



GISERA
Gas Industry Social and
Environmental Research Alliance

GISERA Annual Research & Development Plan and Budget

2017/18



QGC



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COVER PHOTOGRAPH

CSIRO air quality monitoring instrumentation adjacent to a CSG well (in background) in Combabula, near Roma, Queensland, 2017.

Information gathered at this site feeds into the GISERA Surface and Groundwater project entitled 'Air, water and soil impacts of hydraulic fracturing: Phase 2'. This project involves undertaking a comprehensive monitoring campaign to measure the air, surface water groundwater and soil impacts of hydraulic fracturing of gas production wells in the Surat Basin, Queensland.

1 Director's summary

The 2016-17 year has seen great progress in the national expansion of the Gas Industry Social and Environmental Research Alliance (GISERA), with development of the NSW research portfolio to nine projects, and a \$4 million additional Australian Government Department of Industry, Innovation and Science expansion investment.

In total over the year, nine new projects were approved, taking the total number of GISERA projects to 38, taking the total research investment to \$20,965,203¹.

This past year of transition as a national alliance has included expanding relationships in several new state jurisdictions, as well as the ongoing delivery of independent scientific research that contributes constructively and objectively to the needs of community, government and industry on the coal seam gas industry in eastern Australia.

GISERA's primary objectives remain to:

- carry out independent research and improve and extend knowledge of social and environmental impacts and opportunities of onshore gas projects for the benefit of the industry, community and the broader public
- inform governments, regulators and policy-makers on key issues regarding policy and legislative framework for the gas industry.

Projects completed this past year have developed knowledge in a range of areas, including how to enhance the co-existence of agriculture and industry, understanding the wellbeing and economic trajectories of communities in gas regions, and improved tools to support biodiversity protection.

GISERA membership now includes Australia Pacific Liquefied Natural Gas (APLNG), Queensland Gas Company (QGC), Australian Gas Light Company (AGL), Santos, Origin Energy and CSIRO. Financial support is also received from the Australian Government and the New South Wales Government.

The Australian Government's additional \$4 million grant, executed at the end of the 2016-17 year, has enabled the groundwork for the expansion of the Queensland and NSW model into South Australia, the Northern Territory and Western Australia.

GISERA continues to achieve credibility, trust and respect through the open and transparent conduct and communication of its research and synthesis activities. All aspects of GISERA research are publically available on the GISERA website: www.gisera.org.au. In the past year, a new GISERA website was launched, and the GISERA branding was updated to enhance and support our communication and knowledge transfer activities.

¹ This includes CSIRO in-kind contribution.

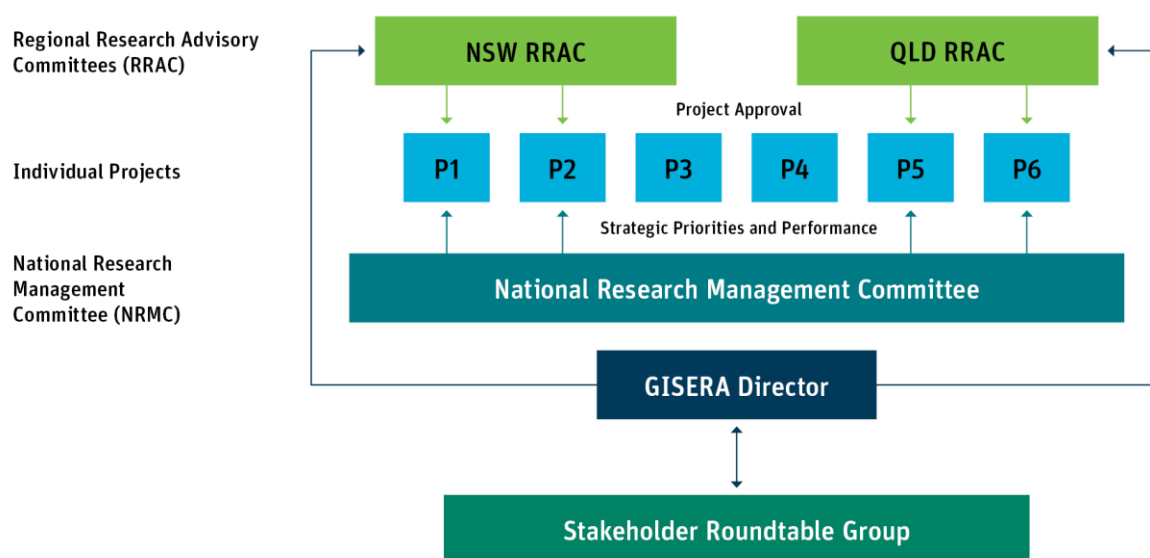
Governance

A key function of CSIRO's GISERA is to undertake research on issues of direct community interest using funding supplied by the gas industry and governments. To ensure independence of CSIRO research, a rigorous governance structure is imposed utilising external stakeholder-dominated Regional Research Advisory Committees (RRAC) in NSW and Queensland.

The RRACs are responsible for approving the allocation of research funds to projects which meet the community objectives. The National Research Management Committee ensures fiscal and project level responsibilities are met but does not determine where research funds are spent. The governance structure is shown below:



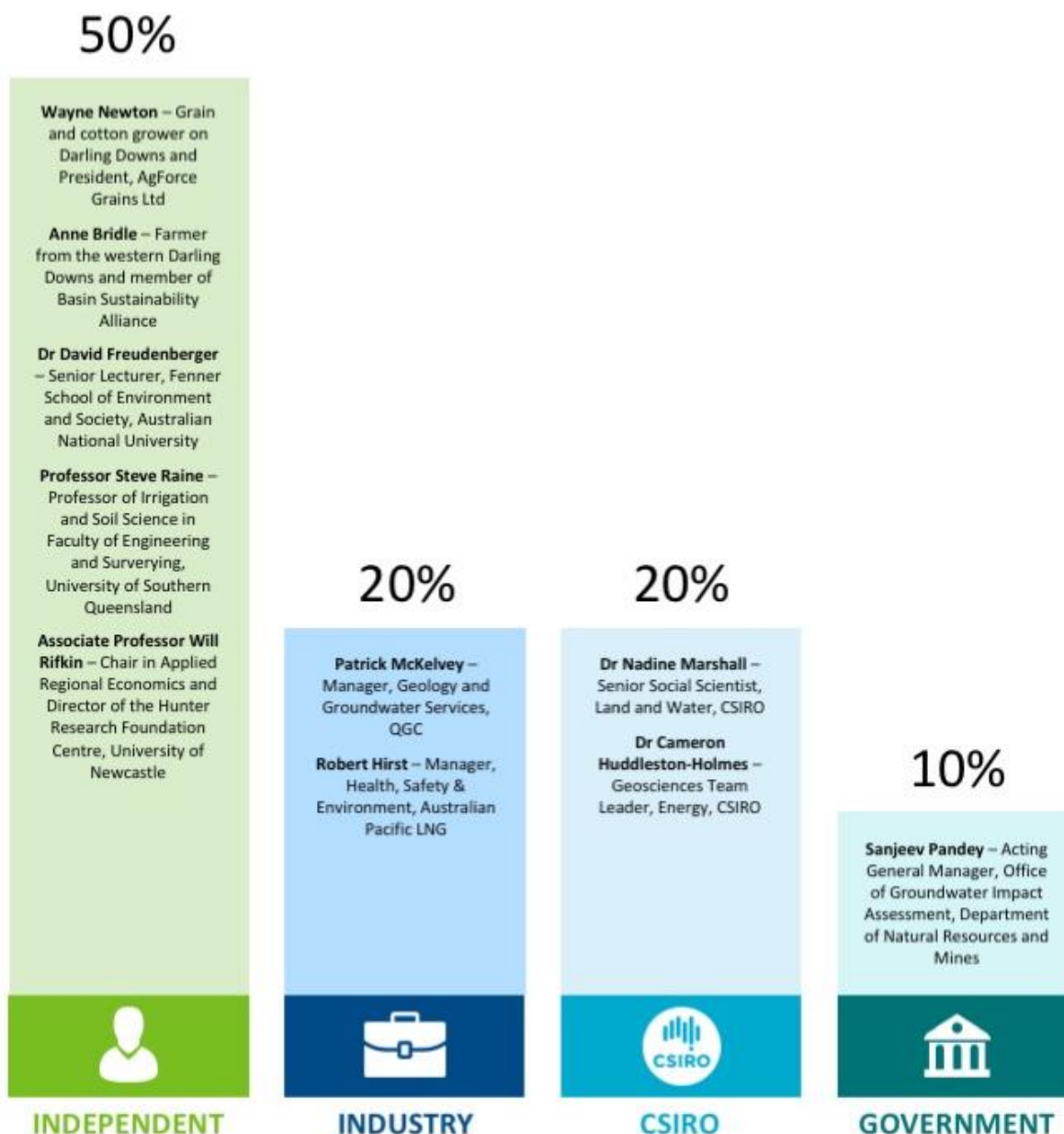
National GISERA Model



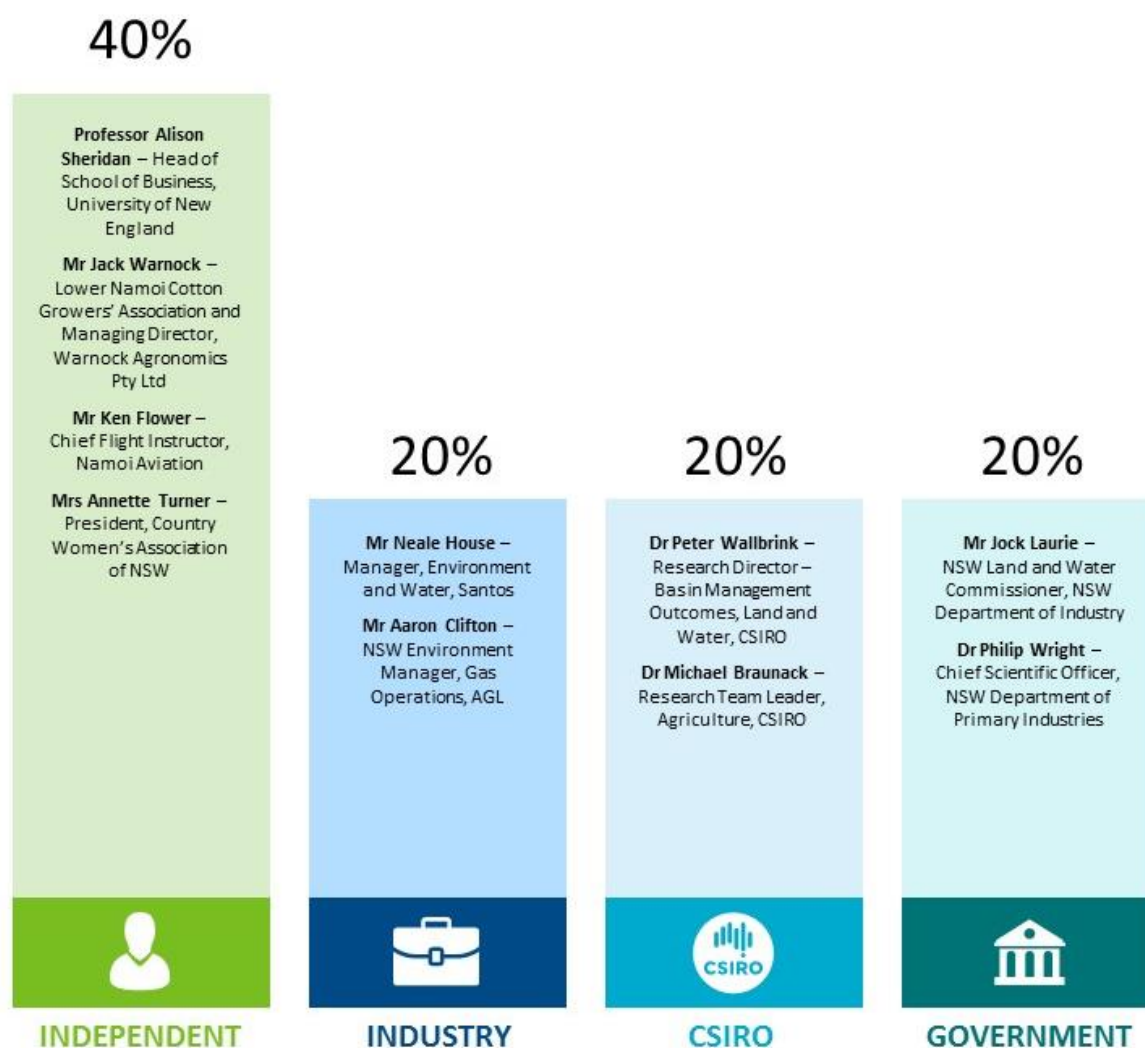
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The composition and membership of the Queensland and New South Wales RRACs is critical to the success of GISERA and, as shown below, are dominated by esteemed and respected independent participants from the communities in which gas development is occurring:

