



GROUND AND SURFACE WATERS

GISERA | Gas Industry Social and Environmental Research Alliance

CSIRO takes to the sky to learn what's beneath our feet around Narrabri, NSW

Using the latest airborne electromagnetic survey technologies to find out more about groundwater in the Narrabri region

Australia's national science agency, CSIRO, is using a helicopter and the latest remote sensing technologies from SkyTEM Australia to conduct an airborne electromagnetic (AEM) survey in the Narrabri region in mid to late November.

The survey is part of a groundwater research project Understanding connectivity between coal seams and aquifers and is designed to provide geophysical data about subsurface geology from the surface to a depth of around 400 metres.

The research project is being conducted by CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA).

Why this survey is important

This scientific study is being carried out to obtain data that will improve understanding of the groundwater resources of the Narrabri region.

This information will help to investigate potential connectivity between coal seams and agriculturally important shallow aquifers, and support future water resource management and decision-making in the region.

AEM survey method

A helicopter fitted with instruments will map variations in the natural electrical conductivity of the ground to a depth of around four hundred metres.

The helicopter flies at a height of approximately 60 metres and tows a circular carbon-fibre frame approximately 35 metres above ground level (see photo page 2). The helicopter flies along carefully selected straight lines to maximise information about the subsurface soil and groundwater conditions (see map page 2).

During the survey, a weak electromagnetic signal will be transmitted from the aircraft into the ground. Towed antennae detect the returned signals and the nature of these signals is analysed to map variations in the conductivity of the ground that are caused by groundwater and certain types of rocks.

Is AEM safe?

Yes. Electromagnetic (EM) fields from the AEM system are comparable with EM fields generated by powerlines, household wiring, and TV antennae.

Survey dates

A helicopter towing an electromagnetic array will fly daily, weather permitting, from approximately **Friday 17 November to Friday 1 December.**



The carbon-fibre frame being towed by the helicopter emits a weak electromagnetic signal that detects changes in sub-surface conditions.



What you may see

A helicopter towing equipment below it will make a single pass approximately 60 metres above the ground, along straight flight paths. The helicopter will avoid towns, private residences, farmhouses, sheds and other infrastructure, livestock mustering and watering points, and steep terrain.

Responding to community concerns

Community concerns continue about potential impacts of coal seam gas development on the Pilliga Sandstone and the Namoi alluvium aquifers, which have significant cultural, environmental and economic values.

About the project

These concerns prompted research into connectivity of the deep coal seam gas development zone in the Gunnedah Basin and the shallow aquifers in the area. CSIRO research to date has found no prima facie evidence of strong connectivity – the target coal seams and shallow aquifers are separated by aquitards that range in thickness from 300 to 700 metres.

Aquitards are compacted layers of clay, silt or mud that act as a barrier for groundwater movement.

CSIRO researchers have adopted a multi-disciplinary approach for this project. They are combining existing data with new hydrochemistry, geochemistry and geophysical survey data.

Research outcomes will include the generation of high-resolution 3D images of subsurface structures, providing additional information on the potential for connectivity pathways.

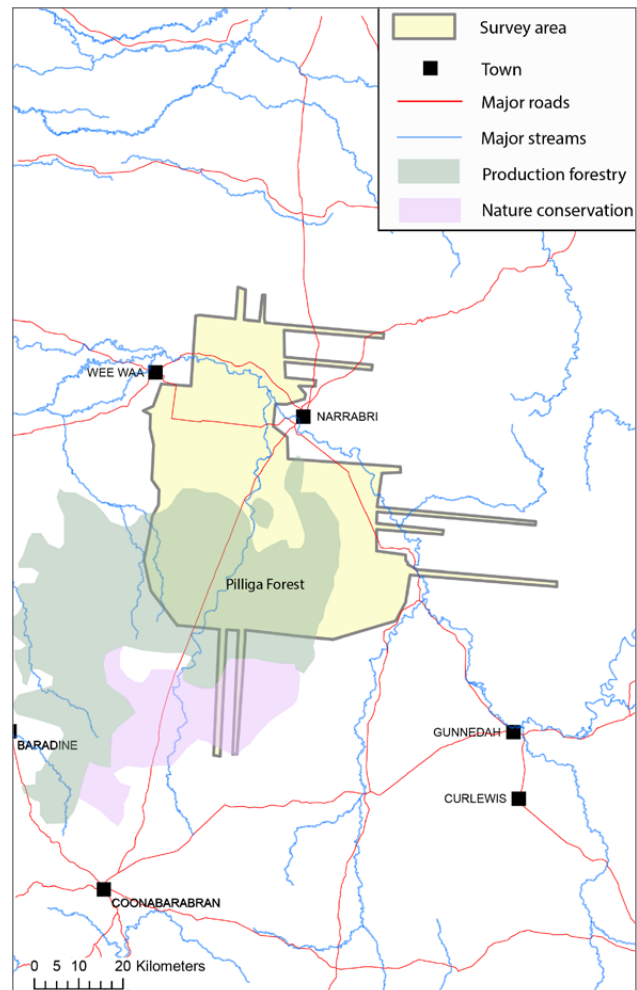
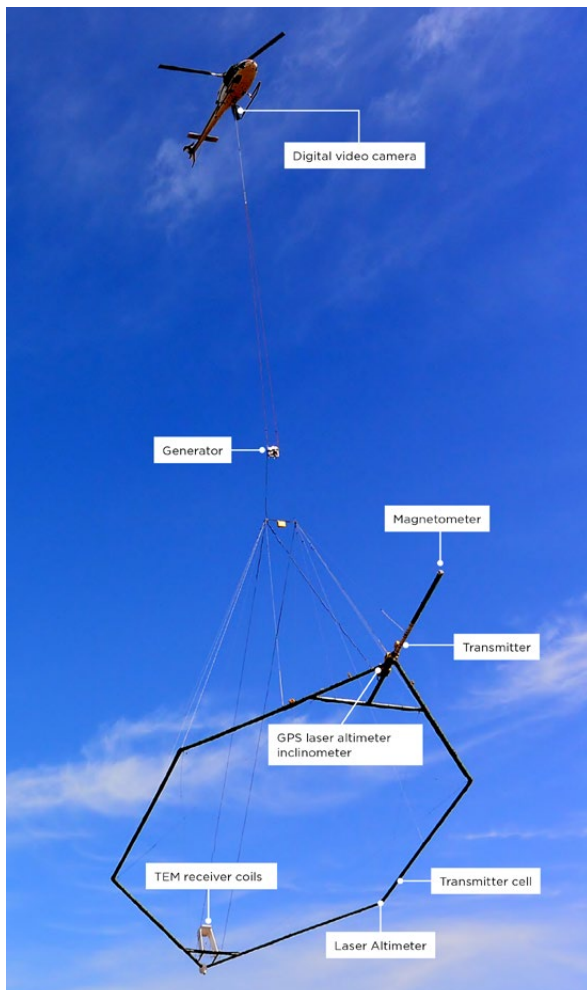
All results will be available on CSIRO's [GISERA web site](#).

More information

Please contact CSIRO enquiries on 1300 363 400 or email gisera@csiro.au

Read about [the project](#)

Find out more about [NSW Government AEM surveys](#)



Further information | 1300 363 400 | gisera@csiro.au | gisera.csiro.au

GISERA is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, greenhouse gas emissions, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research.