with the Uranium Systems Project and Minerals Promotion group.

6.1.2 Output Delivery Date:
Q1 □
Q2 □

Q3 ☐
Q4 ☑

6.2. Output 2: Pine Creek (NT) – AEM data release

6.2.1 Description:
A/ Release contractor supplied AEM data into the public domain including the full tabulated ascii data, multi plots and selected gridded data.
B/ Release processed value-added products into the public domain including conductivity depth sections and grids of conductivity depth slices.

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6.2.2 Output Delivery Date:
Q1 ☐
Q2 ☑ A/
Q3 ☐
Q4 ☑ B/

6.3 Output 3: Pine Creek (NT) – Draft compilation and interpretation report

6.3.1 Description: Compile solid geology, the distribution of regolith materials, and drill-hole data including down-hole conductivities. Generate representative geological sections constrained by surface geology and drill-hole data. Undertake integrated interpretation of AEM and geological data and, in collaboration with the Uranium Systems project and Minerals Promotion group, determine the inferred implications for exploration for uranium and other commodities. Commence documentation of results.

6.3.2 Output Delivery Date:
Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

Information management responsibilities and support for this project are detailed in *OEMD Information Services 2009-10 Workplan, Appendix A* (D2009-43782).

8. Communications Strategies, including publication of Papers

- Project Web page
- Minerals email alerts
- GA what's new
- Ausgeo News articles
- Presentations at State and Territory Survey Offices
- Conference posters and presentations

9. Risk Identification and Management Strategies

Outputs as presented are achievable in terms of currently available allocation of staff.

Some risk is attached to the time required by contractors to complete the survey work and supply data to GA in final form on time for processing and preliminary interpretation. This will be monitored closely, as will expenditure, to ensure work progresses as closely as possible to schedule(s).

10. Workforce Planning/Succession Management

Project will run for four years to 2011 with support from either ongoing staff or contractors on term contracts.

All staff will have an agreed development plan consistent with their career aspirations and Division needs.

Petroleum and Marine Division

2009 - 10 Work Plan

PMD overview

PMD provides geoscientific and technical advice to government on:

- petroleum resources and their development;
- marine and Antarctic geoscience;
- carbon dioxide (greenhouse gas) capture and geological storage (CCS);
- Australia's offshore boundaries.

This assists government and the community to make appropriate and informed decisions about the use of resources and the management of the environment, including contributing to regional marine planning and management of Australia's oceans and coasts.

PMD also provides pre-competitive data and information to industry to promote Australia's offshore petroleum acreage and hydrocarbon potential. This assists in attracting investment to Australian waters in a very competitive international market for exploration capital.

Two ongoing, government initiatives, the Offshore Energy Security Program and the Carbon Capture and Storage – Implementation program, move into their third full year of operations.

Priorities for 09-10 are:

- Promotion of petroleum prospectivity in Australia, particularly provision of scientific and technical support to Government for the 2010 offshore petroleum acreage release;
- As part of the Offshore Energy Security Program:
    - Interpretation of newly acquired geophysical and geological data from the offshore south-west frontiers of WA and assessment of hydrocarbon potential;
    - Continuation of assessment of petroleum potential of remote offshore eastern frontier basins;
- Identification and documentation of regions for geological storage of carbon dioxide, including offshore acreage release and assessment.

This plan captures all of the activities in the Division which includes all outputs delivered by projects.

SOUTHERN FRONTIERS

11. Project Description: The project encompasses basin and margin synthesis studies within the Australian Marine Jurisdiction along Australia's southern continental margin. The area of interest extends from Bass Strait in the east to offshore Cape Leeuwin in the west.

12. Project Outcome: An improved understanding of the petroleum prospectivity and resource potential of frontier basins along the southern Australian margin to underpin promotion of selected areas for petroleum acreage release, as part of the Offshore Energy Security Program, and for future marine planning.

13. Project Link(s) to Intermediate-level Agency Outcomes:

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

14. Project Link(s) to National Research Priority (NRP) Goals:

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries
- Safeguarding Australia □
- This project does not contribute to the NRPs □

15. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

16. Project Outputs:

6.1 Output 1: Deepwater Otway & Sorell Basins prospectivity study

6.1.1 Description: Integrated interpretation of seismic and potential field datasets of the deepwater Otway and Sorell basins, to underpin an improved understanding of the petroleum prospectivity of the basins and future acreage release in the region.

6.1.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Bight Basin prospectivity studies and promotion

6.2.1 Description: Geological studies to improve our understanding of the petroleum prospectivity of the southern margin, including preparation of reports to support release of offshore exploration areas in the Bight Basin, and geological synthesis studies of the southern Australian margin.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☑
Q4 ☑

7.Information Management Considerations:

- Adequate disk space to store and handle new geophysical data, including magnetic data.

8.Communications Strategies, including publication of Papers:

- Collaborative studies with external agencies, e.g. University of London, University of Liverpool, IFP, ICM;
- Meetings with industry clients and stakeholders;
- Conference presentations, e.g. APPEA 2010;
- Scientific papers, e.g. GA Records, journal papers;
- AusGeoNews and Australian Petroleum Newsletter.

9.Risk Identification and Management Strategies:

- Risk - not being able to staff at an appropriate level, as an outcome of meeting changed priorities; Management – strategies to develop partnership arrangements with Australian and overseas universities and industry service provider companies; outsourcing; re-scoping of outputs.

10.Workforce Planning/Succession Management:

Requires retention of existing scientific staff, or maintenance of staffing levels through graduate recruitment.

ACREAGE RELEASE AND PROMOTION

1. **Project Description:** Provide scientific and technical support to the Department of Resources, Energy & Tourism for the release of the 2010 Offshore Petroleum Exploration Areas and promote the petroleum prospectivity of Australia, as part of the Offshore Energy Security Program.

2. **Project Outcome:** Broad awareness and acceptance of the technical opportunities of the acreage offered by the Australian Government for petroleum exploration investment.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities ☑
- Improved resource management and environmental protection □
- Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: 2010 Acreage Release

6.1.1 Description: Plan, scope and compile technical reports and datasets that support the 2010 release of Offshore Petroleum Exploration Areas in producing regions and the frontier Mentelle and Bight basins, as identified in the Portfolio Budget Statement 2009-2010.

6.1.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Petroleum Prospectivity Promotion

6.2.1 Description: Promotion of Australia as an attractive exploration destination both nationally and internationally at petroleum conferences and through planned meetings with petroleum exploration companies.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Timescales- Virtual Centre of Economic Micropalaeontology and Palynology (VCEMP)

6.3.1 Description: Refine and document Australian biozonations, to improve the correlation of events and biozones within Australia to the global geological timescale.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☐

7. Information Management Considerations

- Project needs support from databases (STRATNAMES, WARP, TIMESCALES, ORGCHEM). Transposition of data required. Web delivery of outputs required.

8. Communications Strategies, including publication of Papers

- Good Oil, Fremantle, 1-2 September 2009 (booth);
- IMOG 2009, Bremen, Germany, 6-11 September 2009;
- AAPS The Palynology Society, Tennessee, USA, 27-30 September 09;
- NAPE 2010, Houston, 11-12 February 2010 (booth);
- AAPG, New Orleans, 11-15 April 2010;
- 2010 APPEA Conference, Brisbane, 16-19 May 2010 (booth);
- South Asian Promotion Trip, May/June 2010;
- North Asian Promotion Trip, May/June 2010;
- 2010 APPEX London Expo – no dates;
- 2010 Proposed Queensland Symposium(PESA) – no dates;
- 2010 Proposed ASEG/PESA combined conference(PESA) - no dates;
- 2010 WABS (PESA) – no dates;
- Data room & various company visitors.

9. Risk Identification and Management Strategies

- Risk - Acreage Release/Promotion team will require input from other staff within the Petroleum Prospectivity and Promotions Group. Access to key staff may be affected by reallocation of these resources due to changes in work priority.
  Management - Acreage release has highest priority within group for resourcing. Partnership relationship with universities and industry service providers.

10. Workforce Planning/Succession Management

Level of staff allocation is partly dependent on staff requirements for the Offshore Energy Security Program. There will be on-the-job training of less experienced staff, and staff being allocated to new tasks which will help with succession planning.