Members of the Queensland RRAC



Members of the NSW RRAC



Regional Research Advisory Committees' activities

New South Wales

The NSW Regional Research Advisory Committee (NSW RRAC) held its second meeting in October 2016 to review the second tranche of research proposals, resulting in the following five projects being approved:

- A socio-economic project entitled 'Decommissioning pathways for CSG wells' to review regulatory frameworks in relation to principles derived from international literature and consider social concerns with regard to decommissioning of wells and well pad infrastructure. The outcome will be recommendations for an integrated approach to improving the social, economic and environmental effectiveness of decommissioning of

wells and well pads. Project details are available on the website [Decommissioning CSG wells.](#)

- A health project entitled 'Human Health effects of Coal Seam Gas Activity Study Design' to review current information to design a study on the health effects of CSG activities based on community stakeholder, governmental, expert consultation group, and industry input. This project will result in a comprehensive study design to investigate effects of CSG activity on human health, including development of a conceptual model to inform the study design. Project details are available on the website [Human Health effects of Coal Seam Gas Activity Study Design.](#)
- A surface and groundwater project entitled 'Spatial design of groundwater monitoring networks in the Narrabri Gas Project area' to analyse and design optimal groundwater bore networks for groundwater monitoring that will provide early detection of changes. Optimal spatial design of groundwater monitoring networks will improve confidence around predicted groundwater impacts, and help minimise the risk of environmental damage. Project details are available on the website [Spatial design of groundwater monitoring network.](#)
- A surface and groundwater project entitled 'Improving groundwater models to better represent coal seam gas extraction impacts in the Namoi region' that will develop more representative models for estimating the groundwater impacts from coal seam gas well fields. This will improve the prediction of groundwater impacts by ensuring accurate representation of the effects of CSG production in the groundwater models being developed for the Namoi region. Project details are available on the website [Improving groundwater models to better represent coal seam gas extraction impacts in the Namoi region.](#)
- A surface and groundwater project entitled 'Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction' will assess the likelihood of groundwater contamination from hydraulic fracturing and wellbore damage. This will produce a risk estimate of groundwater contamination at a basin/sub-basin scale. This will help management plans and strategies to reduce the risk of surface and groundwater contamination and provide communities a better understanding of potential impacts to local water resources. Project details are available on the website [Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction.](#) This is a jointly funded NSW and Queensland project.

Queensland

The Queensland RRAC met in November 2016 to review research proposals, resulting in the following four projects being approved:

- A surface and groundwater project entitled [Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction](#) as mentioned above.
- An agricultural land management project entitled 'CSG and Livestock- Inside the herd' to monitor grazing land with coal seam gas (CSG) infrastructure to better understand the impacts of CSG infrastructure, traffic and dust on animals and pastures. This will provide a

detailed study of livestock behaviour, pastures, soil processes, and dust deposition for a real CSG property. Project details are available on the website [CSG and Livestock – Inside the Herd](#).

- A Terrestrial Biodiversity project entitled ‘Guidelines for offset population sizes’ to improve the understanding of how ecological and biological traits of rare species of plants, commonly encountered in restoration projects, and different environmental factors determine viable population sizes by using computer models. It will produce evidence-based guidelines for the size of plant populations needed to maximise establishment and persistence of rare plant species. Project details are available on the website [Guidelines for offset population sizes](#).
- A surface and groundwater project entitled ‘Air, water and soil impacts of hydraulic fracturing: Phase 1’ measures the air, water and soil impacts of hydraulic fracturing of production wells in the Surat Basin. This project outcomes are a report summarising the current state of knowledge regarding sources of air, water and soil pollutants associated with CSG extraction using hydraulic fracturing, a peer-reviewed design for a measurement program that will provide enhanced information of the impacts of hydraulic fracturing, and a report presenting an analysis of air, water and soil quality before commencement of hydraulic fracturing activity. Project details are available on the website [Air, water and soil impacts of hydraulic fracturing phase 1](#).

The Queensland RRAC met again in May 2017 to review a research proposal resulting in the following project being approved:

- A Surface and Groundwater project titled ‘Air, water and soil impacts of hydraulic fracturing: Phase 2’. This project involves undertaking a comprehensive monitoring campaign to measure the air, surface water groundwater and soil impacts of hydraulic fracturing of gas production wells in the Surat Basin, Queensland. This will produce a series of reports summarising the impacts of hydraulic fracturing on of air, water and soil quality, based on data from a comprehensive measurement program air, water and soil quality before, during and after hydraulic fracturing activity.

The following seven Queensland projects were completed during this reporting period:

- [Preserving agricultural productivity](#)
- [Gas-farm design](#)
- [Making tracks, treading carefully](#)
- [Telling the Story](#)
- [Community functioning and wellbeing 2](#)
- [Economic assessment and forecasting](#)
- [Ensuring biodiversity offset success: the right kind of seed for a daisy](#)

All GISERA results and research outputs including scientific reports, journal papers and supporting communication products such as factsheets, communiques and online articles, are available to view and download on their respective [research](#) projects.

Looking ahead

The scale of GISERA research activity in CSIRO continues to increase, with the involvement of about 40 researchers across our Agriculture and Food, Health and Biosecurity, Energy, Land and Water, and Oceans and Atmosphere business units. We seek to retain and recruit researchers of the highest distinction and potential, and we also explore broader research collaboration opportunities as we continue our planned expansion into SA, NT and WA.

Effective government engagement continues to assist in understanding relevant research challenges, to promote adoption of research outcomes, and support positive impact from GISERA science. Negotiations regarding contributions from state/territory governments continue.

Plans for the 2017-18 year include development of a Regional Research Advisory Committee (RRAC) in South Australia to review and approve SA research projects that address community concerns, issues and potential impacts as a result of unconventional gas development.

Establishment of a national Stakeholder Roundtable Group (SRG) in the 2017-18 year provides an opportunity to gather additional information and understanding of stakeholder issues.

2 National Budget

GISERA's first *Annual research & development plan and budget* detailed research projects that were scheduled to commence in 2012. This is the sixth *Annual research & development plan and budget* and covers the financial year 2017-18.

The *Annual research & development plan and budget*:

- Details the minimum contribution of each Partner to GISERA.
- Includes the committed research investment and expenditure for existing projects.
- Identifies proposed research projects to be undertaken in the financial year, including draft project description and project budget.

2.1 National Budget

2.1.1 Contributions and Grants

The committed financial contributions received from membership, in-kind, grants, APPEA and other industry contributions (separate from membership) over the life of GISERA is outlined in Table 2.1.

Table 2.1 Incoming contributions and grants, by contributor, 2011/12-2018/19

GROUP	PAYMENT TYPE	CONTRIBUTOR	INITIAL GISERA	NATIONAL GISERA	TOTAL
Industry	Membership	APLNG	\$10,000,000	\$300,000 ²	\$10,300,000
		QGC	\$1,250,000	\$300,000 ³	\$1,550,000
		Santos	-	\$450,000	\$450,000
		AGL	-	\$287,500	\$287,500
		Origin	-	\$450,000	\$450,000
	Contribution to water 11 (Air, water and soil impacts of hydraulic fracturing: Phase 1 project)	APLNG	-	\$245,670	\$245,670
	Contribution to water 12 (Air, water and soil impacts of hydraulic fracturing: Phase 2 project)	APLNG	-	\$1,285,000	\$1,285,000
	Contribution via APPEA (GHG 1 - Methane Seepage fluxes project)	APLNG, Santos, Arrow Energy & QGC	\$1,121,707	-	\$1,121,707
Government	Grant	Federal Government	-	\$5,500,000	\$5,500,000
		NSW Government	-	\$1,500,000	\$1,500,000
CSIRO	In-kind	CSIRO	\$5,392,093	\$2,395,574	\$7,787,667
Other	In-kind (Agland 5 - Without a Trace project)	USQ	\$79,990	-	\$79,990
TOTAL			\$17,843,790	\$12,713,744	\$30,557,534

² The figure does not include APLNG's first annual contribution of \$150,000 towards National GISERA. As per clause 7.1 (d) of National Alliance Agreement, the parties agreed that this contribution was made under the Initial Alliance Agreement.

³ The figure does not include QGC's first annual contribution of \$150,000 towards National GISERA. As per clause 7.1 (d) of National Alliance Agreement, the parties agreed that this contribution was made under the Initial Alliance Agreement.

