SOCIAL IMPACTS

12

12.1 Introduction

This Chapter examines the social impacts of any onshore shale gas industry in the NT using a social impact assessment (**SIA**) framework (methodology) developed specifically by Coffey Services Australia Pty Ltd (**Coffey**) and a case-study of the Beetaloo Sub-basin undertaken by Coffey. The Panel commissioned the framework and case-study to better understand the likely social impacts of any onshore shale gas industry and how best to manage them.

The scope of works (at Appendix 15) required Coffey to:

- develop a leading practice SIA framework for the identification, assessment and management of the social impacts associated with the development of any onshore shale gas in the NT;
- apply that framework to the Beetaloo Sub-basin to identify the people, or groups of people, that are most likely to be affected by any development of shale gas resources in and around that region and, in consultation with those communities, to identify the impacts, risks and benefits, and the ways to avoid or manage (mitigate) those impacts and risks; and
- discuss the concept of an SLO (social licence to operate) and its application to the NT.

Coffey, working in partnership with CSRM and CSIRO, provided the following reports to the Panel in January 2018 (at Appendix 16) (**Coffey reports**):

- *A framework for Social Impact Assessment of shale gas development in the Northern Territory*, Final Report, November 2017 (**CSRM Report**);
- *Beetaloo Sub-basin Social Impact Assessment Summary Report*, 17 January 2018 (**Beetaloo Sub-basin SIA Report**);
- *Beetaloo Sub-basin Social Impact Assessment Case Study*, 17 January 2018 (**Beetaloo Sub-basin Case Study**); and
- *Social licence to operate in the Beetaloo Basin and Northern Territory* (**CSIRO Report**).

It must be noted from the outset that the Coffey reports are not, and were never intended to be, an SIA. Nor was Coffey asked to determine if any onshore shale gas industry holds an SLO in the NT. Consequently, it did not undertake this task. In this regard, it is acknowledged that many of the people attending the public hearings and community forums were firmly of the opinion the gas industry does not hold an SLO and expressed concern over the ability of the Government and the gas industry to appropriately manage the risks associated with hydraulic fracturing.[1] For this reason, the Coffey reports have effectively assumed that any potential onshore shale gas industry does not currently hold an SLO.

The Panel notes a concern contained in some of the submissions it received and in the feedback at the community consultations, that making specific mention of the social impacts on some groups of people to the exclusion of other groups, such as pastoralists, was somehow unfair.[2] Similarly, the CLC opined that, *"the report does not make a distinction between holders of property rights (traditional owners and native holders as decision-makers) and affected communities. Affected communities are often (but may not always be) comprised of the traditional owners of the land the subject of a project. A community may also comprise many other residents from neighbouring estate groups and other language groups. The statutory arrangements under the ALRA take this important distinction into account and are unique to the NT and must be properly considered in SIA Reports."* [3]

An essential element of any SIA is to ensure that baseline data is collected on impacts identified and derived from the specific concerns of each local community. Ensuring participation of all affected stakeholder groups is necessary in any SIA. It was neither the intention of the Panel to single out any one specific subgroup within a community (or as between communities), nor to ignore specific statutory arrangements governing particular types of landholders, whether

1 H Bender submission 632, Ms Pauline Cass, submission 1162 (**P Cass submission 1162**).
2 NTCA submission 639.
3 CLC submission 1151.

Aboriginal or non-Aboriginal. Rather, any reference to 'community' in this Chapter is intended to be inclusive unless otherwise indicated. The aim of the SIA framework is to ensure that every potentially affected stakeholder, particularly those most vulnerable to social change, has the ability and freedom to participate in, and be appropriately engaged and consulted on, all relevant social impact matters.

Having said this, any attempt to understand social impacts and social change in NT communities as a result of any shale gas development must consider the complex and fraught history of various federal and Territory Government interventions and policies designed to bring about social change and economic development in these communities. This includes an awareness of an ongoing legacy of trauma, grief and loss among Aboriginal people—the cumulative impacts of colonisation, dispossession of and removal from traditional lands, discrimination and paternalistic social policies. In particular, the expulsion of Aboriginal people from cattle stations in the 1960s concentrated the Aboriginal population of a large area onto the traditional country of only a few, and brought with it social complexity as family groups attempted to both maintain their individual cultures and identities, and live harmoniously together.[4]

This Chapter discusses the Coffey SIA framework and its application to the unique circumstances of the NT. It emphasises the importance of undertaking an SIA that accommodates the cumulative social impacts that are likely to arise as a result of multiple onshore shale gas projects occurring at the same time. The Coffey reports provide a snapshot of the social environment within which any onshore shale gas industry in the Beetaloo Sub-basin will operate. In doing so, the reports highlight the issues and community concerns expressed to Coffey during its consultation process. While Coffey developed the framework specifically for use in the NT, it also draws from SIA experience in other jurisdictions, in addition to world leading practice. The Panel's central recommendation is that if the Government lifts the moratorium, the SIA framework described in this Chapter must be implemented prior to the grant of any production approvals (see Chapter 16), and separate from any environmental impact statement (**EIS**). In addition to an analysis of the potential social impacts identified during the course of the Panel's consultations, key elements of what an SLO for any onshore shale gas industry in the NT, and particularly in the Beetaloo Sub-basin, might look like are examined.

12.2 Submission analysis

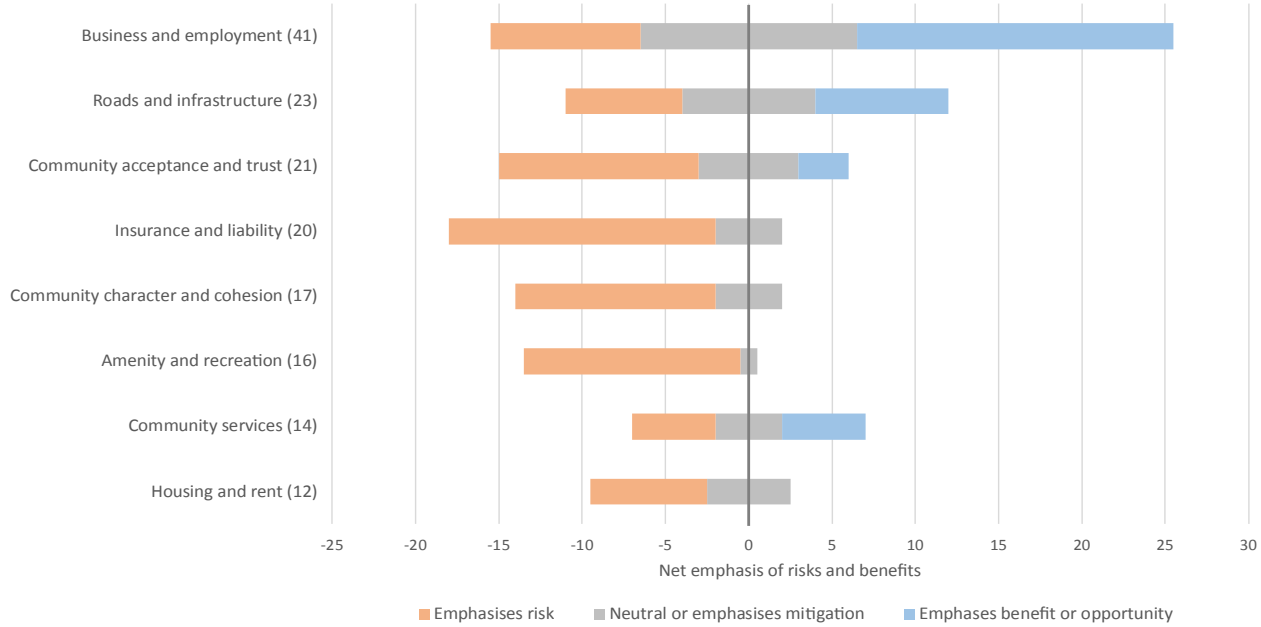
A content analysis of most of the submissions received by the Panel was performed using the computational technique Latent Dirichlet Allocation.[5]

Discussions of social impacts, both positive and negative, featured in at least 175 of the written and verbal submissions and almost all of the public hearings.[6] While the issues raised were diverse, several overarching themes and concerns were identified, as shown in **Figure 12.1**. In this context, it should be noted that there were more than 582 pro forma (see Chapter 2) letters received during the submission process. For the purposes of the thematic analysis, only one of each variety was included in **Figure 12.1** in order to not distort the data.

The graph below shows how many submissions emphasised the positive or negative aspects of each social impact, and how many submissions acknowledged the existence of risks but expressed the view that they could be managed. In this regard, it should be observed that the latter was predominantly from the industry proponents. Several of the social impacts identified in the submissions overlap with other chapters and are therefore covered in that chapter rather than discussed here (for example, see Chapters 10, 11, 13 and 14).

4 Ross 1990.
5 Blei et al. 2003.
6 For the purposes of this Chapter, a submission was counted if it included at least 150 words about or devoted at least 25% of its content to social impacts.

Figure 12.1: Number of submissions emphasising risks and benefits to social impacts.



12.3 Social impacts and SIA

12.3.1 The assessment of social impacts

A social impact can be described as *"any change that arises from new developments and infrastructure projects that positively or negatively influence the preferences, wellbeing, behaviour or perception of individuals, groups, social categories and society in general."*[7] The CSRM Report[8] proposes a similar definition, describing social impacts as the changes experienced by people and communities as a result of projects and activities that affect the way they live, work, relate to one another, relax and organise themselves.[9] Social impacts can be both positive and negative. They include "*changes to the norms, values and beliefs that guide and rationalise their cognition of themselves and their society*".[10] Social change is not recognised as an impact until it has an effect on people. Because a social impact is conceived as being anything linked to a development that benefits, affects, or concerns any affected stakeholder group, almost any change can potentially have a social impact provided that it affects something that is valued by, or important to, a specific group of people.[11] Consequently, it is difficult to pre-emptively narrow the scope of any analysis.

Major resource projects can generate multiple impacts and/or contribute to existing stresses within social systems.[12] Project-specific social impacts vary greatly in their nature, causation, magnitude and other characteristics (see **Table 12.1** below). Depending on the context, different receiving environments (such as a social or cultural group, or a geographic region) may experience the same impacts differently.[13] As such, it becomes the responsibility of the gas company, in consultation with affected people and other stakeholders, to ensure that all the relevant issues and impacts are identified and considered.

7 Geurs, Boon and Van Wee 2009; Vanclay 2003.
8 CSRM Report.
9 Burdge and Vanclay 1996.
10 IOGCP 2003, p 231.
11 Vanclay et al. 2015, p 2.
12 Franks et al. 2010a.
13 Franks et al. 2010a.

Table 12.1: Classification of social impacts.[14]

Category	Descriptor	Examples and explanation
Nature	Tangible	Improved access to health services, better living standards, shortage of affordable housing options.
	Intangible	Breakdown in social cohesion due to population movement.
	Perceived	People's subjective perceptions or experiences of impacts.
Directionality	Positive	Improved access to health services, new recreational areas, upgrades to community facilities, and improved education and employment opportunities.
	Negative	Increased crime rates, higher cost of living and increased health risks caused by pollution.
	Mixed	The impact of some changes is positive in some respects and negative in others, for example, population increase.
Causation	Direct	Directly connected (in space and time) to the activity, for example, resettlement, project-related employment and road construction.
	Indirect	Impacts that occur due to actions resulting from direct impacts. These are usually less obvious, later in time or further away from the source of direct impact, for example, increased income to tradespeople as project employees upgrade houses.
	Induced	Cause is several times removed from project activities, for example, loss of access to land due to market speculation
	Cumulative	Successive, incremental and combined impacts of one or more projects on society, the economy and the environment. These can arise from the compounding activities of a single project or multiple projects and from the interaction with other past, current and future activities. The overall effect being larger than the sum of the parts.[1]
Magnitude	Intensity	The scale of change from the existing condition as a result of the impact, for example, major/critical, high, moderate, minor, negligible.
	Geographic extent	Spatial concentration (for example, site-specific, local, regional, widespread) and[2] distribution (for example, localised, dispersed, contained).
	Duration	Short term (for example, the noise arising from the operation of equipment during construction), medium term, long term (for example, the inundation of land by a dam). Temporary (for example, during construction), fixed term, permanent.
	Frequency	Intermittent (for example, blasting), continuous (for example, electromagnetic fields caused by electricity lines).
	Rate of change	Immediate, delayed, incremental, rapid, gradual.
	Reversibility	Reversible, irreversible/residual.
Probability	Likelihood	Unlikely, possible, likely, certain.
	Confidence	The level of reliability in the estimates of likelihood and consequences.

[1] The word 'cumulative' anticipates a consideration of not just the development the subject of the application, but also the development in combination with other developments in the locality and the effect that the accumulation of such development and successive developments of a similar type will have on the community.

[2] Project-specific SIA is more focussed on potential social impacts on site-specific, local and regional, as opposed to widespread (State level, national and international) levels of analysis.

To evaluate the social impacts of projects on people, and on the ways in which people and communities interact with their socio-cultural, economic and biophysical surroundings, SIA is the usual framework of analysis.[15] SIA is also a field of research and practice comprising a body of knowledge, techniques and values.[16] As a methodology, SIA is used by governments, companies and communities to identify, assess and manage the social impacts of project activities, and to ensure that projects are conducted in a socially responsible manner. It is best understood as the process of analysing, monitoring and informing the management of intended and unintended social consequences of planned interventions, and any social change processes invoked by those interventions on affected communities, from the earliest stages of the planning process to future generations.[17] The objective of the SIA process is to identify, measure, predict and assess the effects of a development on the surrounding population's quality of life, culture, health, social interactions and livelihoods.[18]

14 Adapted from IRMA 2016; Burdge and Vanclay 1996; Franks et al. 2010b; Joyce and MacFarlane 2001.
15 Vanclay 2003.
16 Vanclay 2003.
17 Vanclay 2003; Franks 2012, p 6.
18 Vanclay 2003.

The NLC confirms the need for a participatory practice focussed on affected communities, as reflected in the definition below (which, it is noted, draws from the same authors that informed the SIA framework used in this Chapter):

> *"it is participatory; it supports affected peoples, proponents and regulatory agencies; it increases understanding of change and capacities to respond to change; it seeks to avoid and mitigate negative impacts and to enhance positive benefits across the life cycle of developments; and it emphasises enhancing the lives of vulnerable and disadvantaged people."* [19]

Leading-practice SIA involves identifying and managing the social issues that arise from development activities. This includes the effective engagement of potentially affected communities in participatory processes of identification, assessment and the development of strategies to manage social impacts. Although SIA is still used as an impact prediction mechanism and as a decision-making tool in regulatory processes to consider the social impacts of a project in advance of a permitting or licensing decision, it has an equally important role in contributing to the ongoing management of social impacts throughout the whole lifecycle of the project (in this case, the development of any new onshore shale gas industry), from conception to post-closure.[20]

SIA is widely practised internationally as a predictive study that is part of the regulatory approval process for resources projects. Many resource-rich jurisdictions have a regulatory regime in place to ensure that the social impacts of resources projects are assessed and managed. This includes statutory requirements in place to undertake SIAs, either as a separate procedure, or as part of a broader EIS. According to a 2012 survey, some form of SIA is mandated in 191 of the 193 nations of the world.[21] Despite this widespread and longstanding practice, in most cases SIA remains included as a component of an EIS. Initially, SIAs were narrowly conceptualised, and therefore, applied mainly at the project level and were limited to prediction of the negative consequences of development. This understanding of SIA continues to dominate policy, regulation and procedures in many jurisdictions.[22]

Project-based SIAs rarely adequately account for cumulative impacts that arise after the main construction period is over, or for the impacts of several projects or several industries operating in the same region.[23] A more detailed description of a fit-for-purpose SIA framework for any onshore shale gas development in the NT that takes into account the lifecycle of the industry, the regional and cumulative impacts of multiple projects, and the complex and data-poor nature of the receiving environment is expanded upon below.

12.3.2 An industry lifecycle approach

A SIA is generally required by regulators to assess the potential social impacts of a project before implementation. The primary focus of SIA to date has generally been on predicting impacts that will occur in response to a distinct project, activity or other proposed action. As the government and gas companies are bound to deal first with impacts of most significance or urgency, SIA is often focussed on the impacts that occur in the most intensive phases of development, namely, the 'construction' phase.

However, it is recognised that social impacts begin as soon as new information about a potential project becomes available, as various actors begin to compete to define, influence and respond to the opportunities and threats that may be presented by the project.[24] Impacts can also continue after the development or activity has ended, particularly where former 'booming' communities face a downturn and local businesses must adjust to a smaller and changed clientele, as is now the experience in some Queensland towns. An SIA framework must:

- identify and respond to impacts that occur across different stages of development;
- account for a paucity in statistical social and economic data in remote and Aboriginal communities;
- be culturally sensitive;

19 NLC submission 647, p 10. See also Esteves, Franks and Vanclay 2012; Goldman and Baum 2000.
20 Vanclay et al. 2015.
21 Morgan 2012.
22 Vanclay 2006.
23 Witt et al. 2017.
24 Gramling and Freudenburg 1992.

- identify strategies to maximise benefits and minimise disturbance that are aligned with the needs and aspirations of affected stakeholders;
- inform a more strategic and collaborative approach to development of the region; and
- engage affected individuals and communities in identifying and managing the impacts without placing undue burden on them.

A fit-for-purpose SIA framework for shale gas development in the NT that takes into account the life-cycle of the industry, the likelihood of multiple projects, and the complex and data-poor nature of the receiving environment is shown in **Figure 12.2**.

The steps that comprise an effective and efficient SIA framework are set out below:

12.3.2.1 Step 1: a strategic assessment

A SIA framework should place project-level SIA within a strategic context. A government-led strategic SIA should be conducted in the early stages of any industry development, once feasibility has been established (that is, an adequate resource base has been proven and considered economically viable). Such an assessment is currently under way for offshore gas development in the NT and in SA, and was completed for the terminated Browse LNG project in WA. Given that environmental values are linked strongly with Aboriginal culture, pastoral production, tourism, and social values in the NT, this type of assessment should be undertaken.

The first strategic challenge that any government faces is whether to develop the resource or to leave it in the ground. This is a decision that needs to be arrived at through a transparent and inclusive process, which will improve the quality of decision making as well as build community acceptance for the industry. There may also be occasions where the environmental, social, or cultural context is too sensitive, or where insufficient scientific evidence exists on the potential negative impacts of development. In these cases, the choice is made more complex by the high levels of uncertainty involved.

The objective of any strategic assessment proposed is to generate and disseminate the information needed to make a decision about allowing development that is consistent with the public interest. That information will also enable a planned approach to development, rather than allowing market forces to predominantly determine the scale and pace of development, which was the case in Queensland and in the US.

