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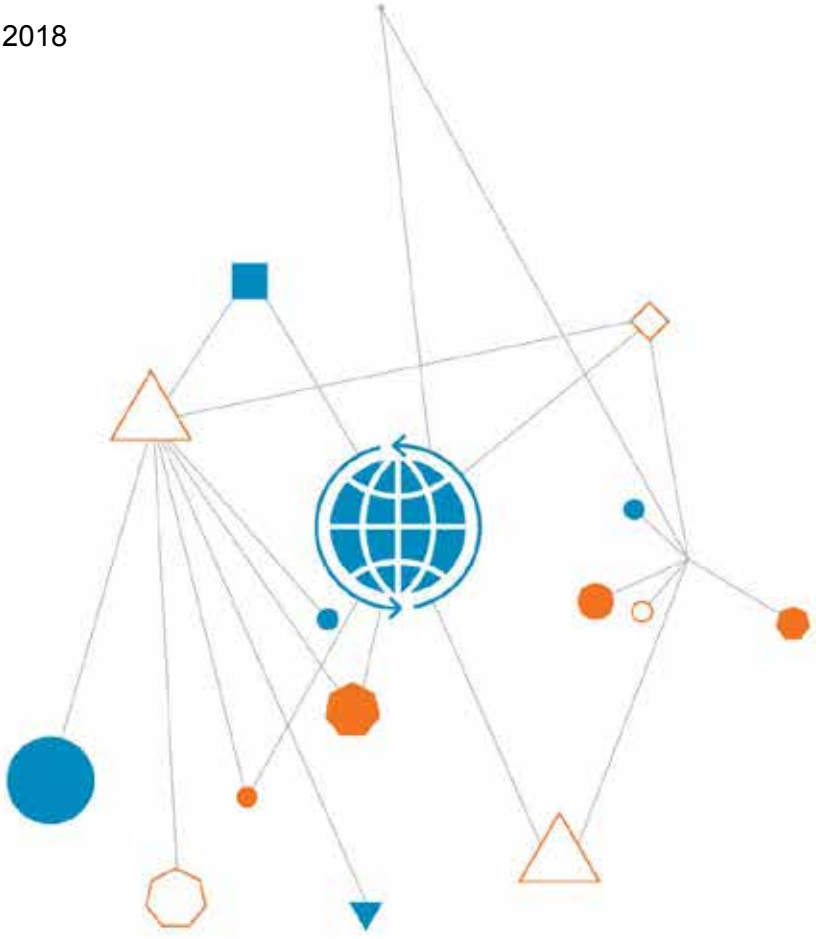
Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

Beetaloo sub-basin Social Impact Assessment Summary Report

CSIRO

17 January 2018



When you think with a global mind problems get smaller

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Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

Prepared for
Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

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1. Background

The Terms of Reference of the Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Gas Reservoirs and Associated Activities in the Northern Territory (the Inquiry) require the independent scientific panel (the Panel) to determine the nature and extent of the risks of hydraulic fracturing of onshore unconventional shale reservoirs and its associated activities on water, land and air conditions in the Northern Territory, as well as on the social, economic and cultural conditions in the Northern Territory.

The Inquiry engaged Coffey and its partners the University of Queensland Centre for Social Responsibility in Mining (CSRM) and CSIRO to address three elements relating to the social and economic conditions.

First, the development of a leading practice framework (SIA Framework) for the identification, assessment and management of the potential social impacts associated with the development of onshore unconventional gas in the Northern Territory, and a description of how this framework could operate in in conjunction with Northern Territory and Commonwealth environmental assessment frameworks.

Secondly, as described in the Inquiry Background and Issues Paper (available at https://frackinginquiry.nt.gov.au/background-and-issues-paper) the Panel will *'use the example of a possible unconventional shale gas project in the Beetaloo Sub-basin, which is where exploration is most advanced, as a case study to demonstrate how the framework could operate, including how risks are to be identified, assessed, and managed'*. As exploration for onshore unconventional gas is at an early stage in the Northern Territory, scenarios for any future development in relation to location, scale and timing are uncertain, which conditioned this assessment to be high-level and indicative of potential impacts of onshore unconventional gas development.

Thirdly, to *'describe, with reference to the literature and examples from other jurisdictions, the concept of a "social licence to operate" as it applies to the onshore unconventional gas industry in the Northern Territory'* and to investigate *'measures that onshore unconventional gas industry and government can take to enable industry to earn and maintain a social licence to operate in the Northern Territory'*. Broadly speaking, a 'social licence to operate' is a measure of the acceptance of an industry within society.

The scope of work was undertaken through a combination of research, analysis of public submissions to the Inquiry, and engagement with key stakeholders through a program of targeted consultation with communities in and around the Beetaloo sub-basin, as well as consultation with government agencies and relevant organisations in relation to their views on the elements of an appropriate SIA Framework, an industry 'social licence to operate', and the potential for social impacts and opportunities for benefits associated with a conceptual development scenario in the Beetaloo sub-basin.

2. Context

Following an extensive community engagement program, the Northern Territory Government released its Economic Development Framework[1] (the Framework) on 20 June 2017. The Framework indicated that in the short to medium-term *'industry sectors expected to experience strong demand growth included energy and minerals, tourism, agribusiness, and international education and training'*. With respect to energy and minerals, the Framework stated that *'To ensure Territorians benefit from our resource wealth we need to ensure there is community support for industry activities and that investors have confidence and certainty when they make investment decisions. In the near-term, government and industry need to work together to ensure key concerns held by the community are addressed and there is a clear, agreed and endorsed pathway to facilitate industry development'* (emphasis added). High-level actions to advance implementation of the Framework included the development of a *'communication strategy to inform the community of benefits from energy and minerals industry activity, including business and job opportunities, and to clarify the impact on the environment'* and a commitment to *'review energy and mineral legislation to improve consistency in applying legislation'*.

The Inquiry has acknowledged the importance of addressing the potential for social impact, and to develop and maintain, in collaboration with industry proponents, a 'social license to operate' associated with the development of a new component of the oil and gas industry (onshore unconventional shale gas) in the Northern Territory. Key to obtaining a 'social licence to operate' is information about how the communities' concerns could be addressed.

CSRM[2] has proposed a SIA Framework for addressing community concerns about how the social impacts will be identified, understood and managed. Drawing upon the lessons of gas industry development on a regional scale in new domains, in Australia (e.g., Surat Basin) and internationally (shale gas development in the United States and South Africa), CSRM's recommendations emphasise the importance of adopting a strategic industry approach for baseline characterisation. This should be complemented with comprehensive education and awareness programs for the potentially affected communities so that informed consideration may be given to the potential for impacts that may be experienced, as well as opportunities that may be available for capture. A key feature of the SIA Framework is the requirement for ongoing participatory monitoring and government-community-proponent collaboration in the development and implementation of strategies to mitigate impacts and capture socio-economic development opportunities.

The Beetaloo sub-basin SIA case study[3] adopted relevant aspects of the SIA Framework to identify and assess the potential social and economic impacts of a conceptual development. The conceptual development was based on the Shale WIND scenario developed by ACIL Allen and presented in their report[4].

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[1] See https://edf.nt.gov.au/home
[2] Witt, K., Vivoda, V., Everingham, J., Bainton, N. (2017). A framework for social impact assessment of shale gas development in the Northern Territory, Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland.
[3] Coffey Services Australia Pty Ltd, Beetaloo sub-basin Social Impact Assessment Case study, Report to the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory, December 2017
[4] ACIL Allen Consulting, The Economic Impacts of a Potential Shale Gas Development in the Northern Territory, Final Report to the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory, October 2017

The Beetaloo sub-basin is an area of the Northern Territory where exploration for shale gas is most advanced, and includes towns and communities typical of urban and remote areas of the Northern Territory. The socioeconomic context for undertaking the SIA case study of the conceptual development in the Beetaloo sub-basin is characterised as follows:

- The Beetaloo sub-basin has seen almost no industrial development. Some affected communities have experience with development. For example, experience with mining development south of Ngukurr (iron ore) and at McArthur River (large-scale underground and open pit mining of lead and zinc). The installation of gas transmission and lateral pipelines through the sub-basin (Amadeus Basin to Darwin Pipeline in 1986; the Elliott Spur Pipeline in 1989, and the McArthur River Pipeline in 1995) that occurred 20 to 30 years ago is not readily recalled by community members. The current installation of the Northern Gas Pipeline from just north of Tennant Creek to Mount Isa is in an early stage of development, and a significant distance south of the Beetaloo sub-basin communities.

- Economic activity is centred on agriculture development (pastoral operations throughout the sub-basin, horticulture south of Katherine and along the Roper Highway) together with Defense activity at RAAF Base Tindal, and tourism activity mainly servicing self-drive visitors. Regional service townships (Katherine and Tennant Creek) are located outside the sub-basin.

- Obvious significant disparities in social status and living conditions between remote Aboriginal communities and regional service townships, as a result of their remoteness affecting access to services, their poor state of housing, limited access to a functioning labour market, and differences in health and education status. This has a significant influence on the potential for community members to capture potential benefits from industry development should it occur.

- Community members have a reasonably high level of awareness (due to the activities of groups opposed to industry development) of historical issues surrounding the development of unconventional gas resources in other jurisdictions but not of the potential unconventional gas industry in the Northern Territory. The Inquiry's Interim Report (Inquiry, 2017b) acknowledged that levels of knowledge in Aboriginal communities about future development is inadequate.

In the absence of any firm proposals and limited information on how a shale gas field would be developed, the case study assumed that initial development would occur to the west of Larrimah and to the east of Daly Waters, in the areas that have shown favourable exploration results. It is assumed the projects would be offset by three years and produce gas for 25 years. Assumptions were made regarding the scale of the development and its key components, project stages and duration; construction and operation workforce numbers, employment policies (i.e., FIFO and DIDO), logistics and maintenance bases etc. The conceptual development was sufficiently defined to support the high-level assessment of social impacts of onshore unconventional gas development and identification of opportunities for benefits.

The nature and elucidation of the concept of the 'social license to operate' or 'how community acceptance of the industry could be assessed' was undertaken by the CSIRO[5]. CSIRO detailed the key drivers of trust and acceptance for the extractive industries in the Northern Territory, and in other jurisdictions and commodities. The drivers include feeling heard, respected and involved in decision making processes (procedural fairness), feeling that the benefits (and impacts) of extraction are shared fairly (distributional fairness), that government has the capacity and will to ensure public

[5] Moffat, K., Lacey, J., McCrea, R., & Poruschi, L. (2017). Social licence to operate in the Beetaloo Basin and Northern Territory. CSIRO, EP177961.

interests are protected and industry held to account (governance capacity), that physical and social impacts are managed effectively and appropriately, and that interactions between company personnel and community members is a positive experience (contact quality). CSIRO proposed a measurement and modelling framework for 'social licence to operate', focusing on the following principles for its development:

- The engagement of a trusted third party – engendering trust and confidence in the process.
- Protection of community rights and safety.
- Longitudinal design – placing the experiences of community at the centre of the process, and to identify issues before they become conflicts.
- Accessibility of data – transparency of process and data provision back to community and other stakeholders is central to building trust that this is a vehicle for community voice.
- Inclusiveness of process – so that vulnerable, marginalised and special status groups are included in 'social licence to operate' research using appropriate methods.

3. Key findings

The following sections summarise the key findings of the three social elements of onshore unconventional gas development.

3.1. The approach to assessing potential social impacts of industry development

Key characteristics of a leading practice SIA Framework for shale gas in the NT must include:

1. ***Strategic assessment*** is needed for a program of development. The strategic assessment would clearly identify the objectives of the program and define the scale (and staging) of development in terms of balancing economic, social and environmental impacts at local, Territory and national scales.
2. A ***strategic regional approach*** is needed that aligns individual projects and their outcomes with the objectives of the NT Economic Development Framework, regional planning objectives and community values and aspirations.
3. ***Coordination and collaboration between multiple projects*** is needed in order to minimise negative cumulative impacts, minimise the 'footprint' of the industry in the placing of associated infrastructure (including workers 'accommodation) and maximise long term social and economic benefits to local and regional communities.
4. Particular attention to ***human rights issues***, and the rights and vulnerabilities of all Aboriginal peoples, (not only those recognised as Traditional Owners).

5. Particular attention to ***psycho-social impacts***, in recognition of the interconnectedness of personal, cultural and environmental integrity for Aboriginal peoples. Also, in recognition of the potentially stressful nature of land access agreements for pastoralists.

6. An ***independently led social baseline assessment***, using 'agreed indicators' to measure impacts, ongoing social performance of the industry and sustainability outcomes (the indicators should be selected in consultation with local people and stakeholders).

7. An ***independently led community engagement*** program with affected stakeholder groups to discern the significance of impacts and to co-develop acceptable and appropriate mitigation and enhancement strategies.

8. The SIA framework should contribute to an ***open data policy*** with ***regular reporting*** on the social, economic and environmental performance of the shale gas industry.

9. Each additional project should provide an adaptive SIA risk assessment that specifically addresses ***cumulative impacts*** and its contribution to the development program's objectives.

Gaps in the current Northern Territory regulatory environment for SIA are considered to include:

1. There are currently no mechanisms for strategic assessment (including strategic SIA) under NT regulations, although implementing strategic assessment has been accepted as a recommendation in a review of environmental assessment policy (the 2015 Hawke Report).[6]

2. There is scope for a strategic assessment under the *Environmental Protection and Biodiversity Conservation Act (*EPBC Act*) 1999 (CW)*, where matters of national environmental significance (MNES) may be affected. A map of protected matters[7] shows there are few matters that would trigger the EPBC Act in the NT. However, if the current 'water trigger' for coal seam gas and large coal projects was to be amended to include shale gas development (as water from underground aquifers is intended to be used) by the Commonwealth Government, all NT projects would be required to gain *EPBC Act* approval.

3. SIA is required only as a subset of an environmental impact assessment, and as such, has the potential to be undervalued in the approvals process.

4. While generic guidelines exist, there are no industry specific guidelines for conducting an SIA in the NT where there is a uniquely high proportion of Aboriginal people and interests.

5. There are currently no requirements or guidelines for cumulative impacts assessment.

Recommendations to adopt a leading practice SIA Framework include:

1. Initiate mechanisms for strategic environmental assessment of a specific program of shale gas development (e.g. Beetaloo sub-Basin) in either NT regulations (as recommended in the 2015 Hawke Report), or in partnership with the Commonwealth government in a Strategic Assessment Agreement under the *EPBC Act* 1999.

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[6] Hawke, A. (2015). Review of the Northern Territory Environmental Assessment and Approval Processes. May 2015.
[7] Australian Government, Department of the Environment and Energy, (2017) Protected Matters Search Tool http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf

2. The Terms of Reference for strategic environmental assessment should include various specialist assessments, including cultural impact assessment. Due to the interconnectedness of Aboriginal peoples and their culture with environmental condition, predicting the significance of social (cultural) impacts (particularly for Aboriginal people, but also pastoral leaseholders) requires the integration of social, environmental, economic and cultural assessments.

3. Consult with the Commonwealth Department of the Environment and Energy in relation to possible amendments to the 'water trigger' under the *EPBC Act* to apply to shale gas projects, as it does for all coal seam gas and large coal projects. If the 'water trigger' were also to apply to shale gas projects, then Territory assessment processes must align with Commonwealth assessment requirements to avoid duplication.

4. Establish or enhance an independent authority (separated from government decision making) for the oversight of the strategic assessment, baseline studies and ongoing monitoring and reporting, as well as for social and environmental compliance auditing. This could be the existing NT Environmental Protection Agency to avoid structural complexity and the fragmentation of decision making that has confounded the effective regulation of the industry in other jurisdictions.

5. Collaboration and coordination between projects, and between gas companies, government and community organisations is necessary for effective identification, assessment and responses to cumulative impacts. A platform for such collaboration (such as a multi-stakeholder working group) would ideally be linked with the ongoing monitoring platform and come under the jurisdiction of the same independent Authority.

6. Third parties should be able to report grievances, or perceived breaches of conditions to the independent Authority where grievances relate to cumulative impacts and issues beyond the scale of project-level grievance mechanisms.

7. The costs of undertaking independent baseline studies (usually conducted by project proponents) should be recovered to an extent from project proponents (who would no longer have to do them individually, but who would use the available data in their risk assessments) by increasing the cost of the petroleum production license (PPL) for operators and/or by charging an annual levee or fee for use of the baseline data and ongoing monitoring and reporting platform.

8. Produce clear guidelines and simple fact sheets for negotiating Land Access Agreements in different tenure types that outline the rights of both the landholder and the project proponent. Considerable stress and negative impact has been associated with misunderstood land rights and perceived disrespect for attachments to, and interests in land.

9. Identify strategies to build local institutional and business capacity early. To best capture the potential economic benefits of shale gas development, adequate lead-time and institutional, business and individual capacity is required.

10. Negotiations with Aboriginal Traditional Owners (TOs) should be inclusive and transparent (on agreement). General informed consent is insufficient. Details of activities should be negotiated in recognition of rights to self-determination and to ensure these groups fully understand the terms of the project and the impacts, benefits and management strategies. The placement of each well and associated infrastructure should be negotiated on a case-by-case basis with local TOs to avoid any culturally sensitive places, and 'sacred sites' as identified by the Aboriginal Areas Protection Authority (AAPA). The process for such negotiations should be fully documented.

11. Royalty payments should not be exclusive to TOs, but a community benefits trust, or other fund designed to distribute economic benefits to regions should be established. (e.g. 'Royalties for Regions' schemes such as in Queensland and Western Australia).

12. Perceptions or evidence of negative impacts on the spiritual wellbeing and social cohesion in Aboriginal communities should be given high priority in risk assessment, as personal safety could be at risk.

3.2. The Beetaloo sub-basin SIA case study

The Beetaloo sub-basin SIA case study identified the threats to community social values. The threats assessed as likely or almost certain to arise in urban communities are:

- Increased risk of road accidents from construction and operations traffic, particularly heavy vehicles during the construction phase.
- Increased levels of anxiety for sub-basin residents over potential risks to groundwater resources.
- A perception that industry development approval is against majority community wishes, contributing to a weakening in trust in government.
- The potential for higher wages to affect local businesses on-going conflict between supporters and opponents of unconventional gas development.

The threats assessed as likely or almost certain to arise in rural communities are:

- Increased risk of road accidents from construction and operations traffic, particularly heavy vehicles during the construction phase.
- Heightened divisions in Aboriginal communities driven by perceived inequity in the receipt of royalties.
- Increased levels of anxiety for sub-basin residents over potential risks to groundwater resources.
- A perception that industry development approval is against majority community wishes, contributing to a weakening in trust in government.
- Heightened perceptions of cultural loss due to perceived impacts to water resources, and uncertainty about the ultimate scale of industry development and landscape alteration.
- The potential for reduced investment in pastoral and horticultural operations due to uncertainty over the long-term sustainability of groundwater resources

The identified threats (and impacts) identified in the high-level assessment can be mitigated and managed, as they are being managed in other onshore gas development areas. Effective management will require close collaboration between various industry groups and project proponents, government and the community to ensure that responsibility for management and reporting of sub-basin level impacts is clear, and that mechanisms for community feedback and response are widely-known and effective.

Ongoing effective community and stakeholder engagement is fundamental to the effective management of impacts and the maintenance of a 'social licence to operate'. Community and stakeholder engagement must commence in the strategic assessment phase at least two to three years prior to the project's environmental and planning approvals phase commencing. Key factors to consider in the development of a community engagement strategy include:

- The need for community industry awareness campaigns, particularly for Aboriginal communities. This needs to be an ongoing process, as the development and deployment of improved technology is proceeding at a rapid rate.
- The requirement for implementation of robust land access protocols.
- The need to provide regular environmental monitoring results to communities in a transparent manner that builds community confidence and trust in the monitoring process.
- Participation in regular community forums with government and other industry participants to discuss industry issues. Responsibility for the design and leadership of these forums may rest with government and peak bodies, however to be successful they will require the participation of industry at a senior level.
- The implementation of a Grievance Management Program, including community access to an independent advocate if necessary.
- The need for monitoring of community and visitor sentiment on a structured basis to ensure that the views of all sectors are heard and considered.
- The development and implementation of a workforce cultural awareness program and a workforce code of conduct to contribute to ongoing positive and supportive community relations.
- The development and implementation, in consultation with government, of local content policies and programs to maximise opportunity for Northern Territory business input and development.

3.3. A Social Licence to Operate

A 'social licence to operate' is a term widely used in the community, though with no common conceptual understanding or agreed method for assessing its status amongst a community or group of stakeholders. With the widespread level of distrust experienced during SIA community consultation and Inquiry hearings, it is imperative that there be a means of independently assessing the status of community acceptance of industry development and operations. CSIRO research indicates that:

- The key drivers of trust and acceptance for the extractive industries in the Northern Territory include:
  - feeling heard, respected and involved in decision making processes (procedural fairness);
  - feeling that the benefits (and impacts) of extraction are shared fairly (distributional fairness);
  - that government has the capacity and will to ensure public interests are protected and industry held to account (governance capacity);
  - that physical and social impacts are managed effectively and appropriately; and

  - that interactions between company personnel and community members is a positive experience (contact quality).

- Data from a CSIRO national survey of citizen attitudes toward the extractive industries revealed that for residents of the Northern Territory, good governance was significantly more important for social acceptance of the extractives than for residents in the rest of Australia.
- The most important predictor of social acceptance was perceived balance of benefits over impacts of mining, or its value proposition for the Territory and its people. Like the rest of Australia, perceived employment from extractives and financial community benefits was the highest predictor of 'balance of benefits over impacts' variable.
- The balance of benefits over impacts with respect to extractives was viewed quite positively in the Northern Territory, in line with the national average.
- Engagement with industry, community and government stakeholders revealed that uncertainty about how the industry would look and fracking as a technology was a locus of attention for all of these stakeholders. Reducing this uncertainty in a framework supported by government appears to be of real interest to most of those spoken with. And extending this, that government plays a more active and creative role in the discussion and engagement of these issues and the development of the industry itself.
- A measurement and modelling framework for 'social licence to operate' should be developed based on the following principles:
  - *The engagement of a trusted third party* – ensuring independence from vested interests.
  - *Protection of community rights and safety* – ethical and privacy standards are applied under the National Statement on Ethical Conduct in Human Research (2015), placing the safety of participants first.
  - *Longitudinal design* – placing the experiences of community at the centre of the process, and to identify issues before they become conflicts.
  - *Accessibility of data* – transparency of process and data provision back to community and other stakeholders in central to building trust that this is a vehicle for community voice.
  - *Inclusiveness of process* – it is important that vulnerable, marginalised and special status groups are included in 'social licence to operate' research using appropriate methods.

4. Conclusion and recommendations

CSRM has proposed a leading practice SIA Framework that adopts the well-established and understood phases of social impact assessment. CSRM's key recommendation is that future project-level SIA be conducted within the framework of a strategic SIA informed by sub-basin wide baseline studies. CSRM recommends monitoring during the construction and operation phases of shale gas developments to enable the effectiveness of strategies and management measures developed to address the socioeconomic impacts to be measured and adapted to changing circumstances.

Independently-led community and stakeholder engagement is recommended, which is supported by CSIRO in its advice on what constitutes a 'social licence to operate'. Independently acquired or verified information that is transparently reported is seen by CSRM and CSIRO as crucial to building confidence in the affected communities and more broadly in the Northern Territory community.

The SIA case study identified the socioeconomic impacts of a conceptual development in the Beetaloo sub-basin. Importantly, it concluded that the impacts are manageable with appropriate strategies and programs. This conclusion was based on experience of unconventional gas development in other jurisdictions where social impacts have been, and are being, successfully managed. Understandably, the scale and pace of development has, in some instances, resulted in suboptimal outcomes. The lessons learned in other jurisdictions provide valuable insight to the practices and processes that can be improved.

The key findings of these investigations are:

- Strategic assessment is required to enable a comprehensive sub-basin wide baseline from which project-level and cumulative impacts can be identified, assessed and managed.
- The comprehensive baseline must be informed by independently-led project-independent studies that are participatory.
- Mitigation strategies and management measures must be developed through collaboration between territory and local government, industry and communities.

The highest risk issues identified in the investigations relate to Aboriginal communities and their unique circumstances. Aboriginal communities are beset by complex issues that are products of history, their current circumstances, and evolving policy.

The remoteness of the Beetaloo sub-basin and gas fields will naturally mitigate some impacts experienced in more densely populated areas where regional centres and towns provide opportunities for colocation of facilities. For example, it is expected that accommodation facilities will be located at the gas fields and remote from Aboriginal communities, thereby avoiding the effects of rapid population increase and competition for housing in vulnerable communities. In these circumstances, the key issue will be how to create opportunities for the people on whose country the gas fields will be developed.

Aboriginal communities are disadvantaged by their lack of experience of unconventional gas development, knowledge of its techniques and impacts, and how they are managed, and most importantly, how these relate to their country and circumstances. Awareness, education and participation in the planning and development process will be crucial to their engagement and ability to put forward ideas and suggestions for involvement in the industry and opportunities to benefit from the industry.

While independently-led baseline studies and independently-led community and stakeholder engagement may build community confidence in the planning and development process, it is crucial that proponents own the relationship with communities. Proponents need to develop working relationships with communities that are built on trust, respect and cooperation. CSRM and CSIRO's recommendations must have regard to the important role proponents play in community and stakeholder engagement and in supporting the strategies for managing the socioeconomic impacts of unconventional gas development.

Effective communication methods that build trust should incorporate:

- Raising awareness of the unconventional gas industry, the contemporary technology employed and environmental performance achieved (complex technology needs to be explained effectively to non-technical lay persons).
- Industry site inspections for community leaders and members to observe industry exploration and production activity, including the deployment of environment management measures in practice.
- Making available technical leaders to engage in dialogue around issues with community members and leaders.
- The allowance of adequate time to establish an authentic dialogue with Aboriginal communities.
- Environmental monitoring, management and reporting measures that include on-going community participation in planning and implementation.

Equity is a key issue in the distribution of benefits from resource projects. CSIRO noted that where this occurred, a 'social licence to operate' was more forthcoming. A key concern raised in the SIA case study and community consultation was the risk of dividing Aboriginal communities between the 'haves' and 'have nots' through royalty distribution.

Consideration must be given to the establishment of a transparent royalty distribution mechanism so that regional areas that host gas development may benefit commensurate with the impacts to which they are subject. This will involve novel approaches to the distribution of benefits under statutory agreements, for example Indigenous Land Use Agreements, where benefits are currently paid to the Traditional Owners registered as Native Title claimants.

4.1. Recommendations

A 'social licence to operate' for an unconventional gas industry, as explained by CSIRO (2017) is possible with implementation of the SIA Framework proposed by CSRM (2017). The Beetaloo sub-basin SIA case study and associated consultation has confirmed that inclusive, well-informed engagement with affected communities is critical to achieving a 'social licence to operate'. The following recommendations will facilitate the quality and effectiveness of the engagement, leading to an environment in which informed decisions can be made about the social, economic and cultural impacts of an unconventional gas development. The recommendations require a collaborative approach – which experience has shown – produces the best outcomes.

Recommendation 1
The SIA Framework proposed by CSRM (2017) is implemented with appropriate lead time allowed for compiling a comprehensive social baseline. The framework to be implemented is to have regard to the following recommendations.

Recommendation 2
Shale gas development proponents and the Northern Territory Government enter into a memorandum of agreement to share socioeconomic data to enable compilation of a comprehensive sub-basin social baseline that is periodically updated.

Recommendation 3
Shale gas development proponents enter into a memorandum of agreement for cost recovery of expenditure on baseline study, whereby late entrants who benefit from the comprehensive social baseline proportionally fund the work of the first movers.

Recommendation 4
A representative consultative committee comprising the Northern Territory Government, shale gas development proponents and community representative bodies is convened to deal with sub-basin wide issues and to integrate government and industry initiatives with community aspirations where appropriate.

Recommendation 5
Shale gas development proponents implement awareness and education programs for affected communities that provide basic information on unconventional gas development, its impacts and their management ahead of discussion about impacts associated with a particular project. The programs involve suitably qualified technical experts to answer community questions and involve visits to operating unconventional gas fields to assist community representatives understand the activities and nature of impacts.

Recommendation 6
The Northern Territory Government implements an awareness and education program on unconventional gas industry regulation that informs affected communities about the approval process and their rights under the applicable statutory processes including access to land.

Recommendation 7
Shale gas development proponents build, own and maintain relationships with communities and are involved in consultation and the compilation of social baselines supported by independent consultants and technical experts.

Recommendation 8
Aboriginal community engagement adopts a structured approach that incorporates preparatory meetings, dialogue on social values, industry awareness and education meetings, project-specific meetings covering proposed development and implementation issues. The meetings are timed and structured to accommodate the needs of each community noting the different issues confronting communities including the potential need for interpreters.

Recommendation 9
Independent monitoring and evaluation is implemented and designed to differentiate industry-related impacts from other impacts and identify the extent to which industry-related impacts exacerbate or ameliorate other impacts. The CSIRO's principles for a 'social license to operate' measurement and modelling framework are incorporated in the design of the monitoring and evaluation program.

Recommendation 10
Social programs and mitigation strategies are to be adaptive and able to be refined to accommodate the findings of monitoring and evaluation of programs and initiatives.

Recommendation 11
Novel approaches, including those proposed by CSRM (2017), to the distribution of benefits (relative to impacts) are investigated to ensure equity within and between communities.

SMI CSRM
Centre for Social Responsibility in Mining

A framework for Social Impact Assessment of shale gas development in the Northern Territory

Final Report
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SMI CSRM
Centre for Social Responsibility in Mining

The Centre for Social Responsibility in Mining (CSRM) is a leading research centre, committed to improving the social performance of the resources industry globally.

We are part of the Sustainable Minerals Institute (SMI) at the University of Queensland, one of Australia's premier universities. SMI has a long track record of working to understand and apply the principles of sustainable development within the global resources industry.

At CSRM, our focus is on the social, economic and political challenges that occur when change is brought about by resource extraction and development. We work with companies, communities and governments in mining regions all over the world to improve social performance and deliver better outcomes for companies and communities. Since 2001, we have contributed to industry change through our research, teaching and consulting.

Executive Summary

Background

This report is one component of a larger task to develop and pilot a framework for social impact assessment specifically relating to potential shale gas development in the Northern Territory (NT). The task was commissioned by the Independent Scientific Panel (the Panel) for the Inquiry into Hydraulic Fracturing in the Northern Territory and awarded to Coffey Services Australia (Coffey). Coffey engaged the team at the Centre for Social Responsibility in Mining (CSRM) at the University of Queensland's Sustainable Minerals Institute to:

a) review current literature on best practice social impact assessment;
b) review the current regulatory environment for social impact assessment in the NT;
c) review case studies of similar onshore unconventional gas development; and
d) develop a 'fit for purpose' leading practice SIA framework for shale gas development in the NT.

This report presents the work undertaken by CSRM.

Purpose

The purpose of this report to provide to the Panel a framework for SIA specific to shale gas development in the NT that is based on leading practice and lessons learned from similar developments elsewhere. The SIA framework presented in this report also informs the accompanying Beetaloo sub-Basin case study report, which is produced separately by Coffey.

Methods

CSRM conducted a review of academic and leading practice literature on SIA, a review of the regulatory environment for SIA in the NT, and distilled lessons learned from case studies of similar developments elsewhere. From these reviews, CSRM developed a conceptual model for a SIA framework that addresses the specific circumstances of shale gas development in the NT. This conceptual model was internally peer-reviewed by senior CSRM researchers, who have substantial international experience in SIA, indigenous agreements and community relations in relation to extractive industries. The conceptual model was then distilled to show the steps involved in implementing the approach. The models are presented and explained further in Section 4 of the report.

Key findings

Key components of a leading practice SIA Framework for shale gas in the NT

1. ***Strategic assessment*** is needed for a program of development. The strategic assessment would clearly identify the objectives of the program and define the scale (and staging) of development in terms of balancing economic, social and environmental impacts at local, Territory and national scales.
2. A ***strategic regional approach*** is needed that aligns individual projects and their outcomes with the objectives of the NT Economic Development Framework, regional planning objectives and community values and aspirations.
3. ***Coordination and collaboration between multiple projects*** is needed in order to minimise negative cumulative impacts, minimise the 'footprint' of the industry in the placing of

associated infrastructure (including workers 'accommodation) and maximise long term social and economic benefits to local and regional communities.

4. Particular attention to ***human rights issues***, and the rights and vulnerabilities of all Aboriginal peoples, (not only those recognised as Traditional Owners).
5. Particular attention to ***psycho-social impacts***, in recognition of the interconnectedness of personal, cultural and environmental integrity for Aboriginal peoples. Also, in recognition of the potentially stressful nature of land access agreements for pastoralists.
6. An ***independently led social baseline assessment***, using 'agreed indicators' to measure impacts, ongoing social performance of the industry and sustainability outcomes (the indicators should be selected in consultation with local people and stakeholders).
7. An ***independently led community engagement*** program with affected stakeholder groups to discern the significance of impacts and to co-develop acceptable and appropriate mitigation and enhancement strategies.
8. The SIA framework should contribute to an ***open data policy*** with ***regular reporting*** on the social, economic and environmental performance of the shale gas industry.
9. Each additional project should provide an adaptive SIA risk assessment that specifically addresses ***cumulative impacts*** and its contribution to the development program's objectives.

Gaps in the current NT regulatory environment for SIA

1. There are currently no mechanisms for strategic assessment (including strategic SIA) under NT regulations, although implementing strategic assessment has been accepted as a recommendation in a review of environmental assessment policy (the 2015 Hawke Report).[1]
2. There is scope for a strategic assessment under the *Environmental Protection and Biodiversity Conservation Act (*EPBC Act*) 1999 (CW)*, where matters of national environmental significance (MNES) may be affected. A map of protected matters[2] shows there are few matters that would trigger the EPBC Act in the NT. However, if the current 'water trigger' for coal seam gas and large coal projects was to be amended to include shale gas development (as water from underground aquifers is intended to be used) by the Commonwealth government, all NT projects would be required to gain *EPBC Act* approval.
3. SIA is required only as a subset of an environmental impact assessment, and as such, has the potential to be undervalued in the approvals process.
4. While generic guidelines exist, there are no industry specific guidelines for conducting an SIA in the NT where there is a uniquely high proportion of Aboriginal people and interests.
5. There are currently no requirements or guidelines for cumulative impacts assessment.

Lessons learned from similar developments elsewhere

1. The scale and pace of development determines the significance of social impacts. So too does the pre-existing / pre-project social, economic, political and cultural environment.
2. The terms of 'co-existence' between shale gas and agricultural (or other industries) need to be negotiated on a business-to-business, case-by-case basis.

[1] Hawke (2015)
[2] Australian Government, Department of the Environment and Energy, (2017) Protected Matters Search Tool http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf

3. Social impact mitigation strategies should not be bilateral agreements (e.g. government placing conditions on operators), nor overly prescriptive (e.g. operator must construct 50 new houses). Instead they should involve local communities (and other key stakeholders who have a role to play), be aligned with their aspirations and needs, and be 'outcomes-focussed'.
4. The social impacts of shale gas development are unevenly distributed. Those with capacity and information can prosper while inflexible or vulnerable groups can be negatively affected.
5. 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.
6. 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 can have a large influence on the process. But not to lose sight of the importance of managing relationships at the ground level, especially in remote areas.
7. Local institutions need to be strengthened (ideally prior to 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
8. Underlying much of the public concern about hydraulic fracturing (fracking) and the shale gas industry generally has been a lack of engagement of affected people in meaningful ways (particularly prior to the current Inquiry). Aboriginal people particularly require detailed information about the proposed activities and likely impacts of the industry to make informed decisions about their land.

Recommendations

1. Initiate mechanisms for strategic environmental assessment of a specific program of shale gas development (e.g. Beetaloo sub-Basin) in either NT regulations (as recommended in the 2015 Hawke Report), or in partnership with the Commonwealth government in a Strategic Assessment Agreement under the *EPBC Act* 1999.
2. The Terms of Reference for strategic environmental assessment should include various specialist assessments, including cultural impact assessment. Due to the interconnectedness of Aboriginal peoples and their culture with environmental condition, predicting the significance of social (cultural) impacts (particularly for Aboriginal people, but also pastoral leaseholders) requires the integration of social, environmental, economic and cultural assessments.
3. Consult with the Commonwealth Department of the Environment and Energy in relation to possible amendments to the 'water trigger' under the *EPBC Act* to apply to shale gas projects, as it does for all coal seam gas and large coal projects. If the 'water trigger' were also to apply to shale gas projects, then Territory assessment processes must align with Commonwealth assessment requirements to avoid duplication.
4. Establish or enhance an independent authority (separated from government decision making) for the oversight of the strategic assessment, baseline studies and ongoing monitoring and reporting, as well as for social and environmental compliance auditing. This could be the existing NT Environmental Protection Agency to avoid structural complexity and the fragmentation of decision making that has confounded the effective regulation of the industry in other jurisdictions.

5. Collaboration and coordination between projects, and between gas companies, government and community organisations is necessary for effective identification, assessment and responses to cumulative impacts. A platform for such collaboration (such as a multi-stakeholder working group) would ideally be linked with the ongoing monitoring platform and come under the jurisdiction of the same independent Authority.
6. Third parties should be able to report grievances, or perceived breaches of conditions to the independent Authority where grievances relate to cumulative impacts and issues beyond the scale of project-level grievance mechanisms.
7. The costs of undertaking independent baseline studies (usually conducted by project proponents) should be recovered to an extent from project proponents (who would no longer have to do them individually, but who would use the available data in their risk assessments) by increasing the cost of the petroleum production license (PPL) for operators and/or by charging an annual levee or fee for use of the baseline data and ongoing monitoring and reporting platform.
8. Produce clear guidelines and simple fact sheets for negotiating Land Access Agreements in different tenure types that outline the rights of both the landholder and the project proponent. Considerable stress and negative impact has been associated with misunderstood land rights and perceived disrespect for attachments to, and interests in land.
9. Identify strategies to build local institutional and business capacity early. To best capture the potential economic benefits of shale gas development, adequate lead-time and institutional, business and individual capacity is required.
10. Negotiations with Aboriginal Traditional Owners (TOs) should be inclusive and transparent (on agreement). General informed consent is insufficient. Details of activities should be negotiated in recognition of rights to self-determination and to ensure these groups fully understand the terms of the project and the impacts, benefits and management strategies. The placement of each well and associated infrastructure should be negotiated on a case-by-case basis with local TOs to avoid any culturally sensitive places, and 'sacred sites' as identified by the Aboriginal Areas Protection Authority (AAPA). The process for such negotiations should be fully documented.
11. Royalty payments should not be exclusive to TOs, but a community benefits trust, or other fund designed to distribute economic benefits to regions should be established. (e.g. 'Royalties for Regions' schemes such as in Queensland and Western Australia).
12. Perceptions or evidence of negative impacts on the spiritual wellbeing and social cohesion in Aboriginal communities should be given high priority in risk assessment, as personal safety could be at risk.

Contents

1. Social Impact Assessment

1.1 What are Social Impacts?

Social impacts are the changes experienced by people and communities, as a result of projects and activities that impact on the way they live work, relate to one another, relax and organise themselves.[3] Social impacts can be both positive and negative as Illustrated in the Table 1. They include "changes to the norms, values and beliefs that guide and rationalise their cognition of themselves and their society".[4] Social change is not an impact until it has an effect on people. Because social impact is conceived as being anything linked to a project that benefits, affects or concerns any impacted stakeholder group, almost any change can potentially have a social impact so long as it affects something that is valued by or important to a specific group of people.[5] Consequently, it is difficult to pre-emptively narrow the scope of analysis.

Major resources projects can generate multiple impacts and/or contribute to existing stresses within social systems.[6] Project-specific social impacts vary greatly in their nature, causation, magnitude and other characteristics (see Table 1 for classification). Depending on the context, different receiving environments (such as a social group or geographic region) may experience the same impacts differently.[7] It is the responsibility of the proponent, in consultation with project-affected peoples and other stakeholders, to ensure that all the relevant issues and impacts are identified and considered.

Table 1: Classification of social impacts[8]

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; e.g. population increase
Causation	Direct	Directly connected (in space and time) to the activity; e.g. resettlement, project-related employment and road construction

[3] Burdge & Vanclay (1996).
[4] The Interorganizational Committee on Principles and Guidelines for Social Impact Assessment (2003), p. 231.
[5] Vanclay et al (2015), p. 2.
[6] Franks et al (2010a).
[7] Ibid.
[8] Adapted from Initiative for Responsible Mining Assurance (2016); Burdge & Vanclay (1996); Franks et al (2010b); and Joyce & MacFarlane (2001).

	Indirect	Impacts that occur due to actions resulting from direct impacts; usually less obvious, later in time or further away from the source of direct impact; e.g. increased income to tradespeople as project employees upgrade houses
	Induced	Cause is several times removed from project activities; e.g. 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; 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[9]
Magnitude	Intensity	The scale of change from the existing condition as a result of the impact; e.g. major/critical, high, moderate, minor, negligible
	Geographic extent	Spatial concentration (e.g. site-specific, local, regional, widespread);[10] Distribution (e.g. localised, dispersed, contained)
	Duration	Short term (e.g. the noise arising from the operation of equipment during construction), medium term, long term (e.g. the inundation of land by a dam) Temporary (e.g. during construction), fixed term, permanent
	Frequency	Intermittent (e.g. blasting), continuous (e.g. 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

1.2 What is Social Impact Assessment?

In general terms, social impact assessment (SIA) is a framework of analysis for the evaluation of impacts on humans and on the ways in which people and communities interact with their socio-cultural, economic and biophysical surroundings.[11] SIA is also a field of research and practice consisting of a body of knowledge, techniques and values.[12]

As a methodology, SIA is used by governments, companies and communities to identify, assess and manage the social impacts of project activities, and 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

[9] The word "cumulative" anticipates a consideration of not just the development the subject of the application, but the development in combination with other development in the locality and the effect that the accumulation of such development and successive development of a similar type, will have on the community.
[10] 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.
[11] Vanclay (2003).
[12] Ibid.

interventions, on affected communities, from the earliest stages of the planning process to future generations.[13] The objective of the SIA process is to identify, measure, predict and assess the effects of a project on the surrounding population's quality of life, culture, health, social interactions and livelihoods. It involves processes for analysing, monitoring and managing the intended and unintended consequences of a project.[14]

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 environmental impact assessment (EIA). According to a 2012 survey, some form of EIA is mandated in 191 of the 193 nations of the world.[15] Despite the widespread and longstanding practice, in most cases SIA remains included as a component of EIA. Initially, SIAs were narrowly conceptualised and, as such, applied mainly at the project level, and were limited to prediction of the negative consequences of projects. This understanding of SIA continues to dominate policy, regulation and procedures in many jurisdictions.[16]

1.3 Leading Practice

SIA has the potential to contribute to sustainable development if it is implemented to the standard recommended in the literature as best or leading practice.[17] This growing body of literature provides detailed guidelines and benchmarks for the management of the social impacts of major resource developments. Several influential publications, mainly commissioned and published by the International Association for Impact Assessment (IAIA), have had the greatest impact on SIA practice.[18] Their most recent publication, *Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects*,[19] published in 2015, provides detailed advice on leading practice in the undertaking and appraisal of SIA and the adaptive management of projects to address the social ramifications. The guidance serves as the definitive standard on leading SIA practice.[20]

[13] Vanclay (2003); Franks (2012), p. 6.
[14] Vanclay (2003).
[15] Morgan (2012).
[16] Vanclay (2006).
[17] Esteves et al (2012). The term "best practice" means cutting edge or leading, and thus good to advocate, but cannot be expected in all circumstances.
[18] The IAIA is the global authority on the leading practice in the use of impact assessment for informed decision-making regarding policies, programmes, plans and projects. The association provides an international forum for advancing innovation and communication of leading practice in impact assessment.
[19] Vanclay et al (2015).
[20] It is widely used by SIA practitioners, social performance teams, government regulators, the international finance community, NGOs and affected community representatives to benchmark performance in relation to the management of social issues arising from projects.

1.3.1 Key assumptions and elements

Box 1 outlines the key assumptions about SIA practice which are fundamental to the effective assessment and management of impacts.

***Box 1: Underlying assumptions of SIA*[21]**

- **Prediction**: Many of the potential social impacts of planned developments can be anticipated.
- **Modification and alternatives**: Alternatives of any planned developments can be considered or plans modified to reduce their negative social impacts and enhance their positive impacts.
- **Mitigation**: Full consideration of potential mitigation measures is appropriate in all cases.
- **Sustainable Development**: SIA can be an integral part of the development process ensuring sound development alternative(s) rather than merely trading off costs and benefits.
- **Action oriented:** Findings of a well-conducted SIA can be used to provide practical guidance and recommendations to proponents and governments.
- **Alignment and coordination:** Considering impacts holistically in relation to community and government planning and preferred futures and the activities of other developers in a region can identify synergies and opportunities to coordinate with others or jointly manage, monitor and mitigate where appropriate**.**
- **Proportionate:** Effort and resources invested into the SIA should be commensurate with the risks and potential impacts.
- **Rigor:** Accepted social science methods, used appropriately by suitably qualified professionals and, where practicable using multiple data sources, provide well-substantiated results that are a valid basis for informed decision-making.
- **Intangible impacts:** Unlike many economic and environmental impacts, social impacts cannot be fully quantified and measured as they have intangible and subjective dimensions which must also be assessed.
- **Transparency:** Project affected people need full information about the proposed development, methodology and data sources to understand the basis for SIA findings.
- **Varied forms of knowledge**: Local knowledge and experience and acknowledgement of various local cultural values provide important input to any assessment.
- **Non-coercive:** There should be no use of violence, harassment, or intimidation in connection with the SIA or implementation of a planned project.

Leading SIA practice includes systems and strategies to both minimise adverse impacts and enhance the benefits associated with major developments for project-affected communities (see Box 2 for a summary of key elements of leading SIA practice).

***Box 2: Elements of leading SIA practice*[22]**

Leading practice SIA is based on systems and frameworks that include the following elements:

- **Inclusiveness:** identifying and involving the full diversity of potentially affected people
- **Equity sensitivity:** fundamentally considering equity issues with particular attention paid to impacts on vulnerable and under-represented groups

[21] Franks (2012), p. 8.
[22] Adapted from Franks (2012) and Kemp et al (2013).

- **Lifecycle approach**: identifying and proposing responses to social impacts at all stages of development projects from inception to completion
- **Long term legacy**: outlining long-term development outcomes that reach beyond the life of the project and consider future generations
- **Human rights due diligence**: identifying, preventing, mitigating and accounting for project impacts on legal, traditional and human rights of local communities.
- **Ongoing engagement**: regularly engaging with project affected people, communities and government, seek active community participation in decision-making, fostering coordination, and partnering with local stakeholders to address issues of concern and mutual interest
- **Materiality:** prioritising issues and public concerns that are of most significance and relevance
- **Social investment and community development**: building the capacity of communities to minimise dependency on major projects and face future changes resiliently.
- **Coordination of cumulative impacts and social investment strategies**: jointly coordinating with multiple proponents and government in a region the management, monitoring and mitigation of cumulative impacts of development and associated social investment activities.
- **Continuous improvement, adaptive management and flexibility**: systems for actively responding to changing circumstances and increased knowledge of impacts and updating predictions

1.3.2 Cumulative Impacts

The alignment of activities with regional and/or community planning objectives, consideration of cumulative impacts of multiple projects and meaningful community participation in decision-making are important elements of leading SIA practice. The aim of cumulative impact assessment and management is to keep the total effects of all stresses at what are generally considered to be 'acceptable' levels (although defining 'acceptable' can be problematic in itself, as this can vary between stakeholder groups) and to enhance opportunities through multi-party co-ordination.[23] Depending on the scale and significance of the project, cumulative impacts can be identified and assessed as part of environmental impact assessments (EIA), SIA, regional or strategic assessments, or may be the subject of a focused study devoted to identifying and responding to cumulative impacts.[24]

Stakeholder participation and decision-making in the SIA process is crucial for improving the quality of the assessments and, ultimately, achieving social acceptance. The SIA process will bring most benefits to local communities and project-affected people when it is supported by a participatory engagement approach (see Box 3 for definitions and key differences between communities, stakeholders, rights-holders and project-affected people).[25]

[23] Franks et al (2010a), p. 2; IFC (2013).
[24] Franks et al (2010a), p. 23.
[25] Kemp & Owen (2013).

Box 3: Communities, stakeholders, rights-holders and project-affected people

Community refers to a grouping of people who have some sense of shared identity, beliefs and values, some shared interactions and some common social and political institutions.[26] The concept can be defined geographically, by proximity to an operation and political or resource boundaries, or socially, as a grouping of people with common interests.[27]

The general assumption is that people live and work in communities, which are therefore a primary focus in SIA.[28] Local communities are groups of people who live and/or conduct activities in close geographical proximity to the operation or within a surrounding area defined by a political or resource boundary. Regional communities live and/or conduct activities in wider geographic areas that may be impacted by the development.

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively.[29]

Rights-holders are individuals and groups whose legal or traditional rights may potentially be impacted by a development. For example, in the Australian context the Native Title Act gives native title holders a right to access and use their traditional lands and to negotiate over future use of these lands. Arguably, rights holders are entitled to a greater voice in the assessment and approval process than those whose rights and interests are unlikely to be directly affected by a development. All people are rights-holders under international covenants and are entitled to a certain standard of well-being.[30]

Project-affected persons/people encompass any person, group or organisation that is directly (or in some significant way) affected by a project's activities.[31]

The above groups are not mutually exclusive and a person can belong to any combination of them simultaneously.

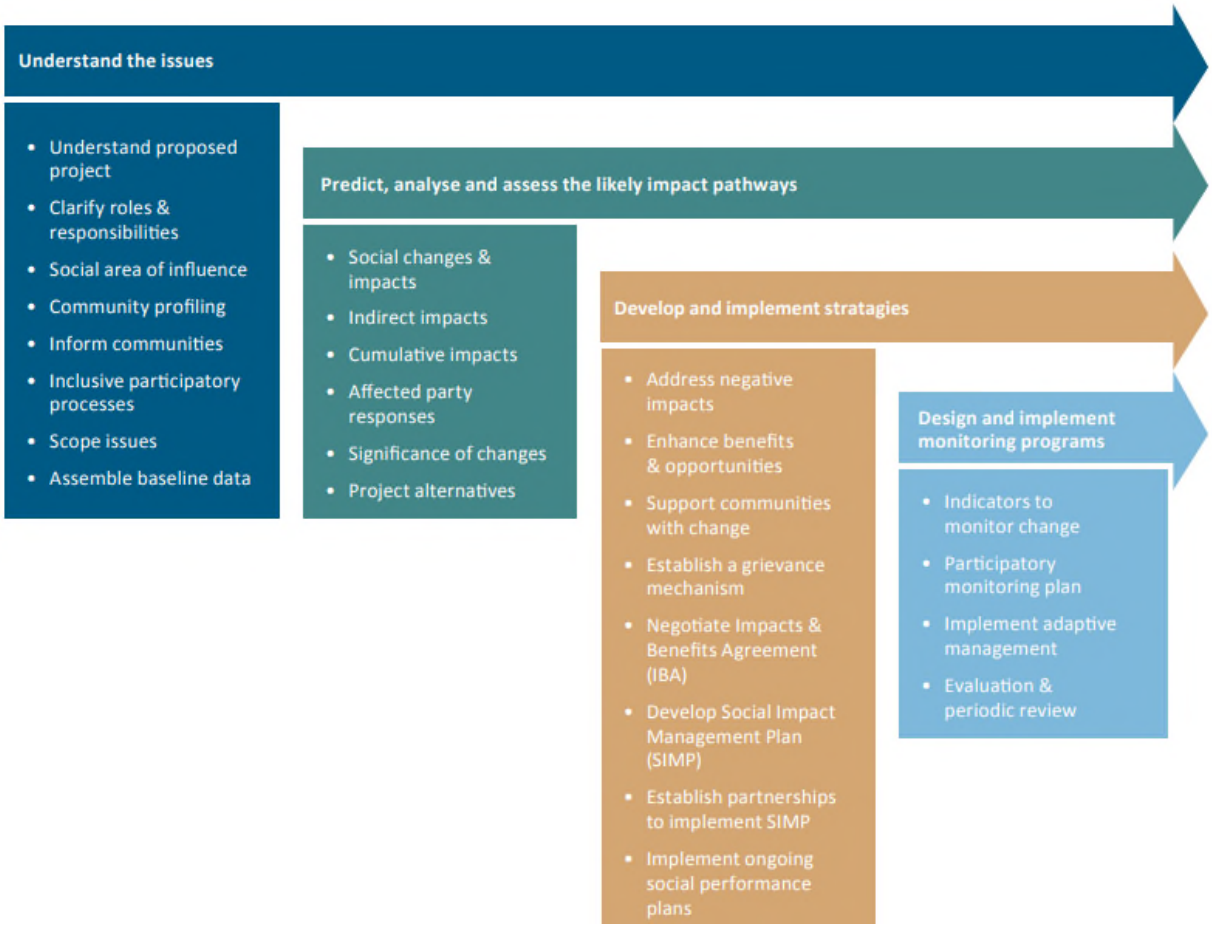
1.3.3. Components of leading practice SIA

The SIA process is a composite of numerous activities or tasks. The selection of activities to be undertaken should be tailored depending on the requirements of each project (see Figure 1 for a list of 26 activities).[32] Activities are carried out using a wide range of qualitative and quantitative social research methods and tools devised for SIA practice.[33] The selection of methods is dependent on what needs to be measured and on the broader SIA objectives. An integrated approach that combines several methods and tools provides

[26] Vanclay et al (2015), p. 76; IFC (2014), p. 137.
[27] IFC (2014), p. 137.
[28] Vanclay et al (2015), p. 76.
[29] IFC (2007); Kemp et al (2013); Vanclay et al (2015), p. 86.
[30] Kemp et al (2013); Vanclay et al (2015), p. 92; Boesen & Martin (2007).
[31] The World Bank (2012); Vanclay et al (2015), p. 91.
[32] For further detail on each activity, see Vanclay et al (2015), pp. 36–63.
[33] A kit of social assessment tools and methods, published by the World Bank, provides additional detail and comprehensive guidance on tools and methods in SIA. See Rietbergen-McCracken & Narayan (1998).

the most comprehensive and reliable prediction of impacts and associated mitigation and management strategies. Trained social scientists employing social science methods often provide the best results.[34]

Figure 1: The phases and activities of SIA[35]

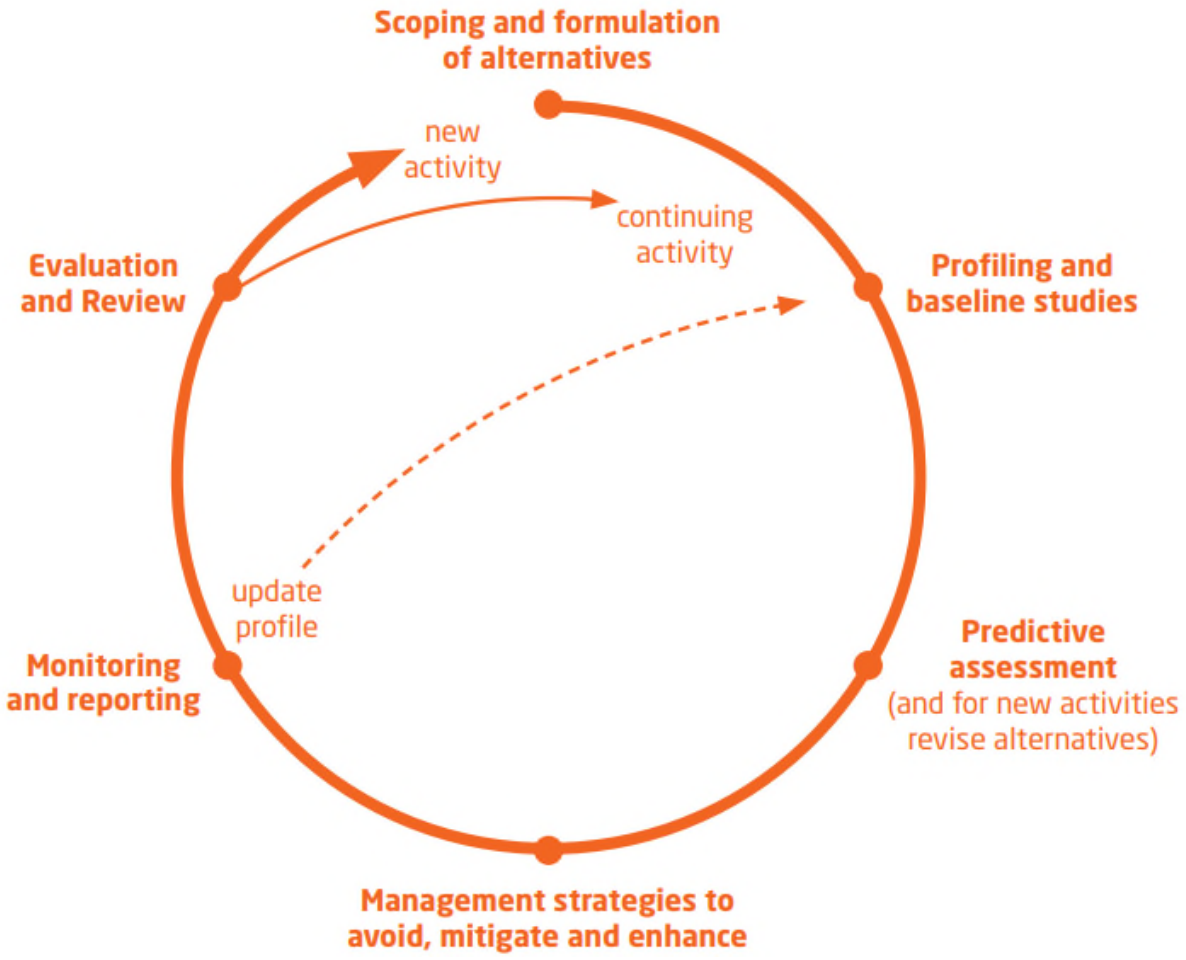


SIA is most effective as an iterative process across the lifecycle of developments, rather than a one-off activity at the outset of project development.[36] Leading practice involves the application of management systems and strategies to monitor, report, evaluate, review and proactively respond to change throughout the life of the project which, in the case of resources projects, extends to closure.[37] Under the adaptive participatory management approach, SIA is considered to be a learning process, in which initial assumptions and preliminary understandings need to be regularly updated based on new data and analysis. It requires update and validation informed by on-going consultation with project proponents

[34] Sustainable Business Initiative (2015).
[35] Vanclay et al (2015), p. 7.
[36] Franks (2012).
[37] Franks et al (2009).

and other stakeholders. The SIA process, based on an adaptive participatory management approach, can be arranged conceptually into distinct but iterative phases (see Figure 2).[38]

Figure 2: The phases of SIA within an adaptive participatory management approach[39]



1.4 Issues Specific to Shale Gas Development

Hydraulic fracturing of shale gas is a form of unconventional gas mining. The Northern Territory's (NT) onshore gas is predominantly shale gas trapped in shale rock, which requires hydraulic fracturing. Assessing the social impacts of hydraulic fracturing requires an examination of the ways in which social, psychological, health and political change processes associated with shale gas developments are impacting, and are likely to impact, the daily lives, beliefs, values and community dynamics of the residents in this region.

The social impacts of shale gas development have been studied. Evidence from North America suggests that despite the different technologies used in shale gas development and evolving characteristics of natural resource extraction, communities are experiencing many

[38] Franks (2012).
[39] Franks (2012), p. 6.

of the same social impacts documented in earlier 'boomtown' studies that focussed on different resource commodities, including conventional gas.[40]

Extractive projects (mining and oil & gas) have common features which set them apart from other large-scale development projects. In particular, these projects:

- are very sensitive to market volatility with boom and bust cycles causing rapid up and downscaling;
- involve many uncertainties about the projects with the size and configuration of the project emerging progressively and incremental expansion of the project as additional resources are discovered or accessed, which can substantially change the characteristics of impacts;
- are often associated with significant impacts over an extended period; and impacts changing across the project lifecycle (exploration, construction, operation, closure);
- often create significant legacy issues related to post-closure landscapes and other socio-economic legacies such as the ongoing maintenance of project-sponsored infrastructure, an oversupply of housing, and where there has been economic dependence on the project, a narrow skills base; and
- are increasingly located in rural and remote areas meaning that small communities and Indigenous people are particularly vulnerable to negative impacts.

There are also unique sets of features associated with different types of extractive projects. Whereas mining activities are geographically contained in the vicinity of a deposit, and the mine operator has legal rights over the lease area, onshore oil and gas extraction is geographically dispersed, and surface rights holders may use land in co-location with oil and gas production. For example, gas well pads can be located on grazing properties or farms.

Although not exclusive to extractive projects, some social changes generated by major developments are particularly pronounced (in part because of the characteristics of the 'receiving environments') and warrant detailed assessment of impacts. While this is not comprehensive list, these generally include changes in:

- population, housing and/ or land availability and affordability;
- social division between 'newcomers' and 'old-timers'
- unemployment and income levels;
- traffic flow and patterns;
- noise levels, the quality and quantity of water, and air quality; and
- the character and identity of a community and people's well-being that can have a more significant impact than any material or tangible changes.[41]

[40] Schafft et al (2014); Council of Canadian Academies (2014).
[41] Franks (2012).

