

# Fieldnotes

## Camels, cars and compasses: 150 years of geological mapping in WA

An exhibition celebrating 150 years of mapping by the Geological Survey of Western Australia (GSWA) opened on 5 August at the Australian Miners and Prospectors Hall of Fame in Kalgoorlie. The display runs until the end of September.

Since the middle of the 19th Century, adventurous men and women have criss-crossed the outback of Western Australia on the back of camels and horses, and finally with cars, in search of mineral and petroleum deposits and studying the rocks that contain them. They had to be resourceful and robust to withstand the harshness of this country, and in the early days of exploration they had to find their way in uncharted and difficult territory, often with only a compass to guide them back home.

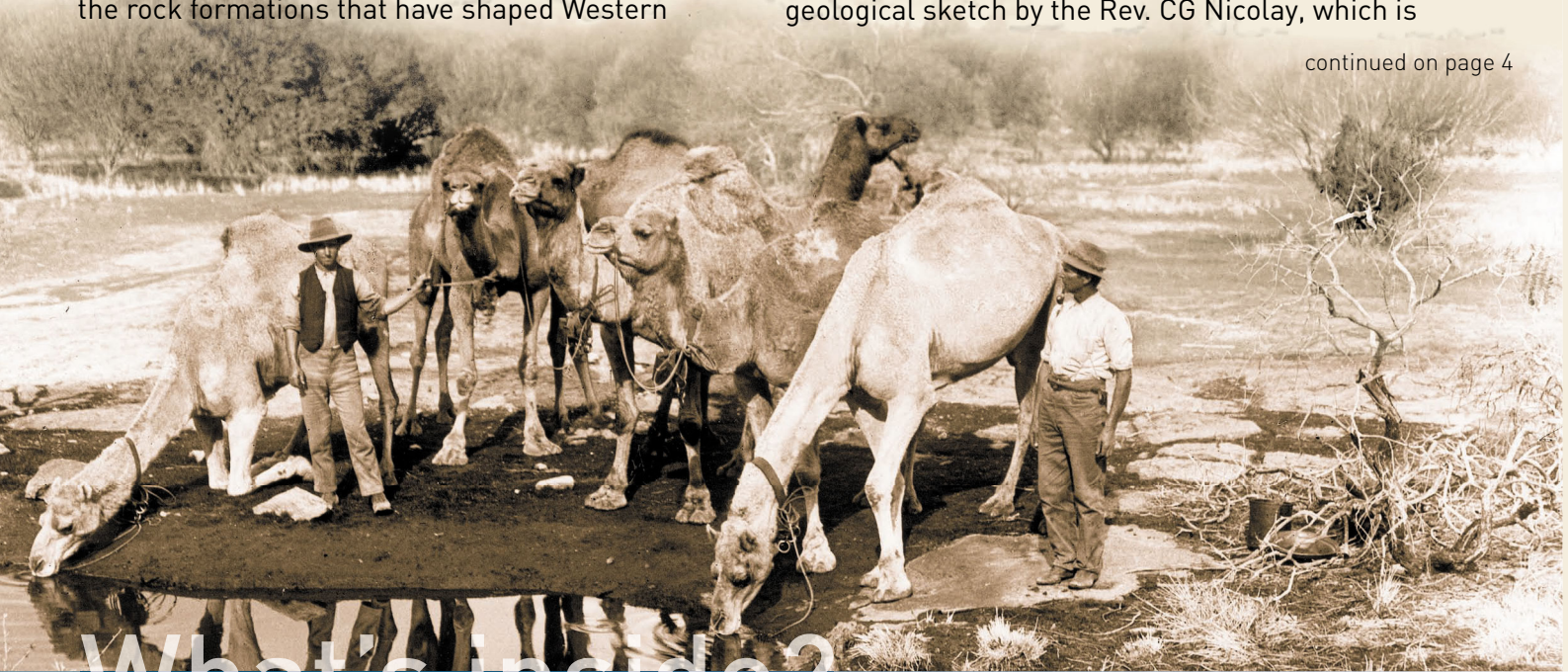
In the course of their expeditions, these geologists have mapped this vast and richly endowed State, and produced detailed geological maps to document the rock formations that have shaped Western

Australia for nearly four billion years. The work of GSWA continues today, to record rock formations in even more detail — work essential to support the enormously wealthy resource industry on which our lifestyles depend.