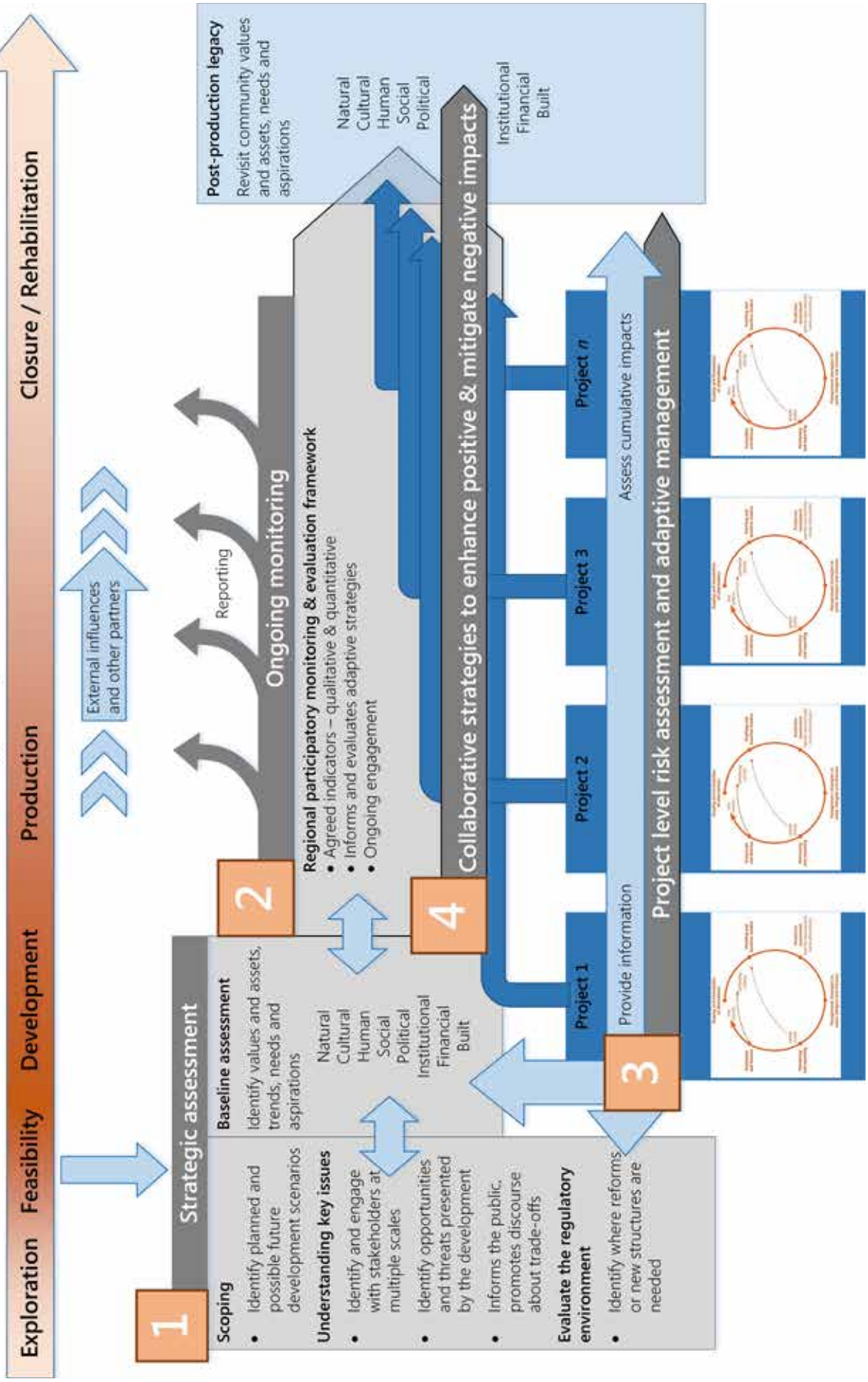
While there is a high degree of uncertainty at this early stage, there is a clear need to gather and provide relevant and reliable information about the industry and its potential impacts to reduce uncertainty to an acceptable level. It is important not to 'pretend to know everything' or to try and 'buy' social acceptance through the promise of jobs, infrastructure and economic benefits.

The strategic SIA stage involves four key components: (1) scoping – identifying possible future development scenarios and their trade-offs; (2) understanding key issues – identifying opportunities and threats presented by the development to a range of stakeholders, and stakeholders' concerns; (3) evaluating the regulatory environment – identifying any regulatory reform, or new governance structures needed; and (4) baseline assessment – identifying values and assets, trends, needs and aspirations for potentially affected regions. These are expanded upon below.

Strategic assessment ensures a transparent and inclusive process. The body of information gathered in this initial step is the starting block for an ongoing, open-access repository of social and industry-related data that is updated and expanded regularly as monitoring and project-level reports are generated (step 2). The suggested stages include:

- **scoping and boundary setting:** first, the strategic assessment seeks to understand the scale and scope of proposed development. This is done by collating information from the individual gas companies about where and how they intend to proceed, and how they might respond under different circumstances. The regulatory body overseeing the strategic assessment (see Chapter 14) should have powers to request such information (similar to the Queensland Gasfields Commission). Companies are hesitant to report this information publicly in the early phases of development as development scenarios can change. They may also not wish to divulge their strategies to other gas companies for loss of competitive advantage. Industry-specific information will inform the setting of meaningful and practical geographic boundaries for the subsequent studies, which might be in terms of geological basins or sub-basins, administrative boundaries, or 'impact' zones. Industry information is also used to identify planned and possible future development scenarios;

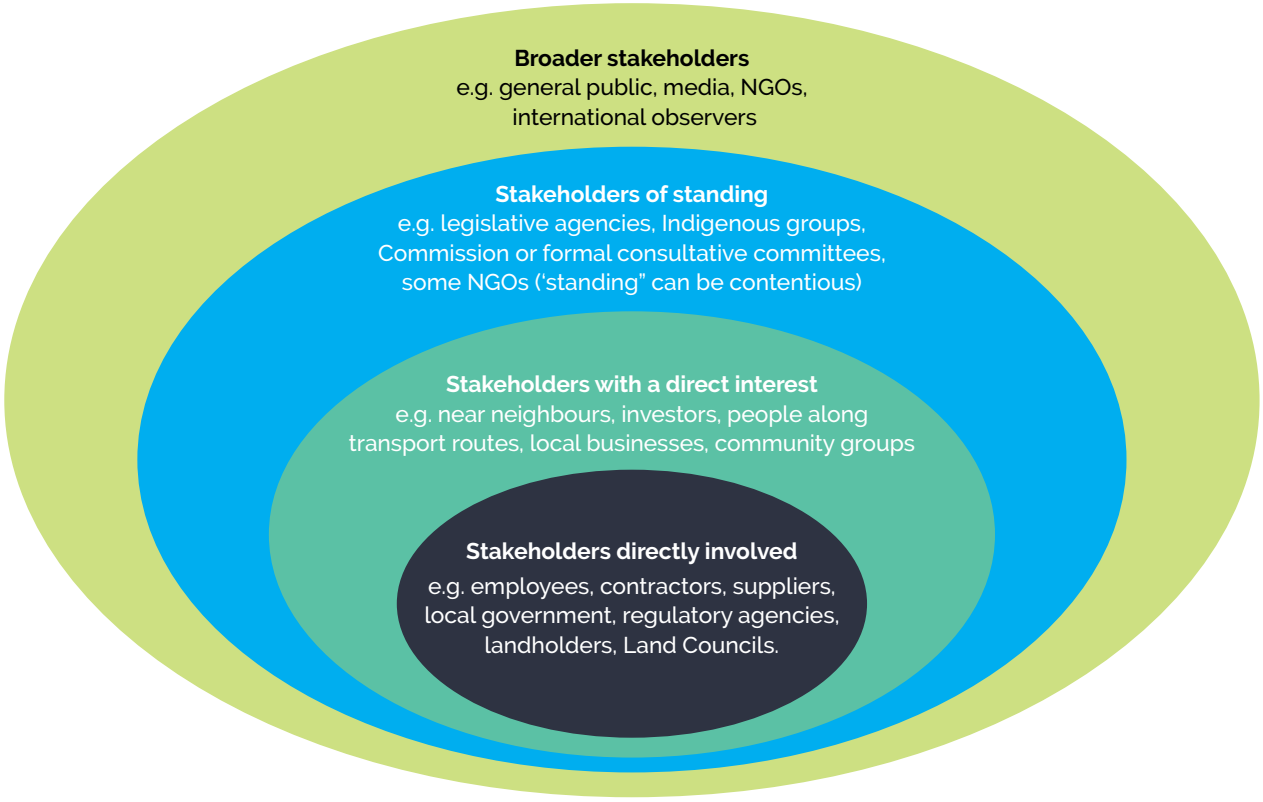
Figure 12.2: Conceptual model of a framework for SIA for any onshore shale gas industry in the NT. Source: CSRM Report.[25]



25 CSRM Report. p 36.

- **understanding the key issues:** with an understanding of what the proposed development might 'look like', the next step is to identify and understand the issues and trade-offs involved under different development scenarios, including identifying the people and organisations that may be affected. The stakeholder engagement component of this step is critical, and must follow leading-practice stakeholder engagement methods with skilled personnel. A 'nested' approach to identifying directly and indirectly affected stakeholders and interested parties should be used. Information about the concerns and interests of these stakeholders can be organised at local, regional, Territory, national and global scales.

Figure 12.3: Stakeholder identification by nature of interest and impact. Source: CSRM Report.[26]



Providing information and promoting discussion about the onshore shale gas industry, its activities and the trade-offs involved, is of crucial importance in the early stages of any development. In Queensland, a lack of freely available, trusted information about the onshore CSG gas industry in terms of the technology used, its requirements for labour, services and resources, and the types of opportunities and impacts it could generate, created a space for controversy and conflict. This was so notwithstanding multiple and lengthy EIS and regulatory reports. With the paucity of locally relevant information, those who wanted to know more about an industry will look to experiences and practices from elsewhere, often with little regard to important contextual differences, such as geology and hydrology, technological advances, institutional arrangements and population characteristics.

In the US, the National Wildlife Federation prepared a series of documents to help people engage in decisions about the oil and gas industry. The publication, *Fuel for Thought: a citizen's guide to participating in oil and gas decisions on your public lands,* outlines the lifecycle of a well, the environmental impacts, the legal framework, the roles and responsibilities of regulating bodies, as well as how to be 'an effective advocate'.[27] The guide provides a good example of the type of information that people require in order to hold an informed opinion about any onshore unconventional gas industry in their local area;

- **regulatory assessment:** a strategic assessment of any onshore shale gas industry must also evaluate the regulatory and approvals processes in place and identify reforms that may be needed. This includes addressing the challenges faced in gaining different types

26 CSRM Report.
27 Zimmerman 2008, p 30.

of consent, and especially those relating to fairness in any land access agreements and benefit sharing arrangements (see Chapters 11 and 14).[28] The emphasis on ensuring that there is a robust regulatory regime is deliberate. Previous inquiries into the impacts of any unconventional gas industry in Australia have concluded that the risks are manageable provided that the industry is properly regulated.[29] Chapter 14 makes recommendations about how the regulatory framework in the NT should be strengthened; and

- **baseline assessment:** arguably the largest component of the strategic assessment is the collation of baseline data.

  The initial baseline data collected is for regions and/or local communities where development is imminent and will involve significant participation by local residents. Regional baseline data should also be collected. This baseline data includes identification of stakeholder values and current assets in different types of capital 'stocks', as well as assessing trends, and aspirations for these stocks. The Community Capitals Framework (**CCF**) is well established in community development literature and practice.[30] The CCF measures community development in relation to seven types of capitals, including:

  - **natural:** the condition of place-specific elements, biodiversity, amenity, beauty;
  - **cultural:** traditional knowledge and languages, rituals and festivals, heritage;
  - **social:** networks, trust, norms of behaviour, giving, neighbourliness, cooperation;
  - **human:** skills, knowledge, health, abilities, leadership;
  - **political:** influence, having a voice, self-determination;
  - **financial:** credit, savings, income, assets; and
  - **built:** infrastructure, housing, roads, sewerage, sports facilities, lighting.

In addition, it has been suggested that institutional capital be included (for example, community organisations). That is, the effectiveness of local and regional institutions as another important consideration for any SIA framework.

As census and other statistical data is limited or flawed for many of the NT's remote communities (it tends to underrepresent the Aboriginal population), the collection of baseline data for these capitals must be a participatory process and part of any SREBA for a particular region (see Chapter 15). A leading practice model developed by CSRM and the CCSG is of relevance in this context, namely, the UQ Boomtown Toolkit and its supplementary annual reports on Queensland's gasfields communities. The UQ Boomtown Toolkit outlines a tested approach to identifying community assets and values, and importantly, for identifying indicators for measuring those values that are meaningful and relevant to multiple stakeholders. For example, it uses collaborative methods to identify indicators that any gas industry needs for compliance and for monitoring social impacts; that the community needs to represent their concerns, values and aspirations; and that the Government wants in order to monitor cumulative impacts and regional development outcomes. For remote NT communities, social indicators may need to be 'bespoke', and more qualitative. They may require local 'data stewards' to report changes in bespoke indicators on a regular basis. For example, an indicator of household wealth might be how many funerals/cultural events are attended in a year, rather than economic measures of disposable income. This 'shared measurement' approach is world leading practice in program evaluation and has clear relevance to impact assessment in data-poor regions. The need to develop bespoke indicators when working with affected communities in the NT was highlighted by the NLC.[31]

The baseline assessment identifies initial stocks of capital, but also trends where possible, and importantly, identifies local and regional goals and aspirations in relation to this capital. This information is used by gas companies, who still need to submit a comprehensive social risk assessment for the approvals process that outlines how the proposed activities will affect, either positively or negatively, the community capital stocks and the strategies proposed to either enhance or mitigate them. The ongoing monitoring and measurement of performance, and the social and cumulative impacts can be openly shared on a dashboard and reported annually in a public document as evidenced by the annual report on the Boomtown Indicators website.[32]

28 Note that in Queensland, the majority of land access issues are in relation to freehold land. This is quite different in the NT, where Indigenous land and pastoral leases are the main forms of land tenure.
29 CSRM Report.
30 Emery and Flora 2006.
31 NLC submission 647.
32 https://boomtown-indicators.org/.

12.3.2.2 Step 2: regional participatory monitoring and evaluation framework

World leading practice in SIA has regional and systems level monitoring for resource areas in place, particularly where social and economic impacts extend well beyond the geographic location of a single operation and where there are interacting impacts from multiple extraction activities.[33] Developing an online, public, open-access data repository for all industry-related information, including monitoring and compliance data, is a positive action for building trust in the industry, which is essential for building and maintaining public acceptance and an SLO.

An additional value of the ongoing, participatory regional monitoring and evaluation database is that it reduces the risk of 'consultation fatigue' as multiple gas companies seek information to inform their social risk assessments. In Queensland's CSG communities, multiple and extensive consultation events (from EIS/SIA consultants, resource companies, various levels of government, media and researchers) have placed high demands on people's time and caused additional stress at a time of rapid change and mixed emotions. As the 'boom' period ended, so did the outside interest. Unsurprisingly, local people reported feeling 'forgotten' and 'abandoned' by many of the consulting agencies.

The online database becomes an open-access resource for information. Each project-level risk assessment is uploaded, and any new indicators and data about communities are added to the database. Ideally, communities themselves can provide and upload data updates to the relevant indicator timeline. This gives communities ownership of the data. As the UQ Boomtown Toolkit has demonstrated, the data can also be used by communities for funding applications, to allocate resources, to argue a need for investment, or purely to advocate for themselves and their needs.

In addition to the open-access resource, there should be a mechanism for periodic reporting out of key information, with accompanying analysis and interpretation of findings. This is important for industry transparency and to build and maintain trust in the industry as indicated in the CSIRO Report. This reporting work is best conducted by an inter-disciplinary and purpose-specific research institution, such as CCSG or GISERA. CCSG produces annual reports for Queensland's gasfields communities, which are widely used by local and State governments, CSG companies and community groups.

A strategic and regional approach to cumulative impact assessment enables gas companies to form partnerships with other companies, service providers and communities and to ensure that the community can play a role in securing outcomes to their benefit. Strategies for social impact mitigation or enhancement can then align with existing community development programs and be targeted toward the needs and aspirations of local communities. This monitoring framework is designed to enable adaptive responses. Each development will provide information about intentions for future development. This allows industry forecasting and amendment to initial development scenarios generated in a strategic assessment. The lifespan of the monitoring framework should last throughout the lifecycle of the industry, that is, approximately 40–50 years. However, the frequency of data updates must be flexible and determined by institutional capacity, sequential development of projects, and the transitioning of projects to another phase.

While this is an ideal model, it is recognised that it places additional burden on government resources, particularly in the early phases of strategic assessment, before any royalties from resource production have been generated. A lower cost version is to create an online data repository, have all data from project-based EIS/SIAs uploaded, with conditions in place for any future projects in the region to adapt to new information and facilitate collaboration. The monitoring framework sets the agreed indicators to be monitored, with sufficient flexibility to adapt to emerging issues as they arise. Responsibility for the data updates, once the baseline is established, is shared by the gas companies and local communities (similar to the UQ Boomtown Toolkit).

The Government could recover costs for the strategic and ongoing assessment by increasing the cost of petroleum approvals or moving towards a full regulatory fee recovery model (see Chapter 14 for further discussion).

The main function of the ongoing collaborative monitoring framework is to provide a structured mechanism for collaboration and adaptive management, and to facilitate processes for capturing learning that leads to continuous improvement. Importantly, it also allows for coordinated responses to other influencing factors, both from within any onshore shale gas industry, such as price fluctuations, and externally, such as biosecurity alerts.

33 Franks et al. 2009.

12.3.2.3 Steps 3 and 4: project-level risk assessments and collaborative strategies

Under the proposed SIA framework each proposed onshore shale gas project will submit an SIA with a comprehensive risk assessment that considers:

- the whole lifecycle of the project and the types of activities involved in each phase;
- the people or groups of people likely to be affected (with attention to vulnerable groups);
- the likely social impacts – both positive and negative;
- the significance of the impacts in terms of likelihood, severity, and ability to be mitigated or enhanced;
- the likely effects of mitigation and enhancement strategies (in relation to baseline assessment of capitals and aspirations for these capitals, but also in relation to strategies that may already be in place by other projects in the region);
- the assessment of residual risks; and
- standardised reporting.

Strategies for enhancing positive outcomes and mitigating negative impacts should be targeted towards the aspirations and needs of communities identified in the strategic SIA and should be in partnership with community organisations and institutions. The social baseline data will be used from the strategic SIA baseline data and updated or expanded to suit the EIS/SIA requirements. This minimises the need to collect baseline data multiple times directly from communities, which contributes to consultation fatigue. Stakeholder engagement processes are critical in prioritising concerns and developing workable agreements for mitigation or enhancing strategies. This approach is detailed in the Beetaloo Sub-basin SIA Report (at Appendix 16).

12.4 Lessons learned from SIA experiences elsewhere

In addition to the Queensland experience, there are a number of lessons that have emerged in other countries that provide useful consideration for the NT. Some of these are summarised below.