While shale gas development may provide significant, albeit varied economic benefits, it can also place stress on communities in relation to:

- community services - such as policing, health and emergency preparedness due to the 'boomtown' effect;
- quality of life and well-being - due to the combination of diverse factors related to the alienation of land, construction of new infrastructure, perceived threat to water quality, additional truck traffic and noise, loss of rural serenity and anxiety about unknown impacts;
- health and safety - issues related to truck traffic and the sudden influx of a large (predominantly male) transient workforce.
- psychological impacts - from physical stressors, such as noise, and non-physical stressors such as disempowerment, perceived lack of trust in the industry and government.

These factors are particularly relevant to the NT context and the ability of Aboriginal people to maintain their traditional way of life. In Canada, for example, several First Nations have expressed concerns about the possible impacts of shale gas development on their quality of life and their rights.[42] In the NT, proposed shale gas development may occur largely in the traditional territories of Aboriginal people who depend on the local environment for food and water and whose culture may be particularly affected. Specific monitoring of impacts on Aboriginal peoples' physical and mental health, social well-being, quality of life and ecological systems on which they depend, is therefore essential. This includes not only direct impacts of shale gas development on health, communities and cultures, but also indirect and long-term impacts of intrusion into traditional territories and economic and social activities.

The type, frequency, and severity of social impacts are highly dependent on the scale and pace of different phases of development and on the physical, economic and social environments in which shale gas development takes place. People living in proximity to areas that experience rapid and large-scale development of gas production using fracking are particularly at risk in terms of social impacts. Research on the social impacts of fracking highlight the importance of having a robust and comprehensive monitoring system in place *before* significant shale gas development occurs. SIA should also evaluate short-term, cumulative and long-term social impacts, and consider mechanisms for addressing social needs of vulnerable populations.[43]

[42] Ibid.
[43] Council of Canadian Academies (2014), p. 150.

1.4.1 Industry standards

The International Petroleum Industry Environmental Conservation Association (IPIECA) is the peak international body for sustainability issues in the oil and gas industry. Its membership includes: the Australian Institute of Petroleum, the World Petroleum Council, BHP Billiton, BP, Shell, ConocoPhillips, Inpex, Petronas, Santos, and Woodside among others. *A Guide to Social Impact Assessment in the Oil and Gas Industry* provides managers of existing oil and gas operations or new projects with an understanding of how to make the best use of SIAs.[44]

IPIECA members are committed to:

- Contribute to sustainable development by providing safe and reliable energy in an environmentally and socially responsible manner
- Conduct their operations and activities in accordance with applicable law related to environmental and social issues and ethical business practices
- Seek to improve their performance in addressing environmental and social issues
- Develop, share and promote implementation of sound practices and solutions with others in industry
- Engage with stakeholders, taking into account their expectations, concerns, ideas and views, and work with government and nongovernment organizations (IPIECA, 2008).

1.5 Complementary Documents, Plans and Strategies

Leading SIA practice is supported by jurisdictional benchmarks and guidelines, and complemented by plans, strategies and processes that are typically undertaken as part of, or in parallel with, the SIA process.

1.5.1 Social baseline assessments

Leading SIA practice is based on rigorous, methodical and detailed social baseline assessment of the social environment before the project. The baseline data become a reference point, along with other benchmark values, against which potential impacts can be anticipated, change measured and future situations compared. The baseline study should include conditions and trends at the project site and along the supply chains including places where the associated service activity is located. It often includes secondary data but should be supported by both quantitative and qualitative primary data from recent on-the-ground research.[45] The reliability of SIAs can be jeopardised by suboptimal baseline data caused by the lack of rigour with respect to methodology, sources and assumptions.[46] Inconsistencies

[44] IPIECA (2004).
[45] The Queensland Government (2013).
[46] Pope et al (2013).

in methodology, scope and depth of SIAs are most pronounced in jurisdictions which lack specific terms of reference, such as guidelines or benchmark standards.[47]

Quantitative data can be accessed from the Australian Bureau of Statistics, longitudinal census data, various government agencies and online data portals. Qualitative data may be sourced from stakeholder engagement activities, community development strategies, plans and other research. The type of information required in a baseline assessment includes:

- community history and culture;
- population;
- workforce participation, employment and diversity profile;
- housing and accommodation;
- education and training;
- business, industry and economy;
- income and cost of living;
- social infrastructure;
- technology and communication services;
- community health and safety;
- transportation and access; and
- other, including socio-economic advantage and resilience, relevant economic modelling and cumulative impact data.

Quantitative and qualitative data captured in the development of the social baseline study should be compared, aligned and analysed using appropriate social science research methods like triangulation, and cause and effect analysis.[48]

1.5.2 SIA guidelines

The scope of SIA differs from country to country, depending on the institutional arrangements that are in place. Some governments publish SIA guidelines, which usually outline the underlying principles and purpose of an SIA and the role of the stakeholders; followed by a description of the SIA process along with detailed guidance for preparing the SIA. Examples from several jurisdictions can be accessed via the following links: The European Commission (guidelines, guidance), Greenland, New South Wales, Northern Territory and Queensland.

SIA guidelines often provide detailed technical guidance that addresses the application of SIA at the project level and at all project phases. They can improve the quality and utility of SIAs for these projects and related processes (e.g. social baselines and social management plans) by providing:

- criteria for the inclusion of the interests and values of stakeholder groups in the planning process;
- information to project proponents about SIA process and expectations;

[47] Howitt (2011); Michella & McManus (2013).
[48] The Queensland Government (2013)

- assistance to all parties – proponents, community, regulators and key decision makers – to enable more effective use of SIA information and processes; and
- assurance that community engagement and participation are enshrined as important features of all SIA-related activities.

The availability of a guidance document does not necessarily correlate to leading or good practice.[49] In fact, there is concern in many jurisdictions over the poor quality of impact assessment guidance information and over the difference between guideline requirements and actual practice (e.g. how well is SIA actually regulated). The tendency in some guidelines to advise that appropriate tools and processes should be selected by practitioners to suit context and circumstances may be inadequate for practitioners who lack the experience and expertise to make such judgments. In those instances, more detailed operational guidance is needed on how to make sound methodological choices and select the best available methods.[50] There is also a need for regulators to have sufficient level of expertise in order to understand what they are looking for in an SIA.

1.5.3 Social management plans

Social management plans (SMPs) describe management actions that can be taken at each stage of a project to avoid or mitigate social impacts and maximise benefits.[51] Over the past decade, SMPs have emerged as a vital link between impact assessment, ongoing management and proactive response to social and community issues. SMPs may be developed in partnership with regulatory agencies, investors and community, and identify the responsibilities of each party in the management of impacts, opportunities and risks. Governments and finance institutions, such as the IFC, increasingly use SMPs as requirements for project approval and finance.[52] SMPs are usually supported by management plans that outline how specific impacts of a project, such as resettlement, community health and safety or cultural heritage, will be managed.[53]

SMPs provide the facility to coordinate project activities with service and infrastructure planning by government. They also provide an opportunity to link activities with local and regional planning processes and, if developed with reference to the management plans of other operations, can assist in predicting and managing cumulative impacts, a key component of any consideration of impact assessment effectiveness.[54]

[49] Morgan (2012); Adelle & Weiland (2012).
[50] Noble et al (2012).
[51] SMPs are also referred to as social impact management plans, environmental and social management plans, social and labour plans and environmental and social action plans.
[52] See IFC Performance Standard 1. International Finance Corporation (2012).
[53] Vanclay et al (2015).
[54] Franks et al (2009).

1.5.4 Strategic and regional assessments

Over the past two decades considerable progress has been made by extractive companies in improving the environmental and social track record of large extractive projects, and the tools available to plan and manage them in a sustainable manner. Traditionally EIA and, more recently, SIA, has been the mechanism of choice to address these issues at the planning stage. However, while EIA/SIA provides a clear practical framework for evaluating the environmental and social effects of specific projects, it is typically focused on a single proposed development rather than an analysis of the wider environmental and social impact of development activity throughout a region. It is not designed to address strategic decisions which often influence the actual development of a country or a region or decisions related to a project entry. Increased attention has thus been given to new assessment types more suited to address strategic environmental, social and economic issues at national and regional level.[55]

Strategic assessments are assessments done at the scale of a policy, plan or program, while regional assessments may be at the scale of a minerals or resource province, catchment, or political jurisdiction. Strategic and regional assessments may be undertaken during, or prior to, the establishment of a new type of industry, extraction method, or exploitable resource. The advantage of such approaches is that they:

- facilitate the early identification and resolution of potential issues when there is the flexibility to make changes;
- provide an opportunity for longitudinal and comparative research;
- may more effectively identify existing and potential cumulative impacts;
- may explicitly link assessment to regional planning and reporting; and
- can establish baseline and regional datasets that assist the development of region-wide monitoring efforts.[56]

A strategic assessment can be the most appropriate form of assessment for regions involving multiple stakeholders or complex, large-scale actions. Strategic assessments are often promoted as a method to more effectively account for cumulative impacts because they are:

- broader in spatial and sometimes temporal extent;
- they may make explicit regional standards, thresholds, and links to land use planning; and

[55] Wagner & Jones (2004).
[56] Franks et al (2010a).

- they often establish regional databases, protocols, management systems and tools for implementation (e.g. the definition of thresholds and methods for allocation within limits).[57]

In some jurisdictions, government-led strategic and regional assessments may establish the conditions for future development and reduce or remove the requirements for project-specific impact assessments prior to regulatory approval, if the proposals meet the conditions outlined in the assessment. Such an approach has obvious benefits for business as it can:

- lead to better delivery of social infrastructure and services, as well as better environmental outcomes;
- provide certainty for development proposals;
- reduce the potential for consultation fatigue;
- reduce the regulatory burden and shorten the approvals process;
- avoid the duplication of project level assessments; and
- inform developers about the environmental and social context in which they operate.[58]

In Australia, a lack of legislation enabling or requiring strategic assessment may explain a lack of widespread practice [59]

2. Regulatory Framework in the Northern Territory

2.1 Social Impact Assessment

SIA is widely practised internationally (usually as part of EIA) as a contributing study that is considered as part of the regulatory approval process for extractive projects. In federal systems of government, oversight and enforcement of compliance with environmental and SIA regulation is commonly at the sub-national (e.g. state or provincial) level. Under the Australian federal system, the regulation and development of natural resources (including project approval and assessment) are primarily the responsibility of state and territory governments. Consequently, SIA is almost exclusively defined under state and territory based schemes.

In the Australian context, there are significant differences between the approaches taken by the various states and territories, although assessments in all cases form part of the EIA process. As a component of EIA, SIA retains aspects of its earliest conceptualisation as a subset and subordinate form of EIA in which social issues are often not adequately

[57] Ibid.
[58] Ibid.
[59] Marsden 2013

addressed (see Box 4 for more detail).[60] Similar to other Australian jurisdictions, SIAs in NT are focused on predicting impacts related to a specific project and are integrated within EIA, as part of the project approval process.

Box 4: key issues to consider when SIA is a subset of EIA

When SIA is included as a subset of EIA as commissioned by the proponent, a common objective is to produce a document for the EIA that will warrant that development consent is granted. Such practice can be characterised by a lack of integration between SIA and the ongoing and adaptive management of social and economic issues once a project commences and after an operation closes.[61] A recent study demonstrates that the role of the SIAs in the EIA programmes and reports is minor: measured in number of pages, the assessments account for three to four per cent of the total.[62]

When integrated within EIA, SIA tends to focus on the predictive aspects rather than incorporate the participatory component.[63] In the NT, as in many other jurisdictions, a requirement for community engagement only applies *after* an initial development application has been submitted. Research shows that this approach is generally procedural and often lacks substantive impact.[64] A once-only snapshot of the social environment as a baseline does not address the requirement for ongoing social relations, nor for adaptive management of issues as they arise throughout the life cycle of the project.

The *Environment Protection and Biodiversity Conservation Act* 1999 (*EPBC Act*) is the Commonwealth's key environmental legislation. The *EPBC Act* is focussed on the protection of matters of national environmental significance (MNES). MNES of most relevance to the NT include listed threatened species and communities, listed migratory species, Ramsar wetlands and national heritage places. Protected matters also include water resources in relation to large coal mining and coal seam gas developments (the 'water trigger'),[65] but *not shale gas developments*. Thus, shale gas developments currently do not require approval under the *EPBC Act* (unless there are other protected matters involved) and are currently only subject to approvals under relevant state or territory legislation.

Environmental (and social) approvals in the NT are regulated under the *Environmental Assessment Act* (*EA Act*) and the *Environmental Assessment Administrative Procedures* (*EA Administrative Procedures*).[66] The *EA Act* and associated procedures commenced in 1984 and have not been subject to significant amendment since that time. The *EA Act* and the *EA Administrative Procedures* establish the framework for the assessment of potential or anticipated environmental impacts of proposed developments. The *EA Act* defines 'environment' as "all aspects of the surroundings of man including the physical, biological,

[60] Esteves et al (2012); Prno & Slocombe (2012).
[61] Franks et al (2009); Esteves et al (2012).
[62] Suopajärvi (2013).
[63] O'Faircheallaigh (2010); Gillespie & Bennett (2012).
[64] João et al (2011).
[65] Power & Tomaras (2016).
[66] See http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/nt/consol_act/eaa294/.

economic, cultural and social aspects."[67] The NT Environmental Protection Authority (NT EPA) administers the *EA Act*. The NT EPA is an independent authority established under the Northern Territory *Environment Protection Authority Act*. The NT EPA consists of a Chairperson and four appointed members who can provide expert advice in relation to a range of environmental, economic and social issues. The roles and functions are set out in the *EA Act*, the *Environment Protection Authority Act* (*EPA Act*) and the *Waste Management and Pollution Control Act* (*WMPC Act*) and these include compliance and enforcement activities.

Proponents are required to develop assessments commensurate with the scale and complexity of their proposals as determined in the NT EPA terms of reference for an Environmental Impact Statement (EIS) or Public Environmental Report (PER).[68] The assessment of projects under the *EA Act* may require the preparation of an Economic and Social Impact Assessment (ESIA) and an accompanying Economic and Social Impact Management Plan (ESIMP). An ESIMP generally forms one component of a broader Environmental Management Plan (EMP).[69]

The generic NT *Guidelines for the Preparation of an Economic and Social Impact Assessment* provide a basis for proponents to prepare assessments of social impacts of development proposals and accompanying ESIMP. The guidelines provide advice to proponents on the NT EPA's expectations for the assessment and management of social impacts of development projects assessed under the *EA Act*. The guidelines are aimed at assisting proponents in achieving the following objectives:

- documenting the economic and social impacts of a proposed development on the locality and region;
- mitigating negative economic and social impacts on the locality and region;
- encouraging development of new and/or expansion of existing businesses in the locality; and
- fostering sustainable development and community wellbeing.

The guidelines are limited to generic matters relating to economic and social assessment and do not address sector or proposal-specific issues that may be of significance. The guidelines require that social assessment is based on consultation with and involvement of the community, and that it includes:

- a description of local and regional social environment;

[67] Ibid.
[68] A decision on the appropriate permitting process for new project proposals is initiated by the proponent's submission of a Notice of Intent (NOI) to the NT EPA. If the NT EPA determines that assessment under the EAA is required, the agency must also determine the appropriate level of assessment (EIS or PER).
[69] The Northern Territory Government (2015), p. 5.

- a development proposal;
- potential social impacts;
- measures for maximising social benefits and minimising social costs; and an ESIMP, which establishes the roles and responsibilities of the proponent, government, stakeholders and the community in mitigating and managing impacts throughout the life of a project.[70]

2.2 Key Gaps and Recommendations

The current regulatory framework for SIA in the NT does not match leading practice standards outlined in Section 1 (Box 2). This section addresses three key identified gaps in the NT's current SIA framework and outlines recommended reforms which may lead to improved regulatory system (see Table 2).

Table 2: Summary of key gaps and recommended reforms in the NT's SIA framework

Gaps	**Recommendations**
The EPA's roles and functions are set out in three separate pieces of legislation.	While retaining the NT EPA's independent role, setting out its roles and functions in one piece of legislation would reduce uncertainty and ambiguity, and would strengthen the regulatory system.
Cumulative impact assessment remains under-developed.	Strategic assessment should be utilised as a method to more effectively account for cumulative impacts and improve the approval pathway for potential shale gas developments.
ESIA guidelines are generic and lack industry relevance and sector-specific guidance.	Guidelines should be developed specifically for mining, petroleum production and extractive industry development, which can lead to better quality and utility of SIAs for these projects and related processes.

1. Setting out the EPA's role, function and objectives in three separate pieces of legislation has contributed to a degree of uncertainty about its core remit. Communities usually have greater confidence in environmental assessment outcomes and approval processes when there is independent authority acting as a check and balance against capture by sectoral interests in the system. Reducing ambiguity, while retaining the EPA's independent role, would strengthen the environmental regulatory system by increasing clarity and certainty. It would also increase system efficiency without undermining the environmental standards.[71]

2. Cumulative impact assessment remains under-developed in the NT, as in most jurisdictions in Australia and elsewhere. Cumulative impact assessment requires greater cooperation between proponents operating in the same area, and the involvement of

[70] Ibid.
[71] Hawke (2015).

regional authorities.[72] In both New South Wales and Queensland, impact assessment procedures require proponents to address cumulative impacts. In practice these requirements are specified in the terms of reference or assessment requirements of the impact assessment. Strategic assessment (see section 1.5.4) should be utilised in the NT as a method to more effectively account for cumulative impacts and improve the approval pathway for potential shale gas developments.[73] An independent agency, in this case the EPA, would be best suited to administer and regulate strategic assessment of shale gas development in the NT. Well executed strategic assessment of shale gas development at the planning stage would be beneficial in the NT context, as it can:

- remove the need for further environmental impact assessment later in the development approval process;
- resolve high level trade-offs between development, environmental and other values in a transparent way;
- provide certainty about which areas are suitable for development;
- establish the performance requirements and outcomes to be achieved from multiple developments in a region;
- establish clear requirements that projects need to meet and remove the need for detailed assessment of particular issues at the project level;
- be a useful means for improving baseline data and making it available to Governments and proponents; and
- facilitate future Commonwealth accreditation under the *EPBC Act* strategic assessment provisions, which if achieved, would streamline Commonwealth/Territory decision making.[74]

3. The NT ESIA guidelines provide a basis for project proponents in the NT to prepare estimations of social impacts of development proposals and accompanying ESIMP. However, the guidelines are generic and, as such, lack industry relevance and sector-specific guidance. Some leading practice jurisdictions (e.g. New South Wales) have developed SIA guidelines specifically for mining, petroleum production and extractive industry development.[75] Sector-specific ESIA guidelines for proponents should be developed in the context of broader strategic assessment process. Sector-specific SIA guidelines can take into account the different phases of exploration, development, production and post-production in the life cycle of the industry. If developed, such guidelines can lead to better quality and utility of SIAs for these projects and related processes (see section 1.5.2).

[72] Morgan (2012); Esteves et al (2012).
[73] Hawke (2015).
[74] Ibid.
[75] The New South Wales Government (2017).

3. Developing a SIA framework for shale gas development in the Northern Territory- key considerations

3.1 Macro-factors

3.1.1 Australian natural gas in the global market

Australia is divided into three natural gas markets due to the geographical isolation of the western and northern markets from the large eastern market. Natural gas production is therefore either consumed within each market or exported as liquefied natural gas (LNG).[76] In 2015, Australia became the world's second-largest LNG supplier after Qatar, supplying 12% of globally traded volumes. In 2016, Australia's share in global LNG supplies increased to 17%.[77] Australian LNG exports increased by 52% in 2016 and will continue to increase throughout 2017 and 2018 as new projects are brought on line. Australia is forecast to rival Qatar as the world's largest LNG exporter by 2021.[78]

LNG accounts for the bulk of recent resources and energy investment in Australia. It is Australia's third-highest goods and services export behind iron ore and coal. Australia was the first country to have had seven LNG projects under construction at the same time since the A$200 billion investment boom entered its full swing in 2007 and 2008. However, the global LNG industry has changed dramatically over the past decade. Most of the projects were commissioned at the height of the commodities boom, when the oil price was near the US$100/barrel mark and demand showed no sign of easing. The overriding sentiment, which has been exacerbated by the decline in the price of oil since 2014, is that most of Australia's new LNG projects are not competitive globally and are costlier than competitors in North America or Africa.[79] While record-breaking, the simultaneous construction of seven new LNG projects with a combined capacity equal to 25% of current global LNG demand has been described as "one of the worse investment cases of the last decades in the oil and gas sector."[80]

The future sustainability and profitability of Australian LNG exports are predicated on a high oil price and a voracious appetite for natural gas in Japan, China and South Korea, Australia's major current and future customers. Global LNG export capacity is forecast to increase by 45% between 2015 and 2021, and 90% of additional capacity will come from the US and Australia. The oversupply in global LNG markets is already causing fierce competition among suppliers as substantial volumes of lower-cost LNG move into Asian markets. As a consequence, Australian projects at the high end of the supply curve are increasingly

[76] Vivoda (2017).
[77] GIIGNL (2017).
[78] Vivoda (2017).
[79] McKinsey & Company (2013).
[80] Maugeri (2014).

vulnerable.[81] Moreover, since oversupplied market conditions are likely to persist well into the next decade, it is unlikely that any undeveloped natural gas resources, such as in the Beetaloo Sub-basin, will become economically viable.

3.1.2 Boom-bust cycles and resource dependency

Research has found that dependence on extractive industries as the primary economic driver can affect a region's longer term economic growth. Extractive industries can have a 'crowding out' effect on resources (both physical and human) which may limit opportunities for growth in other industries. A review of literature found that resource-intense economies also tend to have greater income inequality and higher levels of conflict or social division.[82] Expanding extractive industries will draw labour and resources from other industries and from other places. This period of rapid growth usually includes an influx of workers, new infrastructure to accommodate them and upgraded local services and is sometimes referred to as a 'boom' period. In a 'boom' period, local prices for goods and services are often inflated, placing additional strain on those not participating in the extractive industries. Many of the most visible social impacts are experienced in the 'boom' period.

Extractives industries, and particularly the petroleum sector, are characterised by price volatility arising in international markets. When prices fall, extraction can be slowed and infrastructure 'moth-balled' until the prices rise again. Workers' contracts may be terminated or renegotiated for lesser wages and local content spending may fall. The industry response to a drop in commodity price can be swift and communities may feel the economic effects quickly. This 'bust' period can be associated with an oversupply of housing and services as the high level of demand experienced during the 'boom' drops off. 'Bust' scenarios can be mitigated. There are increasing examples of businesses, communities, states and nations who have successfully avoided the full effects of a 'bust' period. This involves planning ahead, deliberately saving a proportion of the proceeds that may accrue for future use, and using the period of growth to foster alternative industries and economic diversity.

3.1.3 Native Title and Land Tenure

Australia's First Nations peoples have common law rights to their traditional land and waters established by the commonwealth *Native Title Act* in 1993. Where it has been legally recognised, native title gives Traditional Owners (TOs) the right to live and camp in an area, conduct ceremonies, hunt and fish, collect food, build shelters and visit places of cultural importance. Shale gas development activities in NT are likely to occur on land that is subject to the *Aboriginal Land Rights Act* (*ALR Act*) or *Native Title Act*, making TOs and other Aboriginal people who live on this land, key and direct stakeholders in any SIA.

[81] IEA (2016).
[82] Stevens (2003)

The *Native Title Act* is likely to affect most applications for petroleum titles due to the extent of native title interests in land in the NT. Aboriginal people who hold, or have claimed, native title rights over land will have to be consulted about proposed activities on the land. In the NT, fracking is labelled as petroleum mining and regulated by the NT *Petroleum Act*. As stipulated in the *Petroleum Act*, all petroleum exploration permit applications are subject to the right to negotiate process, which requires negotiation with registered native title holders or claimants in order to obtain consent for future activities.[83]

There are four main types of land tenure in the Northern Territory:

- Crown land;
- Freehold;
- Aboriginal freehold; and
- Pastoral leasehold.

As elsewhere in Australia, crown land in the NT refers to all land which is "remaining" that is not freehold title and is still held by the Crown. Crown land is regulated by NT Crown Lands Act and is vested in the NT government. The government may give another person the ability to manage or control that land. Freehold land implies that the government has passed all interest in the land, other than sub-surface resources and water, onto the owner. An example of freehold land is the average house block in a city or town. Crown land and freehold land are not affected by native title.[84]

Most land in the NT, outside of townships, is either pastoral leasehold or Aboriginal freehold land over which native title rights can exist. Pastoral leasehold is land which is owned by the government and leased to a private individual or company for pastoral purposes. This may include cattle grazing, crop growing or pastoral based tourist activities. Pastoral land is subject to native title.[85] Aboriginal freehold land is unique to the NT as it does not exist in any other state or territory in Australia. It came into being in 1976 when the *ALR Act* was passed, converting former Aboriginal reserves into permanent Aboriginal freehold. Aboriginal freehold land is inalienable freehold title, meaning it cannot be sold. It is referred to as 'schedule one' land, and is formally held by an Aboriginal land trust. Any application to explore for petroleum on Aboriginal freehold land has to be negotiated through the process laid out in the *ALR Act*. Grant of an exploration licence or permit on Aboriginal freehold land can only go ahead after consultation with the TOs through their representative land council, and an agreement reached. The TOs have the right to refuse access to their land or refuse permission for exploration.[86]

One problem with this approach is that only TOs who have been formally identified and validated (i.e. 'qualified') and whose ownership of land has been formally recognised under the *Native Title Act* have rights to negotiate the terms of an agreement with a resource

[83] The Northern Territory Government (2017a).
[84] The Northern Territory Government (2017b).
[85] The Northern Territory Government (2017c).
[86] The Northern Territory Government (2017d).

company. They too, are the only people who have rights to royalty payments or other benefits arising from the agreement. Additionally, unlike under *ALR Act*, the *Native Title Act* does not give TOs powers to stop development taking place. The social impacts of a shale gas industry are geographically spread (in comparison to those associated with a discrete mine site) and are likely to affect a number of different Aboriginal groups and families. Not all of these will have formal TO representation, or for various reasons, they may not be included in a share of the benefits. Thus under the current consent mechanisms, particularly those based on the *Native Title Act*, there is the potential for significant inequality between those affected and those receiving compensation and benefits. This in turn could lead to increased social unrest and potentially conflict, both intra-community and conflict aimed at other entities, such as the company or government. The strategic and participatory approach to SIA recommended in this report is an attempt to address this inequality, as there is a focus on community benefits and capital building, with the process of developing strategies to mitigate negative impacts and enhance positive impacts being open to all.

The main consideration surrounding land tenure is that different tenures require different forms of 'consent' in order for project activities to proceed without interference or interruption from dissatisfied stakeholders. Types of 'consent' range from broader community acceptance to individually negotiated agreements with pre-identified, or 'qualified' communities (see Table 2).[87]

In the NT, a 'shared land use' policy is in place, which supports the exploration and mining of minerals on all land tenures, including pastoral land. The strategic approach recommended in this report emphasises regional planning and it may be that this policy should be reviewed to allow the designation of high value agricultural lands, areas of heightened sensitivity (such as where there may be conflict over land ownership and recognition) and 'no go zones' for shale gas development

Table 3: Land tenure in the NT and types of 'consent'

Land tenure	Type(s) of 'consent'	Principles/Pathways	Challenges
Crown Land (about 50% of land mass - ***which includes*** 44% pastoral lease)	'Contingent' consent [88] Often (mis)understood as a 'social license to operate'[89].	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.

[87] O'Faircheallaigh (2007). 'Qualified' communities are those who have been through a formal process of identification and verification as being Traditional Owners of land under the *Native Title Act* 1993 (Cth).
[88] Levi (1997, p.8) in Owen and Kemp (2012).
[89] Owen and Kemp (2012).

Freehold (0.5% 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	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** [90] 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

3.1.4 Historical context: unique to the NT

Any attempt to understand social impacts or social change in NT communities as a result of shale gas development must consider the complex and fraught history of government interventions and policies designed to bring about social change and economic development in these communities. This includes 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. Particularly, the expulsion of Aboriginal people from cattle stations in the 1960s concentrated the Aboriginal population of a large area onto the traditional country of a few, and this has brought with it social complexity as family groups strive to both maintain their individual cultures and identities and live harmoniously together.[91]

Additionally, in order for Aboriginal families to claim rights to traditional land and water, and have those rights recognised under the Commonwealth *Native Title Act* 1993, 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. Commonwealth Native Title policy, while having the objective of empowering Aboriginal people by granting legal rights of traditional ownership, has the additional effect of encouraging Aboriginal families to live in very remote areas, or 'on country', mostly without access to treated water, energy or

[90] Stevens (2003)

[91] Ross (1990)

sanitary services and with very few opportunities for employment. Being able to access, utilise and care for 'country', thereby maintaining a connection to traditional land and practices is vitally important to many Aboriginal people (regardless of whether they are formally recognised as TOs). Any fragmentation or degradation of the landscape translates directly into social and cultural impacts.

Despite recent approaches to social and economic policy that are more holistic and inclusive of Australian Aboriginal and Torres Strait Islands people and culture, there remain significant inequalities in health and well-being between Aboriginal and other Australians, most of which are shaped by the disadvantaged social and economic conditions in Aboriginal communities.[92] The implication for SIA is a learned mistrust of projects that promise improved social and economic outcomes. For SIA and social performance practitioners, impact mitigating and social investment strategies must be developed with active involvement by Aboriginal people.

3.1.5 Social (non)-acceptance and lack of trust in the oil & gas industry

In 2014, a global survey of perceptions of corporate social responsibility (CSR) in business found the oil and gas industry to be one of the least trusted sectors, second only to the tobacco industry. Of 24 countries surveyed, Australia had the highest level of mistrust of the oil and gas industry (equal with France, which in 2011 became the first country to ban 'fracking').[93] Correspondingly, a high proportion of Australians thought that the oil and gas industry needs more regulation (only China had a higher proportion of people who think this).[86] To some extent, this widespread mistrust is influenced by a growing global 'anti-fracking' sentiment, found to be prevalent in Australia and Canada, although 'loudest' in the UK.[86]

In the 2014 global survey, the issues that people were most concerned about in relation to the oil and gas industry were prices and affordability, closely followed by environmental impacts. An accompanying media analysis found high levels of concern about environmental impacts, particularly in relation to fracking.[86]

Despite oil and gas companies in Australia mostly reporting good relations with the communities in which they operate, and the industry has co-existed with both agriculture and tourism industries in Australia for decades, there appears to be a rising wave of mistrust in the onshore oil and gas industry at the national (and international) level.

[92] Osborne, Baum and Brown (2013)
[93] Globescan (2014)

3.2 Localised factors- the unique circumstances of the NT

A fit for purpose SIA framework has to consider localised factors such as:

- the remoteness of communities;
- cultural diversity;
- the time and cost involved in travelling long distances to consult with communities;
- sparse populations (can create problems for anonymous participation, data collection);
- mostly undeveloped, natural/cultural landscapes;
- the under-representation of Aboriginal people in Census and statistical data; and
- seasonal access only to some places.

The NT is unique in relation to several social and economic parameters. The NT, which is about one sixth of the Australian land mass is home to only 1% of the Australian population (about 245,000 people). Around 60% of the NT population lives in the capital city of Darwin, 20% of the population live in regional centres such as Alice Springs, Katherine and Tenant Creek, with another 20% living in remote communities. Access to some remote communities can be limited by road and weather conditions. Almost a third of the NT population is Aboriginal, compared to the national average of 3%.[94] About 50% of land in the NT is held in Aboriginal freehold (see Table 2) which includes a right to permit or not to permit access and resource development.

Without the population and associated development pressures of other jurisdictions, Northern Territory landscapes have remained in a mostly 'natural' state, and therefore have important 'wilderness' and amenity values. More importantly, in terms of SIA, NT landscapes are embedded with cultural meaning for Aboriginal peoples (both Traditional Owner groups and others), and the significance of this meaning is often not documented or captured in the domain of science. For example, 'song lines' are believed to be unseen pathways across the landscape that tell and reinforce Aboriginal stories of creation and place, as well as individual identity. The interruption of song lines is believed to have tangible consequences to those connected to the story it tells. This cultural interconnection with the biophysical landscape places Aboriginal people at potentially greater vulnerability to the impacts of shale gas development, as environmental impacts can also be felt as social and cultural impacts.

A description of the Beetaloo Sub-basin as a case study region, and the challenges these unique NT factors presented in developing a social risk assessment, are contained within the Beetaloo Sub-basin Case Study Report.

[94] The Northern Territory Government (2017e)

4. SIA Framework for Shale Gas Development in the Northern Territory

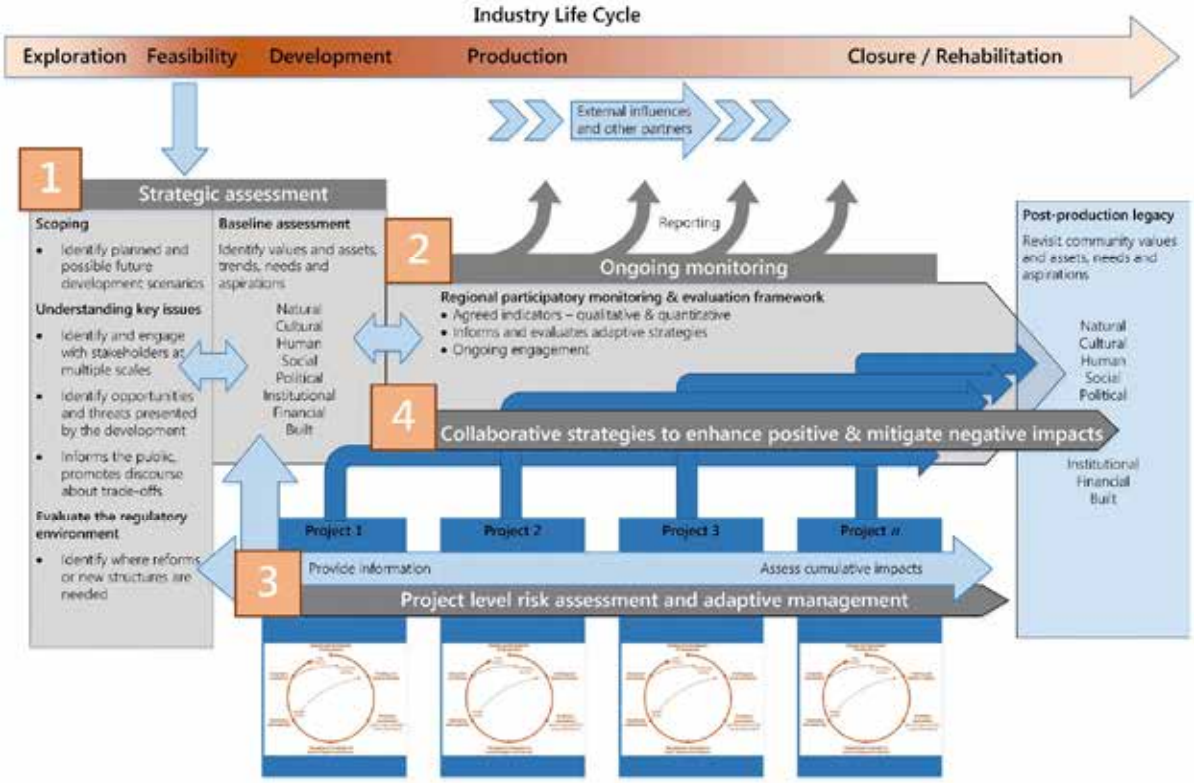
Leading practice SIA involves identifying and managing the social issues that arise from development activities. This includes the effective engagement of potentially affected communities in participatory processes of identification, assessment and the development of strategies to manage social impacts. 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 life-cycle of the project (in this case, the development of a new industry), from conception to post-closure.[95]

The shortcomings of relying on project-based SIAs as a subset of an EIS process have also been discussed. 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.[96] The following sub-sections describe 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.

A conceptual model of the framework is shown in Figure 3 on the following page and explained in the following sections.

[95] Vanclay *et al*. (2015).
[96] Witt *et al*. (2017).

Figure 3: Conceptual model of a Framework for social impact assessment for a shale gas industry in the Northern Territory, Australia.



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4.1 SIA Framework: An industry life-cycle approach

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

It is recognised, however, that social impacts can begin as soon as new information 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.[97] 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. What is needed is a framework that:

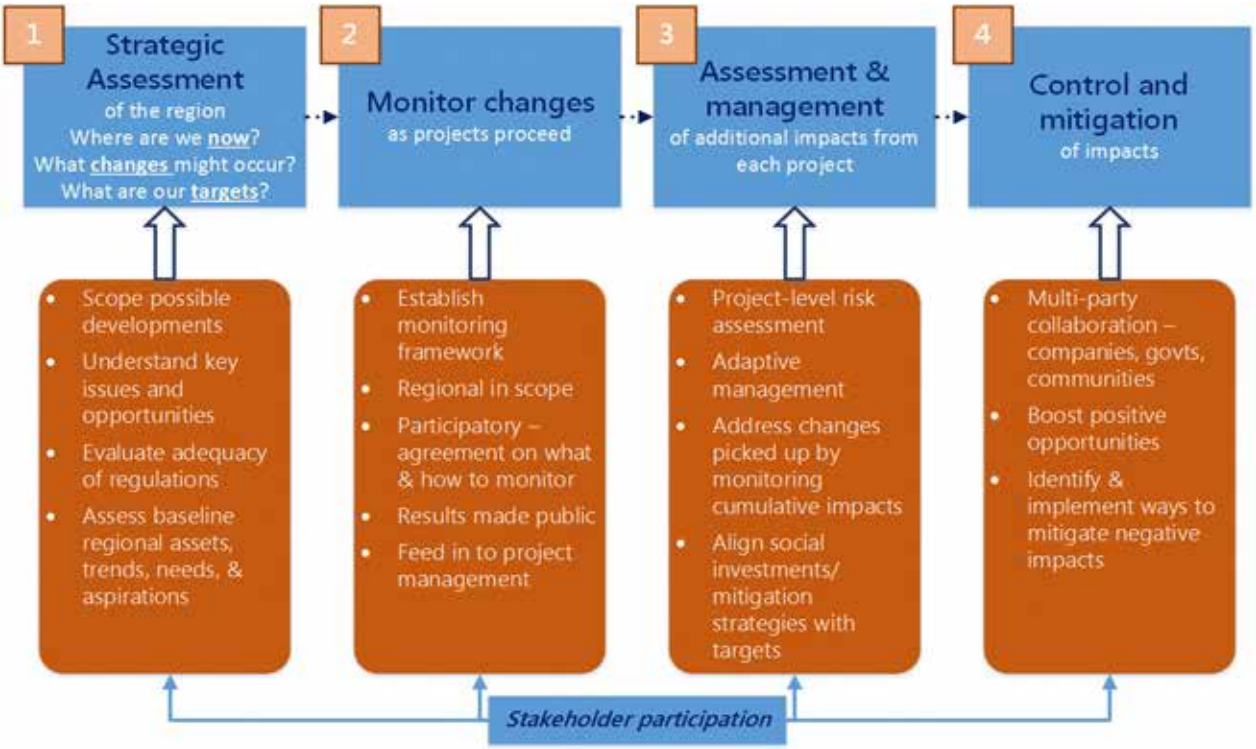
- can identify and respond to impacts that occur across different stages of development;
- can account for a paucity in statistical social and economic data in remote and Aboriginal communities;
- is culturally sensitive;
- can identify strategies to maximise benefits and minimise disturbance that are aligned with the needs and aspirations of affected stakeholders;
- can inform a more strategic and collaborative approach to development of the region; and
- can engage all affected individuals and communities in identifying and managing the impacts without placing undue burden on them.

The conceptual framework presented in Figure 3 holds all the components of a leading practice SIA framework for shale gas development in the NT. The figure shows details of what is needed within each component. Figure 4 is a distilled version of the conceptual framework emphasising the four key steps needed for its implementation.

The steps are explained further in the following sections.

[97] Gramling and Freudenburg (1992).

Figure 4: The implementation steps of the SIA framework



3

4.2 Step 1- A strategic approach

The SIA framework developed here places project-level SIA within a strategic context. We recommend a NT government- led strategic assessment be conducted in the early stages of industry development, once feasibility has been established (that is, an adequate resource base has been proven and considered economically viable), acknowledging that even before then, social impacts will have been felt. This strategic SIA could be done as part of a larger Strategic (Environmental) Assessment, under the Terms of Reference for a Commonwealth/Territory *Strategic Assessment Agreement* under the Commonwealth *Environmental Protection and Biodiversity Conservation (EBPC) Act* 1999 or from within NT processes if reforms were made. Such assessments are currently underway for offshore gas development in the Northern Territory and in South Australia, and were completed for the terminated Browse LNG project in Western Australia. The latter included a strategic social impact assessment, with specialised assessments of cultural and economic values. Strategic assessment is a single overarching assessment that allows for the integration of social, economic and environmental considerations. Given that environmental values and conditions are linked strongly with Aboriginal culture, pastoral production, tourism and social values in the NT, this type of assessment seems most relevant.

The first strategic challenge that a government faces is whether to allow the industry to go ahead and 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 or social and 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 (see lessons from the South African shale gas strategic assessment in section 5.3).

The objective of the strategic assessment proposed here 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, as has been the case in Queensland and in the US.

While there will be 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 a socially 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, but to promote a measured and informed public discourse about the changes the industry could bring. The strategic assessment 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.

In the context of NT's shale gas industry, much of this work has been initiated and carried out by the Independent Scientific Inquiry Panel. The strategic assessment would ensure a transparent and inclusive process (as the Inquiry has sought to). The substantial body of information gathered in this initial step then becomes 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 come in (Step 2).

4.2.1 Scoping and boundary setting

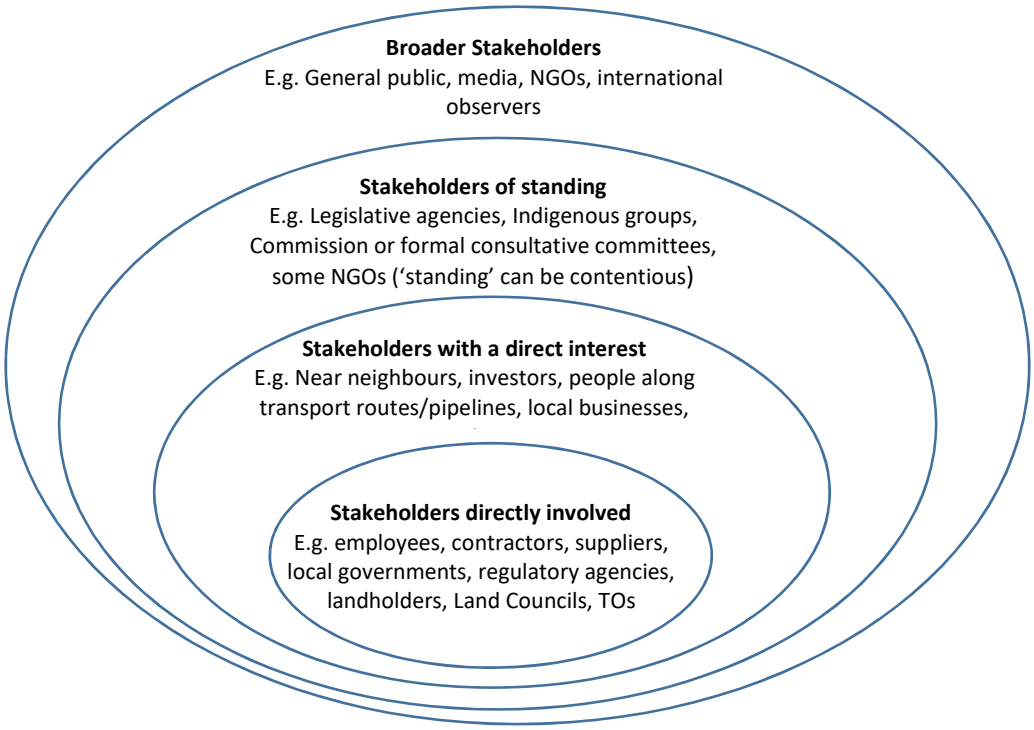
Firstly, the strategic assessment would seek to understand the scale and scope of proposed development. This would be done by collating information from the individual companies about where and how they intend to proceed, and how they might respond under different circumstances. The body overseeing the strategic assessment (who may be an independent unconventional gas regulatory Authority or the existing NT EPA) could have powers to request such information (similar to the GasFields Commission in Queensland). 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. The 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 by 'impact' zones. The industry information is also used to identify planned and possible future development scenarios.

4.2.2 Understand 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 who may be affected.

The stakeholder engagement component of this step is critical, and should follow leading practice stakeholder engagement methods with skilled personnel. We recommend using a 'nested' approach to identifying directly and indirectly affected stakeholders, stakeholders with standing, and interested parties, as illustrated in Figure 4. Information about the concerns and interests of these stakeholders could be organised at local, basin, Territory, National and global scales.

Figure 5: Stakeholder identification by nature of interest and impact.



Providing information and promoting discussion about the industry, its activities and the trade-offs involved is of crucial importance in the early stages. In Queensland, a lack of freely available, trusted information about the onshore unconventional 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 discursive space for controversy and conflict, despite multiple, lengthy EIS and government reports. With the paucity of locally relevant information, those who wanted to know more about the industry looked 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. *Fuel for Thought: a citizen's guide to participating in oil and gas decisions on your public lands* outlines the life cycle of a well, environmental impacts, the legal framework in place, the roles and responsibilities of regulating bodies, as well as how to be 'an effective advocate'.[98] While this document takes a clearly anti-fracking perspective, it nevertheless provides a good example of the type of information people require in order to hold an informed opinion about shale gas industry in their local area.

[98] National Wildlife Federation (2008), p.30.

4.2.3 Regulatory assessment

A strategic assessment of the industry would also evaluate the regulatory and approvals processes in place and identify reforms that may be needed. In the NT, such an exercise has been done in the 2015 Hawke Review and by the Environmental Defenders Office (EDO) Report to the Inquiry Panel. Challenges remain in gaining different types of 'consent' (outlined in Table 2), and especially those relating to 'fairness' in Land Access Agreements and benefit sharing arrangements[99]. The emphasis on setting a robust regulatory regime is deliberate. Previous parliamentary and scientific inquiries into the impacts of a shale gas industry (using hydraulic fracturing) in Australia have concluded that the risks are manageable *provided the industry is properly regulated*.

This component would also look at and consider existing and new governance structures. The NT EPA is an independent Authority that already oversees the project approvals process. This structure could be enhanced to provide it with capacity to perform additional roles in compliance, performance monitoring and reporting as well as providing independent facilitation services to aggrieved landholders and gas companies. In Queensland, the GasFields Commission was established in July 2013 (during the peak of the construction phase of the projects) with powers and functions set out under new regulations, the *Gasfields Commission Act* 2013. Its main functions were to act as an intermediary to facilitate better relationships between landholders, communities and the onshore gas industry. It also plays a key advisory role and has powers to request information from both government departments and gas companies. In 2017, the role of the Gasfields Commission was reviewed, and in light of ongoing disputes between landholders and gas companies, the *Land Access Ombudsman Bill* 2017 was passed to establish an independent, impartial body to facilitate the resolution of disputes in relation to land access, conduct and compensation, and make good agreements, where alleged breaches or additional impacts have occurred.

The enhanced or new structure would oversee the ongoing monitoring program, the repository of data (with powers to request data as required) and facilitate the necessary industry collaboration in relation to cumulative impacts. They may also request that companies work together when engaging with local communities in order to reduce the impacts of 'consultation fatigue'.

4.2.4 Baseline Assessment

Possibly the largest component of the strategic assessment is the collation of baseline data (as this report is about SIA, we focus on social and economic baseline data, but the same approach would be taken for environmental baseline data, particularly where they relate to environmental values with social and cultural significance, possible health impacts, or those

[99] Note that in Queensland, the majority of land access issues were in relation to freehold land, but that is likely to be quite different in the NT where Aboriginal Freehold Land and Pastoral leases are the main land tenures

over which there is widespread concern). Baseline data would usually be collected by consultants as part of a project-based EIA-driven SIA. The shortfalls of this approach for a shale gas industry in NT have been discussed in section 2.3. However, for this step to be taken by a governing body and not by a project proponent is a new development and would require new governance structures and an enduring funding model, linked to the life-cycle of the industry.

The initial baseline data collected would be for regions and/or local communities where development is imminent and would involve significant participation by local residents. Regional baseline data would also be collected. This baseline data would include identification of stakeholder values, and current assets in different types of capital 'stocks', as well as assessing trends, and aspirations for these stocks. We recommend using the Community Capitals Framework (CCF), which is well-established in community development literature and practice.[100] The CCF measures community development in relation to seven types of capitals including:

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

It may also be useful to add:

- **institutional** - e.g. community organisations, the effectiveness of local and regional institutions.

As census and other statistical data is limited or flawed for many of NT's remote communities (they tend to under-represent the Indigenous population), the collection of baseline data for these capitals must be a participatory process. Another leading practice model developed by CSRM and the UQ Centre for Coal Seam Gas is of relevance in this context: 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, using collaborative methods to identify indicators that the industry needs for compliance and monitoring social impacts, that the community agree represent their concerns, values and aspirations and that government want to track 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

[100] Emery and Flora (2006).

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 being promoted as leading practice in program evaluation and has clear relevance to impact assessment in data-poor regions.

The baseline assessment would identify initial stocks of capitals, but also trends, where possible and importantly identify local and regional goals and aspirations in relation to these capitals. This information can be used by project proponents, who would still need to submit a comprehensive social risk assessment for the approvals process that outlines how their proposed activities would impact either positively or negatively on the community capitals stocks, and the strategies they propose to take to either enhance or mitigate them.

4.3 Step 2: Regional participatory monitoring & evaluation framework

In 2009 CSRM identified leading practice in SIA as having in place regional and systems level monitoring for resource regions, 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.[101] In late 2016, the Queensland Government released the draft Queensland Gas Action Plan which attempts to translate ongoing community concerns about and challenges within the gas industry into actionable items.[102] A key action item is the development of an online, open-access data repository for a range of industry-related information, including monitoring and compliance data. This is seen as a positive action for building trust in the industry, which is essential for building and maintaining public acceptance.

An additional value of the ongoing, participatory regional monitoring and evaluation database is that it reduces the risk of 'consultation fatigue' as multiple proponents seek information to inform their social risk assessments. In CSRM's experience in Queensland's gas fields communities, multiple and extensive consultation events (from EIA/SIA consultants, resource companies, governments, media and researchers) placed high demands on peoples' 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 idea of the online database is that it becomes an open-access resource for information. Each project-level risk assessment would be uploaded and any new indicators and data about communities would be added to the database. Ideally, communities themselves could provide data and upload data updates to the relevant indicator timeline. This would give communities ownership of the data. As the UQ Boomtown Toolkit has demonstrated, the

[101] Franks *et al*. (2009)
[102] Queensland Government, Department of Natural Resources and Mines (2016).

data can also be used by communities for funding applications, to allocate resources, to argue a need for investment, or purely to advocate themselves and their assets.

In addition to the open-access resource, there would ideally 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 reported in the accompanying Report on a Social Licence to Operate. This reporting work is best done by an inter-disciplinary and purpose-specific research institution, such as the University of Queensland's Centre for Coal Seam Gas (CCSG), or CSIRO's Gas Industry Social and Environmental Research Alliance. UQ's CCSG already produces Annual Reports for Queensland's Gasfields Communities, which are widely used by local and state governments, CSG companies and community groups.

The identification and management of cumulative social and economic impacts remains a key issue in Queensland gas fields communities. A comparison of social impacts of CSG development as predicted in an individual company's EIS/SIA and those identified in a study of cumulative socioeconomic impacts in the Surat Basin highlighted the importance of coordination across impact assessment studies in the region so that strategies contribute to an overarching monitoring framework.[103] A strategic and regional approach to cumulative impact assessment enables gas companies to form partnerships with other companies, service providers and communities, for negotiated and agreed community development outcomes. 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. The monitoring framework is designed to enable adaptive responses. Each project would provide information about their intentions for future development. This would allow industry forecasting and amendment to the initial development scenarios generated in the strategic assessment. The lifespan of the monitoring framework should last throughout the lifecycle of the industry, which is about 40-50 years. However, the frequency of data updates would be flexible and determined by institutional capacity, sequential development of projects, and 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 may be to create the online data repository, have all data from project-based EIS/SIAs uploaded, with conditions in place for any future projects in the region to collaborate and adapt to new information. The monitoring framework would set the agreed indicators to be monitored, with flexibility to be able to adapt to emerging issues as they arise, but responsibility for the data updates,

[103] Witt *et al*. (2017)

once the baseline is established, would be shared by the gas companies and local communities (similar to the UQ Boomtown Toolkit).

Additionally, the NT government could recover costs for the strategic assessment/fund ongoing assessment by increasing the cost of a petroleum license (PL). Currently, a company applies for an exploration permit under the *Petroleum Act* 1984 (NT), administered by the Department of Primary Industry and Resources, Energy Directorate, at a cost of A$5,280.[104] Once a resource is found, even if still being assessed for commercial viability, the gas company can apply to convert the exploration permit into a production-retention license (PL) (valid 5 years) at a cost of A$3,967.[97] Increasing the cost of a PL for companies would ensure that gas companies contribute to the up-front costs of initial and ongoing impact assessment.

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

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

Under the SIA framework proposed here, each project would still submit an SIA with a comprehensive risk assessment that would consider:

- the whole life cycle 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, ability to be mitigated/enhanced;
- 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); and
- assessment of residual risks;
- standardised reporting out.

An industry-specific project life-cycle SIA risk assessment might resemble the example in Table 4. Strategies for enhancing positive outcomes and mitigating negative impacts should be targeted towards the aspirations and needs of communities identified in the strategic

[104] Australian Government, Department of Industry, Innovation and Science (nd). Australian Business Licence and Information Service (ABLIS), Petroleum - Exploration Permit - Northern Territory

assessment and should be in partnership with community organisations and institutions. This approach to risk assessment is demonstrated in the Beetaloo Sub-basin Case Study Report.

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Table 4: An example of an industry specific, life-cycle approach to social risk assessment

Phase	Activities	Groups affected	Positive and negative impacts		Likelihood/ Significance		Strategies	Residual risk	Indicators
Exploration	Permits Land Access	Landholders TOs	Stress, time burden Inequity Misuse of royalty	Compensation Royalty payments	High,	High	Code of conduct, clear legislation, fact sheets	low	Number of complaints
	Roads Well pads Construction	Landholders TOs Tourists/camper	Traffic, dust, noise, light, visual amenity Workers	Road upgrades Local spending Housing/services	High, low		Water trucks Consultation on placement of roads	low	Traffic counts
	Roads	Commuters Travellers Landholders Transport	Disruption to travel Disruption to stock	Better connectivity Better access, improved roads Job opportunities	high	mod			
	Drilling, fracking	Landholders Local residents	Noise, light, stress	Provide sand, services	high	mod			
Development	Construction Pipelines Well pads Water treatment		Influx of workers Traffic- HVs	Job opportunities Additional housing	high				
Operations	Stimulation Some drilling Waste mgt. Infrastructure maintenance		Light, noise Dust Traffic	Local content					
Closure	Rehabilitation		Loss of employment						
Post-project/ Legacy									

4

The social baseline data would be used from the strategic assessment 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. At the same time, stakeholder engagement processes will be critical in prioritising concerns and developing workable agreements for mitigation or enhancing strategies. Indicators for measuring the community capitals, as recommended in Section 4.2.4, would have been established in the strategic assessment. All project-based EIS/SIAs should use the same set of indicators to assess impacts and monitor change.

The SIAs here should follow leading practice as shown in Figure 2 where the phases of SIA, including profiling, impact assessment and strategy development are developed within an adaptive participatory management approach.

4.5 Implementation of the SIA Framework in the Northern Territory

4.5.1 Strategic Assessment

The NT is considered to have significant shale gas reserves[105] that could potentially generate a number of shale gas development and related infrastructure projects, including infrastructure (such as roads, pipelines and waste facilities) and processing. There are currently no regulatory requirements or provisions for undertaking a strategic SIA in the NT, although the need for an overarching strategic assessment of the industry has been proposed in current NT regulatory reforms (the 2015 Hawke Report), and by the Environmental Defenders Office (EDO) in their submission to the current Independent Inquiry into Hydraulic Fracturing by the Panel.

There are two possible pathways for initiating a strategic assessment. One pathway is for the NT government to approach the federal Minister for the Environment to consider entering into a Strategic Assessment Agreement with the NT under Part 10 of the *EPBC Act*, or other assessment under a bilateral agreement or Part 8 of the EPBC Act. The Commonwealth Environment Minister has a broad discretion to allow a Strategic Assessment and regarding its content. The NT government would first need to define a specific development area (such as the Beetaloo Sub-basin) and outline a 'program' for shale gas development in that area. The federal Minister will consider whether there are matters of national environmental significance (MNES) as defined in Part 3 the *EPBC Act* potentially affected, as these are the only triggers for Commonwealth government involvement. In the NT, there are few listed MNES, and there is very little scope for social or cultural impacts to trigger the *EPBC Act*.

If the Minister decides that the proposed program would require multiple approvals under the *EPBC Act* or that the program would potentially impact landscape scale MNES, then the Territory and Commonwealth governments enter a Strategic Assessment Partnership and

[105] APPEA (2017)

negotiate appropriate Terms of Reference for social, environmental and other specialist impact assessments (such as cultural impacts assessment).

Once the strategic assessment has been completed and if the 'program' for development has been approved by the federal Minister, then this would include 'approved actions' (such individual gas projects, waste treatment facilities, associated infrastructure) that can begin without the need for further *EPBC Act* approvals.

The main limitation on Strategic Assessment under Part 10 of the *EPBC Act* is that it is limited to the impacts on matters of national environmental significance MNES protected under Part 3 of the Act. There are currently few listed MNES in the NT. While matters of national cultural heritage significance can also trigger the *EPBC Act*, places of significance need to be listed on the National Heritage List. Traditional Owners can apply to have their significant places included on the list, with no changes to the ownership of those places. The Australian Heritage Council makes an assessment of the nominated places and advises the Minister for the Environment whether or not the Council assesses that it has national heritage values. The Minister makes the final decision about which places are included in the National Heritage List.[106]

If at some stage the *EPBC Act* was to be amended to extend the application of the 'water trigger' (see Section 2.1) from coal seam gas to shale gas projects, then all projects would need to be assessed to the requirements of the *EPBC Act* and a Commonwealth strategic assessment would be warranted.

Another limitation of a Commonwealth led strategic assessment and approvals process is that the current federal government has clearly stated its position as being in favour of shale gas development in the NT, to the point of putting pressure on the NT government to lift the moratorium. The strong and public pro-shale gas development position of the federal government could be seen to influence the Minister's discretion in relation to the approvals process.

The second and more flexible pathway is to amend existing NT legislation to provide for strategic assessment of proposed development, where a specific area and program for development has been identified. An NT led strategic assessment would not be limited to impacts on MNES. The Terms of Reference for a strategic assessment could be decided on a case by case basis and could give more weight to the outcomes of social and cultural impact assessments. The main benefit of this approach is that it could enable an independently led

[106] Indigenous heritage is also protected through the Commonwealth's *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *Protection of Movable Cultural Heritage Act 1986.* http://www.environment.gov.au/epbc/publications/epbc-act-indigenous-stakeholders

impact assessment, thus mitigating the potential for issues of perceived bias, such as we identified as a limitation of the Commonwealth led strategic assessment.

Under the strategic assessment approach, baseline studies for impact assessment are no longer undertaken by project proponents or their subcontractors but are overseen either under the *EPBC Act* Strategic Assessment management body (a group within the NT Government) or, if NT legislation is reformed to include a strategic assessment mechanism, the process would likely be overseen by the existing NT EPA. Having baseline studies conducted and overseen by an independent, or government body (and not the proponent, with a vested interest in having their project approved, or the government, gives legitimacy to the baseline studies and helps builds trust in the approvals process. However, this also places the burden of cost onto the public purse. Proponents should contribute to the costs of these studies and the government can recover costs by placing a levee or additional fees onto the cost of a petroleum production license (PPL).

Social baseline assessments should be undertaken by trained and experienced social scientists/SIA practitioners, who also have an understanding of the industry activities associated with the different phases of shale gas development. Such specialised expertise can be found in at least two existing research institutions, including the Centre for Coal Seam Gas at the University of Queensland (UQCCSG) and CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA). While both these research institutions rely partly on gas industry funding, researchers work under strict organisational 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 other local institution.

The baseline assessments for the SIA framework proposed here most closely resemble those undertaken by the UQCCSG/CSRM for cumulative social and economic impact assessment, in that they would involve generating timeline charts for a tailored set of locally meaningful indictors. This approach is most relevant to the NT because it allows Aboriginal communities to choose their own set of indictors rather than relying on Census data, which may be of little relevance to their specific circumstances. In this method, communities are able to participate in the development of indictors, 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 should have participatory community planning documents prepared that outline local values and assets that people would like to see protected, those they would like to see enhanced and issues they would like to see resolved.