In this exhibition, GSWA has sought to portray the contributions of the many geologists who have worked for the government since the middle of the 19th Century, and to illustrate how our knowledge and understanding of the geology of the State has evolved since the inception of geological mapping in Western Australia more than a century and a half ago.

At the core of the exhibition is the complete collection of the 12 State geological maps published to date, including both originals and digitally enhanced copies of the oldest and more-fragile maps. The State map series opened with the geological sketch by the Rev. CG Nicolay, which is

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## DigitalPaper user tip #9


If you have recently accessed the WAMEX system to search company mineral exploration reports, or visited our Publications website <<http://www.doir.wa.gov.au/GSWA/publications>> (or simply selected Geological Survey of Western Australia from Publications on the orange bar on the DoIR website), you will know that we have a document server for the delivery of our online documents. Here is the ninth in a series of user tips to help you get the most out of DigitalPaper.

### Navigating DigitalPaper

DigitalPaper has been created to be simple and easy for any user to navigate from document to document. After you have searched for the document you require, clicking on any of the search results will open the document.

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From the document view, you can navigate through other documents in your search results and back to other sections of DigitalPaper using the buttons at the top right of the window:

 The **Close Viewer** button will return you to your search results.

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Do not navigate with your browser's forward/back buttons.

For more information, contact Ryan Aston ([ryan.aston@doir.wa.gov.au](mailto:ryan.aston@doir.wa.gov.au)).

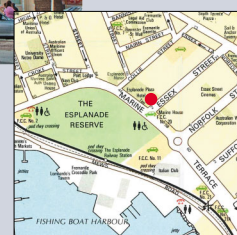


## GSWA Seminar and Poster Display

Thursday 14 February 2008



Venue: Esplanade Hotel Fremantle  
Cnr Marine Tce & Essex St  
Fremantle



GSWA's Seminar and Poster Display will again showcase to mineral and petroleum explorers early results of its ongoing work program. GSWA will also demonstrate current exploration data and software available online.

In addition to our regular mapping program update, focus will be on products from the WA Government's \$3 M per annum additional funding primarily for airborne geophysical surveys, regional gravity surveys and new geochronological data.

Throughout the day there will be geological presentations on GSWA activities and an extensive poster display. A feature of the day will be a panel discussion on the role and work programs of GSWA.

This seminar will follow the RIU Explorers Conference held at the same venue. Stay tuned for more information closer to the date but mark your calendars now!



For more information,  
contact Nell Stoyanoff ([nell.stoyanoff.wa.gov.au](mailto:nell.stoyanoff.wa.gov.au)).



# Customer Satisfaction Survey

## GSWA's customers surveyed

The GSWA 2007 Customer Satisfaction Survey was undertaken as an e-survey in June 2007. This was the fourth in a series of surveys (previous surveys were taken in 1994, 1998 and 2003). The 2007 questionnaire was completed online, or using a printed version of the questionnaire for respondents who did not have access to the Internet. One hundred and twenty-nine effective responses were received, the majority of which were from the private sector — explorers or production companies that are largely Australian based. The survey highlighted the fact that some respondents did not know that all online products may be downloaded free of charge. Other key findings are summarized below.

### Products and services

- More clients are aware of all GSWA products either to purchase or download from the GSWA website. Over 90% of total respondents were aware of the range of products supplied by GSWA.
- There is a significant increase in customers using geological, geophysical, geochemical, resource and technical data in *digital* form.
- Almost 75% of the respondents surveyed in 2007 use mapping software to view geoscience mapping data. The predominant software used is Mapinfo, but many respondents also use ArcGIS and a combination of other software.