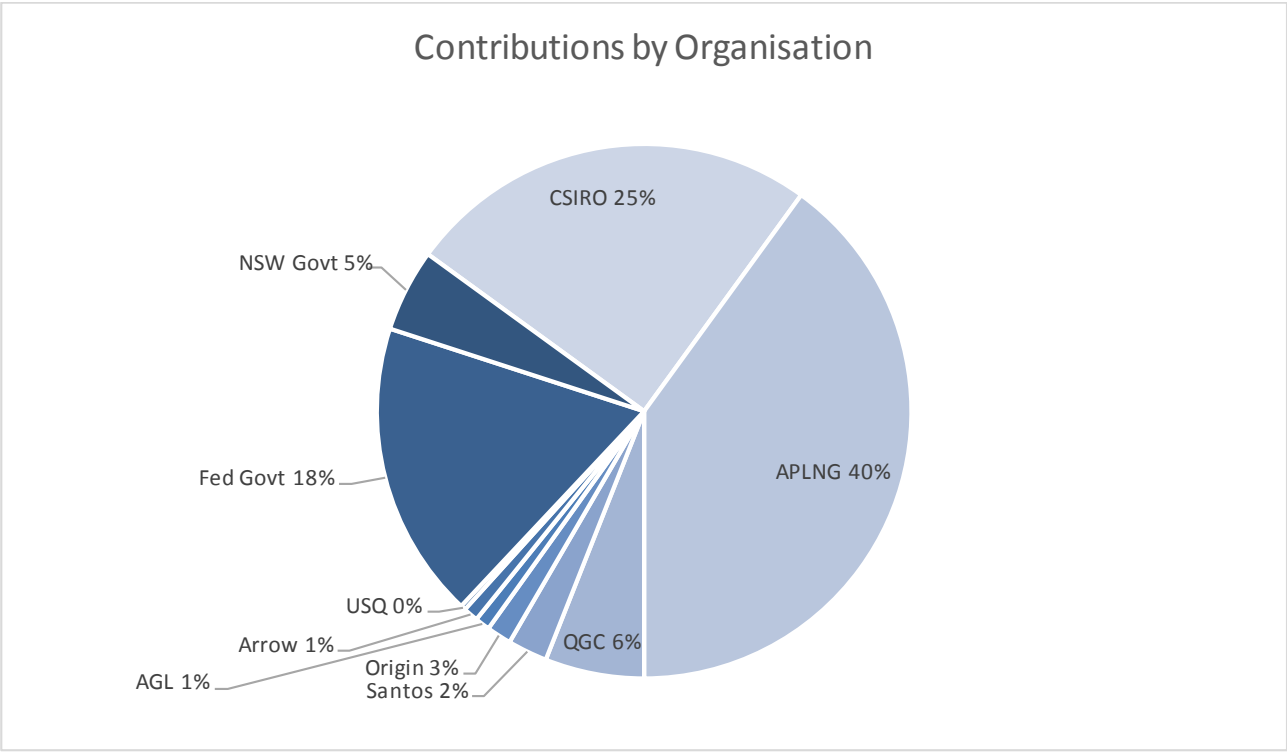


Figure 2.1 Committed contribution over life of GISERA, by organisation

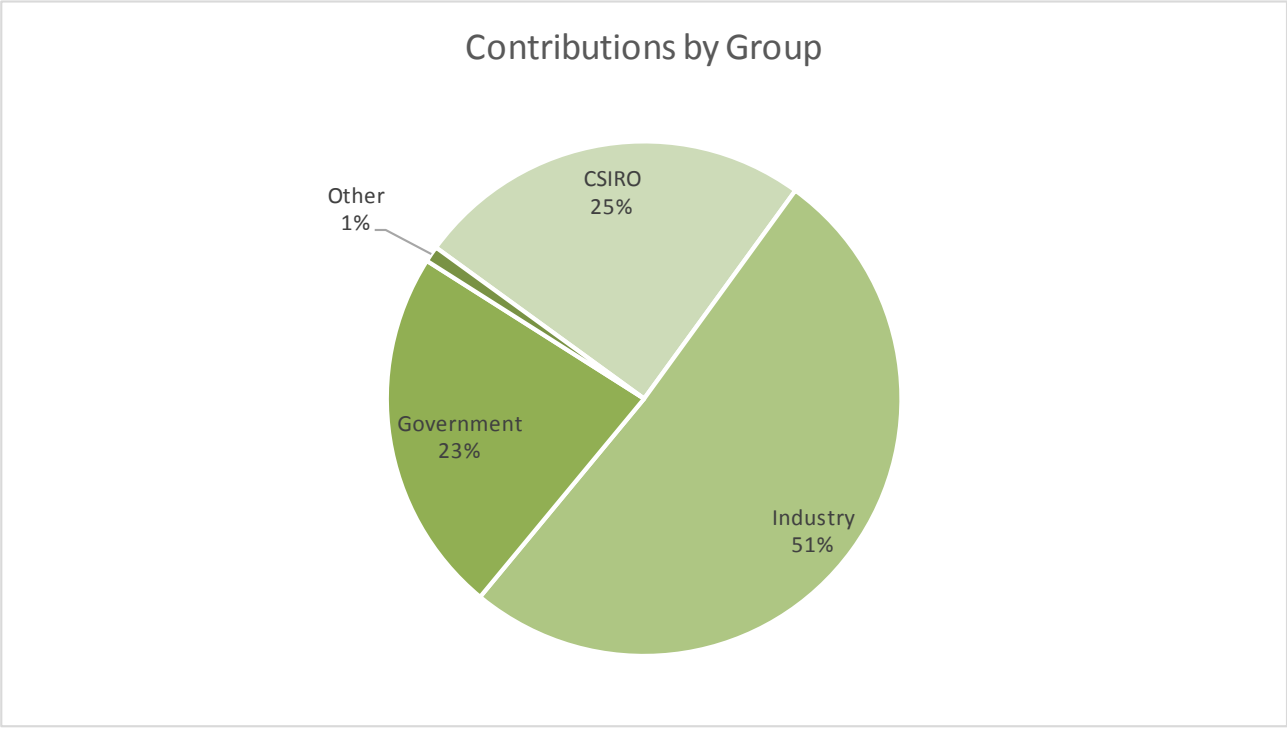


Figure 2.2 Committed contribution over life of GISERA, by group

2.1.2 Committed Research Investment

The committed budget for projects across all regions for 2011/12-2018/19 now stands at \$20,965,203. A breakdown of the committed research budget for the various subject areas is illustrated in Table 2.2 and Figure 2.3 shows the percentage committed to each subject area.

Table 2.2 Committed research investment across all regions, by topic, 2011/12-2018/19

TOPIC / YEAR	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017/18	2018/19	TOTAL
Water	\$1,102,043	\$1,467,580	\$712,245	\$100,000	\$579,672	\$1,774,673	\$2,602,643	\$254,039	\$8,592,895
Greenhouse gas	-	-	\$111,553	\$627,286	\$740,638	\$1,038,438	\$483,410	-	\$3,001,323
Agriculture	-	\$732,594	\$863,669	\$533,301	\$273,747	\$245,384	\$160,471	-	\$2,809,166
Biodiversity	-	\$414,761	\$663,163	\$503,048	\$290,265	\$297,159	\$130,162	-	\$2,298,558
Marine	-	\$857,142	\$357,143	\$478,914	-	-	-	-	\$1,693,199
Social & economic	-	\$420,365	\$434,000	\$300,581	\$266,933	\$723,247	\$152,412	-	\$2,297,538
Health	-	-	-	-	-	\$224,424	\$48,100	-	\$272,524
Total	\$1,102,043	\$3,892,442	\$3,141,773	\$2,543,130	\$2,151,253	\$4,303,325	\$3,577,198	\$254,039	\$20,965,203

**These figures do not include funds for the GISERA Director's office and communications.*

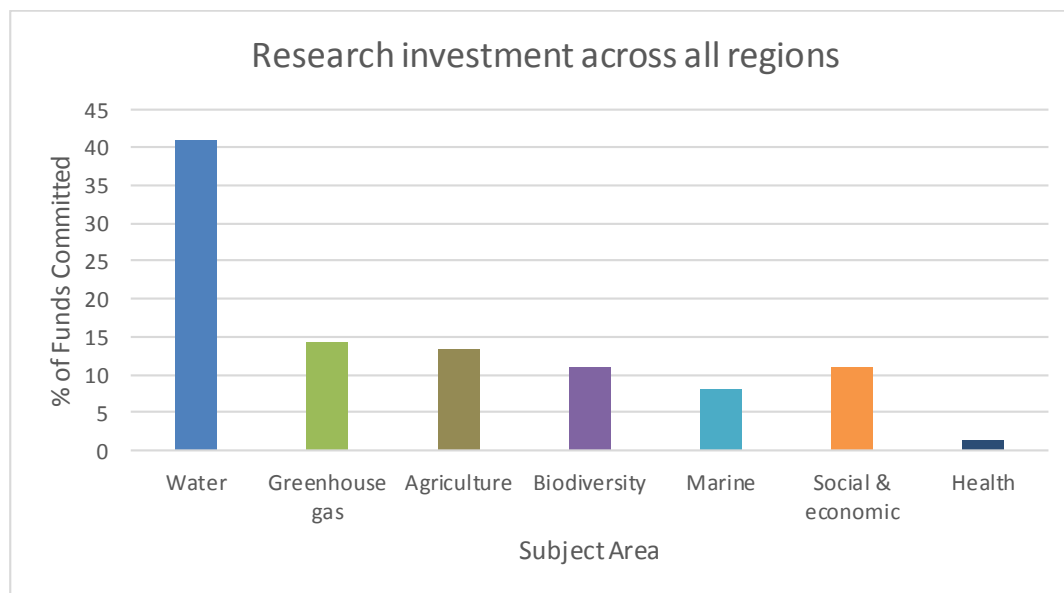


Figure 2.3 Committed research investment across all regions, by subject area, 2011/12-2018/19

3 Queensland R&D Plan & Budget

3.1 Queensland Investment profile

3.1.1 Committed research investment for 2011/12-2018/19

The committed budget for projects in Queensland for 2011/12-2018/19 now stands at \$18,614,350. A breakdown of the committed research budget across the various subject areas is illustrated in Table 3.1 and Table 3.2 shows the investment committed by contributor.

Table 3.1 Committed research investment in Queensland by topic, 2011/12-2018/19

TOPIC / YEAR	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017/18	2018/19	TOTAL
Water (40%)	\$1,102,043	\$1,467,580	\$712,245	\$100,000	\$579,672	\$1,284,398	\$1,975,116	\$179,754	\$7,400,807
Greenhouse gas (15%)	-	-	\$111,553	\$627,286	\$740,636	\$836,528	\$483,410	-	\$2,799,416
Agriculture (15%)	-	\$732,594	\$863,669	\$533,301	\$273,747	\$245,384	\$160,471	-	\$2,809,166
Biodiversity (12%)	-	\$414,761	\$663,163	\$503,048	\$290,265	\$297,159	\$130,162	-	\$2,298,558
Marine (9%)	-	\$857,142	\$357,143	\$478,914	-	-	-	-	\$1,693,199
Social & economic (9%)	-	\$420,365	\$434,000	\$300,581	\$266,933	\$191,326	-	-	\$1,613,205
Total	\$1,102,043	\$3,892,442	\$3,141,773	\$2,543,130	\$2,151,253	\$2,854,795	\$2,749,162	\$179,754	\$18,614,350

Table 3.2 Committed research investment in Queensland by contributor, 2011/12-2018/19

PARTNER	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017/18	2018/19	TOTAL
CSIRO (30%)	\$220,410	\$1,000,445	\$862,590	\$812,370	\$680,418	\$947,205	\$1,015,600	\$69,575	\$5,608,613
USQ (0.5%)	-	\$37,958	\$42,032	-	-	-	-	-	\$79,990
Australia Pacific LNG (58.3%)	\$881,633	\$2,854,039	\$1,950,354	\$987,988	\$1,025,887	\$1,012,384	\$322,075	-	\$9,034,360 (GISERA Membership)
	-	-	\$18,574	\$104,443	\$52,470	\$52,470	\$52,470	-	\$280,427 (Methane Seepage project)
	-	-	-	-	-	\$245,670	-	-	\$245,670 (HF phase 1 project)
	-	-	-	-	-	-	\$1,174,821	\$110,179	\$1,285,000 (HF phase 2 project)
QGC (8.2%)	-	-	\$212,500	\$325,000	\$235,068	\$439,656	\$26,784	-	\$1,239,009 (GISERA Membership)
	-	-	\$18,574	\$104,443	\$52,470	\$52,470	\$52,470	-	\$280,427 (Methane Seepage project)
Santos (1.5%)	-	-	\$18,574	\$104,443	\$52,470	\$52,470	\$52,470	-	\$280,427 (Methane Seepage project)
Arrow Energy (1.5%)	-	-	\$18,574	\$104,443	\$52,470	\$52,470	\$52,470	-	\$280,427 (Methane Seepage project)
Total	\$1,102,043	\$3,892,442	\$3,141,773	\$2,543,130	\$2,151,253	\$2,854,795	\$2,749,160	\$179,754	\$18,614,350

3.1.2 Queensland Current Research Portfolio

A summary of all approved research projects in Queensland is provided in table 3.3.

Table 3.3 Approved Queensland Research Projects

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
Surface and groundwater	Geochemical responses to re-injection*	Understand and quantify aquifer reactions occurring due to re-injection of CSG water, and their impacts on water quality.	Methods for predicting water quality changes resulting from CSG water re-injection.
	Re-injection of CSG water*	Understand, quantify and manage clogging of injection wells during re-injection of CSG water permeates, brines and blends.	Strategies to manage clogging of re-injection wells to maximise re-injection volumes.
	High performance groundwater modelling*	Determine the feasibility of large scale re-injection schemes.	Models that assess the feasibility of large re-injection schemes and predict how re-injection may reduce impacts from CSG development.
	Isotope and geochemical groundwater baseline study*	Characterise the baseline geochemistry of groundwater and formation water prior to and during initial stages of development to understand groundwater age and origin.	Baseline measures of groundwater quality and protocols for monitoring changes in groundwater quality, during and after development.
	Hydrocarbons in groundwater, Surat and Bowen basins	Review and assess the presence of organic compounds in groundwater found in the Surat and Bowen basins using existing open source and company held data.	Information and methods to assess possible sources of hydrocarbons in groundwater to help differentiate naturally occurring hydrocarbons and those potentially introduced during gas extraction process.
	Constraining water flows in the Surat Basin	Measuring and modelling specific chemicals called environmental tracers to gain a better understanding of the speed and direction of groundwater flow.	New data and modelling approach to assess flow rates and volumes of usable groundwater resources in CSG regions in Queensland.
	Groundwater contamination risk assessment	Assess the likelihood of groundwater contamination from hydraulic fracturing and wellbore damage.	Quantitative estimate of the risk of groundwater contamination at a basin/sub-basin scale. This will help management plans and strategies to reduce the risk of surface and groundwater contamination and provide communities a better understanding of potential impacts to local water resources.
	Air, water and soil impacts of hydraulic fracturing (Phase 1)	To design an intensive monitoring campaign that will measure the air, water and soil impacts of hydraulic fracturing of production wells in the Surat Basin.	A report summarising the current state of knowledge regarding sources of air, water and soil pollutants associated with CSG extraction using hydraulic fracturing, a peer-reviewed design for a measurement program that will provide enhanced information of the impacts of hydraulic fracturing and a

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
			report presenting an analysis of air, water and soil quality before commencement of hydraulic fracturing activity.
	Air, water and soil impacts of hydraulic fracturing (Phase 2)	This project involves undertaking a comprehensive monitoring campaign to measure the air, surface water groundwater and soil impacts of hydraulic fracturing of gas production wells in the Surat Basin, Queensland.	A series of reports summarising the impacts of hydraulic fracturing on of air, water and soil quality, based on data from a comprehensive measurement program air, water and soil quality before, during and after hydraulic fracturing activity.
Social and economic	Monitoring regional transition*	Synthesise existing knowledge on the nature of rural socio-economic transitions occurring as a result of resource developments, and track the social impacts of regional economic change.	Identify ways to help local communities in responding to resource development in order to maximise social benefit.
	Community functioning and well-being*	Identify principal indicators of community function and well-being, the resources and strategies necessary for enabling and enhancing community responses, and how communities respond to major developments in their region.	Inform strategic investments that will help maintain or enhance community function and well-being.
	Economic assessment and forecasting project*	Understand future impacts on regional economies and how local businesses can respond.	Forecasts calculating likely economic effects during the operations phase and lessons to support local businesses.
	Understanding community aspirations*	Identify community aspirations and their overlaps and/or disparities with existing resources, industry, and policy trajectories. Specifically, to understand how different community segments see the future of the region and how these reflect the economic and policy avenues for the region.	Help inform sound industry and policy activities to satisfy the social licence to operate.
	Community function and well-being survey 2*	Conduct a community well-being survey to measure the changes since the end of the construction and start of the operations phases and compare results with the Survey 1 in 2014.	Identify strategies that can be enacted by local and state government to proactively reduce stresses associated with rapid change and also to take advantage of opportunities arising from resource development.
Marine environment	Sustaining turtles and their homes*	Understand how sediments from dredging and discharges affect seagrass and turtles.	Quantifying the risks to turtle populations from dredging and increased boat traffic.
Greenhouse gas footprint	Methane seepage in the Surat Basin	Detect and measure methane seeping from underground in the Surat Basin, and identify sources of methane to provide a baseline of methane emissions on a regional scale.	A methane emissions data set that can be used to compare changes in methane concentrations as coal seam gas production in the Surat Basin increases.
	Greenhouse gas emission assessment of the Surat Basin Gas Reserve	Analysis of the whole of life cycle GHG emissions, including extraction, transportation and usage of CSG in the Surat Basin.	Assessments of benefits and risks related to the extraction, transport and usage of gas in terms of their GHG emission footprint.