SOUTHWEST FRONTIERS

1. **Project description:** The Southwest Frontiers Project involves basement, basin and petroleum systems studies of the southwest continental margin, within the Australian Marine Jurisdiction, as part of the Offshore Energy Security Program. The area of interest includes the Mentelle, Perth and Southern Carnarvon basins, and extends from the eastern Naturaliste Plateau in the south to the Exmouth Plateau in the north.

2. **Project Outcome**: The objective is to gain an improved understanding of the petroleum prospectivity and resource potential of the Mentelle, Perth and Southern Carnarvon basins on Australia's southwest margin. The main aims are to maximise opportunities for the discovery of a new oil province, underpin promotion of selected areas for petroleum exploration via acreage release, reduce exploration risk through provision of new data and interpretive information, and assist future marine planning.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia ☑
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. Project outputs

6.1 Output 1: A study of the geology and petroleum prospectivity of the Mentelle Basin

6.1.1 Description: Interpretation, integration and synthesis of new geophysical datasets, collected in 2009, with existing interpretations to provide reports,

maps and concepts that enable assessment of the petroleum prospectivity of the basin and support acreage release in 2010.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☑
Q4 ☐

6.2 Output 2: A study of the geology and petroleum prospectivity of the North Perth Basin.

6.2.1 Description: Plan, scope, interpret and integrate geological and geophysical datasets to enable assessment of the petroleum prospectivity of the basin. Identify areas suitable for future acreage release and scope additional work required to support the release of these areas.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: An initial assessment of the geology and petroleum prospectivity of the Southern Carnarvon Basin and the Wallaby Plateau.

6.3.1 Description: Initial assessment of the newly acquired seismic and seafloor samples to elucidate the geological structure and petroleum potential of the Wallaby Plateau. Plan and scope additional work required to assess petroleum potential of the Southern Carnarvon region and support acreage release in these areas.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations:

- Adequate PCs (equivalent to current hi-end) for all project staff to enable use of GoCad for 3D visualisation and interpretation of seismic, potential field and bathymetry data.

8. Communications Strategies, including publication of Papers:

- Meetings with industry clients and stakeholders;
- Collaborative studies with external agencies, e.g. Royal Holloway;
- Conference presentations, eg APPEA 2010;
- Scientific papers, e.g. GA Records, journal papers;
- AusGeoNews and Australian Petroleum Newsletter.

9. Risk Identification and Management Strategies:

- Risk - reallocation of staff resources to higher priority tasks. Management – develop partnership arrangements with Australian and overseas universities if low-cost solutions could be found; re-scoping of outputs, including longer timeframes and/or reduced output content.

10. Workforce Planning/Succession Management:

- Requires retention of existing scientific staff.

REMOTE EASTERN FRONTIERS

1. **Project Description:** The project encompasses studies of basement terrain, structure, stratigraphy and potential petroleum systems of the Capel, Faust, Moore, Monowai and Gower basins within the Australian Marine Jurisdiction, as part of the Offshore Energy Security Program.

2. **Project Outcome:** Pre-competitive data and information to lessen geologic and environmental uncertainty, in the search for a new petroleum province, through the interpretation and reporting of results from acquired datasets.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection □
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Reporting on Petroleum Prospectivity of the Capel and Faust basins

6.1.1 Description: Provide an integrated set of reports, maps and 3D models that synthesise studies of basement and interpretations of geological and geophysical datasets from the Capel and Faust basins to improve our understanding of the petroleum prospectivity of the region, and underpin future marine planning.

6.1.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Remote Eastern Frontiers Regional Synthesis

6.2.1 Description: Reports and maps that utilize synthesised knowledge from the Capel and Faust basins to constrain remotely sensed and geophysical datasets for the greater Remote Eastern Frontiers region to improve our understanding of the location of basin depocentres and underpin future marine planning. Development of future seismic acquisition plans for data collection in the region.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations:

- Adequate disk space to store and handle new geophysical data, including gravity, magnetic, swath, sub-bottom profile and side-scan data;
- High-end computing capacity to build and handle 3D models.

8. Communications Strategies, including publication of Papers :

- Meetings with industry clients and stakeholders;
- Workshops with industry and clients;
- Scientific papers, e.g. GA Records, journal papers.

9. Risk Identification and Management Strategies:

- Risk - Reallocation of staff resources to higher priority tasks; Management – If changes are required publication strategy will focus first on data reports, followed by synthesis reports, so that acquired data will be underpinned by GA records before scientific outputs are produced.

10. Workforce Planning/Succession Management:

Will occur as part of Division-wide review.

PETROLEUM ENGINEERING AND IDENTIFIED RESOURCES

1. ***Project Description:*** Provide technical advice to the Resources Division of the Department of Resources, Energy and Tourism (RET), relevant to the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA) and its associated Regulations and Guidelines with respect to:
   - Petroleum developments;
   - Petroleum resource management and production, and associated safety matters; and
   - Geological storage of carbon dioxide.

2. ***Project Outcome:*** Enhanced resource management of Australia's petroleum resources for the benefit of the community and technical advice in development of the regulatory regime for the geological storage of carbon dioxide in the offshore.

3. *Project Link(s) to Intermediate-level Agency Outcomes:*

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4. *Project Link(s) to National Research Priority (NRP) Goals:*

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. *Key Performance Information:*

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met □
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. *Project Outputs:*

6.1 Output 1: Petroleum Engineering and Resource Management Advice

6.1.1 Description**:** Provide relevant technical advice to RET on petroleum engineering issues, petroleum resources and greenhouse gas storage issues. Provide relevant advice in association with RET for the purposes of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, the *Excise Tariff Act 1921*, the *Petroleum Resource Rent Tax Assessment Act 1987*, and the

Trade Practices Act 1974. Provide relevant technical advice for activities in the Timor Sea Joint Petroleum Development Area.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Publication of the *Oil and Gas Resources of Australia*

6.2.1 Description: Contribute relevant statistics on Australia's identified petroleum resources, petroleum developments, petroleum production and production forecasts and resources self-sufficiency for inclusion in Geoscience Australia's *Oil and Gas Resources of Australia* publication.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. *Information Management Considerations*

Continue to migrate PGGAG's Access database content to corporate compliant databases.

8. *Communications Strategies, including publication of Papers*

Continue improvement of communication with the Resources Division of RET through contributions to formal working groups on Regulations, regular briefings and jointly agreed outputs.

9. *Risk Identification and Management Strategies*

Identified risks:

- *Large volume of regulatory work especially related to Retention Leases;*
- *Ageing workforce;*
- *Inability to attract suitably qualified petroleum engineers due to skill shortages and continued high demand from industry.*

Management strategies:

- *Strengthen communication with relevant government agencies and industry;*
- *Build efficient and effective project management system and enhance existing staff's expertises by updating their knowledge;*
- *Need to focus on benefits of working at Geoscience Australia, and living in Canberra; possible attraction for those retiring from industry.*

10. *Workforce Planning/Succession Management*

Major issue for this project is an ageing workforce and how to get and train young petroleum engineers.

EXPLORATION AND ENVIRONMENT ADVICE

1. **Project Description:** Technical advice to the Resources Division of the Department of Resources, Energy and Tourism (RET) on petroleum exploration, environmental and marine issues under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA) and other upstream petroleum industry matters.

2. **Project Outcome:** Improved resource management and environmental protection through the provision of relevant and timely technical advice on petroleum exploration, environmental issues and other upstream petroleum matters.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met □
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Exploration Advice

6.1.1 Description: Technical advice to government on petroleum exploration under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, and other upstream petroleum industry matters including prospectivity and resource assessment.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Environment Advice

6.2.1 Description: Technical advice to government on environmental and marine planning issues related to proposed Marine Protected Areas.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Industry and Statistics Advice

6.3.1 Description: Advice to the Department of Resources, Energy and Tourism, other government agencies, and industry, on petroleum industry activities in Australia including delivery of *Oil and Gas Resources of Australia* (OGRA).

6.3.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

No new IM requirements for 2009/10.