The ongoing participatory monitoring program outlives the strategic assessment and approvals stage and so needs a more permanent governance structure than can be provided for in the Commonwealth *EPBC Act* Strategic Assessment Agreement. However, the NT EPA already has an ongoing role in compliance auditing of approved projects, and could take on

the oversight of the ongoing monitoring program, as well as providing regular independent updates on the social (and environmental, economic) performance of the industry. The NT EPA is also well placed to receive complaints about cumulative impacts that go beyond the scope of any single project or company.

4.6 Reforms needed to enable the NT Shale gas SIA Framework

To be operational, the proposed framework would require some structural innovations. These include:

- introduction of mechanisms for strategic assessment, either through reforms proposed in the 2015 Hawke Report, or possibly a Strategic Assessment Agreement under the *EBPC Act* 1999; a strategic assessment is needed to decide if the industry should go ahead and if so, under what conditions;
- establishment of an independent authoritative body, which can include enhancement of the existing NT EPA, or the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEM), with powers to request information from and to facilitate the collaboration between individual gas companies, and between gas companies, government agencies (including local government), communities and landholders;
- establishment of a long-term participatory regional monitoring framework, overseen by the independent authoritative body, with secure funding (raised from industry levees, costs of PPLs) and able to endure multiple election cycles; and
- periodic and standardised reporting out to communities on the social, economic and environmental performance of the industry through an independent source, either the independent body or a specialised research institution; this includes information from the monitoring of key indicators, an industry-wide complaints and escalation process (the experience of CSG in Queensland was that each of the CSG projects reported complaints under different themes, that made it impossible to gauge industry performance).

5. Lessons learned from SIA experiences in Queensland and elsewhere

5.1 The Queensland experience

The Queensland GasFields Commission recently published a report outlining their key learnings from the Queensland experience of coal seam gas development.[107] While we emphasise the distinction between coal seam gas (CSG) and shale gas technologies, the lessons learned about social and economic impacts from the development of an unconventional gas industry in Queensland are relevant in the NT context. These are outlined below and discussed in relation to associated research findings.

[107] QGFC (2017).i8

5.1.1 Lessons about Land Access

A key lesson from Queensland is to have a clear legislative framework for Land Access in place that clearly outlines the rights and obligations of land and tenure holders, and the rights and obligations of gas companies. This may not be a salient issue in the NT as most of the land issues in Queensland arose on freehold land. However, to avoid potentially high levels of confusion and anxiety among rural landholders, as misunderstandings may arise over private property rights and the rights of gas companies, clear Land Access legislation is recommended.

Queensland's *Land Access Code*, published in 2010 and amended in 2016, provides best practice guidelines and specifies mandatory (i.e., minimum) conditions for the conduct of petroleum lease holders (i.e., gas company personnel) on private property. The Code aims to establish compensation arrangements and support effective communication and working relationships, such as entry notices provided to the landholder by the gas company, the need for conduct and compensation agreements (CCAs) or an agreed alternative, the right of the landholder to restrict access to certain areas, a dispute resolution process, and compensation for costs incurred in negotiation of a CCA. The Queensland Government has also recently announced that the position of a Land Access Ombudsman will be created in 2018. The development comes from an independent review of the Queensland Gasfields Commission that identified the need to improve the negotiation of agreements and resolution of disputes between landholders and gas companies.

5.1.2 Lessons about coexistence

The ability to farm productively and sustainably on a property where gas operations are occurring has been referred to as 'co-existence'. The term has been popularized by the CSG industry, but many landholders do not agree that the term 'co-existence', which infers consent and mutualism, properly describes their circumstances. Researchers at UQ's Centre for Coal Seam Gas studied the relationship between agriculture and the gas industry with the dual focus of understanding 'co-existence' and how to facilitate it, and measuring the impacts of gas industry operations on agricultural businesses. The study identified three elements that are crucial for successful and improved co-existence:

- interactions between landholders and companies should be characterized as business to business interactions, (that implies a more level playing field than the traditional business to individual conception) and as such, be guided by a business ethic of respect, cooperation and adaptation;
- that adequate information is accessible to inform negotiations, and
- that third parties such as government representatives and professional advisors play an important role in building capacity and ensuring consistency.

5.1.3 Lessons about strategic planning for industry lifecycle

In Queensland, four major players were simultaneously exploring the feasibility of developing their gas tenements for LNG export, three of which went ahead with it within months of each other. This is similar to the NT where multiple companies are at different stages of exploration and feasibility testing. While the prospect of developing shared infrastructure was canvassed in Queensland, the different projects' timeframes, along with the underlying competition to be the world's first CSG-to-LNG exporter, meant that collaboration between the different projects did not materialise.[108] In terms of social impacts:

- some landholders had multiple pipelines crossing their land and had to negotiate with different companies;
- communities were being consulted in relation to four different EIS processes;
- SIA strategies were not well linked with local government planning; and
- local governments did not have the capacity to review multiple EIS documents, or the time to review their local planning documents.[97]

The lessons learned from Queensland point clearly towards the need for greater industry collaboration in relation to SIA and particularly the management of cumulative impacts arising from multiple projects. The management of social impacts needs to be more responsive so that the significant social investment by gas companies can be better coordinated and aligned with local community needs and aspirations. Such lessons have been captured in the SIA Framework proposed here, where individual SIA risk assessments and social investment strategies are integrated within a regional, collaborative monitoring and evaluation instrument. This includes clear planning for gas field closure and rehabilitation, and legacy planning that leaves communities with assets and strengths to transition to a new economy once the industry has exited the region.

5.1.4 Lessons about workforce accommodation and housing

One of the most far-reaching social impacts arising from CSG development in Queensland's Surat Basin occurred in relation to housing supply and demand, associated price fluctuations and subsequent responses by homeowners, investors, developers, governments and companies. This issue may not be as relevant for some of the smaller NT communities, where housing supply and demand as determined by free market forces. However, the larger centres that act as regional 'hubs', and where gas-related activities may be centred, could be subject to the same types of fluctuations in demand for housing, if accommodation for the construction phase workforce is not managed early and well.

As workers initially arrive in communities, they occupy temporary accommodation (motels, company -provided camps, campgrounds and sometimes rental housing), preferably those

[108] Queensland Gasfields Commission (2017)

that provide house-keeping and meals. The 'second wave' of workers, associated with company staff in regional offices (who are more likely to stay for longer time periods), tends to occupy rental houses, or may choose to purchase property. Rents are driven upwards as demand grows, placing financial stress on lower and fixed income families who may be pushed to smaller, or lesser quality housing, or forced to move away altogether. Higher rents trigger property investor interest and house sales and sale prices are also pushed upwards. New housing developments proceed to capture the demand for housing, from investors and renters. This can result in an oversupply of housing once the temporary workers have left. The switch from a relatively stable rural community of long-term residents to one which has high rental accommodation and a more transient population can be distressing for those who remain.

The lesson is for local governments to be proactive and prepared, and take a long-term view on the issue of housing development, so as not to be responding to short-term fluctuations only. The construction workforce is temporary and requires short-to-mid-term accommodation, not permanent housing - unless population growth is anticipated and housing development is a long-term goal.

5.1.5 Lessons about opportunities for local businesses

Local businesses will vary in their capacity to service the gas industry. The speed at which the industry can progress can be an obstacle for some businesses unable to respond quickly. Communicating information to local businesses about pre-qualifications and other requirements for contracting, should be done early in the life-cycle of the industry to allow local businesses time to prepare. A single registry of contractors/suppliers should be established for the industry with standardised procurement processes. Local businesses must be prepared to meet the high occupational health and safety (OH&S) and accreditation standards required by multinational companies in the industry- for some local businesses, this will require a 'different way of doing things'. Some local businesses in Queensland found this 'cultural shift' initially difficult, but also personally as well as financially rewarding.

Businesses based in larger regional centres could be expected to be more capable of handling the rapid rise and rapid decline of the industry's construction period in a given area. Businesses in more rural areas can tend to lack the necessary connectedness and ability to adapt, and innovative problem-solving skills.

In Queensland, hiring and retaining staff was also difficult for local businesses as employees moved to the high-paid jobs in the gas sector. High rents also meant it was difficult to recruit people from other areas unless accommodation was part of the employment package.

5.1.6 Lessons about cumulative impacts

Current regulatory guidelines in Queensland state that the SIA must assess cumulative impacts resulting from the proposed project and other developments regionally. However, proponents are only required to mitigate impacts that are directly attributed to their own project. Furthermore, the guidelines state that mitigation measures are not required for existing issues and legacy issues that are not attributed to the project in question.[109] The cumulative impact assessment sections of SIAs and SIMPs from the Surat Basin projects state that there is no common, accepted method for conducting a cumulative impact assessment. A study by UQ's CCSG/CSRM was commissioned to specifically design a methodology for assessing and addressing cumulative socioeconomic impacts of CSG development. This study culminated in collaborative and participatory regional assessment framework that has been internationally acclaimed (see the UQ Boomtown-Toolkit). The UQ Boomtown Toolkit methodology forms the basis for the ongoing participatory monitoring component of the SIA Framework proposed here as leading practice for cumulative SIA.

5.2 The US shale gas experience

The US shale gas 'revolution' was characterised by its rapid pace of development and provides a cautionary tale. In the over-riding agenda to become self-sufficient in energy supply as quickly as possible, social impacts of development were largely overlooked (until there was local backlash) and regulatory frameworks were largely insufficient (until they were challenged and amended).[110] 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.[111]

The most effective responses to the negative social impacts of shale gas development were led from the community-county level. These required the development of community-scale consensus-based decision making processes.[112] The need to assess local institutional capacity was identified in the proposed SIA framework baseline assessment. In the NT, local governments may need to establish participatory planning processes and prepare planning documents that reflect the views and aspirations of local residents if development were to go ahead.

[109] Queensland Government, Department of State Development, Infrastructure and Planning (2013).
[110] Brasier *et al*. (2014)
[111] Jacquet (2014)
[112] Environmental Law Institute and Washington & Jefferson College, Center for Energy Policy and Management (2014)

5.3 South Africa's Strategic Environmental Assessment for shale gas development- building trust

South African government, through Cabinet and various other decision-making institutions, has made high-level public commitments to shale gas exploration. The potential future economic and energy security benefits of a large resource of natural gas in South Africa could be substantial; as are both the positive and negative social and environmental issues of establishing a domestic gas industry in the Karoo region. In order to make well-informed decisions and help ensure that decisions will be broadly accepted by stakeholders as credible and legitimate, the government commissioned a Strategic Environmental Assessment (SEA) for shale gas development. The key aim of the project was to develop an integrated decision-making framework which will enable South Africa to establish effective policy, legislation and sustainability conditions under which shale gas development could occur.

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

- *The Conceptualisation and Methodology Phase*. The objectives 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 on the website.
- *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 SEA reports were released for expert and public review. The expert review included peer-reviews from international experts.

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 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 have contracted the science councils to help them in formulating the framework and content of such decisions. The assessment process culminated in November 2016, with the publication of a 1,400-page final report entitled *Shale Gas Development in the Central Karoo: A Scientific Assessment of the Opportunities and Risks*.[113]

[113] Scholes et al (2016).

The extensive report identified a number of potentially significant social risks, particularly related 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 to ensure it has community acceptability, both in South Africa and in other jurisdictions. It is too early to determine whether the exercise resulted in greater trust in government and industry and broader public acceptance of shale gas development in South Africa. However, the scientific rigour, detail and transparency associated with the assessment exercise, without a doubt, provided a significant contribution to that effort.

5.4 Lessons learned from Canada

The Council of Canadian Academies was asked by the federal Minister of Environment to assemble an expert panel to assess the state of knowledge about the impacts of shale gas exploration, extraction and 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 (the Panel) published a 292-page report entitled *Environmental Impacts of Shale Gas Extraction in Canada*.[114]

One of the Panel's main findings was that, relative to conventional gas, the greater scale of development and concentration of infrastructure required to produce shale gas imply increased land impacts and land use conflicts; the only effective way to manage such cumulative effects is at the regional, not local, scale.[115] 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.[116]

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 cut across several layers 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 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.[117] As experience in several U.S. states and Canadian provinces has shown, the manner in which local people are engaged in

[114] Council of Canadian Academies (2014).
[115] Ibid, p. 205.
[116] Ibid, p. 128.
[117] Ibid, p. xix.

decisions concerning shale gas development is an important determinant of their acceptance of this development. Moreover, public acceptance is situation-specific: practices that are acceptable in one situation may not be in another. Therefore, the Panel recommended that a public engagement strategy needs to reflect these differences and be oriented to local context, capacity and concerns.[118]

In the Canadian social and political context, shale gas development must recognize the importance of addressing First Nations' treaty rights, interests and concerns. The legal relationship between the Crown and First Nations 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 in which 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.[119] 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.[120] As many of the known commercially accessible shale gas deposits in Canada are in accepted or claimed traditional territories, the Panel recommended that First Nations need to be consulted meaningfully and early in any shale gas development process, in full respect of their Aboriginal and treaty rights.

5.5 Lessons about Good Practice Agreement Making and Free Prior Informed Consent (FPIC)

5.5.1 Good Practice Agreement Making

In the NT, with large areas of land held in Aboriginal freehold tenure, the concept of free, prior and informed consent (FPIC) provides leading practice standards for negotiating with Indigenous people. There are few cases in the world where the full FPIC process has been undertaken successfully with associated positive outcomes. In the Australian context, one resource company experienced in negotiating agreements on Aboriginal land is Rio Tinto, who work by the following principles for good practice.

[118] Ibid, p. 208.
[119] Ibid, p. 31.
[120] Ibid.

Box 5: Rio Tinto's Guidelines for Successful Indigenous Agreements[121]

A successful Agreement:

- Is perceived by all parties as voluntary and not imposed on the parties;
- Involves all of the people who can demonstrate themselves to be the land-connected peoples;
- Has been negotiated by legitimate representatives;
- Sustains implementation and performance over time, even when there are changes in company personnel and leadership;
- Acknowledges potential price fluctuations of commodities over the life of the agreement;
- Stands the test of time and is reviewed and amended as necessary, with the full support of all parties;
- Is able to be changed and improved (if all parties agree) when things are not working and supports joint adaptation and problem-solving when challenges arise;
- Has clear commitments and benefits for both parties and focuses on long-term rather than short-term goals;
- Delivers on agreed commitments and builds in incentives for all parties to ensure that agreement commitments are upheld;
- Involves agreement-making processes, content and implementation approaches that are consistent with human rights principles;
- Proactively considers future generations;
- Is based on a genuine relation of trust between parties so that the agreement implementation is driven by its spirit and intent, not the legal references;
- Provides flexible frameworks for working together rather than rigid formulas for individual action;
- Acknowledges the importance of cultural heritage and an understanding of legacy and historical issues and their effect on religious responsibilities, spirituality and culture;
- Benefits the community as a whole rather than particular individuals.

5.5.2 Lessons from Papua New Guinea

One example of an effective (and documented) agreement process is the Ok Tedi copper and gold mine in PNG. While the context was highly contentious and problematic (communities had to choose between the mine closing with no alternative income to support development and the mine continuing to pollute the river, but with an income stream), an agreement was negotiated with Indigenous people that is generally thought to provide positive outcomes. The mine was continually polluting the river after a tailings dam collapsed in 1984 and is known as an environmental disaster. There were a series of legal challenges over the environmental impacts. An FPIC process was entered into to decide whether the mine should continue or not. The outcome was the Community Mine Continuation Agreements. The lessons from this process were that it was a consultative and inclusive process in a very difficult context, but the process was also transparent in that it was well documented.

[121] Rio Tinto (2016)

6. Conclusions and Recommendations

CSRM conducted a review of academic and leading practice literature on SIA, a review of the regulatory environment for SIA in the NT, and distilled lessons learned from case studies of similar developments elsewhere in order to develop a leading practice SIA framework for potential shale gas development in the NT. From these reviews, we have identified the key components needed in a leading practice SIA framework for shale gas development in the NT, gaps and opportunities in the current NT regulatory environment for leading practice SIA and lessons learned from similar developments elsewhere that are relevant for the NT.

Key Findings

Key components of a leading practice SIA Framework for shale gas in the NT

1. ***Strategic assessment*** for a program of development that clearly identifies the goals of the program and defines the optimum scale (and pace) of development in terms of balancing economic, social and environmental impacts at local, Territory and national scales.

2. A ***strategic, adaptive, industry life-cycle approach*** that aligns individual projects and their outcomes with the long term objectives of the NT *Economic Development Framework* and enables adaptive responses to community values and aspirations.

3. A ***platform for communication, coordination and collaboration between multiple projects*** in order to identify and respond to cumulative impacts, minimise the 'footprint' of the industry in the placing of associated infrastructure (including workers 'accommodation) and maximise long term social and economic benefits to local and regional communities.

4. In recognition of the unique circumstances of the NT, an inclusive and participatory process that pays particular attention to ***human rights issues***, and the rights and vulnerabilities of Indigenous peoples

5. An ***independently led, participatory*** social baseline assessment, using 'agreed indicators' to measure baseline values and assets (we recommend using the community capitals framework). The indicators should be selected in consultation with local people and stakeholders. Proponent-led collection of baseline data for their prospective area of operation and the wider region tend to emphasise snapshots and predictions. It is less attuned to the monitoring and tracking of trends that are essential to adaptive management, especially in a region with scant information about the receiving social environment. This is especially concerning where multiple projects may proceed.

6. ***Participatory, ongoing monitoring*** of changes in the indicators. This includes periodic (annual or biennial) 'ground-truthing' of indicator data through interviews with local people to understand the lived experience of impacts and sustainability outcomes.

7. An ***independently led community engagement*** program with affected stakeholder groups to discern the significance of potential impacts and to co-develop acceptable and appropriate mitigation and enhancement strategies.

8. The SIA framework should contribute to an ***open data policy*** with ***regular reporting*** on the social, economic and environmental performance of the shale gas industry

10. Each additional project should provide an adaptive SIA risk assessment that specifically addresses ***cumulative impacts*** and its contribution to the development program's objectives.

Gaps in the current NT regulatory environment for SIA

1. There are currently no mechanisms for strategic assessment (including strategic SIA) under NT regulations, although implementing strategic assessment has been accepted as a recommendation in a review of environmental assessment policy (the 2015 Hawke Report).

2. There is scope for a strategic assessment under the Commonwealth *Environmental Protection and Biodiversity Conservation Act (*EPBC Act*) 1999*, where matters of national environmental significance (MNES) may be affected. A map of protected matters[122] shows there are few matters that would trigger the EPBC Act in the NT. However, if the current 'water trigger' for coal seam gas and large coal projects was to be extended to include shale gas development by the Commonwealth government, all NT projects would be required to gain EPBC Act approval.

3. SIA is required only as a subset of an environmental impact assessment, and as such, has the potential to be undervalued in the approvals process.

4. While generic guidelines exist, there are no industry specific guidelines for conducting an SIA in the NT where there is a uniquely high proportion of Aboriginal people and interests.

5. There are currently no requirements or guidelines for cumulative impacts assessment.

[122] Australian Government, Department of the Environment and Energy, (2017) Protected Matters Search Tool http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf

Relevant lessons from similar developments elsewhere

1. The scale and pace of development determines the significance of social impacts, so too does the pre-existing / pre-project social, economic, political and cultural environment.

2. The terms of 'co-existence' between shale gas and agricultural (or other industries) needs to be negotiated on a case by case basis.

3. Social impact mitigation strategies should not be bilateral agreements (e.g. government placing conditions on operators), nor overly prescriptive (e.g. operator must construct 50 new houses). Instead, they should involve local communities (and other key stakeholders who have a role to play) and be aligned with their aspirations and needs and be 'outcomes-focussed'.

4. The social impacts of shale gas development are unevenly distributed. Those with capacity and information can prosper while inflexible or vulnerable groups can suffer.

5. 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.

6. 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 can have a large influence on the process. But not to lose sight of the importance of managing these relationships at the ground level, especially in remote areas.

7. Local institutions need to be strengthened (ideally prior to 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.

8. Negotiations with Aboriginal Traditional Owners (TOs) should be inclusive and transparent (on agreement). General informed consent is insufficient. Details of activities should be negotiated in recognition of rights to self-determination and to ensure these groups fully understand the terms of the project and the impacts, benefits and management strategies. The placement of each well and associated infrastructure should be negotiated on a case-by-case basis with local TOs in avoid any culturally sensitive places, and 'sacred sites' as identified by the Aboriginal Areas Protection Authority (AAPA). The process for such negotiations should be fully documented.

Recommendations

1. Initiate mechanisms for strategic environmental assessment of a specific program of shale gas development (e.g. Beetaloo Sub-basin) in either NT regulations (as recommended in the 2015 Hawke Report), or in partnership with the Commonwealth government in a Strategic Assessment Agreement under the *EPBC Act*.
2. The Terms of Reference for strategic environmental assessment should include various specialist assessments, including cultural impact assessment. Due to the interconnectedness of Aboriginal peoples and their culture with environmental condition, predicting the significance of social (cultural) impacts (particularly for Aboriginal people, but also pastoral leaseholders) requires the integration of social, environmental, economic and cultural assessments.
3. Consult with the Commonwealth Department of the Environment and Energy in relation to possible amendments to the 'water trigger' under the *EPBC Act* to apply to shale gas projects, as it does for all coal seam gas and large coal projects. If the 'water trigger' were also to apply to shale gas projects, then Territory assessment processes must align with Commonwealth assessment requirements to avoid duplication.
4. Establish or enhance an independent Authority (separated from government decision making) for the oversight of the strategic assessment, baseline studies and ongoing monitoring and reporting, as well as for social and environmental compliance auditing. This could be the existing NT Environmental Protection Agency to avoid structural complexity and the fragmentation of decision making that has confounded the effective regulation of the industry in other jurisdictions.
5. Collaboration and coordination between projects, and between gas companies, government and community organisations is necessary for effective identification, assessment and responses to cumulative impacts. A platform for such collaboration (such as a multi-stakeholder working group) would ideally be linked with the ongoing monitoring platform and come under the jurisdiction of the same independent Authority.
6. Third parties should be able to report grievances, or perceived breaches of conditions to the independent Authority where grievances relate to cumulative impacts and issues beyond the scale of project-level grievance mechanisms.
7. The costs of undertaking independent baseline studies (usually conducted by project proponents) should be recovered to an extent from project proponents (who would no longer have to do them individually, but who would use the available data in their risk assessments) by increasing the cost of the petroleum production license (PPL) for operators and/or by charging an annual levee or fee for use of the baseline data and ongoing monitoring and reporting platform.

8. Produce clear guidelines and simple fact sheets for negotiating Land Access Agreements in different tenure types that outline the rights of both the landholder and the project proponent. Considerable stress and negative impact has been associated with misunderstood land rights and perceived disrespect for attachments to, and interests in land.
9. Identify strategies to build local institutional and business capacity early. To best capture the potential economic benefits of shale gas development, adequate lead-time and institutional, business and individual capacity is required.
10. Negotiations with Aboriginal Traditional Owners (TOs) should be inclusive and transparent (on agreement). General informed consent is insufficient. Details of activities should be negotiated in recognition of rights to self-determination and to ensure these groups fully understand the terms of the project and the impacts, benefits and management strategies. The placement of each well and associated infrastructure should be negotiated on a case-by-case basis with local TOs to avoid any culturally sensitive places, and 'sacred sites' as identified by the Aboriginal Areas Protection Authority (AAPA). The process for such negotiations should be fully documented.
11. Royalty payments should not be exclusive to TOs, but a community benefits trust, or other fund designed to distribute economic benefits to regions should be established. (e.g. 'Royalties for Regions' schemes such as in Queensland and Western Australia).
12. Perceptions or evidence of negative impacts on the spiritual wellbeing and social cohesion in Aboriginal communities should be given high priority in risk assessment, as personal safety could be at risk.

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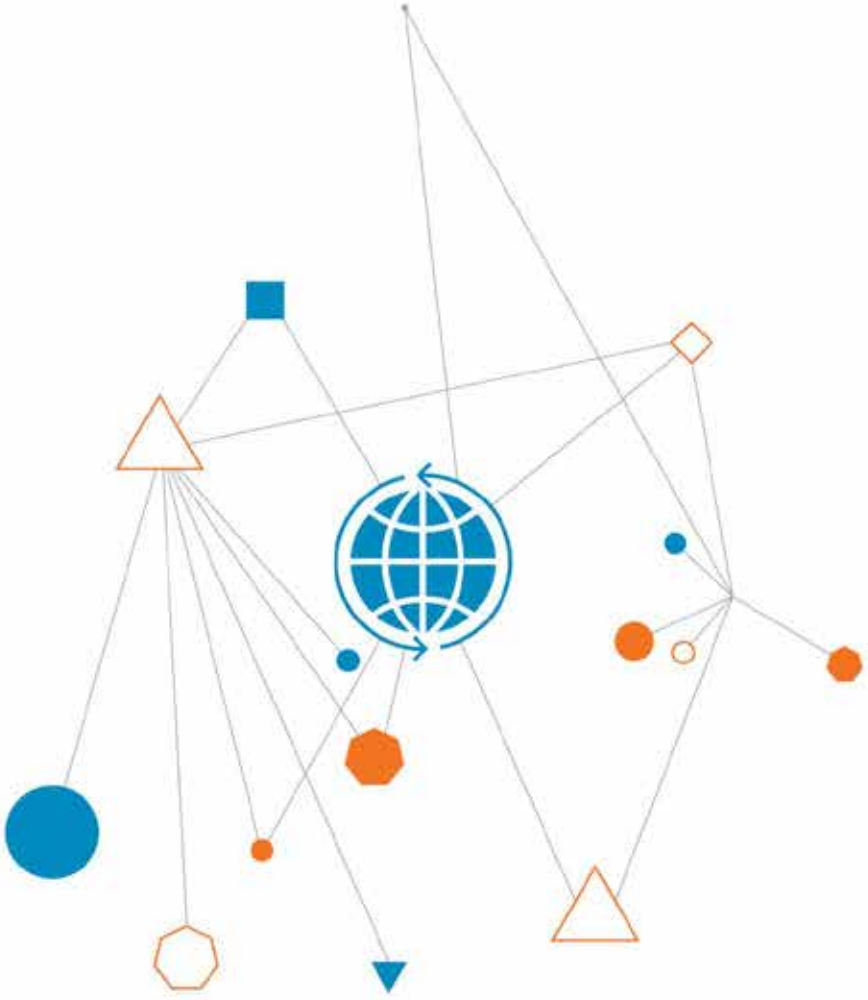
Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

Beetaloo sub-basin Social Impact Assessment Case Study

17 January 2018



When you think with a global mind problems get smaller

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Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

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Executive summary

The independent scientific panel (the Panel) undertaking the Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs and Associated Activities in the Northern Territory (the Inquiry) commissioned a two-part scope of work to assist its deliberations on the social impacts of an unconventional gas industry in the Northern Territory. The scope of work comprised:

Part A Social Impact Assessment

- Develop a leading practice framework for the identification, assessment and management of the social impacts associated with the development of onshore unconventional gas in the Northern Territory.
- Undertake a high-level social impact assessment (SIA) that describes 'the type of potential social impacts, issues, concerns, risks and benefits that may arise from the development of the unconventional gas industry in the Beetaloo sub-basin on the Affected Communities'.

Part B Social Licence to Operate

- Describe and assess the concept, elements and issues surrounding a 'social licence to operate' (SLO), as it applies to the onshore unconventional gas industry in the Northern Territory.

A leading practice SIA framework was developed by The Centre for Social Responsibility in Mining (CSRM) of the University of Queensland (CSRM, 2017). The framework was used to undertake a high-level SIA case study (SIA case study) to assist the Panel to identify and assess the potential impacts on affected communities of an indicative scenario for development of an unconventional gas industry, including their likely significance and ability to be managed.

The CSIRO prepared a report on 'social licence to operate' (CSIRO, 2017) that provides the Panel with the key attributes of a community engagement program that will lead to a shale gas development company obtaining a social licence to operate in the Northern Territory.

Social impact assessment method

CSRM (2017) recommended strategic environmental (and social) impact assessment informed by project-independent baseline studies that are based on an adaptive participatory management approach. The strategic assessment would provide the framework for project-level assessments with project-level monitoring providing information to facilitate review and update of the strategic assessment.

CSRM identified the phases and activities of SIA, and how they relate to an adaptive participatory management approach. The typical phases and adaptive participatory management approach would typically take several years and involve extensive community and stakeholder engagement to understand social values, identify and explain potential impacts, and develop, explain, refine and reach agreement on appropriate responses, management measures and initiatives. This was not possible for the SIA case study which was conducted over a period of six months.

Adopting key elements of the approaches proposed by CSRM (2017), an approach that accounted for the limited time available for the SIA case study and limited information gathering was developed. The approach comprises three stages:

1. Compile social baseline (identify affected communities, define social catchments, identify social values and compile social profiles).

2. Identify and assess threats and potential impacts to social values.
3. Propose mitigation and identify opportunities for enhancing social values.

The Panel required the SIA case study to assess social impacts on '*the people or groups of people that are most likely to be impacted by the development of unconventional gas resources in and around the Beetaloo sub-basin… which may include, without limitation, community members, pastoralists, Aboriginal organisations and local businesses*'.

The geographical scale of the Beetaloo sub-basin necessitated grouping potentially affected communities into social catchments to reflect their relationship to the conceptual development, aid stakeholder engagement and enable an appropriate assessment of the social impacts of unconventional gas development. The following factors were used to define the social catchments:

- **Location and community links**: Centres with a population level that may indicate some potential for providing 'local employment' should sub-basin development proceed. Generally these communities are located outside of, but in proximity to, the Beetaloo sub-basin. Consideration of potential physical and cultural links are also important factors influencing grouping and the potential to experience shared perceptions of impact.
- **Logistics or support industry potential**: It is assumed that the development of an unconventional gas industry would require at least a moderate level of logistical and maintenance support. This could be a purpose-built area within the gas field or a facility located in the existing large towns north and south of the sub-basin that currently support industrial activity, for example Katherine, which currently provides support to the mining industry and RAAF Base Tindal and/or Tennant Creek, which provides support to the mining industry.
- **Dominant economic activity**: Pastoral operations constitute the principal economic activity within the Beetaloo sub-basin, with the Stuart Highway and to a lesser extent the Carpentaria Highway facilitating economic activity associated with tourism.

The affected communities and social catchments to which they were assigned are:

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

Social values of the affected communities were identified and verified through stakeholder engagement that involved two rounds of consultation. A total of 69 meetings were held with stakeholders. Table E1 categorises the stakeholders into key groups. Figure E1 provides the results of an analysis of the frequency of issues raised by stakeholders.

Table E1 Stakeholder consultation effort

Stakeholder category	No. of meetings	%
Government agencies and statutory authorities	7	10
Businesses and peak business organisations	11	16
Local Governments	6	9
Non-government organisations	6	9
Community organisations and residents	39	56

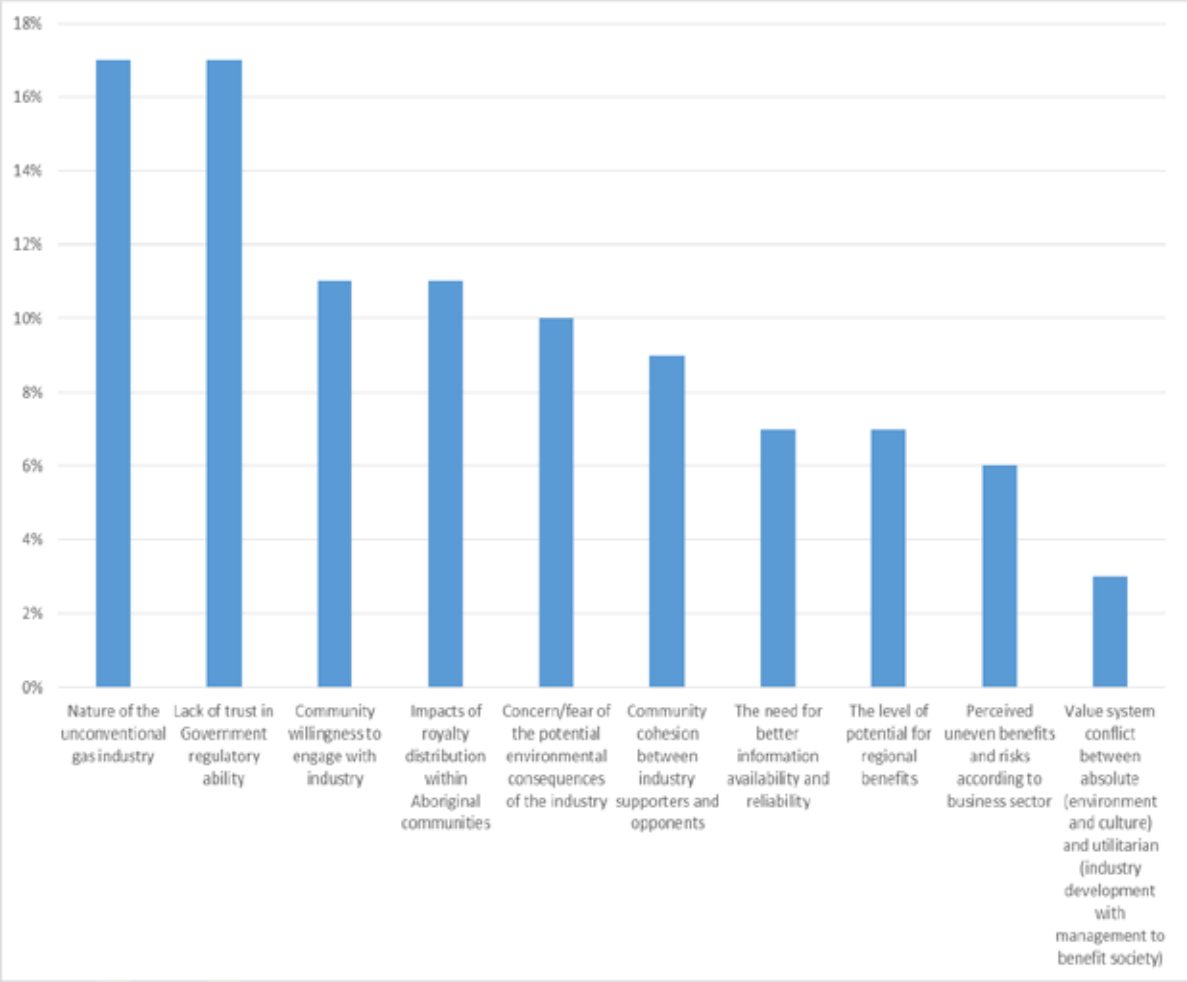


Figure E1 Ranking of issues expressed during stakeholder consultation

The issue – Nature of the unconventional gas industry – relates to community concerns that:

- The resources industries are short-term rather than long-term, and cyclical in nature.
- The impacts associated with development of a shale gas industry in the Northern Territory will be similar to those experienced with the development of the coal seam gas industry in Queensland.
- Industry is aloof from community concerns and has disregard for the social outcomes of their operations.

The identified social values, threats (or impact drivers) and potential impacts associated with unconventional gas development are set out in Table E2.

Threats to and impacts on the social values were assessed using the approach to risk management involving the assessment of likelihood of the threat occurring and the resulting consequence or impact on the social values. A risk matrix was used to determine the significance of the threats (and impacts) on the social values.

Table E2 Identified Beetaloo sub-basin social values, threats and potential impacts

Social value	Threat or impact driver (ID)	Potential impact
SV1 Liveable community	ID1A Rapid workforce influx to urban areas	Impaired community amenity
	ID1B Increase in heavy vehicle traffic on local roads	Reduced amenity, road accidents and increased vehicle maintenance costs
	ID1C Conflict between supporters and opponents of unconventional gas industry development	Conflict between community members
	ID1D Receipt of royalties by a subset of community members	Conflict between community members
	ID1E Concern over potential risk to groundwater quality	Anxiety about availability, access to and quality of water resources
SV2 Affordable lifestyle	ID2A Housing supply unable to meet spike in demand	Decreased housing availability and affordability
	ID2B Increased short-term rental costs	Decreased housing availability and affordability
SV2 Affordable lifestyle	ID3A Significant change in land use and industry development	Loss of 'outback' identity
	ID3B Perception of industry development heralding an era of 'industrialisation' of the landscape	Loss of 'outback' identity
	ID3C Perception that industry development approval is against majority community wishes	Decreased community engagement with local governance
	ID3D Concern with increased access to, and development risks on traditional country	Increased sense of cultural loss
SV4 Capacity for sustainable economic activity	ID4A Concern that long-term access to quality groundwater may be restricted due to industry development	Decreased investment in pastoral and horticultural enterprises
	ID4B Perception that 'outback' identity is compromised by 'major industrialisation' of the region	Decrease in tourist visitation
	ID4C Higher gas industry wage rates available to local residents drives competition for employees	Increased cost of labour for local businesses
	ID4D Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Local business closures

Socioeconomic context of Beetaloo sub-basin

The Beetaloo 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, horticultural enterprises, oil and gas transmission infrastructure, a railway, and highway towns, cattle stations and remote Aboriginal communities. The Australian Defence Force operates RAAF Base Tindal located near Katherine.

Larrimah, Daly Waters, Newcastle Waters and Elliott border or are located in the sub-basin. The adjacent towns and communities of Katherine, Mataranka, Minyerri, Ngukkur, Borroloola, Robinson River and Tennant Creek are located outside the sub-basin. Figure E2 shows the location and extent of the Beetaloo sub-basin and location of affected communities.

The Beetaloo sub-basin has been explored since the 1980s. Figure 6.2 of the Panel's Interim Report shows the extent of unconventional shale gas exploration in the Beetaloo sub-basin which has comprised hydraulically fractured and non-fractured wells.

The Beetaloo sub-basin has seen almost no industrial development. Some affected communities have experience with development. For example, experience with mining development south of Ngukurr (iron ore) and at McArthur River (large-scale underground and open pit mining of lead and zinc). The installation of gas transmission and lateral pipelines through the sub-basin (Amadeus Basin to Darwin Pipeline in 1986; the Elliott Spur Pipeline in 1989, and the McArthur River Pipeline in 1995) that occurred 20 to 30 years ago is not readily recalled by community members. The current installation of the Northern Gas Pipeline from just north of Tennant Creek to Mount Isa is in an early stage of development, and a significant distance south of the Beetaloo sub-basin communities.

Economic activity is centred on agriculture development (pastoral operations throughout the sub-basin, horticulture south of Katherine and along the Roper Highway) together with Defense activity at RAAF Base Tindal, and tourism activity mainly servicing self-drive visitors. Regional service townships (Katherine and Tennant Creek) are located outside the sub-basin.

Obvious significant disparities in social status and living conditions between remote Aboriginal communities and regional service townships are evident. This has a significant influence on the potential for community members to capture potential benefits from industry development should it occur.

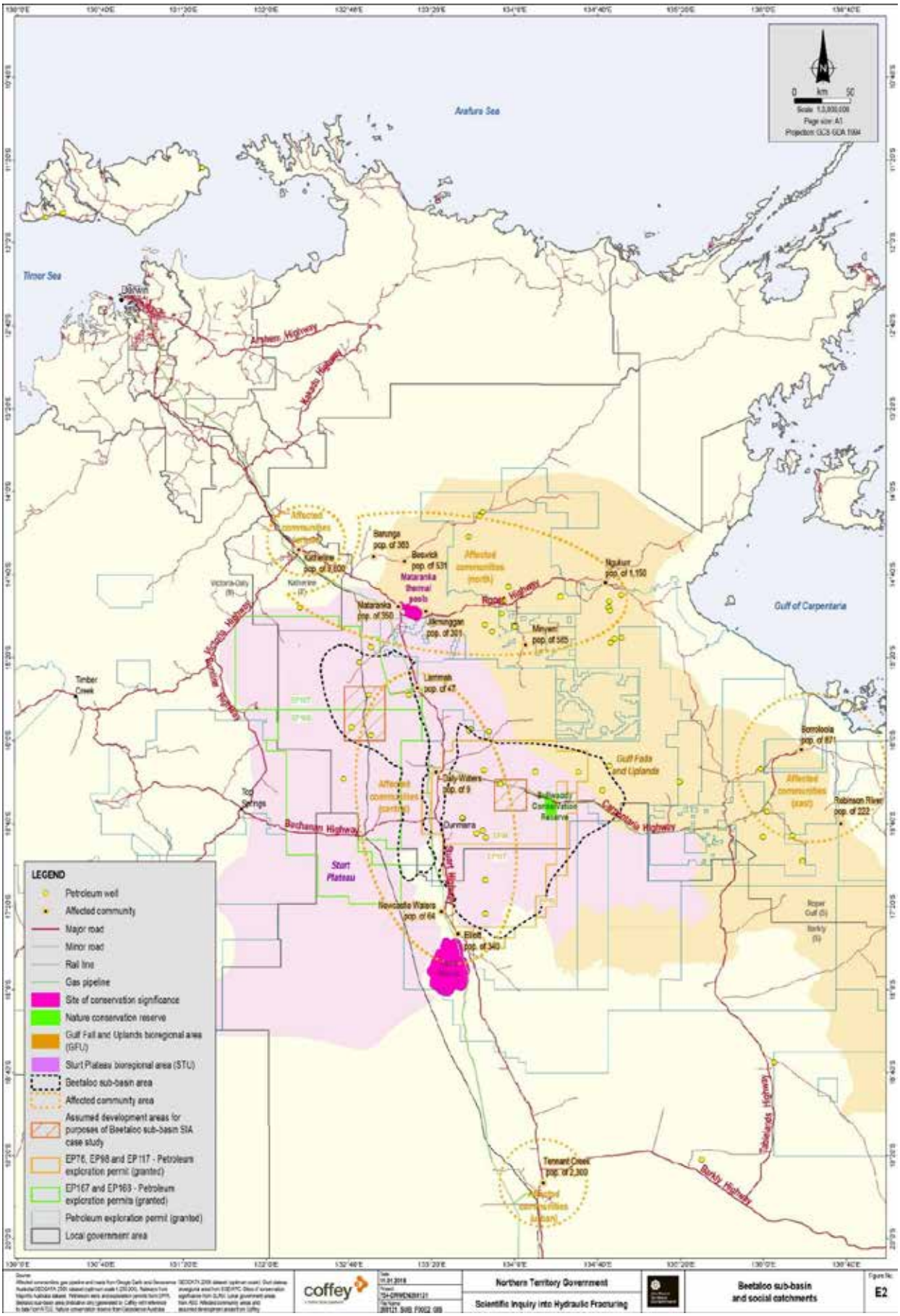
Community members have a reasonably high level of awareness (due to the activities of groups opposed to industry development) of historical issues surrounding the development of unconventional gas resources in other jurisdictions but not of the potential unconventional gas industry in the Northern Territory. The Inquiry's Interim Report (Inquiry, 2017b) acknowledged that levels of knowledge in Aboriginal communities about future development is inadequate.

Conceptual Beetaloo sub-basin development

A conceptual development was defined based on ACIL Allen's (2017) Shale WIND scenario which assumes a 260 well development with a 25 year production life.

The conceptual development assumes the moratorium on hydraulic fracturing will be fully lifted in 2018, allowing exploration, appraisal and pilot testing to proceed for a period of three to five years. Appraisal and pilot testing activities will confirm the technical and commercial parameters for development (e.g., gas availability and volume, cost of extraction, cost of gas processing, compression and transport, demand and wholesale price for gas, etc).

During the appraisal and pilot testing period environmental and planning approvals would be progressed with detailed design and construction of the gas fields and associated gas processing facilities commencing on receipt of territory and federal approvals. Shale gas production is assumed to occur for 25 years after which the production facilities and gas field infrastructure would be decommissioned.



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It was assumed that each project area would require gas field access roads, production wells and gas gathering lines, a gas processing and compression facility, export pipeline connection to the Amadeus to Darwin Gas Pipeline, accommodation facilities and an airstrip for FIFO worker transport during the construction phase for major facilities, such as the gas processing and compression facility.

Table E3 lists the key parameters for the conceptual development scenario adopted for the SIA case study. An indicative development timeframe is presented in Figure E3.

Table E3 Indicative project scenario parameters

Element	Scale
Approximate number of wells drilled per annum	10
Maximum number of wells in operation	257 (in 2042)
Number of well pads (8 wells/pad)	32
Length of gas field roads	55 km (1.7 km for each pad)
Length of gathering pipes	32 km
Area of disturbance (for pads, roads, gathering pipes and camps)	10.9 square kilometres (1,090 ha)
Area of disturbance for pipelines (Armadeus tie-in 50 km; Armadeus duplication 300 km; Northern Gas Pipeline duplication 622 km). It is assumed that the pipeline duplications are on similar alignments to existing pipelines)	Approximately 116 square kilometres (11,600 ha)
Average level of employment for well pad construction and field operations (including camp operations x 2)	250 to 300 persons
Estimated indicative level of local employment	Darwin: 65 persons Katherine: 70 persons Regional Northern Territory: 25 persons
Logistics support facility in Katherine industrial area	5 to 10 persons

It was assumed the peak construction workforce would be approximately 450 persons with 250 persons required for operation and maintenance of the gas field, gas processing and compression facilities and ancillary facilities. The workforce was assumed to be a combination of FIFO (from Darwin) and drive-in drive-out (DIDO) from Katherine and rural communities. Gas field workers were assumed to be housed in accommodation facilities located near transport hubs or at the gas fields while on shift. The accommodation facilities were assumed to be self-contained with medical and recreational facilities.

Construction workers who require specialist skills were assumed to be non-local, with the Northern Territory-sourced workforce drawn from the communities shown in Table E3. It was assumed approximately 70 persons would be locally sourced from the Katherine area, and that one third of these people (approximately 25) will have relocated to live in the area. This will result in a small population increase in the order of 80 persons (assuming 15 families of 4 persons and 10 couples with no children).

Figure E3 Indicative development timeframe

Social impact assessment

The affected community profiles revealed two groups of communities – regional centres with good levels of community infrastructure and services and those reliant on regional centres for such services. Katherine and Tennant Creek are regional service centres and were grouped for the purposes of impact assessment, as despite some differences they have similar characteristics in relation to the other affected communities. The outlying communities were grouped together as rural communities, as their size and remoteness from regional service centres is a key factor in their response to the identified threats.

Threats to social values where the significance is assessed as high or higher are shown in Tables E4 and E5.

Table E4 Summary of high and higher threat significance for urban communities

	Potential threat	Likelihood	Consequence	Assessed risk
ID1E	Concern over potential risk to groundwater quality	Almost certain	Moderate	High

Table E5 Summary of high and higher threat significance for rural communities

	Potential Threat (Rural)	Likelihood	Consequence	Assessed risk
ID1D	Receipt of royalties by a sub-set of community members	Certain	Major	Very High

	Potential Threat (Rural)	Likelihood	Consequence	Assessed risk
ID1E	Concern over potential risk to groundwater quality	Certain	Major	Very High
ID4A	Concern that long-term access to quality groundwater may be restricted due to industry development	Likely	Major	High

For urban communities, the key concern is the risk of impacts on groundwater resources (social value SV1) on which they rely wholly or partially for drinking water. This is likely heightened by the concerns regarding PFAS contamination of water resources in Katherine town and surrounding area. The potential for community discord due to divergent attitudes to risk held by supporters and opponents of unconventional gas development is considered material, particularly as the townships have relatively low populations.

For rural Aboriginal communities, including pastoral properties in the Beetaloo sub-basin area, the key threats are to social values SV1 and SV4, primarily due to the perceived environmental risk to both quantity and quality of groundwater due to hydraulic fracturing required to extract gas from the shale. Receipt of royalties in remote Aboriginal communities also has the potential to induce income disparity that may negatively affect relations between different traditional owner groups.

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 – were identified as particular challenges when undertaking both strategic and project-level SIA in the Beetaloo sub-basin.

The limited understanding of the nature of the unconventional gas industry, and of the technologies that would be deployed to extract gas and manage potential environmental and social impacts, as well as the distrust of governments and their capacity to regulate the industry effectively on behalf of all community members, amplify these challenges.

Notwithstanding, the identified threats were considered manageable, as evidenced by experience in existing onshore unconventional gas developments. Close collaboration between various industry groups and project proponents, government and the community will be required to ensure that responsibility for management and reporting on sub-basin level impacts is clear. Mechanisms for community feedback and response will need to be widely-known and effective as community knowledge with respect to the effective management of identified impacts will be an important component of an industry social licence to operate.

Social impact management programs are expected to include the following components, with additional components and activities likely to be identified when more detailed project descriptions are available and subject to a comprehensive project-level SIA.

Community

Key factors to be considered in the development of a community engagement strategy include:

- The need for community industry awareness campaigns, particularly for Aboriginal communities. This needs to be an ongoing process, as the development and deployment of improved technology is proceeding at a rapid rate.
- The requirement for implementation of robust land access protocols.

- The need to provide regular environmental monitoring results to communities in a transparent manner that builds community confidence and trust in the monitoring process.
- Participation in regular community forums with government and other industry participants to discuss industry issues. Responsibility for the design and leadership of these forums may rest with government and peak bodies, however to be successful they will require the participation of industry at a senior level.
- The implementation of a Grievance Management Program, including community access to an independent advocate if necessary.
- The need for monitoring of community and visitor sentiment on a structured basis to ensure that the views of all sectors are heard and considered.
- The development and implementation of a workforce cultural awareness program and a workforce code of conduct to contribute to ongoing positive and supportive community relations.
- The development and implementation, in consultation with government, of local content policies and programs to maximise opportunity for Northern Territory business input and development.

Workforce and housing

The management of potential housing issues needs considerable care to ensure that housing market distortions are avoided. Local planning needs to be based on realistic long-term employment levels. Factors to consider when developing local workforce recruitment and housing strategies include:

- The need to develop and implement a Workforce Accommodation Strategy with Local Government, with a view to integration with local procurement and logistics support strategies.
- The need for compliance with the Local Government planning scheme if considering the development of accommodation initiatives in urban areas.
- The need for ongoing monitoring of rental housing supply and vacancy levels to identify project-induced demand.
- The merits of implementing a rental support program for periods of high rental housing demand to ensure that low-income people are not priced out of the rental market.

Traffic

Project traffic management plans are generally effective in managing risks involved in the transport of personnel and materials required to develop projects provided that they:

- Identify risks to be managed on low-traffic local roads utilised by local community members.
- Ensure that there is a high level of traffic awareness and safe driver-behaviour requirements imparted to local community members.
- Provide for the training of project drivers and the monitoring and policing of driver behaviour.

Opportunities to enhance social values

The development of unconventional gas extraction in the Beetaloo sub-basin is expected to be gradual under the conceptual development scenario. A number of opportunities for the enhancement of social values, both in urban as well as rural communities, are likely under this scenario. These could include:

- The development of an increased capacity in logistics operations, and the establishment of an unconventional gas industry support base, initially in Katherine but potentially in other towns such as Tennant Creek if favourable conditions eventuate. This would lead to increased employment, training and a broadening of the skills base of the local workforce, and potentially a modest population increase should workers see Katherine or Tennant Creek as a desirable place to live.
- An opportunity, through local procurement of inputs for gas field development, to diversify the economic base of regional support towns through the attraction of new business ventures and the expansion of existing business ventures in construction, mechanical maintenance and industrial supplies.
- Collaboration between industry proponents may also provide an opportunity to establish regional support facilities, such as a worker accommodation village or an upgraded airstrip to handle FIFO transport, in proximity to a rural location (such as Daly Waters) where the opportunity for multi-use of the facility (such as for tourist accommodation) may expand and strengthen the economic base of the town.
- An opportunity, through gas industry supported activity, to deliver training and employment opportunity to residents of Aboriginal communities in the areas surrounding the Beetaloo sub-basin, building on employment and training activity that has been implemented as part of exploration work (undertaken by Pangaea and Origin Energy). This opportunity need not rely solely on the existence of Aboriginal Land Use Agreements (ILUAs) with TO groups, but be a product of a direct government policy to deliver benefits to rural communities. It must also be recognised that the poor housing conditions, in particular over-crowding, in remote communities is a particular barrier to employment retention and the ability to be fit-for-work at the commencement of a roster for community-based employees.
- Community input to gas field development plans provide an opportunity to plan infrastructure development such that communities may benefit (e.g., through improved access to particular sites of importance), as landholders could use gas field infrastructure to benefit property operations.
- Community involvement in regional environmental monitoring associated with industry development, through participation by natural resource management groups and Aboriginal ranger groups who already have demonstrated capacity. As well as providing employment opportunities, this could also act to increase community confidence in the transparency of company environmental management and monitoring programs.

The ability to capture these opportunities will require a collaborative approach to industry development by the Northern Territory Government, project proponents and representatives of the community, which aligns with the industry development approach outlined in the Northern Territory Government's Economic Development Framework[1] released on 20 June 2017. It would also be expected that initiatives aimed at enhancing community capacity to take advantage of opportunities that may be available through industry development would be developed and implemented during the strategic assessment phase, as recommended in the SIA Framework report (CSRM, 2017).

[1] See https://edf.nt.gov.au/growth-sectors/energy-and-minerals

Issues to be considered in implementing the SIA Framework

CSRM (2017) identified leading practice SIA as comprising:

- Strategic, adaptive approach throughout lifecycle of development that addresses cumulative impacts.
- Communication, coordination and collaboration between industry participants.
- Independently-led, participatory social baseline assessment.
- Independently-led community engagement.
- Participatory, ongoing monitoring of social indicators and transparent reporting of results.

The SIA case study found that Aboriginal and other community members were highly sensitised to the potential impacts of an unconventional gas industry, particularly bio-physical impacts on surface water and groundwater, and impacts on their communities and values. Their concerns arise, in part, from a lack of detailed information about the potential unconventional gas industry and actual project proposals.

The Panel noted in its Interim Report (Inquiry, 2017b) that '*current knowledge by the Aboriginal community is inadequate, and as a consequence, this points to an emerging social risk with Aboriginal people becoming enmeshed in conflict between pro and anti-fracking groups'*. This was evident in the consultation undertaken for the SIA case study, where some Aboriginal communities expressed concerns that they were only getting one side of the story – from opponents to an unconventional gas industry – and not facts from technical experts who were not biased.

Engagement with Aboriginal communities must adopt a structured approach that incorporates the following activities:

- **Preparatory meeting(s)** (as done in the second consultation round) that identifies the Aboriginal community members who should be consulted, their needs to participate in the consultation, the issues to be discussed, and appropriate dates and times for the meeting(s).
- **Social values meetings** during which the Aboriginal communities' social values are identified and documented. Sufficient time must be allowed for the complex issues relating to Aboriginal communities to be explored and understood.
- **Awareness meeting(s)** in which the Aboriginal communities are provided with information about unconventional gas development in sufficient detail to enable them to understand how development activities relate to, and might impact on their communities and their values. This engagement should include discussion of what is, and is not negotiable with respect to engineering and technical aspects of unconventional gas development.
- **Project-specific meetings** in which Aboriginal communities are presented with a development proposal and detailed information about its environmental and social impacts. This engagement should allow sufficient opportunity and time for community members to have input to the development concept and management of its impacts.
- **Implementation meetings** in which Aboriginal communities are invited to participate in environmental review or other similar committees that provide ongoing forums for managing project-community relations, monitoring of environmental and social impacts, and implementation of environmental and social programs.

This framework, with refinement, will be equally effective with pastoral and regional service centre communities, noting that preparatory meetings may not be required where the stakeholder groups are well-known and accessible. Pastoralist interests must be considered in conjunction with the broader land management priorities and requirements of the Northern Territory Government due to the nature of their tenure.

Project proponents must have a relationship with the communities in which they operate or who they may affect. The relationship will be most successful where it is developed over time through the staged approach outlined above. The conduct of community engagement must therefore balance the need for independently-led consultation (to build confidence in the process and veracity of data) with company ownership of the relationship (to build credibility, a working relationship and ensure accountability). To be effective, community engagement must incorporate the project proponent, engineering and technical experts, community members and their representative bodies, and independent stakeholder engagement consultants.

Conclusion

Despite heightened sensitivity to the impacts of unconventional gas development due to a concerted campaign by opponents of industry development, information provided to communities in the second round of consultation was well received, confirming that awareness and education are key factors in working towards a 'social licence to operate'.

Significant disparity exists between the regional service centres and remote Aboriginal communities due to their remoteness affecting access to services, their poor state of housing, limited access to a functioning labour market, and differences in health and education status. A key issue will be how affected communities realise opportunities from unconventional gas development when they are expected to be distant from the projects (and the impacts).

Affected communities' key concerns are impacts on surface water and groundwater resources and the distribution of benefits. Concerns about water resources are likely heightened by the PFAS contamination in and around RAAF Base Tindal near Katherine and incorrect assumptions about water management based on coal seam gas development in Queensland. Community cohesion and wellbeing underlie Aboriginal community concerns about the equitable distribution of benefits.

Experience and lessons learned in unconventional gas development in other jurisdictions will enable identified threats and impacts to be managed using proven methods and strategies.

The SIA Framework and CSIRO's guidelines for achieving a 'social licence to operate' will assist in overcoming community perceptions that an unconventional shale gas industry is:

- Short-term and cyclical in nature.
- Similar to the coal seam gas industry in Queensland, with similar impacts.
- Aloof to community concerns and has disregard for the social outcomes of development.

The strategic approach to compiling a social baseline proposed by CSRM (2017) will assist in identifying and managing cumulative impacts on the geographically dispersed and diverse communities.

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1. Introduction

The independent scientific panel (the Panel) undertaking the Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs and Associated Activities in the Northern Territory (the Inquiry) identified risks associated with hydraulic fracturing in its Background and Issues Paper (Inquiry, 2017a). They are: water, land, air, public health, impacts on Aboriginal people and their culture, social impacts, economic impacts, land access, and the regulatory framework. The Panel is required by its Terms of Reference to:

1. determine and assess the impacts and risks associated with hydraulic fracturing of unconventional reservoirs and the associated activities;
2. determine whether additional work or research is required to make that determination;
3. for each risk that is identified, advise the level of impact or risk that is acceptable in the Northern Territory context;
4. describe the methods, standards or strategies that can be used to reduce the impact and risk to acceptable levels;
5. identify what government can do, including implementing any policy, regulatory or legislative changes, to ensure that the impacts and risks are reduced to the required levels; and
6. identify priority areas for 'no go' zones.

The Panel commissioned a two-part scope of work (Appendix B) to assist its deliberations on the social impacts of an unconventional gas industry in the Northern Territory. The scope of work comprised:

Part A Social Impact Assessment

- Develop a leading practice framework for the identification, assessment and management of the social impacts associated with the development of onshore unconventional gas in the Northern Territory.
- Undertake a high-level social impact assessment (SIA) that describes 'the type of potential social impacts, issues, concerns, risks and benefits that may arise from the development of the unconventional gas industry in the Beetaloo sub-basin on the Affected Communities'.

Part B Social Licence to Operate

- Describe and assess the concept, elements and issues surrounding a 'social licence to operate' (SLO), as it applies to the onshore unconventional gas industry in the Northern Territory.

1.1. Purpose of the case study

The preparation of a high-level SIA case study (SIA case study) aims to provide information that will assist the Panel to:

- Identify and assess the potential impacts on affected communities of an indicative scenario for development of an unconventional gas industry, including their likely significance and ability to be managed.
- Identify key issues to guide the approach to any future project-level SIA for inclusion in the SIA Framework methodology.

1.2. Purpose of this report

The Centre for Social Responsibility in Mining (CSRM) of the University of Queensland has proposed a leading practice SIA Framework (CSRM, 2017) for future development of an unconventional gas industry in the Northern Territory.

The SIA Framework proposes project-level SIA are guided by a strategic assessment informed by sub-basin wide baseline studies and monitoring programs. In the absence of sub-basin wide baseline studies and a strategic assessment, the SIA case study is a high-level project-level SIA of a conceptual development scenario.

This report documents the approach to and outcomes of the SIA case study of a conceptual unconventional gas development in the Beetaloo sub-basin using relevant aspects of the SIA Framework proposed by CSRM (2017).

2. Social impact assessment method

CSRM (2017) has proposed a leading practice SIA Framework for future development of an unconventional gas industry in the Northern Territory.

The key recommendations are strategic environmental (and social) impact assessment informed by project-independent baseline studies that are based on an adaptive participatory management approach. The strategic assessment would provide the framework for project-level assessments with project-level monitoring providing information to facilitate review and update of the strategic assessment.

CSRM identified the phases of SIA within an adaptive participatory management approach in Figure 2 of CSRM (2017) which is presented below as Figure 2.1.

The SIA case study is a discrete high-level assessment of a conceptual development and is therefore unable to implement the adaptive participatory management approach identified by CSRM (2017).

CSRM identified the phases and activities of SIA in Figure 1 of CSRM (2017) which are presented below as Figure 2.2.