12.4.1 Queensland unconventional gas experience

The CSRM Report made the following relevant observations based on similar unconventional gas development in Qld, namely, that:

- the scale and pace of development determines the significance of social impacts. Likewise the pre-existing/pre-project social, economic, political and cultural environment;
- social impact mitigation strategies should not be bilateral agreements (for example, government placing conditions on gas companies), nor overly prescriptive (for example, the gas company must construct 50 new houses). Instead they should involve local communities (and other key stakeholders that have a role to play), be aligned with their aspirations and needs and be 'outcomes-focussed';
- the social impacts of unconventional gas development are unevenly distributed. Those with capacity and information can prosper while inflexible or vulnerable groups can be negatively affected;
- social impacts, such as impacts on local social cohesion, and psycho-social stress, arise well before there is a project, and these are often not adequately addressed in SIA processes;
- there is low trust in the onshore unconventional gas industry worldwide. Trust is time-consuming and difficult to earn but quickly and easily lost. In developed countries like Australia, mass media, including social media, can have a large influence on the process. This highlights the importance of managing relationships at the ground level, especially in remote areas;
- local institutions need to be strengthened (ideally prior to any development occurring) to address the challenges and harness the benefits that the industry can bring. SIA needs to identify existing levels of capacity within these institutions and those that would need attention;
- underlying much of the public concern about hydraulic fracturing and the unconventional gas industry generally has been a lack of engagement of affected people in meaningful ways. All affected communities require detailed information about the proposed activities and likely impacts of any industry to make informed decisions;

- a single strategic SIA should include various specialist assessments. However, due to the interconnectedness of Aboriginal people and their country, predicting the significance of social impacts requires the consideration of social, environmental, economic and cultural impacts (see Chapter 11);
- collaboration and coordination between projects, and between gas companies, government and community organisations is necessary for effective assessment and responses to cumulative impacts. A platform for such collaboration (such as a multi-stakeholder working group) should be linked with the ongoing monitoring platform and come under the jurisdiction of the regulator (see Chapter 16);
- clear guidelines for negotiating land access agreements should be produced that outline the rights of both the landholder and gas company. Considerable stress and negative impact has been associated with misunderstood rights and perceived disrespect for attachments to, and interests in, land;
- identify strategies to build local institutional and business capacity early. To best capture the potential economic benefits of any onshore shale gas development, adequate lead-time and institutional, business and individual capacity is required;
- negotiations with traditional Aboriginal owners must be inclusive and transparent. General consent is insufficient. Details of activities must be fully explained to ensure that these landholders properly understand the terms of the consultations and the proposed development's impacts, benefits and management strategies. The process for such negotiations should be fully documented (see Chapter 11 for further discussion in this regard); and
- perceptions or evidence of negative impacts on the spiritual wellbeing and social cohesion in Aboriginal communities must be given high priority.

12.4.2 US shale gas experience

As stated in the Interim Report, the US shale gas 'revolution' was characterised by its rapid pace of development and is a cautionary tale for the NT. In the overriding agenda to become self-sufficient in energy supply as quickly as possible, social (and sometimes environmental) impacts of development were largely overlooked (until there was local backlash) and regulatory frameworks were largely insufficient (until they were challenged and amended).[34] A review of the risks posed to communities from shale gas development in the US identified four key areas of risk:

- rapid industrialisation of communities ('boom and bust');
- uneven distribution of costs and benefits from the development;
- community conflict; and
- social-psychological stress and disruption.[35]

The most effective responses to the negative social impacts of shale gas development were led at the community level. These required the development of community-scale and consensus-based decision-making processes.[36] The need to assess local institutional capacity was identified in the proposed SIA framework baseline assessment.

In the NT, local and State governments and Land Councils will need to establish participatory planning processes and prepare planning documents that reflect the views and aspirations of local residents if any onshore shale gas development is to proceed.

12.4.3 South Africa's strategic environmental assessment for shale gas

The South African Government has made a high-level public commitment to shale gas exploration. The potential future economic and energy security benefits of a large resource of natural gas in the Karoo region of South Africa may be substantial. But so too could the negative social and environmental impacts. In order to make well-informed decisions and to ensure that decisions are broadly accepted by stakeholders, a strategic environmental assessment for shale gas development was commissioned. The key aim of the project was to develop an integrated decision-making framework to enable South Africa to establish effective policy, legislation, and sustainability conditions, under which shale gas development could occur.

34 Brasier et al. 2014.
35 Jacquet 2014.
36 McElfish and Stares 2014.

There were three project phases over the 24-month period:

- **the conceptualisation and methodology phase:** the objectives of this phase were to set up and implement all project management structures, convene the project governance groups, recruit authors and experts to the multi-author teams and release a draft approach report at the end of phase 1 for expert review. This document was also made available to the public online;
- **the scientific assessment phase:** this was the component of the study where the scientific assessment by the multi-author teams for all strategic issues took place. At the end of this phase, draft and final strategic environmental assessment reports were released for expert and public review. The expert review included peer-reviews from international experts; and
- **the decision-making framework phase:** the final phase translated the outputs from phase 2 into operational guidelines and decision-making frameworks. It was undertaken by the project team in close consultation with the various affected government departments. It commenced with initial drafts after the delivery of the first draft of the assessment report and ended with final drafts after the delivery of the final assessment report.

The project teams were separated between phase 2 and 3. The experts involved in phase 2 were not asked to make decisions about the development of shale gas. Rather, they were asked to give an informed opinion on the consequences of different options. The decisions were to be made by mandated government authorities who contracted various science councils to help formulate the framework and content of such decisions. The assessment process culminated in November 2016 with the publication of the report, *Shale Gas Development in the Central Karoo: A Scientific Assessment of the Opportunities and Risks.*[37]

The extensive report identified a number of potentially significant social risks, particularly those relating to increasing social division and inequity between already marginalised populations and those better positioned to capture opportunities from the shale gas industry.

Building public trust remains a key issue for the industry in South Africa. It is too early to determine whether the exercise has resulted in greater trust in government and industry or broader public acceptance of shale gas development in South Africa. However, the scientific rigour, detail and transparency associated with the assessment exercise has undoubtedly provided a significant contribution in this respect.

12.4.4 Canadian shale gas experience

The Council of Canadian Academies was asked to assemble an expert panel to assess the state of knowledge about the impacts of shale gas development in Canada. In response, the Council recruited a multidisciplinary panel of experts from Canada and the United States to conduct an evidence-based and authoritative assessment supported by relevant and credible peer-reviewed research. In 2014, the Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction published its report, *Environmental Impacts of Shale Gas Extraction in Canada.*[38]

One of that panel's main findings was that, compared to conventional gas, the greater scale of development and concentration of infrastructure required to produce shale gas meant increased land impacts and land use conflicts, and that the only effective way to manage such cumulative effects was at the regional, and not local, scale.[39] The panel noted that management of cumulative effects requires effective implementation of strategic impact assessment processes. At the same time, the implementation of a regional strategic impact assessment to reduce cumulative effects of shale gas development requires a significant investment in human and financial resources.[40]

The panel also found that shale gas development poses particular challenges for governance because the benefits are mostly regional, whereas adverse impacts are mostly local and distributed across several levels of government. Engagement of local citizens and stakeholders was identified as a key element of an effective framework for managing risks posed by shale gas development. Accordingly, the panel stressed that public engagement is necessary not

37 Scholes et al. 2016.
38 Council of Canadian Academies 2014.
39 Council of Canadian Academies 2014, p 205.
40 Council of Canadian Academies 2014, p 128.

only to inform local residents of development but to receive their input on what values need to be protected, reflect their concerns and earn their trust.[41] As experience in several US states and Canadian provinces has shown, the manner in which local people are engaged in decisions concerning shale gas development is an important determinant of their acceptance of the development. Moreover, public acceptance is situation-specific: practices that are acceptable in one situation may not be in another. Therefore, the panel recommended that any public engagement strategy needed to reflect these differences and be oriented to local context, capacity, and concerns.[42]

In the Canadian social and political context, any shale gas development must also recognise the importance of addressing First Nations' treaty rights, interests and concerns. The legal relationship between the Crown and First Nations people is defined by the courts through clarification of the existing Aboriginal and treaty rights. Many First Nations are uncomfortable with tripartite negotiations between the provincial, federal and First Nations governments because they see such negotiations as a derogation of the bilateralism established when the treaties were first negotiated. First Nations argue that the cumulative impacts of past authorisations for resource development in Canada have infringed on their Aboriginal and treaty rights. Specifically, they point to instances where the Crown assigned certain procedural aspects of consultation to proponents and asked for amendments to project plans to avoid impacts on Aboriginal and treaty rights.[43] The panel stressed that the impact of First Nations' opposition to other major resource development in Canada indicates that the effect that Aboriginal resistance or support on future shale gas development cannot be overemphasised.[44] As many of the known commercially accessible shale gas deposits in Canada are in accepted or claimed traditional First Nations territories, the panel recommended that First Nations need to be consulted meaningfully and early in any shale gas development process and in full respect of their Aboriginal and treaty rights.

12.5 Implementation of an SIA in the NT

12.5.1 The NT's unique socio-demographic context

To better understand which social impacts are likely to be a priority for those living in the NT, it is necessary to have regard to its particular demographics.

12.5.1.1 The NT's unique statistical population context

At the most recent census, the NT reported a population of 245,740 people, of which 51.8% were male and 48.2% were female. The proportion of the population who identify as Aboriginal or Torres Strait Islander is the highest in the NT, at 25.5%, or 58,247 people. The NT is sparsely populated, with a population density of 0.02 people per hectare.[45] Managing this vast landscape are 17 district councils, ranging in population size from approximately 209 people in the regional council of Belyuen, to more than 140,000 people in the urban council of Darwin.[46] The NT also contains four Aboriginal Land Councils: the NLC, the CLC, the Tiwi Land Council and the Anindilyakwa Land Council.[47]

Comparisons of economic performance to other jurisdictions indicates that overall the NT has consistently low rates of unemployment (on average) and high rates of economic growth and construction work, but poor forward-looking indicators relating to population growth, business investment and housing finance.[48] The majority of Territorians are employed in the greater Darwin region, an estimated 61.5% of employees. The fastest growing industries are in agriculture, retail and utility services, while the largest sectors for employment are public administration, construction, healthcare, education and retail.[49]

The Territory's average rate of unemployment is low, at 5.3%, but these statistics differ between regional and urban areas, and between non-Aboriginal and Aboriginal people. For example,

41 Council of Canadian Academies 2014, p xix.
42 Council of Canadian Academies 2014, p 208.
43 Council of Canadian Academies 2014, p 31.
44 Council of Canadian Academies 2014, p 31.
45 ABS 2017.
46 ABS 2017.
47 NT Government 2017a.
48 CommSec 2017.
49 NT Government 2017b.

the unemployment rate of Aboriginal people in the NT is high, at 24.4%. This is significant when examining labour force participation rates (or the proportion of people in the population engaged in the workforce, either employed or looking for work). This was most recently reported at 48.7% for Aboriginal people, compared to 85.5% for non-Aboriginal people.[50] Aboriginal people were more likely to be employed if they were living in an urban centre, rather than a remote region. With 49% employment in urban areas compared to 36% in remote areas. This is particularly relevant in the NT where 79% of the Aboriginal population reside in remote areas.[51] The statistics suggest there is a lack of employment opportunities for those living in remote areas, particularly for the Aboriginal population. These populations may therefore benefit from the introduction of, and involvement with, any employment opportunities in remote regions of the NT occasioned by any onshore shale gas industry.

12.5.1.2 The NT's unique land tenure context

In order for Aboriginal people to claim rights to traditional land and to have those rights recognised under the Land Rights Act or the Native Title Act, they must be able to demonstrate a continuous connection with the land through regular access and traditional cultural practices from one generation to the next (see Chapter 11). Being able to access, utilise and care for country, thereby maintaining a connection to traditional land and practices, is vitally important to Aboriginal people (whether they are formally recognised as traditional Aboriginal owners or not under the law). Any fragmentation or degradation of the landscape translates directly into social and cultural impacts for Aboriginal people.

Despite recent approaches to social and economic policy that are more holistic and inclusive of Aboriginal people and their culture, there remain significant inequalities in health and wellbeing between Aboriginal and non-Aboriginal people.[52] The implication for SIA in the NT is a learned mistrust of projects that promise improved social and economic outcomes. For SIA and social performance practitioners, mitigation measures and social investment strategies must be developed with active involvement by Aboriginal people.[53]

Furthermore, under the current agreement-making processes in the NT (see Chapter 11), there is the potential for significant inequality between those receiving compensation and benefits and those who do not. This in turn can, and does, lead to increased social unrest and conflict, both inter-community and intra-community and conflict aimed at other entities, such as gas companies or the Government. The strategic and participatory approach to SIA recommended in this Report is an attempt to address this inequality, through a focus on community benefits and capital building, and by developing strategies to mitigate negative impacts and enhance positive impacts.

The main consideration surrounding land tenure is that different landholdings require different forms of 'consent' in order for project activities to proceed without interference or interruption from dissatisfied stakeholders. These range from broader community acceptance to individually negotiated agreements with pre-identified, or 'qualified' communities (see **Table 12.2**).[54]

50 ABS 2016a; ABS 2016b.
51 ABS 2016a.
52 Osborne et al. 2013.
53 Osborne et al. 2013.
54 O'Faircheallaigh 2007. 'Qualified' communities are those who have been through a formal process of identification and verification as being traditional Aboriginal owners of land under the Native Title Act.

Table 12.2: Land tenure in the NT and types of 'consent'. Source: CSRM Report.[55]

Land tenure	Type(s) of 'consent'	Principles/pathways	Challenges
Crown Land (about 50% of land mass - *which includes 44%* pastoral lease)	'Contingent' consent.[56] Often (mis)understood as a 'social license to operate.'[57]	Community acceptance on the basis that net social benefits outweigh the harms. As long as the balance is such, the project is more likely to be supported by the public and their representatives in the public service and government.	Relies on estimation of net benefit or harm when impacts are known to be unevenly distributed. The 'voice of many' can over-ride the voice of those directly impacted.
Freehold (0.5% of land mass)	Land Access Agreements. Includes a right to object to the granting of an exploration permit through written sub-mission – no right to refuse access to permit holders.	Over-riding public good. Fair compensation for surface rights holders. Not within 200m of dwelling.	Capacity to negotiate a fair compensation package varies between individuals. Landholder unaware of rights and obligations.
Aboriginal freehold (about 50% of land mass)	Exploration and Mining Agreements with relevant Land Council. Free Prior Informed Consent.	Includes a right not to permit activities. Indigenous Land Use Agreement. UN Declaration on the Rights of Indigenous Peoples.	Excludes those not identified as 'qualified' from benefit sharing[58] A bilateral agreement not conducive to cumulative impact assessment or collaboration with other 'development' partners.
Pastoral leasehold (44% of land mass)	Land Access Agreements. Includes a right to object to the granting of an exploration permit through written submission – no right to refuse access to permit holders. Indigenous Land Use Agreement- where land held under Native Title.	Negotiation of compensation and conduct agreements.	'Compensation' for damages in excess of normal operations only.

12.5.2 The need for a separate strategic SIA in the NT

There are currently no regulatory requirements or provisions for undertaking a separate strategic SIA in the NT, although the need for an overarching strategic SIA of any onshore shale gas industry has been proposed in prior reports (see, for example, the 2015 Hawke Report) and by the EDO. One pathway for such an assessment is to define a specific development area (such as the Beetaloo Sub-basin) and outline a program for any onshore shale gas development in that area. Where MNES are potentially affected, the Australian Government can be approached to enter into a Strategic Assessment Agreement with the NT under the EPBC Act, as part of a bilateral agreement. However, these agreements are limited in scope and the type of assessment recommended by the Panel in this Chapter (see also Chapter 15) should instead be implemented.

Social baseline assessments must be undertaken by trained and experienced SIA practitioners who also have an understanding of industry activities associated with the different phases of any onshore shale gas development. Such specialised expertise can be found, for example, in the CCSG and at GISERA. While both these research institutions rely partly on industry funding, researchers work under strict codes of conduct and national guidelines for the ethical conduct of research. A similar centre could be established in the NT at Charles Darwin University or another local institution.

The baseline assessments for the SIA framework proposed in this Chapter most closely resemble those undertaken by the CCSG or CSRM for cumulative social and economic impact assessment,

55 CSRM Report, pp 31-32.
56 Levi (1997, p 8) in Owen and Kemp 2012.
57 Owen and Kemp 2012.
58 Stevens 2003.

insofar as they involve generating timeline charts for a tailored set of locally meaningful indicators. This approach is most relevant to the NT because it allows Aboriginal communities to choose their own set of indicators rather than relying on census data, which may be of little relevance to their specific circumstances. Using this method, communities are able to participate in the development of indicators, data collection and reporting, and the design of mitigation strategies that are outcomes-focussed for their needs and aspirations. This requires some local institutional capacity and leadership which may need to be fostered. Local governments and Land Councils should have participatory community planning documents prepared that outline local values and other intangible assets that people would like to see protected and enhanced, together with any issues that they would like to see resolved.

12.5.3 Key components of a leading practice SIA framework for any onshore shale gas development in the NT

There are a number of key findings that arose from the CSRM Report that provide useful insights around the necessary considerations for monitoring and assessing the social impacts of any onshore shale gas industry in the NT. The key components of a leading-practice SIA framework for any onshore shale gas industry in the NT are as follows:

- **strategic assessment**: to develop a program that clearly identifies the goals of the program and defines the scale (and staging) of development in terms of balancing economic, social and environmental impacts at local, Territory and federal scales;
- **strategic approach:** that aligns individual projects and their outcomes with the objectives of the NT Economic Development Framework and community values and aspirations;
- **coordination and collaboration between multiple projects:** in order to minimise negative cumulative impacts, minimise the 'footprint' of any development in the placing of associated infrastructure (including workers' accommodation) and maximise long-term social and economic benefits to local and regional communities;
- **human rights issues:** attention to human rights and the rights and vulnerabilities of Aboriginal people;
- **independently led social baseline assessment:** using agreed indicators to measure impacts and sustainability outcomes (the indicators should be selected in consultation with local people, communities, and stakeholders) with participatory, ongoing monitoring of impacts and outcomes;
- **independently led community engagement program:** using affected stakeholder groups to discern the significance of impacts and to co-develop acceptable and appropriate mitigation and enhancement strategies;
- **open data policy:** regular and open reporting on the social, economic and environmental performance of the onshore shale gas industry; and
- **cumulative impacts:** each additional project should provide an adaptive SIA risk assessment that specifically addresses cumulative impacts and its contribution to the project's program's objectives.

Recommendation 12.1

That a strategic SIA, separate from an EIS, must be conducted for any onshore shale gas development prior to any production approvals being granted.

Recommendation 12.2

That the strategic SIA be funded by the gas industry.

Recommendation 12.3

That the strategic SIA must be conducted comprehensively and in such a manner that it will anticipate any expected impacts on infrastructure and services and to mitigate potential negative impacts.

Recommendation 12.4

That early engagement and communication of the findings of the strategic SIA be systematically undertaken with all potentially affected communities, all levels of government and potentially affected stakeholders, including Land Councils, to ensure that unintended consequences are limited, and that shared understanding of roles and responsibilities, including financial responsibilities, can be developed.

