



ontheoutcrop

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ontheoutcrop is a Geological Survey of New South Wales (GSNSW) e-newsletter. For more information about newsletter items go to: <http://www.dpi.nsw.gov.au/minerals/geological>

GEOLOGICAL MAPPING & GEOPHYSICAL PROJECTS is the theme for this issue.

CONTENTS

1. [Upcoming events](#)
2. [New products and services](#)
3. [Project highlights](#)
4. [Recent events](#)
5. [Staff movements](#)
6. [Products and enquiries](#)
7. [Subscriptions](#)

UPCOMING EVENTS

PDAC, 7–10 March 2010, Toronto, Canada

John Watkins, the Acting Director of GSNSW, will join Team Australia at the Prospectors & Developers Association of Canada international mining investment show.

37th Symposium on the Geology of the Sydney Basin, 6–7 May 2010, Pokolbin, NSW

Organisers are calling for papers for the symposium. Contact Darren Hope, darren.hope@maptek.com.au. For more information on the symposium go to: <http://megms.com.au/sydbasin> or contact Marianne Harvey, marianne.harvey@megms.com.au.

Exploration in the House, Parliament House Theatre, Sydney, June 2010

The GSNSW seminar will be held in mid June 2010. Watch the GSNSW website for confirmation of dates and program.

NEW PRODUCTS AND SERVICES

Free map downloads

[NSW 1:1 500 000 & 1:3 000 000 Surface Geology maps](#)

The 1:1 500 000 Surface Geology map is an up-to-date synthesis of the surface geology of the state. A simplified version is available at 1:3 000 000 in a shirt pocket sized format.

[NSW 1:1 500 000 & 1:3 000 000 Mineral Resource Project maps](#)

The Mineral Resource Project maps show the locations of major mines and advanced exploration projects for metallic and industrial minerals, gemstones, coal and petroleum in NSW, infrastructure and major geology.

Jerilderie/Oaklands Basin and Broken Hill regions merged into Statewide Gravity Image

The new gravity data recently acquired over the Jerilderie/Oaklands Basin and Broken Hill regions have been merged into the statewide gravity data set and are available as 500 m gridded data and ECW, JPEG and GeoTiff images. They can be downloaded from [GADDS](#). Individual datasets are also available on request from: geophysics.products@industry.nsw.gov.au

Thomson Orogen Project products

New *Frontiers* work-in-progress products are now compiled on a single DVD available through geoscience.products@industry.nsw.gov.au.

The compilation includes:

- a preliminary 3D depth-to-basement data set presented as an interactive 3D Adobe PDF (viewer included), and text files of the drill hole database
Contact: Stephen Dick stephen.dick@industry.nsw.gov.au 02 4931 6721
- a 1:250 000 interpretative regolith map generated from supervised classification of spectral response in satellite and radioelement data
Contact: Marta Vega Faundez marta.vega.faundez@industry.nsw.gov.au 02 4931 6677
- a preliminary geophysical/geological interpretation map of the Thomson Orogen based on regional geophysical datasets (particularly aeromagnetics), and integrating available geological information
Contact: Rosemary Hegarty rosemary.hegarty@industry.nsw.gov.au 02 4931 6597
- the [CRC LEME Explorers' Guide](#)

BHEI2009 product release

Products released at BHEI2009 included:

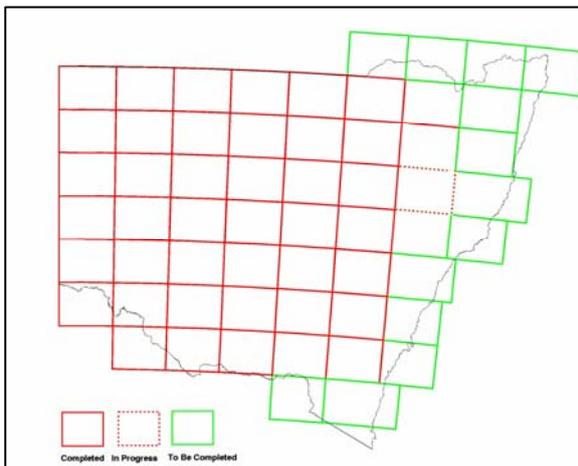
- Preliminary 1:100 000 interpretive map of the Broken Hill Proterozoic available as a high resolution rectified JPEG
- 190 000 point NITON field portable XRF dataset
- Reprocessed HyMap hyperspectral data over Broken Hill
- Reprocessed Broken Hill radioelement data. In 1995, Geoscience Australia acquired and released 160 000 line kms of airborne radioelement data over the Broken Hill Block. GSNSW reprocessed the raw spectral data using recently available radiometric data processing techniques such as spectral smoothing. This has significantly improved the sharpness and clarity of the imaged data.
- 25 m grid of the airborne magnetic data
- 2 km gridded gravity data
- BHEI talks, field trip notes and products listed above are available on request from: BHEI.info@industry.nsw.gov.au
- [BHEI2009 abstracts are available from Geoscience Australia](#)
- Koonenberry talks and field trip notes for BHEI2009 are available from:

Phil Gilmore, Senior Geologist, phil.gilmore@industry.nsw.gov.au, 02 4931 6533

For print on demand Koonenberry maps, contact: geoscience.products@industry.nsw.gov.au

Pre-release notice — 1:250 000 statewide geophysical products map series

A new suite of geophysical images and grids based on the 1:250 000 scale sheets within NSW are being compiled. It includes gridded data and images as ECW, GeoTiff and JPEG in GDA94 Geodetic, MGA zone and NSW Lamberts94 format. These images will be included in the Product Catalogue on our website at the time of their formal release.



The imagery includes:

TMI, TMI RTP, 1VD TMI, 1VD TMI RTP, Ternary K/U/Th, Bouguer Gravity, Isostatic Bouguer Gravity, SRTM DEM, DEM, Landsat-7 Principle Components 1 2 & 3, 2VD TMI, Greyscale TMI, Isostatic Bouguer Gravity Over Isostatic Bouguer Gravity Tilt Filter, Greyscale Isostatic Bouguer Gravity Tilt Filter, TMI RTP Over TMI RTP Tilt Filter and Greyscale TMI RTP Tilt Filter.

The suite of geophysical images will cover the 1:250 000 map sheet areas shown in red.

Contact: Dave Robson, Team Leader Exploration Geoscience, david.robson@industry.nsw.gov.au 02 49316717

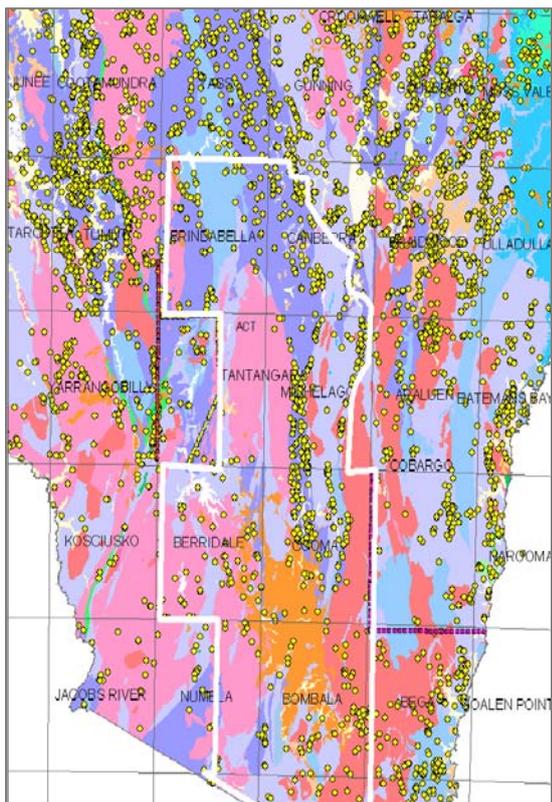
Quarterly Notes 132 — Mineral Systems of the Murray Basin, New South Wales

[Quarterly Notes 132](#) provides a regional analysis of minerals systems involved in the formation of the mineral resources of the Murray Basin, concentrating on NSW. Directions for future investigations and exploration are discussed, and commodity mineral systems are covered in detail in the appendices.