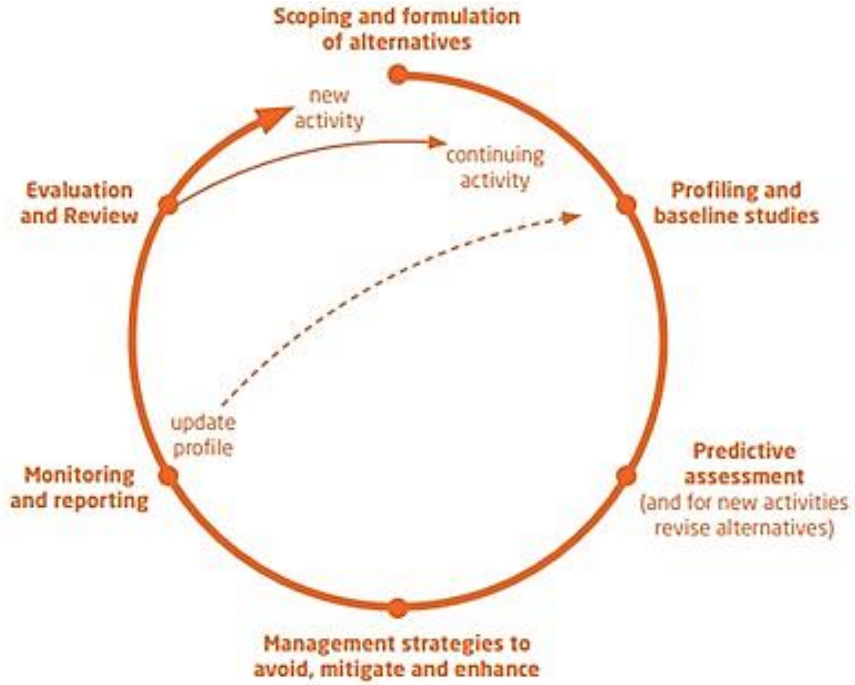


Figure 2.1 The phases of SIA within an adaptive participatory management approach (CSRM, 2017)

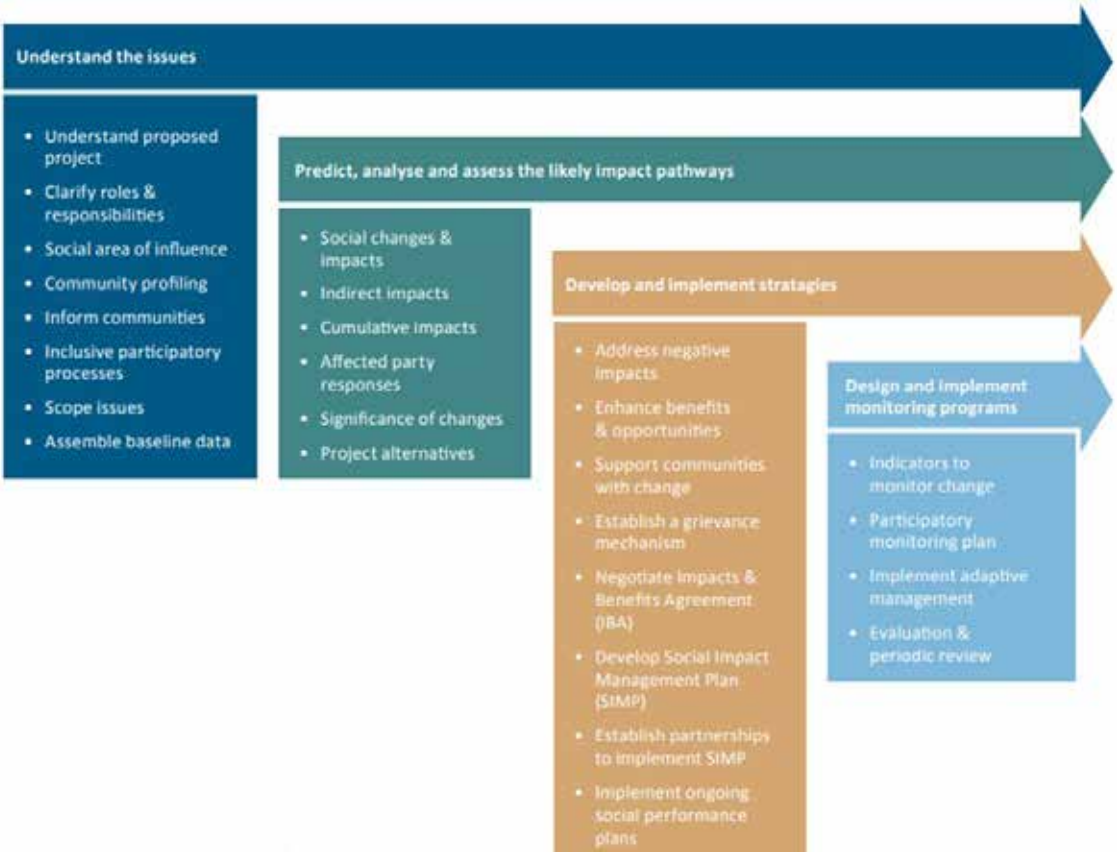


Figure 2.2 The phases and activities of SIA (CSRM, 2017)

A project-level SIA would typically take several years and involve extensive community and stakeholder engagement to understand social values, identify and explain potential impacts, and develop, explain, refine and reach agreement on appropriate responses, management measures and initiatives. This is not possible for the SIA case study which was conducted over a period of six months. The approaches identified in figures 2.1 and 2.2 were revised for the purposes of the SIA case study. The SIA case study was conducted in three stages. The relationship between this approach and those proposed by CSRM (2017) is set out in Table 2.1.

Table 2.1 Relationship of adopted and proposed SIA methods

Adaptive participatory management approach (CSRM)	SIA phases and activities (CSRM)	Beetaloo sub-basin SIA case study
Scoping and formulation of alternatives	Understand the issues	Conceptual development project description
Profiling and baseline studies		Compile social baseline
Predictive assessment	Predict, analyse and assess the likely impact pathways	Identify and assess threats and potential impacts to social values
Management strategies to avoid, manage and enhance	Development and implement strategies	Propose mitigation and identify opportunities for enhancing social values
Monitoring and reporting	Design and implement monitoring programs	Not applicable for case study
Evaluation and review		

The three stages adopted for the Beetaloo sub-basin SIA case study are:

1. Compile social baseline:
   - Identify affected communities based on conceptual development.
   - Compile social profiles on affected communities.
   - Define social catchments based on affected community profiles.
   - Identify social values held by communities and social indicators.
2. Identify and assess threats and potential impacts to social values:
   - Identify and describe threats to social values.
   - Assess risk of threats (and impacts on social values).
   - Describe impacts on social values.
3. Propose mitigation and identify opportunities for enhancing social values:
   - Propose strategies and measures for managing the identified impacts.
   - Identify and describe opportunities for enhancing social values.

The approach taken to each of these stages is described in the following sections.

2.1. Compile social baseline (Stage 1)

Affected communities were defined by the Panel as including community members, pastoralists, Aboriginal organisations and local businesses. Section 2.1.2 describes how the affected communities were identified. Section 2.1.2 describes how the affected communities' values were identified and

Section 2.1.3 describes the communities and stakeholders consulted to confirm the social values and understand potential social and economic impacts of unconventional gas development. Social profiles for a representative sample of the affected communities are presented in Appendix A.

2.1.1. Identify affected communities and define social catchments

Appendix A provides a detailed description of the rationale for categorisation of 'affected communities' which were grouped into social catchments, and the development of social profiles through a structured approach to assembling and assessing existing quantitative and qualitative information. The SIA case study identified four clusters (or social catchments) of 'affected communities' based on the following factors:

- **Location and community links**: Centres with a population level that may indicate some potential for providing 'local employment' should sub-basin development proceed. Generally these communities are located outside of, but in proximity to, the Beetaloo sub-basin. Consideration of potential physical and cultural links are also important factors influencing grouping and the potential to experience shared perceptions of impact.
- **Logistics or support industry potential**: It is assumed that the development of an unconventional gas industry would require at least a moderate level of logistical and maintenance support. This could be a purpose-built area within gas field or a facility located in the existing large towns north and south of the sub-basin that currently support industrial activity, for example Katherine, which currently provides support to the mining industry and RAAF Base Tindal and/or Tennant Creek, which provides support to the mining industry.
- **Dominant economic activity**: Pastoral operations constitute the principal economic activity within the Beetaloo sub-basin, with the Stuart Highway and to a lesser extent the Carpentaria Highway facilitating economic activity associated with tourism.

The four social catchments containing the affected communities (see Appendix A) are:

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

2.1.2. Identify social values

CSRM (2017) recommends using the community capitals framework (CCF) to understand baseline conditions and aspirations in affected communities. While this method is useful where there is a substantial body of secondary data to draw upon, experience in consultations with affected communities in rural areas has shown that dialogue with local people in relation to conditions and aspirations is enhanced when the discussion has centered on values, rather than capitals.

A social value is regarded as a quality of the area, potentially subject to project effects, for which community members have high regard, and that is conducive to individual or community well-being into the future. Community members generally consider and aggregate a number of community capital attributes and indicators when describing the status of a social value.

Diverse community interests require an approach that is understandable to the average community member, is capable of capturing their expressed needs, concerns and aspirations (integrating the

various dimensions of their livelihoods) and promoting dialogue around the inevitable 'trade-offs' involved in seeking the betterment of life for individuals and the community.

Experience in other jurisdictions and in Aboriginal communities in the Northern Territory has found that the following four indicative social values are core values held by people in regional and remote communities:

- SV1 Liveable community.
- SV2 Affordable lifestyle.
- SV3 Community identity and spirit.
- SV4 Capacity for sustainable economic activity.

These values encapsulate the community capitals (CSRM, 2017) and the 'values' set out in IAIA's International Principles of Social Impact Assessment (IAIA, 2003). The indicative social values guided interviews and engagement with local communities.

Their use supports a dialogue that becomes progressively broader when discussing the characteristics or indicators of the values with community members. Table 2.2 shows how these social values capture relevant information about the community capitals put forward in the SIA Framework, while Table 2.3 and Table 2.4 list key stakeholders expected to subscribe to or hold those values strongly, and tentative respective indicators of the values for urban and rural communities. In a participative baseline assessment process, dialogue with stakeholders and communities would refine the list of indicators, and identify the relevant importance of the social values.

The scope of work made specific reference to the list of values put forward by the International Association for Impact Assessment (IAIA). While all of these values have an overlap or relevance to the social values adopted for this case study, Table 2.5 indicates where the IAIA value may have a higher level of relevance to the case study social value.

Urban communities (Katherine and Tennant Creek) are townships with identifiable residential areas and business centres. Rural communities in this instance include Aboriginal communities and small open townships generally administered by a Regional Council.

Secondary baseline information and information and opinion sourced during community consultation was assessed to describe the characteristics of broad social values in communities, and the robustness or vulnerability of these social values to project-induced change. Community consultation also endeavored to elicit stakeholder receptivity and attitudes toward the development scenario proposed.

Table 2.2 Community capital relevance to social values

Social value	Community capitals							
	Natural	Social	Human	Cultural	Political	Financial	Built	Institutional
SV1 Liveable community	✓	✓			✓		✓	✓
SV2 Affordable lifestyle						✓	✓	✓
SV3 Community identity and spirit	✓	✓	✓	✓	✓	✓	✓	✓
SV4 Capacity for sustainable economic activity	✓	✓	✓	✓	✓	✓	✓	✓

Table 2.3 Urban community indicative social values

Social value	Key stakeholder	Possible indicators
SV1 Liveable community	• Community members • Local Government • Service providers (e.g. health, education, police, emergency services etc) • Civic organisations (e.g. service organisations, local community groups)	• Access to, and proximity of, quality services (health, education, aged care, childcare, retail etc) • Balanced demographic profile • Harmonious relationships, lack of conflict • Respect for law by community members • Adequate infrastructure that is well-maintained (housing, roads, airport, power, water & sewerage, telephone, internet) • Effective local governance • Opportunity for recreational, cultural and sporting pursuits • Safe social and physical environment
SV2 Affordable lifestyle	• Community members • Local Government • Business sector	• Cost of land and housing • Local Government charges • Income levels • Cost of food, power and other essential items
SV3 Community identity and spirit	• Community members • Community organisations (including churches and non-government organisations) • Local Government	• Level of volunteering and availability of assistance • Local celebrations • Recognition, preservation and promotion of heritage • Capacity to accommodate visitors • Perceptions of being able to influence community destiny • Employment share by industry
SV4 Capacity for sustainable economic activity	• Retail businesses • Service industries • Agricultural producers • Recreational and tourism businesses (including accommodation providers) • Producer organisations (e.g. NT Cattleman's Association; NT Tourism) • Regional development organisations • Local Government	• Viability, vitality and diversity of local industry • Workforce participation and employment • Job creation and retention of young people • Supportive business environment (e.g. availability of serviced industrial land, adequate zoning, provision of information on opportunities) • On-going environmental integrity (e.g. surface and groundwater, land degradation) • Willingness of business to invest

Table 2.4 Rural community indicative social values

Social value	Key stakeholder	Possible indicators
SV1 Liveable community	• Community elders and members, in particular women • Aboriginal organisations providing services • Local Government • Mainstream service providers (e.g. health, education, police, emergency services etc)	• Proximity and access to traditional country • Degree of satisfaction with management of traditional country • Respectful and harmonious relationships within and between communities (both Aboriginal and non-Aboriginal) • Access to service delivery (in particular health and education) that acknowledges and respects culture • Ability for extended family residence • Respect for law by community members • Adequate infrastructure that is well-maintained (roads, airport, power, water & sewerage, telephone, internet) • Effective local governance • Opportunity for recreational, cultural and sporting pursuits • Safe social and physical environment
SV2 Affordable lifestyle	• Community elders and members, in particular women • Aboriginal organisations providing services • Local Government • NT and Commonwealth Government	• Availability of adequate housing • Cost of housing • Income levels • Cost of food, power and other essential items
SV3 Community identity and spirit	• Community elders, members and affiliates • Aboriginal organisations • Local Government • Community organisations	• Recognition and promotion of cultural heritage • Perceptions of being able to influence community destiny • Existence of viable enterprise activity • Number and strength of Aboriginal organisations • Status of reconciliation with non-Aboriginal community • Level of volunteering and availability of assistance • Local celebrations
SV4 Capacity for sustainable economic activity	• Community elders and members • Aboriginal enterprises and organisations • NT and Commonwealth Government • Training providers	• Availability of employment opportunities • Aboriginal workforce participation and employment • Aboriginal business start-ups and ownership • Level of education achievement, including retention to Year 12 and post-school destinations

Table 2.5 Mapping of relevance of IAIA values to social values adopted for the Beetaloo sub-basin SIA case study

	IAIA value							
Adopted Social Value	**Way of life**	**Culture**	**Community**	**Political systems**	**Relationship to environment**	**Health and well-being**	**Personal and property rights**	**Fears and aspirations**
SV1 Livable community	✓✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓	✓	✓✓
SV2 Affordable lifestyle	✓	✓	✓✓	✓	✓✓	✓	✓✓	✓
SV3 Community identity and spirit	✓✓	✓✓✓	✓✓	✓✓✓	✓	✓✓✓	✓✓	✓✓✓
SV4 Capacity for sustainable economic activity	✓✓	✓	✓✓	✓	✓✓✓	✓	✓✓	✓

✓ ⇨ ✓✓✓ indicates increasing level of relevance

2.1.3. Stakeholder engagement

A targeted program of community consultation was undertaken to gain initial insights into the nature and status of social values (to consider whether this 'values approach' had merit for incorporation in the SIA Framework), and to assess community sentiment toward development (in relation to the potential impacts as well as opportunities that may manifest through industry activity).

Two rounds of consultation were done to inform the SIA. The first round comprised a semi-structured interview approach with individuals and small focus groups to establish an initial dialogue around baseline community attributes, the effects of implementation of the development scenario, social baseline research required for future project-level SIAs, and the concept of a Social Licence to Operate (SLO) as a measure of a community's acceptance of the industry's right to operate.

The second round of consultation comprised two meetings – a preparatory meeting and a consultation meeting to discuss the Beetaloo sub-basin case study. The preparatory meeting sought community advice on who should be consulted and an appropriate date and time, and explained what would be discussed. The consulted communities requested a list of questions/issues for which comment was sought. A list of questions was provided to the communities in advance of the consultation meeting. A formal presentation was prepared and given to the communities. It contained information about unconventional gas development, hydraulic fracturing and associated risks, potential impacts of unconventional gas development and the conceptual Beetaloo sub-basin development. A key focus of the consultation was providing communities with sufficient information to enable informed discussion of the social and economic issues and impacts associated with the conceptual development.

Consultation was undertaken with members of the following communities:

Affected communities (urban)

- Katherine
- Tennant Creek

Affected communities (north)

- Mataranka
- Minyerri
- Ngukurr

Affected communities (central)

- Elliott
- Daly Waters

Affected communities (east)

- Borroloola
- Robinson River

Northern Territory Government, local government, Beetaloo sub-basin exploration permit holders, primary producer and industry organisations, local businesses, community support organisations, and environmental groups were also consulted, including:

- Northern Territory Department of Business
- Northern Territory Environment Protection Authority
- Roper Gulf Regional Council
- Victoria Daly Regional Council
- Katherine Town Council
- Santos Limited
- Origin Energy
- Pangaea Resources
- APPEA
- Northern Territory Cattlemen's Association
- Katherine Mining Services Association
- Sunrise Health
- Katherine Landcare
- Northern Territory Environment Centre
- Lock the Gate
- Frack Free NT Alliance

In total, 69 engagement meetings were undertaken, as indicated in the Table 2.6 which categorises the stakeholders into key groups.

Table 2.6 Stakeholder consultation effort

Stakeholder category	No. of meetings	%
Government agencies and statutory authorities	7	10
Businesses and peak business organisations	11	16
Local Governments	6	9
Non-government organisations	6	9
Community organisations and residents	39	56

The key themes that emerged during consultation on the potential social and economic impacts of the conceptual development scenario substantially mirrored those that were evidenced during the Panel's public consultation. Analysis of the frequency of comments indicates a ranking of issues as shown in Figure 2.3.

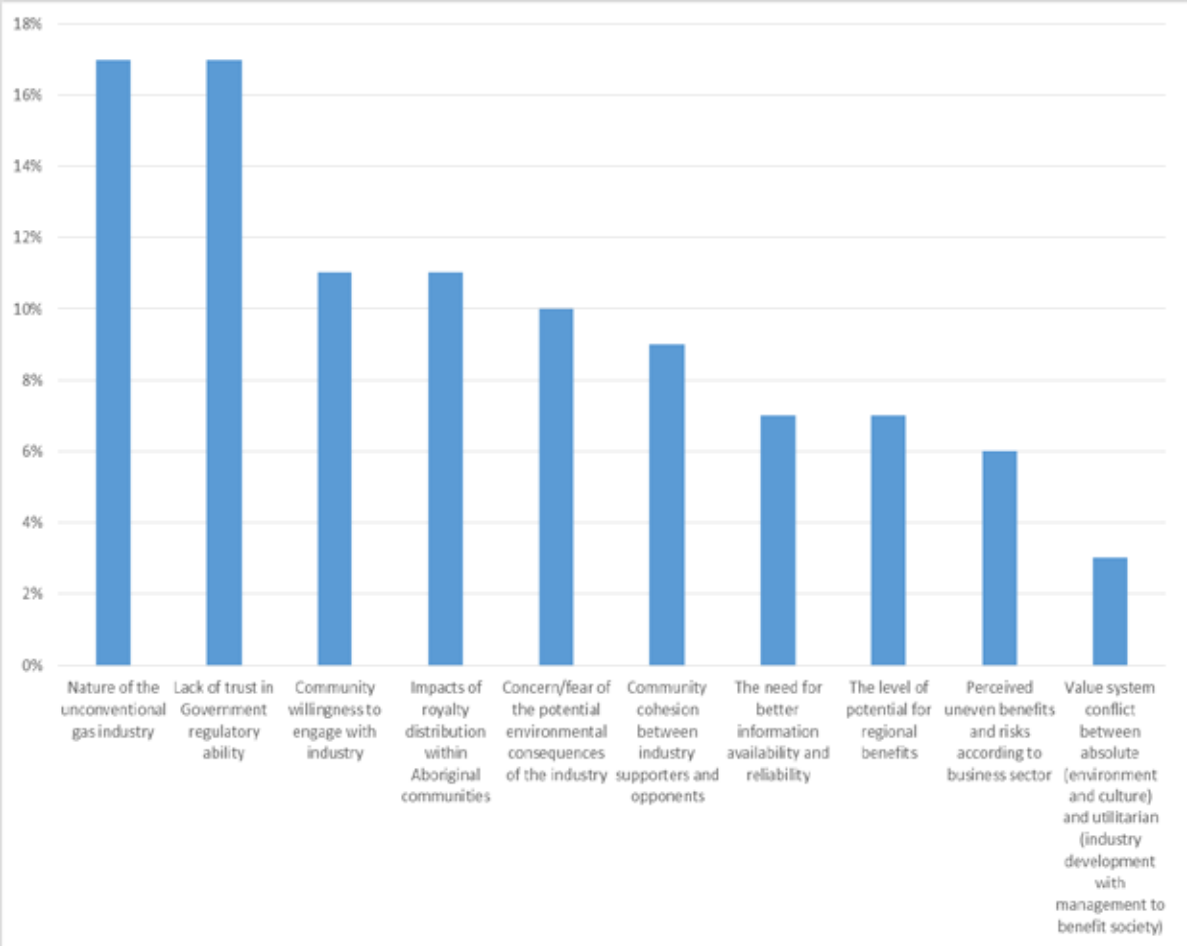


Figure 2.3 Ranking of issues expressed during stakeholder consultation

Factors contributing to the identification of these issues include:

- A perception that the resources industries are short-term rather than long-term, and cyclical in nature.
- Concern that the industry would dominate rather than co-exist with pastoralism and tourism.
- Assumptions about impacts drawing upon issues associated with the coal seam gas industry in Queensland.
- A view that industry was aloof from community concerns with a disregard for social outcomes of their operations.
- A perception that government regulators consistently place industry concerns above community concerns.
- Either a lack of interest or capacity for community to engage with industry.
- Negative observations of past distribution and expenditure of royalty income by some traditional owner (TO) groups.
- A high level of concern for the on-going integrity of groundwater sources, with the need for independent monitoring to ensure transparency.
- Awareness of past environmental issues in other jurisdictions through the activity of activists opposed to industry development.
- Minimal exposure to the views of, and dialogue with, technical experts, and concern that most information was only coming from groups opposed to industry development.
- An awareness of the occupational skills needed by the industry, and a perception that that would preclude a reasonable level of local industry involvement (and consequent community benefit).
- A belief in some quarters that measured consideration of the issues was not possible, with mainly the 'loudest' voices being heard and alternate views not being promoted.
- A belief that some industry sectors (e.g., construction and maintenance) would benefit at the expense of existing sectors (e.g., tourism services).

These views have been considered when assessing the significance of potential risks to social values.

2.2. Identify and assess potential impacts (Stage 2)

Team member's knowledge of Northern Territory communities and of the typical activities involved in onshore unconventional gas development and operation were used in a brainstorming exercise to identify potential threats to social values and opportunities for enhancement of the identified social values.

This exercise considered the views of stakeholders expressed during consultation, the experience of impacts from other major development in the region, as well as the experience of projects in other environments with characteristics similar to the Beetaloo sub-basin communities. Potential threats to values and consequent impacts are shown in Table 2.7, with a description of the nature of threats presented in Table 2.8. Potential opportunities for benefits are discussed in Section 3.5.

The case study assumes a conceptual Beetaloo sub-basin development largely dependent on a skilled workforce sourced from outside the area and residing in project-supplied accommodation, which has medical and recreational facilities and services. Impacts on health services, education and

as a result of crime in sub-basin communities are unlikely as a result of this development scenario and are not considered further in the SIA. These particular risks will not always be absent, as their existence will depend on the particular nature of the projects that advance to development.

Following the identification of threats to social values, the likelihood of the threat occurring and its consequence on the values were determined using risk assessment based on AS/NZS 31000:2009 Risk management – Principles and guidelines. Likelihood and consequence criteria used in the assessment are listed in Table 2.9 and Table 2.10 respectively, with the risk matrix shown in Table 2.11.

Table 2.7 Identified Beetaloo sub-basin community values, threats and potential impacts

Social value	Threat or impact driver (ID)	Potential impact
SV1 Liveable community	ID1A Rapid workforce influx to urban areas	Impaired community amenity
	ID1B Increase in heavy vehicle traffic on local roads	Reduced amenity, road accidents and increased vehicle maintenance costs
	ID1C Conflict between supporters and opponents of unconventional gas industry development	Conflict between community members
	ID1D Receipt of royalties by a subset of community members	Conflict between community members
	ID1E Concern over potential risk to groundwater quality	Anxiety about availability, access to and quality of water resources
SV2 Affordable lifestyle	ID2A Housing supply unable to meet spike in demand	Decreased housing availability and affordability
	ID2B Increased short-term rental costs	Decreased housing availability and affordability
SV2 Affordable lifestyle	ID3A Significant change in land use and industry development	Loss of ‘outback’ identity
	ID3B Perception of industry development heralding an era of ‘industrialisation’ of the landscape	Loss of ‘outback’ identity
	ID3C Perception that industry development approval is against majority community wishes	Decreased community engagement with local governance
	ID3D Concern with increased access to, and development risks on traditional country	Increased sense of cultural loss
SV4 Capacity for sustainable economic activity	ID4A Concern that long-term access to quality groundwater may be restricted due to industry development	Decreased investment in pastoral and horticultural enterprises
	ID4B Perception that ‘outback’ identity is compromised by ‘major industrialisation’ of the region	Decrease in tourist visitation
	ID4C Higher gas industry wage rates available to local residents drives competition for employees	Increased cost of labour for local businesses
	ID4D Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Local business closures

Table 2.8 Threat description

Threat (impact driver)	Description
SV1 Liveable community	
ID1A Rapid workforce influx to urban areas	The early construction phase of projects in rural areas is often characterised by a rapid workforce influx into urban areas of regional service townships. The size of this influx tends to decrease over time as construction accommodation camps are established closer to the building sites in the gas fields. In the early stages it can lead to effects such as a restriction on the availability of rooms in visitor accommodation, increased traffic on local streets, increased 'visibility' of industry workers in local venues, and local resident disturbance due to unfamiliar work hours (e.g., the early morning 'reverse warning beeper' issue in residential areas).
ID1B Increase in heavy vehicle traffic on local roads	Increases in the level of heavy vehicle traffic, on highways and through township areas, may impair amenity through the generation of noise and dust, as well as increase the number of traffic incidents leading to perceptions of compromised road safety. These perceptions will be reinforced should any need for increased road maintenance not be met in a timely manner.
ID1C Conflict between supporters and opponents of unconventional gas industry development	Polarised communities, characterised by strong feelings for and against industry development, subject to the influence of external advocacy groups, and where livelihoods are at stake, may be at increased risk of conflict between members. This could lead to avoidance behaviour between opposing groups, and potentially conflict in venues such as schools and sporting events. The effects may be felt particularly in smaller communities.
ID1D Receipt of royalties by a sub-set of community members	Within Aboriginal communities, the receipt of royalties by traditional owners can lead to increased tension, particularly if it results from an activity that does not have widespread support, and if the behaviour of recipients is not in accord with community norms (emphasising community rather than personal benefit).
ID1E Concern over potential risk to groundwater quality	Reliance on groundwater for domestic and agricultural use is widespread in the Northern Territory, and any activity that may potentially impair the quality or quantity of the resource is likely to evoke a high level of concern in communities, both urban and rural. This effect has been demonstrated through the community response to groundwater contamination with PFAS in the vicinity of Defence Force bases. This concern has the potential to influence water use behaviour (such as opting to consume bottled water only) that may compromise community liveability.
SV2 Affordable lifestyle	
ID2A Housing supply unable to meet spike in demand	A decision to base a workforce residentially (in lieu of a fly-in fly-out (FIFO) arrangement) may result in a spike in demand for housing. A lag in supply (either due to the rate of construction or a shortage of serviced land) to meet this increased demand may result in price rises in the short to medium term limiting the availability and inhibiting the affordability of housing for lower income local community members.
ID2B Increased short-term rental costs	A decision to implement a residential operation rather than FIFO may also increase demand for rental accommodation that may also result in increased costs in the absence of adequate supply. These increased costs may not be affordable to persons on lower incomes.
SV3 Community identity and spirit	
ID3A Significant change in land use and industry development	Extensive change in land-use may result in a change to community self-identification, which could have an effect on community spirit until the change is socialised or accepted. As an example, the community of Katherine underwent a step-change in identity with the re-development of RAAF Base Tindal together with the development of the Katherine East residential area, resulting in a threefold increase in population since the mid-1980s.

Threat (impact driver)	Description
ID3B Perception of industry development heralding an era of 'industrialisation' of the landscape	Highly visible land-use change to residents traversing a project area, associated with a single or multiple projects, may support a perception that the landscape is being 'industrialised'. This type of perception, if strongly held or persistent, may contribute to a change in community identity that is not welcomed by either long-term residents or businesses that depend on a particular perception (e.g., outback spirit or land of the 'never never') for sale of their services (e.g., tourism operators).
ID3C Perception that industry development approval is against majority community wishes	Where communities have a majority strongly-held position on the desirability or otherwise of industry development, the issue of a government approval that is not in accord with the majority position may have an adverse effect on community spirit due to the fostering of feelings that community wishes are being ignored, and that community control of their destiny, in which they have a significant stake, is being weakened.
ID3D Concern with increased access to, and development risks on traditional country	Aboriginal people continue to exercise traditions connected to sites across the landscape, notwithstanding that many of these sites are contained within pastoral leasehold land. Increased access by machinery and the development of infrastructure required for a gas project is likely to promote concern that inadvertent interference or damage to sites does not occur and create or add to a sense of 'cultural loss'.
SV4 Capacity for sustainable economic activity	
ID4A Concern that long-term access to quality groundwater may be restricted due to industry development	As an essential industry input, any threat, real or perceived, to the long-term sustainability of groundwater supply (either in quality or quantity) may have a detrimental effect on pastoral or horticultural property owners willingness to invest due to the uncertainty created by unconventional gas industry development.
ID4B Perception that 'outback' identity is compromised by 'major industrialisation' of the region	The development of an unconventional gas industry may be interpreted as the commencement of regional 'industrialisation', detracting from the image of the Northern Territory as 'Outback Australia', which in turn may act as a disincentive for tourists to visit the region.
ID4C Higher gas industry wage rates available to local residents drives competition for employees	Local employees with appropriate skills may be attracted to work for gas development companies where wages are typically higher. This may result in local businesses having to offer higher wages to compete, potentially driving up the cost of services to local customers who may have limited ability to pass on costs.
ID4D Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Increased gas industry demand for goods and services may not be able to be met by smaller local businesses, or may act to attract larger businesses to establish in the area. These businesses may establish a permanent presence, or may withdraw following a high demand construction period, and may out-compete local businesses affecting their ability to survive and grow.

Table 2.9 Likelihood criteria

Likelihood	Description
Almost certain (common)	Very likely to occur or be an opportunity at either a specific stage of the project lifecycle or more broadly
Likely (has occurred in recent history)	Likely to occur or be an opportunity at either a specific stage of the project lifecycle or more broadly
Possible (could happen, has occurred in the past, but not common)	Possible to occur or be an opportunity at either a specific stage of the project lifecycle or more broadly
Unlikely (not likely or uncommon)	Unlikely to occur or be an opportunity at either a specific stage of the project lifecycle or more broadly
Remote (rare or practically impossible)	Very unlikely to occur or be an opportunity at either a specific stage of the project lifecycle or more broadly

Table 2.10 Consequence criteria

Consequence category	Description
Critical (severe, widespread long-term effect)	Irreversible changes to social values of communities of interest or community has no capacity to adapt and cope with change.
Major (widespread moderate to long-term effect)	Long-term recoverable changes to social values of communities of interest or community has limited capacity to adapt and cope with change. Long-term opportunities emanating from the project.
Moderate (localised, short-term to moderate effect)	Medium-term recoverable changes to social values of communities of interest or community has some capacity to adapt and cope with change. Medium-term opportunities emanating from the project.
Minor (localised short-term effect)	Short-term recoverable changes to social values of communities of interest or community has substantial capacity to adapt and cope with change. Short-term opportunities emanating from the project.
Negligible (minimal impact or no lasting effect)	Local, small scale, easily reversible change on social values of communities of interest or communities can easily adapt or cope with change. Local small-scale opportunities emanating from the project that the community can readily pursue and capitalise upon.

Table 2.11 Risk matrix

	Likelihood				
Consequence	**Remote**	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
Critical	Medium	High	High	Very High	Very High
Major	Medium	Medium	High	High	Very High
Moderate	Low	Medium	Medium	Medium	High
Minor	Very Low	Low	Low	Medium	Medium
Negligible	Very Low	Very Low	Low	Low	Medium

2.3. Manage impacts and enhance opportunities (Stage 3)

The third stage of the approach considers how and to what extent potential impacts can be managed and how opportunities for enhancing social values may be realised, recognising that remote Aboriginal communities in particular often face significant barriers to workforce participation and the development of commercial enterprises. Strategies for managing impacts are presented in Section 5.3 and opportunities for enhancing social values in Section 5.4.

3. Socioeconomic context of Beetaloo sub-basin

The Beetaloo sub-basin is located between Katherine and Tennant Creek and covers an area of approximately 7,000 km^2 (Figure 3.1).

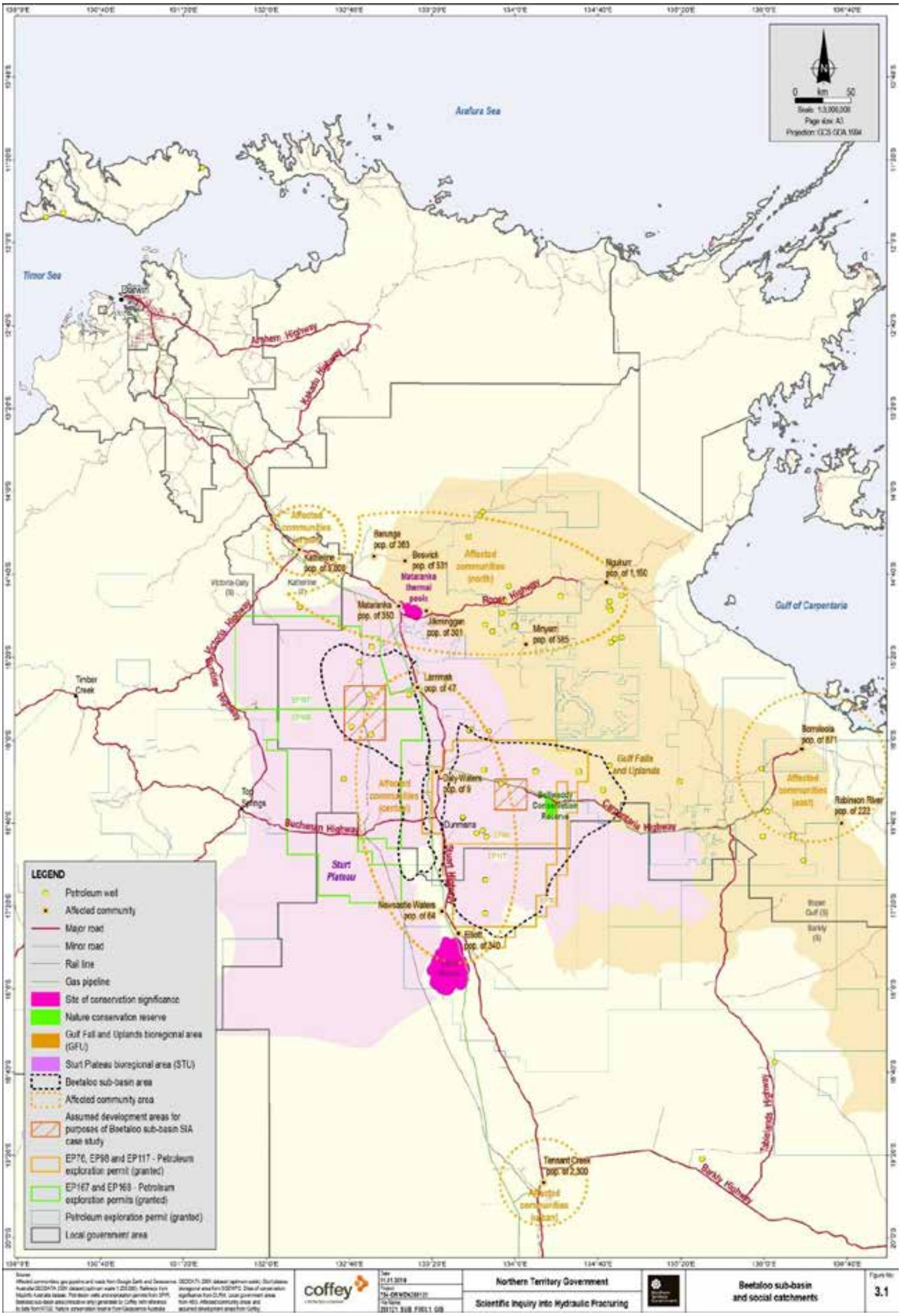
Land use in the Beetaloo sub-basin comprises Aboriginal land, pastoral leases, horticultural enterprises, oil and gas transmission infrastructure, a railway, and highway towns, cattle stations and remote Aboriginal communities. The Australian Defence Force operates RAAF Base Tindal located near Katherine.

The region is accessed by the Stuart, Roper and Carpentaria highways and community and station access roads. The Stuart Highway is a sealed dual-lane road. The Roper and Carpentaria highways comprise sealed and unsealed sections. All other roads and tracks are unsealed and may be subject to temporary closure during the wet season when rivers and creeks can flood. The Ghan Railway passes through the sub-basin, with The Ghan tourist train stopping at Katherine.

Larrimah, Daly Waters, Newcastle Waters and Elliott border or are located in the sub-basin. The adjacent towns and communities of Katherine, Mataranka, Minyerri, Ngukkur, Borroloola, Robinson River and Tennant Creek are located outside the sub-basin.

The Beetaloo sub-basin has been explored since the 1980s. Figure 6.2 of the Panel's Interim Report shows the extent of unconventional shale gas exploration in the Beetaloo sub-basin which has comprised hydraulically fractured and non-fractured wells.

Roper Gulf Regional Council is the local government authority for the northern part of the sub-basin. The southern part of the sub-basin is administered by the Barkly Regional Council, with Katherine administered by the Katherine Town Council. The Northern Land Council, an independent statutory authority established under the *Aboriginal Land Rights (Northern Territory) Act 1976* (Cwlth), represents Aboriginal communities within and adjacent to the sub-basin.


Arafura Sea
Timor Sea
Gulf of Carpentaria
Darwin
Arnhem Highway
Kakadu Highway
Victoria Highway
Buchanan Highway
Roper Highway
Stuart Highway
Carpentaria Highway
Tablelands Highway
Barkly Highway
Katherine pop. of 9,909
Barunga pop. of 383
Beswick pop. of 531
Mataranka thermal pools
Mataranka pop. of 350
Jilkminggan pop. of 301
Ngukurr pop. of 1,150
Minyerri pop. of 585
Larrimah pop. of 47
Daly Waters pop. of 9
Dunmarra
Newcastle Waters pop. of 64
Elliott pop. of 340
Borroloola pop. of 871
Robinson River pop. of 222
Tennant Creek pop. of 2,300
Timber Creek
Top Springs
Sturt Plateau
Gulf Falls and Uplands
Bullwaddy Conservation Reserve
Affected communities (north)
Affected communities (central)
Affected communities (east)
LEGEND
Petroleum well
Affected community
Major road
Minor road
Rail line
Gas pipeline
Site of conservation significance
Nature conservation reserve
Gulf Fall and Uplands bioregional area (GFU)
Sturt Plateau bioregional area (STU)
Beetaloo sub-basin area
Affected community area
Assumed development areas for purposes of Beetaloo sub-basin SIA case study
EP76, EP98 and EP117 - Petroleum exploration permit (granted)
EP167 and EP168 - Petroleum exploration permits (granted)
Petroleum exploration permit (granted)
Local government area
coffey
Northern Territory Government
Scientific Inquiry into Hydraulic Fracturing
Beetaloo sub-basin and social catchments
3.1

The socioeconomic context for undertaking the SIA case study of the conceptual development in the Beetaloo sub-basin is characterised as follows:

- The Beetaloo sub-basin has seen almost no industrial development. Some affected communities have experience with development. For example, experience with mining development south of Ngukurr (iron ore) and at McArthur River (large-scale underground and open pit mining of lead and zinc). The installation of gas transmission and lateral pipelines through the sub-basin (Amadeus Basin to Darwin Pipeline in 1986; the Elliott Spur Pipeline in 1989, and the McArthur River Pipeline in 1995) that occurred 20 to 30 years ago is not readily recalled by community members. The current installation of the Northern Gas Pipeline from just north of Tennant Creek to Mount Isa is in an early stage of development, and a significant distance south of the Beetaloo sub-basin communities.
- Economic activity is centred on agriculture development (pastoral operations throughout the sub-basin, horticulture south of Katherine and along the Roper Highway) together with Defense activity at RAAF Base Tindal, and tourism activity mainly servicing self-drive visitors. Regional service townships (Katherine and Tennant Creek) are located outside the sub-basin.
- Obvious significant disparities in social status and living conditions between remote Aboriginal communities and regional service townships. This has a significant influence on the potential for community members to capture potential benefits from industry development should it occur.
- Community members have a reasonably high level of awareness (due to the activities of groups opposed to industry development) of historical issues surrounding the development of unconventional gas resources in other jurisdictions but not of the potential unconventional gas industry in the Northern Territory. The Inquiry's Interim Report (Inquiry, 2017b) acknowledged that levels of knowledge in Aboriginal communities about future development is inadequate.

4. Conceptual Beetaloo sub-basin development scenario

There are no firm development scenarios for the Beetaloo sub-basin. Several companies holding exploration permits in the area have expressed views on possible development pathways in their written submissions to the Inquiry. While there remain significant technical and commercial uncertainties to address prior to committing to development, for the purposes of the case study it has been assumed that initial development would occur to the west of Larrimah and to the east of Daly Waters, in the areas that have shown favourable exploration results, as shown in Figure 3.1. It is assumed the projects would be offset by three years.

ACIL Allen Consulting prepared a report, *The Economic Impacts of a Potential Shale Gas Development in the Northern Territory, Final Report to the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory*, October 2017 (ACIL Allen, 2017) that assesses the potential economic impacts of several development scenarios. The scenarios range from no shale gas production (baseline scenario) to accelerated production (shale gale scenario) under partial lifting of the moratorium on hydraulic fracturing and full lifting of the moratorium. The Shale WIND scenario assumes the moratorium is lifted and exploration and appraisal activities proceed, and lead to a moderate scale development. Based on industry submissions to the Inquiry this represents the most probable scenario if development was to occur and was adopted for the case study.

Using the information provided in ACIL Allen (2017) a number of assumptions were made regarding the scale and composition of the conceptual development. They are described in the following sections.

4.1. Conceptual development

The conceptual development assumes the moratorium on hydraulic fracturing will be fully lifted in 2018, allowing exploration, appraisal and pilot testing to proceed for a period of three to five years. Appraisal and pilot testing activities will confirm the technical and commercial parameters for development (e.g., gas availability and volume, cost of extraction, cost of gas processing, compression and transport, demand and wholesale price for gas, etc).

During the appraisal and pilot testing period environmental and planning approvals would be progressed with detailed design and construction of the gas fields and associated gas processing facilities commencing on receipt of territory and federal approvals. Shale gas production is assumed to occur for 25 years after which the production facilities and gas field infrastructure would be decommissioned. ACIL Allen's (2017) Shale WIND scenario assumes an approximately 260 well development.

It is assumed that each project area would require gas field access roads, production wells and gas gathering lines, a gas processing and compression facility, export pipeline connection to the Amadeus to Darwin Gas Pipeline, accommodation facilities and an airstrip for FIFO worker transport during the construction phase for major facilities, such as the gas processing and compression facility.

Table 4.1 lists the key parameters for the conceptual development scenario adopted for the SIA case study. An indicative development timeframe is presented in Figure 4.1.

Table 4.1 Indicative project scenario parameters

Element	Scale
Approximate number of wells drilled per annum	10
Maximum number of wells in operation	257 (in 2042)
Number of well pads (8 wells/pad)	32
Length of gas field roads	55 km (1.7 km for each pad)
Length of gathering pipes	32 km
Area of disturbance (for pads, roads, gathering pipes and camps)	10.9 square kilometres (1,090 ha)
Area of disturbance for pipelines (Armadeus tie-in 50 km; Armadeus duplication 300 km; Northern Gas Pipeline duplication 622 km). It is assumed that the pipeline duplications are on similar alignments to existing pipelines)	Approximately 116 square kilometres (11,600 ha)
Average level of employment for well pad construction and field operations (including camp operations x 2)	250 to 300 persons
Estimated indicative level of local employment	Darwin: 65 persons Katherine: 70 persons Regional Northern Territory: 25 persons
Logistics support facility in Katherine industrial area	5 to 10 persons

Figure 4.1 Indicative development timeframe

4.2. Transport and traffic

The most visible project activity for residents of rural communities will be transport to and from work sites. A number of assumptions were made regarding transport routes and traffic, as a detailed trip generation model is not available for the SIA case study.

The Stuart Highway will be used to access the gas fields in the Beetaloo sub-basin, most likely from the north but also from the south. The Carpentaria Highway will be used to access the eastern conceptual development. Regional roads such as Sunday Creek Road to the west of Larrimah and the Daly Waters to Cox River Road will be used to access the gas fields.

Heavy vehicles and light vehicles will be used to construct and operate the gas fields and gas processing and compression facilities. Heavy vehicle use will peak in construction when the major facilities are established. Light vehicles, buses and aircraft will be the predominant transport used in operation. Some heavy vehicle use will be required in operation to install new wells and maintain existing wells, and to service accommodation facilities and maintenance depots.

4.3. Workforce

The peak construction workforce is estimated at 450. The additional workers over that presented in Table 4.1 relate to the construction of gas processing and compression facilities.

The operation and maintenance workforce is estimated at 250. These workers will be engaged in drilling wells, installing gas gathering lines and constructing and maintaining civil works such as roads and well pads.

It is assumed that the workforce will use a combination of FIFO (from Darwin) and drive-in drive-out (DIDO) from Katherine and rural communities, and will stay in an accommodation facility while on shift. The accommodation facilities could be located close to a community near a transport hub (e.g., Daly Waters' airstrip) or collocated with gas processing and compression facility. The accommodation facilities will provide 24-hour medical facilities and support staff, as well as recreational facilities such as a swimming pool and gymnasium.

In order to consider local employment and population growth impacts, it has also been assumed that all gas processing and compression facility construction workers are non-local, with the Northern Territory-sourced workforce drawn from the communities shown in Table 4.2.

It is assumed approximately 70 persons would be locally sourced from the Katherine area, and that one third of these people (approximately 25) will have relocated to live in the area. This will result in a small population increase in the order of 80 persons (assuming 15 families of 4 persons and 10 couples with no children).

Table 4.2 Assumed workforce hire points

Workforce	Darwin sourced	Katherine sourced	Rural community sourced	Sourced in NT	Sourced outside NT
Pad construction (civil works, roads, etc)	50%	30%	20%	100%	-
Field operations (gas field technicians)	50%	50%	-	50%	50%
Camp operations (camp management, catering, accommodation support)	10%	50%	40%	100%	-
Annual average employment	65	70	25		

5. Social impact assessment

Unconventional gas development affects communities differently, with the differences relating to their capacity to absorb and adapt to the changes or impacts. Larger towns with more diverse communities and businesses have greater capacity than small and remote communities.

The SIA case study assessed the impacts of the conceptual development at two scales – the larger or urban communities and the small or rural communities, as follows:

- Urban communities comprises the Affected communities (Urban) catchment and the towns of Katherine and Tennant Creek.
- Rural communities comprises the Affected communities (North, Central and East) catchments and towns:
  - Affected communities (North): Barunga, Beswick, Mataranka, Jilkminggan, Minyerri and Ngukurr.
  - Affected communities (Central): Larrimah, Daly Waters, Dunmarra, Newcastle Waters and Elliott.
  - Affected communities (East): Borroloola and Robinson River.

This grouping is appropriate given the high-level assessment possible under the case study, where detailed information about specific communities is limited and extensive consultation over a period of years has not been possible.

5.1. Urban communities

A summary of the social values of urban communities is presented in this section along with an assessment of the potential threats to social values within those communities.

5.1.1. Social values

Table 5.1 summarises the social values identified for the urban communities of Katherine and Tennant Creek.

Table 5.1 Urban communities' social values

Social value	Indicator	Social value baseline summary
SV1 Liveable community	Access to, and proximity of, quality services (health, education, aged care, childcare, retail, etc) Balanced demographic profile Harmonious relationships, lack of conflict Respect for law by community members Adequate infrastructure that is well-maintained (housing, roads, airport, power, water and sewerage, telephone, internet) Effective local governance Opportunity for recreational, cultural and sporting pursuits Safe social and physical environment	Katherine town has a population of approximately 10,000. The Aboriginal population comprises approximately 28 per cent and migrates to and from the hinterland regions of Victoria-Daly and Roper-Gulf, while the non-Aboriginal residents tend to migrate to and from interstate (possibly heavily influenced by postings to RAAF Base Tindal). It is well-serviced by education facilities (five primary and two high schools), with adequate health facilities based at the Katherine Hospital (60 beds and 24-hour emergency) and Aboriginal health services (such as Sunrise Health and Katherine West Health) that support urban and rural clinics. There is a significant level of community services and residents have access to a broad range of community social and recreational groups. Infrastructure is adequate and well-maintained, and crime is generally not a major issue, though the itinerant nature of a segment of the population possibly contributes to higher levels of crime against persons and property from time to time. There are opportunities for sporting and recreational pursuits. Tennant Creek has a population of approximately 3,000 (2016 Census), indicating a slight contraction (2.2 %) from the 2011 Census counts, with a median age of 33. Aboriginal residents (51%) comprise the largest proportion of the younger age cohorts.
SV2 Affordable lifestyle	Cost of land and housing Local Government charges Income levels Cost of food, power and other essential items	The price of housing in Katherine and Tennant Creek is generally affordable, with 4% and 1.5% respectively of households with a mortgage where repayments are 30% or greater than household income, and with approximately 9% of households with rent payments greater than 30% of household income for both communities. House prices in Katherine appear to have peaked around the middle of 2015. Food prices at local supermarkets are in line with

Social value	Indicator	Social value baseline summary
		levels expected in remote areas where there is a significant freight impost.
SV3 Community identity and spirit	Level of volunteering and availability of assistance Local celebrations Recognition, preservation and promotion of heritage Capacity to accommodate visitors Perceptions of being able to influence community destiny Employment share by industry	Both Katherine and Tennant Creek have a strong sense of community identity. Katherine's identity is based around tourism and the nearby Katherine Gorge (Nitmuluk) landscape, as well as being seen as a vibrant regional centre providing pastoral and horticultural industry services and hosting a forward operational Defence base (RAAF Base Tindal). There are active arts and sports communities, with celebrations for NAIDOC Week and the nearby Barunga Festival in June each year. Tennant Creek has a long history of mining and a strong identification with large historic cattle stations on the extensive Mitchell grass plains of the Barkly Tablelands. There are an ongoing range of community events based on activities such as camp drafts and bush races, and the desert environment. Both Katherine and Tennant have volunteer rates, equivalent to the Northern territory average, at 17% and 16.8% respectively.
SV4 Capacity for sustainable economic activity	Viability, vitality and diversity of local industry Workforce participation and employment Job creation and retention of young people Supportive business environment (e.g. availability of serviced industrial land, adequate zoning, provision of information on opportunities) On-going environmental integrity (e.g. surface and groundwater, land degradation) Willingness of business to invest	Katherine has a developing and diverse economic base with vibrant sectors based on services to Defence, tourism, agriculture including horticulture, mining and logistics. Significant employment areas are public administration and safety, health care and social assistance and education and training reflecting the town's role as regional centre for public services. There is a supportive business environment with strong business development advocacy groups. Public investment (e.g., Defence) is strong and acts to even out the highs and lows of cyclical enterprises (e.g., mining). There is a seasonal labour market for tourism and pastoral enterprises, and some indication that there is a shortage of labour in the horticultural sector due to interest shown in Commonwealth Government supported guest worker schemes. With high numbers of people recorded as not in the labour force, this may indicate that further work could be done to strengthen links to the population in the hinterland areas. Attention would also need to be maintained on schooling performance, as the high school attendance rate appears to have dropped by 14% over the last three years. Key sectors of tourism, agriculture and horticulture depend on the confidence of operators in the integrity of the environment, and the ability for this to be monitored and measured. Principal industries serviced by Tennant Creek include mining, pastoralism and tourism. Important employment sectors are similar to Katherine, with public administration and safety showing a significant expansion in numbers over the last decade

5.1.2. Potential threats and their significance

Potential impacts to the identified social values are discussed in the following sections for each social value and threat (impact driver). The risk of the threats occurring and the associated consequences are assessed to provide an indication of the impacts that are likely to be significant should unconventional gas development proceed in a manner consistent with the conceptual development. The assessment is summarised in Table 5.2.

SV1 Liveable community

Impaired community amenity

ID1A Rapid workforce influx to urban areas

Given the location of the Beetaloo sub-basin project areas, a rapid influx of substantial numbers of workers to either Katherine or Tennant Creek is unlikely, though either community may be required to accommodate transiting workers, or any new workers associated with logistics support facilities that may be established there. Approximately 25 workers, with 55 dependents moving to Katherine is estimated. This may place some pressure on to existing accommodation providers, however there are well-developed measures that could be incorporated into a workforce accommodation strategy to mitigate any adverse effects.

Reduced amenity, road accidents and increased vehicle maintenance costs

ID1B Increase in heavy vehicle traffic on local roads

Should development of unconventional gas in the Beetaloo sub-basin occur it is certain that there will be an increase in the number of heavy vehicles on the Stuart Highway through Katherine if the logistics route is via Darwin. There may be some increase in traffic in Tennant Creek should a portion of supplies be sourced from southern states. While the increase in traffic (and associated noise and dust increases) is likely to be modest, there is some uncertainty in the absence of traffic models at this stage of development. The assessment of traffic for a redevelopment of the Mt Todd Gold Mine[2] provides some insights to transport and traffic impacts. The traffic study (2013) determined that there was substantial spare capacity in the road network, with the Stuart Highway operating at the highest Level of Service standard. The construction phase of the project was considered to possibly have 'short-term adverse effects through the addition of construction related traffic' which could appropriately be mitigated through the implementation of measures, such as a Traffic Management Plan'. The capacity of the Stuart Highway is expected to be sufficient to accommodate the conceptual development and infrastructure upgrades to accommodate gas development transport activity in urban areas would not be expected.

[2] Vista Gold Australia Pty Ltd, Mt Todd Gold Project, Traffic and Transport Impact Assessment, GHD June 2013

Conflict between community members

ID1C Conflict between supporters and opponents of unconventional gas industry development

Development of an unconventional gas industry is a highly emotive issue in the Northern Territory, as evidenced by press reports of community concerns and positions expressed during stakeholder consultation. The likelihood of conflict is considered possible (as it has occurred in other jurisdictions) and the consequences could be moderate in smaller communities, leading to a weakening of social capital and negative perceptions of the community, as being a supportive and welcoming environment for both new and existing residents.

ID1D Receipt of royalties by a sub-set of community members

While Traditional Owners (TOs) may live in Katherine or Tennant Creek, and certainly use the centres for accessing services, there is unlikely to be a level of conflict or strained relationships that may affect liveability in townships of this size, unlike the potential situation in smaller remote communities.

Anxiety about availability, access to and quality of water resources

ID1E Concern over potential risk to groundwater quality

Regardless of the actual location of projects in the Beetaloo sub-basin, there is likely to be concern in urban areas in regard to future groundwater quantity and quality in the event of industry development, as the towns themselves, and the industry that they support, depend on groundwater to a significant extent. Evidence through stakeholder engagement and submissions to the Inquiry indicates a likelihood of almost certain and a consequence of moderate based on the perceived effects on industry, indicating a high risk rating. The distance of towns from the project areas and the ability to source further information through various methods (ranging from direct engagement with experts to use of the internet) warrants a consequence level of moderate rather than major.

SV2 Affordable lifestyle

Decreased housing availability and affordability

ID2A Housing supply unable to meet spike in demand

ID2B Increased short-term rental costs

While there could be expected to be some increase in demand for housing, the distance of the project areas from urban centres most likely will act to minimise the level and duration of any increased demand in the short term, and perhaps smooth demand over the longer term. Workforce sourcing assumptions indicate a relatively small population increase in Katherine. It is also the case that uncertainty surrounding industry development and its timing make it hard determine the likelihood of a market supply response to housing demand at this stage. There must be close collaboration between industry and Local Government in the development of a workforce accommodation strategy to ensure that decisions on housing investment account for a timeframe based on a sound understanding of workforce levels required during project development (construction) and operation and maintenance phases. There is a medium potential for impact of the affordability of urban lifestyles.

SV3 Community identity and spirit

Loss of 'outback' identity

ID3A Significant change in land use and industry development

ID3B Perception of industry development heralding an era of 'industrialisation' of the landscape

The involvement of urban communities in supporting unconventional gas industry development is likely to involve some level of workforce accommodation, and potentially the hosting of a logistics and support facility, both of which are within their existing capacity, and for which existing industry groups are working to attract. The location of these facilities, in existing relevantly zoned areas, is not likely to change the visible nature of the community, or convey impressions of heavy industrialisation of the landscape, as their appearance will be consistent with existing industrial support facilities. For these residents, travel on highways is also not likely to reveal landscape changes likely to evoke concern. Hence the significance of these potential changes on community identity is considered low.

Decreased community engagement with local governance

ID3C Perception that industry development approval is against majority community wishes

The highly sensitised nature of the community with respect to development of unconventional gas resources indicates that this perception is likely, with potentially moderate consequences where 'community' is seen to be a local entity rather than a more Territory-wide grouping. This may have a moderate effect on community identity and spirit where the 'local' community may see themselves as having impacts imposed on them for the sole benefit of the broader community. This sentiment was evident during a community consultation engagement where it was asserted that the remote communities were the only ones that 'paid the price'.

Increased sense of cultural loss

ID3D Concern with increased access to, and development risks on, traditional country

While there will undoubtedly be some stakeholders in urban communities who identify strongly with maintaining the integrity of traditional country, the plural nature of the community and size of the Aboriginal population indicates that these concerns are unlikely to have a significant impact on the community identity and spirit of urban communities, particularly if development is remote from iconic natural areas and sites of historic or Aboriginal significance.

SV4 Capacity for sustainable economic activity

Decreased investment in pastoral and horticultural enterprises

ID4A Concern that long-term access to quality groundwater may be restricted due to industry development

This threat has widespread currency in the current environment, where there is a high level of uncertainty and lack of detailed knowledge of the broader nature of aquifers, and linkages in the

groundwater system. The concern is exacerbated due to the ongoing investigation into PFAS contamination of groundwater in the Tindal/Katherine area. The limited information on the scope of potential development at this stage, and the awareness of the volumes of water required for the hydraulic fracturing process, promotes concerns about the long-term availability of water for pastoral and other agricultural purposes. The significance is assessed as moderate for residents of urban areas which service the pastoral and horticulture industry.

Decrease in tourist visitation

ID4B Perception that 'outback' identity is compromised by 'major industrialisation' of the region

Urban residents and visitors to Katherine in particular, are not likely to perceive the loss of 'outback' identity which is an integral component of the tourism experience. The significant development of mining operations in locations such as Broken Hill and north-west Queensland has not detracted from the 'outback experience', and the areas within the Beetaloo sub-basin proposed for development will have limited visibility to highway travellers. In time, the existence of unconventional gas industry operations may provide opportunity for enhancing the outback tourist experience, as happens in Roma in western Queensland. Hence the significance of this threat is considered low.

Increased cost of labour for local businesses

ID4C Higher gas industry wage rates available to local residents drives competition for employees

While this threat has been manifest in other gas development areas, it has been driven by the scale and rate of project development. Workers with specific gas industry skills will largely be drawn from other locations, and have remuneration determined by industry norms rather than by local conditions. Support workers in civil works occupations already largely work remotely from urban areas, and any shortages in labour supply are likely to be addressed through training programs as currently occurs. The significance of the threat is considered medium and amenable to capacity development programs.

Local business closures

ID4D Industry demand attracts external specialist enterprises to establish and draw business from local businesses

The manifestation of this threat is possible, dependent of the scale and timing of development. In the Surat Basin, Queensland there were instances of specialist suppliers of goods (such as safety equipment and tools) establishing in existing premises in local towns for the intensive construction phase, and then withdrawing once that phase (where there was a high level of procurement) was complete. That mode of operation was largely driven by the scale of the gas-field and infrastructure construction effort occurring at that time in the Surat Basin, where multiple projects proceeded concurrently. The potential impact significance is moderate in small remote towns, and should be recognised and addressed through the local procurement policies of project developers.