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
	Ambient air quality in the Surat Basin	Comprehensive assessment of air quality in the Surat Basin region in Queensland using air quality measurement network and modelling.	Identify the impact of CSG production activities on air quality in the Surat region.
Agricultural land management	Preserving agricultural productivity*	Assist in the preservation of agricultural productivity during land use change.	Developing methods for most equitably and/or cost-effectively preserving agricultural productivity.
	Shared space*	Understand how farmers from a range of production systems (extensive grazing to intensive cropping) perceive and value CSG developments on their and others' farms.	Information that assists farmers and developers to negotiate means of co-existence that maximise benefits and minimise social and economic costs.
	Gas farm design*	Understand how to design farms for a new mixed land use.	Design principles and practices that optimise farm and gas infrastructure and operations, minimising negative impacts and maximising benefits.
	Making tracks, treading carefully*	Understand the direct and indirect impacts of tracks and traffic on invasive species and erosion in agricultural landscapes.	Guidelines for quantifying, monitoring and managing weed and erosion threats.
	Without a trace*	Identify the nature and likely extent of damage to agricultural soils, and methods for avoiding and improving soils.	Methods for installing and operating gas infrastructure that avoids soil damage, and novel methods for rehabilitating damage that does occur.
	Telling the story*	Share understanding of changes on farms and in towns during CSG development in the Surat area.	Development of a detailed landscape map showing changes during CSG developments and face-to-face engagements at local shows or community events in the Surat region.
	CSG and Livestock – Inside the Herd	Monitoring grazing land with CSG infrastructure to better understand the impacts of CSG infrastructure, traffic and dust on animals and pastures.	A detailed study of livestock behaviour, pastures, soil processes, and dust deposition for a real CSG property.
Terrestrial biodiversity	Priority threat identification, management and appraisal*	Identify and understand the broad range of existing and new threats to biodiversity across a CSG development region.	Determine which conservation management activities will best mitigate the risks to biodiversity.
	Fire ecology of grassy woodlands*	Determine the sensitivity of the region's flora and fauna to changed fire regimes, and the thresholds at which changed fire regimes cause substantial ecological impact.	Advice on how to best manage the biodiversity impacts of altered fire regimes associated with CSG development.
	Habitat selection by two focal species*	Study two species, the Golden-tailed gecko and Glossy black-cockatoo, to assess the range of impacts from CSG development in south-west Queensland on their habitat.	Management options for the Golden-tailed gecko and Glossy black-cockatoo habitats to ensure their long-term endurance.
	Ensuring biodiversity offset success: the right kind of seed for a rare daisy*	Identify genetic and demographic factors that may limit the success of establishing a rare daisy (<i>Rutidosia lantana</i>) in a new location.	Best practice guidelines for moving the <i>Rutidosia lantana</i> , a rare daisy, to a new location. The guidelines will help to minimise biological limits to reproductive success and maximise population viability of the daisy.

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
	Guidelines for offset population sizes	Improve the understanding of how ecological and biological traits of rare species of plants, commonly encountered in restoration projects, and different environmental factors determine viable population sizes by using computer models.	Evidence-based guidelines for the size of plant populations needed to maximise establishment and persistence of rare plant species.

**These projects have been completed and their reports are available at www.gisera.org.au*

3.1.3 Queensland Research Progress and Expenditure

The committed Queensland research budget, expenditure and milestones completed for each project is provided in table 3.4.

Table 3.4 Committed research investment, expenditure and progress in Queensland, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE UP TO 30 JUNE 2016	PERCENTAGE OF BUDGET SPENT UP TO 30 JUNE 2017	PERCENTAGE OF MILESTONES COMPLETED UP TO 30 JUNE 2017
Surface and groundwater	Geochemical responses to re-injection*	\$1,061,242	\$969,418	91%	100%
	Re-injection of CSG water*	\$1,039,989	\$1,085,085	104%	100%
	High performance groundwater modelling*	\$928,215	\$1,024,173	110%	100%
	Isotope and geochemical groundwater baseline study*	\$667,053	\$709,848	106%	100%
	Hydrocarbons in groundwater, Surat & Bowen basins	\$571,782	\$385,299	67%	25%
	Constraining groundwater flow models	\$588,957	\$282,374	48%	50%
	Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction	\$290,624 ⁴	\$149,635	51%	22%
	Air, water and soil impacts of hydraulic fracturing (Phase 1)	\$330,795 ⁵	\$306,993	93%	14%
	Air, water and soil impacts of hydraulic fracturing (Phase 2)	\$2,111,056 ⁶	\$0 ⁷	\$0	0%
Social and economic	Monitoring regional transition*	\$376,088	\$404,084	107%	100%
	Community functioning and well-being*	\$417,438	\$457,314	110%	100%

⁴ This is a jointly funded QLD and NSW project. The figures presented in this table are for 'total project costs' and not split by region.

⁵ This includes \$245,670 contribution from APLNG (separate from membership)

⁶ This includes \$1,285,000 contribution from APLNG (separate from membership)

⁷ This project was approved on 29 May 2017 and therefore no expenditure was incurred or progress included in this reporting period.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE UP TO 30 JUNE 2016	PERCENTAGE OF BUDGET SPENT UP TO 30 JUNE 2017	PERCENTAGE OF MILESTONES COMPLETED UP TO 30 JUNE 2017
	Economic assessment and forecasting project*	\$296,508	\$303,399	102%	100%
	Understanding community aspirations*	\$342,692	\$341,821	100%	100%
	Community function and well-being survey 2*	\$180,479	\$188,433	104%	100%
Marine environment	Sustaining turtles and their homes*	\$1,693,199	\$1,802,905	106%	100%
Greenhouse gas footprint	Methane seepage in the Surat Basin	\$2,015,936	\$1,938,587	96%	70%
	Greenhouse gas (GHG) emission assessment of the Surat Basin Gas Reserve	\$241,708	\$266,847	110%	33%
	Ambient air quality in the Surat Basin	\$541,770	\$432,861	80%	10%
Agricultural land management	Preserving agricultural productivity*	\$547,756	\$528,584	96%	100%
	Shared space*	\$140,445	\$138,805	99%	100%
	Gas farm design*	\$651,329	\$626,057	96%	100%
	Making tracks, treading carefully*	\$564,089	\$578,197	103%	100%
	Without a trace*	\$339,990	\$339,990 ⁸	100%	100%
	Telling the story*	\$332,224	\$223,511	100%	100%
	CSG and Livestock- Inside the herd	\$233,333	\$55,589	28%	33%
Terrestrial biodiversity	Priority threat identification, management and appraisal*	\$945,400	\$1,010,427	107%	100%
	Fire ecology of grassy woodlands*	\$789,042	\$840,016	106%	100%
	Habitat selection by two focal species*	\$167,432	\$204,990	122%	100%
	Ensuring biodiversity offset success: the right kind of seed for a rare daisy*	\$198,055	\$225,232	114%	100%

⁸ This includes \$79,990 in-kind contribution from USQ.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE UP TO 30 JUNE 2016	PERCENTAGE OF BUDGET SPENT UP TO 30 JUNE 2017	PERCENTAGE OF MILESTONES COMPLETED UP TO 30 JUNE 2017
	Guidelines for offset population sizes	\$198,630	\$56,589	28%	33%
TOTAL ALLOCATED BUDGET		\$18,614,350			

*These projects have been completed and their reports are available at www.gisera.org.au

3.1.4 Queensland Research Progress update

An approved research project consists of a Project Order and Budget that has been approved by the Regional Research Advisory Committee.

During the execution of an approved project, changes and modifications to the Project Order and Budget may be submitted to the Director for consideration. The Director may approve minor modifications to Project Orders that do not significantly alter the proposed outcomes, and do not have significant financial consequences for the project. The Director may consult the Regional Research Advisory Committee about these modifications.

Major modifications to Project Orders that may involve significant financial consequences or significant change in project scope will be prepared in consultation with the Director and presented to the Regional Research Advisory Committee for approval. Any changes made to Project Orders are clearly recorded on the Project Order, and available for public perusal.

Research updates and progress against project milestones are reported quarterly. Variations, if any, are also included as this allows any variations/modifications to the Project Order to be tracked easily. Summaries of each project's progress against milestones and variations, as well as the original Project Order, are available on the GISERA website: <https://gisera.org.au/research/>.

3.2 Queensland proposed new research projects for 2017/18

There is approximately \$207,024⁹ Australia Pacific LNG and QGC cash research budget available for new project proposals to be initiated in FY 2017/18 and beyond.

The following projects are being discussed, but are yet to be ratified and are subject to review by the relevant Regional Research Advisory Committee. Over coming months once further surveying and stakeholder consultation is complete, CSIRO researchers will consider drafting project proposals on these topics dependent on resource capacity. It is currently unknown whether these projects will be approved and proceed.

Table 3.5 Proposed research investment in Queensland for 2017/18 and beyond, by project

SUBJECT AREA	TITLE	OBJECTIVE	POTENTIAL REGION	COMMENT	ESTIMATED COST
Socio-economic	Community wellbeing and acceptance survey III	The Community Wellbeing and Responding to Change survey measures perceptions of wellbeing, resilience, adaptation to change, and expected future wellbeing within communities affected by natural gas development. This work documents how and why these aspects changes over time.	Queensland	This would be the third, and possibly final time to conduct such a study in Queensland. CSIRO has conducted these in February 2014 and February 2016. February 2018 would be the next most logical time. There is interest from industry and the Queensland DNRMC CSG compliance unit to repeat the work. There are benefits for our understanding of the science around community wellbeing and social licence.	\$250-300K
Socio-economic	Decommissioning / Asset integrity	To find innovative methods to maintain or decommission assets.	QLD and NSW	GISERA has begun to review concerns with regard to decommissioning of wells and well pad infrastructure. Are there other critical asset(s) to do consider such as gathering pipes or processing plants?	\$400K
Health	Human Health effects of Coal Seam Gas	i) Scrutinizing emission pathways for harmful exposure levels using novel risk assessment techniques.	QLD or NSW (likely to be	The review of all current information for the purpose of designing a study to look at potential health impacts from gas activities is now complete. Phase 2 of this study is to	>\$1 million

⁹ This figure is total GISERA funding for QLD, less \$18,198,635 already committed to research (tables 3.1 and 3.2) and less anticipated costs for the Director's Office/Communication for the life of GISERA. The remaining research budget does not include any future Federal or State Government contributions or CSIRO in-kind contributions.