- PDF is the preferred format for reports and books.
- Over 75% of respondents have been using GSWA products for more than five years.

### Satisfaction

- Overall ratings show that respondents were fairly satisfied in all areas of GSWA.
- Satisfaction in the quality of products stands out and has been highly rated over the past nine years.
- 60% of respondents considered that the rate of release of information has improved in the last four years.

## Rating GSWA

### The organisation

- The attitudinal questions revealed that GSWA is seen as inadequately resourced. This has been a consistent perception since 1998.
- Compared to other similar organisations around Australia, GSWA is rated about the same or better than other organisations by 70% of respondents. However, there is a smaller but increasing proportion of the sample that considers GSWA as rated lower than similar organisations in Australia because it is seen to be under-resourced.

### The staff

- The responses indicate that staff are very courteous and professional.

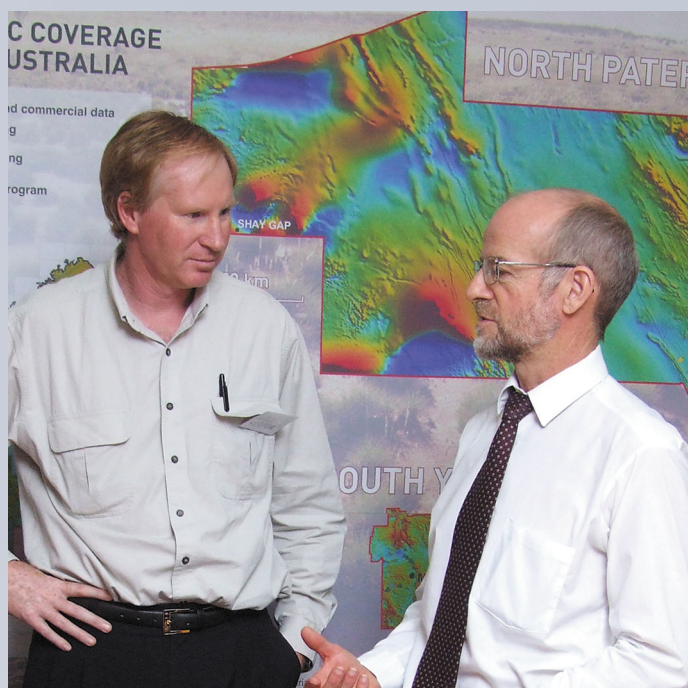
## Prize-winning respondent

GSWA offered the chance to win two bottles of wine to all respondents. The winner of the prize was Grahame Kennedy of Maximus Resources Ltd, who collected his prize from Mineral House recently.

Thanks to all who participated in the survey.

For more information, contact Jenny Mikucki ([jenny.mikucki@doir.wa.gov.au](mailto:jenny.mikucki@doir.wa.gov.au)).

*Grahame Kennedy (left) receives the wine for participating in the 2007 Customer Satisfaction Survey from Tim Griffin, Executive Director, GSWA*