Table 5.2 Urban communities' social value threat assessment

	Potential threat	Pre-mitigated assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social value: SV1 Liveable community ***Impact: Impaired community amenity***				
ID1A	Rapid workforce influx to urban areas	Possible	Moderate	Medium	• Develop and implement a Workforce Accommodation Strategy with Local Government • Develop and implement a Workforce Code of Conduct • Monitor community and visitor sentiment in urban communities
	Social value: SV1 Liveable community ***Impact: Reduced amenity, road accidents and increased vehicle maintenance costs***				
ID1B	Increase in heavy vehicle traffic on local roads	Likely	Minor	Medium	• Project Traffic Management Plans • Community awareness campaigns, particularly for Aboriginal communities
	Social value: SV1 Liveable community ***Impact: Conflict between community members***				
ID1C	Conflict between supporters and opponents of unconventional gas industry development	Possible	Moderate	Medium	• Provide regular environmental and social monitoring results to communities • Implement regular community forums • Implement Grievance Management Program
ID1D	Receipt of royalties by a sub-set of community members	Unlikely	Negligible	Very Low	• Monitor community and visitor sentiment in urban communities

	Potential threat	Pre-mitigated assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social value: SV1 Liveable community ***Impact: Anxiety about availability, access to and quality of water resources***				
ID1E	Concern over potential risk to groundwater quality	Almost certain	Moderate	High	• Provide regular environmental and social monitoring results to communities • Implement regular community forums • Implement Grievance Management Program
	Social Value: SV2 Affordable lifestyle ***Impact: Decreased housing availability and affordability***				
ID2A	Housing supply unable to meet spike in demand	Possible	Moderate	Medium	• Develop and implement a Workforce Accommodation Strategy with Local Government
ID2B	Increased short-term rental costs	Possible	Moderate	Medium	• Monitor rental housing supply and vacancy • Implement rental support program for period of high rental housing demand
	Social Value: SV3 Community identity and spirit ***Impacts: Loss of 'Outback' identity***				
ID3A	Significant change in land use and industry development	Unlikely	Minor	Low	• Comply with Local Government Planning Scheme
ID3B	Perception of industry development heralding an era of 'industrialisation' of the landscape	Unlikely	Minor	Low	• Comply with Local Government Planning Scheme
	Social Value: SV3 Community identity and spirit ***Impacts: Decreased community engagement with local governance***				
ID3C	Perception that industry development approval is against majority community wishes	Likely	Moderate	Medium	• Implement regular community forums • Implement Grievance Management Program

	Potential threat	Pre-mitigated assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social Value: SV3 Community identity and spirit ***Impacts: Increased sense of cultural loss***				
ID3D	Concern with increased access to, and development risks on, traditional country	Unlikely	Negligible	Very Low	• Implement robust land access protocols • Monitor community and visitor sentiment • Implement regular community forums
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Decreased investment in pastoral and horticultural enterprises***				
ID4A	Concern that long-term access to quality groundwater may be restricted due to industry development	Possible	Moderate	Medium	• Provision of regular monitoring results to communities • Implementing regular community forums
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Decrease in tourism visitation***				
ID4B	Perception that 'outback' identity is compromised by 'major industrialisation' of the region	Unlikely	Minor	Low	• Monitoring of community and visitor sentiment • Implementing regular community forums
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Increased cost of labour for local businesses***				
ID4C	Higher gas industry wage rates available to local residents drives competition for employees	Likely	Moderate	Medium	• Implementing regular community forums • Implement Grievance Management Program
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Local business closures***				
ID4D	Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Possible	Moderate	Medium	• Implementing regular community forums • Development and implementation of Local Content Policies and programs • Implement Grievance Management Program

5.2. Rural communities

Rural communities include the 'affected communities' in the north, east and central areas of the Beetaloo sub-basin (see Appendix A), where there is a majority of Aboriginal residents in townships. This section presents a summary of indicative social values associated with these communities and an assessment of the significance of the threats to social values.

5.2.1. Social values

Table 5.3 summarises the social values identified for the rural communities in the three catchments.

Table 5.3 Rural communities' social values

Social value	Indicator	Social value baseline summary
SV1 Liveable community	Proximity and access to traditional country Degree of satisfaction with management of traditional country Respectful and harmonious relationships within and between communities (both Aboriginal and non-Aboriginal) Access to service delivery (in particular health and education) that acknowledges and respects culture Ability for extended family residence Respect for law by community members Adequate infrastructure that is well-maintained (roads, airport, power, water and sewerage, telephone, internet) Effective local governance Opportunity for recreational, cultural and sporting pursuits Safe social and physical environment	Rural communities comprise a predominantly Aboriginal population characterised by a young age profile (median age ranging from 21 to 26). The exceptions are Mataranka, the area surrounding Borroloola and the pastoral properties within the Beetaloo sub-basin area which have higher numbers of non-Aboriginal persons involved in tourism and pastoral enterprises. Communities are generally harmonious places, and have high levels of one-parent families. The activities of young persons in larger communities such as Ngukurr contribute to inter-family tension from time to time (through disregard for elders, substance abuse, general behaviours not consistent with traditional social norms etc). Community members are mostly close to traditional country, though often restricted in mobility which limits activity on country. A Territory-wide survey of community wellbeing in 2011 indicated that while a majority of individuals felt their life was improving, there was less support for the notion that communities were improving (or on the 'way up'). While services in health are generally adequate by rural standards, population health can be poor, characterised by low life expectancy for men, high child morbidity due to inadequate environmental health standards, and chronic circulatory and respiratory illnesses and diabetes in middle age. Despite this, people often self-report health as being good, due to a worldview that includes other factors such as being close to family. Road access is reasonable, but often subject to seasonal restrictions. The Roper Highway is gradually being upgraded with high-level crossings of the Roper and Wilton Rivers being installed. Most communities have an adequate level of community facilities. Local governance is functional,

Social value	Indicator	Social value baseline summary
		but often budget constrained due to the inability to raise rate income. The formation of larger Councils initially fostered a perception that there had been a diminution of local community control and local leadership.
SV2 Affordable lifestyle	Availability of adequate housing Income levels Cost of housing Cost of food, power and other essential items	The availability of housing continues to be a major problem in Aboriginal communities with shortage and overcrowding common (together with associated problems such as occupant tensions and accelerated deterioration). High population growth rates in Aboriginal communities indicate that this situation is unlikely to be resolved in the near to medium term. The adequacy of income levels are uncertain. Census data indicates that Aboriginal and Torres Strait Islander (ATSI) household median income ranges from 75% to 140% of the Roper Gulf Regional Council median household income, but is around 50% of the NT median household income. Some living expenses are low (e.g., housing rents), however food costs are in the order of 30 to 40% above costs in regional centres. While lifestyles may be affordable, there may be little room for external shocks (e.g., due to serious illness), and lifestyles are subject to low accommodation standards.
SV3 Community identity and spirit	Recognition and promotion of cultural heritage Perceptions of being able to influence community destiny Existence of viable enterprise activity Number and strength of Aboriginal organisations Status of reconciliation with non-Aboriginal community Level of volunteering and availability of assistance Local celebrations	Aboriginal people's residence in rural communities close to traditional country contributes markedly to community identity and spirit, particularly with smaller communities. Challenges are more significant in larger communities that contain residents from a diversity of clans. Consequently the protection of sites is a general concern of all community members. Voluntary work is noted as being higher in smaller communities. Art and Craft Centres and Aboriginal Ranger Groups are also evidence of a significant level of community spirit, in contrast to the often negative portrayal of community life in mainstream media. There are a number of festivals and other community events (such as rodeos and NAIDOC Week celebrations) and investment in local pastoral enterprises (such as at Minyerri) which contributes to pride in moving from welfare dependence. All communities express pride in the number of members who are able to secure jobs in the mainstream labour market, or establish a commercial enterprise as an alternative to dependence on welfare payments.
SV4 Capacity for sustainable economic activity	Availability of employment opportunities Aboriginal workforce participation and employment	Rural communities are characterised by an extremely limited range of economic activity and associated employment opportunities. Most formal employment is in the provision of government services (education,

Social value	Indicator	Social value baseline summary
	Aboriginal business start-ups and ownership Level of education achievement, including retention to Year 12 and post-school destinations	health and government administration) though continual effort is made to engage with private sector economic activity through seasonal pastoral and mining work where available, and through the pursuit of flexible labour hire initiatives that depend on worker mobility. The employment participation rate is low, and the numbers not in the labour force have been steadily increasing. This situation presents youth with little to no incentive to put effort into education which often means leaving the familiar surrounds of community and family.

5.2.2. Potential threats and their significance

Potential impacts to the identified social values are discussed in the following sections for each social value and threat (impact driver). The risk of the threats occurring and the associated consequences are assessed to provide an indication of the impacts that are likely to be significant should unconventional gas development proceed in a manner consistent with the conceptual development. The assessment is summarised in Table 5.5.

SV1 Liveable community

Impaired community amenity

ID1A Rapid workforce influx to urban areas

The conceptual development includes accommodation facilities near transport hubs where they are located within commuting distance to the gas fields or accommodation facilities located at the gas fields, with the workforce working rosters on a FIFO or DIDO basis. Small and Aboriginal communities do not have the capacity or infrastructure to accommodate gas field construction and operation workforces and are unlikely to be considered for accommodation. Consequently, the risks associated with this threat were not assessed for rural communities.

Reduced amenity, road accidents and increased vehicle maintenance costs

ID1B Increase in heavy vehicle traffic on local roads

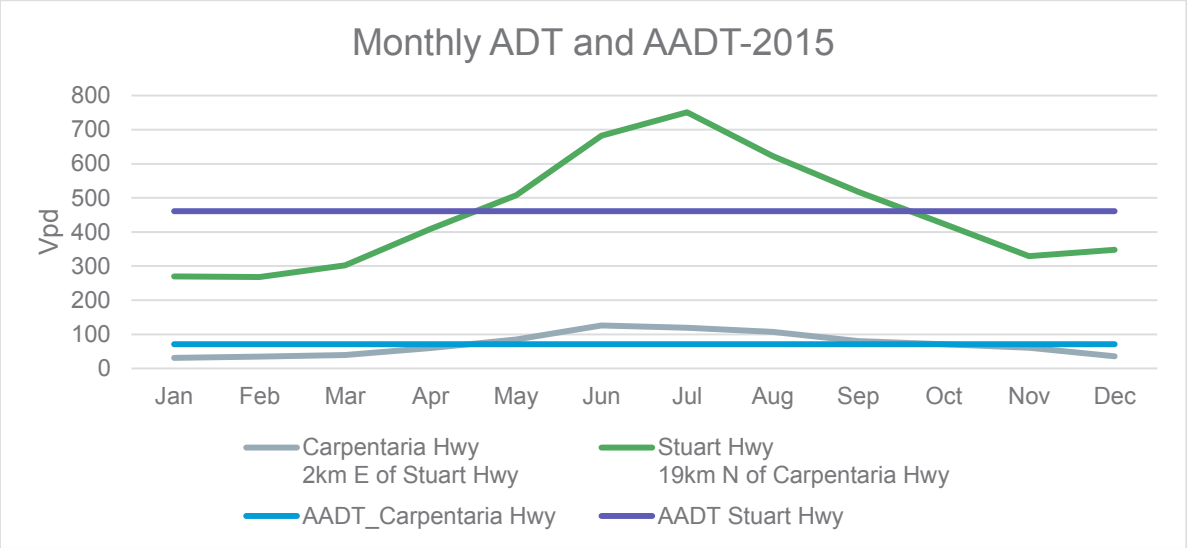
An increase in heavy vehicle traffic on highways is certain, particularly during the construction phase for a gas processing and compression facility or when pipe for a new pipeline is being delivered. The use of local roads, such as the Daly Waters to Cox River Road by heavy vehicles will be contingent on the location of major facilities. Light vehicle traffic associated with construction or operations will be present on highways as well as on local roads. The most important generators of traffic associated with a project will be workforce accommodation and construction hubs.

A summary of the Average Annual Daily Traffic Volumes (AADT) and the percentage of heavy vehicles in 2015 for the Stuart and Carpentaria highways are provided in Table 5.4. Figure 5.1 indicates the seasonal variability in traffic volumes on these highways.

Table 5.4 Traffic volumes from 2015 vehicle count

Highway	Description	AADT	% Heavy vehicles*
Carpentaria Highway	Tablelands Highway to Stuart Highway 2 km east of Stuart Highway	71	21.6% (~13% triple road trains)
Stuart Highway	Carpentaria Highway to Roper Highway 19 km north of Carpentaria Highway	461	22.2% (~12% triple road trains)
	Roper Highway to Victoria Highway 6 km south of Cutta Cutta Caves	890	14.5% (~7% triple road trains)

* AUSTROADS Class 6 to 12, Long, Medium and Large Combinations
Source: NT Government, Department of Transport, Annual Traffic Report, 2015



Source: NT Government, Department of Transport, Annual Traffic Report, 2015

Figure 5.1 Highway traffic variability - 2015

The consequences of any increase in traffic are expected to be minor. The capacity of both the Stuart and Carpentaria highways is such that increased traffic levels will be well below the levels requiring any road upgrade works. The capacity of the Carpentaria Highway is estimated at 9,000 vehicles per day between the Stuart Highway and the McArthur River Mine access road[3]. As background traffic volumes are very low (with a 3% growth rate, AADT in 2024 without the project is in the order of 95 vehicles per day (vpd)), traffic volumes are expected to remain significantly below the existing road capacity of 9,000 vpd requiring no upgrade works to accommodate future year traffic volumes on the Carpentaria Highway. The same situation is likely to prevail on the Stuart Highway.

Local residents have an existing awareness of the presence and effects of heavy vehicles on local roads, and it is assumed that maintenance will be delivered on time, and that Traffic Management Plans governing speed and use of approved routes only and driver behaviour are in place and enforced.

[3] McArthur River Mine Stage 3 EIS https://ntepa.nt.gov.au/__data/assets/pdf_file/0004/287788/Chapter-8-Traffic-and-Transport.pdf

Conflict between community members

ID1C Conflict between supporters and opponents of unconventional gas industry development

Development of an unconventional gas industry is a highly emotive issue in the Northern Territory, as evidenced by press reports of community concerns and positions expressed during stakeholder consultation. There appears to have been a significant level of anti-industry advocacy, and the likelihood of conflict is considered possible (as it has occurred in other jurisdictions) and the consequences could be moderate in smaller communities, leading to a weakening of social capital and negative perceptions of the community as being a supportive and welcoming environment for both new and existing residents.

ID1D Receipt of royalties by a sub-set of community members

Traditional owners (TOs) are entitled to and will receive royalties linked to gas production. These TOs will almost certainly live in small communities across and beyond the Beetaloo sub-basin, where the potential for strained relations with other community members not in receipt of royalties will be high. As well, the impacts of gas development are perceived to occur on a regional scale (e.g., ground and surface water effects), even though the actual areal footprint of development will be relatively limited (and hence, result in a limited or tightly targeted distribution of royalties). This may have major consequences for intra-community and TO inter-group relationships.

Anxiety about availability, access to and quality of water resources

ID1E-Concern over potential risk to groundwater quality

Regardless of the actual location of projects in the Beetaloo sub-basin, there is likely to be concern in regard to future groundwater quantity and quality in the event of industry development. Evidence through stakeholder engagement and submissions to the Inquiry indicates a likelihood of almost certain and a consequence of major based on anxiety about the perceived effects on human health and cultural integrity, indicating a very high risk rating.

SV2 Affordable lifestyle

Decreased housing availability and affordability

ID2A Housing supply unable to meet spike in demand

ID2B Increased short-term rental costs

The nature of development in the Beetaloo sub-basin (where workers are likely to be based on site in accommodation facilities due to remoteness) is not likely to affect housing in rural communities where there is a limited housing market, or where communities are located on Aboriginal land where there is a predominance of social housing allocated to Aboriginal people and not available for lease. It is possible that Mataranka could see some effect through a limited stimulation for increased supply. Hence the significance of the above threats are categorised as low and very low respectively.

SV3 Community identity and spirit

Loss of 'outback' identity

ID3A Significant change in land use and industry development

ID3B Perception of industry development heralding an era of 'industrialisation' of the landscape

Decreased community engagement with local governance

ID3C Perception that industry development approval is against majority community wishes

Increased sense of cultural loss

ID3D Concern with increased access to, and development risks on, traditional country

Two potential threats to this value (ID3A and ID3B) are assessed as possible, depending on the scale and location of development and its potential to generate significant visual effects that may influence perceptions. As development will coexist with pastoral operations and not involve highly visible large-scale infrastructure or landscape change (such as overburden dumps) the consequences are assessed as minor indicating low significance. Travellers or tourists who may seek out an 'outback' experience often expect to see resource development in remote areas (for example, in the Cooper Basin and in the Mount Isa area).

Threats ID3C and ID3D are assessed as likely with minor and moderate consequences for small communities in the absence of any concerted program of education and awareness in regard to the impacts and benefits of industry development based on realistic scenarios of industry/project development, together with proposed measures for the management of impacts. While threat ID3C is difficult to ameliorate (either the decision is against community wishes or it isn't), threat ID3D consequences may diminish over time should participation in the identification and management of cultural heritage sites and impacts be demonstrated to be effective.

SV4 Capacity for sustainable economic activity

Decreased investment in pastoral and horticultural enterprises

ID4A Concern that long-term access to quality groundwater may be restricted due to industry development

Decrease in tourist visitation

ID4B Perception that 'outback' identity is compromised by 'major industrialisation' of the region

Increased cost of labour for local businesses

ID4C Higher gas industry wage rates available to local residents drives competition for employees

Local business closures

ID4D Industry demand attracts external specialist enterprises to establish and draw business from local businesses

Threat ID4A is currently felt strongly, prior to any detailed project proposal being advanced, and is likely to remain for the foreseeable future with the potential to restrict investment in pastoral or tourism enterprises, or impair their future sale value. The significance of the threat is assessed as high. The significance of the additional three threats are rated as low or very low for rural communities. Apart from small highway communities, it is not envisaged that development would occur in the immediate vicinity of communities which may induce perceptions of 'major industrialisation', and there is little to no evidence of this occurring in other gas development areas, such as the Surat Basin, where some communities have accommodated such development and built tourist attractions on its presence (e.g., Roma). The limited skills in small community populations, where labour markets are very thin, means that labour competition is a remote possibility.

Table 5.5 Rural communities' social value threat assessment

	Potential threat	Pre-mitigation assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social Value: SV1 Liveable community ***Impact: Impaired community amenity***				
ID1B	Increase in heavy vehicle traffic on local roads	Almost certain	Minor	Medium	• Project Traffic Management Plans • Community awareness campaigns, particularly for Aboriginal communities
	Social Value: SV1 Liveable community ***Impact: Impaired community amenity***				
ID1C	Conflict between supporters and opponents of unconventional gas industry development	Possible	Moderate	Medium	• Provide regular environmental and social monitoring results to communities • Implement regular community forums • Implement Grievance Management Program
	Social Value: SV1 Liveable community ***Impact: Impaired community amenity***				
ID1D	Receipt of royalties by a sub-set of community members	Almost certain	Major	Very High	• Provide financial management and investment support
	Social Value: SV1 Liveable community ***Impact: Impaired community amenity***				
ID1E	Concern over potential risk to groundwater quality	Almost certain	Major	Very High	• Provide regular environmental and social monitoring results to communities • Implement regular community forums • Implement Grievance Management Program

	Potential threat	Pre-mitigation assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social Value: SV2 Affordable lifestyle ***Impact: Decreased housing affordability***				
ID2A	Housing supply unable to meet spike in demand	Unlikely	Minor	Low	• Regular monitoring of housing affordability
ID2B	Increased short-term rental costs	Remote	Minor	Very Low	• Regular monitoring of housing affordability
	Social Value: SV3 Community identity and spirit ***Impacts: Loss of 'Outback' identity, Decreased community engagement with local governance, Increased sense of cultural loss***				
ID3A	Significant change in land use and industry development	Possible	Minor	Low	• Monitor community and visitor sentiment in rural communities
	Social Value: SV3 Community identity and spirit ***Impacts: Loss of 'Outback' identity, Decreased community engagement with local governance, Increased sense of cultural loss***				
ID3B	Perception of industry development heralding an era of 'industrialisation' of the landscape	Possible	Minor	Low	• Monitor community and visitor sentiment in rural communities
	Social Value: SV3 Community identity and spirit ***Impacts: Loss of 'Outback' identity, Decreased community engagement with local governance, Increased sense of cultural loss***				
ID3C	Perception that industry development approval is against majority community wishes	Likely	Moderate	Medium	• Implement regular community forums • Implement Grievance Management Program
	Social Value: SV3 Community identity and spirit ***Impacts: Loss of 'Outback' identity, Decreased community engagement with local governance, Increased sense of cultural loss***				
ID3D	Concern with increased access to, and development risks on, traditional country	Likely	Moderate	Medium	• Regular visitation and feedback to TOs on effectiveness of management measures • Implement robust land access protocols

	Potential threat	Pre-mitigation assessment			Mitigation
		Likelihood	Consequence	Assessed risk	
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Decreased investment in pastoral and horticultural enterprises***				
ID4A	Concern that long-term access to quality groundwater may be restricted due to industry development	Likely	Major	High	• Provide regular environmental and social monitoring results to communities • Implement regular community forums • Implement Grievance Management Program
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Decrease in tourism visitation***				
ID4B	Perception that 'outback' identity is compromised by 'major industrialisation' of the region	Possible	Minor	Low	• Monitor community and visitor sentiment in rural communities
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Increased cost of labour for local businesses***				
ID4C	Higher gas industry wage rates available to local residents drives competition for employees	Remote	Negligible	Very Low	• Implement regular community forums • Implement Grievance Management Program
	Social Value: SV4 Capacity for sustainable economic activity ***Impacts: Local business closures***				
ID4D	Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Remote	Negligible	Very Low	• Implement regular community forums • Implement Grievance Management Program

5.3. Impact summary and mitigation strategies

Table 5.6 and Table 5.7 list the threats for urban and rural communities respectively where the assessed risk of the threat occurring is medium or higher.

For urban communities, there is a medium level of threat to social values SV1, SV2 and SV4, primarily due to the potential for population increase and the concern for groundwater sustainability. The potential for community discord due to divergent attitudes to risk held by supporters and opponents of unconventional gas development is considered material, particularly as the townships have relatively low populations.

For rural Aboriginal communities, including pastoral properties in the Beetaloo sub-basin area, the key threats are to social values SV1 and SV4, primarily due to the perceived environmental risk to both quantity and quality of groundwater due to hydraulic fracturing required to extract gas from the shale. Receipt of royalties in remote Aboriginal communities also has the potential to induce income disparity that may negatively affect relations between different TO groups.

Table 5.6 Summary of medium and higher threat significance for urban communities

	Potential threat	Likelihood	Consequence	Assessed risk
ID1A	Rapid workforce influx to urban areas	Possible	Moderate	Medium
ID1B	Increase in heavy vehicle traffic on local roads	Likely	Minor	Medium
ID1C	Conflict between supporters and opponents of unconventional gas industry development	Possible	Moderate	Medium
ID1E	Concern over potential risk to groundwater quality	Almost certain	Moderate	High
ID2A	Housing supply unable to meet spike in demand	Possible	Moderate	Medium
ID2B	Increased short-term rental costs	Possible	Moderate	Medium
ID3C	Perception that industry development approval is against majority community wishes	Likely	Moderate	Medium
ID4A	Concern that long-term access to quality groundwater may be restricted due to industry development	Possible	Moderate	Medium
ID4C	Higher gas industry wage rates available to local residents drives competition for employees	Likely	Moderate	Medium
ID4D	Industry demand attracts external specialist enterprises to establish and draw business from local businesses	Possible	Moderate	Medium

Table 5.7 Summary of medium and higher threat significance for rural communities

	Potential Threat (Rural)	Likelihood	Consequence	Assessed risk
ID1B	Increase in heavy vehicle traffic on local roads	Certain	Minor	Medium
ID1C	Conflict between supporters and opponents of unconventional gas industry development	Possible	Moderate	Medium

	Potential Threat (Rural)	Likelihood	Consequence	Assessed risk
ID1D	Receipt of royalties by a sub-set of community members	Almost certain	Major	Very High
ID1E	Concern over potential risk to groundwater quality	Almost certain	Major	Very High
ID3C	Perception that industry development approval is against majority community wishes	Likely	Moderate	Medium
ID3D	Concern with increased access to, and development risks on, traditional country	Likely	Moderate	Medium
ID4A	Concern that long-term access to quality groundwater may be restricted due to industry development	Likely	Major	High

Particular challenges when undertaking both strategic and project-level SIA 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 unconventional gas industry, and of the technologies that would be deployed to extract gas and manage potential environmental and social impacts, as well as the distrust of governments and their capacity to regulate the industry effectively on behalf of all community members.

Despite these challenges, none of the identified threats are considered to be incapable of being mitigated and managed, as they are being managed in other onshore gas development areas currently. Effective management would require close collaboration between various industry groups and project proponents, government and the community to ensure that responsibility for management and reporting on sub-basin level impacts is clear, and that mechanisms for community feedback and response are widely-known and effective.

Indicative components of a social impact management program, based on the level of impact definition available from the high-level assessment, are outlined below. Additional activities would likely be identified when a more detailed project description is subject to a comprehensive project-level SIA.

5.3.1. Community

Ongoing effective community and stakeholder engagement is fundamental to the effective management of impacts and the maintenance of a ‘social licence to operate’. Key factors to consider in the development of a community engagement strategy include:

- The need for community industry awareness campaigns, particularly for Aboriginal communities. This needs to be an ongoing process, as the development and deployment of improved technology is proceeding at a rapid rate.
- The requirement for implementation of robust land access protocols.
- The need to provide regular environmental monitoring results to communities in a transparent manner that builds community confidence and trust in the monitoring process.

- Participation in regular community forums with government and other industry participants to discuss industry issues. Responsibility for the design and leadership of these forums may rest with government and peak bodies, however to be successful they will require the participation of industry at a senior level.
- The implementation of a Grievance Management Program, including community access to an independent advocate if necessary.
- The need for monitoring of community and visitor sentiment on a structured basis to ensure that the views of all sectors are heard and considered.
- The development and implementation of a workforce cultural awareness program and a workforce code of conduct to contribute to ongoing positive and supportive community relations.
- The development and implementation, in consultation with government, of local content policies and programs to maximise opportunity for Northern Territory business input and development.

5.3.2. Workforce and housing

The management of potential housing issues needs considerable care to ensure that housing market distortions are avoided. While communities generally do not favour FIFO practices, due consideration needs to be given to planning factors such as local availability of skills, and the sometimes limited period of time for which particular employment levels are required, such as the construction phase for a gas processing and compression plant where a high level of employment may only last around 18 months. Local planning needs to be based on realistic long-term employment levels. Factors to consider when developing local workforce recruitment and housing strategies include:

- The need to develop and implement a Workforce Accommodation Strategy with Local Government, with a view to integration with local procurement and logistics support strategies.
- The need for compliance with the Local Government planning scheme if considering the development of accommodation initiatives in urban areas.
- The need for ongoing monitoring of rental housing supply and vacancy levels to identify project-induced demand.
- The merits of implementing a rental support program for periods of high rental housing demand to ensure that low-income people are not priced out of the rental market.

5.3.3. Traffic

Project traffic management plans are generally effective in managing risks involved in the transport of personnel and materials required to develop projects provided that they:

- Identify risks to be managed on low-traffic local roads utilised by local community members.
- Ensure that there is a high level of traffic awareness and safe driver-behaviour requirements imparted to local community members.
- Provide for the training of project drivers and the monitoring and policing of driver behaviour.

5.4. Potential opportunities for enhancement of social values

While the development of unconventional gas extraction in the Beetaloo sub-basin is expected to be gradual under the conceptual development scenario and not schedule-driven as witnessed with coal seam gas development in the Surat Basin, there are likely to be a number of opportunities for the enhancement of social values, both in urban as well as rural communities. These could include:

- The development of an increased capacity in logistics operations, and the establishment of an unconventional gas industry support base, initially in Katherine but potentially in other towns such as Tennant Creek if favourable conditions eventuate. This would lead to increased employment, training and a broadening of the skills base of the local workforce, and potentially a modest population increase should workers see Katherine or Tennant Creek, as a desirable places to live.
- An opportunity, through local procurement of inputs for gas field development, to diversify the economic base of regional support towns through the attraction of new business ventures and the expansion of existing business ventures in construction, mechanical maintenance and industrial supplies.
- Collaboration between industry proponents may also provide an opportunity to establish regional support facilities, such as a worker accommodation village or an upgraded airstrip to handle FIFO transport, in proximity to a rural location (such as Daly Waters) where the opportunity for multi-use of the facility (such as for tourist accommodation) may expand and strengthen the economic base of the town.
- An opportunity, through gas industry supported activity, to deliver training and employment opportunity to residents of Aboriginal communities in the areas surrounding the Beetaloo sub-basin, building on employment and training activity that has been implemented as part of exploration work (undertaken by Pangaea and Origin Energy). This opportunity need not rely solely on the existence of Aboriginal Land Use Agreements (ILUAs) with TO groups, but be a product of a direct government policy to deliver benefits to rural communities. It must also be recognised that the poor housing conditions, in particular over-crowding, in remote communities is a particular barrier to employment retention and the ability to be fit-for-work at the commencement of a roster for community-based employees.
- Community input to gas field development plans provide an opportunity to plan infrastructure development such that communities may benefit (e.g., through improved access to particular sites of importance), as landholders could use gas field infrastructure to benefit property operations.
- Community involvement in regional environmental monitoring associated with industry development, through participation by natural resource management groups and Aboriginal ranger groups who already have demonstrated capacity. As well as providing employment opportunities, this could also act to increase community confidence in the transparency of company environmental management and monitoring programs.

The ability to capture these opportunities will require a collaborative approach to industry development by the Northern Territory Government, project proponents and representatives of the community, which aligns with the industry development approach outlined in the Northern Territory Government's Economic Development Framework[4] released on 20 June 2017. It would also be expected that initiatives aimed at enhancing community capacity to take advantage of opportunities

[4] See https://edf.nt.gov.au/growth-sectors/energy-and-minerals

that may be available through industry development would be developed and implemented during the strategic assessment phase, as recommended in the SIA Framework report (CSRM, 2017).

6. Issues to be considered in implementing the SIA Framework

CSRM (2017) identified leading practice SIA as comprising:

- Strategic, adaptive approach throughout lifecycle of development that addresses cumulative impacts.
- Communication, coordination and collaboration between industry participants.
- Independently-led, participatory social baseline assessment.
- Independently-led community engagement.
- Participatory, ongoing monitoring of social indicators and transparent reporting of results.

The SIA case study found that Aboriginal and other community members are highly sensitised to the potential impacts of an unconventional gas industry, particularly bio-physical impacts on surface water and groundwater, and impacts on their communities and values. Their concerns arise, in part, from a lack of detailed information about the potential unconventional gas industry and actual project proposals.

The Panel noted in its Interim Report (Inquiry, 2017b) that '*current knowledge by the Aboriginal community is inadequate, and as a consequence, this points to an emerging social risk with Aboriginal people becoming enmeshed in conflict between pro and anti-fracking groups'*.

This was evident in the consultation undertaken for the SIA case study.

The Panel also noted that '*it is imperative that accurate information is provided to the Aboriginal groups likely to be directly affected by hydraulic fracturing as soon as practicable, and that the peak bodies with responsibility for carrying out this work give the highest priority to ensuring this occurs well in advance of requirements for decision-making'*.

Information about unconventional shale gas development and hydraulic fracturing was provided to the Aboriginal and urban communities in the second consultation round and was generally well received, indicating that with appropriate planning and care, the knowledge base of Aboriginal communities can be raised sufficiently to enable them to make informed decisions and provide informed comment and input on potential impacts of unconventional gas development and their management.

Engagement with Aboriginal communities must adopt a structured approach that incorporates the following activities:

- **Preparatory meeting(s)** (as done in the second consultation round) that identifies the community members who should be consulted, their needs to participate in the consultation, the issues to be discussed, and appropriate dates and times for the meeting(s).
- **Social values meetings** during which the communities' social values are identified and documented. Sufficient time must be allowed for the complex issues relating to Aboriginal communities to be explored and understood.

- **Awareness meeting(s)** in which the communities are provided with information about unconventional gas development in sufficient detail to enable them to understand how development activities relate to, and might impact on their communities and their values. This engagement should include discussion of what is, and is not negotiable with respect to engineering and technical aspects of unconventional gas development.
- **Project-specific meetings** in which Aboriginal and other communities are presented with a development proposal and detailed information about its environmental and social impacts. This engagement should allow sufficient opportunity and time for community members to have input to the development concept and management of its impacts.
- **Implementation meetings** in which Aboriginal and other communities are invited to participate in environmental review or other similar committees that provide ongoing forums for managing project-community relations, monitoring of environmental and social impacts, and implementation of environmental and social programs.

Project proponents must have a relationship with the communities in which they operate or who they affect. The relationship will be most successful where it is developed over time through the staged approach outlined above. The conduct of community engagement must therefore balance the need for independently-led consultation (to build confidence in the process and veracity of data) with company ownership of the relationship (to build credibility, a working relationship and ensure accountability).

Project proponents are the most qualified to talk about their projects and the engineering and technical aspects of their proposed development, including how impacts will be managed. Technical experts are most qualified to talk about potential impacts and the effectiveness of proposed management measures. Community engagement must incorporate the following participants throughout the lifecycle of the project:

- Project proponent.
- Engineering and technical experts.
- Community members and their representative bodies.
- Independent stakeholder engagement consultants.

7. Conclusion

The Beetaloo sub-basin SIA case study assessed the impacts of a conceptual shale gas development on communities in and around the Beetaloo sub-basin. The affected communities were grouped into social catchments due to their relationship to the regional service centres of Katherine and Tennant Creek and the major roads that connected these centres and the communities.

Indicative social values incorporating the community capitals and IAIA values were identified based on experience in Northern Territory Aboriginal communities and with unconventional gas development in other jurisdictions. The values informed community consultation on the social impacts of unconventional gas development, which was conducted in two stages.

Detailed discussion to confirm the social values, understand community concerns and inform the social baseline was compromised by the short duration of the case study (in contrast to the long-term strategic approach proposed by CSRM (2017)), community opposition to an unconventional gas industry, and lack of a real project with clearly defined activities and impacts.

Despite heightened sensitivity to the impacts of unconventional gas development due to a concerted campaign by opponents of industry development, some communities were appreciative of the information provided in the second round of consultation, confirming that awareness and education are key factors in working towards a 'social licence to operate'.

The study found significant disparity between the regional service centres and remote Aboriginal communities due to their remoteness affecting access to services, their poor state of housing, limited access to a functioning labour market, and differences in health and education status. With development expected to be distant from these communities, the more pressing issue will be how they realise opportunities from unconventional gas development.

A range of threats and impacts, typical of unconventional gas development were identified. The key concerns for communities are impacts on surface water and groundwater resources, likely heightened by the PFAS contamination in and around RAAF Base Tindal near Katherine and incorrect assumptions about water management based on coal seam gas development in Queensland. The other key concerns relate to the manner in which Aboriginal communities will benefit from unconventional gas development, with the equitable distribution of benefits a major concern.

The study found that the identified threats and impacts can be managed using proven methods and strategies from unconventional gas development in other jurisdictions. Lessons learned in other jurisdictions will enable these approaches to be refined for the Northern Territory context and improved to avoid the suboptimal outcomes achieved in some instances.

The SIA Framework and CSIRO's guidelines for achieving a 'social licence to operate' will assist in overcoming community perceptions that an unconventional shale gas industry is:

- Short-term and cyclical in nature.
- Similar to the coal seam gas industry in Queensland, with similar impacts.
- Aloof to community concerns and has disregard for the social outcomes of development.

The strategic approach to compiling a social baseline proposed by CSRM (2017) will assist in identifying and managing cumulative impacts on the geographically dispersed and diverse communities.

8. References

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Appendix A - Affected community profiles

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Tables

Figures

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1. Introduction

The approach to identifying and grouping affected communities into social catchments and compiling baseline profiles of the communities is presented in this appendix along with a regional overview and baseline information for affected communities in each social catchment.

2. Affected communities and social catchments

The Inquiry Terms of Reference defined 'affected communities' as:

> *the people or groups of people that are most likely to be impacted by the development of unconventional gas resources in and around the Beetaloo sub-basin… which may include, without limitation, community members, pastoralists, Aboriginal organisations and local businesses.*

By this definition, communities in and adjacent to the Beetaloo sub-basin are affected communities, particularly those in proximity to areas explored for unconventional gas reserves and those on or serviced by major transport routes, as these routes provide access to goods and services, labour markets and business opportunities. The affected communities, their relationship to the Beetaloo sub-basin and related transport routes are listed in Table A2.1.

Table A2.1 Affected communities and their relationship to the Beetaloo sub-basin

Affected community	Major transport route	Relationship to Beetaloo sub-basin
Katherine (town)	Stuart Highway	Outside; northwest of sub-basin
Barunga	Central Arnhem Road	Outside; northeast of sub-basin
Beswick	Central Arnhem Road	Outside; northeast of sub-basin
Mataranka	Stuart Highway	Outside; north of sub-basin
Jilkminggan	Roper Highway	Outside; northeast of sub-basin
Minyerri	Roper Highway	Outside; northeast of sub-basin
Ngukkurr	Roper Highway	Outside; northeast of sub-basin
Borroloola	Carpentaria Highway	Outside; east of sub-basin
Robinson River	Carpentaria Highway	Outside; east of sub-basin
Larrimah	Stuart Highway	Inside northern part of sub-basin
Daly Waters	Stuart Highway	Inside northern part of sub-basin
Dunmarra	Stuart Highway	Inside southern part of sub-basin
Newcastle Waters	Stuart Highway	Outside; south of sub-basin
Elliott	Stuart Highway	Outside; south of sub-basin
Tennant Creek	Stuart Highway	Outside; south of sub-basin

To facilitate assessment, the affected communities were grouped into social catchments. The factors influencing the clustering of the communities are:

- **Location and community links**: Centres with a population level that may indicate some potential for providing 'local employment' should sub-basin development proceed. Generally these communities are located outside of, but in proximity to, the Beetaloo sub-basin. Consideration of potential physical and cultural links are also important factors influencing grouping and the potential to experience shared perceptions of impact.
- **Logistics or support industry potential**: It is assumed that the development of an unconventional gas industry would require at least a moderate level of logistical and maintenance support. This could be a purpose-built area within gas field or a facility located in the existing large towns north and south of the sub-basin that currently support industrial activity, for example Katherine, which currently provides support to the mining industry and RAAF Base Tindal and/or Tennant Creek, which provides support to the mining industry.
- **Dominant economic activity**: Pastoral operations constitute the principal economic activity within the Beetaloo sub-basin, with the Stuart Highway and to a lesser extent the Carpentaria Highway facilitating economic activity associated with tourism.

These factors resulted in the affected communities being grouped according to the major transport route they used or were serviced by, and their relationship to Katherine and Tennant Creek, the regional towns north and south of the sub-basin respectively. Katherine and Tennant Creek were grouped together as they are the only urban centres in vicinity of the sub-basin. An overview of the social catchments and their affected communities is provided below.

2.1. Affected communities (urban)

This social catchment comprises the towns of Katherine and Tennant Creek, with populations of 9,800 and 3,000 respectively. Located on the Stuart Highway, these towns are service centres for their hinterland areas and have a higher population and broader array of services compared to the predominantly Aboriginal communities in the hinterland region. They have active community and business representative groups who plan and engage with government in order to draw public investment for development purposes in their area.

2.2. Affected communities (north)

The communities within this area to the east of Katherine include Barunga, Beswick, Mataranka, Jilkminggan, Minyerri, and Ngukurr. They have a combined population of approximately 3,300 of predominantly Aboriginal persons with the exception of Mataranka. These communities are within relatively easy reach of services available in Katherine. The furthest, Ngukurr, is located approximately 320 km east along the Roper Highway. Residents are likely to have traditional landownership interests in the northern part of the Beetaloo sub-basin and form a community of interest supported by access provided by the Roper Highway.

2.3. Affected communities (central)

The main communities in this area include Larrimah, Daly Waters, Dunmarra, Newcastle Waters and Elliott. They have a combined population of 460, which excludes residents on pastoral stations (of which there are 24 with land within the Beetaloo sub-basin). Common interests centre on pastoral operations, as well as servicing vehicle traffic (including the tourist trade) on the Stuart Highway.

While there may be limits on the ability to source a labour force from within this area, it could be expected that residents would seek opportunities for work and supplementary income, particularly if facilities and infrastructure were located on their properties.

2.4. Affected communities (east)

The main community in this area is Borroloola which has a population of approximately 700. Residents commonly access services in Katherine via the Carpentaria Highway through the Beetaloo sub-basin, but also in Tennant Creek accessed via the Tablelands and Barkly highways. Relationships extend north toward the Roper River and southeast toward the Queensland Gulf country and Mount Isa. As the nearest residential location to the McArthur River Mine, there are likely to be a number of residents with skills and work experience that are compatible with workforce requirements for a gas project, particularly during the construction phase where facilities and support infrastructure is being established.

The affected communities and social catchment they have been assigned are listed in Table A2.2.

Table A2.2 Social catchments and affected communities

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

3. Baseline characterisation method

The term ‘baseline’ refers to the socioeconomic characteristics of affected communities. Data to support the characterisation of the socioeconomic baseline of affected communities is described in this section.

3.1. Data collection

The SIA case study reports secondary data collection. The primary data source was the Australian Bureau of Statistics (ABS). Table A3.1 presents the ABS statistical areas used in this report.

Additional information was sourced from the Northern Territory Government Treasury, as well as regional and local planning documentation developed by government and industry bodies.

Where possible, the latest census data (2016) was used. However, some data from the 2016 census was not available to the public at time of writing, and where this was the case 2011 census data was used.

Table A3.1 ABS statistical areas used in the SIA case study

Level	Statistical area level
Territory	
Northern Territory	SA4
Regional	
Katherine region	SA3-70205
Victoria River	SA2-702051068
Katherine Town	SA2-702051067
Elsey	SA2-702051065
Gulf	SA2-702051066
Social catchment	
Affected communities (urban)	
Katherine (town)	SA2-702051067
Tennant Creek	SA2-702021056
Affected communities (north)	
Roper Gulf RC	LGA-73600
Elsey	SA2-702051065
Barunga	SA1-7106501
Beswick	SA1-7106502
Mataranka	SA1-7106506
Jilkminggun	SA1-7106507
Minyerri	SA1-7106606
Ngukurr	SA1-7106608
Affected communities (central)	
Roper Gulf RC	LGA-73600
Elsey	SA2-702051065
Central Beetaloo	SA1-7106508
Elliott	SA1-7105510
Affected communities (east)	
Roper Gulf RC	LGA-73600

Level	Statistical area level
Borroloola	SA1-7106601
Borroloola surrounding area	SA1-7106602
Garawa	SA1-7106614
Mara	SA1-7106613
Yanula	SA1-7106612

3.2. Data analysis

In conjunction with community and stakeholder consultation, the data presented herein contributed to the derivation and substantiation of social values. A social value is defined in the SIA case study, as a quality of the area potentially subject to project effects for which community stakeholders have high regard, and that is conducive to individual or community well-being into the future.

The potential for a project to impair or enhance existing social values is central to assessing how communities may be affected if the unconventional gas industry were to be developed within the Beetaloo sub-basin.

The data informing the socioeconomic baseline is framed according to the social values, as defined in the SIA case study (which were in turn influenced by the data presented herein).

Four indicative social values were identified as being of importance to affected communities:

- SV1 Liveable community.
- SV2 Affordable lifestyle.
- SV3 Community identity and spirit.
- SV4 Capacity for sustainable economic activity.

The key indicators of these values differ depending on whether the community was rural or urban, as presented in Table A3.2 and Table A3.3. These indicators are intended to be illustrative rather than exhaustive.

Table A3.2 Social values and indicators for urban communities

Social value	Indicators (urban)
SV1 Liveable community	• Access to, and proximity of, quality services (health, education, aged care, childcare, retail etc) • Balanced demographic profile • Harmonious relationships, lack of conflict • Respect for law by community members • Adequate infrastructure that is well-maintained (housing, roads, airport, power, water and sewerage, telephone, internet) • Effective local governance • Opportunity for recreational, cultural and sporting pursuits • Safe social and physical environment
SV2 Affordable lifestyle	• Cost of land and housing • Local Government charges

Social value	Indicators (urban)
	• Income levels • Cost of food, power and other essential items
SV3 Community identity and spirit	• Level of volunteering and availability of assistance • Local celebrations • Recognition, preservation and promotion of heritage • Capacity to accommodate visitors • Perceptions of being able to influence community destiny • Employment share by industry
SV4 Capacity for sustainable economic activity	• Viability, vitality and diversity of local industry • Workforce participation and employment • Job creation and retention of young people • Supportive business environment (e.g. availability of serviced industrial land, adequate zoning, provision of information on opportunities) • On-going environmental integrity (e.g. surface and groundwater, land degradation) • Willingness of business to invest

Table A3.3 Social values and indicators for rural communities

Social value	Indicators (rural)
SV1 Liveable community	• Proximity and access to traditional country • Degree of satisfaction with management of traditional country • Respectful and harmonious relationships within and between communities (both Aboriginal and non-Aboriginal) • Access to service delivery (in particular health and education) that acknowledges and respects culture • Ability for extended family residence • Respect for law by community members • Adequate infrastructure that is well-maintained (roads, airport, power, water and sewerage, telephone, internet) • Effective local governance • Opportunity for recreational, cultural and sporting pursuits • Safe social and physical environment
SV2 Affordable lifestyle	• Availability of adequate housing • Income levels • Cost of housing • Cost of food, power and other essential items
SV3 Community identity and spirit	• Recognition and promotion of cultural heritage • Perceptions of being able to influence community destiny • Existence of viable enterprise activity • Number and strength of Aboriginal organisations • Status of reconciliation with non-Aboriginal community • Level of volunteering and availability of assistance • Local celebrations
SV4 Capacity for sustainable economic activity	• Availability of employment opportunities • Aboriginal workforce participation and employment • Aboriginal business start-ups and ownership • Level of education achievement, including retention to Year 12 and post-school destinations

4. Katherine regional context

A regional summary is provided as context for the affected communities' baseline profiles. The relevant region is the Katherine region, also known as the 'Big Rivers Region'. This summary is not intended to be a comprehensive characterisation of the region – it is intended as a high-level overview of key social characteristics.

The Katherine region extends from the border of Western Australia to the border of Queensland, and to the Gulf of Carpentaria in the north. It covers an area of 326,250 square kilometres and is represented by four SA2-level statistical areas: Victoria River, Katherine Town, Elsey and Gulf. The region recorded a population of 18,710 at the 2016 census, equating to 8.1% of the Northern Territory population. Katherine Town, the fourth largest town in the Northern Territory, is the regional centre for the provision of government and private sector services.

Summary regional statistics are shown in Table A4.1. These data show that Katherine Town dominates statistics for the Katherine region, comprising over half of the regional population. People identifying as Aboriginal or Torres Strait Islander (ATSI) comprise approximately 49% of the regional population, and between 70% and 85% in areas outside of Katherine Town. Outside of Katherine Town, English is a minority language.

This suggests that social analysis must be conducted at a community scale rather than a regional scale, because broad-scale analyses would not capture significant variations within the region. Studies and/or communications should be multi-lingual to reflect a variety of primary languages.

Table A4.1 Summary statistics for Katherine region (ABS Census, 2016)

	Northern Territory	Katherine region	Victoria River	Katherine Town	Elsey	Gulf
Population	228,836	18,716	2,487	9,777	2,301	4,151
% Territory	100%	8%	1%	4%	1%	2%
% Region	-	100%	13%	52%	12%	22%
ATSI People	58,248	9,162	1,829	2,179	1,635	3,519
%	25.5%	48.9%	73.5%	22.3%	71.1%	84.8%
Median age	32	29	25	33	29	25
ATSI median age	25	23	22	25	25	22
Top 3 languages spoken at home	English (58.0%)	English (46.3%)	English (21.7%)	English (65.0%)	Kriol (61.5%)	Kriol (41.8%)
	Kriol (1.9%)	Kriol (19.9%)	Warlpiri (19.1%)	Kriol (4.6%)	English (21.1%)	English (31.2%)
	Djambarrpuyngu (1.9%)	Warlpiri (2.8%)	Gurindji (13.6%)	Tagalog (1.2%)	Rembarrnga (0.4%)	Nunggubuyu (5.8%)

Notwithstanding intra-regional variations, broad characteristics of Katherine region can be set out. This section discusses population and demographics, the region's economic profile, and the degree of community services available.

4.1. Population and demographics

As shown in Table A4.1, the population of Katherine region was 18,710 persons in 2016. Population trends in the past and projected into the future are shown in Table A4.2. This projection suggests that the rate of Aboriginal population growth is projected to be more than twice the growth rate of the non-Aboriginal population in the 2021–2026 period.

In future, there is likely to be a larger Aboriginal population, both numerically and as a proportion of the total population. The growth rate of the non-Aboriginal population is projected to slow, which may accentuate the proportional difference between Aboriginal and non-Aboriginal populations.

Table A4.2 Population growth rates (past, current and projected) for Katherine region

	2011–2016	2016–2021	2021–2026
Katherine region Aboriginal population	1.1%	1.1%	1.2%
Katherine region non-Aboriginal population	0.7%	0.7%	0.5%

Source: Northern Territory Department of Treasury and Finance, Northern Territory Population Projections Main Update (2014 Release)

Population growth is not expected to be uniform across the region, as Table A4.3 shows. Growth rates ranged from 2.3% annually in Elsey, compared to a 0.2% decline in Victoria River. There does not appear to be any correlation between growth rates and the proportion of Aboriginal persons.

Table A4.3 Population growth within Katherine region (2011–2016)

SA2-level statistical area	2011 population	2016 population	Annual growth rate	% ATSI in 2016
Katherine (town)	9,209	9,777	1.2%	22%
Gulf	4,044	4,151	0.5%	85%
Victoria River	2,515	2,487	-0.2%	74%
Elsey	2,054	2,301	2.3%	71%

The proportion of ATSI persons varies significantly across the region (Table A4.1Table A4.1 and Table A4.3). Aggregated as a region, the ratio of Aboriginal to non-Aboriginal persons within the Katherine region was 49% in 2016, representing a slight decline from previous years (Figure A4.1).

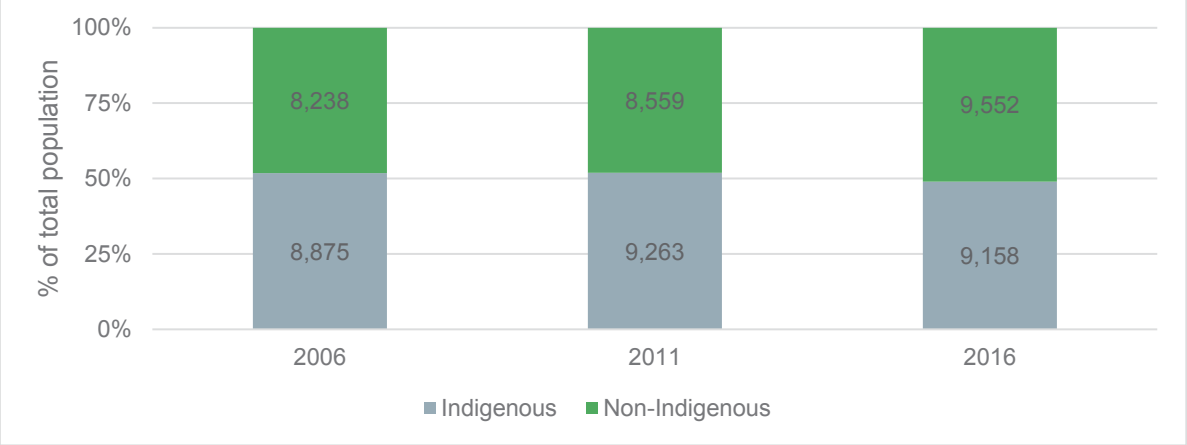


Figure A4.1 Aboriginal and non-Aboriginal populations in Katherine region (2006–2016)

4.2. Major industries

Katherine region had a gross regional product of $1,338 million in 2011–2012 (Regional Development, 2014), equating to 7.4% of the Northern Territory's gross state product. The major industries in the region are defence, mining, tourism, public administration, agriculture, forestry and fishing.

Defence

The defence sector contributes approximately $42 million annually to the gross regional product, and 46% of businesses service the sector in some form (Regional Economic Development Committee, 2014). Two military facilities are located within the region: the RAAF Base Tindal, and the Australian Army's Bradshaw Field Training Area. The Northern Territory Government notes that the Department of Defence has a significant infrastructure program proposed for the Northern Territory over the next decade (Defence Strategy Northern Territory, 2016).

Mining

The mining industry is the highest contributing industry to the Katherine regional economy, making up $293 million in gross regional product in 2011-2012 and employing 265 people (Regional Economic Development Committee, 2014). Major mining operations include McArthur River Mine, Redbank Mine and Mataranka Limestone. There are also a number of quarries and extractive operations (sand, soil, rock, gravel). The McArthur River Mine is situated near Borroloola, and is a large-scale zinc-lead mine. The mine has been operating since 1995 and is the world's second largest zinc resource. The mine operates 24/7 on a fly-in fly-out basis. In 2013, regulatory approval was given to increase production to 5 million tonnes per annum and extend the mine life to 2037. Since 2007, the mine has invested more than $12.3 million into the Roper Gulf Region through the MRM Community Benefits Trust and other community service initiatives and employed 762 people (McArthur River Mine, 2017).

Tourism

Tourism is a major industry in the Katherine Region. Key tourist attractions include Nitmiluk National Park, Edith Falls, Daly Waters Pub, and Mataranka Hot Springs, as well as other cultural tourism and fishing opportunities. Tourism in the Katherine Region is highly seasonal with peak activity during the dry season, between May and August. In the previous year (ending March 2017), the Katherine Daly

tourism region recorded 317,000 visitors, slightly lower than the three-year average of 339,000 visitors from 2015–2017 (Northern Territory Tourism, 2017). Of all visitors, 54% of overnight visitors are from elsewhere within the Northern Territory, 36% are interstate, and 10% international (ibid).

Agriculture, forestry and fisheries

Agriculture, forestry and fisheries contributed $144 million to the gross regional product in 2011-2012, and employed over 700 people (Regional Economic Development Committee, 2014). Of all field and horticultural crops produced in the Northern Territory, over 40% are supplied from the Katherine region (Northern Territory Farmers, 2015). Key crops include mangos, melons, hay/fodder, citrus and nursery/turf products. Similarly, nearly 40% of all cattle in the Northern Territory are raised in the Katherine region (Regional Economic Development Committee, 2014), which are generally exported through the Port of Darwin. This industry more than doubled in its gross regional product contribution in the decade between 2002 and 2012.

Public administration and safety

The public administration and safety industry contributed $139 million to the gross regional product in 2011-2012, employing 1,922 persons, more than any other sector (Regional Economic Development Committee, 2014). However, there was a slight decline of about 3% over the preceding decade, indicating that this industry is steady but slightly receding.

4.3. Workforce participation

ABS data for the Katherine region indicates that approximately 40% of people of working age (15 years or older) are not employed. Figure A4.2 indicates that this pattern was steady between 2001 and 2011. Figure A4.3 shows that Aboriginal persons tend to be disproportionately unemployed within the Katherine region.

Figure A4.2 Workforce engagement in the Katherine region (2001–2011)

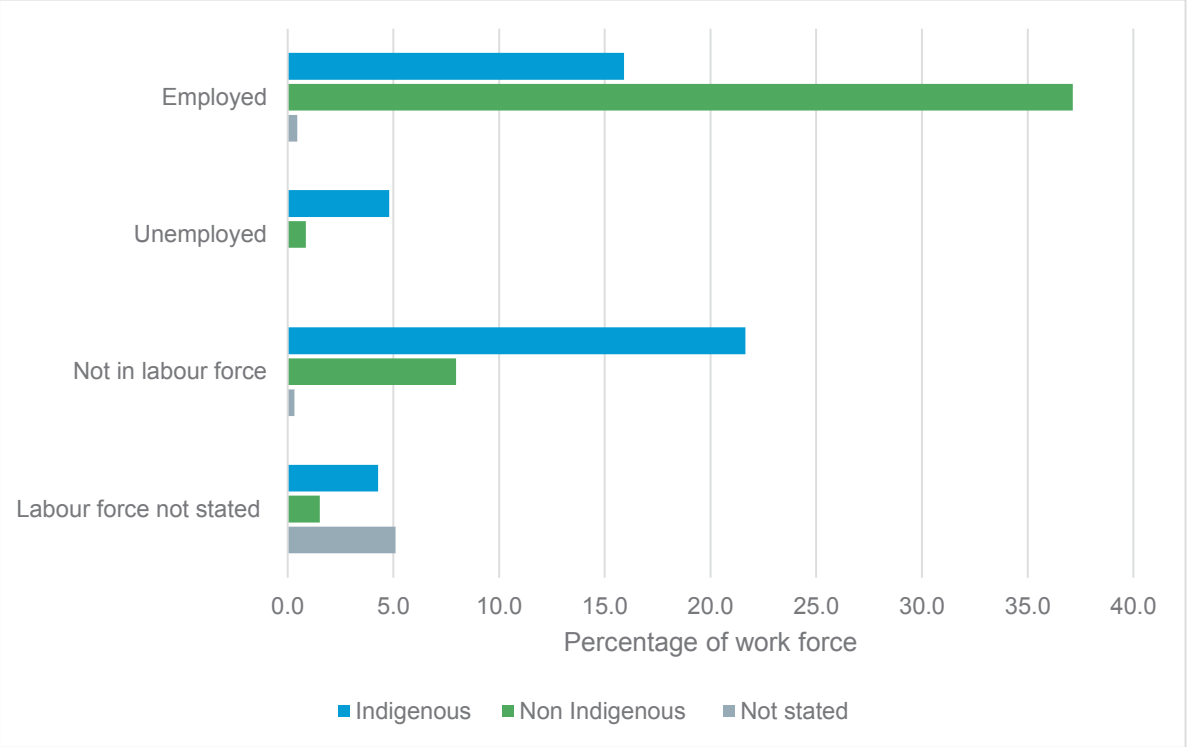
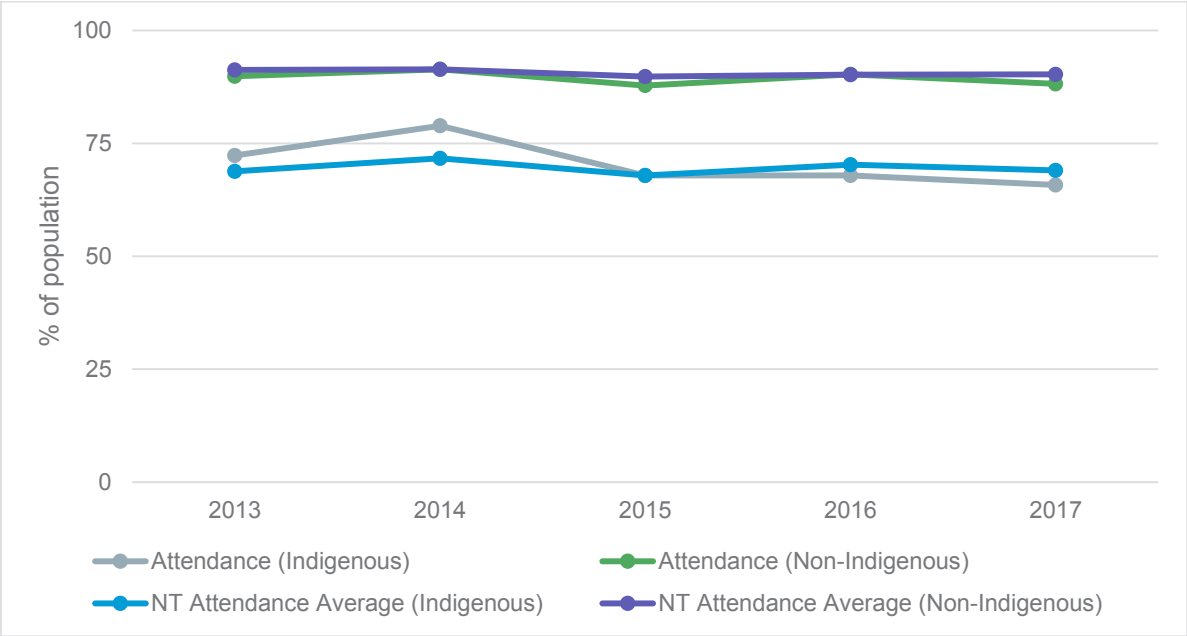


Figure A4.3 Aboriginal and non-Aboriginal engagement in the work force in the Katherine region

4.4. Education

Access to educational facilities varies across the region. In Katherine (town), there are eight schools which collectively cater for high school, primary school and special needs. Across the region, students usually have access to the one school in the town or community which caters for all students from kinder to Year 10 or 12 (NT Government, 2017).

School attendance rates in the Katherine region are presented in Figure A4.4. Aboriginal attendance is consistently lower than non-Aboriginal attendance, by over 20% in some years, which is also the case for the Northern Territory as a whole.



Source: NT Department of Education, 2017

Figure A4.4 School attendance in the Katherine region compared to Northern Territory average

4.5. Health services

The region's major hospital (Katherine Hospital) is located in Katherine town and has 60 beds. Specialist or acute health conditions which cannot be treated in Katherine are most often transferred to Darwin or Adelaide hospitals. There are a number of community General Practitioners and Aboriginal health organisations in the region.

