

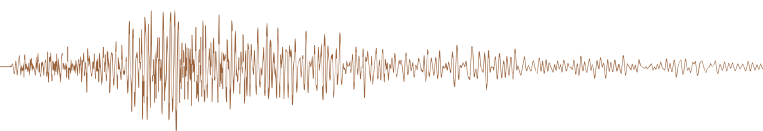
## Update on geophysical survey progress from Geoscience Australia and the Geological Surveys of Western Australia, South Australia, Northern Territory, Queensland, New South Wales, Victoria and Tasmania (information current on 8 September 2017)

Further information on these surveys is available from Murray Richardson at GA via email at [Murray.Richardson@ga.gov.au](mailto:Murray.Richardson@ga.gov.au) or telephone on (02) 6249 9229.

Table 1. Airborne magnetic and radiometric surveys

Survey name	Client	Project management	Contractor	Start flying	Line km	Spacing AGL Dir	Area (km <sup>2</sup> )	End flying	Final data to GA	Locality diagram (Preview)	GADDs release
Murloocoppie	GSSA	GA	MAGSPEC Airborne Surveys	11 Feb 2017	109 560	200 m 60 m E–W	19 540	25 May 2017	Final magnetic and elevation data QA/QC in progress	183: Aug 2016 p. 34	TBA
Warrina	GSSA	GA	MAGSPEC Airborne Surveys	11 Feb 2017	135 628	200 m 60 m E–W	24 140	25 May 2017	Final magnetic and elevation data QA/QC in progress	183: Aug 2016 p. 34	TBA
Andamooka	GSSA	GA	Sander Geophysics	23 Feb 2017	81 396	200 m 60 m E–W	14 560	The survey flying was completed on 6 Jun 2017	Final elevation data QA/QC in progress	183: Aug 2016 p. 34	TBA
Barton	GSSA	GA	Thomson Aviation	22 Jan 2017	111 758	200 m 60 m E–W	20 560	11 May 2017	Raw data QA/QC in progress	183: Aug 2016 p. 34	TBA
Fowler	GSSA	GA	Thomson Aviation	18 Feb 2017	95 009	200 m 60 m E–W	17 360	2 Jun 2017	Raw data QA/QC in progress	183: Aug 2016 p. 34	TBA
Torrens	GSSA	GA	Sander Geophysics	4 Mar 2017	79 990	200 m 60 m E–W	14 800	15 Jun 2017	Final elevation data QA/QC in progress	183: Aug 2016 p. 34	TBA
Coonabarabran	GSNSW	GA	UTS Geophysics	17 May 2017	50 827	250 m 60 m E–W	11 000	TBA	Final magnetic and elevation data QA/QC in progress	184: Oct 2016 p. 23	TBA
Tasmanian Tiers	MRT	GA	TBA	TBA	Up to an estimated 66 000	200 m 60 m N–S or E–W	11 000	TBA	TBA	TBA	National Collaborative Framework Agreement between GA and MRT has been executed. The survey has been deferred to occur between Oct 2017 and Mar 2018
Isa Region	GSQ	GA	GPX	3 Jul 2017	120 062	100 m 50 m E–W	11 000	55.5%	TBA	188: Jun 2017 p. 21	TBA
Tallaringa N (1A)	GSSA	GA	TBA	Est. late Sep 2017	97 762	200 m 60 m E–W	17 320	TBA	TBA	Figure 1	TBA
Tallaringa S (1B)	GSSA	GA	TBA	Est. late Sep 2017	145 042	200 m 60 m E–W	26 010	TBA	TBA	Figure 1	TBA
Cooper Pedy (8A)	GSSA	GA	TBA	Est. late Sep 2017	90 627	200 m 60 m N–S	16 140	TBA	TBA	Figure 1	TBA
Billa Kalina (8B)	GSSA	GA	TBA	Est. late Sep 2017	90 625	200 m 60 m N–S	16 140	TBA	TBA	Figure 1	TBA
Childara (9A)	GSSA	GA	TBA	Est. late Sep 2017	135 021	200 m 60 m N–S	23 910	TBA	TBA	Figure 1	TBA
Lake Eyre (10)	GSSA	GA	TBA	Est. late Sep 2017	91 800	200 m 60 m E–W	16 180	TBA	TBA	Figure 1	TBA

TBA, to be advised.