Recommendation 12.5

That ongoing monitoring and measurement of social and cumulative impacts be undertaken, with the results being made publicly available online as soon as they are available.

12.5.4 Reforms required to enable an SIA framework in the NT

For the proposed steps in an SIA to be operational, a number of structural innovations are required. These include:

- introducing regulatory mechanisms for a separate strategic SIA. A strategic SIA is needed to manage the social impacts associated with any onshore shale gas development. The SREBA recommended in Chapter 15 is central to this reform;
- establishing a regulator (see Chapter 14) with powers to request information from and to facilitate collaboration between gas companies, government agencies (including local government), Land Councils, communities and affected landholders;
- establishing a long-term participatory regional monitoring framework overseen by the regulator, with secure funding (raised from industry levies) and able to endure multiple election cycles (see Chapter 14); and
- periodic and standardised reporting to communities on the social, cultural, economic and environmental performance of the onshore shale gas industry through an independent source, either the regulator or a specialised research institution. This includes information from the monitoring of key indicators and an industry-wide complaints and escalation process (the experience of CSG in Queensland is that each of the CSG projects reported complaints differently, which made it impossible to gauge industry performance).

Recommendation 12.6

That a strategic SIA be conducted as part of any SREBA to obtain essential baseline data.

Recommendation 12.7

That in order to operationalise an SIA framework in the NT, the Government must:

- ***give the regulator power to request information from, and to facilitate the collaboration between, individual gas companies, government agencies (including local government), Land Councils, communities and potentially affected landholders;***
- ***establish a long-term participatory regional monitoring framework, overseen by the regulator, with secure funding from the gas industry and able to endure multiple election cycles; and***
- ***establish periodic and standardised reporting to communities on the social, cultural, economic and environmental performance of the industry through either the regulator or a specialised research institution. This includes information from the monitoring of key indicators, and an industry-wide complaints and escalation process.***

12.6 Summary of identified social impacts of any onshore shale gas development in the NT

12.6.1 Impacts on public infrastructure and services

The submissions and public consultations identified a variety of ways in which any onshore shale gas industry could both positively and negatively affect infrastructure and services in the NT. There was general agreement that increases in population and industrial activity would place pressure on many types of existing infrastructure and services. For example, by increasing the amount of heavy vehicle traffic on public roads or the demand on health services and schools. Views varied about whether such pressures presented a threat or an opportunity for communities in the NT.

Some submissions emphasised the potential improvements to infrastructure and services that can flow from resource developments, whether as a result of direct investment from resource companies, or through royalties that add to public revenue. Among these submissions were several from pastoralists or pastoral service providers, who described the challenges of conducting business in remote areas with minimal public infrastructure and utilities. As Mr David Armstrong of Terrabos Consulting explained:

> *"Key infrastructure developments that pastoralists are always asking me about are road upgrades, mobile phone coverage, improved internet service and mainstream power. Currently the cattle industry is a world leader in beef production operating in third world conditions. I would encourage any business owner to imagine their life without mobile phone coverage, generating their own power at a cost upwards of $200 per day, with very poor internet connection, roads that can become inaccessible for a number of months of the year."* [59]

Similarly, Mr Tom Stockwell and Ms Tracey Hayes from the NTCA noted that while pastoralists have a variety of views about hydraulic fracturing, they are united on the need for better roads and other supply chain infrastructure. [60] As well as benefiting pastoralists, there is a view that improvements to roads and other infrastructure would stimulate the development of industries and ultimately be of benefit to remote communities and, therefore, all of the NT.

Some submissions expressed the opinion that onshore shale gas development presented a good opportunity for these utilities and services to be improved. This belief was founded, in some cases, on the perception that such improvements had rarely occurred in the past without investment from mining companies.[61] Widely cited as an example of what onshore shale gas development could deliver in the NT was the sealing of the Western Creek Road, a project that Pangaea had planned to complete prior to the moratorium being announced.[62] In relation to services, APPEA and other gas industry proponents highlighted contributions that CSG companies had made to health and education services in Queensland. For example, by funding healthcare initiatives and emergency services, and by investing in school-based traineeships and apprenticeships.[63]

Many submissions, however, expressed doubt that the potential benefits to services and infrastructure would materialise, or that they would be sustained beyond the initial stages of development. Much of this scepticism derives from accounts of impacts of the CSG industry on regional communities in Queensland, especially in the Darling Downs. These accounts include peer-reviewed research from the University of Queensland (**UQ**) and CSIRO, as well as news stories and anecdotes. For example, submissions from the Lock the Gate and The Australia Institute cite findings from UQ researchers suggesting that built capital, including transport and communications infrastructure, has deteriorated in regions in southern Queensland where the CSG industry is present.[64]

Taking a broader economic perspective, the written and verbal submissions from The Australia Institute note that mining royalties account for a relatively small proportion of revenue in the NT,

59 Mr David Armstrong, Terrabos Consulting, submission 180 (**Terrabos Consulting submission 180**).
60 Northern Territory Cattlemen's Association, submission 261 (**NTCA submission 261**).
61 Mr Bill Sullivan, Sully Pty Ltd, submission 160 (**B Sullivan submission 160**).
62 Mr Rohan Sullivan, Cave Creek Station and Birdum Creek Station, submission 243 (**R Sullivan submission 243**); B Sullivan submission 160.
63 APPEA submission 215; Santos submission 168; Origin, submission 153.
64 Lock the Gate Alliance submission 171; The Australia Institute, submission 158 (**The Australia Institute submission 158**).

and that allowing onshore shale gas development would not substantially change the amount of funds available for improving services and infrastructure.[65] Mr Rod Campbell of The Australia Institute also cautioned against depending on the gas industry to build public infrastructure, noting that, *"State governments end up building things for resource industries rather than the other way around".*[66]

Other submissions questioned the likely public benefit of infrastructure built by gas companies. Ms Helen Bender's submission noted that new roads would service the locations used by gas companies and not those most used or most needed by the public. [67] With new roads, and the increasing use of existing roads, comes increased maintenance costs, which, as the Central Desert Regional Council noted, the gas industry cannot presently be compelled to pay for.[68]The issue of road maintenance and upkeep was raised when the Panel visited communities in Queensland.

As well as increased maintenance costs, concerns were expressed that increased traffic use could lead to a higher rate of road accidents, increased pollution, noise, and impacts to wildlife (see Chapters 8 and 10). [69] Road use and safety was also an issue present with the expansion of the CSG industry in Queensland. Issues acknowledged by the Queensland Gasfields Commission included that:

> *"significant increases in traffic flows, truck movements on school bus routes, large/wide transports on regional highways and the generation of dust and noise on unsealed roads. Many existing roads in the Surat Basin required upgrading to withstand the change in traffic type and frequency."* [70]

Although these impacts are relevant to the NT, given the remote location of many of the roads and the lack of built up areas in much of the Territory, the extent of these negative impacts will depend on the location of any onshore shale gas development.

Early in the development of the CSG industry in Queensland there were examples of gas company employees and contractors exhibiting a lack of safe driving behaviour. For example, not complying with speed restrictions, driving long distances without adequate breaks, and noise from employees reversing from their homes early in the morning. These risks were mitigated by gas companies implementing a number of initiatives including 'In Vehicle Management Systems', which monitored the speed at which vehicles were being driven, as well as mandated rest periods every two hours. It is noted in the submissions from several gas companies that they propose to implement 'Traffic Management Plans' [71] as part of any onshore shale gas development to ensure adequate preparation for potential high or increased traffic.

The Academy of Medicine, Engineering and Science of Texas (**TAMEST**) also reported an order of magnitude increase in road traffic (not only trucks) and road accidents, as well as clearly observed degradation of roads and roadside infrastructure.[72] TAMEST noted that in Texas:

> *"Not only have there been considerable increases in truck traffic across the state, other modes of transportation have also experienced a surge in traffic, as evidenced by the significant increase in energy-related activities at transportation facilities such as ports, railroads, and pipelines."* [73]

TAMEST also acknowledged that the level of funding allocated to address the impact on road infrastructure and traffic safety was low when compared to the magnitude of impact. This mirrors findings from Queensland where the upkeep and maintenance of roads over the longer term fell to local government.

65 The Australia Institute submission 158; The Australia Institute, submission 322 (**The Australia Institute submission 322**).
66 The Australia Institute submission 322.
67 H Bender submission 144.
68 Central Desert Regional Council, submission 76 (**CDRC submission 76**).
69 P Cass submission 192; Lock the Gate submission 171.
70 Queensland Gasfields Commission 2017a, p 80.
71 Pangaea submission 427, p 17; Origin submission 433, p 63; Armour Energy Ltd, submission 23 (**Armour Energy submission 23**), p 2; Santos submission 168, p 66.
72 TAMEST 2017.
73 TAMEST 2017, p 22.

Concerns were expressed about the Government's ability to cover all of these necessary costs in a sustainable way (see also the discussion in Chapter 8 in Section 8.3.2.1 and Chapter 10 in Section 10.3.4). One suggestion from the EDO was to create a mechanism in the Petroleum Act allowing the Government to require contributions from gas operators for the purpose of road maintenance.[74] Similarly, North Star Pastoral suggested that there should be an "*annual roads maintenance financial contribution that will cover the gas companies' share (based on the percentage of tonnage hauled along that road) of the road maintenance costs for the life of the project*". There were also several suggestions around relevant Austroad standards, which have been incorporated in the recommendations.[75]

Recommendation 12.8

That as part of any strategic SIA and prior to any significant increase in traffic as a result of any onshore shale gas industry, consultation must be undertaken on road use and related infrastructure requirements that results in road upgrades and work schedules to the appropriate Austroad standards and commensurate with the anticipated vehicle type required for any onshore shale gas industry.

Recommendation 12.9

That gas companies provide the necessary funds to ensure the ongoing maintenance requirements for road infrastructure are met for the life of any onshore shale gas project. These should be based on the individual gas company's percentage of tonnage hauled along the roads.

Recommendation 12.10

That road use agreements between gas companies and local NT road authorities be mandated to include safety considerations and to ensure monitoring for compliance and reporting requirements.

The literature cites both potential positive and negative impacts on services in the community. Research has shown that rapidly increased population can bring a variety of new services and businesses to a region. These might include new restaurants and hairdressers, as well as an increased range of retail goods.[76] A negative effect, however, can materialise by increasing pressure on health services,[77] a service that is often already strained in regional and remote areas. Several studies report increased wait times for hospitals and doctors' services, an impact that was exacerbated in several south-west Queensland regions by an increase in mental health issues in connection with the CSG development throughout that region.[78]

These findings were also recognised in a recent Queensland Gasfields Commission report on lessons learned.[79] The report noted, however, that impacts around health and emergency services can be made worse through cumulative impacts arising not only from a growth in the gas industry but also combined with significant weather related events or downturns in other industries. It also acknowledged that it is not just local communities that are impacted but also FIFO workers. Several gas company employees reported mental health issues as a direct result of living away from their families.

The positive impacts were that communities were seen to benefit through gas company funds directed to local hospitals, the introduction of mobile health clinics and increased emergency response and aeromedical services such as CareFlight.[80] However, the report identified that companies were unprepared for *"government expectations that they must fund a range of community, health and other services."* [81] Managing such expectations from the beginning is essential.

74 EDO submission 456.
75 North Star Pastoral, submission 535 (**North Star submission 535**).
76 SA Report, p 20.
77 Bec, Moyle and McLennan 2016.
78 Hossain, Gorman, Chapelle et al. 2013; Bec, Moyle and McLennan 2016; Lai, Lyons and Kyle et al. 2017.
79 Queensland Gasfields Commission 2017a, p 82.
80 Queensland Gasfields Commission 2017a, pp 84-85.
81 Queensland Gasfields Commission 2017a, p 82.

Studies conducted in the US suggest additional challenges for education services, such as accommodating higher intakes of students as populations increase or updating curricula in a way that increases job opportunities. Managing these challenges was reported to be difficult and US schools reported no significant beneficial impacts from the resource development.[82] Conversely, anecdotal evidence in the Surat Basin suggests that investment by some gas companies in local school science programs has had positive impacts, resulting in an over subscription to senior science programs at the high school level, which is unprecedented in many schools around Australia. Another benefit that emerged in Queensland was that some local children who left to obtain university degrees were able to return to their hometowns where their qualifications made them perfect candidates for jobs with some of the gas companies.[83] Reversing the exodus of young people from rural communities is beneficial, with many rural towns in decline due to a lack of employment opportunities for youth.

Recommendation 12.11

That gas companies be required to work closely with all levels of government, Land Councils and local communities early in any onshore shale gas development project to quantify the potential impacts on health and educational services and ensure steps to mitigate adverse impacts are implemented.

12.6.2 Impacts on housing and rental prices

The potential for rents and housing prices to rise and fall sharply with a 'boom and bust' cycle was referred to in several submissions.[84] Also noted was the potential for council rates to increase.[85] Citing experiences in Queensland and other places where unconventional gas development had occurred, these submissions expressed the concern that the initial rise in prices would squeeze out many local residents, while the subsequent fall could leave houses vacant and/or worth less than prior to the boom. However, housing issues in the NT are not uniform across the Territory. Some remote communities already suffer from a lack of adequate housing, which means housing impacts will be location dependent. Potential impacts on housing and rent were acknowledged in submissions from the gas industry, and cited as a major reason for the use of FIFO/DIDO workers and temporary housing.[86] The submission from the CLC also highlighted the dire nature of housing for some Aboriginal people in the NT and wanted this, and related health indicators, to be considered as threshold factors for any onshore shale gas project approval:

> *"remote communities in Central Australia already face significant issues relating to housing and maintaining connection to land. Rates of homelessness in the NT are higher than any other Australian State or Territory, significantly higher amongst Aboriginal people, and are expected to worsen. Homelessness, overcrowding and poor living conditions can have a profound impact on economic, social and health indicators".* [87]

The literature provides examples of increased pressure on housing availability in communities experiencing 'boom and bust' development. The large demand on housing can dramatically raise prices for both buyers and renters.[88] Those who are employed locally may be forced out of a market that they can no longer afford, especially if they are not receiving comparable salaries to those in the gas industry. In some cases, this results in the displacement of local residents to the outskirts of town, or further, in search of more affordable living, as was reported in the town of Roma in Queensland.[89]

Conversely, research showed that in Queensland individual property owners were able to profit from a temporary demand increase in accommodation, but that they also risked economic loss if the demand is not sustained.[90] These effects can be mitigated by gas companies ensuring that a temporary housing shortage does not arise. Ensuring temporary housing accommodation in

82 Schafft, Borlu and Glenna 2013.
83 Schafft, Borlu and Glenna 2013.
84 Lock the Gate submission 171; P Cass submission 192; H Bender submission 144.
85 G McCarron submission 53.
86 APPEA submission 215.
87 CLC submission 1151.
88 Benham 2016.
89 Bec, Moyle and McLennan 2016.
90 Benham 2016.

various camps before the need for a construction workforce will assist in easing potential housing pressures,[91] although it should be acknowledged that mining camps bring their own challenges, both for the workers who reside in them and also for the communities nearby. Finding the balance can be challenging. Gas companies need to take a proactive and responsible approach to solving the housing needs of its workforce to ensure adequate coverage of all housing requirements.[92] Although this may increase construction time, and therefore, reduce profits, it will help to mitigate the risk of over inflated prices for real estate in communities.

Recommendation 12.12

That any strategic SIA anticipate the long-term impacts and requirements for housing (not just through the construction phase) to adequately mitigate the risk of inflated real estate prices and shortages within a community.

Recommendation 12.13

That in consultation with all local community stakeholders, Land Councils, local government and the Government, gas companies be required to provide accommodation, whether temporary or permanent, which must be completed prior to the granting of any production approvals.

Valuation of agricultural properties can also be affected, depending on how the activities are perceived in the region. With industries such as agriculture or pastoralism, where landholdings tend to be intergenerational, this creates concern for landholders. If the value of the property is perceived to decrease due to the presence of shale gas activity, it is likely that the next generation will be reluctant to assume responsibility for properties because they see less potential value. This may result in them being more inclined to move away from the region for other employment opportunities.[93] The most effective way to mitigate such risks is by ensuring that the gas companies are operating in a responsible way. In Queensland, legislation exists to ensure that landholders are compensated for a range of activities including loss of property value and other uses that may have occurred on the land.[94] Chapter 14 outlines a number of considerations and recommendations in respect of land access to mitigate these risks.

12.6.3 Impacts on employment and businesses

As with impacts on infrastructure and services, the submissions expressed a wide range of views about the potential impacts on employment and businesses. Several submissions were positive about the potential jobs and economic activity that onshore shale gas projects would generate in the NT. The Urban Development Institute of Australia (NT) suggested that, *"becoming a gas hub offers the Northern Territory the greatest chance of achieving the economic growth we currently need"*.[95] According to Ms Teresa Cummings of North Australian Rural Management Consultants Pty Ltd (**NARMCO**):

> *"The exploration activity generated by the Natural Gas Industry using hydraulic fracturing methods, to date has seen a range of local businesses being engaged, both in Katherine and Mataranka. Transport operators, civil construction companies, environmental consultants, accommodation and hospitality providers, engineers, and many more types of businesses have already benefited."* [96]

Contrary to fears about the cyclical nature of any onshore shale gas industry, the submissions from NARMCO suggest that such development will have a stabilising economic influence in the NT:

> *"The seasonal nature of some of the key local industries creates significant economic challenges for local businesses. … It is extremely difficult for many employees to remain in the seasonal industries long term, as there are limited opportunities for stable career path. … A shale led Natural Gas Industry … will provide stable contract options for local business and provides real potential for local businesses to overcome their seasonal volatility."* [97]

91 Hossain, Gorman, Chapelle et al. 2013; Morrison, Wilson and Bell 2012.
92 Morrison, Wilson and Bell 2012.
93 Hossain, Gorman, Chapelle et al. 2013.
94 Queensland Gasfields Commission 2017a, p 42.
95 Urban Development Institute of Australia (NT), submission 436 (**UDI submission 436**).
96 North Australian Rural Management Consultants Pty Ltd, submission 186 (**NARMCO submission 186**).
97 NARMCO submission 186; Ms Teresa Cummings, submission 249 (**T Cummings submission 249**).