Katherine West Health Board (KWHB) and Sunrise Health Service Aboriginal Corporation are the two major Aboriginal and remote health providers for the region. KWHB health board provides health services to remote aboriginal communities to the West of Katherine. The Sunrise Health Service Aboriginal Corporation works with communities to the east of Katherine (Sunrise Health Services Aboriginal Corporation, 2016).

4.6. Cost of living

The cost of housing within Katherine region (2011 compared to 2016) is presented in Table A4.4. The median rent rose approximately 5.3% per year. In both years, a minority of households paid rent equivalent to more than 30% of the household's income – but, as a percentage of all households, this proportion more than doubled between 2011 and 2016. This may indicate a rising trend of affordability stress for renters, though more research would be required to determine underlying reasons. For example, the possibility of rental increases in Aboriginal communities following the Commonwealth and NT Government Strategic Indigenous Housing and Infrastructure Program.

Homeowners within the Katherine region did not exhibit similar levels of stress. Monthly mortgage payments increased less than 2% between 2011 and 2016. The proportion of households spending more than 30% of the household's income nearly halved over the same period, suggesting that homeownership had become more affordable relative to income levels over the 5-year period.

The cost of goods (as given in Table A4.5) rose on average 2.4% per year.

Table A4.4 Katherine regional rental and mortgage breakdown

Category	2011	2016	2011	2016	2011	2016
	Katherine region		Northern Territory		Australia	
Median rent	$100	$130	$225	$315	$285	$335
Households where rent payments are 30%, or greater, of household income (%)	3.4%	7.6%	9.0%	9.1%	10.4%	11.5%
Mortgage monthly repayments ($)	$1,700	$1,733	$2,054	$2,167	$1,800	$1,755
Households where mortgage payments are 30%, or greater, of household income (%)	4.8%	2.5%	7.7%	5.5%	9.9%	7.2%

Source: ABS Census, 2011 and 2016

Table A4.5 Katherine regional cost of food basket survey

Area	2010	2011	2012	2014	2015
Katherine district average	$724	$797	$796	$801	$814
Katherine supermarket	$508	$565	$542	$571	$559
Katherine corner stores	$656	$720	$628	$746	$800

Source: NT Department of Health, 2012, 2014, 2015

5. Baseline profiles for affected communities

This section presents social baseline information for the four social catchments, within which affected communities have been grouped. The baseline information is sorted according to the social values identified. As discussed in the introduction to this appendix, the purpose of this information is to provide an evidence base for the SIA. As a high-level SIA case study, the evidence collected was not intended to be comprehensive, but to provide an indicative baseline for each social value.

5.1. Affected communities (urban)

This social catchment comprises Katherine town and Tennant Creek. Katherine is the fourth largest town, with 4% of the Northern Territory's population, about a quarter of which is Aboriginal. It is located 312 km southeast of Darwin on the Katherine River. The Katherine Local Government area covers 7,417 square kilometres. The Stuart Highway runs through Katherine, linking the town to Darwin in the north and other urban centres to the south.

The Aboriginal people of Katherine live in different communities located in and around Katherine. The largest of these are Mialli Brumby (also known as Kalano), which is located along the northern side of the Katherine River, and Rockhole, which is 15 km from the town centre. The other living areas are Binjari, Walpiri, and Gorge Camp (Jodetluk). Many Aboriginal people also live within the Katherine town itself.

Tennant Creek is the Northern Territory's fifth largest town, with 2% of the Northern Territory's population, about a half of which is Aboriginal. It is located on the Stuart Highway, approximately 989 km south-southeast of Darwin. The Traditional 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 (Northern Institute, 2013).

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 (Jemena, 2016).

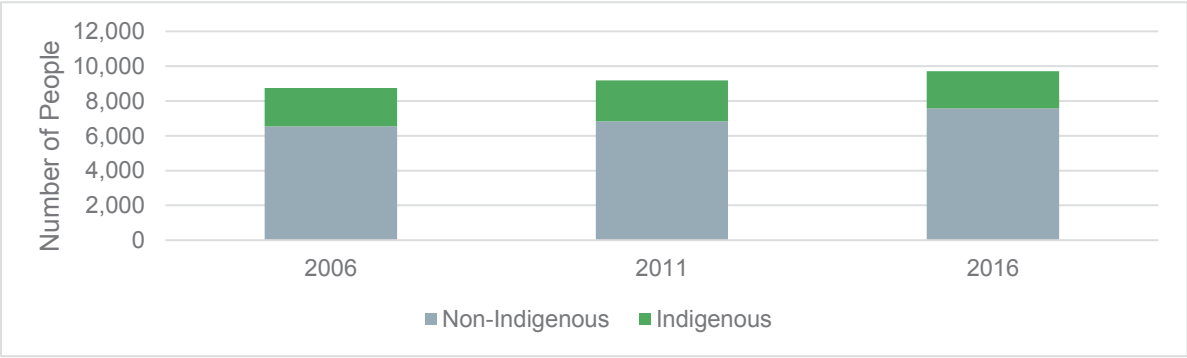
Katherine and Tennant Creek are grouped in the same social catchment because they share characteristics as urban communities. Because they are not located proximately to each other (being separated by over 600 km), baseline information for each will be presented separately.

5.1.1. Baseline information for Katherine town

SV1 Liveable community

Population and demographics

According to the 2016 census, Katherine town has a population of 9,717 persons with a median age of 33 – older than the other areas of Katherine region and likely due to its relatively lower proportion of ATSI people (22% compared with 49% for the region), who tend to have a lower median age (see Table A4.1). The total population has exhibited steady growth over the last decade (Figure A5.1).

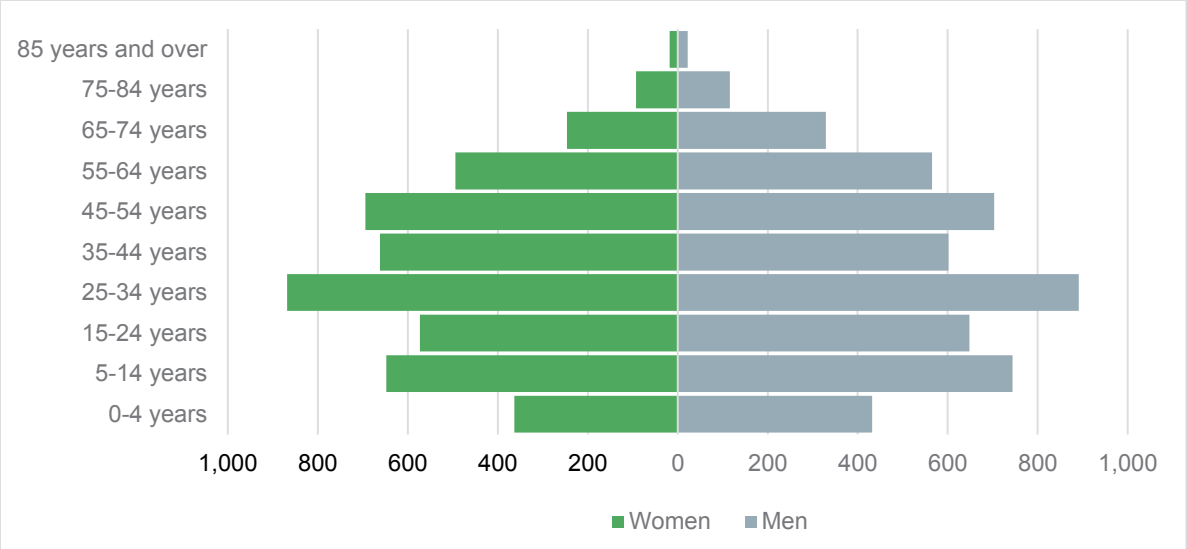


Source: ABS Census, 2016

Figure A5.1 Katherine town population growth (2006–2016)

The average household size has been 2.8 persons per household since the 2006 census, with an average of 1 person per bedroom (Table A5.1). This may be due to Katherine being made up largely of working-age non-Aboriginal residents, and school-age and older working-age Aboriginal residents (Northern Institute, 2014). Figure A5.2 presents an age-sex pyramid for Katherine for 2016, showing

that the town's population tends to be 25 to 54 years of age, with relatively fewer children and young adults.



Source: ABS Census, 2016

Figure A5.2 Age-sex pyramid of Katherine town

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 (ibid). This suggests a certain level of demographic instability, possibly leading to fluctuating needs of Katherine town over time. Non-Aboriginal migrants tended to migrate to and from other Australian states, while Aboriginal migrants tended to be intra-Territory migrants moving to and from Roper Gulf, Victoria River, Daly, and Darwin.

Table A5.1 Median age and household demographics for Katherine town

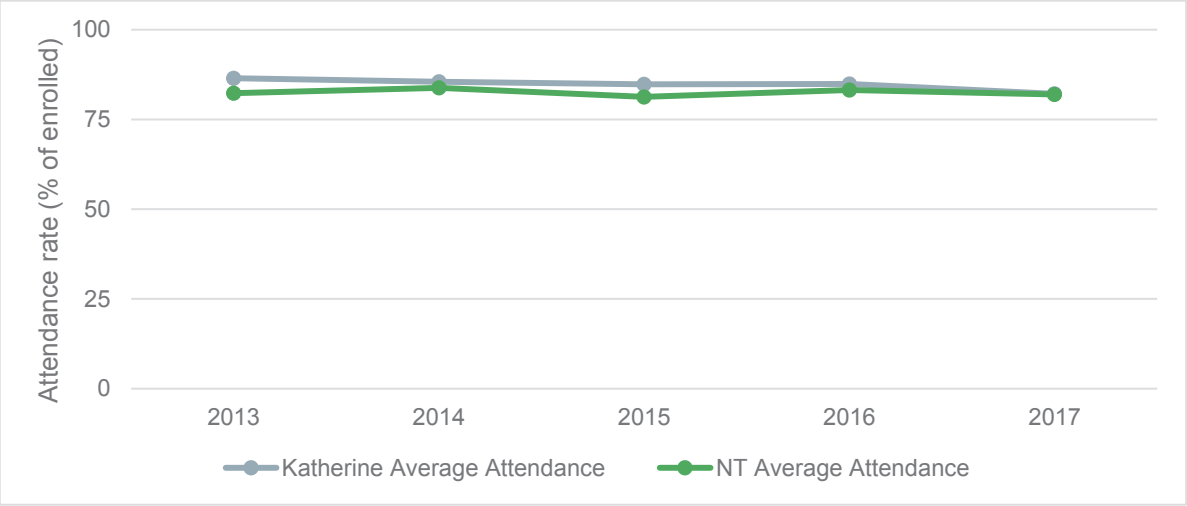
Category	2006	2011	2016
Median age	31	31	33
Average household size	2.8	2.8	2.8
Average number of people per bedroom	1	1	1

Education

Katherine has a number of public and private primary and high schools. These include St Joseph's Catholic College, Kintore Street School, Clyde Fenton Primary School, Katherine High School, Mac Farlane Primary School, Katherine South Primary School and Casuarina Street Primary School. The Kintore School caters for students with physical and intellectual impairments from pre-school to Year 12. Charles Darwin University also has a campus located on the outskirts of Katherine which offers agriculture, rural operations, conservation and land management and automotive courses.

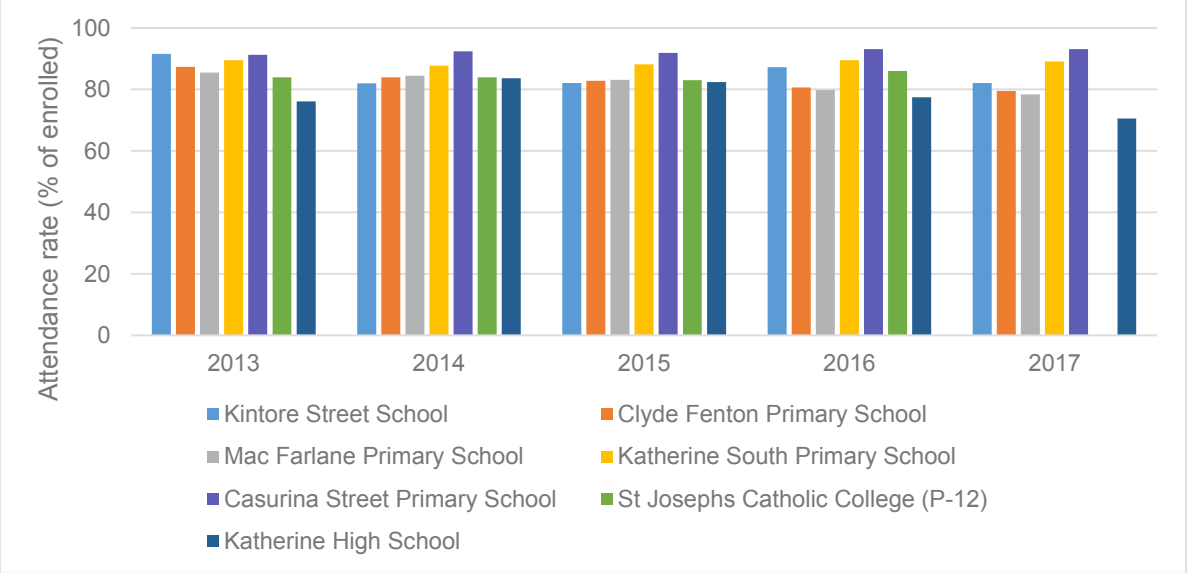
The attendance rates for the Katherine schools have been declining over the last five years, but until 2017 have historically been higher than the Northern Territory average (Figure A5.3). When disaggregated by school (Figure A5.4), it can be seen that primary school attendance has declined

over the last five years but remained above 78%, while attendance at Katherine High School has dropped below 71% in 2017.



Source: NT Department of Education, 2017

Figure A5.3 Katherine school attendance rates compared to the Northern Territory average



Source: NT Department of Education, 2017

Figure A5.4 Katherine town attendance - by school

Crime

Katherine has seen an increase in crime against people and property over the last two years. Crimes against the person were committed at a rate of 5,290 per 100,000 population in 2016–2017, a 16% increase from the previous year. Crimes against property were committed at a rate of 9,128 per 100,000 population in 2016–2017, a 23% increase (Northern Territory Police, 2017).

The rate of crime against the person in Katherine is close to double the rate of Darwin and is slightly less than Alice Springs. The rate of crime against property is less than Darwin and significantly less than Alice Springs. The Northern Territory has the highest offender rate in Australia.

In 2016, the highest offending group in the Northern Territory was 20 to 24 year olds (ABS Census, 2016). The Northern Territory Government is spending $18.2 million on youth crime prevention and allocating funding for new youth workers for Katherine as part of a youth justice system overhaul (Jones, 2017).

Community services

As Katherine is the largest town in the region it acts as a community services hub. Commonwealth and Territory Governments have offices and staff based in the town which service the wider region. The Northern Territory Police have a large station in Katherine. Many other non-government organisations and community groups are clustered in Katherine. Some of these include Anglicare, Red Cross, Beyond Blue, Cares NT, Cancer Council, Head Space, Lion's Club, Salvation Army, Apprenticeships NT, Women's Crisis Centre and RESPECT – Relationships Australia.

There are a large number of community and social groups in the town. These include Big River BMX Club, Katherine Air Force Cadets, Katherine Archery Club, Katherine Bowls Club, Roller Derby, Community Radio Station, Girl Guides, Krocs Social Rugby Club, Senior Citizen Association, QLife (for lesbian, gay, bisexual, transgender and intersex) and Landcare groups.

Katherine has a number of facilities and programs for young people. There are four sports ovals (two with lights for night use), a BMX track, a skate park, children's adventure playground, aquatic centre and a number of park and recreational areas.

The Katherine YMCA provides an Aboriginal youth program which is targeted at assisting students at risk of disengaging from education. In July 2017, the Commonwealth Government committed $200,000 to support the program (Aboriginal Affairs Media Hub, 2017). The YMCA also provides youth diversion programs for at risk youth and boys and girls groups which provide activities and social networks. The YMCA Community Youth Development provides constructive and engaging youth activities, events and programs and schools holiday programs.

The lists of community services is much greater than other towns and communities within the region. Katherine's population has far greater access to community and government support services than any other town in the Katherine Region.

Health

As Katherine is a regional hub there are a number of large health services based in the town, including Katherine Hospital. The Katherine Hospital is a non-specialist public hospital that services Katherine and the surrounding region and remote areas. It has 60 beds and a 24-hour emergency department.

Katherine also has general practitioner community practices, Aboriginal health clinics and mental health services. The Wurli Wurlinjang Health Service provides services to Aboriginal people in Katherine. Significant health issues impact Aboriginal populations in Katherine. There is a high level of endemic diseases such as diabetes, rheumatic heart disease, and chronic heart and kidney disease (Roper Gulf Regional Council, 2017). These endemic diseases are linked to the relative poverty of the region and lifestyle issues such as high alcohol consumption, high smoking rates,

overcrowded social housing and poor nutrition (ibid). There is a significant health gap between Aboriginal and non-Aboriginal Australians which is apparent within the Katherine population (ibid).

Access to health services is significantly better for the Katherine population than the wider Katherine Region.

Infrastructure

Katherine is a regional hub and the largest town in the region, with correspondingly sophisticated infrastructure relative to the rest of the region. Katherine has a small shopping mall with retail outlets, a Woolworths supermarket, chemists, bakeries and bottle shops. There are a number of other retail outlets, cafes, fast food restaurants, pubs, petrol stations, and shopfronts around Katherine.

There is also a number of government buildings including a courthouse and tourist information centre. The aquatic centre, sports grounds and showgrounds are all managed by the Katherine Town Council (Katherine Town Council, 2009). There is also a speedway where racing events are held. The roads in Katherine are all sealed and access to Katherine is open all year, other than in major flood events.

Katherine has a number of tourism facilities and accommodation. There are two small museums, art centres and a visitor's centre. There are a number of hotel and motel accommodation businesses in Katherine which support the seasonal tourism business.

Most of the major banks have offices in Katherine including the Commonwealth Bank, ANZ Bank, Westpac Bank, Bendigo Bank and the Territory Insurance Office.

Katherine has a domestic airport and RAAF Base Tindal. There is a large amount of infrastructure on the base to support the Defence population.

Katherine is currently experiencing ground and drinking water contamination from PFAS chemicals. The contamination has been linked to the use of firefighting foams on the RAAF Base Tindal and treatment options are currently being explored. This contamination has heightened the towns concerns around risks posed to water from other technologies, such as hydraulic fracturing.

SV2 Affordable lifestyle

The cost of housing and rental costs have remained proportional over the last five years, although rental costs increased at a slightly faster rate (Table A5.2). The median personal income between 2011 and 2016 increased 22%, while rental costs increased 25%. There was a 40% increase in the proportion of households who devoted more than 30% of their household income to rent. This increase was less than the region as a whole, which more than doubled over the same period. Home ownership appeared to have become relatively cheaper compared to income.

Table A5.2 Income and housing statistics for Katherine town

Category	2011	2016
Median total personal income ($/weekly)	$758	$922
Median total family income ($/weekly)	$1,766	$2,081
Median total household income ($/weekly)	$1,429	$1,690
Median rent	$200	$249
Households where rent payments are less than 30% of household income (%)	93.8%	91.4%

Category	2011	2016
Households where rent payments are 30%, or greater, of household income (%)	6.2%	8.6%
Mortgage monthly repayments ($)	$1,733	$1,733
Households where mortgage payments are less than 30% of household income (%)	94.9%	96%
Households where mortgage payments are 30%, or greater, of household income (%)	5.1%	4%

SV3 Community identity and spirit

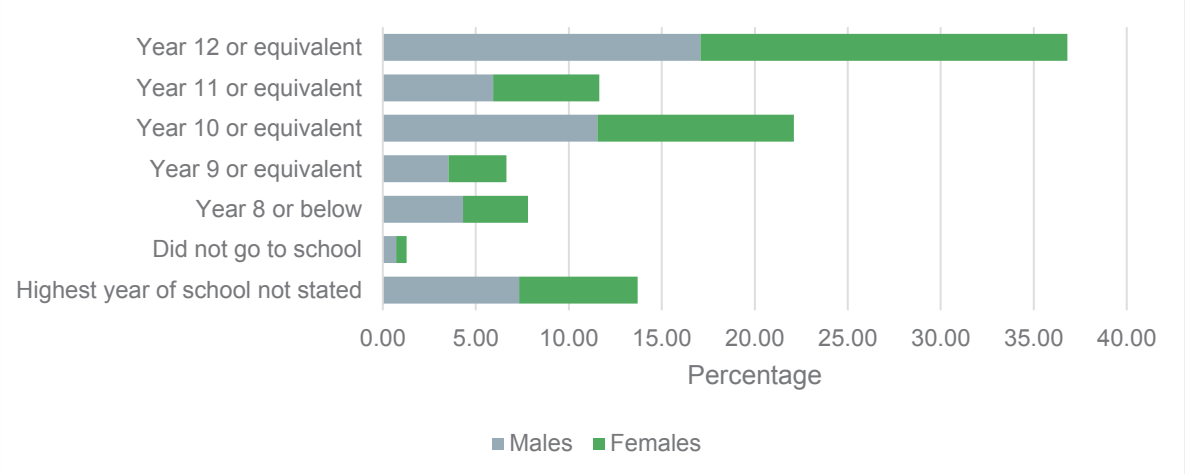
Being the major town within Katherine region, Katherine provides community services and functions which engage people from across the region. Katherine is a large multicultural town, with a strong Aboriginal and agricultural history and identity. It attracts tourists each year from across Australia and from overseas. Being the largest town in the region, Katherine has a wide range of community events, social activities and shows which draw people from across the region.

Katherine has a number of community forums including the Katherine Times newspaper, the local 8KTR Community Radio Station, the Katherine Community Markets held each Sunday morning and a number of community social and interest groups. One of the largest annual events is the Katherine Agricultural Show, which people from across the region travel to attend and compete in various events.

The Department of Defence has a number of initiatives to help promote community and inclusion in Katherine and on the Defence RAAF Base Tindal (Defence Community Hub, 2017). These include a community-based newsletter, swimming sessions, choir and a special needs support group.

SV4 Capacity for sustainable economic activity

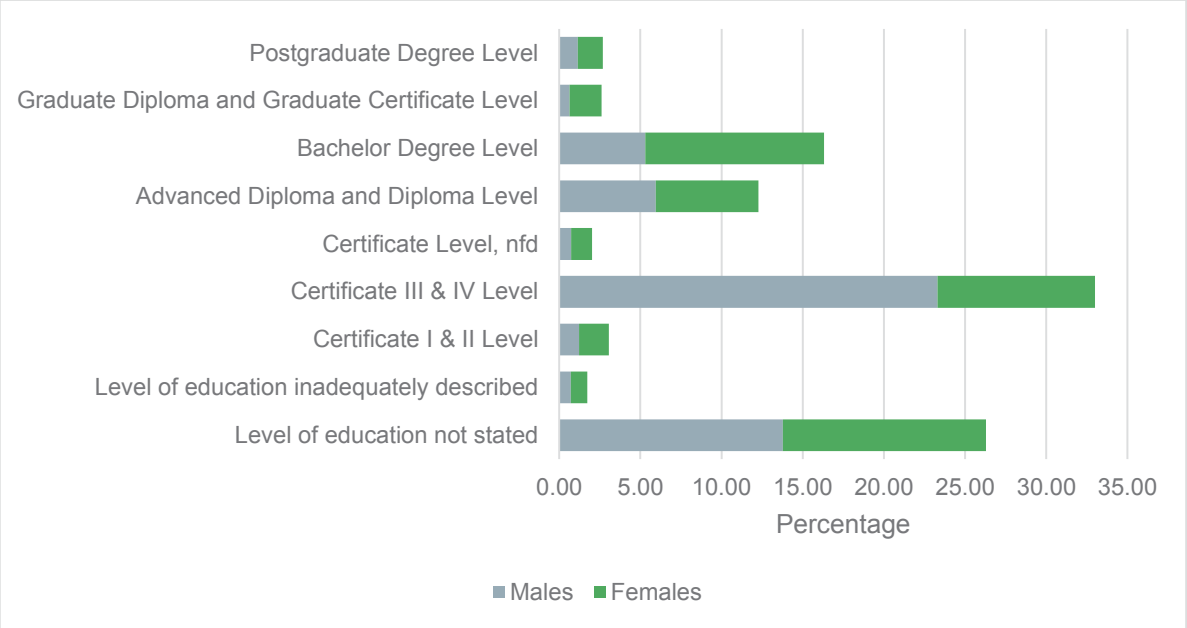
The most common level of education achieved in Katherine is Year 12, as shown in Figure A5.5. This is significantly different to the Roper Gulf and surrounding communities, where Year 10 and below where the most commonly achieved. Katherine is comparable to Darwin, which also has Year 12 as the highest level of education achieved.



Source: ABS Census, 2011

Figure A5.5 Katherine highest level of education achieved

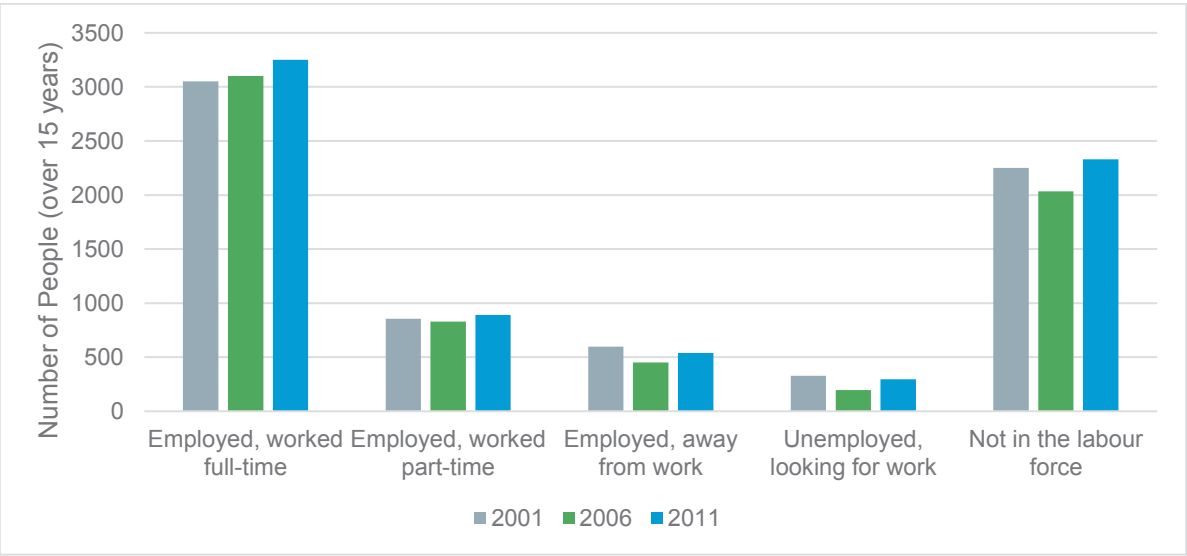
The most commonly achieved post-school qualification is a Certificate III and IV (Figure A5.6), comparable to patterns in the Roper Gulf. Higher levels of education, including advanced diplomas and bachelor degrees are commonly achieved in Katherine than the wider region. This is likely due to the high level of government, health and social services based in Katherine. The access to Charles Darwin University Campus would also influence the population's tertiary education levels.



Source: ABS Census, 2011

Figure A5.6 Katherine non-school qualifications

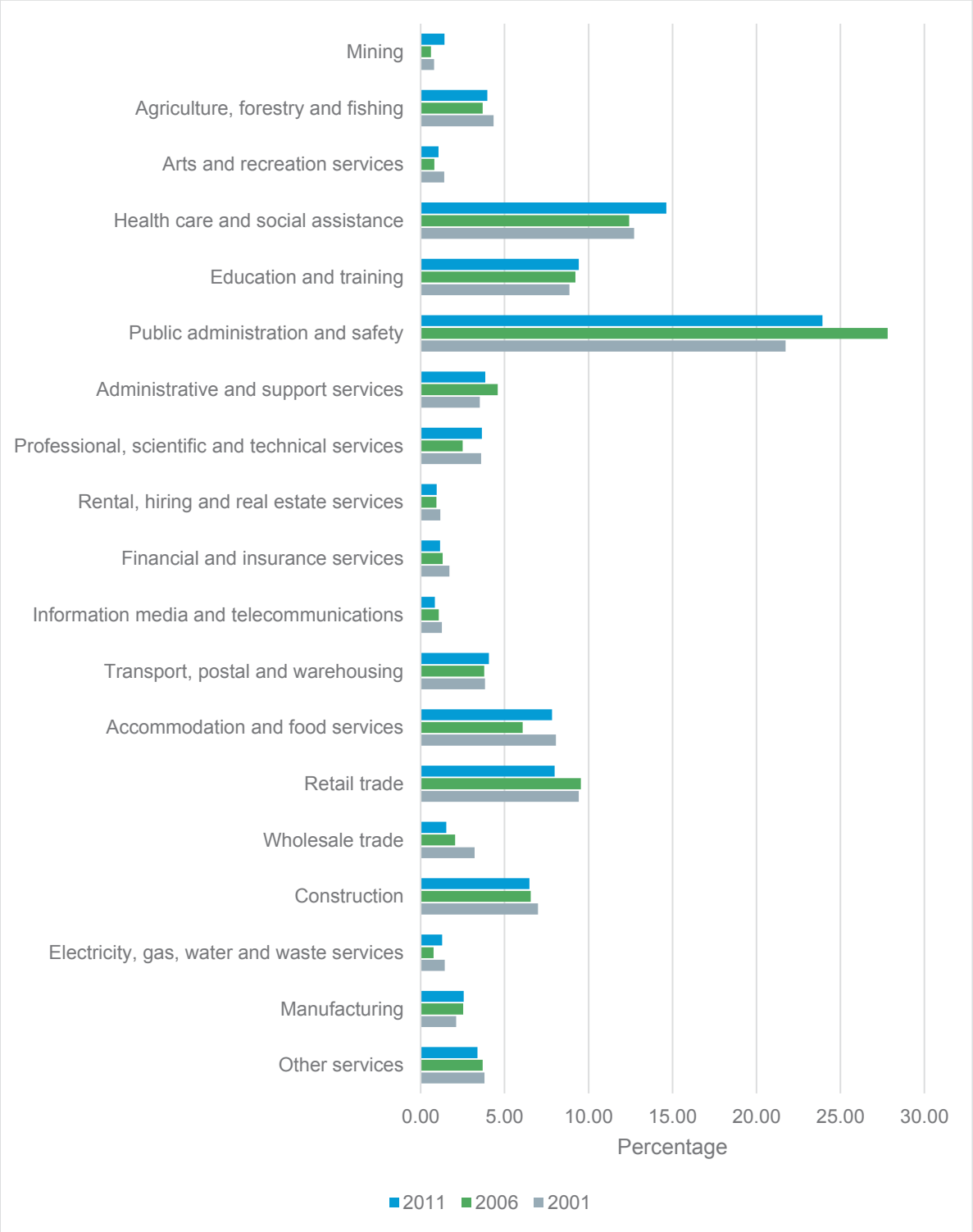
The majority of the Katherine population was employed full-time between 2001 and 2011, indicating a highly engaged workforce. Census data is shown in Figure A5.7.



Source: ABS Census, 2011

Figure A5.7 Workforce participation in Katherine

The key employment sectors in Katherine town are public administration and safety, health care and social assistance, and education and training (Figure A5.8). Katherine town also operates as a supply hub for regional businesses, as discussed above.



Source: ABS Census, 2011

Figure A5.8 Employment by sector in Katherine town

5.1.2. Baseline information for Tennant Creek

SV1 Liveable community

Population and demographics

Tennant Creek is the Northern Territory's fifth largest town, with 2% of the Northern Territory's population. It is located on the Stuart Highway. The Traditional 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 (Northern Institute, 2013a).

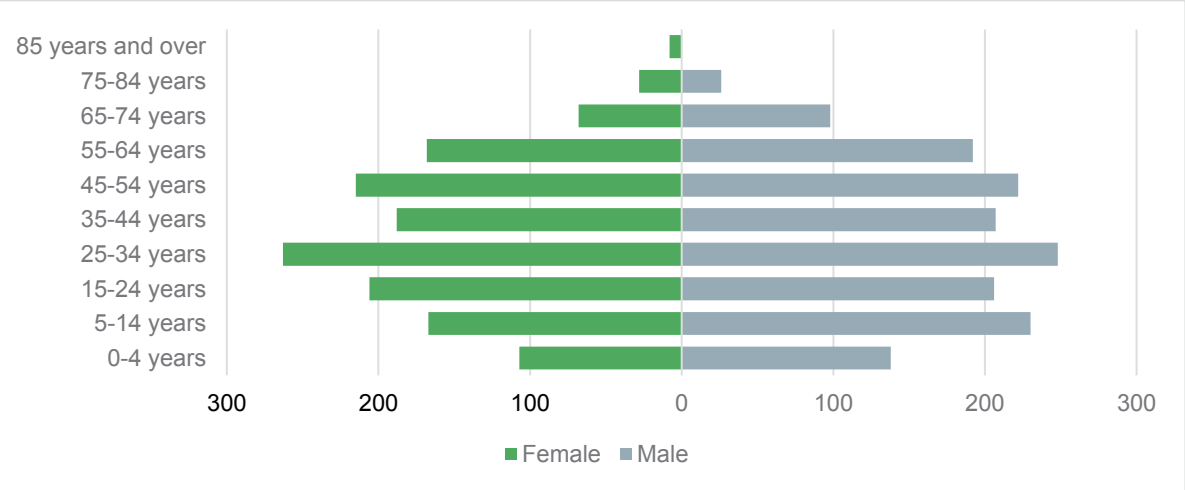
Tennant Creek is located in the Barkly Region and serves as the region's key service centre. In addition to the major towns and major populations, the Barkly Region includes 8 minor communities, 70 family outstations, 49 pastoral stations, mining operations and commercial properties (Barkly Regional Council, 2011).

Tennant Creek has a population on 2,991 and has seen a 2% decrease in population of since 2011 (Table A5.3). The median age in Tennant Creek in 33, which is slightly higher than the Northern Territory average, and the age bracket 25 to 34 years of age is the largest (Figure A5.9; also Northern Institute, 2013a). 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 (ibid).

Table A5.3 Key demographic data for Tennant Creek

Category	2006	2011	2016
Median age	31	32	33
Average household size	2.9	2.9	2.7
Average number of people per bedroom	1	1	1

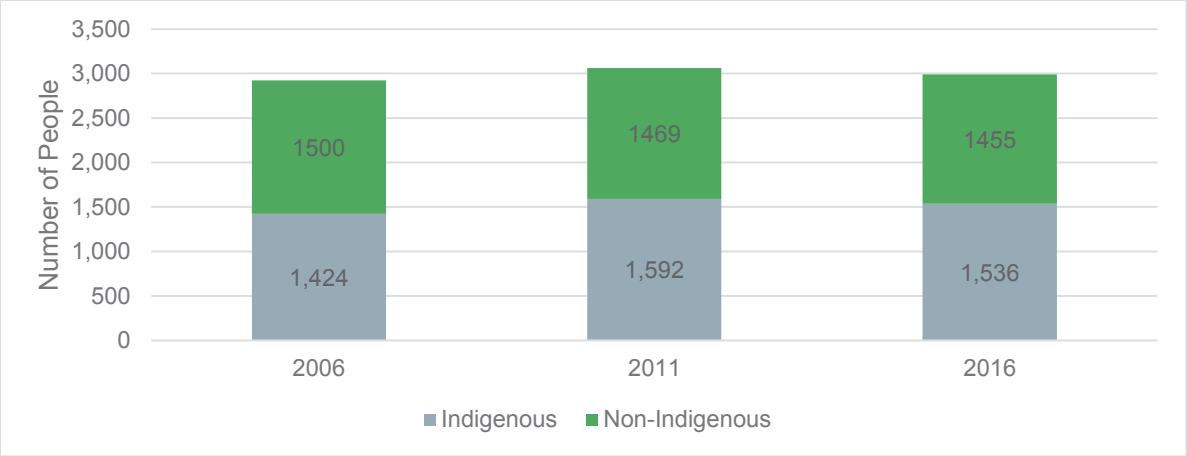
Source: ABS Census, 2006, 2011 and 2016



Source: ABS Census, 2016

Figure A5.9 Age-sex pyramid for Tennant Creek

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 (ABS Population Projections, 2008). As can be seen in Figure A5.10, Aboriginal residents make up approximately 50% of the population.



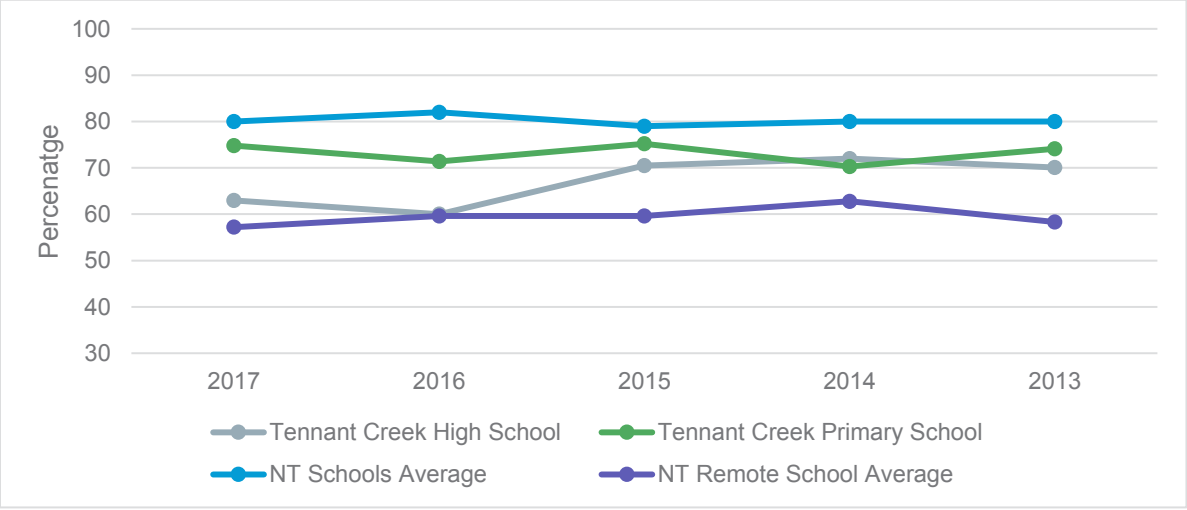
Source: ABS Census, 2016

Figure A5.10 Tennant Creek population breakdown – Aboriginal and non-Aboriginal

Education and community services

As Tennant Creek is a region hub for the Barkly Region, it has a number of community services. These include childcare services, school nutrition programs, aged cared and disability services, safe houses, night patrol, community arts center, Australian Post and Centrelink. A number of government departments, legal services and commercial business located in Tennant Creek.

One primary school and one secondary school are located in Tennant Creek. School attendance averages in the town fluctuate below the Northern Territory average but sit above the average attendance rates for remote schools (Figure A5.11) (NT Department of Education, 2015).



Source: NT Department of Education, 2015

Figure A5.11 Tennant Creek school attendance compared to Northern Territory averages

Crime

Tennant Creek recorded 10,647 crimes per 100,000 against the person and 17,208 per 100,000 against property between July 2016 and June 2017 (Northern Territory Police, 2017). During this time there was a 19.9% increase in crimes against the person and a 7% increase in crimes against property. Crimes against the person in Tenant Creek are approximately 26% higher per 100,000 than across the Northern Territory. Crime against property in Tennant Creek is approximately 17% less per 100,000 than across the Northern Territory (ibid).

Health

While health data specific to Tennant Creek was not available, the Northern Territory Medicare Local Health Atlas of 2014 (Medicare Local Northern Territory, 2014) indicated that the Barkly Region has a low Index of Relative Social Disadvantage (IRSD). The Barkly Region fell within the lowest decile of IRSD ranking within Australia. The IRSD is a general socioeconomic index that summarises a range of information about the economic and social conditions of people and households within an area. The mortality ratio for the Barkly region (the number of deaths per 1,000 people over a given period) is approximately 13.3, which is higher than the Northern Territory ratio of 7.6. According to the Northern Territory Medicare Local Health Atlas of 2014 the Barkly Region is of particular concern for low birth weights, with almost a quarter (24.7%) of the babies having a low birth weight (ibid).

Tenant Creek has a 20-bed hospital which provides accident and emergency and outpatient facilities. The hospital also provides allied health services, aged care and visiting specialists' services. St John Ambulance is located at the hospital and services a 150 km radius around Tennant Creek.

Anyinginyi Health Aboriginal Corporation provides primary health care and dental services to Aboriginal people in Tennant Creek and the surrounding region in addition to services such as community development, sport, and alcohol after care and education. More than 2,500 people access Anyinginyi's health clinic each year, with 90% of services and 80% of patients being Aboriginal (Jemena, 2016).

SV3 Affordable lifestyle

Housing and income data for Tennant Creek is provided in Table A5.4. Rental costs have risen 14% in the last five years, while personal income has risen only 3%. The average personal income is $650 per week, which is approximately a quarter less than the Northern Territory average and nearly a third less than Katherine.

Table A5.4 Housing affordability in Tennant Creek

Category	2011	2016
Median total personal income ($/weekly)	$631	$650
Median total family income ($/weekly)	$1,401	$1,592
Median total household income ($/weekly)	$1,373	$1,551
Median Rent	$125	$175
Mortgage monthly repayments ($)	$969	$1,216

Source: ABS Census, 2016

SV4 Community identity and spirit

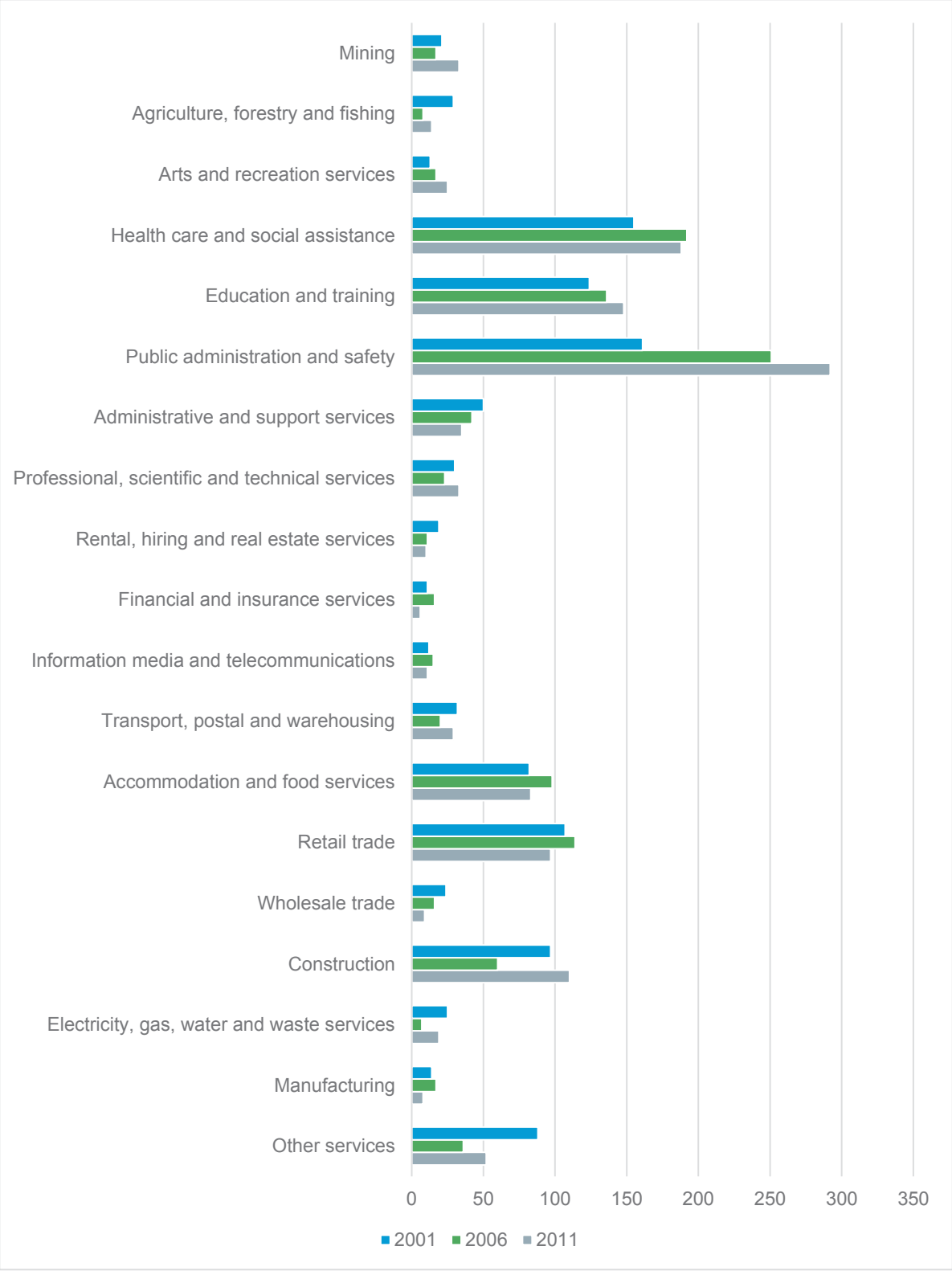
Tennant Creek is a multicultural society, with half of the population identifying as Aboriginal. There are residents from a range of nations including England, India, Germany, Greece, Philippines, Nepal and New Zealand (ABS Census, 2016). The region has a strong and proud Aboriginal history which is celebrated in the Nyinkka Nyunyu Art and Culture Centre, which has a number of fixed exhibitions which tell the local history from an Aboriginal point of view (Nyinkka Nyunyu Art and Culture Centre, 2004). It is also a space where local community performances are held, including traditional and contemporary dance, music, theatre and visual arts. Interstate and Northern Territory artists also hold performances and community events at the centre (Nyinkka Nyunyu Art and Culture Centre, 2004).

Tennant Creek is an important social and cultural hub for the Barkly Region. The town holds a number of large regional events which bring together people from across the region and Australia. A major community event is the annual Dessert Harmony Festival. The festival is the region's platform for the culturally diverse population to present, engage, participate and access the arts. The festival attracts artists from across Australia and allows the region to celebrate creativity and cultures (Desert Harmony Festival, 2017).

Tennant Creek also holds the Barkly Campdraft and Rodeo, which brings together a large number of people from pastoral stations across the region. The historic significance of this event represents the tradition of practicing, and competing in, the pastoral skills that provided the backbone of establishing the cattle industry and the pastoral stations that are one of the major economic factors in the region (Do the NT, 2017). Several horse racing events throughout the year also draw people to the town from across the Northern Territory.

SV4 Capacity for sustainable economic development

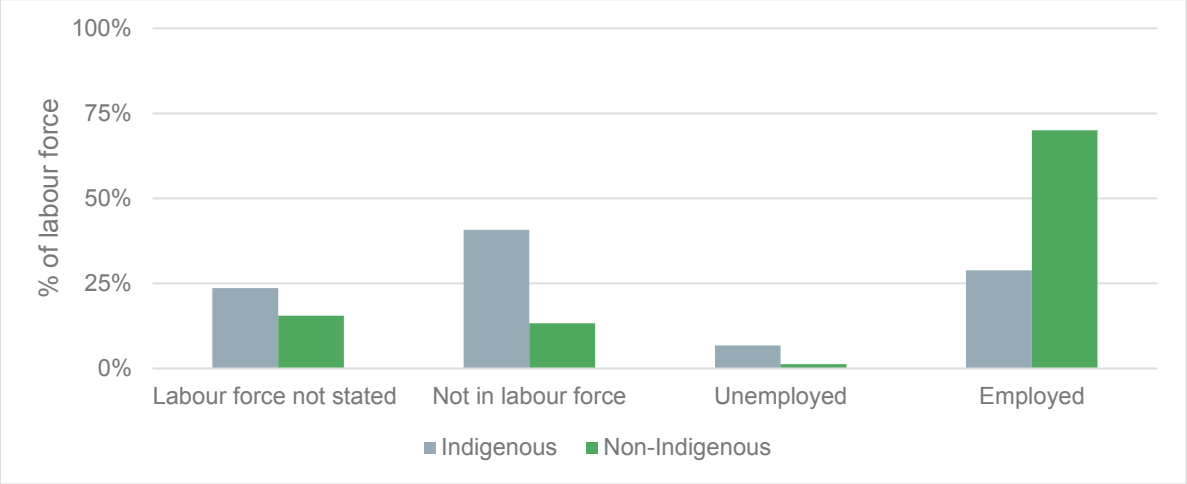
The key industries in and around Tennant Creek are mining, cattle and tourism. Public administration, health/social assistance and education/training are the highest areas of employment in Tennant Creek (Figure A5.12). Accommodation/food services and retail trade are also high areas of employment, due to their connection with the tourism industry.



Source: ABS Census, 2011

Figure A5.12 Employment by Industry in Tennant Creek

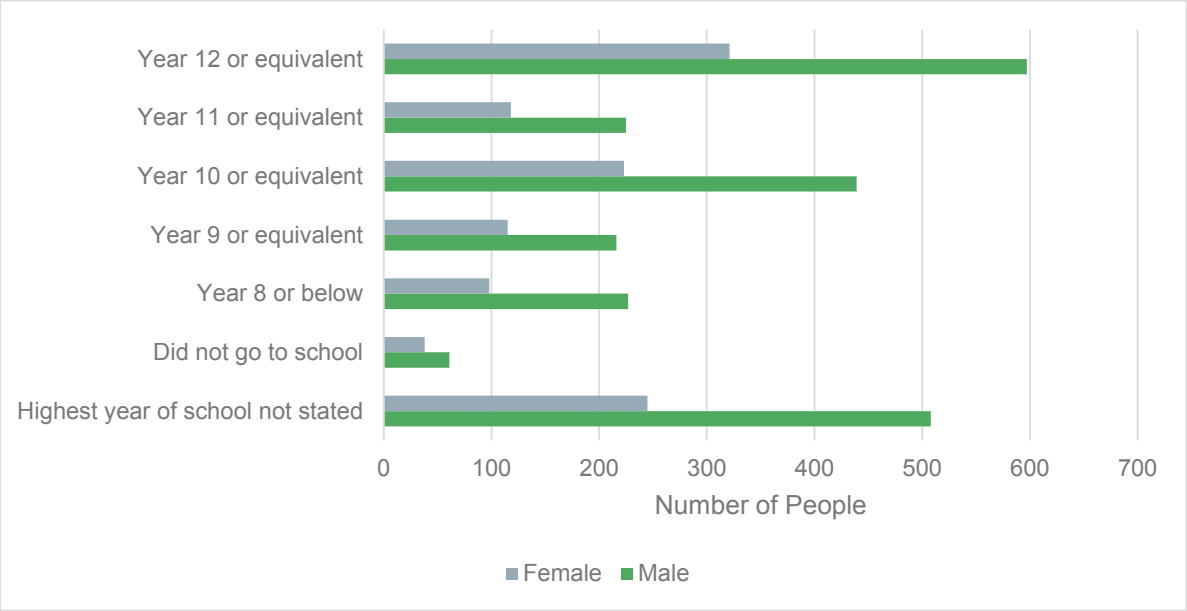
Unemployment in the Barkly Region is a significant issue. The overall unemployment rate of 8.9% for Tennant Creek was the highest in the Northern Territory in 2015, although it was down from 9.6% in 2014 (Jemena, 2016). The unemployment rate for Aboriginal people is 23.1% in the Barkly region. This is almost four times the Northern Territory unemployment rate (Jemena, 2016). Similarly, Figure A5.13 shows that unemployment among Aboriginal people is significantly higher than among non-Aboriginal people.



Source: ABS Census, 2011

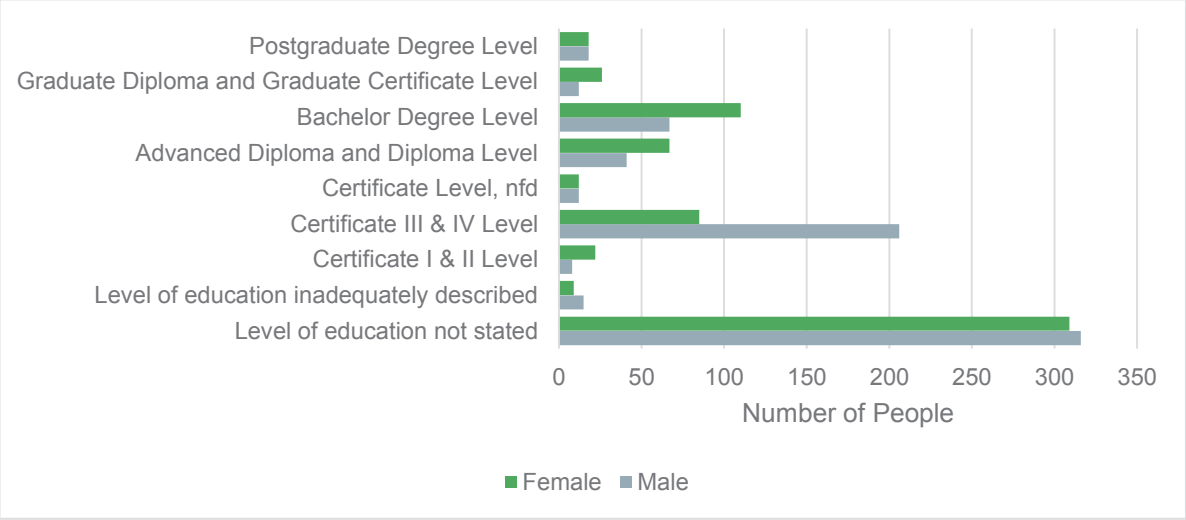
Figure A5.13 Workforce participation in Tennant Creek

Figure A5.14 and Figure A5.15 provide an indication of the educational attainment in Tennant Creek. Overall, 27% completed Year 12, while 41% did not progress beyond Year 10. Certificate III and IV qualifications was the most commonly completed non-school training.



Source: ABS Census, 2011

Figure A5.14 Highest level of schooling attained in Tennant Creek



Source: ABS Census, 2011

Figure A5.15 Non-school qualifications in Tennant Creek

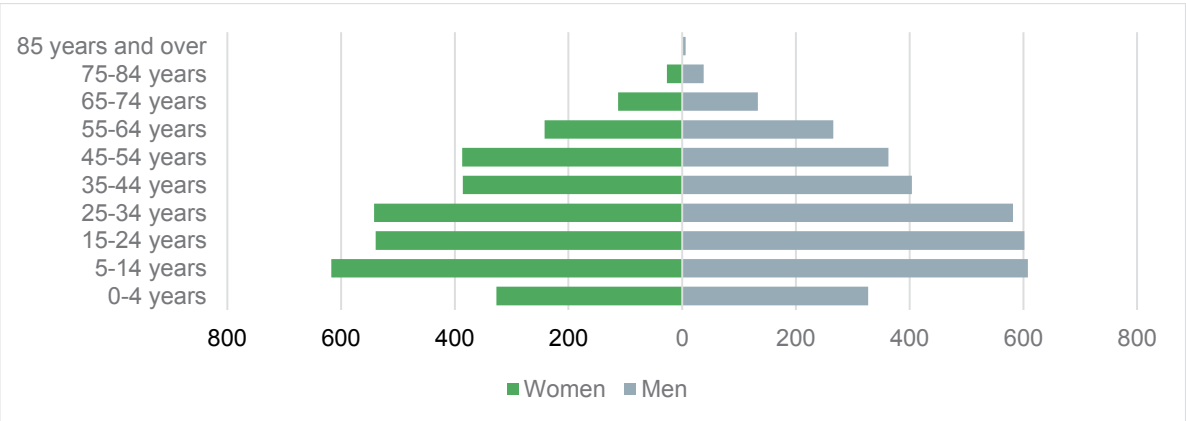
5.2. Affected communities (north)

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 square kilometers, with roughly one person for every 26 square kilometers.

5.2.1. SV1 Liveable community

Population and demographics

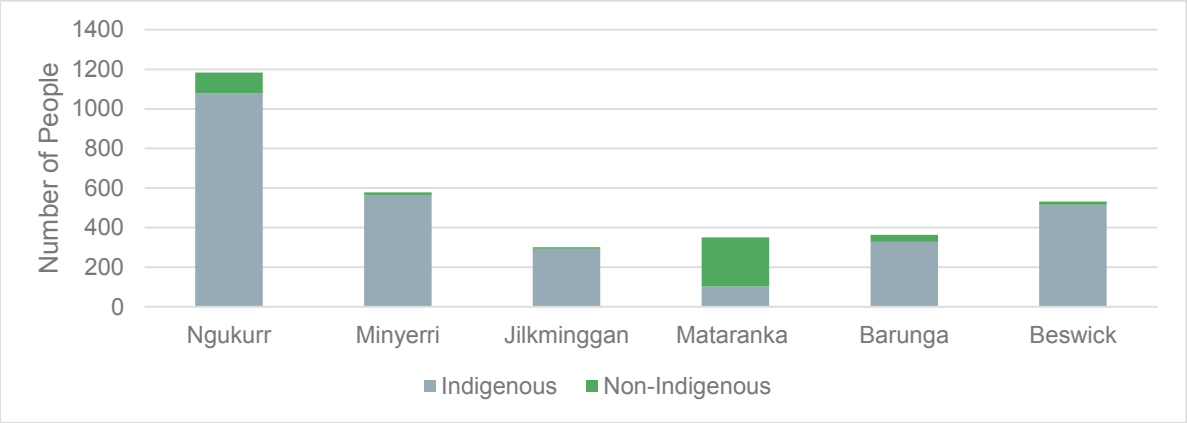
The Roper Gulf Region in 2016 had a population of 6,505. The region is demographically young with a median age of 26 years. The population has grown at approximately 1.3% each year since 2006. Figure A5.16 shows a generally balanced population, with the exception of low numbers of children 4 years old and younger. It is unclear why this pattern was recorded.



Source: ABS Census, 2016

Figure A5.16 Age-sex pyramid of Roper Gulf region

The population is predominantly Aboriginal across all communities within this social catchment, as shown in Figure A5.17. The only exception is Mataranka, which is 71% non-Aboriginal.

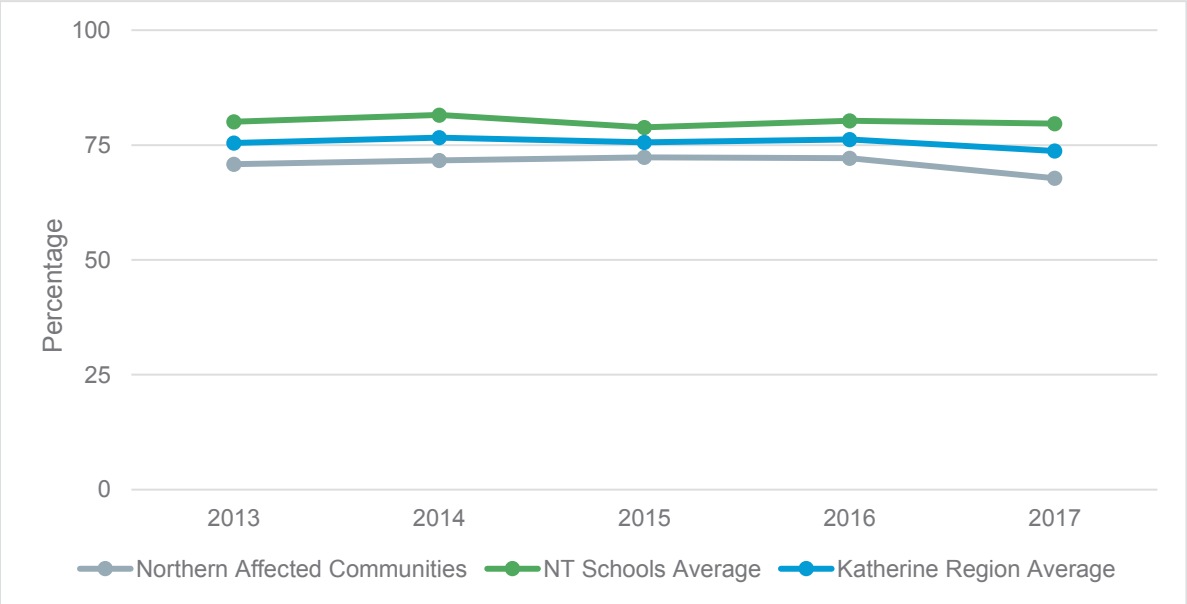


Source: ABS Census, 2016

Figure A5.17 Aboriginal and non-Aboriginal population of Affected communities (north)

Education

Each community has a primary and/or senior school, suggesting that educational facilities are accessible in all communities. The school attendance rate across the Roper Gulf Region is 10% to 15% below the Northern Territory rates, and 5% to 10% lower than the Katherine regional average, as shown in Figure A5.18.



Source: NT Department of Education, 2017

Figure A5.18 School attendance in Affected communities (north)

Figure A5.19 shows school attendance disaggregated by community. Attendance is relatively higher for Mataranka, Minyerri and Ngukurr, compared to Barunga, Beswick and Jilkminggan. Attendance for each community is fairly consistent across the last five years.