8. Communications Strategies, including publication of Papers

Technical advice is provided either formally by Minute for regulatory OPGGSA matters, or less formally by other means as required. Communication with clients includes bilateral and multilateral meetings, and networking at various industry and intra-Government forums, including conferences and inter-Departmental meetings.

Continue redevelopment of the web accessible *Oil and Gas Resources of Australia* (OGRA) publication. Finalise putting in place formal links with State/NT agencies to collect data needed for OGRA and other advice.

9. Risk Identification and Management Strategies

The key risk is imminent loss of staff. Provision of technical advice is not a function that can be delegated to inexperienced staff, as poor or incorrect advice could have political consequences for Geoscience Australia.

10 Workforce Planning/Succession Management

A particular issue relating to this project is “ageing staff”. The average age of the staff currently in the project is over 53.

GREENHOUSE GAS STORAGE (CO2CRC)

1. **Project Description:** Specialised input by Geoscience Australia staff into selected projects of the Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC), including the Otway Basin Pilot Project.

   Projects include:
   - geomechanics of the faults of the Gippsland Basin;
   - geochemical study of CO_2 gases in the Gorgon and surrounding area gas fields;
   - gas storage analogue study, focussed on better understanding of the geomechanical behaviour of the Otway Basin Pilot Project;
   - multidisciplinary study designed to better understand the controls on fault seal capacity.
   - Monitoring and verification of greenhouse gas storage

2. **Project Outcome:** Publication of relevant research into various aspects of the geological storage of carbon dioxide that will enable the development of the CCS industry and government regulations.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1.1 Output 1: CO2CRC Projects

6.1.2 Description: Continued technical input into projects including the Otway Basin Pilot Project.

6.1.3 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

No new IM requirements.

8. Communications Strategies, including publication of Papers

Presentations at conferences and symposia as required by the CO2CRC. Publication of peer reviewed papers in international journals. Publication of reports to participants in the CO2CRC.

9. Risk Identification and Management Strategies

Risk management plan to be developed as part of detailed project planning. The project will continue to engage with CO2CRC management and encourage new areas of investigation and involvement.

10. Workforce Planning/Succession Management

Historically the particular issue relating to this project has been the ability to attract and retain experienced staff with relevant experience. The CO2CRC funding finishes in June 2010, and GA's forward involvement will depend on the CRC re-bid.

GREENHOUSE GAS STORAGE (Advice & Acreage)

1. **Project Description:** Continue to develop a carbon dioxide (greenhouse gas) geological storage program, including acreage release packages, and provide technical advice to Government to develop the legislative framework for management of the geological storage of carbon dioxide and other greenhouse gases (GHG).

   Develop independent in-house expertise in the evaluation of selected offshore sedimentary basins for geological storage, to aid in the advice both on acreage release and applications for greenhouse gas titles under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

2. **Project Outcomes:** Development of a robust GHG Acreage Release process in conjunction with RET through provision of relevant technical support.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**

   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**

   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: GHG Storage advice

6.1.1 Description: Provide technical advice to the Department of Resources, Energy and Tourism on the geological storage of carbon dioxide including revisions to the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* for the development of regulations and guidelines for GHG storage operations. Geological support and advice as required to other bodies such as the Carbon Storage Taskforce. Work with relevant government agencies to assist in the development of the assessment of onshore storage potential.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: GHG Acreage Release

6.2.1 Description: Promote, as required, the first tranche of GHG Acreage Release. Continue to develop new areas for release, as requested by industry and government.

6.2.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

7. Information Management Considerations

Project needs support from databases (STRATNAMES, WARP, TIMESCALES, ORGCHEM). Transposition of data required. Web delivery of outputs required.

8. Communications Strategies, including publication of papers

- Meetings with industry clients and government stakeholders;
- Publication of Acreage Release and associated documentation as determined by RET;
- Collaborative studies with external agencies, e.g. GSV, CO2CRC;
- Conference attendance and presentations, e.g. APPEA 2010, International GHG Conferences;
- Scientific papers, GA Records, journal papers;
- GHG Web page on Geoscience Australia's website;
- AusGeo News, Australian Petroleum Newsletter and planned RET CCS newsletter – particularly for interim results.

9. Risk Identification and Management Strategies

- Risk - Changes in focus due to urgent short term strategic requirements may divert staff from the longer term core projects. Management - This risk can be managed by ensuring that these new tasks are structured in such a way as to provide significant learning experiences for the junior staff.
- Risk - There continues to be a risk that when the younger staff are fully trained they will become attractive recruits to the petroleum industry, when it recovers from the present down-turn. Management - This risk can be managed by ensuring that staff are given interesting and varied work, and that training continues, but there remains a recognised gap in the team structure due to previous loss of mid-level staff.

10. Workforce Planning/Succession Management

A major recruitment process was undertaken in 2007-08. The project is currently fully staffed with 5 junior and 3 senior staff. The challenge will be to grow the technical capability of this group.

GREENHOUSE GAS MONITORING

1. **Project Description:** The project involves assessing monitoring and verification techniques for greenhouse gas storage. Baseline data for atmospheric and groundwater greenhouse gas monitoring programs will be determined for selected onshore areas.

2. **Project Outcomes:** Review of techniques for offshore monitoring of GHG storage, implementation of facilities to be used to determine baseline GHG levels in selected onshore areas.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries ☑
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: A facility to monitor baseline greenhouse gas concentrations within the atmosphere

6.1.1 Description: A joint facility will be built to monitor baseline concentrations of greenhouse gases in the atmosphere as part of a National Collaboration Framework agreement with CSIRO Division of Marine and Atmospheric Research. Following stakeholder consultation, the facility will be sited onshore within a region where geological storage of greenhouse gases is likely to take place.

6.1.2 Output Delivery Date:

Q1 □

Q2 □

Q3 ☐
Q4 ☑

6.2 Output 2: Database of baseline groundwater chemistry

6.2.1 Description: Continued development of a database of groundwater chemistry for Australia based on new and previously acquired datasets. New data will be obtained through a series of groundwater sampling surveys under a National Geoscience Agreement with the Geological Survey of Queensland.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: A facility to monitor the simulated leakage of greenhouse gases from the ground

6.3.1 Description: A facility will be built to simulate the leakage of greenhouse gases from the ground. A series of experiments will be conducted in partnership with leading local and international collaborators, involving the release of very low volumes of CO_2 into the shallow subsurface. The movement of the gas will be closely measured and monitored in order to improve our understanding of leakage and measurement, monitoring methods and to test new monitoring technologies.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.4 Output 4: A review of offshore greenhouse gas monitoring technologies

6.4.1 Description: A report will be produced reviewing technologies for monitoring movement and leakage of CO_2 from offshore greenhouse gas storage formations. This study will be a collaborative study with the CO2CRC and various experts.

6.4.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

Additional requirements will not be significant.

8. Communications Strategies, including publication of papers

- Inform stakeholders about monitoring for geological storage of greenhouse gases through written advice, formal meetings, workshops and websites;

- Inform, and seek consensus from, government bodies and other stakeholders when developing and implementing greenhouse gas monitoring programs;
- Report on the results of the baseline monitoring program through appropriate forums.

9. Risk Identification and Management Strategies

Due to the level of demand for CCS studies in Australia, such as the Carbon Storage Taskforce, there may be a risk that staff are diverted to more urgent projects.

10. Workforce Planning/Succession Management

The project currently funds four full time staff and one hydrologist from GEMD. The monitoring programs will require substantial management and travel in 2009-10.

There is a significant risk that there may be periods when the project is understaffed due to conflicting demands on staff time which could result in delays to implementation of some work programs. Well scoped and managed project plans are necessary to deliver outputs.

INTERNATIONAL CARBON CAPTURE & STORAGE

1. **Project Description:** This project will provide technical and advisory support for Carbon dioxide Capture and geological Storage (CCS) at an international level. It will be engaged in the development of collaborative activities with bodies such as: the Global CCS Institute,
   the Carbon Sequestration Leadership Forum (CSLF), International Energy Agency Greenhouse Gas R&D Programme; and through specific country to country activities, such as the Asia-Pacific Partnership on Clean Development and Climate (APP).