SUBJECT AREA	TITLE	OBJECTIVE	POTENTIAL REGION	COMMENT	ESTIMATED COST
	Activity Study Design, Phase 2	ii) Understanding non-physical factors that affect the understanding of issues and overall health and wellbeing.	extended into other regions)	implement the research framework devised in Phase 1 to generate information required to investigate the health impacts of CSG activities. A RRAC must approve the proposal for Phase 2.	
Surface and Groundwater	Aquifer connectivity and GW dynamics	To assess a methane concentration and other tracers (including isotopes) baseline and their source(s) to determine the origin of the gas and possible diffusive and advective pathways for gases from industry target units to overlying shallow sedimentary bedrock aquifers.	QLD or NSW	Advice by the Independent Expert Scientific Committee (IESC, 2017) to decision makers on the Narrabri Gas Project, which suggested that 'the collection and analysis of isotope data could provide more confidence in the overall water balance, mixing and conceptual models of geology and associated connectivity'.	\$250-300K
GHG / Methane	Assessment of the total and local gas emissions potential from natural gas basins	Quantify fugitive and natural gas seepage through subsurface strata – to understand how methane levels change from pre and post development	QLD or NSW	Further research is required to evaluate the ongoing change in emissions after industrial development. The main objective of this research project is to improve our understanding of gas release from coal, its movement through the subsurface and its emission into the atmosphere.	\$250-300K

4 NSW R&D Plan & Budget

4.1 NSW Investment profile

4.1.1 Committed research investment for 2015/16-2018/19

The committed budget for projects in New South Wales for 2015/16-2018/19 now stands at \$2,350,854. A breakdown of the committed research budget across the various subject areas is illustrated in Table 4.1 and Table 4.2 shows the investment committed by contributor.

Table 4.1 Committed research investment in NSW by topic, 2015/16-2018/19

TOPIC / YEAR	2015/16	2016/17	2017/18	2018/19	TOTAL
Water (51%)	-	\$490,275	\$627,527	\$74,285	\$1,192,087
Greenhouse gas (8.5%)	-	\$201,910	-	-	\$201,910
Social & economic (29%)	-	\$531,921	\$152,412	-	\$684,333
Health (11.5%)	-	\$224,424	\$828,039	-	\$272,524
TOTAL	-	\$1,448,530	\$828,039	\$74,285	\$2,350,854

Table 4.2 Committed research investment in NSW by contributor, 2015/16-2018/19

PARTNER	2015/16	2016/17	2017/18	2018/19	TOTAL
CSIRO (24%)	-	\$351,792	\$199,182	\$18,573	\$569,547
Santos (13%)	-	\$188,305	\$108,983	\$9,285	\$306,573
AGL (13%)	-	\$188,305	\$108,983	\$9,285	\$306,573
Federal Government (26%)	-	\$368,336	\$211,705	\$18,571	\$598,612
NSW Government (24%)	-	\$351,792	\$199,186	\$18,751	\$569,549
TOTAL	-	\$1,448,530	\$828,039	\$74,285	\$2,350,854

4.1.2 NSW Current Research Portfolio

A summary of all approved research projects in NSW is provided in table 4.3.

Table 4.3 Approved NSW Research Projects

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
Surface and groundwater	Impacts of CSG depressurization on Great Artesian Basin flux	Improve the understanding of the GAB groundwater flow in the Pilliga region through integration of existing information from models, hydrochemical data and environmental tracers.	Assess the chances of extreme changes in GAB groundwater flux (flow volumes) as a result of CSG development using state of the art uncertainty analysis and modelling.
	Spatial design of groundwater monitoring network in the Narrabri Gas Project area	Analysis and design of groundwater bore networks for optimal groundwater monitoring and early detection of changes.	Optimal spatial design of groundwater monitoring networks to improve confidence around predicted groundwater impacts, and help minimise the risk of environmental damage.
	Improving groundwater models to better represent coal seam gas extraction impacts in the Namoi region	Develop more representative models for estimating the groundwater impacts from coal seam gas well fields.	Improving the prediction of groundwater impacts by ensuring accurate representation of the effects of CSG production in the groundwater models being developed for the Namoi region.
	Groundwater contamination risk assessment	Assess the likelihood of groundwater contamination from hydraulic fracturing and wellbore damage.	Quantitative estimate of the risk of groundwater contamination at a basin/sub-basin scale. This will help inform management plans and strategies to reduce the risk of surface and groundwater contamination and provide communities a better understanding of potential impacts to local water resources.
Social and economic	Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations	Identify current levels and trajectories of economic, social and demographic variables in CSG regions within NSW and analyse whether or not the CSG industry could change the trajectory of these variables.	Comprehensive baseline assessment of economic, social and demographic characteristics of CSG regions in NSW and the potential impacts of CSG on these characteristics.
	Social baseline assessment of the Narrabri region of NSW in relation to CSG development	Understand and measure attitudes, perceptions and expectations that exist within the community with respect to CSG development, and current levels of community wellbeing and community resilience.	Baseline information about the community's wellbeing, perceptions, expectations and resilience in relation to CSG development.
	Decommissioning pathways for CSG projects	Review regulatory frameworks in relation to principles derived from international literature and consider social concerns with regard to decommissioning of wells and well pad infrastructure.	Recommendations for an integrated approach to improving the social, economic and environmental effectiveness of decommissioning of wells and well pads.

RESEARCH SUBJECT AREA	PROJECT	SCOPE	OUTCOMES
Greenhouse gas footprint	Regional Methane Emissions in NSW CSG Basins	This project will identify and quantify methane emission sources such as CSG infrastructure, feedlots, coal mining, legacy bore holes in the Pilliga region.	This research will result in a detailed inventory and map of methane emissions for the Pilliga region that can be used to compare emissions once large scale gas extraction starts.
Health	Human health effects of coal seam gas	Review current information to design a study on the health effects of CSG activities based on community stakeholder, governmental, expert consultation group, and industry input.	Comprehensive study design to investigate effects of CSG activity on human health, including development of a conceptual model to inform the study design.

4.1.3 NSW Research Progress and Expenditure

The committed New South Wales research budget, expenditure and milestones completed for each project is provided in table 4.4.

Table 4.4 Committed research investment, expenditure and progress in NSW, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE UP TO 30 JUNE 2017	PERCENTAGE OF BUDGET SPENT UP TO 30 JUNE 2017	PERCENTAGE OF MILESTONES COMPLETED UP TO 30 JUNE 2017
Surface and groundwater	Impacts of CSG depressurisation on the Great Artesian Basin flux	\$453,288	\$75,409	17%	60%
	Data- worth analysis and spatial design of groundwater monitoring networks in the Narrabri Gas Project area	\$248,599	\$5,089	2%	25%
	Improving groundwater models to better represent coal seam gas extraction impacts in the Namoi region	\$301,295	\$74,498	25%	33%
	Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction	\$290,624 ¹⁰	\$149,635	51%	22%
Social and economic	Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations	\$113,167	\$51,649	46%	50%
	Social baseline assessment of the Narrabri region of NSW in relation to CSG development	\$272,292	\$212,040	78%	50%
	Decommissioning CSG Wells	\$298,876	\$164,492	55%	50%
Greenhouse gas footprint	Regional methane emissions in NSW CSG basins	\$201,910	\$91,793	45%	80%
Health	Human Health effects pf Coal Seam Gas Activity Study Design	\$272,524	\$182,110	67%	0%
TOTAL ALLOCATED BUDGET		\$2,350,854			

¹⁰ This is a jointly funded QLD and NSW project. The figures presented in this table are for 'total project' and not split by region.

4.1.4 NSW Research Progress update

An approved research project consists of a Project Order and Budget that has been approved by the Regional Research Advisory Committee.

During the execution of an approved project, changes and modifications to the Project Order and Budget may be submitted to the Director for consideration. The Director may approve minor modifications to Project Orders that do not significantly alter the proposed outcomes, and do not have significant financial consequences for the project. The Director may consult the Regional Research Advisory Committee about these modifications.

Major modifications to Project Orders that may involve significant financial consequences or significant change in project scope will be prepared in consultation with the Director and presented to the Regional Research Advisory Committee for approval. Any changes made to Project Orders are clearly recorded on the Project Order, and available for public perusal.

Research updates and progress against project milestones are reported quarterly. Variations, if any, are also included as this allows any variations/modifications to the Project Order to be tracked easily. Summaries of each project's progress against milestones and variations, as well as the original Project Order, are available on the GISERA website: <https://gisera.org.au/research/>.

4.2 Summary of leading stakeholder key issues/questions

Following extensive consultation with various stakeholders in NSW, a list of stakeholder questions/concerns was developed. A list of these issues can be found in table 4.5 and the proposed projects to address the issues is provided in table 4.6.

Table 4.5 List of key issues identified during stakeholder consultation

SUBJECT AREA	ID NO.	KEY ISSUE / QUESTION
Water	WQ01	What amount of water is used by the CSG industry, and where does it come from?
	WQ02	How much groundwater is being extracted from CSG wells; and how much from other bores and industries?
	WQ03	How do coal seams and aquifers and groundwater systems interact?
	WQ04	Is fracking dangerous for the environment or people?
	WQ05	What are the major water impacts from CSG; and what are the cumulative impacts along with agriculture and mining?
	WQ06	Is there a sufficient amount of water for everyone, including future generations?
	WQ07	What will happen with produced water? What amount of water is recycled and reused? Will this be an overall net gain?
	WQ08	Does CSG development affect any particular water sources, or other people's water uses such as farmers?
	WQ09	How will the brine resulting from CSG activities be cost-effectively and sustainably managed?
Greenhouse Footprint	GQ01	What is the overall carbon account or baseline of the region and what contribution will come from CSG?
	GQ02	What is the gap between the carbon content of CSG and coal, and could fugitive emissions and seeps affect that gap?
	GQ03	What are the risks and opportunities for CSG around climate change?
	GQ04	Under what climate change mitigation scenarios is CSG an advantage; and when are gas resources at risk of being underused (creating stranded assets)?
	GQ05	What is the full breadth of scientific research being undertaken in the region on greenhouse gases and what are the collective findings?
Health	HQ01	Do people get sick from CSG?
	HQ02	What are the potential exposure pathways or situations where people's health or livelihoods can be affected and what is the probability of being affected?
	HQ03	How do people typically assess risk; and does this affect the way people interpret both factual and non-factual data?
Impacts on Communities	SQ01	Which communities, and who in those communities, are impacted by CSG?
	SQ02	Are impacts being managed to the satisfaction and acceptance of the impacted communities?

SUBJECT AREA	ID NO.	KEY ISSUE / QUESTION
Land management issues (also includes community and economic questions)	SQ03	Does CSG development, and the activities designed to attenuate its imposition such as community investment, align with community aspirations?
	SQ04	What are the most effective and efficient social impact mitigation programs that can be implemented?
	LQ01	How much land do CSG companies need access to and what type of land will it be?
	LQ02	Will access to land be gained voluntarily? And at what cost and benefit to locals?
	LQ03	Do landholders obtain an overall net gain from the presence of CSG?
	LQ04	How many landholders are aggrieved by CSG and why? What proportion are content? (considering both Queensland and NSW)?
Biodiversity	LQ05	What is the estimated net result for ecosystem services and agriculture productivity for the lands to be impacted?
	BQ01	What can be done about the cumulative impacts of the CSG industry, agriculture, transport and mining on biodiversity?
	BQ02	Which CSG projects are to be located in or near protected or high value areas?
	BQ03	Has CSG or natural gas development had any detrimental impacts on biodiversity anywhere in Australia?
	BQ04	Is there any possible danger to any threatened species?
	BQ05	How much land will be disturbed and how much of this will have to be rehabilitated? Will this reduce biodiversity?
	BQ06	What is the potential success of the relevant offset programs?
Economics	BQ07	To what success will current policies and strategies protect biodiversity going forward?
	EQ01	How much will be spent at the local / regional / state levels in the future because of CSG? Will this expenditure meet community aspirations?
	EQ02	How many jobs will the CSG industry create in the future; how many will be directly employed by companies vs contractors vs supply chain impacts?
	EQ03	How are other industries affected by the CSG industry e.g. growth/decline in the service industry, agriculture, incubation of new industries?
	EQ04	Are there potential innovations to consider such as using methane for energy demand by farmers?
	EQ05	What interventions can be recommended to make it easier for local businesses to supply goods and services to the industry?
Decommissioning and legacy issues	EQ06	What market position does Australian unconventional gas have under various climate change mitigation scenarios?
	DQ01	What happens to wells, and any contaminants, once they are plugged and abandoned?
	DQ02	Who has the legal and financial responsibility for the maintenance and integrity of CSG assets over time? Is this adequate?
	DQ03	What improvements can be found to decommissioning approaches and technologies?
	DQ04	What legacy issues bother the community and what is socially and environmentally acceptable?

4.3 NSW proposed new research projects for 2017/18

There is approximately \$907,419¹¹ Santos, AGL, Federal Government and NSW Government cash research budget available for new project proposals to be initiated in FY 2017/18 and beyond.

The following projects are being discussed, but are yet to be ratified and are subject to review by the relevant Regional Research Advisory Committee. Over coming months once further surveying and stakeholder consultation is complete, CSIRO researchers will consider drafting project proposals on these topics dependent on resource capacity. It is currently unknown whether these projects will be approved and proceed.