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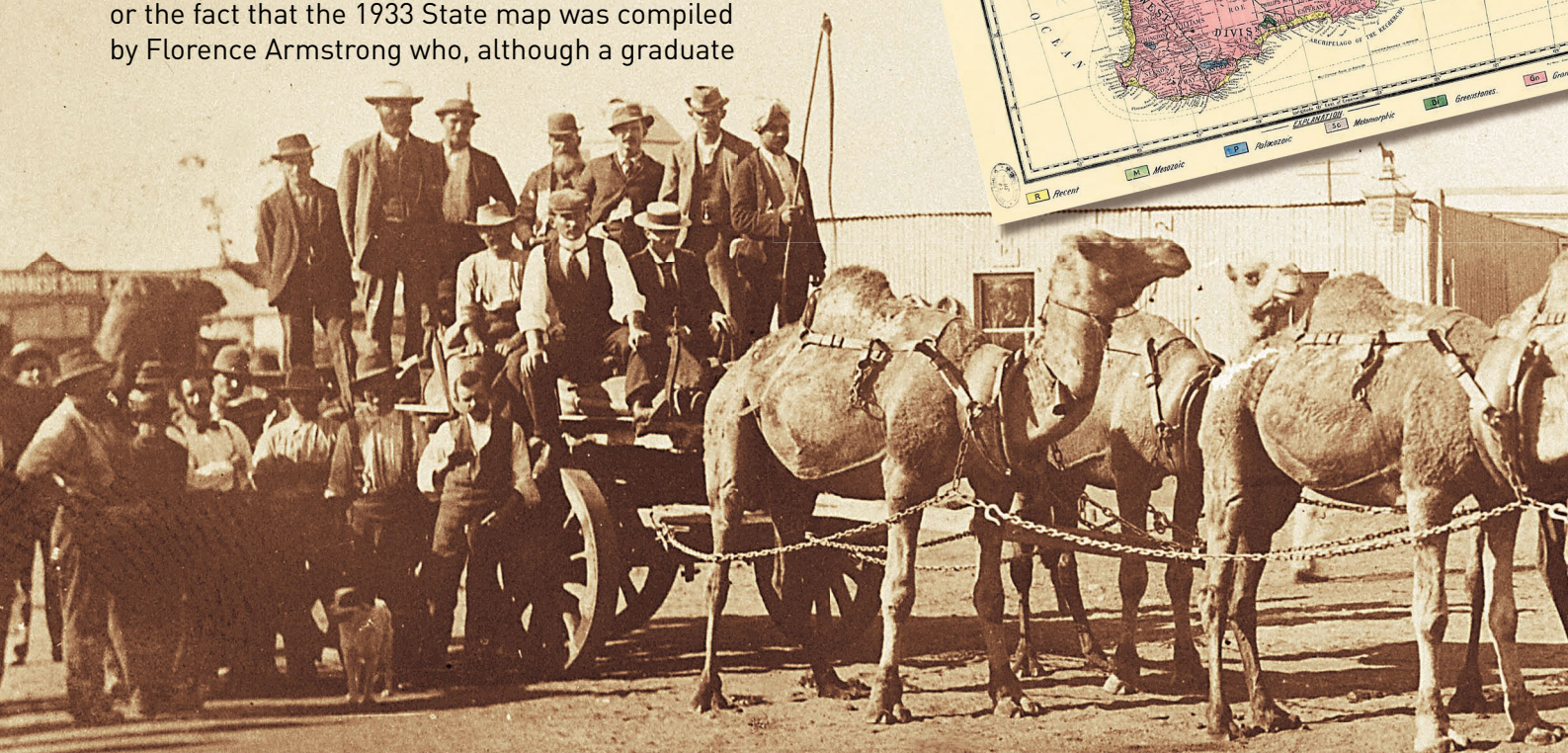
thought to have been compiled as part of the paper 'Some notes on the geology of Western Australia' for the Colonial and Indian Exhibition of 1886. State maps that followed this early effort were published at intervals of roughly 10 years, with a longer gap during World War II. Some of the State maps were released to coincide with important events or celebrations, such as the release of the first compendium on the geology of Western Australia by Gibb Maitland in 1920, or the sesquicentennial of the State of Western Australia in 1979. The 1988 State map was published to celebrate the centenary of the establishment of GSWA.

The colourful display of all the State maps together brought to immediate attention some of the important landmarks in the evolution of the way mapping is conducted. The 1957 State map was the last which depended largely on mapping carried out by traditional methods (plane-table, telemetry, and pace and compass) and guesswork. From the 1966 State map onwards, the use of airphoto interpretation and progressively more refined aeromagnetic images has led to the portraying of increased structural details. Advances in the ability to date rocks precisely have led to more accurate depiction of time scale and of stratigraphic relationships.