## News

Table 2. Gravity surveys

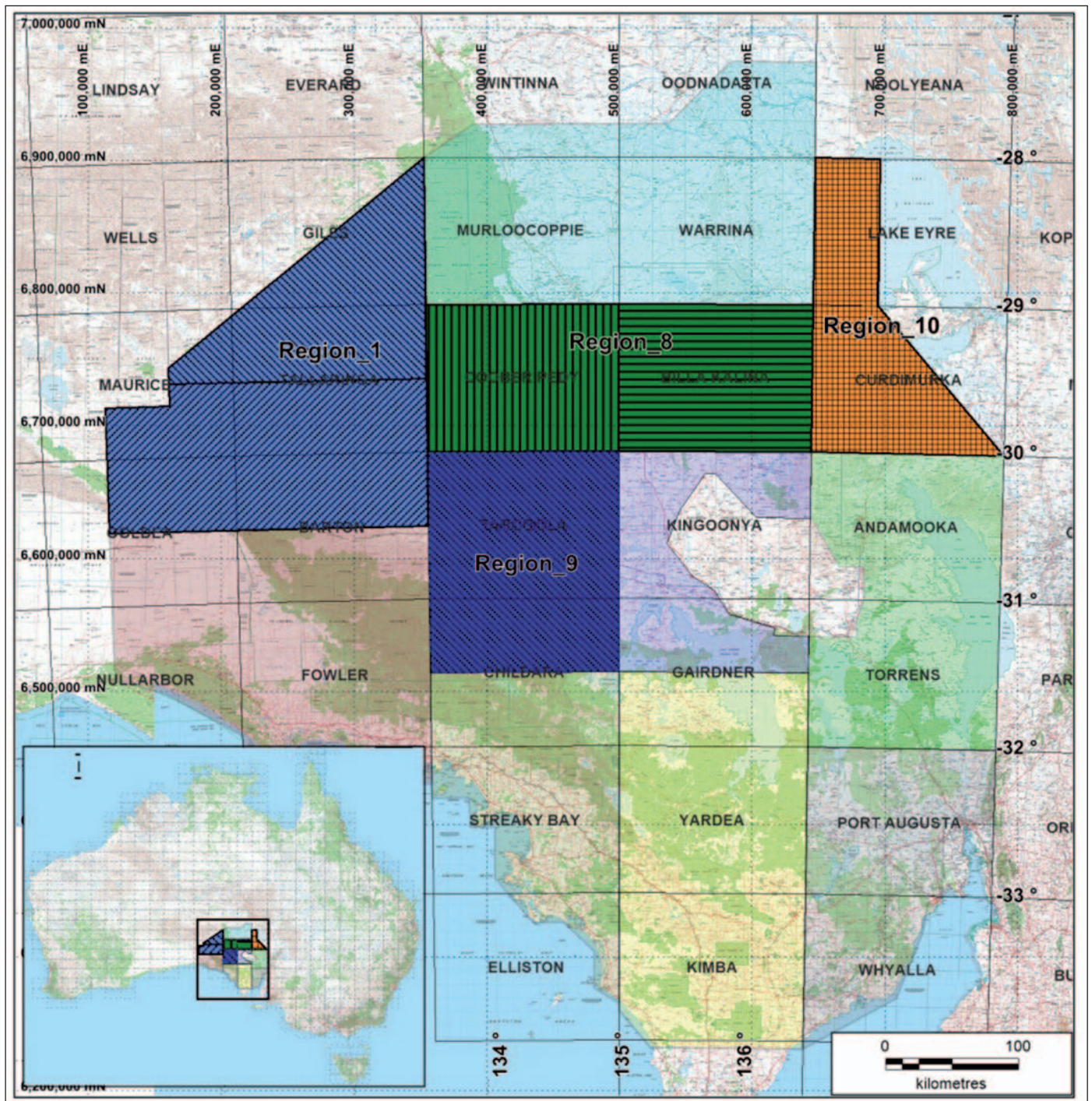
Survey name	Client	Project management	Contractor	Start survey	No. of stations	Station spacing (km)	Area (km <sup>2</sup> )	End survey	Final data to GA	Locality diagram (Preview)	GADDS release
Tanami-Kimberley	GSWA	GA	Thomson Aviation	16 Jun 2017	49 825	2500 m line spacing	110 000	TBA	64.4%	The survey area covers the Billiluna (all), and parts of the Lucas, Cornish, Mount Bannerman, Mount Ramsay, Noonkanbah, Lansdowne, Lennard River, Derby, Charnley and Yampi 1:250 k standard map sheets	TBA
Kidson Sub-basin	GSWA	GA	CGG Aviation (Australia)	14 Jul 2017	72 933	2500 m line spacing	155 000	TBA	20%	The survey area covers the Anketell, Joanna Spring, Dummer, Paterson Range, Sahara, Percival, Helena, Rudall, Tabletop, Ural, Wilson, Runton, Morris and Ryan 1:250 k standard map sheet areas	TBA
South Nicholson	GA	GA	Atlas Geophysics	30 Jul 2017	2724	4 km spacing	43 330	28 Jul 2017	1 Sep 2017	The survey area covers parts of the Mount Drummond, Ranken and Avon Downs standard 1:250 k map sheet areas	12–14 Sep 2017

TBA, to be advised.