Table 4.6 Proposed research investment in NSW for 2017/18 and beyond, by project

SUBJECT AREA	TITLE	OBJECTIVE	POTENTIAL REGION	COMMENT	ESTIMATED COST
Socio-economic	Decommissioning / Asset integrity	To find innovative methods to maintain or decommission assets.	NSW and QLD	GISERA has begun to review concerns with regard to decommissioning of wells and well pad infrastructure. Are there other critical asset(s) to do consider such as gathering pipes or processing plants?	\$400K
Socio-Economic	Benefits of natural gas	Understanding the economic and supply chain use and benefits of natural gas.	NSW	This could include: environmental benefits from displacing coal, energy security and prices, and supply chain effects	\$200K
Health	Human Health effects of Coal Seam Gas Activity Study Design, Phase 2	iii) Scrutinizing emission pathways for harmful exposure levels using novel risk assessment techniques. iv) Understanding non-physical factors that affect the understanding of issues and overall health and wellbeing.	NSW or QLD (likely to be extended into other regions)	The review of all current information for the purpose of designing a study to look at potential health impacts from gas activities is now complete. Phase 2 of this study is to implement the research framework devised in Phase 1 to generate information required to investigate the health impacts of CSG activities. A RRAC must approve the proposal for Phase 2.	>\$1 million
Surface and Groundwater	Aquifer connectivity and GW dynamics	To assess a methane concentration and other tracers (including isotopes) baseline and their source(s) to determine	NSW or QLD	Advice by the Independent Expert Scientific Committee (IESC, 2017) to decision makers on the Narrabri Gas Project, which suggested that 'the collection and analysis of isotope data	\$250-300K

¹¹ This figure is total GISERA funding for NSW, less \$2,350,854 already committed to research (tables 4.1 and 4.2) and less anticipated costs for the Director's office/Communications for the life of National GISERA.

SUBJECT AREA	TITLE	OBJECTIVE	POTENTIAL REGION	COMMENT	ESTIMATED COST
		the origin of the gas and possible diffusive and advective pathways for gases from industry target units to overlying shallow sedimentary bedrock aquifers.		could provide more confidence in the overall water balance, mixing and conceptual models of geology and associated connectivity'.	
Surface and Groundwater	Impacts of CSG development to surface water – groundwater interactions along the Bohena Creek	Develop a model that simulates: a) the alluvium water levels and surface water groundwater interaction for a wide range of drawdowns predicted for a generic scenario of CSG development from the Pilliga forest b) evaluates the effects to the alluvium water levels and SW-GW interaction resulting from managed release of water into the Creek	NSW	The impacts of CSG development in the Pilliga forest to the Bohena Creek alluvium surface water – groundwater interaction in Bohena Creek has not been explicitly modelled in previous groundwater modelling studies. This water resource is considered particularly important because of the presences of Groundwater Dependent Ecosystems (GDE). Independent Expert Scientific Committee (IESC) has identified GDEs, and that “potential impacts to this area should be represented and accounted for in the groundwater model or, preferably, in a separate smaller scale (daughter) model that enables time-variable localised impacts to be considered.”	\$300-350K
GHG / Methane	Assessment of the total and local gas emissions potential from natural gas basins	Quantify fugitive and natural gas seepage through subsurface strata –to understand how methane levels change from pre and post development	NSW or QLD	Further research is required to evaluate the ongoing change in emissions after industrial development. The main objective of this research project is to improve our understanding of gas release from coal, its movement through the subsurface and its emission into the atmosphere.	\$250-300K
Agriculture	Landscape capacity and value	Understanding the land capacity and valuation metrics where natural gas is developed.	NSW	This could relate to agriculture, urban land or forestry areas.	\$200K

5 Proposed management and communication budget for 2017/18

Table 5.1 shows GISERA's actual management and communications expenditure during the 11-12 to 16-17 financial years and the proposed management and communications budget for 17-18.

Table 5.1 Proposed management and communications budget, 2017/18 with actual expenditure for 2011/12-2016/17

ITEM	SUB-ITEM	ACTUAL EXPENDITURE							2017-18	TOTAL
		2011-12	2012-13	2013-14	2014-15	2015-16 Initial GISERA (Jul-Dec 15)	2015-16 National GISERA (Jan-Jun 16)	2016-17		
Comms	Comms salary & OH	\$188,899	\$214,378	\$259,429	\$110,422	\$95,405	\$86,480	\$163,470	\$192,690	\$1,311,173
	Travel & accommodation	-	-	\$4,116	\$3,490	\$8,787	\$11,039	\$20,951	\$30,000	\$78,383
	Factsheets, brochures infographics, videos etc.	\$11,300 ¹²	-	\$600	\$489	\$0	\$7,110	\$19,537	\$30,000	\$69,036
	Public info. sessions	-	-	-	-	\$3,145	-	\$3,312	\$12,000	\$18,457
	Vodcasts	-	-	\$3,000	-	-	-	-	-	\$3,000
	Printing	\$4,520	-	\$296	\$555	\$2,109	\$2,038	\$1,324	\$2,500	\$13,342
	Annual review of web design	-	-	-	-	-	-	-	\$0	\$0
	General Expenses & Annual report	\$8,303	\$21,937	\$511	\$3,507	\$372	\$2,922	\$5,277	\$4,500	\$47,329
	Media training	\$7,530	\$689	\$7,327	\$10,741	-	-	-	-	\$26,287

¹² Includes design & artwork for GISERA launch

ITEM	SUB-ITEM	ACTUAL EXPENDITURE							2017-18	TOTAL
		2011-12	2012-13	2013-14	2014-15	2015-16 Initial GISERA (Jul-Dec 15)	2015-16 National GISERA (Jan-Jun 16)	2016-17		
Comms total		\$220,552	\$237,004	\$275,279	\$129,204	\$109,817	\$109,589	\$213,870	\$271,690	\$1,567,006
Director's office	Director salary & OH	\$104,671	\$148,924	\$101,727	\$204,799	\$62,688	\$61,827	\$237,765 ¹³	\$290,213	\$1,212,614
	Admin support	\$0	\$25,801	\$18,416	\$167,848	\$63,488	\$68,411	\$252,594 ¹⁴	\$408,691	\$1,005,249
	Contractor	-	-	-	-	-	\$61,584	\$168,292	\$80,100	\$309,976
	Travel & accommodation	\$28,384	\$13,653	\$23,760	\$48,129	\$15,853	\$42,619	\$46,297	\$55,000	\$273,695
	Conferences	-	-	-	-	-	\$30,315	\$10,524	\$20,000	\$60,839
	Annual GISERA Workshop	-	-	\$1,859	\$13,410	\$10,279	\$417	\$4,848	\$20,000	\$50,813
	Office supplies	-	-	-	-	\$1,089	\$7,648	\$2,650	\$5,500	\$16,887
	Auditor	-	-	-	-	-	-	-	\$2,975	\$2,975
Director's office total		\$133,055	\$188,378	\$145,762	\$434,186	\$153,399	\$272,821	\$723,887	\$882,479	\$2,933,048
TOTAL (Director's office & Comms)		\$353,607	\$425,382	\$421,041	\$563,390	\$263,216	\$382,411	\$936,841	\$1,154,169 ¹⁵	\$4,500,055

¹³ Includes increased time allocation of Director's time to GISERA.

¹⁴ Includes additional Administration Support from 1 February 2017.

¹⁵ This figure is the anticipated Director's office and Communications costs up to 30 June 2018 (not over life of National GISERA).

Table 5.2 Partner contributions – Initial GISERA 2011/12-2015/16

	COMMS & MNGT COSTS CONTRIBUTIONS	2011-12	2012-13	2013-14	2014-15	2015-16 (JUL-DEC 15)	2015-16 (JAN-JUN 16)	2016-17	2017-18	TOTAL
Initial GISERA	CSIRO	\$176,804	\$212,691	\$210,520	\$281,695	\$131,608	-	-	-	\$1,013,318
	APLNG/QGC	\$176,804	\$212,691	\$210,520	\$281,695	\$131,608	-	-	-	\$1,013,318
TOTAL		\$353,607	\$425,382	\$421,041	\$563,390	\$263,216	-	-	-	\$2,026,636

Table 5.3 Partner contributions – National GISERA 2015/16-2017/18

	COMMS & MNGT COSTS CONTRIBUTIONS	2011-12	2012-13	2013-14	2014-15	2015-16 (JUL-DEC 15)	2015-16 (JAN-JUN 16)	2016-17	2017-18	TOTAL
National GISERA	CSIRO	-	-	-	-	-	\$172,083	\$421,579	\$519,376	\$1,113,038
	DolIS	-	-	-	-	-	\$45,889	\$112,421	\$369,334	\$527,644
	NSW Government	-	-	-	-	-	\$68,834	\$168,631	\$150,042	\$387,507
	APLNG	-	-	-	-	-	\$19,121	\$46,842	\$23,083	\$89,046
	QGC	-	-	-	-	-	\$19,121	\$46,842	\$23,083	\$89,046
	Origin	-	-	-	-	-	\$19,121	\$46,842	\$23,083	\$89,046
	Santos	-	-	-	-	-	\$19,121	\$46,842	\$23,083	\$89,046
	AGL	-	-	-	-	-	\$19,121	\$46,842	\$23,083	\$89,046
TOTAL		-	-	-	-	-	\$382,411	\$936,841	\$1,154,167	\$2,473,419

6 Communication

6.1 Overview

As gas exploration and development increases in regions around Australia, information about the onshore gas industry is being sought by local communities, governments, land-use industries (especially farmers), environmentalists and the wider public. GISERA's accessible, transparent research outcomes are well placed to contribute constructively and objectively to this need.

GISERA plays an important role in providing trusted information about the challenges and opportunities associated with coal seam and shale gas industries. Details of GISERA's communication goals are summarised in [Section 7.2 Communication goals and KPIs](#).

Since launching GISERA in July 2011, the GISERA Director and CSIRO research staff have participated in 783 engagements with a range of stakeholders, such as federal and state Members of Parliament, industry associations, community groups, research organisations, gas developers, journalists and consultants. A breakdown of this activity can be found [in Table 7.3 Summary of engagements over the life of GISERA](#).

GISERA presentations at conferences, community information sessions and seminars continue to be key opportunities to inform stakeholders about research outcomes which address the social and environmental impacts and opportunities arising from onshore gas development. Examples of presentations can be found at: <https://gisera.org.au/more-information/presentations/>

Communication of GISERA research has occurred through use of traditional and online media channels, as appropriate, to reach wider community audiences. While the GISERA Director and CSIRO research staff provided 12 media interviews with traditional media channels, including print, television and radio in 2016-17, a key communication focus was development of innovative online communication products accessible directly by public audiences.

Communication highlights during this period include development of a range of communication products to showcase GISERA research, including:

- An online animation and communicate sharing advice from the 'Looking to the Future: Job forecasts for the Surat Basin 2014 to 2034' project to understand future impacts on regional economies of development of the CGS industry, and how local businesses can respond;
- A video showcasing the availability of live air quality monitoring data online, through the 'Assessing the air quality in the Surat Basin' project;
- Informing rural landholders about tools to assist the agriculture sector, through a 'Telling the story' online video and supporting fact sheets;
- Highlights and key messages from research to understand community wellbeing, attitudes towards CSG development and adaptation to a local coal seam gas industry, via research communicate and a series of factsheets;
- Factsheets explaining the science of fugitive emissions from unconventional gas, and methane seeps in the Condamine River;
- Factsheets on water research, including: Groundwater flows in the Hutton Sandstone and Precipice Sandstone aquifers factsheet;
- Factsheets explaining air quality research, including a fact sheet on regional air quality in the Surat Basin, Queensland;

- Factsheets sharing agricultural land management research on soil compaction, understanding the way farmers see their farm, and access tracks and soil erosion; and
- Terrestrial biodiversity research factsheet on 'Ensuring biodiversity offset success'.

GISERA's reputation as a provider of trusted advice to community has been enhanced by the past year's engagements with landowners, farmers and the local communities at a range of community and industry forums and rural shows, including:

- Showcasing GISERA's agricultural research to CSIRO AgCatalyst, CSIRO's premier showcase of the latest innovations and technologies in agriculture and food, Sydney, December 2016;
- Presentations from GISERA Director Damian Barrett at several Northern Territory presentations, meetings, and community information sessions across NT, including Kalkaringji, Maningridge, Darwin, and Alice Springs, from July 2016 to March 2017;
- Groundwater research presentation on 'Innovative solutions to water challenges in WA', Perth, October 2016;
- Presentation of research findings from 2016 CSIRO Community Wellbeing to a range of forums, including the AgForce – UQCCSG Community Forum, to the Western Downs and Maranoa regions including local government, Gasfields Commission Qld, special interest groups interested in CSG issues, and other community representatives, throughout 2016-17;
- GasFields Commission Queensland Community Leaders Breakfast: Dan O'Sullivan, Roma, June 2016;
- Stakeholder workshops on biological traits and ecological aspects for plant population viability, Health and CSG, Brisbane, May 2017; CSG well decommissioning workshop; and
- Expert workshop on health impacts of CSG scoping study, Brisbane, May 2017.

