



# Exploring for the Future

## Darling-Curnamona-Delamerian project



**The Australian Government's Exploring for the Future program, led by Geoscience Australia, is committed to supporting a strong economy, resilient society and sustainable environment for the benefit of Australians.**

At its heart, the program is about contributing to a sustainable, long-term future for Australia through an improved understanding of the nation's mineral and energy potential and groundwater resources.

Since 2016 the program has been working to understand the potential for buried resources in underexplored areas. The program's focus now includes the southern half of the continent, with deep dive projects in potentially resource-rich corridors that stretch across the country. Continental-scale projects are developing a national picture of mineral, energy and groundwater resources.

### **The Darling-Curnamona-Delamerian (DCD) project**

This deep dive project will investigate the mineral potential of the Curnamona Province and Delamerian Orogen in eastern South Australia, western New South Wales, western Victoria and western Tasmania. It will investigate the mineral and groundwater potential of overlying basins including the Murray-Darling Basin and the upper Darling River floodplain.

The DCD project will encourage mineral and groundwater resource exploration and discovery and document new methods for exploring for mineral deposits through the overlying sedimentary basin cover. The project will acquire new data and create new understanding to improve drought resilience in communities and help to provide baseline environmental data for a sustainable future. New

resource systems syntheses will stimulate the creation of business and employment opportunities, particularly in the Broken Hill region.

Proposed activities will include new multi-scale geophysical data acquisition (airborne electromagnetics, magnetotellurics, deep reflection seismic, surface magnetic resonance and downhole geophysics); stratigraphic and groundwater drilling; hydrogeochemical, geochronological and geochemical sampling and analysis; and integration of these new data with historical and state data to deliver geological framework understanding and resource potential assessments. The project will work collaboratively to complement state government and research initiatives in the region. The DCD project incorporates a number of work modules, including:

#### *AusAEM and minerals AEM infill*

Airborne electromagnetic (AEM) surveys using fixed-wing aircraft or helicopters to map near-surface geology and assess the potential of the region for mineral and groundwater resources.

#### *Deep crustal reflection seismic*

Seismic data to map geology to the base of the Earth's crust and help interpret the geological history of southeastern Australia. The data will also be assessed for clues to new mineral, groundwater and energy resources.

#### *Curnamona Cube Extension magnetotelluric survey*

Magnetotelluric (MT) surveys to measure the Earth's natural magnetic and electric fields. These data help map the electrical structure of the Earth's crust and

complement the seismic and AEM data gathered in the region, as well as providing clues to potential buried mineralisation.

### Source to Sink

Integration of the geochemistry of rocks, soils and groundwater across the Curnamona Province to understand geochemical baselines, geochemical migration and mineral potential under cover.

### Stratigraphic drilling

Targeted drilling to fill knowledge data gaps in undercover geology in the project region. The rocks will be analysed for geochemistry, structures and isotopic ages and the data used to inform the Geological Framework and Mineral Potential Assessment work modules below.

### Geological Framework

Document models for the assembly of eastern Australia through geological time and use these to interpret the geological meaning of regional geophysical datasets.

### Mineral Potential Assessment

Use the knowledge gained in the work modules above to develop testable mineral potential models for a range of commodities including copper, gold, lead, zinc and critical minerals important for economic development.

### Upper Darling River floodplain groundwater

Acquire multi-scale AEM data followed by non-intrusive surface geophysics (surface magnetic resonance), water monitoring bore drilling, groundwater hydrogeochemistry and borehole geophysics to assess groundwater quality and levels. Results will help build drought resilience through identifying potential new groundwater resources, managed aquifer recharge opportunities and augmenting salt interception schemes and weirs. This work will be conducted in collaboration with the NSW Department of Planning, Industry and Environment.

## Work program

The DCD project will run from 2020 to 2024 and will involve extensive stakeholder engagement including state and local government agencies, landholders and traditional owner groups. In-air and on-ground data acquisition activities commenced in early 2021 and are planned into 2023, culminating in stratigraphic drilling.

Geoscience Australia staff and contractors will contact landholders individually prior to each field activity to discuss land access, biosecurity measures, any environmental concerns, cultural heritage and to minimise disruption to landholder activities. Staff will travel to the site either by 4WD or, if necessary, by helicopter with prior notification. Existing roads and tracks will be used as a priority, although some areas may require off-road access.

All field staff will be complying with Commonwealth and State Government COVID-19 legislation and protocols.

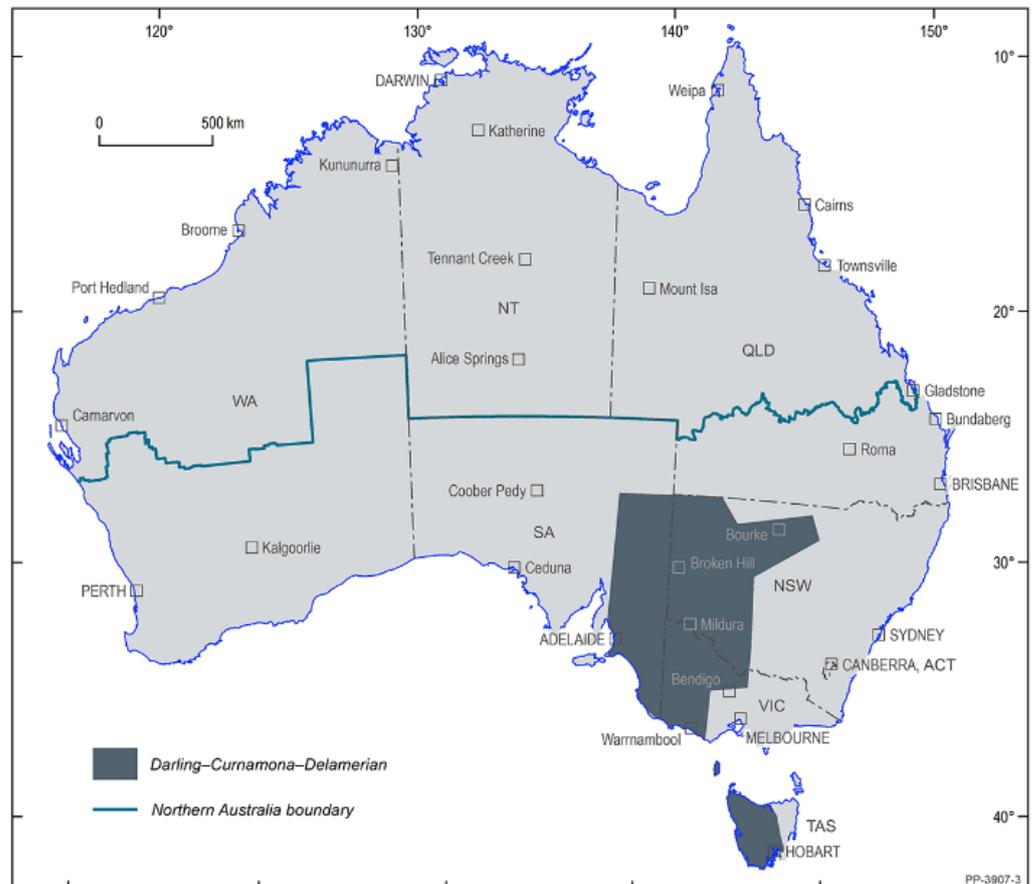
### For further information

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The Darling-Curnamona-Delamerian project area