Table 3. AEM surveys

Survey name	Client	Project management	Contractor	Start flying	Line km	Spacing AGL Dir	Area (km <sup>2</sup> )	End flying	Final data to GA	Locality diagram (Preview)	GADDS release
Musgraves – CSIRO Area	GSSA	GA	SkyTEM Australia	15 Sep 2016	7182	2 km; E–W lines	14 320	The survey completed flying on 13 Oct 2016	8 Mar 2017	179: Dec 2015 p. 23	22 Aug 2017
Isa Region	GSQ	GA	Geotech Airborne	8 Aug 2016	15 692	2 km; E–W	33 200	The survey completed flying on 4 Nov 2016	12 Apr 2017	182: Jun 2016 p. 23	The East Isa data were released on 11 Apr 2017. The Lawn Hill Extension data were released on 20 May 2017
AusAEM (Year 1)	GA	GA	CGG	TBA	59 349	20 km with areas of infill	TBA	TBA	16.9%	186: Feb 2017 p. 18	TBA
Surat-Galilee Basins QLD	GA	GA	SkyTEM Australia	2 Jul 2017	4627	Variable	Traverses	23 Jul 2017	21 Aug 2017	188: Jun 2017 p. 21	TBA
Stuart Corridor, NT	GA	GA	SkyTEM Australia	6 Jul 2017	9832	Variable	Traverses	12 Aug 2017	21 Aug 2017	188: Jun 2017 p. 22	TBA
Olympic Domain	GSSA	GA	TBA	TBA	3181	1.5 & 3 km E–W	33 200	TBA	TBA	Figure 2	TBA
Fowler Domain	GSSA	GA	TBA	TBA	3057	5 km NW–SE	15 000	TBA	TBA	Figure 3	TBA

TBA, to be advised.



**Figure 1.** Location of the Tallaringa N (1A), Tallaringa S (1B), Coober Pedy (8A), Billa Kalina (8B), Childara (9A) and Lake Eyre (10) airborne magnetic and radiometric surveys.



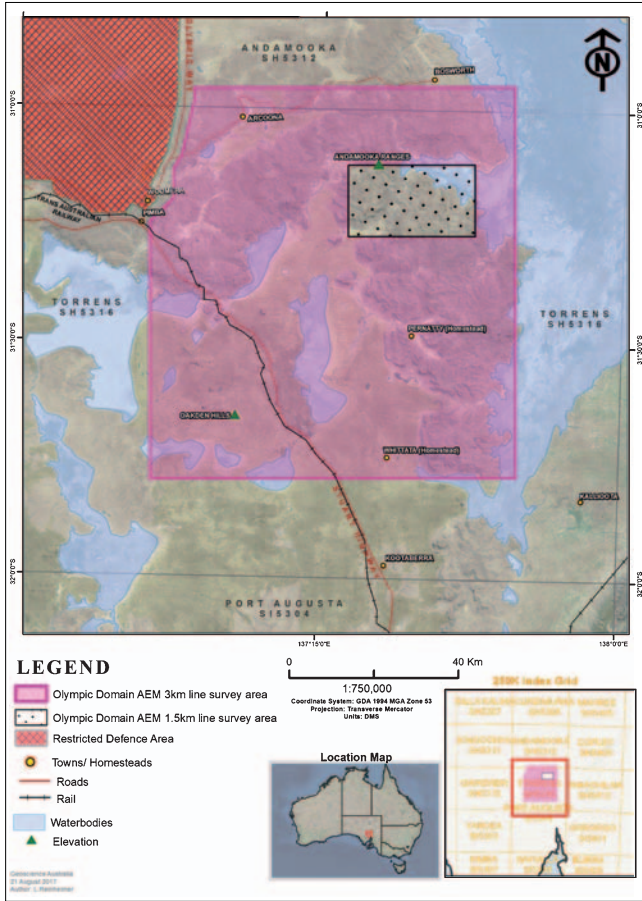
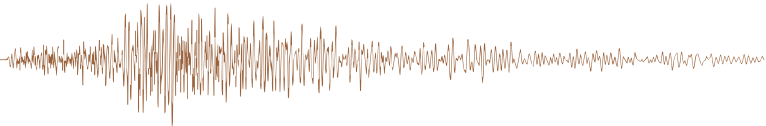


Figure 2. Location of the Olympic Dam AEM survey, South Australia.