Notes accompanying the maps also pointed out interesting snippets of information, such as the change in the 1966 State map from the previous Imperial 1 inch to 40 miles to the metric 1:2 500 000, or the fact that the 1933 State map was compiled by Florence Armstrong who, although a graduate

in geology from UWA, was only employed by GSWA as a clerical assistant. It would be another 40 years before GSWA would employ the first woman geologist.

The State maps of the future will be largely produced digitally using state-of-the-art technology. Fittingly then, the State map series concluded with a computer where the current 1:500 000 State map





# Camels, cars and compasses



could be viewed onscreen using GeoView, our online browser-based visual tool for exploring GSWA's geoscience datasets. Digital production allows immediate updates of the map as new geological information is collected by GSWA's geologists.

The State map collection was preceded by selected historical maps that illustrate how early mapping progressed in different parts of the State. These included reproductions of some of the maps of the early Government Geologists, including the 1848 geological sketches by Ferdinand von Sommer for the areas nearest Perth, an 1870 map covering the southern part of the State, and the 1884 map of the Kimberley published under the then-Government Geologist ET Hardman that sparked the gold rushes in Western Australia with its depiction of areas of alluvial and reef gold at Halls Creek.

A second part of the exhibition was dedicated to Andrew Gibb Maitland, who was appointed as Government Geologist in November 1896. At the request of the Minister for Mines, Maitland drew up proposals for a formal Geological Survey department within the Ministry, with staff

comprising assistant geologists, chemists and an assayer, topographic surveyor, lithographic draftsman, clerk/accountant, and cadet, and the establishment of a laboratory, library, and geological museum. Gibb Maitland was the Director of GSWA until 1926; his definitions of the functions of GSWA are still basically unchanged today.

Gibb Maitland's work was illustrated by framed originals of some of the maps that he compiled in person or that he supervised, complemented by one of his neatly annotated field maps, and an array of mapping tools and instruments that were used at the time for geological surveying. Enlarged black and white photos showing life in geological survey camps in the early part of last century, and illustrating the variety of transport modes used by GSWA geologists at the time, were also on display.

The career of Gibb Maitland has been well-celebrated and several accolades were awarded to him. Maitland was awarded the Von Mueller medal for the advancement of science, the medal of the Royal Society of Western Australia, and the King's Silver Jubilee Medal. He was also awarded the Clark Memorial Medal, but this has been mislaid. The Maitland family has kindly lent the Mining Hall of Fame some of these medals for display as part of this exhibition.

For more information, contact Angela Riganti ([angela.riganti@doir.wa.gov.au](mailto:angela.riganti@doir.wa.gov.au)).







# Data and Software Centre

## DATA AND SOFTWARE CENTRE

West Australian Resource Information and Map Services



The [Data](#) and [Software](#) Centre enables the download of statewide spatial datasets and various spatial application software, including GeoVIEWER.VIA and the Mineral Exploration Reporting Templates Software.

Each dataset zip file contains the following:

- Metadata statement (HTML File).
- The Dataset (unproject, geographical coordinates based on the 1994 Geocentric Datum of Australia (GDA94)).
- Licence statement (text file).

To view a dataset's metadata, click on the dataset name. The last updated column will assist you in determining the latest dataset or software build.

To download a dataset, click on the [Download link](#) and select a data format.

For instructions on using KML / KMZ files in Google Earth [click here](#).