NARMCO also noted the potential for employment benefits in remote and Aboriginal communities:

> *"I'm convinced that allowing natural gas industry to develop in the remote areas in the NT will bring many economic and social benefits to indigenous people. There aren't many local opportunities out there. When you start talking about remote regions like Elliott, it's extremely limited, and this will be one industry that will actually have strong potential to overcome that."* [98]

A submission from APPEA cited increases in employment and business expenditure that were attributable to CSG development in Queensland as a reason to anticipate positive outcomes in the NT.[99] Unsurprisingly, a similar sentiment was expressed by Elengas and Pangaea which, based on their own modelling (which is far more optimistic that the ACIL Allen study discussed in Chapter 13), suggest that an onshore shale gas industry will be critical in light of the NT's declining population growth.[100] However, other submissions drew on similar comparisons to suggest a less optimistic economic outlook. A submission from Mr Tom Measham of CSIRO noted from his own study of the Surat Basin in Queensland that, *"while net employment increases overall, there can still be reductions in some sectors as people move out of one sector (e.g. agriculture) into another"*. Furthermore, that the number of jobs flowing to local residents varies on a case-by-case basis.[101] The same submission also claimed that the job creation effects claimed by industry have often been exaggerated. A finding also cited by several other submissions to the Panel.[102] The CLC submission expressed caution when estimating employment opportunities, noting that in some instances it can have a negative impact on community cohesion.[103]

> *"While resource activities can result in increased training, employment and community development opportunities for Aboriginal communities, the CLC notes that these opportunities have the potential to affect community cohesion (Draft final report, p. 278) and that previous initiatives, particularly around employment, have not delivered benefits to communities to the extent anticipated."*

The Australia Institute expressed further scepticism about purported benefits to business and employment. Citing a study by UQ about the impacts of CSG in the Darling Downs in Queensland, it noted that, *"far from mining and unconventional gas providing economic benefits, local businesses felt that it had reduced financial capital, human capital, infrastructure, social capital and natural capital"*. In addition:

> *"Local businesses have to compete with inflated gas industry wages in order to recruit and retain staff and they experience increased rent and competition for services (particularly trade and mechanical repairs)."* [104]

The potentially short-term nature of positive employment impacts was also observed.[105] Citing job figures from Queensland Treasury, Lock the Gate argued that, *"the scale of the 'bust' after the short unconventional gas construction period ends is severe, and long-term job opportunities are extremely limited"*. [106] The economic modelling prepared by ACIL Allen for the Panel (see Chapter 13) indicates a number of jobs will be generated, but that this will vary depending on the size of any onshore shale gas industry. In their final response to the Panel, Santos provided comprehensive details of the economic benefits and number of jobs created by their presence in Southwest Queensland:

"For example, over the past two years, Santos has paid more than $140 million (M) to South West Queensland postcodes in wages and purchases from small businesses". [107] It also claimed that "*there have been 62 apprentice and trainee opportunities across the GLNG business*". Santos

98 T Cummings submission 249.
99 APPEA submission 215.
100 Pangaea submission 1147; Elengas, submission 470.
101 Mr Tom Measham, Commonwealth Scientific and Industrial Research Organisation, submission 77 (**T Measham submission 77**).
102 Lock the Gate submission 171; P Cass submission 33; H Bender submission 144.
103 CLC submission 1151.
104 The Australia Institute submission 158.
105 K Marchment submission 438; Barkly Landcare submission 241; H Bender submission 144; P Cass submission 33.
106 Lock the Gate submission 171.
107 Santos submission 1249.

provided an estimated breakdown of the expected jobs and likely local business opportunities in relation to each of the different onshore shale gas activity phases in the Beetaloo Sub-basin if the moratorium is lifted. This included targeting local businesses for procurement opportunities, as well as specific training and employment to enhance Aboriginal participation.

Concern was raised that hydraulic fracturing for onshore shale gas would harm tourism, fishing and other long-term businesses that were dependent on the amenity, environmental health and natural image of the NT.[108] As Ms Petrena Ariston from Top Didj Cultural Experience and Art Gallery explained:

> *"An extensive line of oil fracking wells dotted throughout the outback could undermine the tourism brand that Tourism NT and tour companies market nationally and internationally. … I think, as a tourist, the very presence of well-drilling sights and flares burning gas will not only disfigure the beauty of the NT and its small communities, but will definitely discourage them to come back or recommend us as a destination."* [109]

The literature similarly presents many discussions around the effect on jobs and economic development, although there is less information regarding the effects on tourism. Economic activity can be accelerated due to the higher salaries of gas company employees being injected into local communities.[110] However, this can also generate challenges for a community because some local businesses may find it hard to compete with the higher salaries, and a shortage in skilled workers can result. This was noted as an issue in Roma where one local business owner remarked that, *"we had a small business in town that closed because of mining and the gas. Firstly, they took the workers, then they cranked all the rental properties up and it killed it. We've just closed it down."* [111]

While there tends to be a net increase in employment, skill shortages can have a negative effect on pre-existing industries, particularly in agricultural regions. These effects were recognised in the Marcellus shale development in Pennsylvania in the US.[112]

But the literature also shows that the increased demand for workers can provide unique opportunities for younger people and remote Aboriginal communities.[113] There have been instances of economic support for training and development programs through the local TAFE institutions. For example, there was support of a Certificate II in Plant Operations supported by Santos in Roma to provide additional opportunities for local employees.[114] These financial contributions tend to be seen as positive development. This investment can prevent the next generation from moving away from the community toward urban centres, because it provides them with an opportunity for employment stability and career development within the gas industry.[115] This can be particularly beneficial for younger remote Aboriginal populations, as was observed by Buru Energy in Western Australia:

> *"Our experts looked at Buru's plans and let us know this is a safe activity if it is done properly. We trust Buru to do this properly. It has been great to see our young people work closely with Buru and we have that connection."* [116]

But equally it has been acknowledged that there is a risk that the number of jobs can be overestimated. This is particularly so if the majority of the workforce is sourced externally through a FIFO or DIDO arrangement.[117] This type of workforce creates its own unique set of challenges and requires thoughtful mitigation. A transient workforce can affect community cohesion and can contribute to its loss if workers are unable to positively contribute towards the community.[118] Understanding exactly what the implications might be for businesses and employment will be

108 P Cass submission 192; Ms Jean McDonald, submission 182 (**J McDonald submission 182**); Ms Monica O'Connor, submission 3 (**M O'Connor submission 3**); Amateur Fishermen's Association of the Northern Territory, submission 190 (**AFANT submission 190**).
109 Ms Petrena Ariston, Top Didj Cultural Experience and Art Gallery, submission 269 (**P Ariston submission 269**).
110 Bazilian, Brandt and Billman et al. 2014.
111 Bec, Moyle and McLennan 2016.
112 Schafft, Borlu and Glenna 2013.
113 Norman 2016.
114 SA Report, p 24.
115 Brasier, Filteau, Mclaughlin et al. 2011.
116 WA Report, p 173.
117 Fleming and Measham 2015.
118 Haswell and Bethmont 2016; Vojnovic et al. 2014; Bec, Moyle and McLennan 2016.

a critical component of any SIA conducted in advance of any shale gas industry roll out and by project proponents themselves.

There can also be overestimations in relation to the economic benefits available to local businesses within a community. Smaller towns in Queensland reported no positive impact as a result of the increased activity because the gas companies tended to rely on larger regional centres, like Toowoomba, to provide project supplies.[119] More recent analysis by UQ has shown that although there was some downturn after the major construction phase, overall local businesses have experienced a net positive change in their average income since onshore CSG gas industry was established.[120]

Critical for maximising the benefits that return to local communities, is to ensure that all gas companies implement a 'buy local' strategy. This can range from everything to supporting the local supermarket and newsagents (assuming one exists within a community) to working with local business groups and chambers of commerce to identify ways that local businesses might be considered as suppliers for various contracting and other work. One finding from Queensland is the importance of gas companies working with local businesses to ensure that they have the skills, pre-qualifications, and other requirements needed early in the process to allow local businesses time to prepare.[121] Again, although many NT communities are very different from Queensland communities, the findings that have emerged reflecting upon how the CSG industry developed in Queensland are helpful for businesses and communities in the NT who will seek to benefit from any emerging onshore shale gas industry. Accordingly, the key findings are replicated below:

1. *Find out about projects and the local market;*
2. *Know the rules of engagement for your tier level;*
3. *Understand how work packages will be advertised and awarded;*
4. *Work with others;*
5. *Promote your business capabilities;*
6. *Be ready to adapt to change in the industry; and*
7. *Prepare for contractual negotiations."* [122]

Recommendation 12.14

That to the extent practicable, gas companies be required to source goods, services and workers from local communities. This must include the development of training programs for Aboriginal and other local workers to develop the necessary skills and expertise to maximise opportunities for local employment in any onshore shale gas industry.

Recommendation 12.15

That gas companies work proactively with local businesses, local government, Government, Land Councils and communities to ensure that local businesses are able and adequately skilled to compete for contracts, and to assist local businesses to be ready to participate in any economic opportunities that may emerge.

12.6.4 Insurance and 'make good' agreements

Several submissions expressed concern that landholders are unable to obtain insurance against damage caused to their property due to onshore shale gas operations, including damage to infrastructure and livestock, in addition to the contamination of soil, surface water and groundwater resources.[123] Lexcray Pty Ltd, a cattle business in Daly Waters upon which Origin wants to conduct exploration activities, provided an account of this difficulty, while other submissions cited similar cases in Queensland and NSW.[124] As well as citing the need for more comprehensive pollution liability insurance, some submissions called for the establishment of

119 Bec, Moyle and McLennan 2016.
120 UQ Boomtown Toolkit 2016; Queensland Gasfields Commission 2017a, p 70.
121 Queensland Gasfields Commission 2017a, p 67.
122 Queensland Gasfields Commission 2017b.
123 ALEC submission 88; Mr Daniel Tapp, Big River Station, submission 242 (**D Tapp submission 242**); Ms Katherine Marchment, submission 2 (**K Marchment submission 2**).
124 Lock the Gate submission 171; The Australia Institute submission 158.

an *"eternal insurance fund"* [125] or *"orphan well trust fund"* [126] to cover the remediation or repair of any legacy damages to water and other resources. In Queensland, legislation exists to ensure that landholders are compensated for a range of activities including any damages or losses to property or from conducting activities on the land.[127] The submission from NARMCO argued that pastoralists should be compensated through land access agreements for any "*direct operational and capital impacts.*" [128] Chapter 14 discusses and makes specific recommendations in respect of land access agreements and compensation (see Section 14.6).

12.6.5 Community cohesion

Concern was expressed that the development of any onshore shale gas industry in the NT could affect the overall character and cohesion of communities, and that it may also affect people's relationships, mental health, and sense of identity and place.[129] Citing studies and anecdotes about unconventional gas development in Queensland and overseas, these submissions opined that the nature and pace of changes brought about by unconventional gas development can lead to feelings of anxiety, anger, injustice and betrayal within communities:

> *"Production ramps up with drilling and fracking, with its 24-hour lights, noise, privacy invasion, odours, tree clearing and truck movements - causing some people to feel a deep sense of loss of control, loss of place and loss of peace and a feeling of being trapped and unable to escape. All of these phases present risks of depression, anxiety and increased use of alcohol and other drugs for coping."* [130]

The potential for people to experience solastalgia (a sense of powerlessness and lack of control amid change) that has been observed in other communities affected by resource booms, was referred to.[131] A related issue was the perception that negotiations between gas companies and communities, or individuals, did not take place on a level playing field (see the discussion at Section 14.6).

As Mr Warwick Giblin explained:

> *"There is a power imbalance, unequivocally, and this is the root cause of the angst. I really can't say it more plainly than that, but this is the fundamental issue that the broader community and broader society has. And in the case of pastoralists, but at the same goes for all stakeholders, we don't have the time, the technical knowledge, the economic capacity, or the political clout compared to the gas companies."* [132]

A similar point was made in relation to Aboriginal communities, which often have little or no knowledge about hydraulic fracturing and onshore unconventional gas processes (see Chapter 11).[133] Notably, however, positive relationships between gas companies and pastoralists were reported in some submissions, including from pastoralists themselves.[134]

Many observed that the debate about fracking in the NT has itself been a source of division within the community. People on both sides have reported feeling intimidated or unwelcome within certain businesses or social circles as a result of a position that they had taken.[135] Examples of this effect are reinforced by the literature.

Moreover, with a large FIFO workforce, it can be difficult to integrate employees into the community. Residents in a range of regions experiencing unconventional gas development report feeling a loss of community following rapid change and the influx of FIFO workers.[136] Landholders have reported feeling stress regarding their alleged lack of rights in providing land access

125 Ms Charmaine Roth, submission 191 (**C Roth submission 191**).
126 S Bury submission 189.
127 Queensland Gasfields Commission 2017a, p 42.
128 North Australian Rural Management Consultants, submission 1264 (**NARMCO submission 1264**), p 3.
129 PHAA submission 107; Ms Rachel Tumminello, submission 187 (**R Tumminello submission 187**); Lock the Gate submission 171; Y Doecke submission 25.
130 Prof Melissa Haswell, submission 183 (**M Haswell submission 183**); NARMCO submission 1264. p 3.
131 R Tumminello submission 187; Lock the Gate submission 171.
132 North Star Pastoral, submission 260 (**North Star submission 260**).
133 Mr Tony Hayward-Ryan, submission 54 (**T Hayward-Ryan submission 54**).
134 Ms Helen Armstrong, Gilnockie Station, submission 48 (**H Armstrong submission 48**); Terrabos Consulting submission 180; Mr Mark Sullivan, Flying
135 Ms Annette Raynor, submission 67 (**A Raynor submission 67**); T Cummings submission 249.
136 Brasier, Filteau and Mclaughlin et al. 2011; Curran 2017; Bec, Moyle and McLennan 2016; Haswell and Bethmont 2016.

(see Chapter 14). There is a perception that landholders are being forced to allow exploration and development, which has resulted in landholders feeling helpless and has resulted in a heightened risk of mental health issues.[137]

These negative impacts have contributed to an anti-shale gas sentiment, which has in turn contributed to tension and division within a community. On the other hand, many people appreciate the economic benefit that an onshore shale gas industry may bring, and therefore, view development as a positive thing for the region.[138] This divergence of opinion can create tension among those groups who are not supportive, and those who are.[139] The division between those who oppose, and those who support, leads to tension within different groups which further disrupts community cohesion. For example, this has occurred in Gloucester in NSW.[140]

Another potential impact on community cohesion is an increase in crime based on observed correlations between crime and CSG development in Chinchilla, Queensland, and in shale gas development areas in the United States.[141] There have been increases in petty crime and public nuisance related arrests, which tend to be associated with the increase of a typically young and single male workforce of transient nature. An increased police presence is usually necessary, which may place a strain on services.[142] Women may report feeling less safe in this environment, although there is no significant statistical increase in cases of sexual assault.[143] One explanation for this may be that women in the community are venturing out less due to their decreased feeling of safety in the community.[144]

With the distinct differences between communities across the NT and their sometime stark contrast in socio-economic status, there is likely to be even greater potential for disruption of community cohesion which will need to be well managed and monitored over time through the implementation of ongoing participatory SIA as recommended in the CSRM Report.

There are examples of successful management of this issue that are best demonstrated in a CSIRO study of Chinchilla, Queensland.[145] A community group was established with assistance from the police with the intent of solving drug and alcohol related issues. The group worked proactively with the gas company and their contractors, with whom they had a well-established relationship, to facilitate terms within employment contracts that would result in the employee losing their job if they were arrested for any public disorder offences. A co-regulation and zero tolerance approach was also adopted by all publicans in the town so that an offending individual could be banned for three months from all hotels. The gas company also contributed funds towards the re-establishment of a youth-focussed alcohol education program. This approach was found to be highly effective in managing alcohol-related issues.[146] This highlights how increasing community cohesion and participation can be encouraged alongside an emerging onshore shale gas industry.

Recommendation 12.16

That gas companies must establish a relationship with communities to determine how to best facilitate community cohesion on an individual and collective level. This should be done in consultation with all landholders, Land Councils and local government, to ensure that the needs of all stakeholders are accommodated.

Recommendation 12.17

That a representative community advisory group be established to act as a conduit for ongoing monitoring of community cohesion.

137 Bec, Moyle and McLennan 2016.
138 Fleming and Measham 2015.
139 Norman 2016.
140 Lai, Lyons, Kyle et al. 2017.
141 H Bender submission 144; Lock the Gate submission 171.
142 Brasier, Filteau and Mclaughlin 2011.
143 Benham 2016.
144 Benham 2016.
145 Walton et al. 2013.
146 Walton et al. 2013.

Recommendation 12.18

That gas companies must develop and implement a social impact management plan for communities, detailing how they will optimise the relationship with a community prior to the grant of any production approvals. This plan should be developed in consultation with all landholders, Land Councils and local government to ensure that it meets community needs. The regulator must consent to the plan prior to the grant of any production approvals.

The CLC endorses these recommendations but stresses that they must take into account the unique characteristics of the NT, including the high percentage of Aboriginal people, Aboriginal land tenure, the remoteness of communities, the cultural diversity, and the high rates of homelessness and inequality:

"The CLC adds that a clear, structured framework is required prior to commencement of the relationship building to ensure the correct approach is taken in the cultural setting and in response to the land tenure and ownership for a Project." [147]

12.6.6 Intergenerational equity issues

Intergenerational equity was a priority for many of those attending the consultations, both Aboriginal and non-Aboriginal. Participants stressed that allowing any onshore shale gas extraction was contrary to urgently needed climate change mitigation and they did not accept that industry cared about the interests of future generations. ALEC observed that:

> *"Intra- and inter-generational equity, public participation, precautionary principle and the polluter-pays approach should be embedded in the process of identifying and assessing the scientific material on the risk of hydraulic fracturing. The decisions taken now in this panel will impact communities for many generations to come and their rights to a healthy environment and sustainable development are just as important as the needs of current generations."* [148]

12.6.7 Social licence to operate

The concept of an SLO relates to community acceptance or approval of a project, company, or industry (see Section 12.8). Several submissions explicitly discussed the concept of an SLO and the question of whether any onshore shale gas industry has, or could gain, an SLO in the NT. Most submissions discussing this issue were of the view that the industry lacked an SLO and this was also echoed by those present at the community forums. As Mr Daniel Leather put it:

> *"Industry, regulators and governments of all levels have both failed in their responsibilities of maintaining and presenting any valid argument for gaining, let alone maintaining community consent, as the industry is viewed as potentially being worse than coal or even nuclear, a perception that should have been impossible."* [149]

For some, the lack of trust also extended to a lack of faith in the Government's capacity to regulate any such industry.[150] Given this, many felt that the onshore shale industry would only gain acceptance if it was overseen by a regulator tasked with aspects of the industry's governance such as handling public enquiries and concerns, reviewing performance, collecting and analysing scientific data, and administering funds to address legacy impacts.[151]

Also perceived as a major obstacle to gaining an SLO is the manner in which the gas industry engages with, and relates to, the community. Formal engagement processes have been characterised as tokenistic and one-sided, with one-to-one negotiations described as intimidating or unfair, and discourse with opponents as dismissive and adversarial.[152] Gas companies in the NT were criticised for being impersonal in their dealings with the community, principally as a result of not having a single point of contact. The practice of interfacing with the

147 CLC submission 1151, p 6.
148 ALEC submission 88.
149 Mr Daniel Leather, submission 40 (**D Leather submission 40**).
150 Environmental Defender's Office (NT) Inc, submission 253 (**EDO submission 253**).
151 Lock the Gate submission 437; Mr Rod Dunbar, submission 297 (**R Dunbar submission 297**); DR Johns, submission 154; A Raynor submission 67; Armour Energy submission 23.
152 Dr Errol Lawson, submission 216 (**E Lawson submission 216**); North Star Pastoral, submission 155 (**North Star submission 155**).

community through contractors or rotating personnel was also perceived as a way of hiding from risk and responsibility.[153]

Not all submissions shared this view. Central Petroleum describes a range of positive and arguably successful efforts by that company to accommodate and benefit the local community.[154]Pangaea also highlighted its successes in engaging pastoralists and the broader community.[155]

The most effective way to mitigate the risk of not obtaining an SLO, according to the literature, is by successful and thoughtful community engagement. The region of Chinchilla presents a case study of early and continuously developing engagement that has significantly increased levels of trust.[156] This engagement was driven equally by the community and the gas companies. The community formed several interest groups, which were able to come together and present their concerns in a respectful format, and which allowed the company to provide responses and solutions to the issues ventilated. The engagement was also assisted through so-called 'enterprise evenings', where local businesses could interact with the larger contracting firms and identify shared business opportunities.[157]

Similar levels of engagement were cited as successful examples of acceptance by a spokesperson for Santos, giving evidence to a South Australian inquiry into hydraulic fracturing. Commenting on the behaviour in the communities of the Cooper Basin, Santos stated the following:

> *"We establish a physical presence, open shopfronts in town, contribute to the local causes in the town and employ local people to make sure that, through the informal contact that those people have with their schools, sporting clubs and other activities in town, we become part of that community and that we are understood and accepted. We think that is the framework that enables us to succeed in building our business."* [158]

The employment of local community members, particularly in roles related to land and environmental management, also builds trust and acceptance. This was demonstrated in a CSIRO study of the Bowen and Surat Basins in Queensland, where a survey participant noted that, "the landholder relation officers they are using are local graziers. I mean, they are smart with who they have chosen to do this."[159] As the community already knew and trusted these people it felt assured that the gas company was 'doing the right thing', which further contributed to the successful development of the relationship.