2. **Project Outcome:** Active Australian Government engagement in international CCS activities.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: China Capacity Building Activities (CAGS Project)

6.1.1 Description: Leadership and management of a collaborative project with the Chinese Government agencies (China Australia Geological Storage of CO_2 Project - CAGS) to build capacity in China and Australia in the area of geological storage of carbon dioxide, and to facilitate China's own assessment of prospectivity for geological storage of CO_2. The project, beginning in 2009 and expected to be completed in 2011, is supported through the Asia Pacific

Partnership on Clean Development and Climate and the Department of Resources, Energy and Tourism (RET).

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Support for RET engagement in international CCS forums

6.2.1 Description: Provide ongoing technical and advisory support to RET for CCS activities in international forums, including Carbon Sequestration Leadership Forum, International Energy Agency Greenhouse Gas R&D Programme, Global CCS Institute, and others. RET represents the Australian Government at the CSLF Policy Group and GA provides support by representing Australia at the Technical Group and engaging with its task forces and working groups (including the Projects Interaction and Review Team, the Risk Assessment Task Force, and others as appropriate).

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

The scale of the bilateral arrangements and collaboration activities will result in development of individual IM plans to cater for each proposal as they emerge.

8. Communications Strategies, including publication of Papers

Communication occurs principally through participation in international forums, workshops, meetings, and via papers and presentations at invited meetings. Visits to GA are actively encouraged and facilitated where possible. Communication of progress, outputs and outcomes will also occur through the corporate GA website and other non-GA web presence (e.g. the CAGS website). Communication about the concepts of CCS and project achievements to the public are planned through outreach activities (such as GA foyer displays, open day, fact sheets and other educational materials, and the education centre).

9. Risk Identification and Management Strategies

Risk - The major risk will be associated with government-to-government relations and the politics of Greenhouse Gas issues and how they develop at the international level. Commitments from developing countries to CCS are currently highly variable and so collaborations will be occurring in an evolving environment. Management - Establishment and maintenance of good collaborative working relationships with partners (for example, this is vital to the successful implementation of the CAGS project) through frequent communication and face-to-face contact helps to mitigate this area of risk. The relationship with the Global

CCS Institute is new and emerging, and requires further effort and clarification.

10. Workforce Planning/Succession Management

This project requires a small number of highly knowledgeable and skilled staff who are able to participate effectively in international forums and work with other project staff at GA (particularly CCS groups) where required or deemed appropriate to complete project tasks. GA's ability to continue to develop project staff and/or to attract suitable staff as required will be critical to the project's continued success. The project will engage closely with other projects at GA, including the GHG group, PMD more broadly, access skills in other divisions (such as risk assessment expertise in GEMD), and forge links and share experience with similar "new" areas such as the geothermal group in OEMD. Wider and more active engagement with the CCS group will ensure that corporate knowledge and networks built through this project are maintained even through periods of staff turnover.

COASTAL RESEARCH AND MANAGEMENT

1. **Project Description:** The Coastal Research and Management project provides scientific information and advice on estuaries and the coastal zone of Australia. The project addresses questions related to the role of sediments on coastal water quality and the vulnerability of coastal habitats to climate change. Water quality studies focus on the impact of urbanisation and land use on nutrient enrichment in estuaries, as well as on water turbidity. The project is part of both the Commonwealth Environmental Research Facility (CERF) Tropical Rivers and Coastal Knowledge (TRaCK) and the CSIRO Coorong Lower Lakes and Murray Mouth (CLLAMM) programs.

2. **Project Outcome:** The project provides technical information to inform resource management decisions for the coastal zone and Australian marine jurisdiction.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**

   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**

   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Preparation of four publications on estuarine water quality

6.1.1 Description: This output comprises the publication of scientific results on water quality in selected estuaries and the population and maintenance of GA's database for estuarine water quality data. The following publications are planned:

1. Scientific journal article on water quality in Darwin Harbour as part of the

CERF-funded TRaCK program;
2. Scientific journal article on water quality in the Coorong as part of the CSIRO CLLAMM program;
3. A GA Record on water quality in estuaries in the south of WA as part of our collaboration with the Department of Water (WA);
4. A GA Record on seagrass monitoring methodology using underwater video footage as part of our collaboration with the Department of Water (WA).

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☑

6.2 Output 2: Report on water quality in the Bonaparte Basin

6.2.1 Description: Water quality studies will be undertaken in the Bonaparte Basin to provide environmental information to the oil and gas industry. The study will focus on water turbidity and the importance of detrital sediment, particulate and dissolved organic matter for light attenuation in the water controlling light availability at the sediment surface. Water and sediment samples will be collected during the *Solander* survey in August/September 2009 and results will be reported in the survey report.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☑
Q4 ☐

7. Information Management Considerations

The project will not require specific support from ISB. We will, however, require support from the OzCoasts data manager (IDeAS in PMD) to facilitate uploading of water quality data into OzCoasts.

8. Communications Strategies, including publication of Papers

The FY 09/10 will be an important year to compile and consolidate water quality data and knowledge on nutrient enrichment in estuaries and to make these information publicly available through websites, reports and peer-reviewed publications.

9. Risk Identification and Management Strategies

- Any re-location of staff will immediately impact the delivery of outputs.

10. Workforce Planning/Succession Management

Jodie Smith will remain in her role as a 2IC for CREAM, which will allow her to gain further project management experience. The project will start to work more closely with other projects within the Marine and Coastal Environment Group, e.g through participation in the Solander Survey and collaborative projects on reefs, which will allow staff to broaden their technical and scientific

skills. The project also supports the professional development of junior scientists through a graduate rotation project within GA.

LAW OF THE SEA AND MARITIME BOUNDARY ADVICE (LOSAMBA)

1. **Project Description:** The LOSAMBA project undertakes the technical work to define Australia's national maritime boundaries, advice on the definition of administrative boundaries within the Australian maritime jurisdiction, and advice on geoscientific aspects of the Law of the Sea where appropriate. These activities include
   - The identification of Australia's territorial sea baseline;
   - The calculation of the limits derived from it (the territorial sea, coastal waters, contiguous zone, and exclusive economic zone);
   - The definition of Australia's legal continental shelf where it extends beyond the EEZ;
   - The management of the Australian Maritime Boundaries geodatabase and associated release product;
   - The ongoing administration and enhancement of web-based information systems, in particular the Australian Marine Spatial Information System (AMSIS);
   - The provision of specific ad-hoc advice including provision of maps, written boundary descriptions and digital data to assist Government Agencies with regulatory authority in the Australian maritime jurisdiction.
   - Support to the Office of Transport Security on the definition of Security Regulated Ports;
   - Advice to Pacific Island Countries through SOPAC on maritime boundary related issues.

2. **Project Outcome:** Improved management and administration of Australia's coastal and marine jurisdiction via provision of reliable and accurate information and advice.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - ➢ Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - ➢ Improved resource management and environmental protection ☑
   - ➢ Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - ➢ An environmentally sustainable Australia ☑
   - ➢ Frontier technologies for building and transforming Australian industries □
   - ➢ Safeguarding Australia ☑
   - ➢ This project does not contribute to the NRPs □

5. Key Performance Information:

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Maritime Boundaries Advice – data maintenance

6.1.1 Description: Technical work relating to the definition of Australia's national boundaries throughout its jurisdiction, including negotiations with adjacent States, and ECS definition. Determination of Australia's national boundaries under the UN Convention on the Law of the Sea, the Seas and Submerged Lands Act and the Coastal Waters State Powers and Title Acts. Included in this output is the maintenance of the Australian Maritime Boundaries data and promoting Australia's approach to this activity to maintain acceptance of Australia's views on these matters.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.2 Output 2: Activities associated with role of Commissioner on the UN Commission on the Limits of the Continental Shelf

6.2.1 Description: Participation by Commissioner Symonds in the deliberations of the UN Commission on the Limits of the Continental Shelf

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: Management of Australian Marine Spatial Information System (AMSIS)

6.3.1 Description: AMSIS is a web-based tool for decision making in the maritime jurisdiction Migration of AMSIS into the MAPCONNECT environment to reduce the management overhead and increase useability and performance.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.4 Output 4: Maritime Boundaries – Advice to Government

6.4.1 Description: Reports and maps for the Australian Government relating to boundary-related issues of the management of the marine jurisdiction. Provision of ad-hoc advice to government agencies on specific issues of

boundary definition in the maritime jurisdiction including the provision of maps, written boundary descriptions and digital data as well as geoscientific aspects of UNCLOS.