### Statewide spatial datasets

- ☐ Airborne geophysics
  - [Commercial](#)
  - [Government](#)
  - [Registered](#)
- ☐ Geochemistry
- ☐ Geochronology
- ☐ Geology
- ☐ Indexes
- ☐ Mineral information
- ☐ Petroleum information

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### Statewide spatial datasets

- ☐ Airborne geophysics
- ☐ Geochemistry
- ☐ Geochronology
- ☐ Geology
- ☐ Indexes
- ☐ Mineral information
  - [Current Tenements \(Live and Pending\)](#)
  - [Dead Tenements](#)
  - [Historical exploration activity \(EXACT\)](#)
  - [Mineral drillholes](#)
  - [Mineral fields](#)
  - [Mines and mineral deposits \(MINEDEX\)](#)
  - [Southwest titanium project](#)
- ☐ Petroleum information

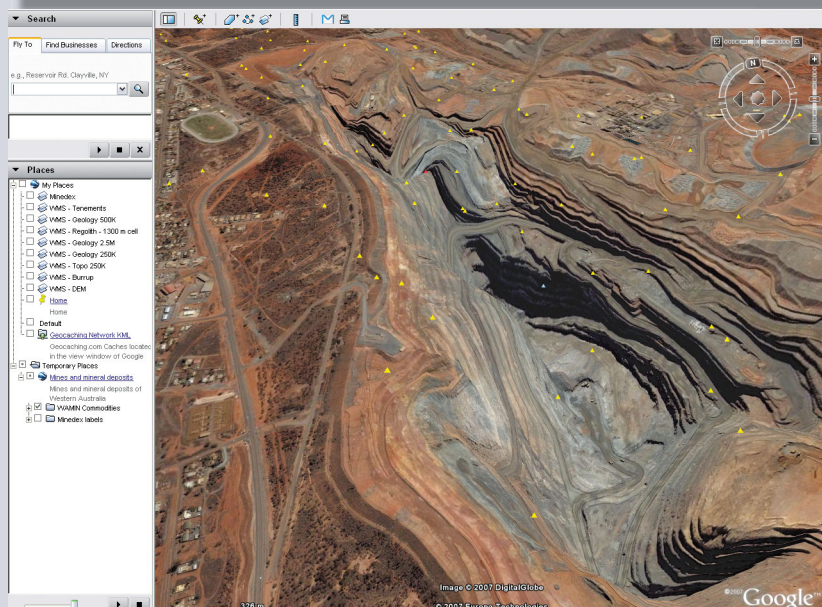
Current Tenements (Live and Pending)			
Download	Last Updated	Size	File Format
<a href="#">Download</a>	05/07/2007	4 MB	ESRI SDE Export
<a href="#">Download</a>	05/07/2007	7 MB	ESRI Shape File
<a href="#">Download</a>	05/07/2007	7 MB	Google Earth KML / KMZ File
<a href="#">Download</a>	05/07/2007	5 MB	MapInfo TAB File

S01726

#### Attributes

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Site_long_name	BODDINGTON BAUXITE
Site_type	MINE OPENPIT
Commodity_group	ALUMINA
Site_short_name	Boddington Bauxite
Site_commodities	BAUX
Project_name	WORSLEY
Project_commodity_group	BAUXITE - ALUMINA
EXTRACTION_DATE	05/07/2007

Directions: [To here](#) - [From here](#)



## Google Earth formats now available for mineral deposits and mineral tenements

The Data and Software Centre has again been enhanced to make it a more valuable resource for our customers. The latest enhancements include:

- less complex browsing
- more data
- more data formats
- more frequent updates.

Expandable categories have been implemented. Click on the “+” next to a category to see all data available in that category.

New data are being added to the Data and Software Centre as they become available and data already held are being prepared for inclusion. The 1:50 000 environmental and urban series has been added along with the new 1:500 000 Geology and Tectonic units data. All geological series maps (1:100 000 and 1:250 000) released during the 2006–07 financial year are now available for download.

More data formats have been added. Google Earth KML/KMZ files and ESRI SDE export files have been included with the MapInfo TAB files, ESRI shape files and CSV files already available. Simply place the cursor on the Current Tenements (Live and Pending) “download” link to see what data formats are available.

