



GROUND AND SURFACE WATERS

GISERA | Gas Industry Social and Environmental Research Alliance

Establishing an environmental baseline characterisation of the springs in Hot Springs Valley, Northern Territory

This research project will provide baseline environmental information – including data on ecology, water, geology and gases – on the springs in Hot Springs Valley, northeast of the Beetaloo Sub-basin in the NT.

There is little baseline environmental data on the springs of the Hot Springs Valley, an area northeast of the Beetaloo Sub-basin. The valley includes several spring complexes, which discharge hot water at temperatures ranging from around 42 to 65°C.

Key points

- The Beetaloo Sub-basin contains large shale gas resources and has been identified as a potential area for onshore gas production.
- Local communities are concerned about potential environmental and cultural impacts of development.
- Springs within or adjacent to the Beetaloo Sub-basin hold high environmental, cultural and recreational values.
- CSIRO scientists will conduct a field campaign to collect detailed data on the geology, hydrogeology and ecology of the Hot Springs Valley. This will extend on the data collected in previous surveys of the area.
- Engagement with local Indigenous groups will inform the research.
- Baseline environmental data on the Hot Springs Valley springs will provide an important benchmark and evidence base for the protection and management of this environmentally and culturally significant area.

CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA) has initiated a research project which will involve CSIRO scientists working in the field to collect baseline data.

Research objectives

This project will:

- build on previous studies by providing a comprehensive baseline of terrestrial ecology, water and gas discharge at the Hot Springs Valley
- provide a comprehensive characterisation of the likely groundwater discharge pathways, and determine the likely sources of water and gas at the springs
- engage with local Indigenous communities – and, where relevant, representatives from other community groups – to share knowledge about the project, and ensure research is conducted in a culturally-sensitive way.

Information collected through this research can be used to inform ongoing management, monitoring and preservation of the springs.



Springs in the Hot Springs Valley

Springs are naturally occurring discharge points of groundwater that flows out of the ground, often forming a small stream or pool of water.

Environmentally, springs can sustain unique ecosystems. Culturally, springs are connected to Traditional Owners, with many important cultural sites surrounding springs.

Springs within or adjacent to the Beetaloo Sub-basin hold high environmental, cultural, and recreational values.

The Hot Springs Valley is a relatively understudied area that holds significant environmental and cultural value.

The valley is located to the northeast of the Beetaloo Sub-basin, within the headwaters of the Cox River catchment.

In addition to discharging hot water, the springs also feature bubbling natural sources of methane and ethane.

Building on previous studies

Due to their remote location, limited environmental data has been captured on the springs of Hot Springs Valley.

Recent studies including the Geological and Bioregional Assessments (GBA) Program and the Strategic Regional Environmental and Baseline Assessment (SREBA) provide regional scale information across the Beetaloo Sub-basin.

These studies showed that the springs support diverse terrestrial and aquatic ecosystems, and several groundwater springs have a confirmed or potential relevance to development activities in the region.

Past studies have included:

- limited baseline hydrochemistry sample collection
- greenhouse gas surveys around the springs
- aquatic ecology surveys.

However, significant gaps in baseline data remain.

There is limited documented information about the perspectives of Indigenous communities in the area, and the source of groundwater and gas discharging from springs remains poorly understood.

And previous research has not included data on atmospheric gas measurements, quantification of emission rates from the gas seepages, water chemistry, geochemistry or geological mapping.



Gorge Spring – one of several hot springs in the Hot Spring Valley.

Research activities

CSIRO scientists will engage with key stakeholders including Indigenous communities and landholders – about access, permissions and research methodology.

Scientists will conduct a desktop study of existing data on the Hot Valley Springs, refine fieldwork plans, and then undertake field survey activities, including:

- geological mapping of outcrops and fault segments
- comprehensive atmospheric gas sampling
- sampling spring water to determine a biological baseline of the springs' microbial communities
- comprehensive atmospheric and groundwater sampling and characterisation of the flux from gas bubbles across the Hot Springs Valley region
- hydrogeochemical and biological baseline characterisation of the source of gas seepages, and
- a terrestrial ecology survey to determine the water-dependent terrestrial species occurring in the region, including birds, bats and other mammals, reptiles, and frogs.

Scientists will collate new and existing baseline data.

Data collected in the project will be integrated to develop conceptual models of potential gas and water connectivity pathways across the Hot Springs Valley.

All research results will be made publicly available on the GISERA web site.

More information

Find out more about [this study on the GISERA's website](#)

Read about other [GISERA projects in the NT](#)

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