PROJECT HIGHLIGHTS

GEOPHYSICS PROJECTS

Southeast Lachlan Airborne Geophysical Survey



GSNSW will acquire a large airborne geophysical survey, funded under the *New Frontiers* 2009–2010 initiative. The survey will cover the Lachlan Orogen in the southeast corner of NSW and includes the Eden, Bombala, Delegate, Cooma, Adaminaby and Tumut regions.

Over a period of 3 months, both magnetic and gamma-ray data will be acquired along approximately 75 000 kms of east–west lines. These will be separated by 250 m within NSW and 500 m within the ACT. The data are expected to be released mid 2010.

Outline of proposed Southeast Lachlan survey (white outline) on a backdrop of geology and mineral (mostly gold) occurrences.

Contact: Dave Robson, Team Leader Exploration Geoscience, david.robson@industry.nsw.gov.au 02 49316717

Geophysical modelling of circular magnetic anomalies in the Murray Basin

Approximately five hundred, 1–3 km diameter, magnetic anomalies in a 250 km swath trending ENE were identified in geophysical interpretation work over the Hay–Balranald 1:250 000 map sheet areas. Magnetic modelling, with remanence, generated elliptical source bodies that are approximately 200 m wide (long axis) and have magnetic susceptibility values comparable with intermediate volcanic rocks. The interpreted bodies have a pipe-like shape, are near vertical and could correspond to volcanic plugs or diatremes which may have potential to host diamonds or gemstones. A Late Permian date for the anomalies has been inferred by comparing the magnetic inclination, declination and intensity of the modelled remanence values to the palaeomagnetic polar wandering curves. Similar magnetic anomalies in the Koonenberry Belt–western Thomson Orogen, with a similarly inferred age, have been explored for diamonds and precious and base metals.

Ground magnetic and gravity surveys were completed in the Hay–Balranald area to better define the position and depth-to-top of the modelled sources.

Contact: Astrid Carlton, Geophysicist: astrid.carlton@industry.nsw.gov.au, 02 4931 6732

Tilt filter imaging of aeromagnetic data

GSNSW is examining different ways of visualising potential field data. An example is the tilt filter as a new tool for visualising TMI data. The tilt filter of total magnetic intensity reduced to the pole (TMI RTP) data traces the outline of the magnetic sources. Its output is related to the 1st vertical derivative of TMI and produces a sharpened image that allows geology to be traced. However, the tilt filter amplitude has a larger dynamic range and responds well to the contribution from both shallow and deep magnetic sources. The image of the

tilt filtered TMI data is a good compromise for mapping structures below cover of variable thickness, and for integrating structural elements at different depths.

Geo-rectified images and grids are available through: geophysics.products@industry.nsw.gov.au

Updated AEROFIND index

Open file airborne geophysical data submitted as part of NSW mineral exploration title reporting, are indexed in the statewide AEROFIND database.

AEROFIND is an index of open file airborne geophysical surveys in NSW. It provides precise locations and metadata of most airborne geophysical surveys carried out for mineral exploration in the state. Approximately 50 additional surveys were indexed and released in 2009. They include specific company data sets acquired over exploration lease areas. A further release of surveys is planned for early 2010. There are currently more than 800 airborne surveys indexed in this database.

[MinView](#) users can use the 'Spatial Search' facility to determine which surveys cover a specified area without having to download data and use a GIS system. Alternatively, the entire AEROFIND layer index can be downloaded from MinView as an ArcGIS shape file. Data is available on request from geophysics.products@industry.nsw.gov.au.