Increased understanding of research results occurred through GISERA's knowledge transfer sessions for:

- Biodiversity project 4 – Translocation research project providing recommendations for rare daisy *Rutidosia lantana*, Brisbane, September 2016
- Agriculture project 6- Telling the story, Toowoomba, December 2016;
- Social project 6- Community functioning and wellbeing 2, various meetings across Toowoomba, Chinchilla, Tara, throughout November, 2016, and Brisbane, February 2017;
- Social project 3- Economical assessment and forecasting, Toowoomba, December 2016, and Brisbane, February 2017;

Scientific presentations, poster presentations and interactions promoting GISERA research occurred at:

- 43rd International Association of Hydrogeologists Congress: Dr Sreekanth Janardhanan, on application of groundwater tracers in coal seam gas development, France, September 2016;
- Australian Water Association (NT Branch) Water in the Bush 2016 conference: Dr Damian Barrett, Darwin, September 2016;
- ECOFORUM Conference: Dr Sreekanth Janardhanan presented on groundwater modelling, Fremantle, October 2016;
- National Farmers' Federation National Congress, Canberra, October 2016;

- Atmospheric Composition & Chemistry Observations & Modelling Conference : Dr David Etheridge, Dr Stuart Day, on greenhouse gas monitoring, and Dr Sarah Lawson on air quality results from monitoring in the Surat Basin, Tasmania, November 2016;
- Stakeholder Workshop - Impacts of CSG on GAB flux in the Pilliga region, Brisbane October 2016;
- APA Group Conference: Dr Damian Barrett presentation on environmental considerations relating to unconventional gas, Sydney, November 2016;
- European Geosciences Union (EGU) international conference : Dr Axel Suckow presentation on geochemical baseline monitoring, Zoe Loh poster presentation on monitoring fossil fuel sources of methane, Vienna, April 2017;
- APPEA Conference, Perth, May 2017;

Media interviews with lead GISERA scientists discussed topics including:

- Fugitive emissions
- Reinjection of treated CSG water into aquifers
- Hydraulic fracturing
- The differences between CSG and Shale gas extraction
- Ambient air quality, live data streaming project
- Economic estimates from CSG Extractions on agro-economic returns
- Gas in water bores

6.2 Communication outputs

A suite of communication tools have been used to ensure effective and meaningful communication of research outcomes. Table 6.1 shows a range of communication outputs GISERA has achieved over the last 6 years.

Table 6.1 Summary of multi-media communication outputs

COMMUNICATION TOOL	NAME OF COMMUNICATION PRODUCT	DATE FIRST PUBLISHED	LATEST EDITION	NUMBER OF VIEWS
Newsletter	GISERA e-newsletter (for both external and internal stakeholders)	December 2013 (bi-annual publication)	June 2017	N/A 191 subscribers
Videos - CSIRO	Unearthing shale gas	October 2014	-	4,390
	Unearthing coal seam gas	September 2014	-	11,102
Videos - GISERA	Looking to the Future: Job forecasts for the Surat Basin, 2014 to 2034	March 2017	-	131
	Assessing the air quality in the Surat Basin	August 2016	-	279
	Telling the story	August 2016	-	121
	Methane seeps in the Surat Basin	September 2014	-	532
	Understanding groundwater movement	January 2014	-	493
	Collecting ants in coal seam gas development regions	June 2013	-	211
	Tagging turtles in Gladstone Harbour	May 2013	-	132
	GISERA over view	March 2013	-	425
	Over view of surface and groundwater projects	March 2013	-	371
	Over view of agricultural land management projects	March 2013	-	418
	Over view of terrestrial biodiversity projects	March 2013	-	247
	Over view of marine environment projects	March 2013	-	173
	Over view of social and economic projects	March 2013	-	304
Brochures / info-graphics	Looking to the Future: Job forecasts for the Surat Basin 2014 to 2034	March 2017	-	N/A

COMMUNICATION TOOL	NAME OF COMMUNICATION PRODUCT	DATE FIRST PUBLISHED	LATEST EDITION	NUMBER OF VIEWS
	Community wellbeing and adapting to coal seam gas: Survey highlights and key messages	March 2017	-	N/A
	Research Progress Infographic	May 2012 (update as required)	June 2017	N/A
	Summary of research projects	May 2012	April 2017	N/A
Fact sheets	What does science tell us about fugitive methane emissions from unconventional gas? (new)	May 2017	-	N/A
	Methane Seeps in the Condamine River	March 2017	-	N/A
	Groundwater flows in the Hutton Sandstone and Precipice Sandstone aquifers	March 2017	-	N/A
	Surat Basin regional air quality, Queensland	February 2017	-	N/A
	Soil Compaction	May 2016	December 2016	N/A
	Understanding the way farmers see their farm.	May 2016	December 2016	N/A
	Access tracks and soil erosion.	May 2016	December 2016	N/A
	Community Wellbeing in the Western Downs: 2014 and 2016	May 2016	April 2017	N/A
	Community attitudes towards CSG development: 2014 and 2016	May 2016	April 2017	N/A
	Ensuring biodiversity offset success: the right kind of seed for a rare daisy (Rutidosia lanata)	January 2016	May 2016	N/A
	Characteristics of methane seeps	April 2015	April 2017	N/A
	Coal seam gas regions reverse rural decline trend	January 2014	-	N/A
	Community resilience	July 2013	-	N/A
	Rural change as a result of CSG developments and the associated economic impacts	July 2013	-	N/A
	Social licence to operate	May 2013	-	N/A

COMMUNICATION TOOL	NAME OF COMMUNICATION PRODUCT	DATE FIRST PUBLISHED	LATEST EDITION	NUMBER OF VIEWS
	Five fact sheets on coal seam gas extraction and some potential environmental impacts. Now incorporated on the FAQs page	April 2012 (updated as required)	April 2017	N/A
Media Releases / Statements	Australia Institute "discussion paper"	October 2016	-	N/A
	Live stream air quality data from coal seam gas regions	August 2016	-	N/A
	CSIRO research alliance expands into New South Wales	March 2016	-	N/A
	CSIRO conducting world's best practice methane emissions research	May 2015	-	N/A
	Landmark report reveals how regional communities really feel about coal seam gas	September 2014	-	N/A
	First ever coal seam gas scientific research alliance established	July 2011	-	N/A
Presentations	Briefings, seminars, workshop forums and conference presentations on unconventional gas have been given to scientists, students, teachers, the general public, government departments and members of parliament	Published as required	-	N/A
Articles	59 media articles have been published on GISERA and its research projects in the print media and online media portals. These have included Brisbane's Courier Mail, The Narrabri Courier, the Northern Leader (Tamworth), The Land, Australian Mining, Chinchilla News, Dalby Herald, Stock Journal, Rural Press, ECOS, Conversation, ABC Science, GasFields Commission e-newsletter, Australian Oil and Gas Review,	N/A	N/A	N/A

COMMUNICATION TOOL	NAME OF COMMUNICATION PRODUCT	DATE FIRST PUBLISHED	LATEST EDITION	NUMBER OF VIEWS
	AusIMM Bulletin, Australian Resources and Investment and Resourceful magazines.			

6.3 Stakeholder Engagement

GISERA aims to achieve credibility, trust and respect from all stakeholders through the open and transparent conduct and communication of its research and synthesis activities. Table 6.2 outlines the engagements for 2016-17 and Figure 6.1 shows stakeholder interactions over the last five years.

Table 6.2 Summary of GISERA engagements for 2016-17

STAKEHOLDER	NUMBER OF ENGAGEMENTS FOR 2016-17
Regional community	13
Gas Industry	38
Federal, State and Local Departments and Agencies	37
Media (includes print, TV and radio)	12
School/Educational institutions/Students	6
Research organisations	23
Industry associations	4
Business groups	4
Total	137 ¹⁶

¹⁶ It is important to note here that these numbers of interactions do not take into account the number of individuals engaged in that interaction. For example regional community group interactions can range from 20-360 participants and a gas industry interaction can be a technical meeting with only 1-10 participants

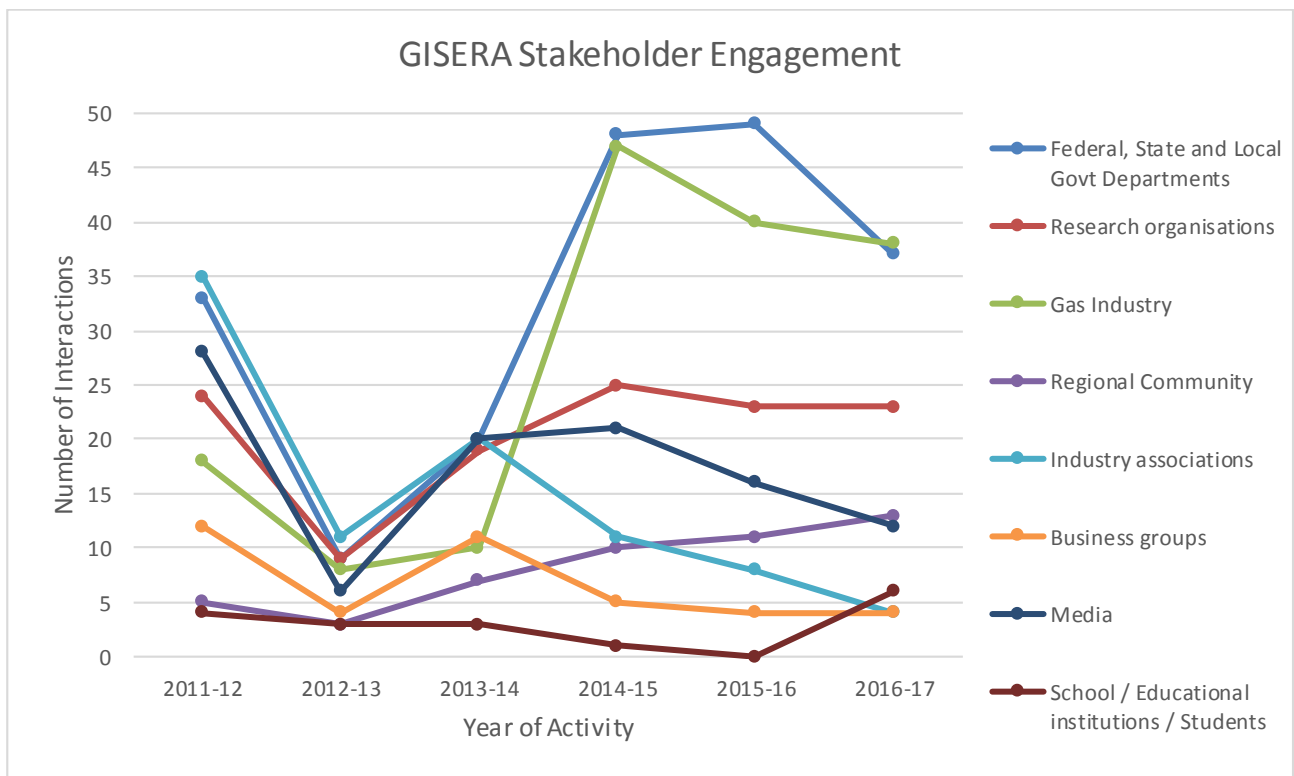


Figure 6.1 Stakeholder interactions from 2011/12 to 2016/17 - These numbers do not take into account the number of individuals engaged in that interaction. Regional community group interactions can range from 20-360 participants and a gas industry interaction only 1-10 participants.

7 Performance against KPIs

7.1 Overall KPIs

GISERA's key performance indicators are:

- Impact
- Capacity building
- Leverage
- Management.

Table 7.1 illustrates GISERA's performance against each KPIs specific assessment criteria from 2011/12-2017/18.