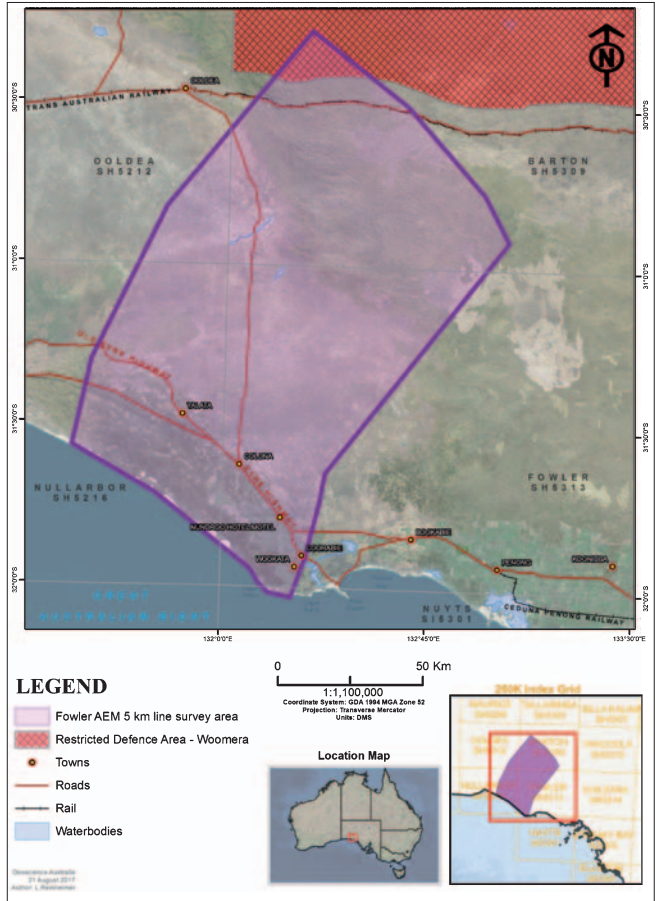


Figure 3. Location of the Fowler AEM survey, South Australia.

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## Geological Survey of South Australia: The Musgrave Ranges AEM surveys

Two AEM surveys conducted in the Musgrave Ranges in South Australia in late 2016 are now available for download via SARIG (<https://map.sarig.sa.gov.au/>). The surveys were funded by the Government of South Australia, through the Plan for Accelerated Exploration (PACE) Initiative and through the Goyder Institute of Water Research. Geoscience Australia managed the survey as part of a National Collaborative Framework project agreement with SA.

The first survey – a High Moment TEMPEST survey – was flown between 18 August and 17 September 2016 by CGG Aviation (Australia) Pty Ltd. This survey – on the west side of the total survey area – comprises 8595 line

kilometres of data. The survey lines were oriented 177–357 degrees and the line spacing was 2 km. The nominal terrain clearance was 120 m.