Where possible, hyperlinks are included with Google Earth data format. For example, you can view the Mines and Mineral Deposits (MINEDEX) data in Google Earth; clicking on the Web Link will take you to the relevant page in our MINEDEX on the Web application.

Data is being updated more frequently. For example Current Tenements (Live and Pending), and Mines and Mineral Deposits (MINEDEX) are just two datasets that are updated on a daily basis.

To have a browse or download our data go to <http://www.doir.wa.gov.au/datacentre/>.

For more information, contact  
Neville D'Antoine ([neville.dantoine@doir.wa.gov.au](mailto:neville.dantoine@doir.wa.gov.au)).



# Geophysics survey program

## GSWA regional geophysics survey program

### Radiometric anomaly grids (80 m) of Western Australia — Edition 1, 2007

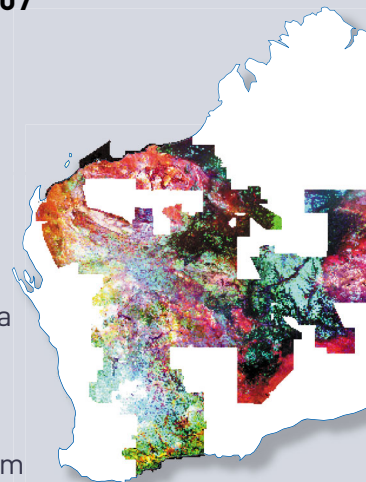
GSWA is in the process of compiling a set of merged radiometric grids of potassium, thorium and uranium with 80 m cell size generated from Federal and State government datasets acquired with a line spacing of 500 m or less and selected open-file datasets. Edition 1 covers the region south of 20°S. Subsequent editions will increase coverage to the north and fill in holes as new data become available.

These 80 m grids complement the radiometric grids at 250 m cell size for the whole of continental Australia presently being compiled by Geoscience Australia (GA). The (as yet unpublished) GA grids have been used as a base reference in compiling the Western Australian 80 m grids.

The complete dataset is 4 Gb in size (1.4 Gb for each of the three grids) and, at present, is only available on DVD from GSWA; it is not available by download from the Geoscience Australia GADDS facility.

Available for \$99 (inc. GST) from 22 August 2007 via request submitted from the GSWA website at <<http://www.doir.wa.gov.au/GSWA>> (Regional Geophysical Surveys page).

For more information, contact David Howard ([david.howard@doir.wa.gov.au](mailto:david.howard@doir.wa.gov.au)).



## AESC 2008

### New generation advances in geoscience

The Geological Society of Australia (GSA) and the Australian Institute of Geoscientists (AIG) are delighted to invite you to the Australian Earth Sciences Convention 2008 to be held at the Perth Convention Exhibition Centre, Western Australia, 20 to 24 July 2008.

This is your opportunity to gain new insight into Western Australia's unique geology and tectonic history, and join an outstanding selection of international speakers, industry leaders, and key decision makers in Perth. Western Australia is home to a globally significant mining and petroleum industry dependent on leading edge geoscientific data and technology.

Be part of this premier showcase of Australian geoscience and participate in a program of sessions designed to address contemporary Earth Science issues during the International Year of Planet Earth!

#### Call for Abstracts

**Deadline for submission of abstracts: Tuesday 11 December 2007**

**Authors notified: Friday 8 February 2008**

Abstracts are invited for 20-minute oral presentations or poster presentations, which incorporate the following themes:

- Geoscience in the service of society
- Resources — foundation of our future
- The evolution of life and the solar system
- Earth's environments: past, present and future
- The dynamic Earth — from crust to core

#### Convention organising committee

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Ian Fitzsimons  
Sue Fletcher  
Marcus F Harris  
Jon Hronsky  
Bree Goff  
Tim Griffin  
Sandra Occhipinti  
Rick Rogerson  
Jocelyn Thomson

#### For more information, contact:

##### AESC 2008 Convention Secretariat

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Fax: +61 (8) 9381 9560  
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# Product releases