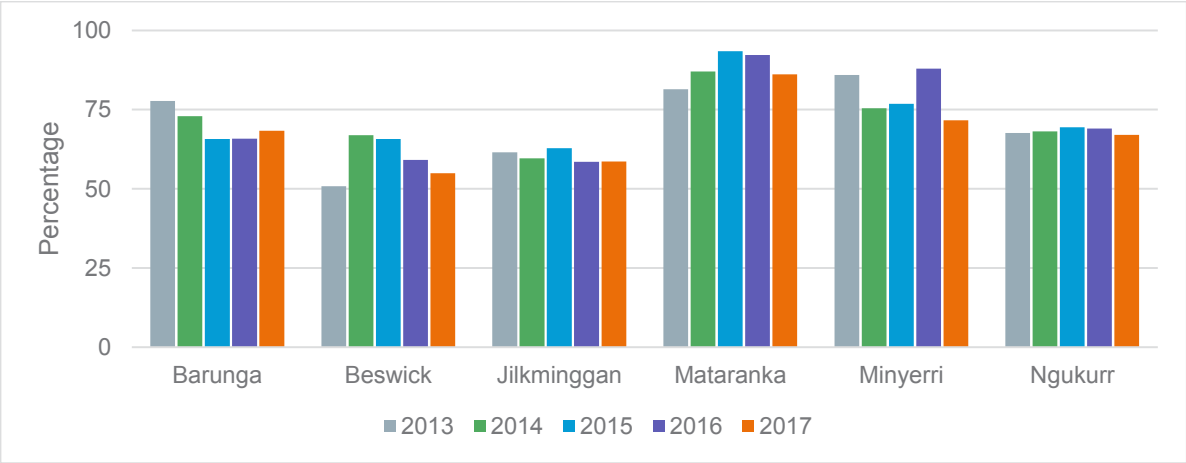


Figure A5.19 School attendance by community - Affected communities (north)

There are some youth services and programs available in the region. Ngukurr and Numbulwar have dedicated youth services, all northern affected communities have sport and recreation programs. Schools based in Bulman and Manyallaluk have nutrition programs. Ngukurr has a town swimming pool. Crèche services are lacking in the region, as they are only available in Beswick, Jilkminggan and Manyallaluk.

Centrelink agencies and Australian Post Offices are available in each of the communities in this social catchment. Training and employment of local people in Council operations occurs in each community, which supports local government as being the largest employer in the region. The Roper Gulf Shire provides aged care facilitates in limited communities.

Crime

Police stations are located in each of the communities, and crime statistics are aggregated under the NT Balance category in official statistics due to the low population numbers.

The NT Balance area has seen a slight decrease in crime against people over the last two years, and an increase in crime against property. Crimes against the person were committed at a rate of 2,942 per 100,000 population in 2016–2017, a 0.2% decrease from the previous year. Crimes against property were committed at a rate of 5,309 per 100,000 population in 2016–2017, a 12.8% increase (Northern Territory Police, 2017).

The rate of crime against the person in the NT Balance area is close to 60% of the rate in Katherine and close to 30% of the rate in Tennant Creek. The rate of crime against property is less than Katherine and significantly less than Tennant Creek. The Northern Territory has the highest offender rate in Australia.

Community services

Other services throughout the Roper Gulf Region include art centres, petrol stations and tourist accommodation in Mataranka, Daly Waters and Borroloola. Each community has at least one shop which sells food and an array of various retail goods. The range of retail goods is limited. Aboriginal communities have alcohol restrictions.

Health

Health clinics are located in each community and are generally bulk-billed. Doctors are available in clinics, with availability ranging from one day a fortnight to a full-time permanent basis. According to the 2015/2016 Sunrise Health Service Aboriginal Corporation Annual Report there were 56,094 episodes of care and 74,090 client contacts for the 2015–2016 period (Sunrise Health Services Aboriginal Corporation, 2016).

Mortality rates in the Roper Gulf Region are higher than the Australian average and life expectancy is much lower.

Infrastructure

Minyerri does not have mobile phone coverage though pay phones are available in the community. Other communities have Telstra mobile network coverage, however limited services are available outside the towns and communities.

The majority of local roads in the Roper Gulf Region are not sealed, though some communities have sealed streets. The Stuart Highway, part of the National Highway system, and the Carpentaria Highway are the major roads servicing the region. Much of the road network is subject to seasonal closure because of flooding. Unsealed roads are graded throughout the year. The Roper Gulf Shire spent $88,871 on local roads maintenance in 2015–2016 (Roper Gulf Regional Council, 2016). In 2016, the Roper Gulf Regional Council secured $2.31 million to deliver infrastructure to Ngukurr and Numbulwar, including sealed heavy vehicle routes and undercover laydown areas to the communities (ibid).

Public transport is very limited and expensive and private vehicle ownership levels are low, with 39% of people having no registered vehicle. This is much higher than the Katherine region where 19% of people do not own a registered vehicle (ABS Census, 2016).

All communities and towns have airstrips and a number of outstations have airstrips and/or helicopter access points.

5.2.2. SV2 Affordable lifestyle

The towns and communities in the Roper Gulf Region are remote, and as such the cost of living is higher than that of Darwin and Katherine. The Northern Territory Government Market basket survey (NT Department of Health, 2015) found that cost of a food basket in remote stores was $266 higher than the supermarket in the corresponding district centre ($817 compared with $599 in Katherine).

Personal average weekly income is $279, which is less than half of the Northern Territory average. Table A5.5 shows income and housing affordability statistics for the Roper Gulf Region. Personal income has remained steady between 2011 and 2016, while household income has risen 11%. Rental costs (as a proportion of income) have increased, although the cost of buying a home appears to have remained steady.

Table A5.5 Income and housing affordability statistics for the Roper Gulf Region

Category	2011	2016
Median total personal income ($/weekly)	$279	$279
Median total family income ($/weekly)	$717	$670

Category	2011	2016
Median total household income ($/weekly)	$1009	$1120
Median Rent	$50	$50
Households where rent payments are less than 30% of household income (%)	97.6%	94.8%
Households where rent payments are 30%, or greater, of household income (%)	2.4%	5.2%
Mortgage monthly repayments ($)	$806	$1733
Households where mortgage payments are less than 30% of household income (%)	99.6%	99.7%
Households where mortgage payments are 30%, or greater, of household income (%)	0.4%	0.3%

Source: ABS Census, 2016

5.2.3. SV3 Community identity and spirit

Mataranka is a tourist destination and attracts a large number of visitors each year to the town. As such, much of the town's businesses rely on and cater to tourists. The permanent population in Mataranka has a strong sense of community. An example of this is the Mataranka Better Half Club, which has been active in the community since 1977. This group has contributed to renovating the town hall, hosting community Christmas parties and a number of other community events which bring people from surrounding pastoral properties together (Rigby, 2017).

Barunga and Beswick communities both hold large annual community events. The Barunga Festival is held over the Queen's Birthday long weekend each year and attracts thousands of visitors from around the Northern Territory and Australia. The three-day event is a celebration of Aboriginal culture, sport and music. Sporting teams from across top end communities travel to the festival to compete in a range of events, such as AFL, baseball and basketball (Barunga Festival, 2017).

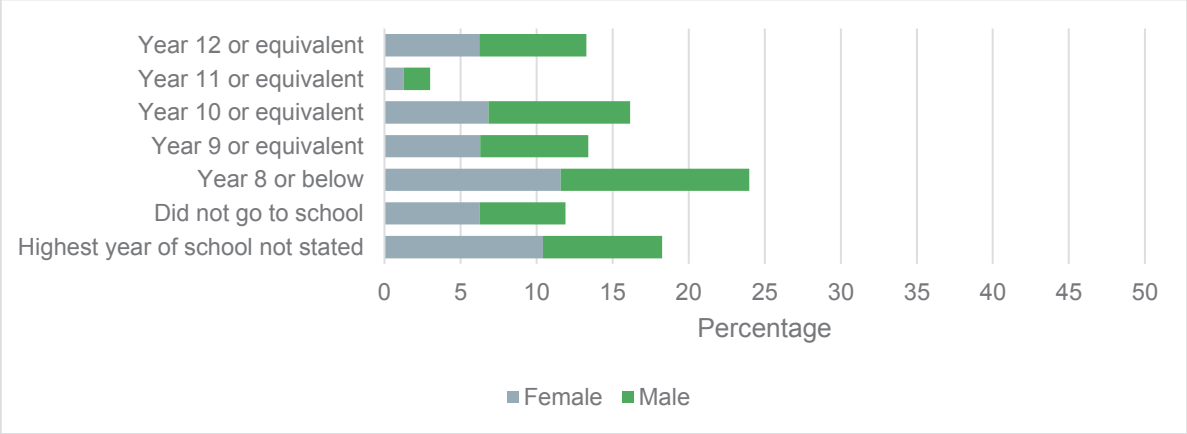
Beswick community holds the Walking with Spirits Festival each year in partnership with the Australian Shakespeare Company. The festival is a celebration of Beswick's culture and heritage through music, art and traditional corroborees from several Arnhem Land language groups (Djilpin Arts, 2017). These festivals enable people to visit, celebrate and learn from the communities.

Traditional owners in the Roper Gulf area have expressed concern over mining exploration activities in recent years. The Traditional Owners in Katherine and Ngukurr have voiced concern over exploration by Hancock Prospecting's Jacaranda Minerals and Minerals Australia in 2016. More than 6,500 square kilometers of Aboriginal-owned land in the McArthur Basin was announced in March 2016 as the first gas exploration permit on land managed by the Northern Land Council. The Traditional Owners have threatened legal action against the Northern Land Council for failing to properly consult the communities (Hope, 2016).

5.2.4. SV4 Capacity for sustainable economic activity

Educational attainment

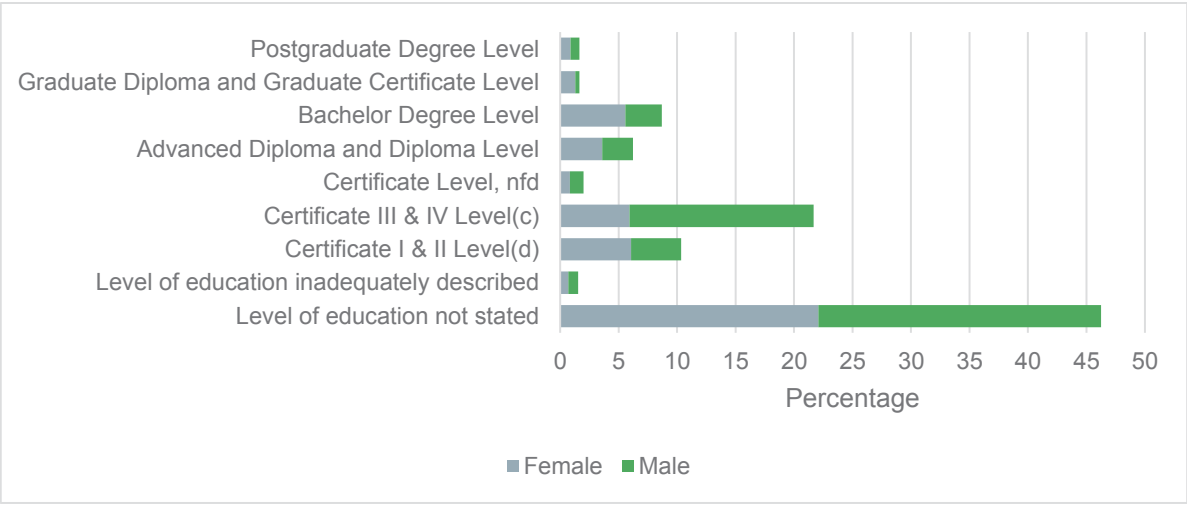
Within this social catchment, 53% of students left school during or before completing Year 10, and only 13% completed Year 12. Figure A5.20 shows that nearly a quarter of people indicated progressing no further than Year 8. This is significantly less than attainment rates within the Katherine Region, where Year 12 was the most common level of education achieved (28%).



Source: ABS Census, 2011

Figure A5.20 Highest level of education achieved within the Roper Gulf Region

For non-school qualifications, Certificate III and IV were the most commonly reported, with males achieving the majority of these qualifications (Figure A5.21). Overall, 60% of the population aged 15 years and older had no qualifications, compared with 51% for regional NT. Between 2006 and 2011 there was a decrease in the percentage of people holding vocational or tertiary qualifications (Regional Development Australia, 2016).



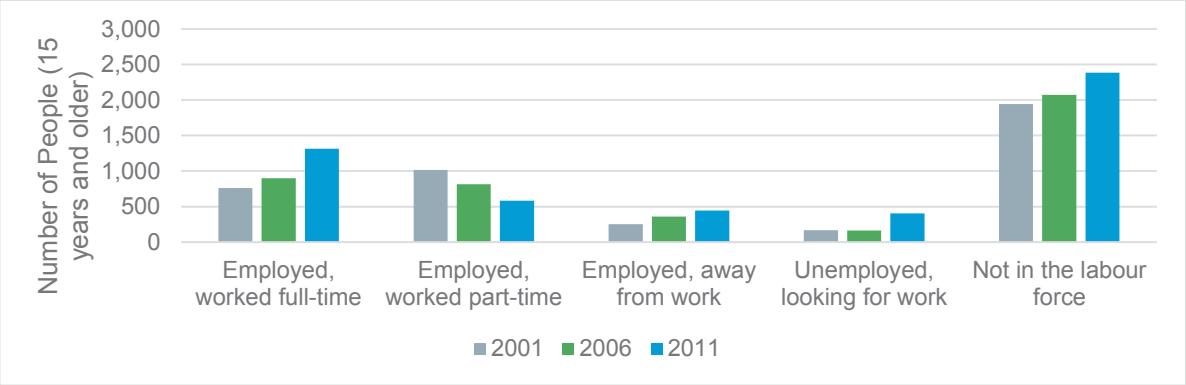
Source: ABS Census, 2011

Figure A5.21 Roper Gulf Region non-school qualifications

Workforce participation

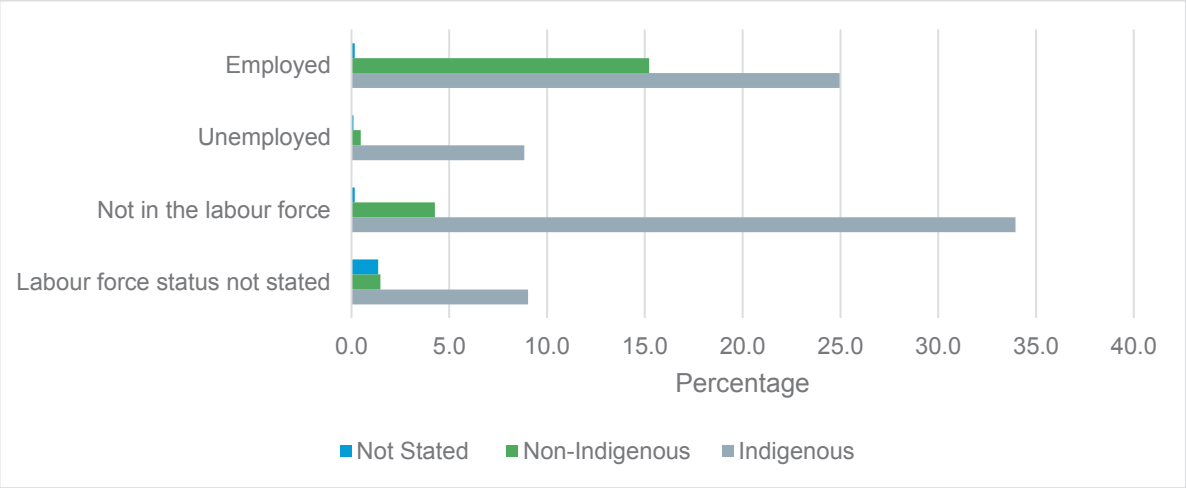
As Figure A5.22 shows, the majority of the population older than 15 years within this social catchment is not employed, and rising, with a 13% increase between 2006 and 2011. This is a similar trend to the wider Katherine Region, which saw an 11% increase over the same period. Conversely, there has also been a 31% increase in the number of people employed full-time in the Roper Gulf Region. This is much higher than the 10% increase seen in the Katherine Region. While there are a diverse range of employment opportunities in the region, the number of positions is small. Government administration, education and local retails provided the largest number of positions (EcOz, 2013).

As the largest of the communities in this social catchment, Ngukurr offers the greatest range of employment in the catchment. A jobs profile on Ngukurr (NT Department of Business, 2014c) indicated that jobs increased 30% from 2011 to 2014, to a total of 237 jobs. Approximately one quarter of these jobs were held by Aboriginal people (see Figure A5.23), and community and personal service workers made up the largest occupation group.



Source: ABS Census, 2011

Figure A5.22 Workforce participation in the Roper Gulf Region



Source: ABS Census, 2011

Figure A5.23 Aboriginal versus non-Aboriginal engagement in the workforce

Local industries

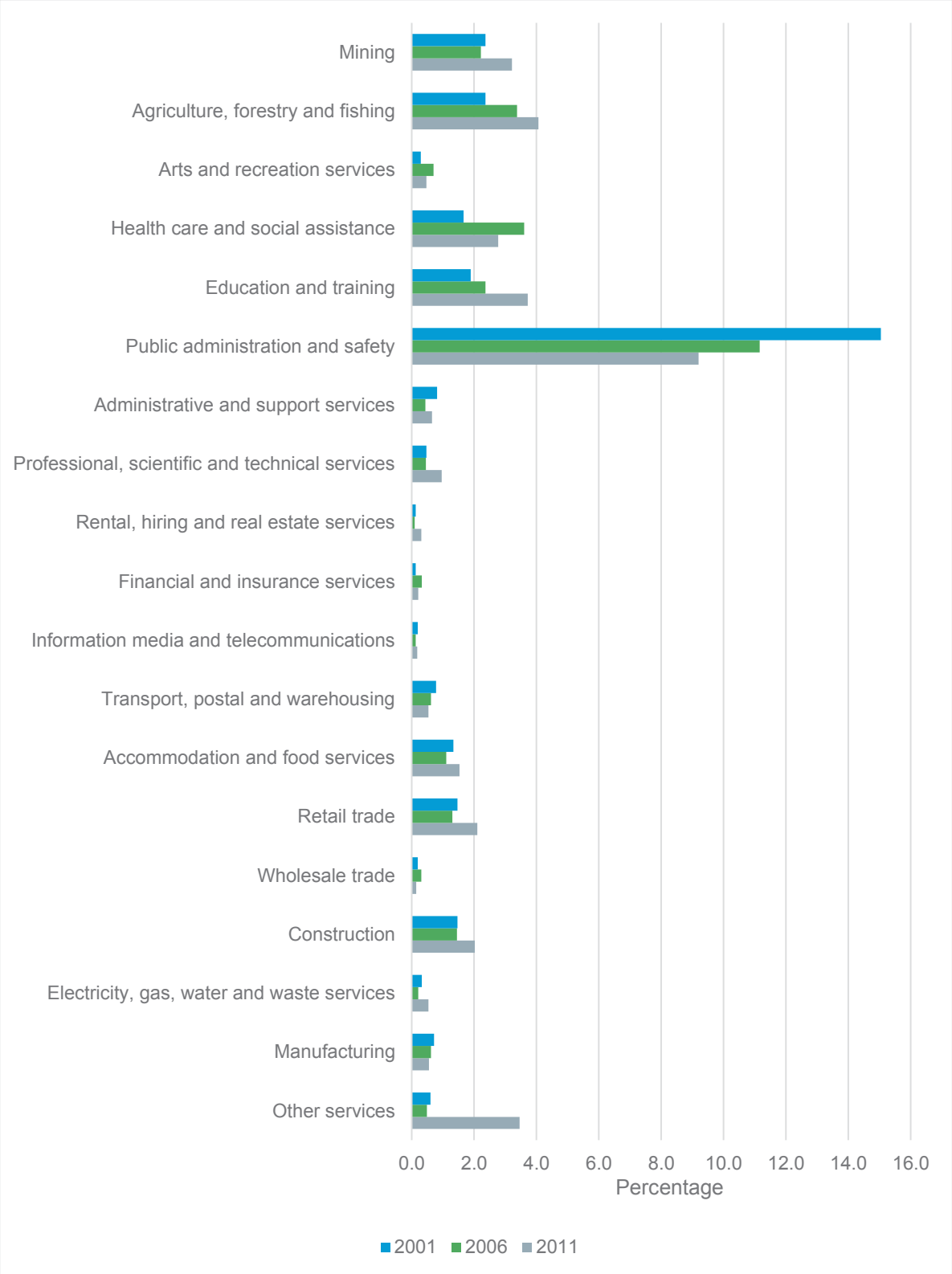
The Roper Gulf region is made up of a number of different land tenures. These include pastoral leases, mining leases, native title/Aboriginal Land and general township leases. These land tenure types influence the type of economic activity being undertaken in the region (EcOZ, 2013).

The rural land in the Roper Gulf Region is predominantly used for pastoral purposes, primarily grazing. The pastoral industry is a key part of the region's identity, with both Aboriginal and non-Aboriginal persons having strong connections to the industry (O'Brien, 2011). There are approximately 56 pastoral properties ranging from 440 to 5,000 square kilometers. As of 2011 these properties ran in excess of 200,000 cattle (O'Brien, 2011).

Government, tourism and mining are also key industries in the region. The GPD of the Roper Gulf Regional Council was $554 million, increasing 24% since 2012 (Regional Development Australia, 2011). The Roper Gulf Regional Council is one of the largest employers in the region. This is reflected in Figure A5.24, showing that 9% of people are employed in public administration (similar to the Katherine Region).

Figure A5.24 also suggests that, since 2001, there has been an increase in both agriculture and mining sectors. As discussed in Section 4, the McArthur River Mine is the largest mining operation in the region. Since 2007, the mine has employed 762 people, and has invested more than $12.3 million into the Roper Gulf Region through the MRM Community Benefits Trust and other community service initiatives (McArthur River Mine, 2017).

Mataranka is a tourist destination. In 2012, 146,300 people visited Elsey National Park, which includes Bitter Springs, Mataranka Thermal Pool and John Hauser Drive (NT Department of Tourism and Culture, 2017). This is the second most frequented park in the Katherine Region, after Nimiluk National Park.



Source: ABS Census, 2016

Figure A5.24 Roper Gulf Region – employment by industry

5.3. Affected communities (east)

This social catchment comprises two communities, Borroloola and Robinson River. Borroloola is located approximately 972 km southeast from 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 Northern Territory Government.

Due to its size (871 people according to ABS Census, 2016), 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 which reply on services from Borroloola (see McArthur River Mine, 2017). There are four main Aboriginal language groups in Borroloola, the Yanyuwa, Garawa, Mara and Gurdanji.

The baseline profile focusses on Borroloola.

5.3.1. SV1 Liveable community

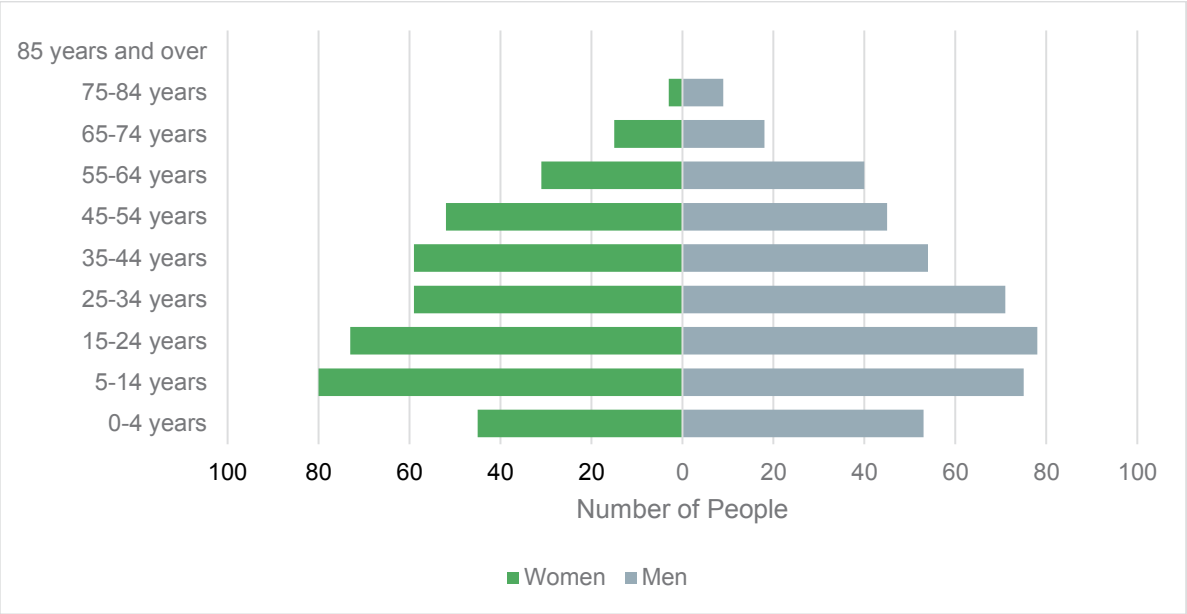
Population and demographics

Table A5.6 displays demographic statistics for Borroloola. Borroloola has a median age of 26, lower than the Northern Territory 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. However, overcrowding would be expected in some households as the Northern Territory Government has planned for the construction of 22 new houses to alleviate housing issues, including overcrowding (Housing Action NT Policy, 2016).

Table A5.6 Demographic statistics for Borroloola

Category	2006	2011	2016
Median Age	25	26	26
Average household size	4.5	3.9	3.5
Average number of people per bedroom	1.9	1.8	1.6

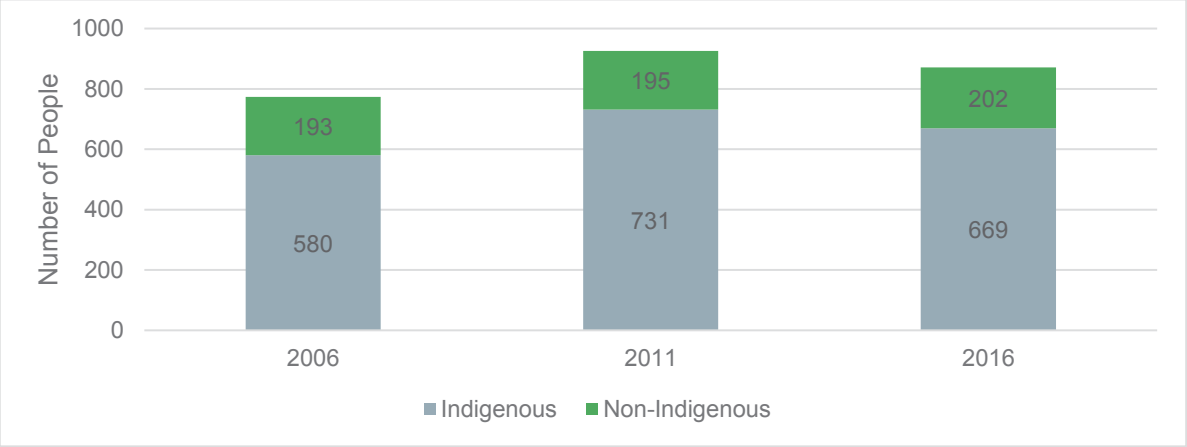
Figure A5.25 is an age-sex pyramid for 2016, which shows a roughly pyramidal shape, except for disproportionately low numbers of children 4 years old and under.



Source: ABS Census, 2016

Figure A5.25 Combined age–sex pyramid for Borroloola

Borroloola has a mostly Aboriginal population (Figure A5.26), 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.

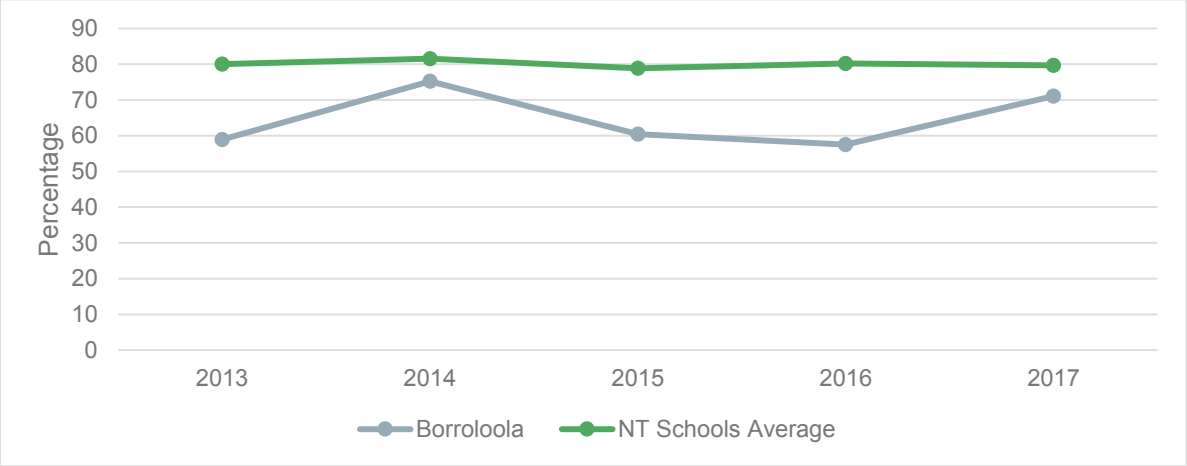


Source: ABS Census, 2016

Figure A5.26 Aboriginal and non-Aboriginal population breakdown of Borroloola

Education and community services

There is one school in Borroloola. The attendance rate over the last five years is shown in Figure A5.27. Attendance fluctuates between nearly 60% and 75%, but generally lags behind the NT average. In 2015 and 2016, over $3 million was spent on building two new classrooms and refurbishments, as well as a Trades Training Centre (NT Department of Education, 2015).



Source: NT Department of Education, 2015

Figure A5.27 School attendance average of Borroloola compared with the Northern Territory

A key issue in the community is a lack of recreational activities, facilities and infrastructure for young people. The McArthur River Mine SIA (McArthur River Mine, 2011) indicated a high level of concern for this aspect in the region, with a number of stakeholders (particularly Aboriginal leaders) indicating they felt young people needed such facilities and services to help divert them from anti-social behaviour, such as drug and alcohol abuse.

One of the more prominent community infrastructure developments in Borroloola in recent years was the $2.1-million Borroloola Swimming Pool Complex, which opened in 2009. The complex features a 25 m swimming pool, wading pool for small children, and change room facilities servicing both the pool and neighbouring soccer club.

Crime

Crime data is as described in Section 5.2.1.

Health

Borroloola has one community health clinic, staffed by a general practitioner with nursing support services. In 2009–2010, Aboriginal patients accounted for over 90% of reported episodes of care (McArthur River Mine, 2011). The MacArthur River Mine Emergency Rescue Team provides emergency first aid assistance, as required. In the event of a severe medical emergency, a number of local airfields are available for use. The Borroloola Police Station coordinates emergency services. In addition to the Borroloola Health Clinic, a number of other health-related programs are currently in operation in the community, including (ibid):

- Meals on Wheels.
- Substance abuse support.
- School screening.
- Aged screening.
- Under-5 screening.
- Men and women general wellness checks.
- Immunisation.

- Chronic Disease Outreach.
- Maternity / child health.
- Communicable disease reporting and management.
- Home visiting services.
- Palliative care.

Additionally, Borroloola has three fuel outlets, three supermarkets, a post office, a caravan park (including guest house and hotel), airstrip, women's shelter and library.

Infrastructure

Road access to Borroloola is provided mainly by the Carpentaria Highway. It is a sealed highway with one lane in each direction. It is open all year but cyclonic weather or heavy monsoonal rains may close the highway for periods of up to one week. A 2WD is sufficient to get to the township during dry weather but a 4WD is necessary for some travel during the wet season.

A mail plane services the town three times weekly, which can take passengers.

5.3.2. SV2 Affordable lifestyle

Borroloola is a remote community. Personal average income is $424 per week which is significantly higher than the wider Roper Gulf region. This is likely influenced by employment opportunities at the McArthur River Mine. Similarly, the proportion of households who spend more than 30% of their income on rent has dropped in the last five years, which distinguishes this social catchment from the others reported on here. Table A5.7 provides an overview of income and housing affordability between 2011 and 2016.

While no data on food and grocery prices were available, in general, remote Northern Territory communities pay significantly more than urban centres. For example, a food basket in remote stores costs approximately $817 compared to $599 at a supermarket in Katherine (NT Department of Health, 2015).

Table A5.7 Income and housing affordability statistics in Borroloola

Category	2011	2016
Median total personal income ($/weekly)	$386	$424
Median total family income ($/weekly)	$938	$1050
Median total household income ($/weekly)	$1160	$1289
Median Rent	$50	$50
Households where rent payments are less than 30% of household income (%)	95.2%	97%
Households where rent payments are 30%, or greater, of household income (%)	4.8%	2.1%
Mortgage monthly repayments ($)	$0	$0
Households where mortgage payments are less than 30% of household income (%)	100%	100%
Households where mortgage payments are 30%, or greater, of household income (%)	0%	0%

Source: ABS Census, 2016

5.3.3. SV3 Community identity and spirit

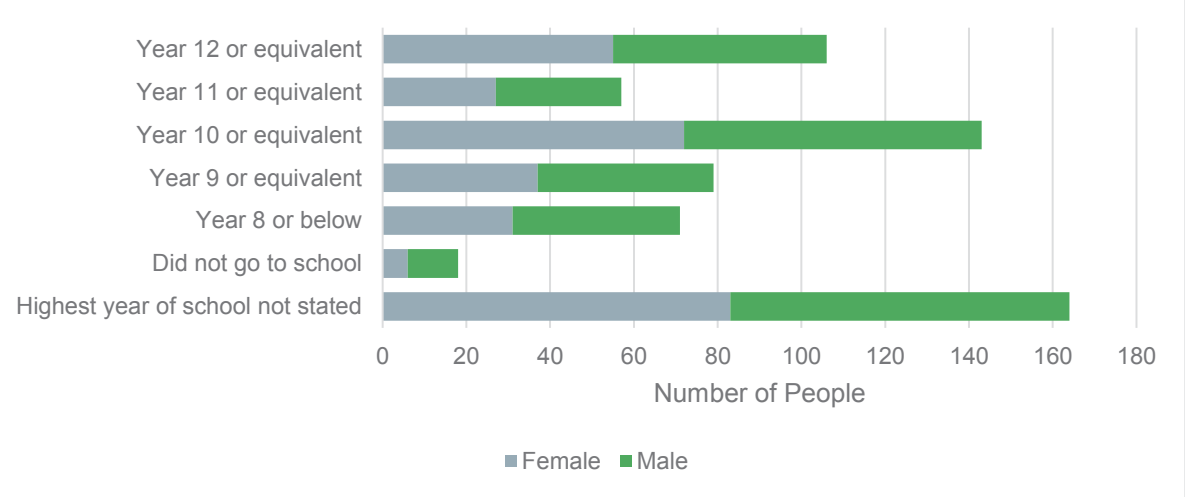
Recreational and cultural events play a role in the social fabric of Borroloola. Being a largely Aboriginal community, there is importance placed on encouraging the participation of youth in cultural events such as NAIDOC Week and Boonu Boonu Festivals (McArthur River Mine, 2011).

Borroloola's natural attractions, such as Butterfly Springs and the sandstone pillars of the Lost City, contribute to its community identity. King Ash Bay, located 50 km north of Borroloola, is a popular fishing destination which hosts the annual Easter Fishing Classic.

5.3.4. SV4 Capacity for sustainable economic activity

Educational attainment

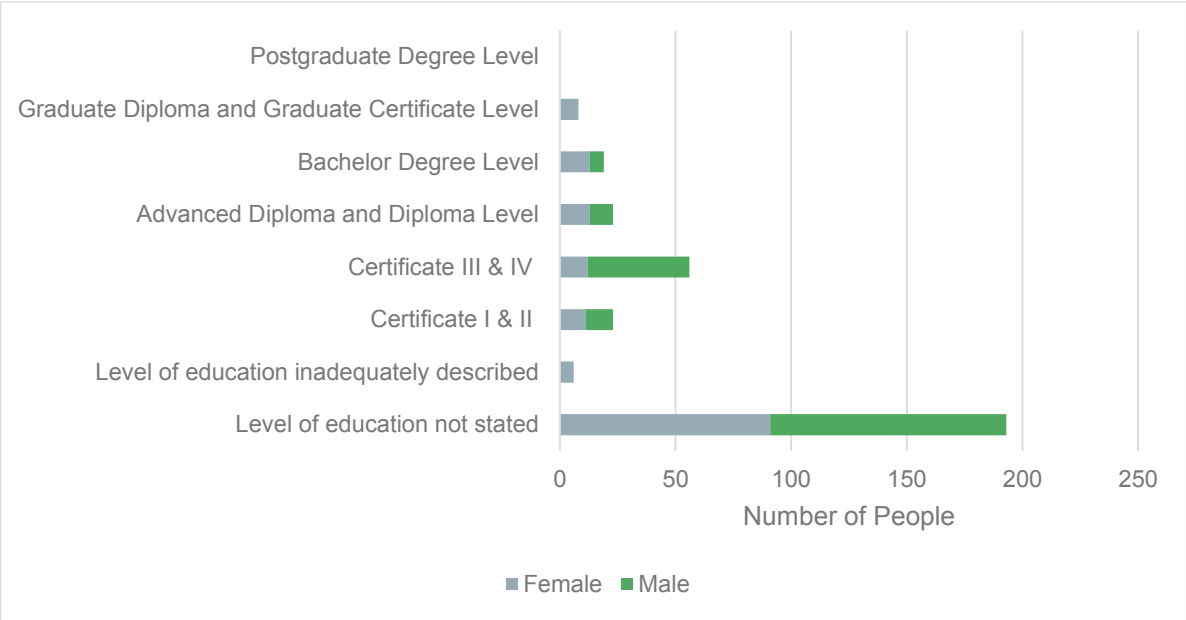
Within this social catchment, 19% of students left school during or before completing Year 10, and 26% completed Year 12. The remaining 26% did not indicate their highest level of schooling (Figure A5.28). These levels of attainment are comparable to the Katherine Region, where 28% of people had completed Year 12.



Source: ABS Census, 2011

Figure A5.28 Highest level of education achieved in Borroloola

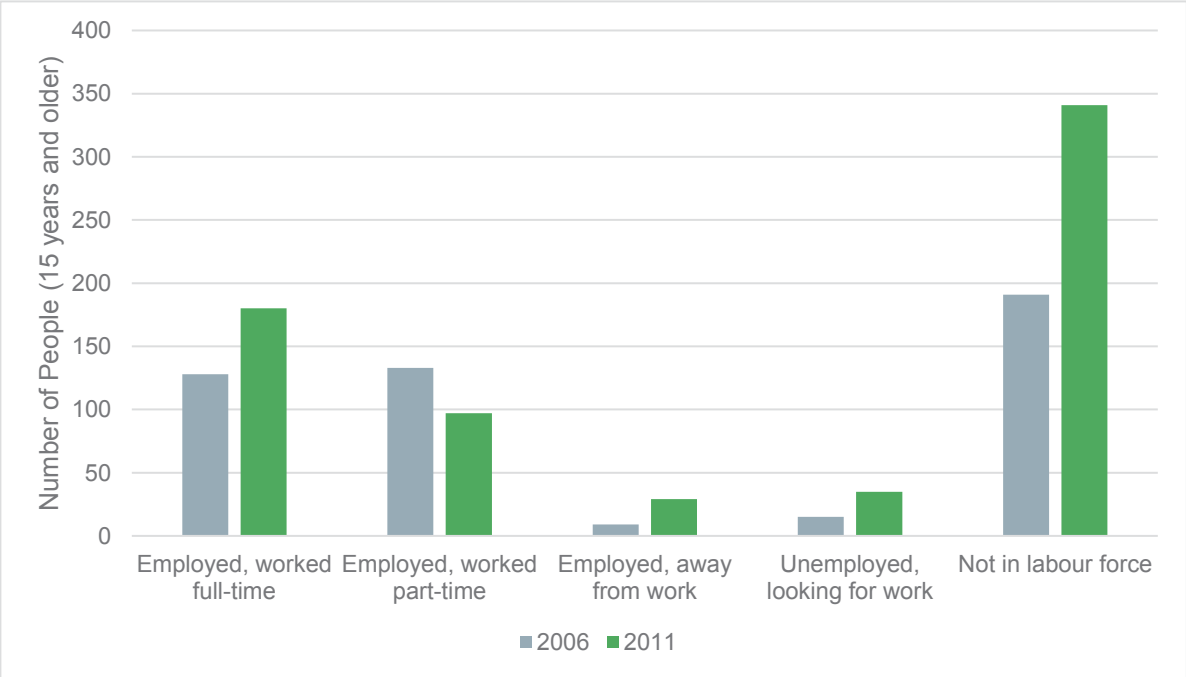
The rates of attainment of non-school qualifications is presented in Figure A5.29. Certificate III and IV were the most commonly completed, and predominantly by males.



Source: ABS Census, 2011

Figure A5.29 Non-school qualifications held in Borroloola

The majority of people in Borroloola indicated not working in the labour force (Figure A5.30). This number has grown by 79% (almost doubled) between 2006 and 2011. Full-time employment was the next most common employment type, which had also increased in number over the same period.



Source: ABS Census, 2011

Figure A5.30 Employment type in Borroloola

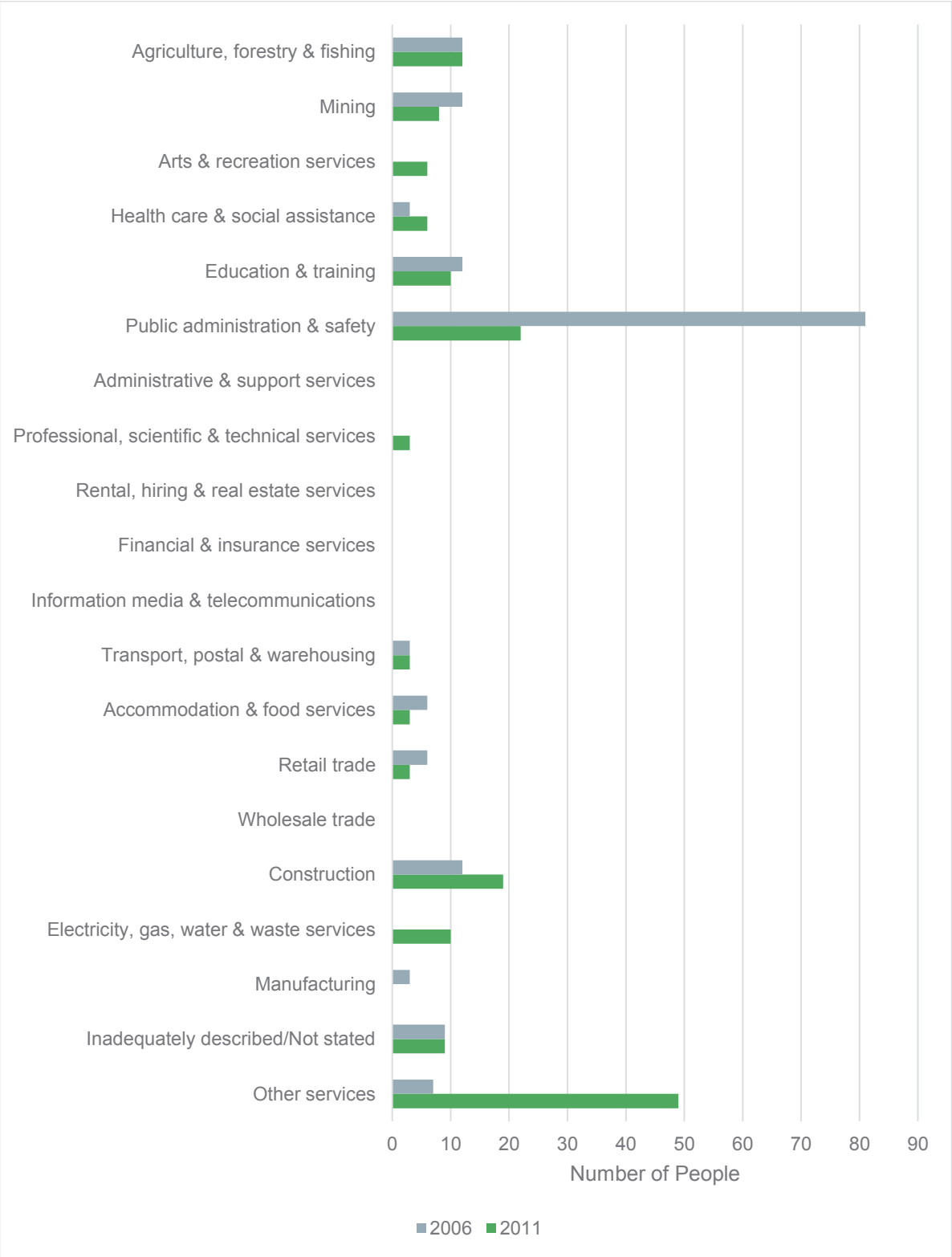
Local Industries

The most significant industry by economic output in the region is the McArthur River Mine (MRM), one of the world's largest zinc mines. While there has been a decrease in employment in the mining sector between 2006 and 2011 in Borroloola, MRM currently employs approximately 600, mostly FIFO and some local workers (Brardon, 2017).There is considerable community concern regarding environmental contamination by the mine, leading to significant community concern about a current proposal to expand the mine.

There are a number of pastoral properties around Borroloola in the Gulf of Carpentaria region. According to the EIS undertaken for the Sherwin Creek Iron Ore Project in 2013 most station owners (with the exception of Hodgson Downs) believe that their stations are underdeveloped and have the capacity to hold more cattle, but current economic circumstances make stocking with additional cattle unviable (EcOZ, 2013).

Borroloola is located on the Carpentaria Highway and is an attractive destination for tourists traveling between the Northern Territory and Queensland. There are a number of natural attractions, such as Butterfly Springs and the sandstone pillars of the Lost City. King Ash Bay is a popular fishing destination located 50 km north of Borroloola, and large numbers of tourists take part in the annual Easter Fishing Classic, held over three days. Emu Station and Lorella Springs offer tourists a cultural heritage and nature experience unique to the region.

These industries (mining, pastoralism and tourism) are key employers within this social catchment. Figure A5.31 indicates that, aside from 'other services', the largest employer (by sector) is the public administration and safety sector, potentially due to the number of people employed through the Australian Government-funded Community Development Employment Project (CDEP) program. The CDEP program aims to assist Aboriginal job seekers to gain skills, training and capabilities to find sustainable employment and improves the economic and social wellbeing of remote communities (NT Department of Business, 2014a).



Source: ABS Census, 2011

Figure A5.31 Employment by industry in Borroloola

5.4. 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.

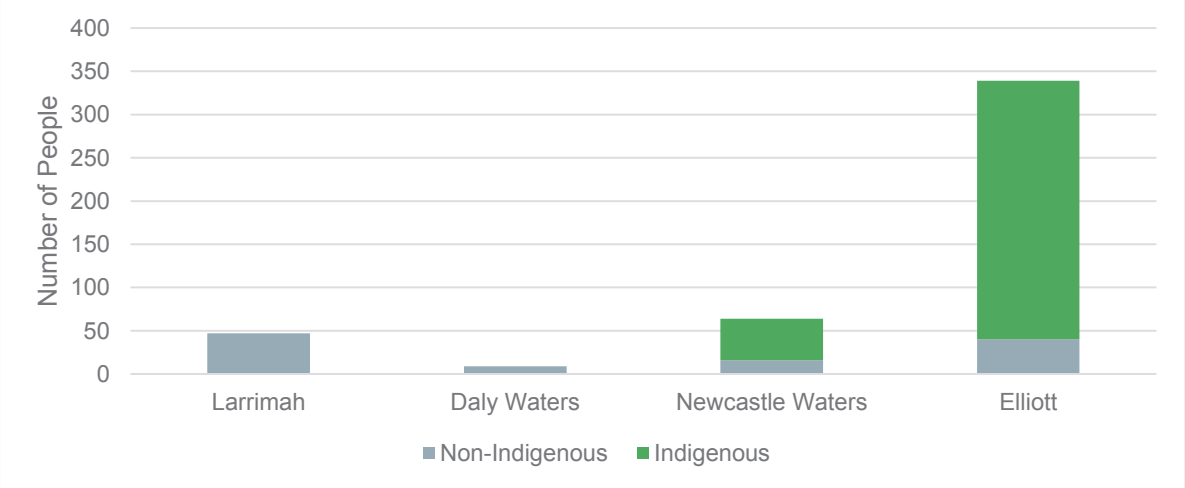
5.4.1. SV1 Liveable community

Population and demographics

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 and a medium age of 34. There are 12 families in the area recorded in the 2016 census with an average of 1.3 children per family (ABS Census, 2016).

Elliott and Newcastle Waters are located within 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 (Barkly Regional Council, 2017). A small, self-sufficient community, the majority of the population lives in two town camps, known as Gurungu and Wilyuga. The Aboriginal persons residing in these camps are of the Mudburra/Djingila, Wambaya, Kutanyi and Wagai clans (Remote Area Health Corps, 2009). Newcastle Waters is a historic township located on Newcastle Waters Station. There is an Aboriginal community called Marlinja located on the station.

Figure A5.32 presents the Aboriginal and non-Aboriginal populations of the communities within this social catchment. The Aboriginal population in Elliott and Newcastle Waters is significantly greater than Larrimah and Daly Waters.



Source: ABS Census, 2016

Figure A5.32 Aboriginal and non-Aboriginal population of Affected communities (central)

Table A5.8 indicates the median age of Elliott and Newcastle Waters is significantly younger than Larrimah and Daly Waters 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 a reflection of these communities acting as more of a service centre, rather than a residential community.

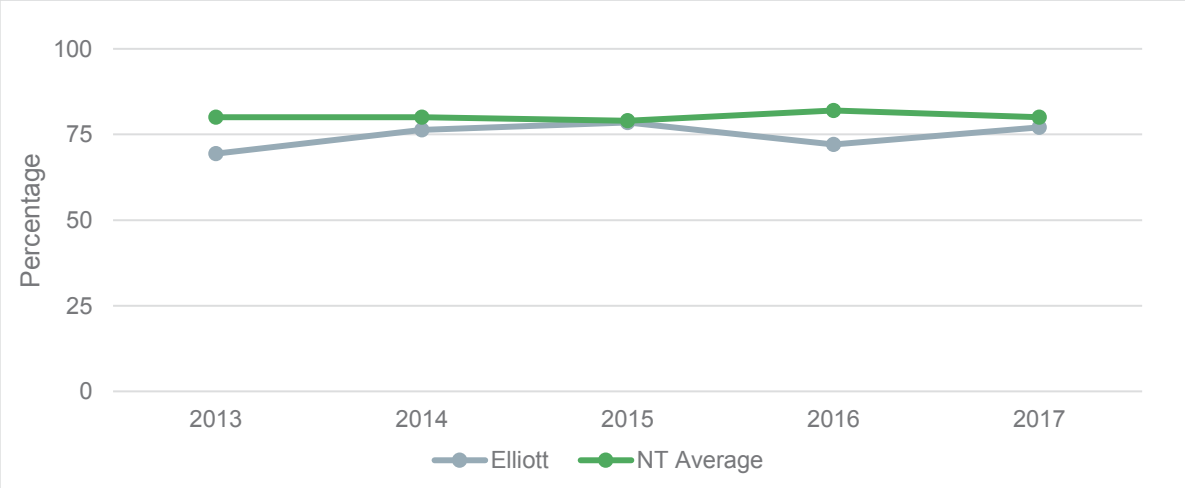
Table A5.8 Median age and household demographics for Affected communities (central)

Category	Larrimah	Daly Waters	Newcastle Waters	Elliott
Median Age	41	54	22	24
Average household size	2.1	1.4	3.4	4.1
Average number of people per bedroom	0.9	0.8	0.9	1.3

Source: ABS Census, 2016

Education and community services

There are no schools located in Daly Waters or Larrimah. The closest school to these communities is located in Mataranka. The School of the Air provides educational services to communities in this social catchment. Elliott has one school which caters for students from pre-school to middle school. As can be seen in Figure A5.33**Error! Reference source not found.**, school attendance in Elliott f luctuates below the Northern Territory average. No data was available for the other communities in this social catchment.



Source: NT Department of Education

Figure A5.33 School attendance in Affected communities (central)

Adequacy of housing is an issue in Elliott and Marlinja. The Northern Territory Government has invested in upgrading houses in both locations (Department of the Chief Minister, 2016). Houses in Elliott and Marlinja outstation are being upgraded through the Department of Local Government and Community Services Homelands and Town Camps program. The work focuses on urgent repairs, functional upgrades, and extending living areas, and will focus on local employment and training and Aboriginal employment on the project. Two local work crews have been working under the close supervision of a qualified builder and tradespeople to undertake the refurbishments (ibid).

Infrastructure in Elliott includes workshop yards to service the communities of Wilyuku, Gurungu and Marlinja outstation, a sport and recreation centre, aged care services, safe house, police station, BP

service station, art centre, play group, library, post office, Elliott School, caravan park and community store. The population in Marlinja access these services.

Daly Waters and Larrimah have very limited services and infrastructure compared to most other towns and communities in the region and Australia. The Roper Gulf Regional Council provides a range of local government services including maintenance and upgrade of infrastructure, weed control and fire hazard reduction in and around the township, as well as providing governance support. Both towns act as a road stop along the Stuart highway; as such, there are stores with fuel available, caravan parks and motels, pubs, and an air strip suitable for light aircraft.

Crime

Crime data is as described in Section 5.2.1.

Health

Communities in this social catchment are susceptible to the health issues affecting the Katherine region more broadly (see Section 4). Within this social catchment, there is one community health clinic located in Elliott. 'MiTrack', which is funded by the Department of Social Services, is a free service in the Alice Springs region to the south, for children and youth up to the age of 18 who are at risk of or experiencing early signs of mental illness (Mental Illness Fellowship of Australia, 2017).

Access to health and social services is restricted for the Daly Waters and Larrimah populations. To access medical support people need to travel hundreds of kilometers to either Mataranka or Elliott and further to Katherine or Darwin for more serious health issues. This makes people vulnerable in times of emergencies.

Infrastructure

Daly Waters is accessed via the Stuart Highway, which is sealed and accessible all year. Most roads in the region are not sealed. Surrounding properties may be vulnerable to isolation during the wet season. The Daly Waters Pub and Larrimah Hotel are key places for both tourism and as a place for local people to meet and socialise.

5.4.2. SV2 Affordable lifestyle

The remoteness of this social catchment drives up the cost of living compared to urban areas within the Northern Territory. The average cost of a food basket in remote stores in the Northern Territory is $817, compared with $844 in Alice Springs supermarkets (NT Department of Health, 2015). People from Elliott and Newcastle Waters would typically visit Tennant Creek or Alice Springs for shopping or access to higher levels of service. The cost of transport in accessing goods and services contributes significantly to the cost of living.

5.4.3. SV3 Community identity and spirit

Elliott and Marlinja's community identity is different in its demography and history than Larrimah, Newcastle Waters and Daly Waters. The country around Elliott belongs to the Jingili desert people with the Wambaya people to the east and southeast, the Yangman and Mangarrayi to the north, the Mudbura and Gurindji to the west, and the Warlpiri, Warlmanpa and Warramungu to the south and southwest. The Aboriginal people have strong spiritual connections to the country through ceremony and important dreaming tracks (Barkly Regional Council, 2017). Each year, the community of Elliott

come together to celebrate Mardi Gras with a float parade and costumes. The event is now in its twelfth year and attracts visitors from across the Northern Territory and Australia.

Newcastle Waters, Larrimah and Daly Waters are more service hubs than townships. These communities are focused around providing services along the Stuart highway than as a standalone community.

The historic township of Newcastle Waters was a gathering place for drovers on their overland cattle drives. It is located at the junction of three major overland stock routes. The historic town is not inhabited, but is it located on the actively run Newcastle Waters Station. The town attracts tourists for its history and bird watching.

Daly Waters holds a number of key social events for the region. The Daly Waters Pub is central to these events and provides a valuable meeting and socialising point for the region. The pub is an iconic feature of the area and draws a number tourists to the district.

The Daly Waters' rodeo and camp draft is held over three days and attracts large crowds from across the Northern Territory and Australia. Stations around the Daly Waters district provide help in setting up and running the event. The Daly Waters Ball is held over Easter each year and attracts mostly young crowds from across Australia. Crowds can reach upwards of 400 people at the festivities. Daly Waters has both camping and cabin accommodation for visiting tourist (Zillman, 2015).

Larrimah played an important supply and logistical role in World War II, which is celebrated in the Larrimah Museum. The town has a number of quirky tourist attractions, including the Big Stubby and the Pink Panther sitting on a chair outside the Larrimah Hotel.

5.4.4. SV4 Capacity for sustainable economic activity

The primary industry in the Larrimah and Daly River region is pastoral grazing. In the 2011 census (relevant data from the 2016 census has not yet been published), there were 66 cattle properties in the Birdum region and 58.9% of people were employed in agricultural businesses (ABS Census, 2011).

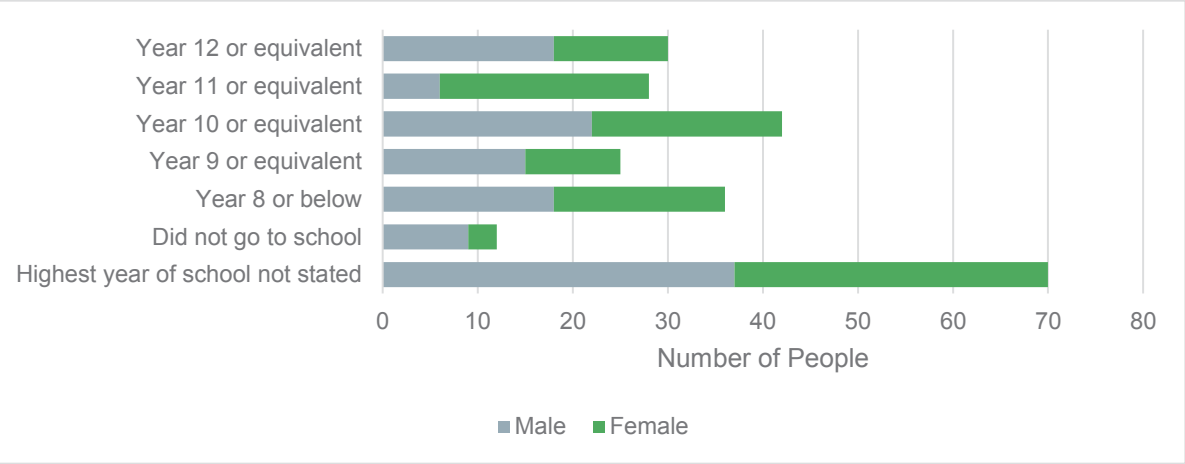
Employment in the Larrimah and Daly River region is split between pastoral grazing and businesses in the towns (ABS Census, 2011). Accommodation and pubs/taverns/bars were the second highest employment industries (ibid).

The Daly Waters and Larrimah townships are heavily dependent on the tourism industry. The towns businesses, such as the pub, store and fuel station are reliant on tourist traffic for income. The Daly Water Pub has marketed itself as a tourist destination and allows people to leave their mark on the pub by leaving a personal item behind. Larrimah's tourist attractions include the Old Police Station Museum, Teahouse and the Pink Panther outside the historic pub. The tourism industry is seasonal and is therefore much quieter from October to April (during the wet season).

In Elliot, there is a limited number of employment opportunities due to its size and remote location. According to the 2014 Jobs Profile Elliott (NT Department of Business, 2014b) there were a total of 93 jobs available in Elliott. Of these jobs, 54 were filled by an Aboriginal person. There was a decrease of 25 jobs between 2011 and 2014. In 2011, public administration and safety was the highest area of employment, followed by education/training and agriculture, forestry and fisheries (ibid).

Figure A5.34 indicates that data is scarce on educational attainment levels in Elliot, with almost 30% not disclosing the highest level of schooling attained. Fifteen percent of the population indicated not

progressing further than Year 8. The level of education in Elliott may impact people's ability to engage in higher-skilled economic activity.



Source: NT Department of Education

Figure A5.34 Educational attainment in Elliott

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Appendix B - Scope of work

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3. SCOPE OF SERVICES

3.1 BACKGROUND TO THE INQUIRY

On 14 September 2016 the Chief Minister of the Northern Territory, the Hon Michael Gunner MLA, announced a moratorium on hydraulic fracturing of onshore unconventional reservoirs in the Northern Territory. At the same time, the Chief Minister announced that a *Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs in the Northern Territory* (the **Inquiry**) would be established and released draft Terms of Reference, which were open for public comment for four weeks.

On 3 December 2016 the Northern Territory Government announced the final Terms of Reference for the Inquiry and the composition of the panel that will be undertaking the Inquiry (the **Panel**).

The Inquiry was established under section 4 of the *Inquiries Act 1945* (NT) and is comprised of a judicial chair, the Hon Justice Rachel Pepper, and ten scientists with expertise in areas ranging from hydrogeology to social science.

The Inquiry's final Terms of Reference can be read in full on the Inquiry's website (www.frackinginquiry.nt.gov.au).