6.4.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.5 Output 5: Advice, to Pacific Island States on Continental Shelf issues

6.5.1 Description: Advice to be given to Pacific Island Countries (co-operating with SOPAC which will undertake the in-State co-ordination role) to assist them in the definition of their maritime boundaries.

6.5.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

6.6 Output 6: Determination of and technical descriptions of Port Security Zones

6.6.1 Description: Field work and technical definition for Department. of Infrastructure, Transport, Regional Development and Local Government of Port Security Zones under the Maritime Transport Security Act 2003 for the majority of Australia's ports.

6.6.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

7. Information Management Considerations

Migration of project spatial data into an ESRI 9.3 geodatabase for more efficient management and sharing of data.
Consolidation of various LOS, MCIBA WEB pages.
***LOS/Article76* -** Archiving of Submission data and materials for future use and lodgement to National Archives.
Support for AMSIS - Migrate AMSIS into the MAPCONNECT environment and make application go live outside of the building. Scope next stage of development for AMSIS/MAPCONNECT as the systems they operate become redundant.
Ongoing development and maintenance of AMSIS datasets.
***Support for Boundaries/AMB* -** Further development and maintenance of the Australian Maritime Boundaries database for monitoring impacts of climate change on Australia's maritime boundaries and integration with high resolution imagery datasets..
Complete Integration of AMB database with boundary definition tools (Marzone).

8. Communications Strategies, including publication of Papers

For the boundary component the most important aspects are continuous engagement with the project's primary stakeholders, engagement with international peer groups to maintain Australia's influence on national boundary definition issues, maintenance and development of AMSIS and maintenance of the guidelines for maritime boundary definition.
For the national boundaries, communication is focused on the Australian Government, in particular the Attorney General's Department and the Department of Foreign Affairs and Trade.

9. Risk Identification and Management Strategies

- Risk - Loss of critical Staff. Management – target suitably skilled graduates. Looking forward the project may need to reduce scope.

10. Workforce Planning/Succession Management

Ageing project workforce is an issue - target suitably skilled graduates. Looking forward the project may need to reduce scope.

FIELD AND ENGINEERING SUPPORT

1. **Project Description:** Field and Engineering Support (FES) supplies a wide variety of sampling, geophysical, mapping and geochemical equipment to marine survey operations as well as the skilled personnel to operate and maintain the equipment and provide logistics support. FES also designs and develops marine geoscience equipment for new survey applications as well as supplying miscellaneous survey and engineering services to other parts of Geoscience Australia and to external agencies and organizations.

2. **Project Outcome:** The project provides services which allow Geoscience Australia to undertake marine geoscience and oceanographic research in the field and laboratory and thus complete environmental management and resource assessment tasks. Support is also provided to assist non-marine and external collaborative projects.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia ☑
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Marine surveys and science services to PMD

6.1.1 Description: FES provides technical support for the safe and effective delivery of field programs and instrumentation. Major PMD survey activities include:

- Collaborative marines survey(s) to Bonaparte Gulf with the Australian Institute of Marine Science

- Arrange field tests of equipment and field training for scientific and technical staff
- Continuation of Jervis Bay CERF study;
- Support for Antarctic base (Davis) bathymetry survey.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: PMD Engineering design, development, maintenance and construction projects

6.2.1 Description: The major works for 2009-2010 include:

- Continue vessel installations and testing of EM3002 multibeam system;
- Biological sampling equipment provision including benthic sled / beam trawl equipment;
- Equipment maintenance, calibration and testing and update of Standard Operating Procedures
- Maintenance and modifications to shallow video camera;
- Testing of new benthic chamber;
- Upgrade and maintenance of multi-channel seismic system;
- Design of multi-beam mounting and workboat modifications for Antarctic survey.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Engineering and survey services for other GA Divisions

6.3.1 Description: Projects include:

- Support for Broken Hill aquifer survey;
- Provision of equipment components for tsunami and magnetic stations;
- Laboratory and incidental design, construction, upgrades and maintenance work
- Support seismometer station upgrades and maintenance.

6.3.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Field data acquisition and data security including collection, QC, copying and input to GA database managers; maintenance of equipment standard Operating Procedures; and IM training for staff as required;
- Working with ISB, GPDA section, MARS database administrator, and IDEAS project to develop better procedures for management of data

collected on marine surveys.

8. Communications Strategies

- Focus on improving liaison with internal PMD stakeholders and external collaborators.

9. Risk Identification and Management Strategies :

- Risk - equipment failure. Management – maintain sufficient backup equipment and spare parts;
- Risk - data loss and corruption. Management – ensure redundancy and archive integrity;
- Risk - operational and acquisition risks. Management - maintaining OH&S and survey procedures;
- Risk – insufficient expertise. Management – sufficient trained and cross trained staff, careful crew selection, contract and consultant backup.

10. Workforce Planning/Succession Management:

Issues for this project include:

- Growing the technical capability of new staff – more experienced staff acting in a mentoring capacity;
- Attracting and retaining experienced and skilled technical staff.

CERF MARINE BIODIVERSITY HUB

1. **Project Description:** The Marine Biodiversity Hub is a collaborative research program within the Commonwealth Environment Research Facilities (CERF) Program that is run by the Department of Environment, Water, Heritage and the Arts (DEWHA). The aim of the Hub's research is to improve the management of Australia's marine biodiversity. GA is working in partnership with the University of Tasmania (Lead Agency), CSIRO Marine and Atmospheric Research, Australian Institute of Marine Science and the Museum of Victoria. Key project stakeholders are Geoscience Australia, Australian Fisheries Management Authority, Australian Petroleum Production and Exploration Association, DEWHA, and the World Wildlife Fund for Nature. In 2009/10 the Project will deliver reports on the results of research into the performance of a range of physical seabed parameters as surrogates of benthic habitats and biological communities. These findings will enable the better prediction of patterns of biodiversity in areas that lack biological data, which includes the large majority of the marine estate.

2. **Project Outcome:** Increased availability and use of scientific information in the management of Australia's marine biodiversity.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Progress report on the performance of a range of physical variables as surrogates of patterns of benthic marine biodiversity

6.1.1 Description: A description of progress in the analysis of co-variance between physical and biological variables that have been measured at the Hub's field survey areas: South East Tasmanian Shelf, Carnarvon Shelf, and Jervis Bay.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☐

6.2 Output 2: Progress report on the development of seabed disturbance indexes using oceanographic data

6.2.1 Description: A description of the methods employed in deriving various potential seabed disturbance regimes from seabed current data (generated from 11 years of wind, wave and tide records) using GA's GEOMAC seabed shear stress model.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☐

6.3 Output 3: Final report on the performance physical variables as surrogates of marine biodiversity at fine spatial scales

6.3.1 Description: A description of the performance of a range of seabed physical parameters (seabed morphology, sediment type, geochemistry) as surrogates of patterns of marine biodiversity as measured in the project's study sites on the SE Tasmanian Shelf, Lord Howe Shelf, Carnarvon Shelf, and in Jervis Bay.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.4 Output 4: Final report on the development of seabed disturbance indexes, and their utility as surrogates of patterns of benthic marine biodiversity

6.4.1 Description: A description of the development of potential seabed disturbance indexes, how the disturbance regimes are related to ecological processes that drive biodiversity patterns, and on their performance as surrogates of marine benthic biodiversity at a range of spatial scales.

6.4.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations:

The Marine Biodiversity Hub requires:

- Support from the Geophysical Analysis and Data Access Project (GADA) in the processing, gridding and management of multibeam bathymetry data;
- Production of graphics and visualisation products by GAV;
- GIS and web page development, and support with data management by IDEAS.