GEOLOGICAL MAPPING PROJECTS

Koonenberry Geological Mapping Project

The Koonenberry Geological Mapping Project is being finalised. The maps are undergoing final editing and cartographic processes before publishing; the explanatory notes are nearing completion as Bulletin 35; and data is being collated for a DVD.

Contact: Phil Gilmore, Senior Geologist, phil.gilmore@industry.nsw.gov.au, 02 4931 6533

Tasmanides Project

Work for the Tasmanides Project has focused on the Ordovician of the Lachlan Orogen. This includes assessing the relationships between the different packets of Ordovician turbidites in terms of terranes; assessing relationships between these terranes and the Macquarie Arc; and working on the Jindalee Ophiolite Belt. The last is the subject of a collaborative agreement with the Institute of Geology and Geophysics of the Chinese Academy of Sciences.

Contact: Cameron Quinn, Research Geologist, cameron.quinn@industry.nsw.gov.au, 02 4931 6730

Moss Vale Mapping Project

Fieldwork for the Moss Vale 1:100 000 Mapping Project has been completed and differences in lithology and sedimentology to the type sections of rock units proximal to the western depositional edge of the Sydney Basin have been noted. Bore hole data and university research work has helped to identify subsurface distribution of units as well as provide information on basement lithologies resulting in a more detailed understanding of the Sydney Basin basement.

Contact: Steven Trigg, Senior Geologist, steven.trigg@industry.nsw.gov.au, 02 6360 5361

Braidwood Mapping Project

The Braidwood 1:100 000 map sheet has been completed to provisional status and the explanatory notes are being compiled. Nine east-west oriented cross sections have been completed and are being used in the construction of a 3D model.

Contact: Owen Thomas, Senior Geologist, owen.thomas@industry.nsw.gov.au, 02 6360 5339

OTHER PROJECTS

COGENT II — Geoscience Data Management Project update

Progress was made in data compilation, system design and data governance documentation, which are three of the major components of the COGENT II project. Marta Vega Faundez is compiling radiogenic isotope data. Her work will add new records, and enhance and spatially enable existing records. David Collins continues to model datasets, design system architecture and review alternatives for uploading, warehousing and delivery. Brendon Sisson will take over from Phil Gilmore as Project Manager in early January.

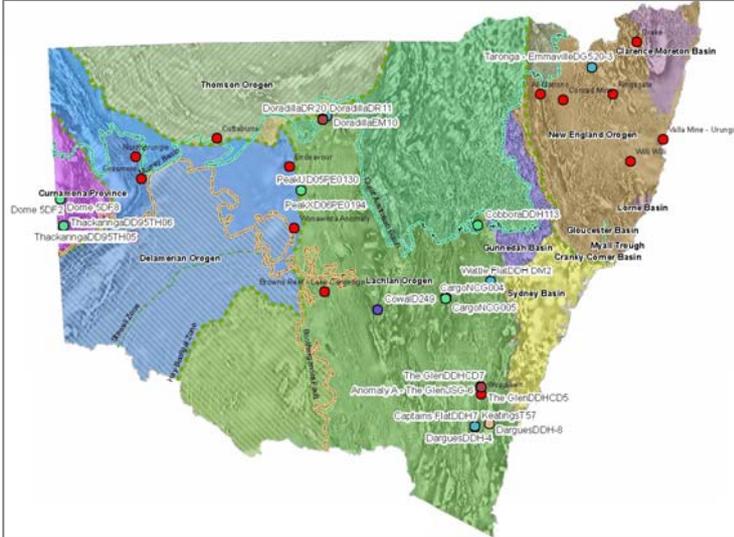
Contact: Phil Gilmore, Senior Geologist, phil.gilmore@industry.nsw.gov.au, 02 4931 6533
or Brendon Sisson, Project Manager, brendan.sisson@industry.nsw.gov.au, 02 4931 6502

Statewide Geodatabase

A new statewide geodatabase has been developed. It provides a template for geologists to enter in mapping data, and uses the same format for map publications and storage. It was tested in the field in late October by the regional mapping team using ARCGIS on mapping tablets.