The resilience of a community can also be a large determinant of the acceptability of any onshore shale gas development and the community's ability to manage any consequential challenges. In the literature, 'resilience' has been described as the ability of a community to build up strength to deal with external shocks and changes that may occur in and around it.[160] Resilience is built and developed through engagement between different groups within the community, and between those groups and the government and industry. The submissions from the CLC and the NLC draw attention to the marginalised nature of many Aboriginal people in the NT, indicating that some Aboriginal communities are likely to be far from resilient, and therefore, potentially more at risk than other communities in different jurisdictions.[161]

The gas industry can help to build resilience in the communities that it will be working with by supporting community development and by ensuring a respectful and informative discourse that enables and integrates community feedback. The gas industry can assist by ensuring adequate planning is in place and that development occurs at a rate that can be managed by the community without negative consequences. By enabling a genuinely vested interest in the long-term wellbeing of the region, any onshore shale gas developer should be able to ensure the provision of a wide range of social and economic benefits to a community.

153 Coomalie Council submission 15; E Lawson submission 216.
154 Central Petroleum submission 99.
155 Pangaea submission 220.
156 Walton et al. 2013.
157 Walton et al. 2013.
158 SA Report, p 35.
159 Parsons and Moffat 2014.
160 Barr and Devine-Wright 2012.
161 CLC submission 1151; NLC submission 647.

Recommendation 12.19

That gas companies be required to develop a social impact management plan that outlines how they intend to develop, obtain and maintain their SLO within communities. This must be developed in conjunction with any SIA, and should be implemented prior to the grant of any further production approvals, to ensure that any potential changes can be identified in advance to allow communities time to adapt and prepare for the changes.

12.7 Case study results of the Beetaloo Sub-basin

Given the focus on the Beetaloo Sub-basin, with its high proportion of Aboriginal people, the key socio-demographics identified by Coffey in the Beetaloo Sub-Basin Case Study of the potentially "*affected communities*" in that region are detailed in this Section.

12.7.1 Beetaloo Sub-basin-affected communities

The Aboriginal people of the Beetaloo Sub-basin are living on country in communities that arose out of a combination of structural changes in the pastoral industry and post-war shifts in Aboriginal policy. Aboriginal employment in the Beetaloo Sub-basin collapsed 50 years ago after the award of equal wages to Aboriginal station workers and the mechanisation of the cattle industry. Between 1955 and 1975, federal government policy evolved from assimilation to recognition of culturally based land-rights and self-governing communities. Central to this was the recognition of traditional land tenure under the Land Rights Act and Native Title Act. Today, Aboriginal people have a form of traditional ownership rights to most land proposed for any development of an onshore shale gas industry in the Beetaloo Sub-basin.

Aboriginal communities in the Beetaloo Sub-basin, in common with other remote Aboriginal populations in the NT, have young populations. A consequence of this is a diminished capacity of the adult population to transmit cultural knowledge and generally educate and socialise emerging generations. These structural issues are magnified by inadequate housing, chronic health problems, such as diabetes, and the corrosive effects of widespread alcohol and substance abuse. As a consequence, social and educational development is not uniform, education attainment is low and youth suicide levels are high.

There are few elders still living who remember when whole communities were employed in the cattle industry. Two generations have grown up in communities where unemployment is the norm. With few local employment opportunities, those with skills or sufficient educational levels have tended to move to larger townships in the region (Katherine and Tennant Creek), or further afield to Alice Springs or Darwin. The welfare of the growing number of young Aboriginal people who now make up the population of the Beetaloo Sub-basin must be the central concern of a SIA of the effects of the development of an onshore shale gas industry in this region.

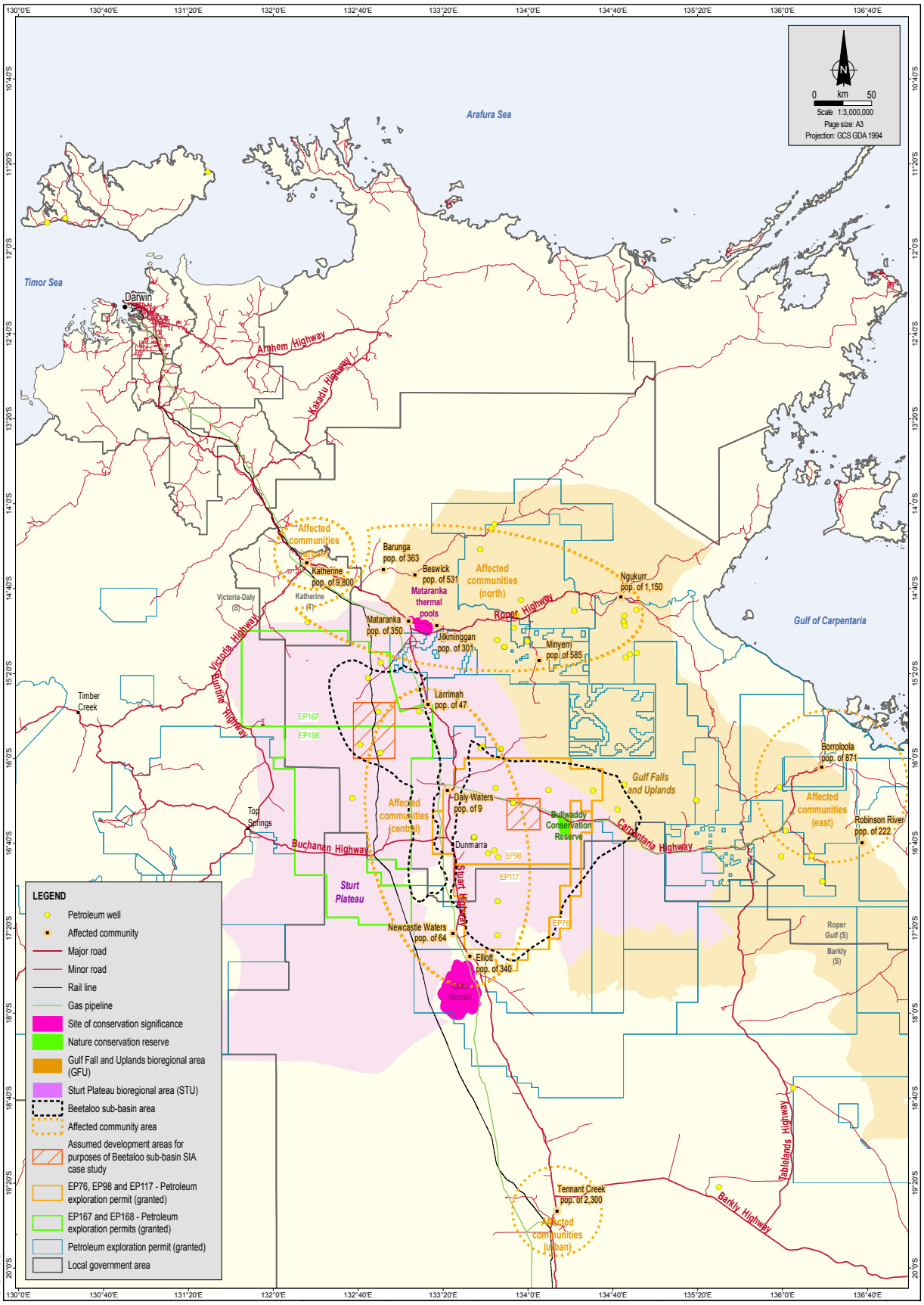
Coffey examined a range of individual communities across the Beetaloo Sub-basin and grouped the affected communities into four areas, which are shown in **Table 12.3** below. The demographics of these areas are expanded on below.

Table 12.3: Social catchments and affected communities. Source: Beetaloo Sub-basin Case Study.[162]

Social catchment	Affected communities
Affected communities (urban).	Katherine (town). Tennant Creek.
Affected communities (north).	Barunga. Beswick. Mataranka. Jilkminggan. Minyerri. Ngukurr.
Affected communities (central).	Larrimah. Daly Waters. Dunmarra. Newcastle Waters. Elliott.
Affected communities (east).	Borroloola. Robinson River.

162 Beetaloo Sub-basin Case Study, Appendix A, p 3.

Figure 12.4: Map showing affected communities and their populations. Source: Coffey Source.[163]



163 Beetaloo Sub-basin Case Study, p 18.

12.7.2 Affected communities (urban)

12.7.2.1 Katherine township population and demographics

According to the 2016 census, Katherine township has a population of 9,717 persons with a median age of 33, which is older than the other areas of the Katherine region due to its relatively lower proportion of Aboriginal people (22% compared with 49% for the region) who tend to have a lower median age. The total population has exhibited steady growth over the last decade. The average household size is 2.8 persons per household since the 2006 census, with an average of one person per bedroom. This is due to Katherine largely being comprised of working-age non-Aboriginal residents, and school age and older working age Aboriginal residents.[164] The age-sex pyramid for Katherine for 2016 shows that the town's population tends to be between 25 and 54 years of age, with relatively fewer children and young adults. The population turnover (the sum of intra-Territory, interstate and overseas migration as a percentage of the resident population) is high, reaching 63% in 2011. This suggests a certain level of demographic instability, possibly leading to fluctuating needs of the Katherine township over time. Non-Aboriginal migrants tended to migrate to and from other Australian states, while Aboriginal migrants tended to be intra-Territory, moving to and from Roper Gulf, Victoria River, Daly, and Darwin.[165]

12.7.2.2 Tennant Creek population and demographics

Tennant Creek is the NT's fifth largest town, with 2% of the Territory's population. It is located on the Stuart Highway. The traditional Aboriginal owners of the area surrounding Tennant Creek are the Warumungu people. The two main Aboriginal languages spoken are Warumungu and Walpiri. The other main languages in the region are Walmanpa, Alyawarra, Kaytete, Wambaya and Jingili[166] Tennant Creek is located in the Barkly region and serves as the region's key service centre. In addition to the major towns and major populations, the Barkly region includes eight minor communities, 70 family outstations, 49 pastoral stations, mining operations and commercial properties.[167]

Tennant Creek has a population of 2,991 and has seen a 2% decrease in population of since 2011. The median age in Tennant Creek is 33, which is slightly higher than the NT average, and the age bracket of 25 to 34 years of age is the largest.[168]

While non-Aboriginal residents tend to migrate to and from the town to interstate, Aboriginal residents migrate in from the surrounding region, and out to Darwin and interstate. Tennant Creek makes up close to half of the Barkly region's population of 6,893, which is estimated to increase by 8.9% by 2021–2026.[169] Aboriginal residents make up approximately 50% of the population.

12.7.2.3 Affected communities (north)

There are six communities in this social catchment: Mataranka; Barunga; Beswick; Jilkminggan; Minyerri; and Ngukurr. These communities are all serviced by the Roper Gulf Regional Council. This region is largely rural and has a number of small towns and Aboriginal communities and outstations. The Roper Gulf Regional Council area encompasses a total land area of nearly 186,000 km^2, with roughly one person for every 26 km^2. The Roper Gulf Region in 2016 had a population of 6,505. The region is demographically young with a median age of 26 years. The population has grown at approximately 1.3% each year since 2006. It shows a generally balanced population, with the exception of low numbers of children four years old and younger. It is unclear why this pattern is recorded.

164 Northern Institute 2014.
165 Beetaloo Sub-basin Social Impact Assessment Case Study, Appendix A
166 Northern Institute 2013.
167 Barkly Regional Council 2011.
168 Northern Institute 2013.
169 ABS Population Projections 2008.

Figure 12.5: Aboriginal and non-Aboriginal population of affected communities (north). Source: Beetaloo Sub-basin Case Study.[170]

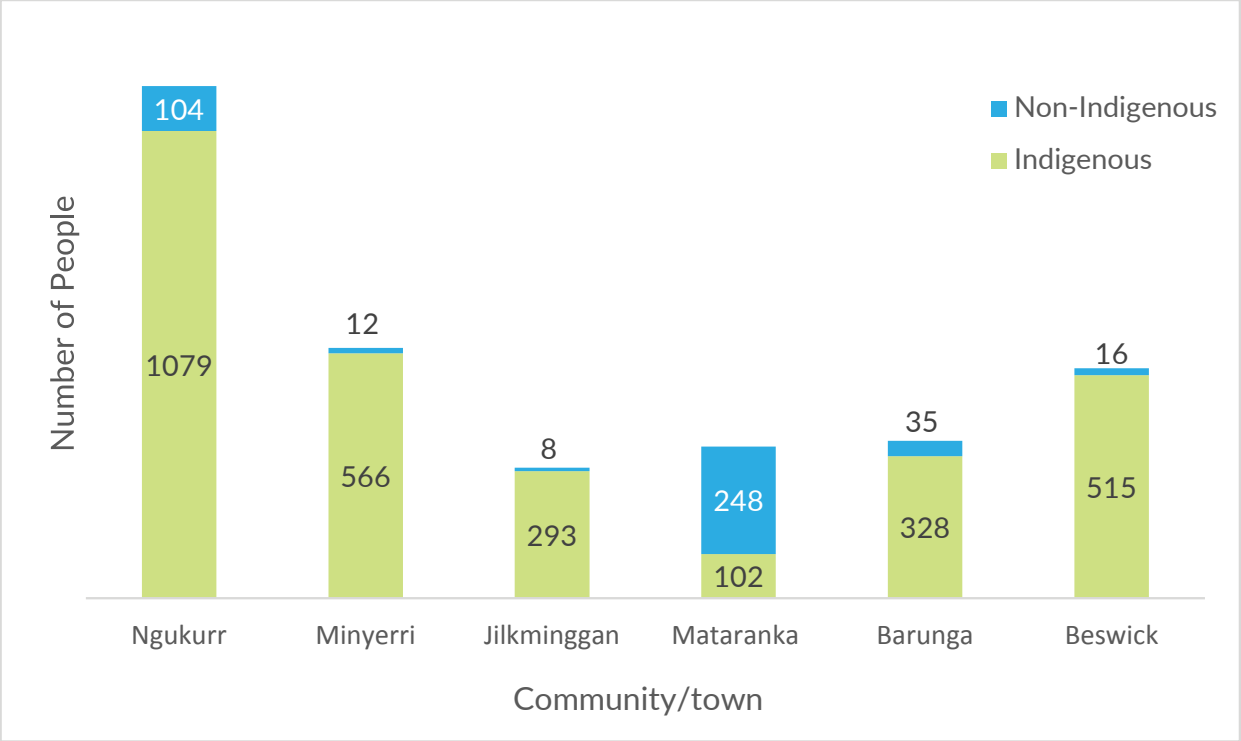
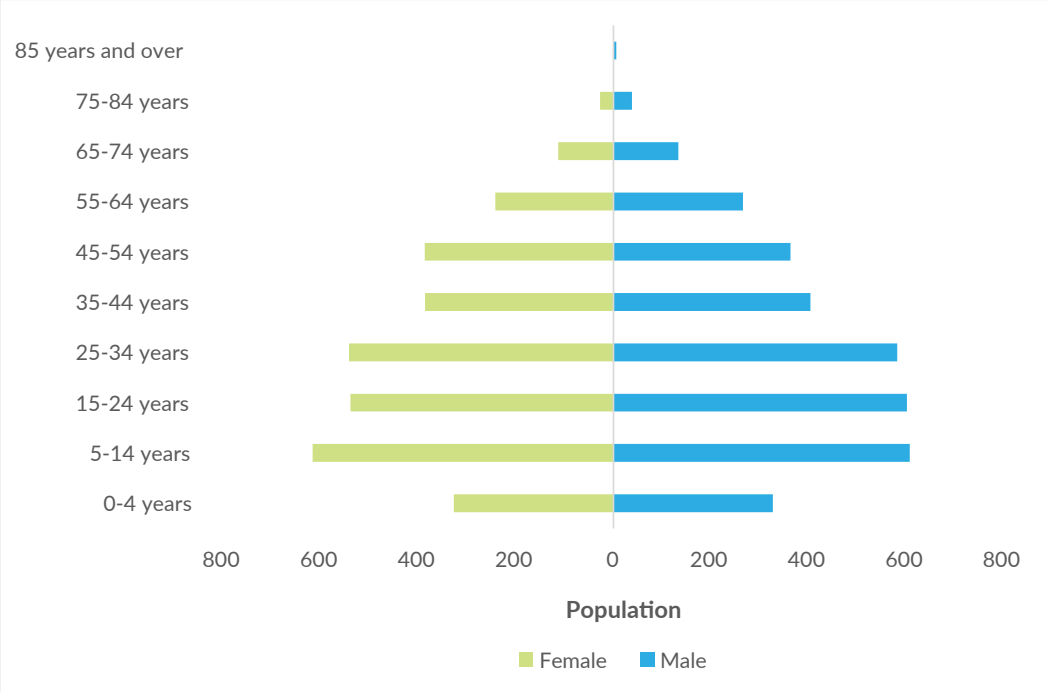


Figure 12.6: Age-sex pyramid of Roper Gulf region. Source: Beetaloo Sub-basin Case Study.[171]



170 Beetaloo Sub-basin Case Study, Appendix A, p 29.
171 Beetaloo Sub-basin Case Study, Appendix A, p 28.

12.7.2.4 Affected communities (central)

There are four communities and towns located along the Stuart Highway in this social catchment: Larrimah; Daly Waters; Newcastle Waters; and Elliott. Larrimah and Daly Waters have very small populations. According to the 2016 census, the population of Larrimah is 47 (median age of 41) while the population of Daly Waters is 9 (median age of 54). The key feature of Daly Waters is the Daly Waters Pub, which services locals and acts as a tourist information centre. The surrounding district is known as Birdum and has 86 people with a medium age of 34. There were 12 families in the area recorded in the 2016 census with an average of 1.3 children per family.[172]

Elliott and Newcastle Waters are located within the Barkly Shire along the Stuart Highway. The traditional name for the township of Elliott is Kulumindini. Elliott is the Barkly region's second largest town and sits on the edge of Newcastle Waters Station. Elliott is a stopover point on the Stuart Highway for tourists and local people.[173]

A small, self-sufficient community, the majority of the population of Elliott lives in two town camps, known as Gurungu and Wilyuga. The Aboriginal people residing in these camps are of the Mudburra/Djingila, Wambaya, Kutanyi and Wagai clans.[174]

Newcastle Waters is a historic township located on Newcastle Waters Station. There is an Aboriginal community (Marlinja) located on the station. The Aboriginal population in Elliott and Newcastle Waters is significantly greater than that of Larrimah and Daly Waters. The median age of Elliott (24 years) and Newcastle Waters (22 years) is significantly younger than Larrimah (41 years) and Daly Waters (54 years), and is more comparable to communities in affected communities (east) and affected communities (north). Larrimah and Daly Waters have significantly higher median ages compared to all affected communities. This high median age is likely to be a reflection of these communities acting as a service centre, rather than a residential community.