8. Communications Strategies, including publication of papers:

- Presentations at science and technical workshops organised as part of the CERF Marine Biodiversity Hub;
- Presentations at the GeoHab Conference in Wellington, Statistical Society of Australia Conference and the Australian Institute of Marine Science Conference;
- GA staff will contribute research products to the Hub website housed at UTAS, and relevant modules in OzCoasts.

9. Risk Identification and Management Strategies:

- Support is required to update and derive grid files from GA bathymetry datasets;
- GA has committed to providing GIS and visualisation product development as part of our in-kind contribution to the CERF Hub.

10. Workforce Planning/Succession Management:

A second in charge (2IC) for the project has been appointed (Scott Nichol). The project also has a senior scientist (Michael Hughes) as Task Leader for the Seabed Disturbance work. Both Hughes and Nichol have the capability to act as Project Leader when required.

SEABED MAPPING AND CHARACTERISATION

1. **Project Description:** The Seabed Mapping and Characterisation (SMAC) project coordinates the delivery of technical advice to the Department of Resources, Energy and Tourism in support of the Offshore Energy Security Program, and to the Department of the Environment, Water, Heritage and the Arts in support of bioregional planning and the development of a national representative system of marine protected areas. This involves:
    1. Preparing seabed environmental assessments for future acreage release areas;
    2. Conducting marine reconnaissance surveys;
    3. Deriving and maintaining fundamental national geoscience datasets for the seabed of Australia's marine jurisdiction;
    4. Developing and undertaking scientific research in the use of abiotic variables to predict potential marine biodiversity and habitat distributions; and
    5. Providing scientific support for the development of web-based information systems to deliver high-quality data and scientific products to government and the public.

2. **Project Outcomes:** A raised awareness of the use of geoscience data in marine environmental assessments by Australia's offshore resource industry and government. Emplacement of geoscience data and advice in the Australian Government's decision-making processes for offshore resource development and marine environmental management.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
    - Enhanced global attractiveness of Australian exploration investment opportunities ☑
    - Improved resource management and environmental protection ☑
    - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
    - An environmentally sustainable Australia ☑
    - Frontier technologies for building and transforming Australian industries □
    - Safeguarding Australia □
    - This project does not contribute to the NRPs □

5. **Key Performance Information:**
    - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
    - Quarterly output milestones met ☑
    - Project budget met ☑

- This project contributes to agency-level reporting obligations ☑

6. Project Outputs:

6.1 Output 1: Preparation of an environmental assessment report in support of future petroleum acreage release

6.1.1 Description: Report for the Department of Resources, Energy and Tourism summarising and synthesising environmental geoscience information for an offshore basin that will be released for petroleum acreage. This output is a deliverable of the Offshore Energy Security Program. Information synthesised in the report is designed to inform the Department on the seabed geoscience components of the acreage release areas. Information to be summarised include seabed geomorphology, sedimentology, oceanography, and benthic habitats.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☑
Q4 ☐

6.2 Output 2: Preparation of a report synthesising and integrating offshore seabed environmental data collected by Australia's petroleum industry

6.2.1 Description: A report on seabed environmental data collected by Australia's petroleum industry integrating these data with datasets held by Geoscience Australia. The results will be made available to stakeholders. The report will inform environmental management and infrastructure development in the region.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: Seabed mapping survey to the Bonaparte Basin

6.3.1 Description: This output involves the planning, execution and write-up of a seabed mapping survey to the Bonaparte Basin as part of a collaborative study with the Australian Institute of Marine Science (AIMS). The survey will collect baseline geological and geophysical data for the seabed. Data collected on the survey will be added to the regional synthesis (see Output 2).

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

6.4 Output 4: GIS of wave and tide energy for Australia's continental shelf as an assessment of alternative energy sources

6.4.1 Description: This output involves deriving datasets of wave and tide energy on Australia's continental shelf, which will be analysed using stochastic methods to assess their potential as alternative energy sources. The GIS can be

interrogated to provide information at two levels: 1) a national or regional overview, and 2) a detailed site analysis.

6.4.2 Output Delivery Date:

Q1 ☐
Q2 ☐
Q3 ☐
Q4 ☑

7. Information Management Considerations

SMAC will be updating the following fundamental national marine datasets:

- Geomorphic features = based on new 250 m bathymetry model + adding detail for the proposed acreage release areas and for the shelf from CERF surveys;
- Sediment texture and composition;
- GEOMACS outputs and GIS;
- Seascapes.

SMAC will also be adding the following national dataset:

- Seabed substrates.

8. Communications Strategies, including publication of Papers

- Publication of an environmental assessment for acreage release area;
- Publication of a GA Record on seabed environments for Bonaparte Basin region;
- Publication of post-survey report;
- Publication of AUSGEO News articles;
- Science delivery at conferences (GEOHAB 2010; AMSA 2010);
- Publication of scientific manuscripts on main research outcomes.

9. Risk Identification and Management Strategies

In the event of reallocation of staff, outputs will be revised

10. Workforce Planning/Succession Management

A second-in-charge for the project has been identified and been in place for the past two financial years. Senior project science staff, including recently promoted graduates, have been appointed as output leaders to help co-ordinate delivery of the outputs.

ANTARCTIC GEOSCIENCE

1. **Project Description:** Provide advice to government on issues relating to Antarctic geoscience as necessary, in particular, by updating the Australian National Antarctic Research Expeditions (ANARE) geoscience strategic plan, organising assessment of project proposals, and providing annual reports to government. It includes:
   - Leadership for Australian Antarctic geoscience research contributing to the Australian Government Antarctic Division (AAD) strategic plan; and
   - Geoscience research in the Antarctic where necessary.

2. **Project Outcome:** Maintenance of the Antarctic Treaty System (ATS) and enhancement of Australia's influence within the ATS; protection of the Antarctic environment; and improved understanding of the role of Antarctica in the global climate system.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities □
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Australian Antarctic geoscience program leadership

6.1.1 Description: Geoscience Australia provides the Geoscience Program Leader for Australia's Antarctic Program. This involves providing advice to government on geoscience issues in the Antarctic, organisation of project proposal reviews for Australian Antarctic Division, and participation on international Antarctic bodies. Outputs are the Annual Report to the Department of the Environment, Water, Heritage and the Arts on Australian

Antarctic geoscience research, and reports to international bodies involved in the Antarctic. GA also provides a contribution to the revised AAD Science Strategic plan which is being re-written in 2009.

6.1.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☐

6.2 Output 2: Benthic Bioregionalisation of Antarctic waters and controls on Vulnerable Marine Ecosystems

6.2.1 Description: Australian Antarctic Division (AAD) represents Australia at the Commission for the Conservation of Antarctic Living Marine Resource (CCAMLR). CCAMLR has called on member countries to identify and protect Vulnerable Marine Ecosystems (VMEs) and has begun the process of setting up a system of Marine Protected Areas. They wish to start with a bioregionalisation of Antarctic waters as a first step. The geomorphic mapping of the CCAMLR region developed by GA has provided a data layer that identifies some VMEs (e.g. seamounts). Other nominated VMEs include cold seeps, hydrothermal vents, coral and sponge communities.

Outputs for the CCAMLR VME workshop in USA in August:

- Two reports on the use of geomorphic mapping and using physical data sets in identifying likely locations of VMEs;
- Report to CCAMLR workshop documenting methods of identifying seeps and vents and identifying those known in CCAMLR region. Final report by mid 2010. Reports and data to be delivered to the Scientific Committee on Antarctic Research and CCAMLR.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☐
Q3 ☐
Q4 ☑

6.3 Output 3: Geological influences on the Antarctic marine environment

6.3.1 Description: Geological processes and settings exert strong controls on the marine environment and on benthic communities in particular. There is a need for enabling basic science to develop the management regimes needed in the Antarctic (see Output 2). This output delivers research that feeds management of marine ecosystems.

Outputs: Paper on the physical controls on benthic ecosystems in the George V Land margin for CAML special publication.

Post-survey report and data sets from a multibeam, video and sediment sampling survey offshore from Davis station in conjunction with AAD and the Australian Hydrographic Service.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☑

6.4 Output 4: Geology of the Australian Antarctic Territory continental margin

6.4.1 Description: GA is custodian of the Australian Antarctic Southern Ocean Profiling Project (AASOPP) and other seismic data. Outputs: publications on margin geology and geophysics with external collaborators.