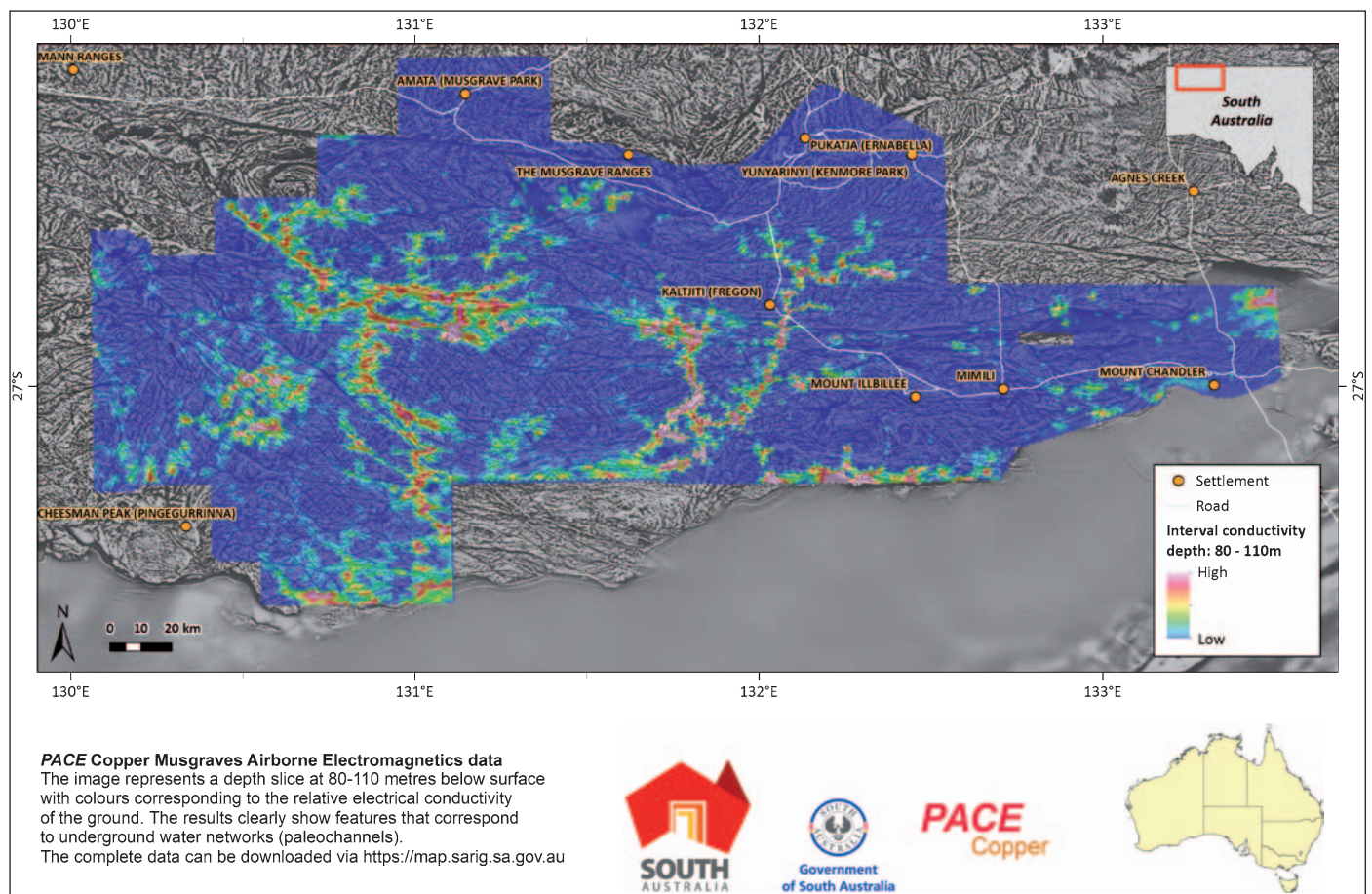
The second survey – a SkyTEM survey – was flown between 9 September and 13 October 2016 by SkyTEM (Australia) Pty Ltd. This survey – to the north and east of the total survey area – is comprised of 8800 line kilometres of data. The survey lines were oriented N-S and the line spacing was 2 km, 500 m and 250 m. The nominal terrain clearance was 45 m.

These AEM surveys reveal new insight into the geology under the Musgrave Province. The data from both surveys have been merged together into a single

seamless image and the figure here shows some of the exciting results from the surveys. The left portion shows some results of the CGG TEMPEST survey and the right side shows some SkyTEM survey data. The data are showing the conductivity of the earth at a depth between 80–110 m. The results clearly show features that correspond to underground water networks; palaeochannels.

Complete data and reports can be downloaded via SARIG (<https://map.sarig.sa.gov.au/>).

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**Figure 1.** The AEM data clearly show features that correspond to underground water networks, including palaeochannels.

## Geological Survey of New South Wales

### Coonabarabran airborne geophysical survey complete!

Acquisition of the Coonabarabran airborne magnetic and radioelement survey is complete (Figure 1). Acquisition commenced May 10 and finished July 30. The aircraft flew east–west traverses every 250 m at an altitude of 60 m.

The survey area includes Warrumbungle National Park where Geological Survey New South Wales has been mapping geology in collaboration with National Parks and Wildlife Service. The park's distinctive landforms and rocks are due to hot spot volcanism; the park encompasses a volcano that was active 13–17 Ma. The centre of the volcano was previously mapped as Jurassic Pilliga Sandstone and Purlewaugh Formation. However, geological mapping with the aid of preliminary geophysical data indicate volcanic deposits (lavas and volcanoclastic rocks) within the central valley area, which are more consistent with a central volcanic vent area than Jurassic basement deposits. The geophysical data particularly helped the mapping team to define the various mafic and felsic lava flows around the volcano, and differentiate volcanoclastic rocks from the coherent lavas and intrusions, and also from Jurassic sedimentary rocks (Figures 1 and 2).

This survey was funded by the GSNSW New Frontiers initiative, with project management by Geoscience Australia. The survey data were acquired and processed by UTS Geophysics Pty Ltd. The data will be available for free through Geoscience Australia's Geophysical Archive Data Delivery System (GADDS). It will also be available via the NSW Government geophysical-data package; a portable hard drive that contains all geophysical data acquired by the NSW Government can be purchased (for \$110 plus postage).