Table 7.1 GISERA's performance against its overall KPIs

KPIs	ASSESSMENT CRITERIA	PERFORMANCE (OVER LIFE OF GISERA)
Impact	Formal government, industry and community request for technical advice	GISERA's communication goals and KPIs tie in with this objective. GISERA has made significant impact in this area as detailed in Section 7.2
	Industry and institutional awards for innovative research	The 2015 Agriculture Director's Awards in CSIRO recognise the achievements of individuals and teams across 11 different categories. The GISERA Agricultural Land Management Team were nominated for and received the Collaboration Award. Team members included staff from CSIRO and USQ/NCEA.
	Publication of papers	Journal – 10 Conference – 8
	Citation of publications	276
	Conference invitations and presentations	207
Capacity building	Total number of research studentships	3
	Number of research studentships for residents of CSG and LNG operational areas	2
	Number of Masters and PhD theses awarded	0 (1 thesis has been submitted)
	Number of Publication authorships by industry staff	Nil
Leverage	Participation from industry developers	Australia Pacific LNG, QGC, Origin, AGL, Santos through membership to GISERA and Arrow Energy (through Industry Leader's Group, APPEA)
	Participation from government departments and agencies	QLD Department of Natural Resources and Mines; QLD Department of Science, Information Technology and Innovation; NSW Environment Protection Authority; NSW Health; North West Local Land Services; NSW Department of Industry; NSW Department of Primary Industries; Department of Industry Innovation and Science; and CSIRO

KPIS	ASSESSMENT CRITERIA	PERFORMANCE (OVER LIFE OF GISERA)
	Participation from non-government organisations	AgForce, Basin Sustainability Alliance, Australian National University, University of Queensland, University of Southern Queensland, University of New England, Lower Namoi Growers' Association, Country Women's Association of NSW
	Number of universities, particularly those local to CSG and LNG activity, participating in research projects	University of Queensland, University of Southern Queensland, Queensland University of Technology, University of Sydney, University of Heidelberg, University of Newcastle, University of New England, University of Tasmania, University of Colorado
	Financial leverage, or the ability to multiply the research value of contributions	See section 1.1.1
Management	Percentage of research projects achieving target deliverables	<p>53% of projects are complete and have achieved deliverables (20 projects)</p> <p>44% of projects are currently meeting or exceeding target deliverables (17 projects)</p> <p>3% of projects are not meeting target deliverables due to delays in obtaining required data (1 project). It is anticipated that this will be resolved before December 2017.</p>
	Percentage of research projects meeting schedule	<p>53% of projects are complete (20 projects)</p> <p>40% pf projects are currently meeting schedule (15 projects)</p> <p>6% of projects currently have an amber light against a milestone (2 projects). It is expected that these milestones will be completed before October 2017.</p> <p>3% of projects are not meeting research schedule due to delays in obtaining required data (1 project). It is anticipated that this will be resolved before December 2017.</p>
	Percentage of research project meeting budget	<p>53% of projects were completed within 5% of budget (based on aggregate average across the 20 projects).</p> <p>23% of current projects are within budget (9 projects)</p> <p>3% of projects are over budget (1 project).</p> <p>18% of projects are currently overspent due to phasing issues (7 projects). This issue is expected to be rectified by the end of project.¹⁷</p> <p>3% of projects are new (1 project) with expenditure expected to commence in early 2017/18.</p>

¹⁷ CSIRO is responsible for any budget overspend at completion of project.

7.2 Communication goals and KPIs

GISERA works to achieve credibility, trust and respect from all stakeholders through the open and transparent conduct and communication of its research and synthesis activities.

The strategic communication and engagement goals for GISERA are to:

- Engage with and build landholder, community, government and industry understanding of the impacts, risks, challenges and opportunities associated with onshore gas development
- Communicate information in plain English that helps to address knowledge gaps in environmental, social and economic impacts from onshore gas development, whether that is through original research or synthesis of existing independent and peer reviewed knowledge
- Raise awareness of CSIRO's public good research and its outcomes to inform public discourse, government policy development and gas industry best practice through GISERA
- Ensure GISERA's website is a trusted and citable source of information on gas development, social and environmental impacts, and opportunities.

A separate Communications and Stakeholder Engagement Plan guides GISERA communication and engagement outputs. A GISERA Government Stakeholder Engagement Strategy paper has been developed to support a coordinated approach so that research can be effectively and efficiently communicated towards regulatory needs and government priorities. Effective government engagement also assists in identifying relevant processes and channels for communication, to promote adoption of research outcomes and positive impact from GISERA science.

Table 10.2 provides an overview of the performance to date in achieving GISERA's strategic communication goals.

Table 7.2 Performance against key communication goals

STAKEHOLDER	KPI (TARGET)	PERFORMANCE OVER LIFE OF GISERA
Government	Advice provided to senior bureaucrats / ministers / policy makers	Since July 2011, 210 invitations to provide advice, briefings and presentations were received from senior ministers and policy makers.
	Requests by policy makers for advice	These include Prime Minister and Cabinet Office, Queensland Premiers Office, NSW Department of Premier and Cabinet, and ministerial departments, the Independent Expert Scientific Committee on CSG and Large Coal Mining Development, state expert panels, Qld Agriculture Resources and Environment Committee, and a range of briefings to Qld, NSW and federal parliamentarians, departments and agencies.
		GISERA input has been acknowledged in reports from inquiries, including the specific citing of GISERA publications in the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory interim report, June 2017, and the Independent review of the national electricity market by Australian Chief Scientist Dr Alan Finkel, June 2017.
		GISERA input has previously been sought by a range of governments and policy makers, including: During development of the Commonwealth's Government Domestic Gas Strategy
		GISERA and University of Queensland provided a briefing to Queensland Parliamentarians on 'The Science of GSG and Onshore Gas'

STAKEHOLDER	KPI (TARGET)	PERFORMANCE OVER LIFE OF GISERA
		<p>The Bureau of Resources and Energy Economics' (BREE) 2014 Gas Market report drew strongly on GISERA research, in particular the research on employment effects, household income and demographic change. Three GISERA publication outputs were specifically cited</p> <p>Briefings on results from GISERA's community wellbeing and responding to change survey were provided to local government in the Surat Basin region, Chambers of Commerce, State members of Parliament and Queensland Resources.</p>
Community	GISERA seen as trusted source of information by community	<p>GISERA has had over 783 engagements with a wide range of stakeholders over the last five years (See Table 7.3). As the shale gas industry increases its exploration activities in Australia, this demand from GISERA is expected to increase.</p> <p>CSIRO researchers through GISERA have engaged with landowners, farmers and the local communities at a range of community and industry forums and rural shows, including:</p> <p>Showcasing GISERA's agricultural research to CSIRO AgCatalyst, CSIRO's premier showcase of the latest innovations and technologies in agriculture and food, Sydney, December 2016;</p> <p>Presentations from GISERA Director Damian Barrett at several Northern Territory presentations, meetings, and community information sessions across NT, including Kalkaringi, Maningridge, Darwin, and Alice Springs, from July 2016 to March 2017;</p> <p>Groundwater research presentation on 'Innovative solutions to water challenges in WA', Perth, October 2016;</p> <p>Presentation of research findings from 2016 CSIRO Community Wellbeing to a range of forums, including the AgForce – UQCCSG Community Forum, to the Western Downs and Maranoa regions including local government, Gasfields Commission Qld, special interest groups interested in CSG issues, and other community representatives, throughout 2016-17;</p> <p>GasFields Commission Queensland Community Leaders Breakfast: Dan O'Sullivan, Roma, June 2016;</p> <p>Stakeholder workshops on biological traits and ecological aspects for plant population viability, Health and CSG, Brisbane, May 2017; CSG well decommissioning workshop; and</p> <p>Expert workshop on health impacts of CSG scoping study, Brisbane, May 2017.</p> <p>Previously, CSIRO researchers through GISERA engaged with landowners, farmers and the local communities at the Miles Show (May 2016) and CRT Farmfest (June 2016) in Toowoomba.</p> <p>GISERA is sought as trusted source of advice on hydraulic fracturing and shale gas development at the Central Land Council Information Session in April 2016 (CLC represents the indigenous communities of the southern half of the Northern Territory).</p> <p>GISERA sought as a trusted source of advice on the drilling and proposed development of the deep gas project nearby (Warro</p>

STAKEHOLDER	KPI (TARGET)	PERFORMANCE OVER LIFE OF GISERA
		<p>Gasfield) managed by Latent Petroleum during the Badgingarra Community Forum in September 2015.</p> <p>GISERA sought as a trusted source of advice on impacts of gas development by KRED and Yamatji Marlpa (representatives of 33 Traditional Owner groups in WA) – community workshops for Yamatji were undertaken in July 2014.</p> <p>The Social and economic CSG research forum was held on November 2014 in Chinchilla and attracted stakeholders from state government departments, local government, service providers, local businesses, gas companies and community groups.</p> <p>The GHG and Agricultural CSG research forum was held on 22 April 2015 in Chinchilla and attracted 48 stakeholders from government departments, industry, Council, service providers, research organisations, landowners and community groups.</p> <p>The Marine environment CSG research forums were held in Brisbane and Gladstone on 11 and 12 August 2015 with 70 stakeholders from community groups, Council, service providers, research organisations, government and industry.</p>
	Demand for GISERA's engagement is maintained as development progresses	<p>GISERA has had over 783 engagements with a wide range of stakeholders over the last five years (See Table 7.3). As the shale gas industry increases its exploration activities in Australia, this demand from GISERA is expected to increase.</p> <p>GISERA continues to be a trusted source of advice on issues related to CSG development, including:</p> <p>Supplying management guidelines for biodiversity offset processes through knowledge transfer sessions for a translocation research project providing recommendations for rare daisy <i>Rutidosis lantana</i>, Brisbane, September 2016</p> <p>Advice to the agricultural sector regarding managing changes in rural areas brought on by the introduction of a CSG industry, through "Telling the story" project knowledge transfer session, Toowoomba, December 2016;</p> <p>Socialising outcomes of GISERA research on community functioning and wellbeing 2, various meetings across councils and regional community groups in Toowoomba, Chinchilla, Tara, throughout November, 2016, and Brisbane, February 2017;</p> <p>Knowledge transfer sessions on economical assessment and forecasting research to community and government groups in Toowoomba, December 2016, and Brisbane, February 2017;</p> <p>Previously, GISERA advice has been sought on issues such as the drilling process, well integrity, water safety and fracking by Badgingarra Community Association - community forum held on 2 September 2015.</p> <p>The Social and economic CSG research forum, held on November 2014 in Chinchilla, attracted stakeholders from state government departments, local government, service providers, local businesses, gas companies and community groups.</p>

STAKEHOLDER	KPI (TARGET)	PERFORMANCE OVER LIFE OF GISERA
		<p>The Greenhouse Gas and Agricultural CSG research forum was held on 22 April 2015 in Chinchilla and attracted 48 stakeholders from government departments, industry, Council, service providers, research organisations, landowners and community groups.</p> <p>The Marine environment CSG research forums were held in Brisbane and Gladstone on 11 and 12 August 2015 and attracted 70 stakeholders from community groups, Council, service providers, research organisations, government and industry.</p>
Industry	GISERA members adopt practice change	<p>CSIRO through GISERA has provided policy related advice to industry on a range of topics including groundwater reinjection strategies, agricultural engagement, socioeconomic advice and information for stakeholders of Gladstone Harbour. Furthermore, advice to Queensland and Federal governments has been incorporated into development of the regulatory environment towards improved industry best practice.</p> <p>Geochemical response to re-injection project work informed GISERA members and regulators about the required level of injectant pre-treatment to minimise adverse impacts on groundwater quality by reinjection</p>
	Industry adopts methods for improving community engagement	<p>In July 2016, researchers from the Community Wellbeing project met with Origin's Manager for Public Policy to discuss indicators of community wellbeing, resilience and social licence to operate. Origin were planning to conduct their own survey to monitor the community 'pulse'. After discussing findings, methods and measures from the CSIRO community wellbeing surveys, Origin planned to use 5 or 6 of the same items in their own survey to allow for comparison with CSIRO's 2014 and 2016 research findings. In this way, the community wellbeing research is feeding into industry benchmarks, standards and policies.</p>

Continued demand for information and advice from GISERA shows that GISERA is meeting the needs of a range of stakeholders (see Table 7.3) and that it is seen as a source of trusted information and advice.

Table 7.3 Summary of engagements over life of GISERA

STAKEHOLDER	NUMBER OF ENGAGEMENTS OVER LIFE OF GISERA
Regional community	49
Gas Industry	163
Federal, State and Local Departments and Agencies	196
Media (includes print, TV and radio)	103
School/Educational institutions/Students	17
Research organisations	126
Industry associations	89
Business groups	40
Total	783 ¹⁸

¹⁸ It is important to note here that these numbers of interactions do not take into account the number of individuals engaged in that interaction. For example regional community group interactions can range from 20-360 participants and a gas industry interaction can be a technical meeting with only 1-10 participants



GISERA
Gas Industry Social and
Environmental Research Alliance

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