6.4.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☐
Q4 ☐

7. Information Management Considerations:

Surveys (including bathymetry) database needs to be quality controlled and maintained.

8. Communications Strategies, including publication of papers:

Key international meetings**:**

1. CCAMLR VME workshop, La Jolla, USA 3-7 August. CCAMLR is a key policy setting forum for the Antarctic in which Australia seeks to exert influence. GA is providing an Invited Expert.
2. CAML special volume is a key output to establish the scientific credibility of the strategies being used in the Australian program.

9. Risk Identification and Management Strategies:

Risk: Loss and/or diversion of key staff. Management - Trying to get new staff familiar with issues and activities within the project.
Risk: Key staff fail Antarctic Medical. Management - Identify potential back up staff.

10. Workforce Planning/Succession Management:

The project still lacks sufficient experienced staff to deal with other unanticipated demands and still maintain outputs**.**

OZCOASTS

1. **Project Description:** The OzCoasts project provides web-based tools, geoscientific data, coastal environmental information (the OzCoasts website) and knowledge-brokering (National Estuaries Network) to help bridge gaps between science, management, community and policy making organizations.

2. **Project Outcome:** Improved natural resource management and environmental conservation of Australia's coastal zone, estuaries and near-shore environments.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**

- Enhanced global attractiveness of Australian exploration investment opportunities □
- Improved resource management and environmental protection ☑
- Safer communities and infrastructure □

4, **Project Link(s) to National Research Priority (NRP) Goals:**

- An environmentally sustainable Australia ☑
- Frontier technologies for building and transforming Australian industries □
- Safeguarding Australia □
- This project does not contribute to the NRPs □

5. **Key Performance Information:**

- Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
- Quarterly output milestones met ☑
- Project budget met ☑
- This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Delivery of web-based products for Department of Climate Change through OzCoasts

6.1.1 Description: Products to assist with quantifying coastal vulnerability around Australia. OzCoasts will draw together a diverse range of information on nearly 1000 of Australia's estuaries and ~10,000 of Australian beaches. This output aims to enhance the OzCoasts website with conceptual models illustrating the different beach morphologies found around Australia. A nationally-consistent Geomorphic Map of the Australian Coastal Zone will be produced.

6.1.2 Output Delivery Date:

Q1 □
Q2 □
Q3 □
Q4 ☑

6.2 Output 2: Chair and Coordinate National Estuaries Network meetings

6.2.1 **Description:** The National Estuaries Network is a network for coastal managers to exchange knowledge and keep up-to-date with scientific research. The bi-annual NEN forums are now a key mechanism for linking estuarine decision makers and scientists. For this output GA will coordinate the meetings in collaboration with partners from State and Commonwealth coastal management and research organisations.

6.2.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☑

6.3 Output 3: New Coastal Eutrophication Risk Assessment Tool in OzCoasts

6.3.1 **Description:** 'CERAT' is a coastal eutrophication risk assessment tool that was developed to help identify and prioritise management actions that protect and preserve coastal ecosystems. This output will make the CERAT tool available through OzCoasts.

6.3.2 Output Delivery Date:

Q1 ☐
Q2 ☑
Q3 ☐
Q4 ☐

7. Information Management Considerations:

OzCoasts requires:

- Significant data-base development, software engineering and BA support from the IDEAS Project ;
- Significant additional data storage requirements will be required if Department of Climate Change products are delivered.

8. Communications Strategies, including publication of papers

- Presentations/posters at science and management conferences (e.g. Coast to Coast, State coastal conferences and AMSA);
- AUSGEO News article on new content in OzCoasts website.

9. Risk Identification and Management Strategies:

- The IDEAS group at GA may not be able to complete aspects of the project within the designated time-frame due to unanticipated demands;
- Loss of key staff.

10. Workforce Planning/Succession Management :

The project lacks sufficient experienced staff to deal with other unanticipated demands and still maintain outputs**.**

PETROLEUM AND MARINE DIVISION LABORATORY

1. **Project Description:** The Laboratory provides specialist support in key discipline areas: oil, gas and marine geochemistry, palaeontological, sedimentological and water analyses.

2. **Project Outcome:** Timely delivery of high-quality results to projects across the agency. The continuing development of a range of laboratory techniques to achieve efficient outputs in an OH&S compliant environment.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure ☐

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries ☐
   - Safeguarding Australia ☐
   - This project does not contribute to the NRPs ☐

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☐

6. **Project Outputs**.

6.1 Output 1: Delivery of high-quality organic and marine geochemistry services

6.1.1 Description: the Geochemistry Laboratory processes samples and provides and high-quality petroleum and biogeochemical analyses services in a safe and timely manner, to support pre-competitive studies for the Offshore Energy Security Program.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Delivery of high-quality Palaeontology and Sedimentology laboratory services

6.2.1 Description: Provision of specialist services, including: sample preparation, data analyses, and imaging services in a safe and timely manner.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Ongoing support for the Oracle compliant database: Laboratory Submissions (LabSubs);
- Develop automated data capture of analytical results into Oracle 'ORGCHEM' system;
- Investigate improved Lab Subs technology, through the new Marine-Repository system.

8. Communications Strategies, including publication of Papers

- Inform clients on progress of work and seek feedback on performance.
- Involvement in scientific presentations and papers where required.

9. Risk Identification and Management Strategies

- Risk – OH&S incident. Management – ensure compliance with Standard Operating Procedures. Undertake risk assessments where required, subscribe to Chemwatch, ongoing staff training.

10. Workforce Planning/Succession Management

- Review operation of all GA labs to take advantage of synergies.

INFORMATION DEVELOPMENT AND ANALYSIS SERVICES

1. **Project Description:** IDeAS provides support and advice for all Divisional information management and information technology systems. This includes:
   - Development and support of information systems and tools within a corporate infrastructure;
   - Analysis, development and support of geospatial applications (ie. GIS, web & databases);
   - Providing business analysis, project planning and general project services (including communication, governance and support of corporate ICT).

2. **Project Outcomes:** Facilitate access by stakeholders to quality information. Provide a central Divisional point of contact for all ICT matters. Influence technical decisions on Information Management (IM) and the strategic IM direction for the Division and the agency.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - ➢ Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - ➢ Improved resource management and environmental protection ☑
   - ➢ Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - ➢ An environmentally sustainable Australia ☑
   - ➢ Frontier technologies for building and transforming Australian industries □
   - ➢ Safeguarding Australia □
   - ➢ This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - ➢ Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - ➢ Quarterly output milestones met ☑
   - ➢ Project budget met ☑
   - ➢ This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Develop and maintain GA collection, management and delivery systems

6.1.1 Description: Provide technical application advice and development services to PMD projects and maintain existing applications.

6.1.2 Output Delivery Date:

Q1 ☑

Q2 ☑

Q3 ☑
Q4 ☑

6.2 Output 2: Provide geospatial application analysis, support, data maintenance and archive

6.2.1 Description: Provide geospatial services to PMD projects ensuring maximum access to support divisional and external programs.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Provide business analysis and project planning

6.3.1 Description: Design and document business requirements for Divisional applications based on internal and external stakeholder input to support project outcomes.

6.3.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Populate and maintain application code library;
- Provide database development frameworks that take PMD and GA into an external client discovery and delivery model, including instigation of ANZLIG/ISO metadata standards, web services architecture, rapid data delivery, community standards and creative commons licensing for delivery of data.

8. Communications Strategies, including publication of Papers

- Improve communication with PMD staff with regard to Divisional ICT strategies;
- Engage with external stakeholders to ensure that our applications meet their needs;

9. Risk Identification and Management Strategies

- Risk – project slippage. Management – proactive project management with well defined deliverables and timeframes. Introduction of Taskforces to ensure science engagement;
- Risk - Sourcing appropriate staff to deliver taskforce requirements. Management – use contractors or short-term non-ongoing staff.

10. Workforce Planning/Succession Management

- Skills audit to ensure capability for data stewardship role is ongoing.

GEOPHYSICAL ANALYSIS AND DATA ACCESS

1. **Project Description:** This project provides geophysical and bathymetric services for internal and external clients.