#### GADDS

[https://www.google.com.au/search?q=gadds&rlz=1C1GGRV\\_enAU751AU751&oq=gadds&aqs=chrome..69i57j69i60j0l4.1535j0j8&sourceid=chrome&ie=UTF-8](https://www.google.com.au/search?q=gadds&rlz=1C1GGRV_enAU751AU751&oq=gadds&aqs=chrome..69i57j69i60j0l4.1535j0j8&sourceid=chrome&ie=UTF-8)

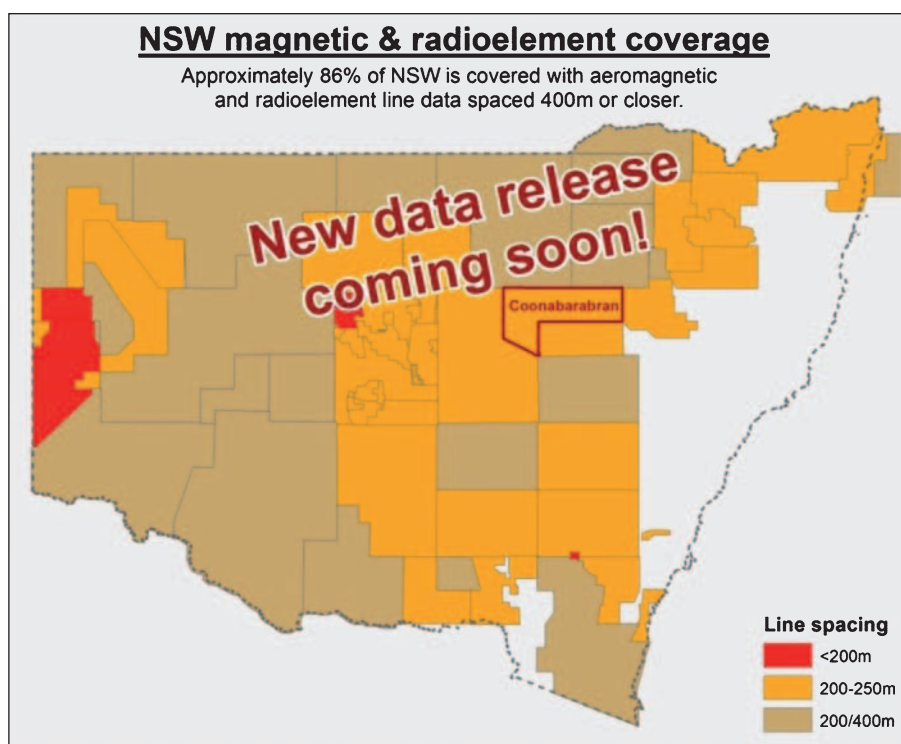


Figure 1. Map of NSW government funded airborne magnetic & radioelement surveys.

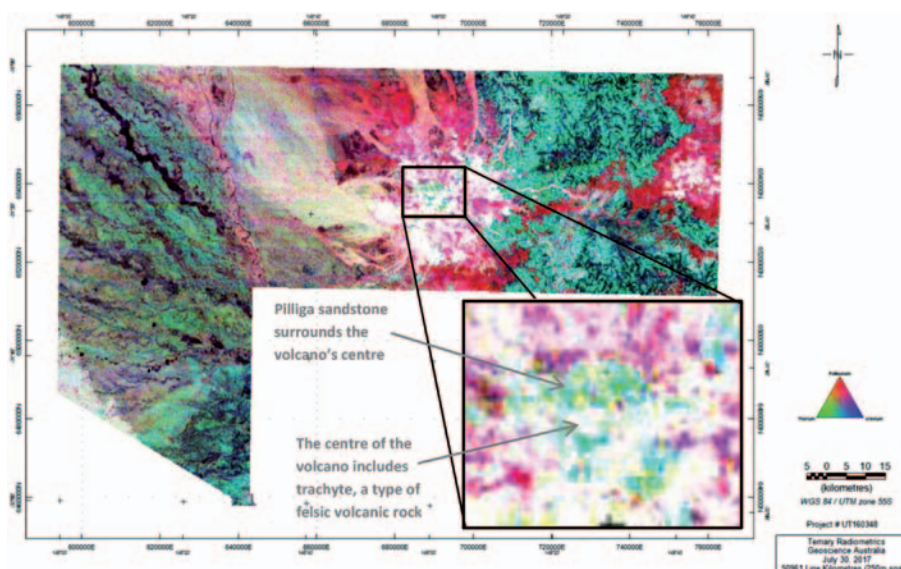
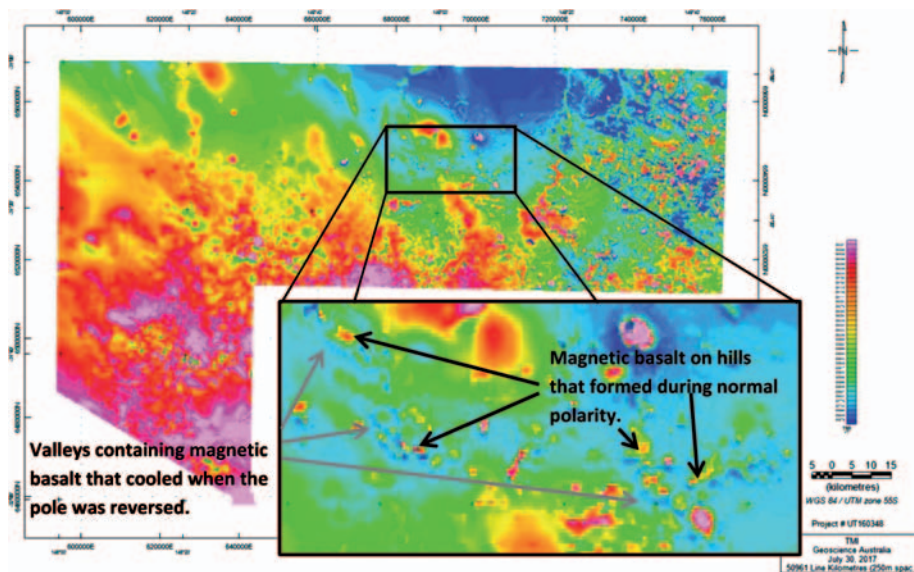