Contact: John Greenfield, Team Leader Regional Mapping, john.greenfield@industry.nsw.gov.au 02 4931 6728

National Virtual Core Library (NVCL)¹ update



To date, over 12 500 m of core have been scanned, representing 35 drillholes from 15 deposits from each of the major mineral districts in New South Wales. The program is guided by I&I NSW reconnaissance mineral and coal exploration scanning priorities and industry requests. A number of companies are collaborating with the project and their core is providing valuable information for research on mineral systems and associated alteration.

A second round of drill holes (shown in red in the figure at left) have been chosen for scanning. They focus on the Delamerian and the New England orogens.

The figure above shows the location of NVCL planned drillcore scans (red) and completed drillcore scans (other colours) against the tectonic divisions of NSW.

Contact: Rob Barnes, Team Leader Minerals, rob.barnes@industry.nsw.gov.au; 02 4931 6697

¹ NVCL is an initiative of the Australian Government being conducted as part of the National Collaborative Research Infrastructure Strategy

RECENT EVENTS

BHEI2009 Conference

The [Broken Hill Exploration Initiative conference](#) was held in Broken Hill 29 September–1 October and attracted over 100 delegates. GSNSW released a range of products which encouraged some companies to launch new exploration projects over the Koonenberry region. The abstracts are available from Geoscience Australia. (Korsch, R J., Editor, Broken Hill Exploration Initiative: [Abstracts for 2009 conference](#). *Geoscience Australia, Record*, 2009/028)

Director of the Geological Survey of NSW retires

Lindsay Gilligan retired from his position as Director of the Geological Survey of NSW on 30th October, 2009 after 41 years of service with the Department. He played a major role in the development of initiatives such as *Discovery 2000*, *Exploration NSW*, and *New Frontiers*; was awarded a Public Service Medal in the 2008 Queens Birthday Awards for his services to geoscience and for enhancing mineral exploration and was awarded the *Australian Mining* magazine's 2008 award of 'Most Outstanding Contribution to Mining' by the mining industry.

Mineral Sands Conference, 7–8 December 2009, Mildura

Cameron Ricketts, Assistant Director, Minerals and Land Use Assessment, presented a paper at the [AJM 10th Anniversary Mineral Sands Conference](#) on the emergence of the Murray Basin as a heavy mineral province.

STAFF MOVEMENTS

Lindsay Gilligan has retired from his position as Director, Geological Survey of NSW. This position will be rotated through the Assistant Directors commencing with **Cameron Ricketts** until 29th November, passing to **John Watkins** until 31st December and then to **Graham Butt** until 29th January.

John Whitehouse has retired from his position as Industrial Minerals Geologist with Minerals and Land Use Assessment. His duties have been taken up by **David Forster**.

Iain Paterson is Acting Team Leader, Land Use Assessment.

Dave Robson is Acting Assistant Director, Regional Mapping and Exploration Geoscience.

Brendan Sisson has commenced as Project Manager, Geoscience Information.

Cameron Quinn and **Bob Musgrave** have been both appointed Research Scientists.

PRODUCTS AND ENQUIRIES

Internet product catalogue

The online [Geoscience Products Catalogue](#) includes over 240 hard copy maps and over 70 geoscience data packages (including geophysical data) on CD or DVD ROM.

Enquiries about purchasing products

Maps and data packages: geoscience.products@industry.nsw.gov.au: Tel: 02 4931 6503

Geophysical images and data: geophysics.products@industry.nsw.gov.au: Tel: 02 4931 6717

Counter sales: mineralpublication.orders@industry.nsw.gov.au Free call: 1300 736 122 Tel: 02 4931 6666

Online sales: <http://www.shop.nsw.gov.au/index.jsp>

General enquiries about products and services

Contact: Michael Hallett, michael.hallett@industry.nsw.gov.au: Tel: 02 4931 6724

SUBSCRIPTIONS

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (Dec 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of I&I NSW or the user's independent adviser.

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