12.7.2.5 Affected communities (east)

This social catchment comprises two communities, Borroloola and Robinson River. Borroloola is located approximately 972 km southeast of Darwin, 655 km southeast of Katherine and 940 km northwest of Mount Isa in Queensland. Borroloola is designated as a 'major remote town' by the Government. Due to its size (871 people according to the 2016 ABS Census[175], it functions as a regional hub and service area for surrounding communities, outstations and pastoral properties. Borroloola has four camps: Garawa Camp One; Garawa Camp Two; Yanyuwa Camp; and Mara Camp. There are 26 outstations located in the surrounding regions that rely on services from Borroloola.[176] There are four main Aboriginal language groups in Borroloola: the Yanyuwa; Garawa; Mara; and Gurdanji.

Borroloola has a median age of 26—lower than the NT average of 31 years. Household sizes have decreased in the last 10 years. At 3.9 persons per household, the average household size is lower than the Roper Gulf average of 4.2. Overcrowding exists in some households, and the Government has planned for the construction of 22 new houses to alleviate housing issues, including overcrowding.[177]

The age-sex pyramid for 2016 shows a roughly pyramidal shape, except for disproportionately low numbers of children four years old and under. Borroloola has a mostly Aboriginal population, with the 2016 ABS Census reporting 77% of the population identifying as Aboriginal. Borroloola is an open township which has a steady tourism industry and is largely influenced by the McArthur River Mine.

172 ABS Census 2016.
173 Barkly Regional Council 2017.
174 Remote Area Health Corps 2009.
175 ABS Census 2016.
176 McArthur River Mine 2017.
177 Beetaloo Sub-basin Case Study, Appendix A, p 37.

Figure 12.7: Aboriginal and non-Aboriginal populations in Katherine, Tennant Creek and Borroloola (2006–2016). Source: Beetaloo Sub-basin Case Study.[178]

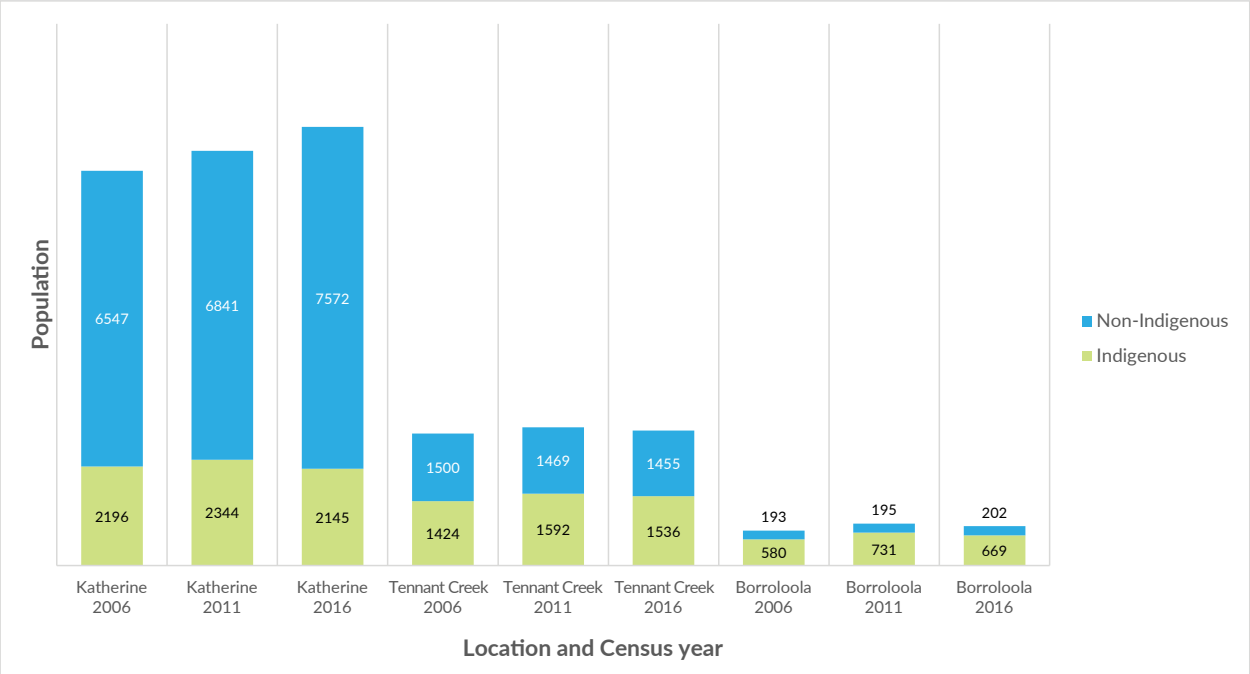
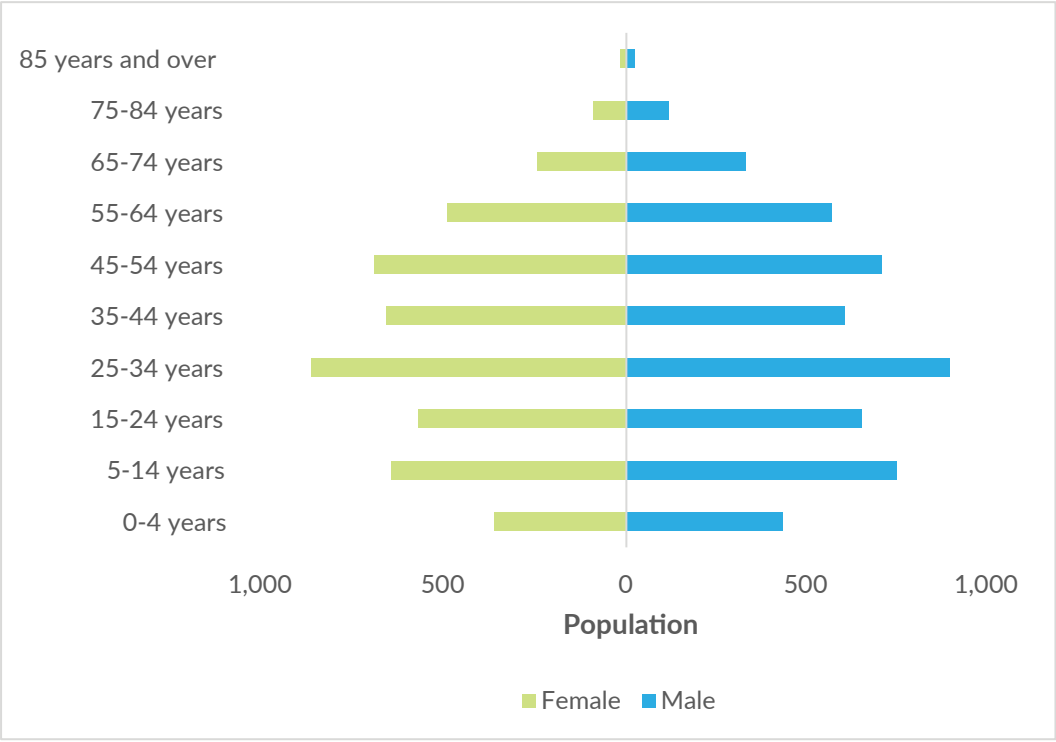


Figure 12.8: Katherine age and gender pyramid (2016). Source: Beetaloo Sub-basin Case Study.[179]



178 Beetaloo Sub-basin Case Study, Appendix A, pp 14, 23, 38.
179 Beetaloo Sub-basin Case Study, Appendix A, p 15.

Figure 12.9: Tennant Creek age and gender pyramid (2016). Source: Beetaloo Sub-basin Case Study.[180]

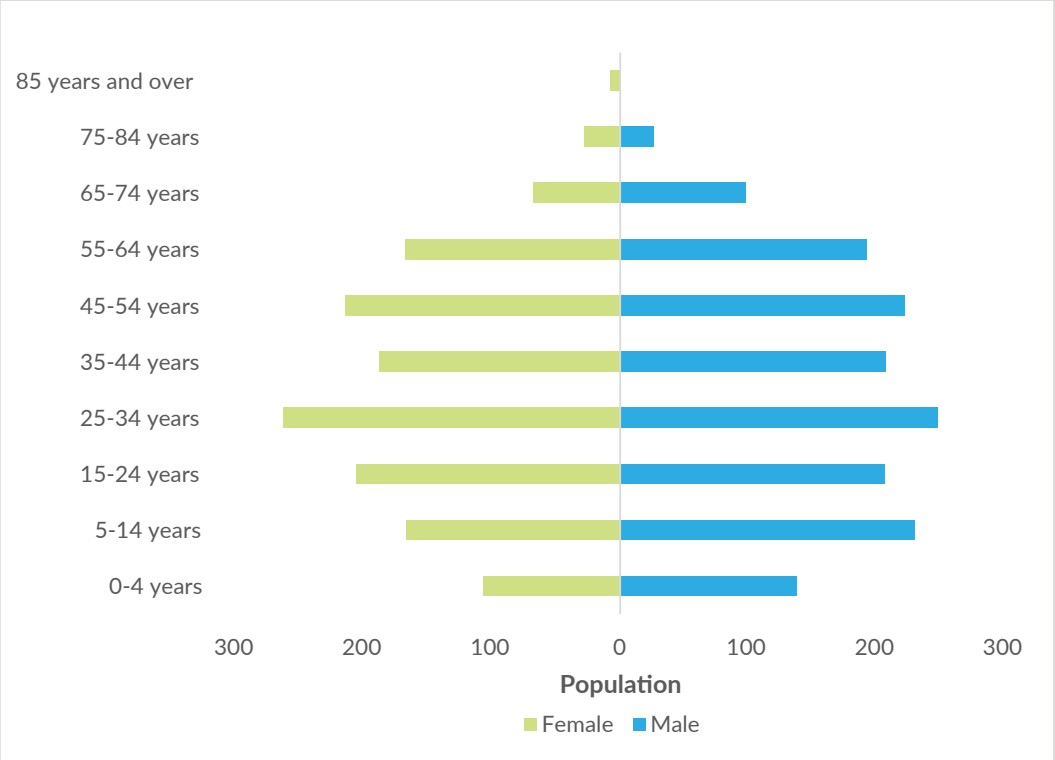
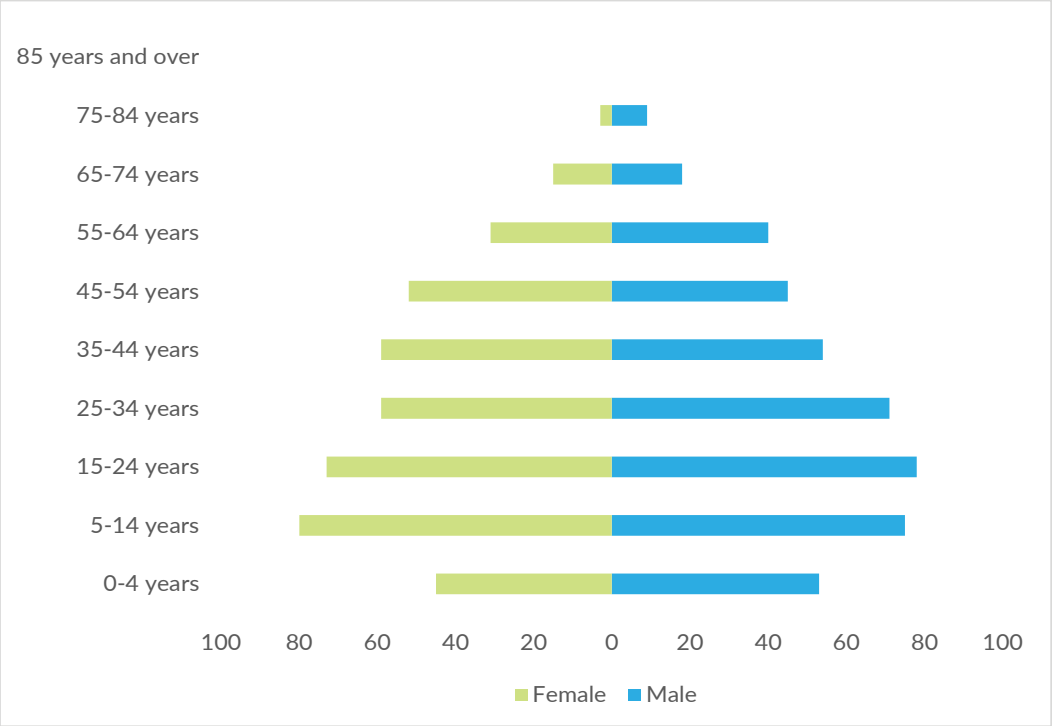


Figure 12.10: Borroloola age and gender pyramid (2016). Source: Beetaloo Sub-basin Case Study.[181]



180 Beetaloo Sub-basin Case Study, Appendix A, p 22.
181 Beetaloo Sub-basin Case Study, Appendix A, p 38.

12.7.3 The social context of the affected communities

In addition to the socio-demographics presented above, this Section describes key characteristics and considerations that arose from the Beetaloo Sub-basin Case Study that have a bearing on the likely social impacts across the Beetaloo Sub-basin. The Sub-basin is located between Katherine and Tennant Creek and covers an area of approximately 7,000 km^2. Land use in the Beetaloo Sub-basin comprises Aboriginal land, pastoral leases (which co-exist with native title rights and interests), horticultural enterprises, oil and gas transmission infrastructure, a railway, highway towns, cattle stations and remote Aboriginal communities. The Australian Defence Force also operates the Tindal RAAF Base located near Katherine and has a strong presence around that community.

Within the affected areas, there are stark contrasts between those living in the urban areas and those living in the more remote and regional areas, with the ratio of Aboriginal to non-Aboriginal people rising rapidly in the remote communities. This change in ratio impacts many of the social issues from age, education, schooling attendance, unemployment and health outcomes. Across the Sub-basin, those communities with a predominantly Aboriginal population have a much younger median age of around the mid-20s. Mortality rates in the Roper Gulf region are higher than the Australian average, and life expectancy is much lower. In many of the regions, school attainment levels are much lower than the NT average. For example, in the northern region, 53% of students left school during or before completing Year 10, and only 13% completed Year 12 and nearly a quarter of people indicated progressing no further than Year 8. This is significantly less than attainment rates within the Katherine region, where Year 12 was the most common level of education achieved (28%). The eastern region's educational attainment rates are similar to the Katherine region levels. Within the central region, due to the small population size, the School of the Air provides educational services to communities in this social catchment.

In Borroloola, a key issue in the community is a lack of recreational activities, facilities and infrastructure for young people. The cost of living in the Roper Gulf region is higher than Darwin and Katherine, but personal average weekly income is less than half of the NT average at $279. On the other hand, Borroloola has a personal average weekly income of $424, influenced by employment opportunities at the McArthur River Mine. Housing and health also vary across the region and need to be considered on a case-by-case basis for any onshore shale gas projects.

Some of the locations are tourist destinations, which attract large numbers of visitors each year, and therefore, tourism is an important part of those towns' income. Most communities have Telstra mobile network coverage, however, limited service is available outside the towns and communities. The majority of local roads are not sealed, although some communities have sealed streets. Much of the road network is subject to seasonal closure because of flooding.

12.7.4 Key concerns and opportunities

Coffey reported that the major concern across all communities – urban, Aboriginal and pastoral – was the potential impacts of hydraulic fracturing on groundwater, both quality and quantity. This issue is addressed in detail in Chapter 7. Other concerns that frequently arose during its consultations included the potential to create massive income disparity through the receipt of royalties in remote Aboriginal communities. The concern was that such royalties, unless managed well, could negatively affect relations between different traditional Aboriginal owner groups.

Particular challenges when undertaking both strategic and project-level SIAs in the Beetaloo Sub-basin include the remoteness of communities (influencing the time available to consult effectively), and the cultural diversity and differing world views of the major stakeholder groups (Aboriginal communities and pastoral leaseholders). The significance of these challenges is amplified due to the limited understanding of the nature of the onshore shale gas industry, and of the technologies that would be deployed to extract shale gas and manage potential environmental and social impacts. Distrust of the Government and its capacity to regulate any shale gas industry was also a matter of concern.

Despite these challenges, none of these risks are considered to be incapable of being mitigated and managed. But effective management will require close collaboration between the gas companies, Government and the community to ensure that responsibility for management and reporting on Sub-basin impacts is clear, and that mechanisms for community feedback and

responses are widely known and effective.

Coffey identified a number of opportunities that may emerge from any onshore shale gas industry. The first was the potential for increased employment, training and a broadening of the skills base of the local workforce. Given the unemployment and younger average age of the population living in and around the Beetaloo Sub-basin, developing a local workforce and providing opportunities for meaningful employment was seen to be important, with potential flow-on benefits. For example, if the workers saw Katherine or Tennant Creek as a desirable place to live, it could lead to modest population increases. The opportunity, through local procurement of inputs for shale gas development, to diversify the economic base of regional support towns was also seen positively.

Other suggested opportunities included the development of regional support facilities through worker accommodation or upgrades to airstrips, which could be used for tourism, training and employment opportunities for Aboriginal communities in the area, co-development of infrastructure, and regional environmental monitoring through participation by natural resource management groups and Aboriginal ranger groups.[182] However, central to realising these opportunities is to ensure that the SIA framework is implemented at the earliest opportunity to gather essential baseline data from which to measure progress.

Recommendation 12.20

That as part of the SREBA for the Beetaloo Sub-basin, a strategic SIA be conducted to obtain essential baseline data prior to the granting of any further production approvals.