Figure 2. Preliminary ternary radioelement image from the Coonabarabran Project. In a ternary radioelement image red, green and blue respectively represent the naturally radioactive occurring elements K, Th & U. The zoom insert shows the radioelement signature of the central volcanic vent.





**Figure 3.** Preliminary image of Total Magnetic Intensity data from the Coonabarabran Project, zoom insert showing anomalies from magnetic basalts.

NSW Government geophysics-data package

<http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/products-and-data/geophysical-images-and-data>

Final processing of the data is complete; the data will be made publicly available on 23 November at a meeting of the Sydney Mineral Exploration Discussion Group. To be notified about the Coonabarabran airborne magnetic, radioelement and elevation data public release please email [geophysics.products@industry.nsw.gov.au](mailto:geophysics.products@industry.nsw.gov.au).

For more information about the survey and the use of the data visit:

<http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/projects/coonabarabran-project>

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## The Coonabarabran airborne geophysical survey is

# Finished!



The data will be publicly available in November 2017. Register your interest in the data release by emailing [geophysics.products@industry.nsw.gov.au](mailto:geophysics.products@industry.nsw.gov.au).



# Stratigraphic drilling samples basement in the Southern Thomson Orogen Project

Seven drill holes have successfully sampled basement rocks of the Thomson Orogen, beneath the Eromanga Basin, in the Bourke – Hungerford area of remote northwest NSW. The drilling program is part of the cross-border collaborative Southern Thomson Project between GSNSW, the Geological Survey of Queensland and Geoscience Australia. The project sits within the national Uncover Initiative, which aims to reverse the decline in Australia’s known mineral reserves by providing new information to explorers about undercover regions.

The rocks of the Thomson Orogen are potentially prospective for copper, lead–zinc, gold and other useful metals, however very little is known about them because they lie underneath younger sedimentary rocks of the Eromanga Basin. The Southern Thomson Project initially acquired and analysed airborne and ground-based geophysical surveys and

undertook surface geochemical sampling, field mapping and satellite image analysis to define areas of interest within this vast region (300 km by 300 km).

A program of drill holes tested distinctive basement signatures in the aeromagnetic data (locations in Figure 1) using a combination of rotary mud drilling through cover sequences and diamond drilling of underlying basement rocks to

provide around 50 m of representative core samples from each site (examples Figure 2). Wireline geophysical logs were run in the holes prior to casing. Preliminary drilling details to date are summarised in Table 1.