2. **Project Outcome:** Management of Australia's bathymetry and acoustic datasets for the enhancement of marine environment and petroleum prospectivity within Australian offshore waters. Management of the acquisition and processing of seismic data, potential field data and other geophysical datasets for the enhancement of petroleum prospectivity within Australia.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection ☑
   - Safer communities and infrastructure ☑

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries ☐
   - Safeguarding Australia ☐
   - This project does not contribute to the NRPs ☐

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations ☑

6. **Project Outputs:**

6.1 Output 1: Acquisition, management and delivery of bathymetry and acoustic datasets

6.1.1 Description: Acquire and manage bathymetry and acoustic datasets for delivery to internal and external clients as part of the Offshore Energy Security Program.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Acquisition, management and delivery of geophysical datasets

6.2.1 Description: Acquire and manage geophysical data (Seismic, Potential Field etc) including processing, integration and archival support as part of the Offshore Energy Security Program.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Management of seismic interpretation platforms and preparation of acreage release seismic packages

6.3.1 Description: Systems management of seismic interpretation platforms. As part of the Offshore Energy Security Program manage all data loaded into the physical and virtual data rooms. Process coordinate, create, manage and distribute all relevant seismic data for an offshore Acreage Release data packages.

6.3.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Over the next year the following disk space will be required by the GADA group:
    - disk space for the load of work station data for the physical data room and client delivery;
    - disk space for the loading and processing of swath, seismic and sidescan from the Offshore Energy Security program;
    - disk space for the loading of existing data holding currently stored on external tape drives and tape.
- Investigation of higher speed network connections between server and PC. Many of the processing applications that will access and process this data are PC based;
- Analysis and monitoring of seismic interpretation platform/s, seismic analysis and other analysis applications for PMD projects.

8. Communications Strategies, including publication of Papers

- Ongoing liaison with IDeAS and Digital Data management projects to ensure data is catalogued and metadata correct;
- Ongoing assistance and support in publication of papers in journals and meetings by co-authoring and providing technical advice and involvement in scientific presentations and papers where required.

9. Risk Identification and Management Strategies

- Risk – provision of sub-standard data. Management - Assess and monitor quality of geophysics and bathymetry processing outputs;
- Risk – poorly scoped acquisition program. Management - Liaison with other projects to ensure acquisition services undertaken to meet project specifications.

10. Workforce Planning/Succession Management

- Management of staff time to ensure availability for surveys;
- Limited back-up for key staff – training other staff to broaden skills base.

GEOLOGICAL AND GEOPHYSICAL DATA REPOSITORIES

1. **Project Description:** Provision of efficient and effective archiving and access to the seismic data, well data, physical samples and other datasets, submitted under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA) and from other sources.

2. **Project Outcome:** To increase and improve petroleum exploration and resource management by rapid access to the OPGGSA and Geoscience Australia collections held within the Repositories.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection □
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: OPGGSA Collection

6.1.1 Description: Registration, cataloguing and preservation (including appropriate remastering) of well, seismic and other digital and physical data (including core, cuttings and fluid samples) submitted through the requirements of the OPPGSA and other sources. Ensure openfile data readily accessible to industry, and other stakeholders.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Digitisation of Hard-Copy OPGGSA Data and Reports

6.2.1 Description: Continued digitisation and archiving of hard-copy data and reports to support the annual Offshore Petroleum Exploration Acreage Release and to supply individual client data requirements for openfile data.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.3 Output 3: Corporate Physical Samples (Marine, Minerals and Rock Stores)

6.3.1 Description: Maintenance of, and provision of access to, non-confidential physical sample collections acquired by GA. Address preservation issues related to these collections through the identification of specific management plans for the individual collections.

6.3.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.4 Output 4: Digital Collections Migration

6.4.1 Description: Commence the migration of the Repository's digital media collection (tapes and optical media) to the Robotics Data System. Develop processes to automate data loading and QC.

6.4.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

The Marine and Repository Data Management System is now scheduled for implementation in 2009-2010. Repository staff will be required for further

requirements input, system testing and data migration support during this project.

8. Communications Strategies, including publication of Papers

The Repository now has a Client Services Unit with a dedicated client service manager. The client service manager is responsible for reporting to industry on any changes in the cost and methods of data supply.

9. Risk Identification and Management Strategies

A Business Continuity Plan was developed for the Repository in 2008-2009. This included the analysis and documentation of discreet business processes within the Repository and new lines of responsibility. Operating Procedures and Guidelines for each of these processes will be reviewed throughout 2009-2010.

10. Workforce Planning/Succession Management

The review of business processes subsequent to the audit review of 2007-2008 resulted in an organisational restructure of the Repository into three units with the identification of possible successors to each of the Unit Managers within each group. The demands of new digital technologies and the expanding volume and types of digital data being submitted to the Repository require continual technical training for staff.

PETROLEUM INFORMATION AND DATA MANAGEMENT

1. **Project Description:** Manage and populate Geoscience Australia's petroleum databases, including information submitted under the OPGGSA 2006. Data types include well header data (WELLS), biostratigraphic data (STRATDAT), depositional environments and reservoir data (RESFACS), source rock and maturity data (ORGCHEM), checkshot data and directional survey data (DEVIANT), and seismic and marine surveys.

2. **Project Outcome:** Provision of comprehensive and accurate data for Geoscience Australia projects and industry stakeholders.

3. **Project Link(s) to Intermediate-level Agency Outcomes:**
   - Enhanced global attractiveness of Australian exploration investment opportunities ☑
   - Improved resource management and environmental protection □
   - Safer communities and infrastructure □

4. **Project Link(s) to National Research Priority (NRP) Goals:**
   - An environmentally sustainable Australia ☑
   - Frontier technologies for building and transforming Australian industries □
   - Safeguarding Australia □
   - This project does not contribute to the NRPs □

5. **Key Performance Information:**
   - Level of uptake by, and satisfaction levels of, key stakeholders with GA outputs ☑
   - Quarterly output milestones met ☑
   - Project budget met ☑
   - This project contributes to agency-level reporting obligations □

6. **Project Outputs:**

6.1 Output 1: Management, population, and delivery of the well and well-related databases

6.1.1 Description: Delivery of petroleum databases in support of GA projects, technical advice, the 2010 Acreage Release, and the wider petroleum exploration industry.

6.1.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

6.2 Output 2: Management, population, and delivery of seismic, marine and coastal survey databases

6.2.1 Description: Delivery of survey databases in support of GA projects, technical advice, the 2010 Acreage Release, and the wider petroleum exploration industry.

6.2.2 Output Delivery Date:

Q1 ☑
Q2 ☑
Q3 ☑
Q4 ☑

7. Information Management Considerations

- Work with PMD Database staff to improve the management, discovery and delivery aspects of the Petroleum databases; ensuring confidentiality of data is of prime importance.
- Ensure all key inputs and outputs are stored in corporate-compliant Oracle databases.

8. Communications Strategies, including publication of Papers

- On-going good communication with internal clients, mainly the various projects and staffs;
- Ensuring communication of usage and improvements with GA's internal and external clients;
- On-going assistance and support in publication of papers in journals and meetings by co-authoring and providing technical advices;
- Communication of developments with industry and state geological surveys through correspondence and visits, attending and presenting at petroleum data management conferences (PPDM etc) and data managers meetings (including Petroleum Consultative Data Group, State Data Managers).

9. Risk Identification and Management Strategies

- Risk - Loss of expertise and insufficient staff to deliver acreage release data entry. Management - high priority placed on retaining critical staff and using contract staff if required;
- Risk - release of confidential data. Management - has been mitigated by introduction of multiple traps in internet applications and staging areas where compiled acreage release data files can be rigorously checked prior to release. Continual development and maintenance on data entry/data delivery applications and staff training required for handling confidential data.

10. Workforce Planning/Succession Management

- High emphasis placed on cross training staff and ongoing documentation of processes to reduce impact of staff attrition and reduce training time of new staff;

- Identification and implementation of successful strategies within the project to ensure workforce planning and succession management;
- Use Agency-developed procedures where appropriate.