12.8 Social licence to operate in the Beetaloo Sub-basin and the NT

An SLO is critical for any successful onshore shale gas industry. The origins of the concept of an SLO trace back to the mining sector around the mid-1990s. It emerged in response to a number of highly publicised conflicts with communities over failures of chemical spills and tailing dams.[183]Although it has no agreed formal definition, the concept is known as *"the ongoing acceptance or approval of an operation by those local community stakeholders who are affected by it and who can affect its profitability".* [184] Due to the intangible nature of an SLO, many argue that it is easier to know when an industry or project does not hold an SLO, than when it does.[185] A failure to gain or hold an SLO can often lead to political intervention and sometimes project failure.[186]

Trust is a critical element of an SLO. While trust takes time to be established, it can very easily and very quickly be eroded if it is not well managed. Trust is built through open and transparent communication between all parties. There is a recognition that to gain trust, cognisance of the cultural differences and the requirements of different stakeholder interests involved, or intersecting with the project, must exist in some way.[187] As part of building trust, the context in which a project is operating, including any legacy issues, has been shown to strongly influence how new projects are accepted.[188] If historical evidence suggests that poor regulatory conditions have prevailed, or there is a track record of industry failure to uphold explicit commitments to stakeholders and the environment, it will result in low trust in both the government and the associated industry. This will limit the ability of those project operators, and often the associated government, to gain an SLO.[189]

12.8.1 SLO in the NT

Research conducted over several years has now identified a common set of relational variables that underpin social acceptance, or SLO, at local, State and national scales. These critical relational variables (that is, focussing on stakeholder interactions) include: contact quality between gas company personnel and community members at the local scale; distributional fairness (particularly in relation to benefits) across scales; procedural fairness across all scales;

182 Beetaloo Sub-basin Cast Study, p xv.
183 Thomson, Boutilier and Darling 2011.
184 Moffat and Zhang 2014.
185 Parsons, Lacey and Moffat 2014.
186 Prno and Slocombe 2012.
187 Serje 2017.
188 Bradbury et al. 2009.
189 Gallois, Ashworth et al. 2016.

and citizen confidence in the governance arrangements around extraction at the State and national scale. Each of these variables is summarised below.[190]

12.8.1.1 Contact quality between gas companies and community members

At the local scale, the quality of contact between gas company personnel and community members can have a significant influence on the quality of interactions between a gas company and a community. For example, in a longitudinal survey of community attitudes to CSG extraction in Queensland, the quality of contact between gas company personnel and community members was a significant predictor of the community's trust in the company and acceptance of its operation.[191] What made little difference to trust and acceptance was the amount of contact between the gas company and the community.

12.8.1.2 Distributional fairness

Distributional fairness refers to the extent to which the benefits of an extractive operation are perceived to be distributed fairly within a community or society more broadly.[192] In the extractive context, the fair distribution of industry related benefits has been shown to be a significant predictor of trust and acceptance of both local operations and the industry.[193] For example, communities may benefit through direct compensation, royalty payments or participation in joint ventures.[194] Other benefits may include industry's contribution to employment and training opportunities,[195] or investment in local and regional infrastructure.[196]

12.8.1.3 Procedural fairness

Procedural fairness in a non-legal sense routinely requires the implementation of processes that are considered to be fair by all involved, are transparent, are inclusive of diverse perspectives and priorities, and allow the public to access information and to feel respected and listened to in that process.[197] Given the increased participation of communities in decision-making about how extractive resource operations and other large infrastructure projects will be developed, designing and implementing fair processes (including a reasonable access to justice: see Chapter 14 for further discussion) has become a critical part of creating equitable participation, creating meaningful dialogue among stakeholders, diffusing conflict and achieving sustainable resource management decisions.[198]

12.8.1.4 Governance

When the public believes that the governance arrangements in place are not capable of ensuring responsible resource development, its attitude toward extraction tends to be less favourable. Research has shown that public perceptions of the regulatory arrangements around extractive industries moderate the relationship between their concerns over environmental impacts and their acceptance of industry.[199] More specifically, when citizens strongly believe that existing regulation and legislation has the capacity to hold extractive industries to account for their actions (that is, strong governance), there is an increased likelihood of acceptance of that industry compared to those who perceive governance arrangements as being weak, irrespective of their views on the environmental impacts of the industry.[200] Chapter 14 discusses how the current regulatory framework can be strengthened to increase the community's trust in the shale gas industry and in the Government.

12.8.2 NT results of a national survey

CSIRO conducted a survey in late 2016 and early 2017 across Australia that focussed on attitudes toward extractive industries. The following summarises the findings of the 227 participants that participated from across the NT. With such small numbers, particularly in those areas that are

190 CSIRO Report.
191 Moffat and Zhang 2014.
192 Kemp et al. 2011; Zhang, Moffat, Lacey et al. 2015.
193 Moffat, Zhang and Boughen 2014.
194 O'Faircheallaigh 2002.
195 Measham and Fleming 2014.
196 Michaels 2011.
197 Lacey, Carr-Cornish, Zhang et al. 2017.
198 Kemp et al. 2011; Holley and Mitcham 2016; Lacey, Edwards and Lamont 2016.
199 Zhang and Moffat 2015.
200 Zhang, Moffat, Lacey et al. 2015.

likely to be most affected by any onshore shale gas industry, drawing any conclusions from the survey needs to be treated with extreme caution. However, the data does provide some insights into issues of concern that Government, regulators and gas companies need to be mindful of when considering the implementation of any onshore shale gas industry.

In general, residents of the NT perceive governance capacity significantly poorer than those respondents from all other States and Territories. This was something that the Panel heard repeatedly both in submissions and at the various hearings and community forums. NT residents have low trust in extractive industries and the Governments, marginal trust in advocacy groups, but higher trust in research organisations relative to residents in all other States. Low trust in the Government is a common phenomenon across all States, as is low trust in the extractive industries. NT residents, however, trust the extractive industries significantly less than residents do in other jurisdictions.

Low trust perceptions are underpinned by low perceptions of procedural and distributional fairness. Perceptions of procedural fairness (feeling heard, respected and included in decision making processes) and distributional fairness (that the benefits of extractive industries are spread fairly) were significantly lower in the NT when compared to all other States.

Although trust and the perceptions of extractive industries was low, impacts and benefits relating to regional infrastructure, employment and local community benefits were particularly favourably perceived in the NT. However, financial benefits at the individual, family, and general public levels were less influential. Perceived adverse environmental effects were the most negatively viewed industry impact, which was followed by impacts on living costs, and impacts on other sectors (for example, tourism and manufacturing).

Good governance was significantly more important for social acceptance of any extractive industry in the NT than for residents in the rest of Australia. This highlights the need for the Government to accept and implement the recommendations made in Chapter 14. Governance was approximately as important as trust in the petroleum industry as a direct predictor of social acceptance, and it was also an important predictor of trust. Governance, therefore, has both direct and indirect effects on social acceptance of extractive industries. Trust in the petroleum industry is also influenced by perceptions of procedural and distributional fairness. Since both of these are rated unfavourably in the NT, improving these perceptions create opportunities for improving trust in, and social acceptance of, extractive industry in the NT, including any onshore shale gas industry.

However, the most important predictor of social acceptance was a perceived balance of benefits over the impacts of the petroleum industry, or its 'value proposition'. The perceived employment benefit from extractive industries along with financial community benefits, were the highest predictors of the 'balance of benefits over impacts' variable. This is particularly important in the NT, which is experiencing increasing inequality in family income. Any potential royalty payment scheme for any new onshore shale gas industry must therefore be designed carefully to ensure that sharing economic benefits does not exacerbate underlying trends in family income inequality in novel ways (see Chapter 13).

12.8.3 Improving SLO

Discussed below are findings from the CSIRO Report, including interviews and fieldwork with representatives from a range of industry, community and government stakeholders in the NT.

The conversations identified a number of concerns and areas for improvement relating to SLO. Community members expressed strong interest in resolving, or at least addressing, their uncertainty through accessing information from the gas industry and the Government regarding the use of hydraulic fracturing technologies in the Beetaloo Sub-basin, but also expressed frustration that there appeared to be no one to ask.[201] By contrast, it is clear that gas industry representative bodies have been providing opportunities to the public in more populated centres of the NT to access relevant information from technical experts. There appears, therefore, to be a gap in who is actively seeking information to resolve uncertainty and where this information is being made available.

Oilfield Connect[202] was adamant that the claims by Lock the Gate were particularly damaging to the NT's trust in the industry, the Government and the Inquiry's findings. It recommended

201 CSIRO Report, p 35.
202 Oilfield Connect Pty Ltd, submission 1164 (**Oilfield Connect submission 1164**).

that, "*the Inquiry panel may consider that there needs to be a new recommendation to the NT government for a 'post-Inquiry public awareness campaign', which more clearly articulates the facts learned by the Inquiry about the onshore shale gas industry, and also point out the many nonfactual misinformation and false allegations, such as evident in this incident by the LTGA.*" [203]

Similarly,[204] Origin made reference to the lack of understanding around the terms *"conventional"* and *"unconventional"* gas plays, which was evident in submissions to the Panel. There was a call to ensure that factual information was made available to those living in the NT to counter some of the misinformation that had been promulgated by some activists.

The gas companies conducting exploration in the Beetaloo Sub-basin that were interviewed by CSIRO reported strong engagement locally with potentially affected community members and traditional Aboriginal owners. Gas companies indicated that where they were able to meet regularly with community members to discuss uncertainties and explore opportunities for future benefits, relationships were more positive. However, comments from the community regarding the lack of engagement in areas alongside, or even overlaying, the exploration permits demonstrate the need for a broader and more inclusive definition of who is the 'community' in this context.

All stakeholders stated that the role of the Government was critical to how any onshore shale gas industry will, or will not, progress.[205] There was a perception that the Government had been largely absent from the discussion about onshore shale gas development in the NT for some time, and that greater involvement was not only welcome, it was necessary to meet the challenges that communities might face with the introduction of this new industry.

Constructively, interviewees discussed ways in which the Government could be more effective. First, regulation had to be creative, modern, and based on the experiences of other jurisdictions. Second, the need for careful and deliberate planning was seen as important. While planning around infrastructure and regional industry capacity is well developed within governments generally, skills around planning for social infrastructure and capacity are less well developed but are nevertheless as important. What services will be required to build the capacity of community members for work and participation in any new onshore shale gas industry, to support a potential influx of construction personnel, and to support changing community dynamics were all areas that were seen to be important in managing SLO issues through good planning. Third, there was a desire from the community and from some industry participants for the Government to play a more active role in engaging the community.

The need to develop any new onshore shale gas industry in a manner consistent with 'the NT way' was emphasised in all of the community consultations. There was a clear view that the NT has unique characteristics and cultural norms that meant that lessons from other jurisdictions were not able to be directly applied without reflection. However, research on SLO in many contexts around the world indicates that there are usually many more similarities in the way community acceptance is developed and maintained over time than there are differences. The issues of relevance to other communities (for example, water quantity and quality) and the factors that are known to be important in building trust and acceptance (for example, procedural and distributional fairness and contact quality) will also be central in the NT. But how strategies for their management are executed will benefit greatly from contextualisation.

203 Oilfield Connect submission 1164.
204 Origin submission 1248
205 CSIRO Report, p 35.

Community members from the Gurdanji, Mara, Garawa and Yanyuwa clans groups from Borroloola. Source: Seed.

12.8.4 Measuring SLO in the NT

Measuring and monitoring community sentiment has value because community voice is often largely absent from discussions and decision-making processes that shape development trajectories in extractive industries. This lack of voice is at the heart of much community and gas company conflict. Less formal consultative processes are often felt by communities to have pre-determined outcomes, while communities also express concerns about 'survey fatigue', with multiple companies or governmental agencies often regularly asking the same communities questions over time.

Critically, community members must be reassured that any research is being conducted under conditions that protect them as participants. This can be managed through provisions around informing participants about research purpose, seeking informed consent, limiting the use of incentives for participation, incorporation of culturally sensitive methods, assurances that participants can withdraw from the research at any time without consequence, and reassurances that any personal information or data that may identify them is appropriately managed and secured. Proper mechanisms for seeking more information about the work and/or lodging a grievance are also important in building trust in the process that the community is invited to participate in.

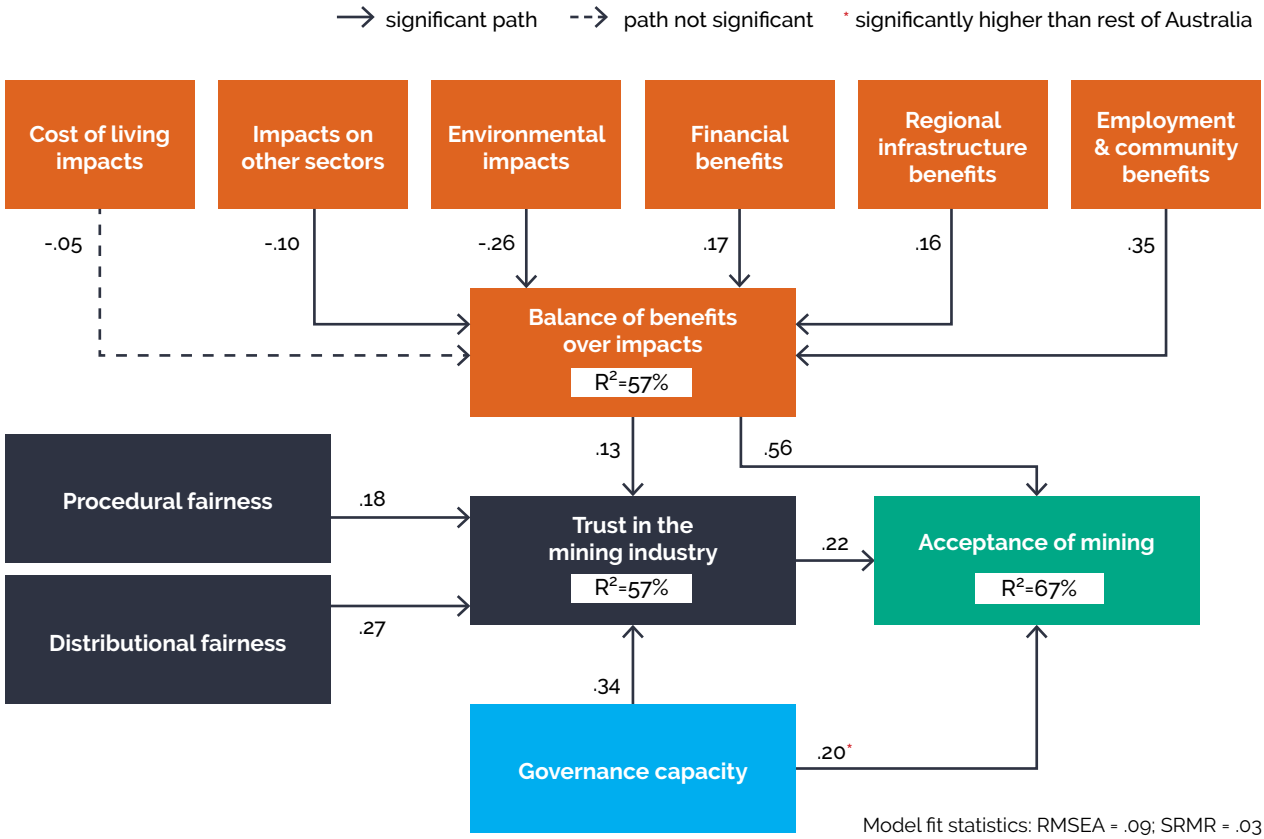
CSIRO's own practice, supported by 'listening tours' conducted by the Queensland Resources Council,[206] suggests that it is not fatigue with participating in survey research that communities are frustrated by, but the lack of even basic feedback or transparency about the way their data is used and how it has, or has not, affected decision-making processes. By successfully measuring and modelling the critical elements leading to social acceptance, gas companies can also prioritise their activities and investment in a way that maximises the creation of trust between its activities and the communities affected by those activities.

What may be more helpful in this regard is a measurement and monitoring framework that seeks to understand and reconcile the multiple perspectives that are held. For research focussed on SLO to be seen as relevant to all stakeholders, it is advantageous to also consider the role of a trusted third party.

206 Queensland Resources Council 2016.

In the CSIRO Report, a statistical technique called 'structural equation modelling' was used to establish the relative importance of key drivers of trust and acceptance in the NT. A comprehensive model of trust and social acceptance of extractives was developed by CSIRO at the national level, and this model was applied to the NT data. At both the national and NT level, the model performed well, predicting more than half the variation in individual levels of trust, perceptions of benefits over impacts, and the respondents' overall social acceptance of the industry in the NT (57%, 57%, and 67%, respectively: see **Figure 12.11** below).

Figure 12.11: Comprehensive model of NT data predicting trust and acceptance of the extractive industries. Source: CSIRO Report.[207]



There is great opportunity for the NT to determine the conditions under which any future onshore shale gas industry is developed, taking the best and most current lessons from other jurisdictions and implementing them in 'the NT way'. With respect to SLO, any new shale gas industry will not be possible without achieving some level of acceptance in local communities and in the Territory more broadly. But SLO is not a tangible, one-off requirement. SLO is about relationships, sharing decision-making power and supporting communities to have constructive ways of influencing development trajectories.

207 Moffat et al. 2017.

12.9 Conclusion

The Beetaloo Sub-basin Case Study identified that significant disparity exists across the Beetaloo Sub-basin between the regional service centres and Aboriginal communities due to their remoteness. This affects access to services, housing, access to a functioning labour market, and accounts for critical differences in health and education status. A key issue will be how affected communities realise opportunities from any onshore shale gas development.

From the submissions and the information shared with the Panel at the consultations, it is clear that many Territorians hold a range of concerns in relation to the social impacts of any onshore shale gas industry. Most people who appeared before the Panel did not believe that the gas industry held an SLO. Different stakeholder groups do not share the same concerns. Similarly, many of the concerns are location specific, while others relate to the whole of the NT.

Key issues important for any SIA undertaken in the NT include impacts on housing and infrastructure, employment, business income, education and skills development, community cohesion, crime rates, transport, and the transient nature of the workforce. What is critical to ensure that the social impacts are acceptably mitigated is the need for strong regulatory structures that include necessary consultation and engagement with all affected stakeholders.

Through open and transparent processes and strict governance structures, the Panel's view is that the social impacts can be mitigated to an acceptable level. However, to obtain an SLO for any onshore shale gas industry in the NT, considerable resources will be required when planning and implementing the SIA framework. Extensive participation and engagement of all stakeholders will be critical for the industry to succeed.

An independent strategic SIA with specific attention to social, cultural, economic and environmental values is an essential starting point. Critical for success is to ensure that any engagement is well managed and coordinated across the affected regions to mitigate the potential for cumulative impacts and consultation fatigue. The creation and maintenance of an open and shareable database of information collected over time will help to build trust in how the projects are being monitored. Such transparency, together with careful attention to procedural fairness and distributive justice, will be critical for the success of any shale gas industry. Finally, adequate monitoring and engagement through a reflexive and ongoing process will also be fundamental to build an SLO for any onshore shale gas industry.