All prices include 10% GST

## RELEASED

### ■ MAPS

1:100 000 Geological Series

MOUNT PHILLIPS, BELL ROCK, MOUNT AUGUSTUS, PEEDAWARRA

1:250 000 Geological Series

NULLAGINE 3rd edition

### ■ RESOURCE POTENTIAL FOR LAND USE PLANNING

Kalgoorlie–Boulder town site, and surrounding areas  
(1:25 000 scale)

### Non-series

Iron ore deposits of the Pilbara region — 2007

Iron ore deposits of the Yilgarn Craton — 2007

### ■ 1:100 000 GEOLOGICAL INFORMATION SERIES

Central Yilgarn, 2007 update

Murchison

West Musgrave, 2007 update

West Tanami, 2007 update

### ■ GEOLOGICAL EXPLORATION PACKAGE

Southern Yilgarn

### ■ MISCELLANEOUS DIGITAL PRODUCTS

Compilation of geochronology data, 2007 update

GSWA publications 2006–07

Tectonic units of WA 2007, GIS layer in GeoVIEW.WA

Western Australian petroleum acreage release,  
September 2007

### ■ REPORT

Report 104 Geochemistry of volcanic rocks, northern  
Pilbara Craton

### ■ RECORDS

2007/3 Structural and lithological evolution of the Jack  
Hills greenstone belt, Narryer Terrane, Yilgarn Craton

2007/5 Copper–lead–zinc in Western Australia:  
commodity review for 2005–06

2007/7 Blackstone 1:100 000 map sheet gravity survey  
— technical summary

2007/10 Neoproterozoic reworking in the  
Paleoproterozoic Capricorn Orogen

2007/11 Stratigraphy and facies of the 3.43 Ga Strelley  
Pool Chert

2007/12 Nickel–cobalt in Western Australia: commodity  
review for 2005

### ■ 1:100 000 GEOLOGICAL SERIES EXPLANATORY NOTES

ERAYINIA, YILGALONG

## IN PROGRESS

### ■ GEOLOGICAL MAPS

1:100 000 Geological Series

BULDANIA, COWALINYA, MARBLE BAR, MINERIE, MOUNT EDGAR v. 2

### ■ RESOURCE POTENTIAL FOR LAND USE PLANNING

Sand resources south of Perth

### ■ GEOLOGICAL INFORMATION PACKAGES

Western Capricorn (MOUNT PHILLIPS, EUDAMULLAH,  
MOUNT AUGUSTUS)

### ■ MISCELLANEOUS DIGITAL PRODUCTS

Iron ore deposits of the Pilbara region — 2007

LEGENDRE outcrop geology layer

### ■ RECORDS

2007/14 Composition of the Bunbury Basalt (BB1) and  
Kerba Monzogranite (KG1) geochemical reference  
materials

2007/15 Stratigraphy and structure of the Kalgoorlie  
Terrane

2007/16 Magnetotelluric investigation into the electrical  
structure of the Capricorn Orogen, WA

2007/19 Diversity of structurally controlled gold through  
time and space of the central Eastern Goldfields  
Superterrane — a field guide

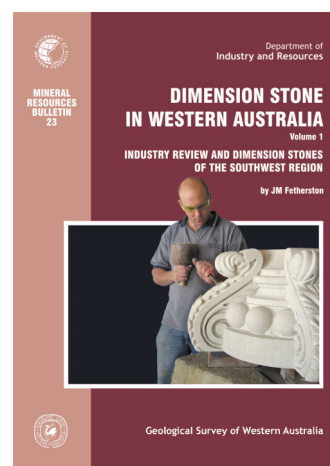
2007/20 A geological traverse across the northern Yilgarn  
Craton — a field guide

### ■ 1:100 000 GEOLOGICAL SERIES EXPLANATORY NOTES

YARDINA

### ■ MINERAL RESOURCES BULLETIN

Dimension stone in Western Australia Volume 1



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