All cores will be comprehensively sampled for mineralogy, geochemistry and geochronological analysis as well as being scanned by the Hylogger™. Final

Table 1. Preliminary drilling results

Site ID (ref. Figure 1)	Total depth (m)	Basement lithology
GSNSW Milcarpa 1	290.9 m	Rhyodacite
GSNSW Euroli 1	153.7 m	Metasedimentary schist
GSNSW Tongo 1	312.8 m	Granodiorite
GSNSW Laurelvale 1	386.8 m	Siliciclastic turbidite
GSNSW Janina 1	222.2 m	Granite
GSNSW Congarrara 1	119.6 m	TBC
GSNSW Congarrara 1	TBC	TBC

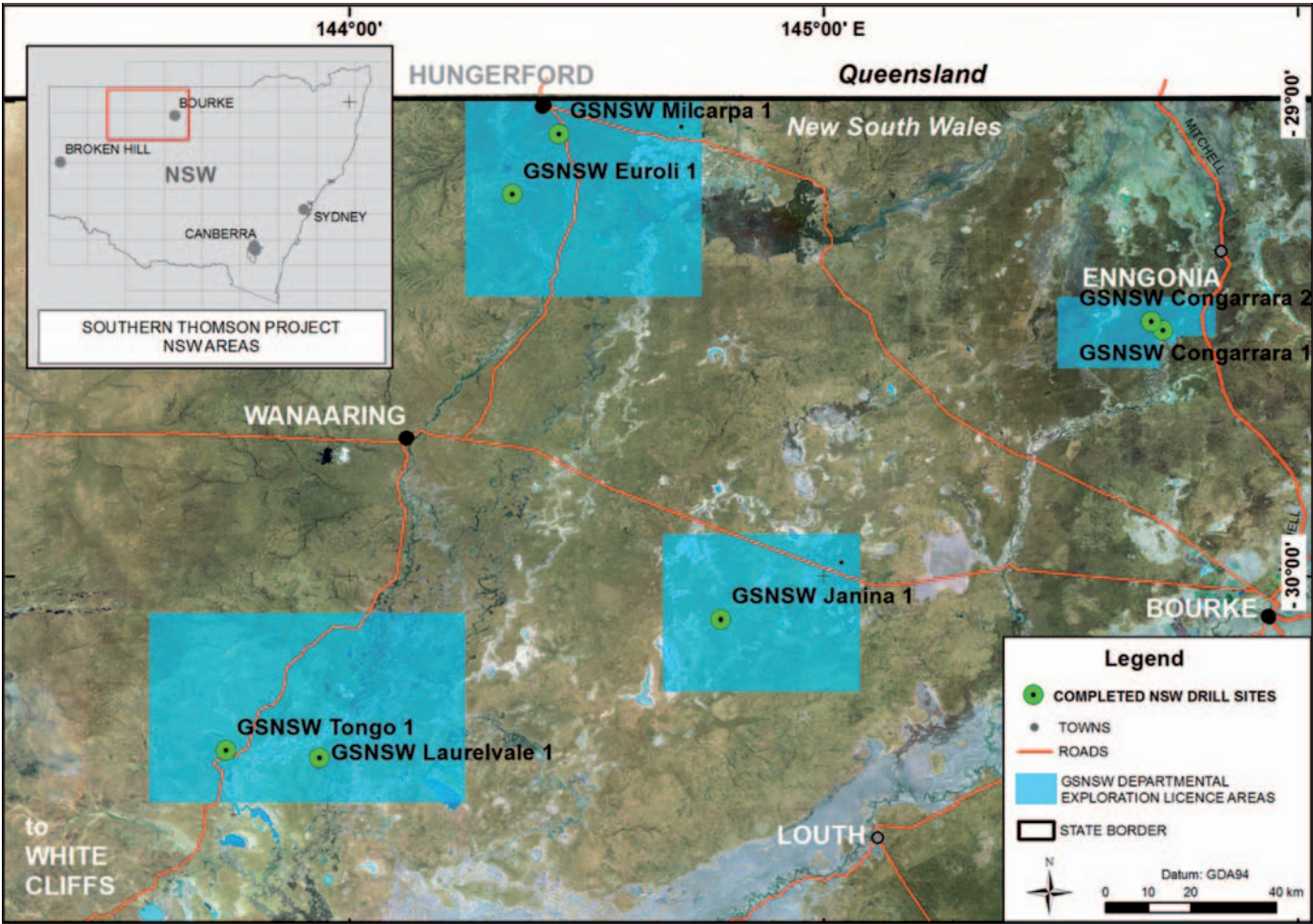
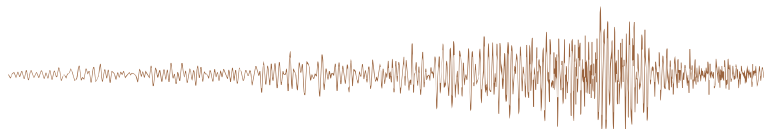


Figure 1. Location of drill sites in the Bourke – Hungerford region.





**Figure 2.** Rhyodacite core from GSNW Milcarpa 1 (top), metasedimentary schist from GSNW Euroli 1 (centre) and granodiorite from GSNW Tongo 1 (below).

results will be made publicly available through the GSNW website and presented at Southern Thomson Project workshops.

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