On 20 February 2017 the Inquiry released a *Background and Issues Paper*, also available on the Inquiry's website, which was followed by hearings and community meetings in March 2017 in various town centres and remote communities across the Northern Territory. The Issues Paper includes a timeline for the Inquiry, which indicates that an interim report will be released in mid-2017, a draft final report will be released during the last quarter of the year, and a final report will be released in December 2017.

The Hydraulic Fracturing Taskforce (the **Taskforce**) has been established in the Department of the Chief Minister to support the Panel.

3.2 TERMS OF REFERENCE FOR THE INQUIRY AND THE SOCIAL IMPACT THEME

The Panel has divided the work of the Inquiry into the following themes: water, land, air, social impacts, economic conditions, cultural conditions, human health, land access, and the regulatory framework. This request for tender relates to the social impacts theme only, however, there are overlaps with the economic, cultural and regulatory framework themes.

The Terms of Reference for the Inquiry require the Panel to do the following:

(a) determine and assess the impacts and risks associated with hydraulic fracturing of unconventional reservoirs and the associated activities;

(b) determine whether additional work or research is required to make that determination;

(c) for each risk that is identified, advise the level of impact or risk that is acceptable in the Northern Territory context;

(d) describe methods, standards or strategies that can be used to reduce the impact and risk to acceptable levels; and

(e) identify what government can do, including implementing any policy, regulatory or legislative changes, to ensure that the impacts and risks are reduced to the required levels.

The *Background and Issues Paper* includes a non-exhaustive list of the potential risks and benefits associated with the social impact theme at page 21.

The Terms of Reference make it clear that the Panel must not only look at the impacts of hydraulic fracturing and the associated activities on social conditions in the Northern Territory – the Panel must also consider the social impacts of the onshore unconventional gas industry *as a whole* on the Northern Territory. This is made clear in the following extract from the Terms of Reference, which has been amended to include the relevant language only:

"When the inquiry makes a determination… about whether or not there has been an impact or risk on … social conditions, the inquiry will … consider the impacts and risks of the development of the onshore unconventional gas industry, including exploration activities such as seismic surveys and aerial surveys, land access and costs and benefits of the industry. This may be undertaken through a social impact assessment or similar activity."

In accordance with the definitions in the Terms of Reference, a reference to an "unconventional reservoir" in this document is a reference to a reservoir where the rock formation is *shale*. There is currently no gas being produced from shale reservoirs in the Northern Territory. The Amadeus Basin is currently producing gas from conventional reservoirs.

3.3 STEERING COMMITTEE

A Steering Committee has been established to oversee the work of the supplier. The Steering Committee is comprised of the Hon Justice Rachel Pepper, Dr David Ritchie, Prof Peta Ashworth and the Executive Director of the Hydraulic Fracturing Taskforce. The point of contact for all matters will be the Executive Director of the Hydraulic Fracturing Taskforce.

3.4 PROBITY ADVISOR

The Territory has appointed a Probity Advisor to oversee the Territory's processes in relation to the stages of this process. The Probity Advisor's role is to ensure that fairness and impartiality are observed throughout, and that the evaluation criteria stated in any related documentation are consistently applied to all submissions.

PART A – SOCIAL IMPACT ASSESSMENT

3.5 DEVELOPMENT AND IMPLEMENTATION OF A SOCIAL IMPACT ASSESSMENT FRAMEWORK

3.5.1 The supplier must develop a leading practice framework for the identification, assessment and management of the social impacts associated with the development of onshore unconventional gas in the Northern Territory.[1] The framework:

(a) must include a requirement for public participation;

(b) may include components of both strategic and project-level social impact assessment; and

(c) must operate in conjunction with the Northern Territory and Commonwealth environmental assessment frameworks in a way that minimises unnecessary duplication and inconsistency.

3.5.2 The supplier must explain why the proposed framework is leading practice and in doing so must refer to the literature and leading practice social impact assessment frameworks used in other jurisdictions, including overseas jurisdictions.

3.5.3 The supplier must describe the current policy and regulatory regime in the Northern Territory for the identification, assessment and management of social impacts associated with onshore unconventional gas development.

3.5.4 The supplier must identify the structural, policy, regulatory and legislative reforms that must be made to the current regime in the Northern Territory to implement the social impact assessment framework described above.

3.5.5 The supplier must describe how the framework will operate in conjunction with the Northern Territory and Commonwealth environmental assessment frameworks in a way that minimises unnecessary duplication and inconsistency.

3.6 BEETALOO SUB-BASIN

3.6.1 The supplier must identify the people or groups of people that are most likely to be impacted by the development of unconventional gas resources in and around the Beetaloo sub-basin, shown in **Attachment B**, which may include, without limitation, community members, pastoralists, Aboriginal organisations and local businesses (the **Affected Communities**).

3.6.2 The supplier must describe the methodology used to identify the Affected Communities.

3.6.3 The supplier must describe the Affected Communities (that is, describe the community profile or baseline conditions), which must include a description of the values listed at **Attachment A** and how such information was collected.

[1] A "social impact" is defined as a change to any of the values or conditions set out at **Attachment A** and must include cumulative social impacts.

3.6.4 The supplier must describe the type of potential social impacts, issues, concerns, risks and benefits that may arise from the development of the unconventional gas industry in the Beetaloo sub-basin on the Affected Communities. In identifying the potential impacts the supplier must consider:

(a) the list of social impacts, risks and benefits described in sections 7.5, 7.6, 7.7, and 7.8 of the *Background and Issues Paper*;

(b) submissions made to the Panel in connection with the *Background and Issues Paper*;

(c) social impacts, issues, benefits and risks typically associated with the development of onshore unconventional gas resources that have been identified in the literature and in other jurisdictions; and

(d) issues that have been identified in other social impact assessments and related studies that have been completed in or around the Beetaloo sub-basin, including those listed at **Attachment C**.

3.6.5 For each potential impact identified, the supplier must, to the extent possible:

(a) assess the potential impact (or risk) in terms of likelihood and consequence (high, medium, low);

(b) identify a potential measurable indicator, which can be qualitative or quantitative, and develop a methodology for the collection of appropriate baseline data in the Affected Communities so that changes in social values or conditions as a result of any unconventional gas development can be measured over time;

(c) collect such baseline data;

(d) identify ways to avoid, mitigate and/or manage the risk over time (including the entity that should be responsible for the management and monitoring of such risk) and predict what the level of risk will be following mitigation; and

(e) indicate whether or not the level of risk following mitigation would be deemed acceptable, and why.

3.6.6 For every potential social benefit that is identified, the supplier must recommend strategies to realise and maximise such benefit.

3.6.7 The supplier must identify any issues that must be addressed in subsequent project-based social impact assessments associated with the development of unconventional gas in the Beetaloo sub-basin.

3.6.8 The supplier must develop and implement a leading practice community consultation program to support its responses to section 3.6. The supplier must consult, without limitation and where practicable, the Aboriginal Areas Protection Authority; the Northern Land Council; the Departments of Primary Industry, Resources and Trade, Business and Innovation, and Tourism NT; local and regional councils; the Northern Territory Cattleman's Association; NT Farmers, and petroleum operators and titleholders in the Beetaloo sub-basin. The Steering Committee must approve the program prior to implementation.

PART B - SOCIAL LICENCE TO OPERATE

3.7 The supplier must describe, with reference to the literature and examples from other jurisdictions:

(a) the concept of a "social licence to operate" as it applies to the onshore unconventional gas industry in the Northern Territory;

(b) the nature and extent of any potential risks to affected stakeholders, including the Northern Territory Government, petroleum titleholders and operators in the Northern Territory, the Northern Territory community, and the communities affected by development, where industry has not obtained and/or maintained a social licence to operate;

(c) the measures that onshore unconventional gas industry and government can take to enable industry to earn and maintain a social licence to operate in the Northern Territory; and

(d) how industry's social licence to operate can be measured in the Northern Territory, including a part of the Northern Territory.

3.8 The supplier must identify, to the extent practicable, the measures that the petroleum titleholders and operators in the Beetaloo sub-basin have taken in the past, and can take in the future, to earn and maintain a social licence to operate in the Affected Communities.

3.9 TIMELINES AND REPORTING

3.9.1 The work must be in the form of a written report.

3.9.2 The report must include a literature review that includes all references used in section 3.5 and 3.6.

3.9.3 At the end of each calendar month following the award of the tender the supplier must provide the Steering Committee with a written progress report and a verbal presentation within five working days of receipt of the report.

3.9.4 The supplier must provide the Steering Committee with a draft final report and a verbal presentation to the Steering Committee on or prior to 1 September 2017.

3.9.5 A final report must be provided to the Steering Committee by 15 September 2017 and the supplier must present the final report to the Panel on a date to be determined.

3.9.6 The Inquiry will publish the final report on the Inquiry's website on a date to be determined.

ATTACHMENT A

The *International Association for Impact Assessment* defines "social impacts" as changes to one or more of the following:[2]

(a) people's way of life – that is, how they live, work, play and interact with one another on a day-to-day basis;

(b) their culture – that is, their shared beliefs, customs, values and language or dialect;

(c) their community – its cohesion, stability, character, services and facilities;

(d) their political systems – the extent to which people are able to participate in decisions that affect their lives, the level of democratisation that is taking place, and the resources provided for this purpose;

(e) their relationship with their environment – the quality of the air and water people use; the availability and quality of the food they eat; the level of hazard or risk, dust and noise they are exposed to; the adequacy of sanitation, their physical safety, and their access to and control over resources;

(f) their health and wellbeing – health is a state of complete physical, mental, social and spiritual wellbeing and not merely the absence of disease or infirmity;

(g) their personal and property rights – particularly whether people are economically affected, or experience personal disadvantage which may include a violation of their civil liberties; and

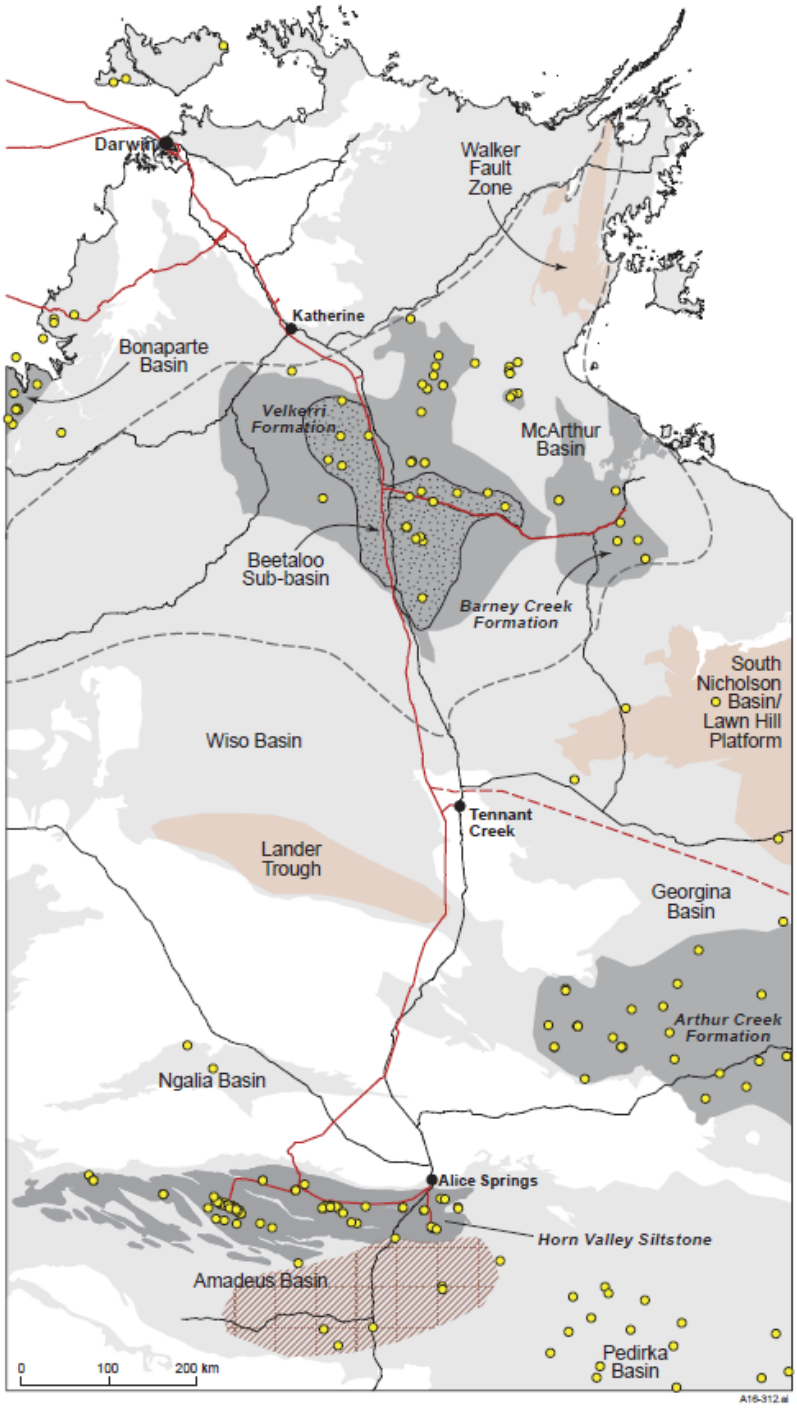
(h) their fears and aspirations – their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children,

in each case, to the extent such impact would not otherwise be assessed as part of an environmental impact assessment under Northern Territory or Commonwealth legislation.

[2] Adapted from Vanclay, F. 2003 International Principles for Social Impact Assessment. *Impact Assessment and Project Appraisal* 21(1), 5-11 (available at http://dx.doi.org/10.3152/147154603781766491 last accessed 21 April 2017)

ATTACHMENT B (1)

Northern Territory petroleum potential



sedimentary basins
extent of known prospective source rocks#
largely untested petroleum plays
Amadeus Basin subsalt play
Beetaloo Sub-basin

petroleum wells
potential extent of McArthur Group*
Beetaloo Sub-basin
gas pipeline
proposed gas pipeline
road
major town

Approximate areas within which key prospective shales are likely to be present, although this does not imply that the shales are necessarily present or are gas-bearing over the entire area indicated (sources: Bonaparte and Amadeus basins from Ahmad and Scrimgeour (2006); Velkerri Formation from Bruna (2015) NTGS DIP012; Arthur Creek Formation adapted from Munson (2014).

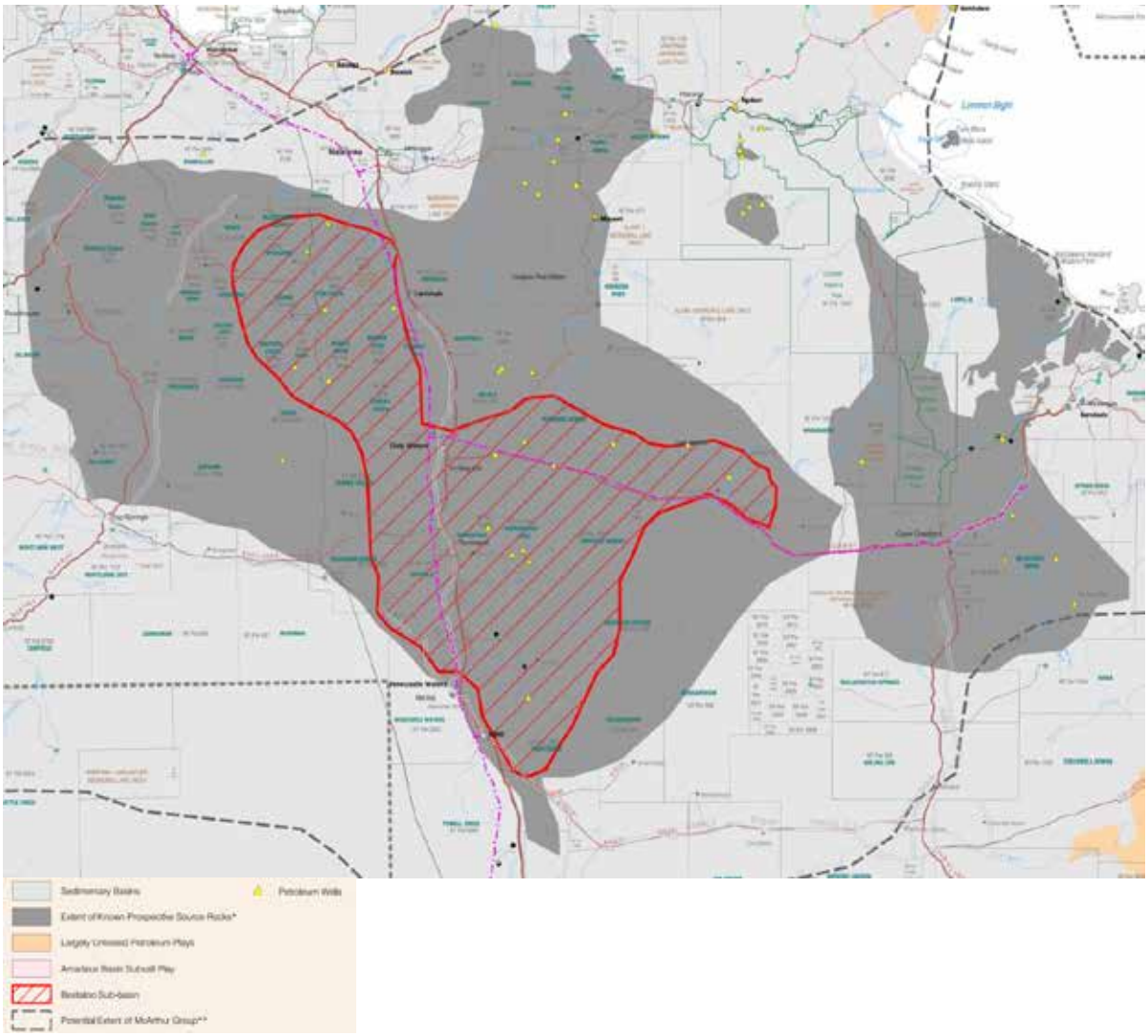
* Approximate interpreted area within which the McArthur Group and equivalents may occur in the subsurface. This does not include the Lawn Hill Platform, which also contains shales of this age.

Dec 2016

Northern Territory Geological Survey
Department of Primary Industry and Resources

AUSTRALIA'S NORTHERN TERRITORY

ATTACHMENT B (2)



ATTACHMENT C

1. The research monograph entitled Ngukurr at the Millenium:" A Baseline Profile for Social Impact Planning in South East Arnhem Land, by J. Taylor, J. Bern, and K.A. Senior.

2. Social Impact Assessment undertaken by EcOz in connection with the Western Desert Resources Roper Bar Iron Ore Project.

3. The Economic and Social Impact Assessment undertaken by EcOz in connection with the Sherwin Creek Iron Ore Project.

4. The Social Impact Assessment Scoping Study and the Economic and Social Impact Assessment undertaken by Circle Advisory in connection with the Northern Gas Pipeline.

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Social licence to operate in the Beetaloo Basin and Northern Territory

Citation

Moffat, K., Lacey, J., McCrea, R., & Poruschi, L. (2017). Social licence to operate in the Beetaloo Basin and Northern Territory. CSIRO, EP177961.

Contents

Figures

Tables

Acknowledgments

This report was produced for the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory.

Executive summary

This report provides an overview of social licence to operate (SLO) in the context of the Northern Territory (NT) gas industry and the deployment of hydraulic fracturing ('fracking') technologies. The report is structured to provide:

- A brief review of literature relevant to SLO
- NT specific data from a 2016 national survey of citizen attitudes toward the extractive industries conducted by CSIRO
- A 2006-2016 comparative analysis of family income inequality (calculated as a gini co-efficient) based on NT census data
- A summary of conversations with industry, community and government stakeholders in the NT gas industry detailing key issues and challenges
- A discussion regarding approaches for measuring and monitoring SLO in the NT

Research presented in this report details the key drivers of trust and acceptance for the extractive industries in the NT, and across other jurisdictions and commodities. These include feeling heard, respected and involved in decision making processes (procedural fairness), feeling that the benefits (and impacts) of extraction are shared fairly (distributional fairness), that government has the capacity and will to ensure public interests are protected and industry held to account (governance capacity), that physical and social impacts are managed effectively and appropriately, and that interactions between company personnel and community members is a positive experience (contact quality).

Analysis of family income inequality for the NT, calculated using 2006 and 2016 census data, revealed that the NT has declining family income equality. This is a baseline measure that allows for reflection on how the development of the gas industry may assist in redressing this trend, while the risks of exacerbating it were also discussed.

Engagement with industry, community and government stakeholders in the gas industry in the NT revealed that uncertainty about how the industry would look and fracking as a technology was a locus of attention for all of these stakeholders. There is a broad recognition that these technologies are not well understood beyond those that have been directly engaged by industry or have technical background. Reducing this uncertainty in a framework supported by government

appears to be of real interest to most of those spoken with. And extending this, that government plays a more active and creative role in the discussion and engagement of these issues and the development of the industry itself.

A measurement and modelling framework for SLO is described, focusing on the following principles for its development:

- *The engagement of a trusted third party* – CSIRO's Gas Industry Social and Economic Research Alliance (GISERA) offers one such model
- *Protection of community rights and safety* – ethical and privacy standards are applied under the National Statement on Ethical Conduct in Human Research (2015), placing the safety of participants first
- *Longitudinal design* – placing the experiences of community at the centre of the process, and to identify issues before they become conflicts
- *Accessibility of data* – transparency of process and data provision back to community and other stakeholders in central to building trust that this is a vehicle for community voice
- *Inclusiveness of process* – it is important that vulnerable, marginalised and special status groups are included in SLO research using appropriate methods.

1 Introduction and structure of this report

There are few more (socially) controversial issues in the extractive industries than hydraulic fracturing ('fracking') to facilitate the exploitation of gas and oil reserves. The perceived and potential consequences from the application or proposed application of this mature technology is material in state based Australian moratoriums on the gas industry as a whole, Commonwealth intervention (through the Environment Protection and Biodiversity Conservation Act 1999 'water trigger' provisions), and industry efforts to engage and reassure government and communities of interest regarding potential impacts. More specific to this report, the potential impacts of fracking have been a locus of community based push back against the onshore gas industry in Australia, as it has been in other jurisdictions.

This report will focus on the community perspectives regarding the extractive industries, and where available, the onshore gas industry in the Northern Territory. The concept of social licence to operate (SLO) will be used a framing device and mechanism for exploring the influence of community sentiment on development trajectories and what research in this area indicates is effective and required to build and maintain a SLO. Conversely, the issues that erode SLO and lead to rejection of extractive industries will also be discussed.

As per the scope of works defined by the inquiry, this report will:

- Provide context for SLO in the Northern Territory through a literature review
- Introduce current, independent community survey data regarding attitudes toward the extractive industries in the Northern Territory
- Introduce socio-economic analysis of the Beetaloo Basin with a Northern Territory context
- Discuss local level community engagement data collected through field work for this report
- Outline mechanisms for measuring and monitoring SLO in the Beetaloo Basin and NT more broadly

- Discuss key considerations in this area that should inform how future work takes place to ensure the rights and welfare of community members are of primary concern in any future work
- Provide guidance on a proposed framework for measuring and monitoring SLO in the Beetaloo Basin and Northern Territory.

2 Social licence to operate and the extractive industries: a brief review of literature

The influence of community members in development trajectories is the topic of considerable writing and discussion. While the gas industry has technology and development characteristics that are unique, there are lessons to be understood from research conducted across a range of extractive industries. Increasingly, community concerns strongly influence the way the extractive industries operate, how governments regulate them, and the manner in which broader development responsibilities are met. It is now increasingly understood that the voice of citizens must be heard if extractive developments are to achieve broad social acceptance. This has largely been brought about by changing societal expectations over recent decades, which have fundamentally influenced the way the extractive industries conduct operations around the world.

The shift toward more socially acceptable extractive development has emerged, in part, as a result of the increasing pressure and scrutiny these industries face regarding their environmental impacts and social performance. For example, throughout the 1990s, there was a fundamental shift in the way that the environmental and social impacts of the mining industry were perceived, with highly publicised tailings dam failures, chemical spills, and conflicts with communities impacting negatively on the industry's reputation (Schloss, 2002; Thomson & Boutilier, 2011). More recently, resistance to the extraction of gas has been articulated through effective use of social media platforms, popular culture mechanisms such as film, and 'grassroots' campaigns involving diverse communities of stakeholders.

Given the term 'social licence to operate' originated in the mining industry in the mid 1990's, coined by a senior mining executive (Thomson & Joyce, 2000), the development of the concept in this industry is instructive. At the same time as the mining was under pressure for its physical impacts through the mid 1990's, societal values and attitudes toward the natural environment and the industries impacting negatively on it were changing (Joyce & Thomson, 2000). Increasingly, the concerns of society were also being translated into direct action against mining projects at a local level. Such conflict with communities has

been shown to have high financial, opportunity, and personal costs to mining companies and their personnel (Franks et al., 2014).

These pressures on industry also signalled that communities were becoming more active in challenging the nature and fairness of the impacts and benefits associated with mining developments (ICMM, 2012). This was further reflected in communities demanding more involvement in decision-making around such operations, having clear expectations about receiving a greater share of the benefits from these operations, and requiring assurances that the industries involved were being appropriately regulated (Prno, 2013). Thus, not only have community expectations about the performance of the minerals industry increased over time, so too has the direct involvement of citizens in decision-making about industry development (Harvey & Brereton, 2005). This has seen community relations and participation now recognised as a strategic part of managing risk and opportunity (Humphreys, 2000). This combination of increasing pressures on industry performance and the associated social acceptance of mining operations has been widely referred to as the industry's 'social licence to operate'. However, the drivers of acceptance for the mining industry and the gas industry are complex and operate across scales.

Social acceptance at multiple scales

At the local scale, an extractive operation is said to have a social licence when it achieves ongoing acceptance or approval from the local community and other stakeholders who can affect its profitability (Graafland, 2002). Without this social acceptance, it is very difficult for a mine or gas development to operate effectively or profitably. At this local scale, it is well understood that social (or community) acceptance of an operation is a reflection of the quality of the relationship a company has with their host community (Thomson & Boutilier, 2011; Lacey & Lamont, 2014; Parsons et al., 2014; Moffat et al., 2015a; Cooney, 2017). Community relations are an integral part of successful operations and where these interactions are effective, they tend to foster mutual understanding, trust and support between a company and the host community (Kemp et al., 2006; Holley & Mitcham, 2016). Research further demonstrates that where such interactions are perceived to be procedurally fair, the increased trust created in these company-community interactions tends to lead to higher levels of acceptance of mining and gas operations (Moffat & Zhang, 2014; Lacey et al., 2017).

Similarly, at a national scale, social acceptance of the extractive industries reflects the distribution, and perception of distribution of risks and benefits arising from the industries' activities. Frequently, the acceptability of operations at the local and regional scales can be affected by what happens at national or even international scales. For instance, local rejection of some mining projects has been fundamentally strengthened by the involvement of 'outsiders' or distal communities across national and even international boundaries, leading to the loss of support in a number of projects (e.g. Kirsch, 2007; Prno & Slocombe, 2014). Hence, local acceptance of an extractive project cannot be obtained and maintained in isolation from what happens at national and international scales (Zhang et al., 2015). Similarly, what takes place at the local scale can also impact perceptions of and attitudes toward extraction at the national and international scales. The performance of a particular project, either positive or negative, can affect the reputation of the industry it belongs to and shape the general public's perceptions of and attitudes toward extraction more generally.

In many ways, the drivers of social acceptance of mining across these scales reflects the evolving nature of the relationships between industries and their communities and other stakeholders. The variables operating at these multiple scales are intertwined, effectively influencing both the acceptance of extractive projects at the local scale and of the extractive industries at the state and national scale. Hence, there is real value in understanding how the general public's attitudes toward extraction can influence the local conditions for acceptance of an operation, and how local issues influence decision-making by companies and governments at the national scale. It is also critical to be able to bring citizen voice into decision-making about resource development, which has traditionally been the domain of industry and government alone.

Applied research to identify the drivers of social acceptance

Applied research can play a critical role in developing the evidence-base for a detailed knowledge of the drivers of trust and social acceptance (i.e. SLO) of the extractive industries across scales and how they operate. For example, research to date has quantified the critical role of trust for social acceptance including how the relational aspects of stakeholder interactions can influence this. Key findings to date have already identified that:

- As stakeholder expectations and experiences of mining impacts converge, acceptance and approval of an operation increases (i.e. when companies do what they say they will do acceptance is high)
- Procedural fairness (i.e. influence over decisions made by company, respect shown to community) is a strong predictor of trust
- Relationship quality rather than the amount of contact with company personnel is key to building trust.

Such insights can assist industry, communities and governments understand what drives increased trust and, in turn, support stronger relationships between these stakeholders that will lead to better outcomes for all parties and more sustainable and efficient industry. The remainder of this review draws on surveys of more than 14,000 community members conducted in eight countries, summarising recent applied research to measure and model the drivers of trust and social acceptance of extractive industries across scales, how these variables interact, and identifies implications for improved practice.

The drivers of social acceptance of the extractive industries

There is significant qualitative research documenting processes of community relations practice and the successes and failures of citizen engagement around extractive sites. Such failures can arise even where communities are explicitly involved in consultation processes around new or existing resource development, where the potential for mismatched expectations among the stakeholders in these operations is high (Kapelus, 2002; Prno & Slocombe, 2012; Bice, 2013; Kemp & Owen, 2013). For example, in a study of mining affected communities in Australia, Cheney et al. (2001) found that local communities often felt marginalised in what was perceived to be a pre-determined development trajectory defined together by government and mining companies.

Community members have also reflected that companies and communities tend to hold distinctly different value sets and worldviews. This is even more likely in the context of negotiations with Indigenous peoples on whose land extractive project development may be taking place (Banerjee, 2000), particularly where a stakeholder approach which involves 'providing a seat at the table' may reduce a radically distinct and prior historical claim to one among a series of other interests to be traded off, effectively limiting the possibility of

reaching understanding with key cultural and community groups. This difference in values and worldviews between companies, communities and government may also lead to fundamental misalignment of expectations regarding the terms of their relationship with each other and what is deemed socially acceptable to each party (Thomson & Joyce, 2006). While Nelson and Scoble (2006) see the path to social acceptance through industry maintaining positive corporate reputation and educating local stakeholders about a project, Thomson and Joyce (2006) point out that community members, in their experience, tend to be more concerned about whether they are respected, listened to, and whether they are allowed to participate in the development of an operation. These criteria summarise the distinctly relational aspects of procedural fairness in company-community interactions but these differences also bear out the powerlessness that Cheney et al. (2001) observed among community members, and reflect a more general disconnect between a key company driver to 'make a deal' and that of community to establish an equitable relationship of exchange (Joyce & Thomson, 2000).

Thus, even when all key stakeholders are explicitly invited into a conversation regarding the nature and shape of extractive development, asymmetric power relations between parties, and differences in values, worldviews and perspectives are still likely to create opportunity for mistrust and conflict. As Swain & Tait (2007) observe, creating and sustaining trust among parties with conflicting goals and deeply different underlying values remains one of the major challenges of effective participatory processes, and this equally relates to the engagement and dialogue that underpins the social acceptance of extractive resource development. What emerges from this is that it is most often the relational factors that play a critical role in determining the quality of the interactions and relationships between companies, communities and other stakeholders in minerals development. Put another way, very often, the physical and financial impacts (positive and negative) of extractive development are less important to a social licence than these relational characteristics. The importance of these relationships underpins how communication take place and how negotiations can be reached.

There is little doubt that operations and communities vary widely across contexts and industries. This diversity of experiences with extraction means that the nature of stakeholder interactions can also look very different based on differences in local priorities

(for a company, a community or both), the nature of the extractive activity and its history in a place, or even the demographic profile of a community and the mix of other industries comprising the economy. For example at the local scale of impact, mining developments can create adverse environmental and amenity impacts associated with increased noise, dust, pollution or other disturbances. While these negative impacts are often managed through formal instruments such as Environmental and Social Impact Assessments and other regulatory instruments, it is has been demonstrated that a community's experience of those localised social, environmental and economic impacts of extraction and a company's ability to reduce those impacts voluntarily in response to community feedback plays a role in determining their acceptance of mining operations (Moffat & Zhang, 2014). For the NT, its particular set of largely unique characteristics also make generalisation of lessons learned in other jurisdictions challenging. A relatively sparse and unevenly distributed population, a very strong emphasis on the role of water in livelihoods and connection to place, the importance of Indigenous peoples and their connection to country (and legal rights to refuse consent), and the role of pastoralism in local and state based economies, add complexity and nuance to considerations of the nature of social acceptance in that place, and how to understand it.

Similarly, these contextual differences can influence how extractive operations are perceived at the national scale. For example, extractive industries tends to be associated with a range of costs and benefits. The nature and extent of these costs and benefits play a role in the level of acceptance of mining. For example, in a national survey of Australian citizens' attitudes to extraction industries (Moffat et al., 2014a), the three main areas of impact and benefit, respectively, were found to be:

- Impacts on the environment (including climate change), costs of living, and negative impacts on other sectors (including manufacturing, agriculture and tourism)
- Employment and other regional benefits, general economic benefits (personal, family and national wealth), and development of regional infrastructure.

Routinely, similar research in different contexts around the world tends to find similar patterns in how citizens assess the impacts and benefits of the extractive industries (Moffat et al., 2014b; Zhang et al., 2015) (i.e. environmental impacts are routinely perceived as the

most negative impact associated with extraction whereas the economic contributions of the sector are considered to be the most positive benefit).

The way citizens perceive these impacts and benefits does influence their acceptance of extraction, such that the more negative citizens believe the impacts are, the less inclined they are to accept the industry; and the more positive citizens perceive the benefits to be, the higher their acceptance of the industry. While these large scale surveys of citizen attitudes provide an evidence base for confirming how such impacts and benefits are perceived, what tends to be more revealing is assessing the strength of the relationships between them. For example, in the 2014 Australian national survey, citizens were also asked to consider whether they felt the benefits of mining (including gas extraction) outweighed the impacts (i.e. was it worthwhile having a mining industry in Australia?), to understand how this influenced their acceptance of the extractive industries. The results from this analysis revealed that weighing up the impacts and benefits was a strong positive predictor of social acceptance over and above the other individual impact and benefit measures. This suggests that citizens hold a nuanced view of the impacts and benefits of extraction and that where the balance of benefits is seen to outweigh the impacts, acceptance will likely be higher (Moffat et al., 2014a & 2014b; Lacey et al., 2017).

However, what is more interesting is that the most significant predictors of trust in the industry and acceptance of the industry have tended not to be related to impacts and benefits at all. Rather, at both the local and national scales and in diverse extractive contexts around the world, what has emerged is that strong acceptance tends to be about building trust between industry, government and society. There is a growing understanding that the way people are treated in decision-making processes, the ways that benefits are distributed from mining and the role of governance in setting the rules for mining, are most important for developing strong trust and acceptance (Moffat et al., 2014a; Zhang et al., 2015). This confirms the observations of Joyce and Thomson (2000). Despite differences in the experiences and conditions of extraction around the world, research conducted over several years has now identified a common set of relational variables that underpin social acceptance, or social licence, at local, state and national scales. These critical relational variables (i.e. focusing on stakeholder interactions) include: (i) contact quality between company personnel and community members, at the local scale; (ii) distributional fairness

(particularly in relation to benefits), across scales; (iii) procedural fairness, across scales; and (iv) citizen confidence in the governance arrangements around extraction, at the national scale. Each of these variables is summarised below.

Contact quality between company and community members

At the local scale, the quality of contact between company personnel and community members can have a significant influence on the quality of company-community interactions. Extensive research demonstrates that positive contact or interactions between groups can improve intergroup relations and increase trust between those groups (Pettigrew & Tropp, 2006; Tam et al., 2009; Hewstone & Swart, 2011). This has been shown to be equally true when tested in mining contexts. For example, in a longitudinal survey of community attitudes to coal seam gas extraction in Queensland, Moffat and Zhang (2014) found that the quality of contact between CSG company personnel and community members was a significant predictor of trust in the company and acceptance of its operation. What made no difference to trust and acceptance was the amount of contact between the company and community. Their findings corroborate those of Kemp et al. (2011) who also found that the nature and quality of the interface between individuals, plays a key role in mitigating social conflict in mining contexts.

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 (Kemp et al., 2011; Zhang et al., 2015). Empirical studies have also shown that people express greater satisfaction when they believe that they receive a fair share of the benefits in a given situation, or they will tend to reject the arrangement (McComas & Besley, 2011; Siegrist et al., 2012). 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, more broadly (Moffat et al., 2014a). For example, communities may benefit through direct compensation, royalty payments or participation in joint ventures (O'Faircheallaigh, 2002). Other benefits may include the industry's contribution to employment and training opportunities (Measham & Fleming, 2014) or investment in local and regional infrastructure (Michaels, 2011). At the national scale, such benefits may be

reflected in macroeconomic consequences such as increased revenues resulting from export markets or taxation regimes (Battelino, 2010).

Procedural fairness

Procedural fairness can be achieved in many ways but it routinely requires the implementation of processes that are considered to be fair by all involved, are transparent and inclusive of diverse perspectives and priorities, allow the public to access information and debate, and to feel respected and listened to in that process (Lacey et al., 2017). Procedural fairness also refers to whether individuals believe that they have had a reasonable voice in decision-making processes (Tyler, 2000; Besley, 2010). Perceptions of fairness in processes leading to decision outcomes increase trust between those who are involved in negotiating decisions and ultimately, the acceptance of the outcomes of those decisions, even among those who may be disadvantaged by such outcomes (Lind & Tyler, 1988; Tyler, 2015). Given the increased participation of communities in decision-making about how mining operations will be developed, designing and implementing fair processes has become a critical part of creating equitable participation, creating meaningful dialogue among stakeholders, diffusing conflict and achieving sustainable resource management decisions (Kemp et al., 2011; Holley & Mitcham, 2016; Lacey et al., 2016).

Governance

At the national scale, governments around the world play a major role in regulating the extractive industries and stipulating how extractive activities should be conducted in their jurisdiction. The regulations are often introduced in the form of legislation, and approval and reporting processes. This also includes regional and national laws governing environmental assessment and public participation processes (MMSD, 2002; Solomon et al., 2008). From the public's perspective, these are the major formal mechanisms for managing the social and environmental impacts of extractive activities. When the public believe that the governance arrangements in place are not capable of ensuring responsible resource development, their attitudes toward extraction tend to be less favourable. Indeed, research has shown that public perceptions of the governance arrangements around extraction moderate the relationship between their concerns over environmental impacts and their acceptance of the industry (Zhang & Moffat, 2015). More specifically, when citizens strongly believe that existing regulation and legislation has the capacity to hold the extractive

industries to account for their actions (i.e. strong governance), there is an increased likelihood to accept industry compared to those who perceive governance arrangements as being weak, irrespective of their views on the environmental impacts of industry (Zhang et al., 2015).

How the drivers of social acceptance interact in practice

There is clear evidence that the interactions between these relational drivers of social acceptance can be systematically modelled and measured at local and national scales by conducting large scale surveys of citizen attitudes (Moffat & Zhang, 2014; Moffat et al., 2015b; Zhang et al., 2015).

Social acceptance at the local scale

At the local operational level, for example, Moffat and Zhang (2014) have developed an integrative, quantitative model to understand the paths to community acceptance of extractive operations. Their analysis reveals that building trust with local communities is crucial for resource companies to obtain and maintain support and acceptance of those operations. This trust is fundamentally shaped by the contact quality (but not quantity) and procedural fairness through which companies deal with communities, as well as perceptions of how fairly the benefits of extraction are distributed in the community.

Figure 1 illustrates how these relational variables interact in practice at the local scale, with positive relationships between the three relational variables indicating that the more distributional fairness, contact quality and procedural fairness perceived by communities, the greater the level of trust in and acceptance of operations is realised. The model and the relationships illustrated in Figure 1 have been developed based on a range of theoretical and applied research (e.g. Kemp et al., 2006 & 2011; Thomson & Boutilier, 2011; Kemp & Owen, 2013; Lacey & Lamont, 2014; Moffat et al., 2014a & 2015a; Moffat & Zhang, 2014; Zhang et al., 2015; Lacey et al., 2017) and empirically validated in multiple contexts including Australia, New Zealand, and South Africa, and in multiple commodity contexts including gas extraction. The arrows represent the predicted interactions between the variables that can be measured and modelled using structural equation modelling (an advanced statistical modelling technique). A positive symbol indicates that increased levels in one variable is expected to lead to increased levels of another (e.g. increased procedural

fairness predicts increased trust). The strength of these predictive relationships often varies between contexts but the elements themselves have been found to remain unchanged across highly differentiated contexts. These three relational variables were also found to be strongly correlated with each other suggesting that increased procedural fairness can positively influence perceptions of contact quality and distributional fairness, and vice versa.

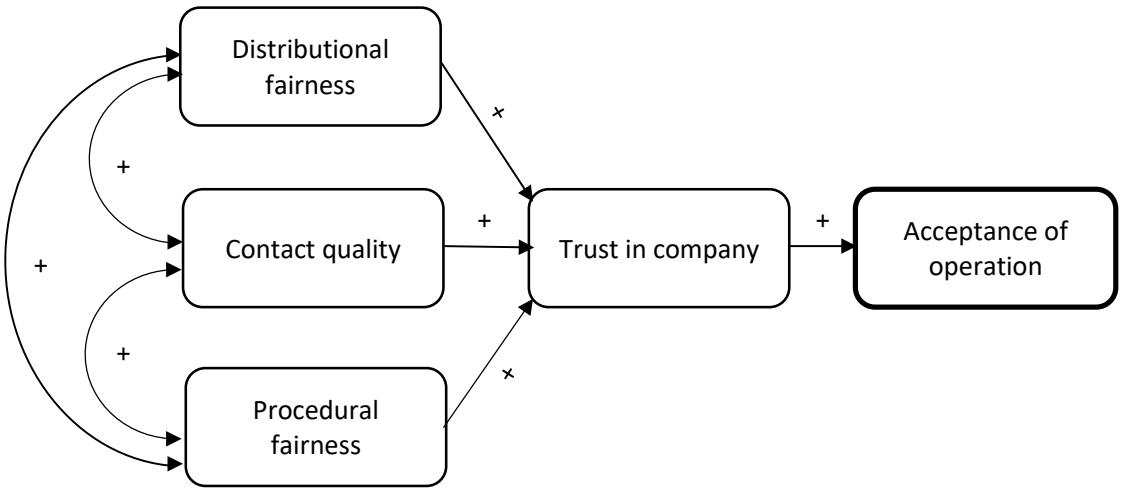

Figure 1 Conceptual model of the drivers of trust and acceptance of local extractive operations

This model challenges some key assumptions about the drivers of trust in company-community relations. For example, all communities surveyed tend to express the view that the environmental and social impacts of mining matter a great deal to them. However even though these concerns are important across all contexts, they are rarely found to be the main predictors of trust or acceptance of a company or its operations. This is significant because it highlights that the relationships between the stakeholders needs to be strong and supported to enable effective negotiations around matters such as the social and environmental impacts of extractive operations.

Social acceptance at the national scale

Similarly, large scale survey research at the national scale assessing citizen attitudes towards the extractive industries (as opposed to localised impacts) also reveal the key predictors of trust in industry, and in turn, the drivers of social acceptance of extraction. Figure 2

illustrates an empirically validated model of social acceptance that highlights procedural fairness, distributional fairness and confidence in governance as the three most significant predictors of trust, and in turn acceptance of the industry (Zhang et al., 2015). This model was developed based on over 14,000 citizen responses testing attitudes to the mining sector (including gas extraction) collected in Australia, Chile, China and Zambia over a two year period.

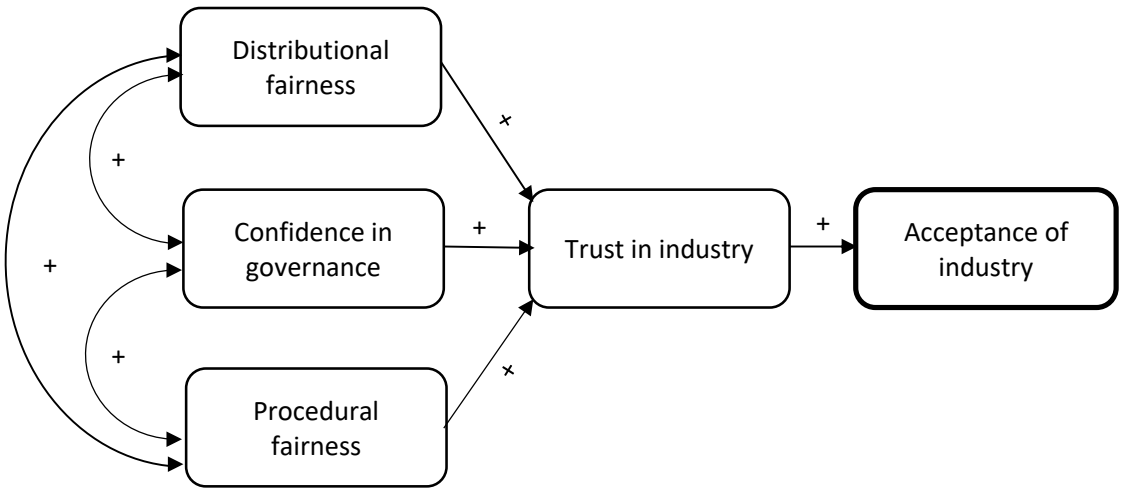

Figure 2 Conceptual model of the drivers of trust and acceptance of national scale extractive industries

At this scale, a measure such as contact quality ceases to become relevant (i.e. most citizens in a nation do not live near operations) but the citizenry's expectations of government tend to come to the fore more strongly as the drivers of trust in and acceptance of the industry. A key message from this research and its interpretation, is that in effect, social licence is everyone's business. The interrelationships between procedural fairness (determined in this work by industry behaviour), faith in governance (determined by government behaviour), and distributional fairness (what may be seen as an interaction between industry and government behaviours) are strong, even as each drives trust and acceptance individually. Neglecting one component erodes the relationship between the others and trust/acceptance. Equally, industry working with community to build faith in governance capacity, for example, improves the likelihood of greater trust and social acceptance for the industry as a whole.

SLO and ownership of risk

The work around SLO in the literature and by CSIRO speaks clearly to the direction of the risk associated with loss of community acceptance. Where SLO is degraded or lost such that a company or industry is rejected, the risk lies predominantly with that company or industry. As mentioned briefly above, conflict with communities leads to high financial, opportunity, and personal costs to mining companies and their personnel (Franks et al., 2014). Where communities do not have a constructive way to express concerns about the impacts and processes associated with large scale development, they may choose to exert influence on these development processes in more creative ways. Franks et al (2014) provide the most systematic and methodical examination of these risks in a mining context, demonstrating that apart from the significant financial costs of shutting down development, this conflict also impacts directly on the capacity of companies to conduct their core business. Executives in particular are required to manage the actual and reputational costs such rejection may bring, taking them away from their core roles and creating additional opportunity costs.

For communities that already see little local benefit from development, particularly in its early stages, the costs of rejection may be seen to be less severe. Conflict with companies is likely to lead to reduction or cessation of investment into communities, as has been the case in the Northern Territory during the moratorium. There are also opportunity costs for communities relating to local investment, investment uncertainty and fractures within communities that conflict creates or exacerbates. However, with respect to loss of social licence, the risk lies predominantly with the companies and industry(ies) that lose it.

3 Northern Territory specific data

In late 2016 and early 2017, a second national survey of citizen attitudes toward the extractive industries (including minerals and gas in a broad definition of 'mining') was conducted by CSIRO. The aim of this work was to provide a comparative dataset to that collected in 2014 and detailed in part above. For the purposes of this report, this 2016/17 data has been analysed to allow comparisons between states in Australia. Data was collected from communities where the extractive industries are present and operating, from non-extractive communities and from urban communities in Australia's capital cities (Table 1 describes the number of participants by location category, Table 2 describes location of respondents by state or territory and Figure 3 shows where participants were located spatially, by postcode). In total, 8,020 Australians completed the online survey, 227 of whom were in the NT.

Table 1 Respondents by region: Mining, non-mining and metropolitan

Region	Freq.	Percent
Mining	1,780	22.19
Non-Mining	2,384	29.73
Metro	3,856	48.08
Total	**8,020**	**100**

Table 2 Respondents by state and territory

State	Freq.	Percent
ACT	70	0.87
NSW	2,470	30.86
NT	227	2.84
QLD	1,850	23.11
SA	762	9.52
TAS	266	3.32
VIC	1,612	20.14
WA	747	9.33
Total	**8,004**	**100**

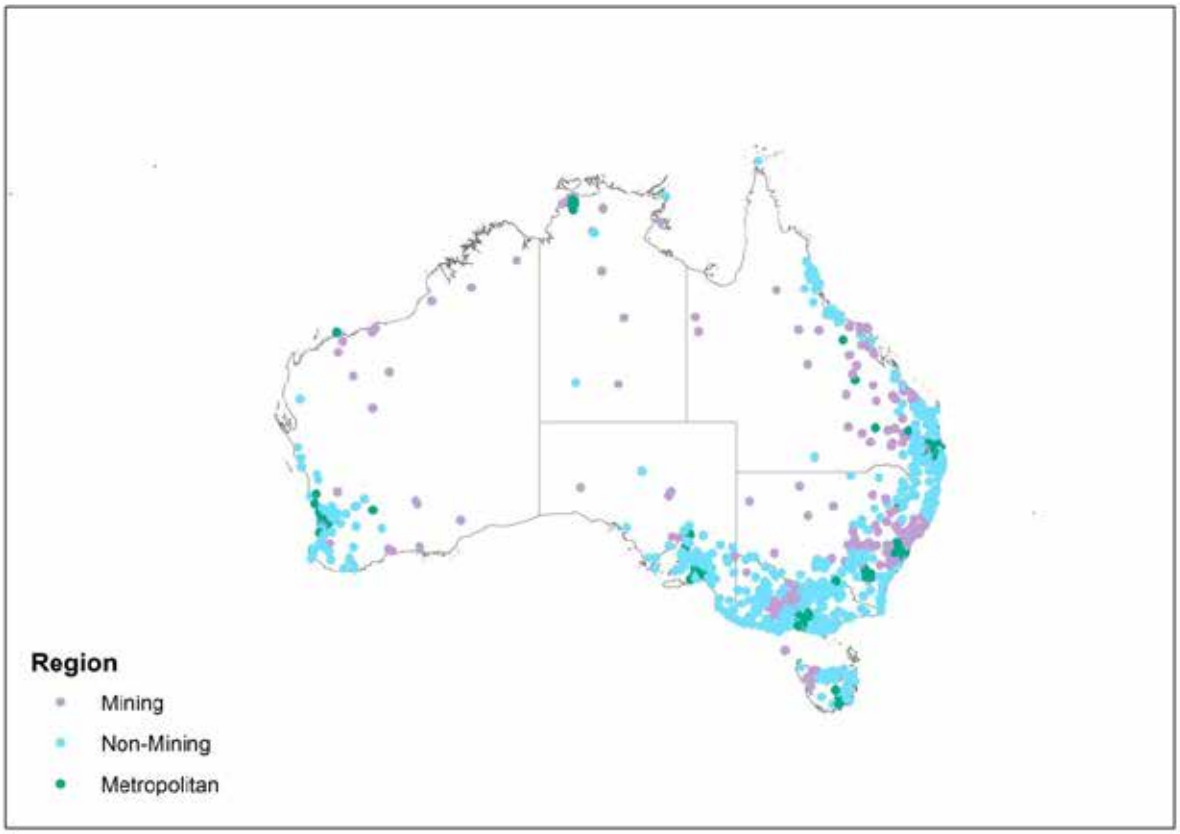

Figure 3 Distribution of survey participants in 2016-17 across regions and states in Australia

A broad range of topics was covered in the 2016/17 survey, including acceptance of extractive industries overall, acceptance at the local community level, and trust in a range of industry actors. Distributional fairness, procedural fairness and governance capacity were also assessed as per previous work in this area. Finally, for the purposes of this report, data relating to community perceptions of a range of benefits and negative impacts of the extractive industries are reported (Table 3 details the mean responses of community members overall for each item assessed, by state).

3.1 Descriptive data key findings

Acceptance of extractives

Mining (inclusive of gas) is generally accepted in the NT, though Western Australia (WA) has significantly higher levels of acceptance overall. NT residents were, however, significantly less accepting of mining activity were it to be in their own local community. This

phenomena is consistent across states and territories, and acceptance of mining in one's own local community is around 3 on average (i.e. the mid-point of the scale, where 1 reflects very low acceptance and 5 reflects very high acceptance).

Acceptance was also mapped spatially by postcode across the NT. While this is a course method for representing a relatively small set sub-set of data, it illustrates a broader trend for the NT: that acceptance is higher in larger population centres than in less populated areas. In Figure 4, levels of acceptance around the mid-point of the scale used (3) can be seen as yellow. South of Tennant Creek acceptance can be seen to be lower than in several areas around Darwin.

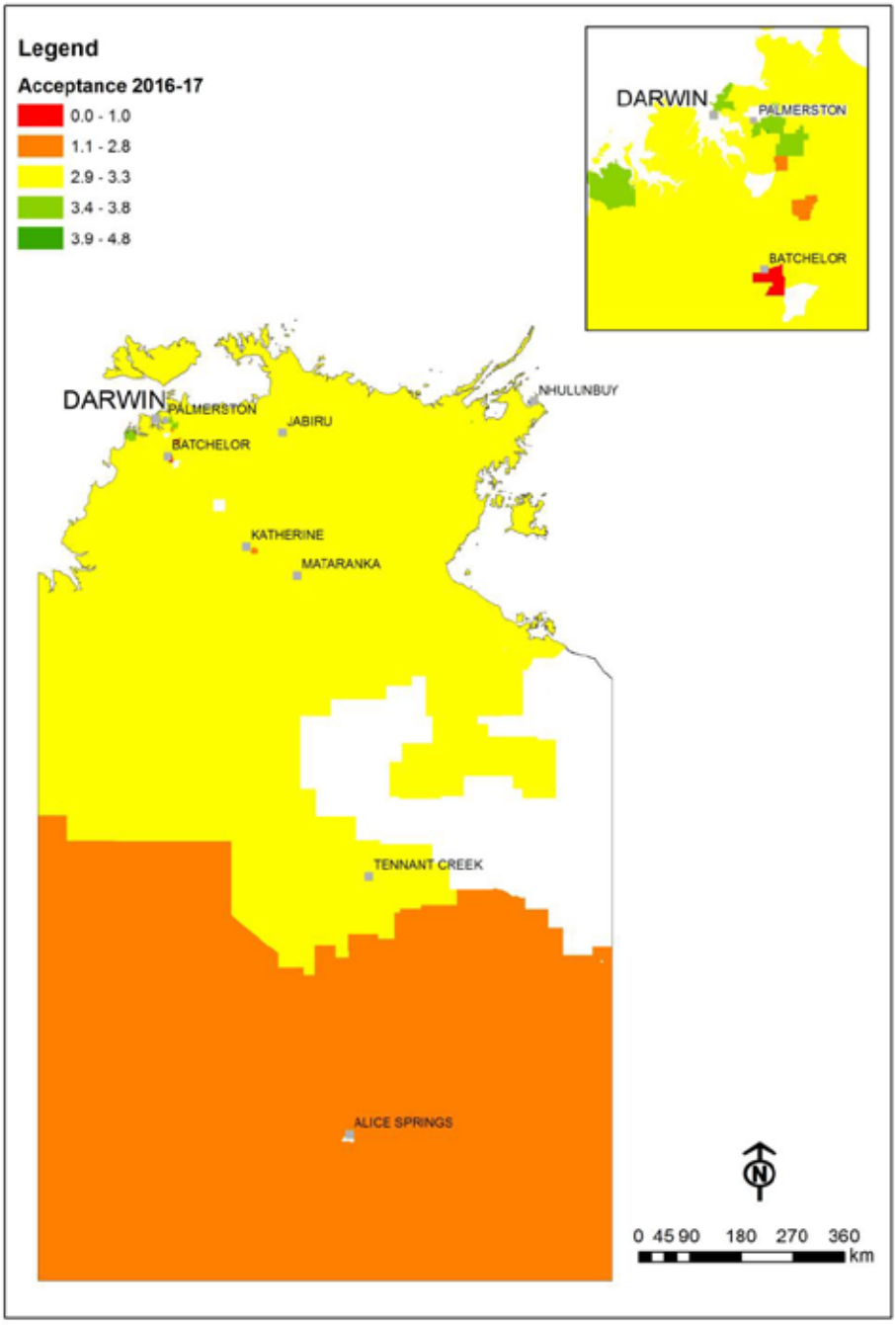

Figure 4 Spatial representation of NT acceptance data

Governance capacity

Perceived governance capacity of governments at state/territory and federal levels is unfavourable across Australia, on average. This is particular the case among residents of the NT, who perceive governance capacity significantly poorer than those respondents from all

other states and territories. This relates to being able to rely on legislation, regulations, and governments at the territory and federal levels to ensure mining companies do the right thing and are accountable.

Trust

NT residents also have low trust in the extractive industries and governments, marginal trust in advocacy groups, but higher trust in research organisations relative to residents in all other states. Low trust in government is a common phenomenon across states, as is low trust in the extractive industries. NT residents, however, trust the extractive industries significantly less than residents in other states.

There are marginal levels of trust in advocacy groups, which is common across states and territories, though this would vary between individual advocates and advocacy groups (the survey did not explore this issue by different advocacy groups).

Procedural and distributional fairness

Low trust perceptions are underpinned by low perceptions of procedural and distributional fairness (midpoint = 4). 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.

Impacts, benefits and the value proposition for extractives

Even though there is low trust in the extractive industries, and associated negative perceptions of procedural and distributional fairness, and even though there is low trust in government and associated governance, residents across the states and territories still see consider the balance of benefits over costs to be favourable on average. This was particularly the case in WA.

Regional infrastructure, employment and local community benefits were particularly favourably perceived in the NT, while financial benefits at the individual, family, and general public levels were less influential. This was also true in other states, though their residents generally rated higher employment and local community benefits flowing from extractives more positively.

Perceived environmental impacts were the most negatively viewed industry impact, with these views significantly more negative in the NT than in all other states and territories apart from New South Wales (NSW). This was followed by impacts on living costs in the NT, and then impacts on other sectors (e.g. tourism, manufacturing). Residents in other states also saw impacts on the environment as the most concerning for the industry, though were less concerned about impacts on living costs.

Table 3 State based comparison of mean community responses

	NT	NSW	VIC	QLD	SA	WA	TAS	Aus.	Mid-point
Acceptance of mining generally	3.34	3.30	3.30	3.34	3.36	**3.61**	3.32	3.34	3
Acceptance in local community	3.07	2.93	**2.87**	2.96	3.00	3.22	3.06	2.96	3
Governance capacity	2.62	**2.86**	**2.85**	**2.84**	**2.83**	**2.92**	**2.83**	2.85	3
Trust in state/territory government	2.44	2.55	**2.63**	2.56	2.54	**2.74**	**2.63**	2.59	3
Trust in federal government	2.51	2.57	2.62	2.59	2.57	**2.71**	2.52	2.59	3
Trust in research organisations	3.74	**3.51**	**3.52**	**3.46**	**3.53**	**3.50**	**3.53**	3.51	3
Trust in advocacy groups	3.06	3.04	3.01	2.96	2.97	2.97	**2.83**	2.99	3
Trust in mining industry	2.42	**2.67**	**2.70**	**2.68**	**2.69**	**2.86**	**2.65**	2.69	3
Procedural fairness	3.32	**3.74**	**3.75**	**3.72**	**3.83**	**3.86**	**3.75**	3.74	4
Distributional fairness	3.12	**3.74**	**3.74**	**3.66**	**3.75**	**3.65**	**3.75**	3.69	4
Balance of benefits over impacts	5.00	4.93	4.89	5.04	5.12	**5.29**	5.00	5.00	4
Impacts on living costs	4.66	**3.25**	**2.80**	**3.16**	**2.96**	**4.16**	**2.52**	3.21	4
Environmental impacts	5.01	4.74	**4.61**	**4.61**	**4.55**	**4.57**	**4.54**	4.65	4
Impacts on other sectors	4.06	4.27	4.08	4.11	4.09	3.89	3.88	4.12	4
Financial benefits	3.79	3.61	**3.46**	3.56	**3.48**	3.85	**3.41**	3.57	4
Regional infrastructure benefits	4.85	4.73	4.68	4.77	4.78	4.93	4.79	4.76	4
Employment and community benefits	4.87	5.01	4.91	**5.03**	5.03	**5.15**	5.05	5.00	4

Note: Bolded means are significantly different from NT; the scale midpoint is 3 in the top half of the table up to and including 'trust in mining industry' and it is 4 in the rest of the table; comparisons with ACT are excluded due to the relative small mining industry and sample size.

3.2 Modelling social acceptance of extractives in the Northern Territory

While descriptive data (above) provide very useful comparisons of respondent views in the BY relative to other states on key variables related to SLO, it is also important to understand how these variables relate to each other. In other words, it is important to understand what

drives trust and acceptance of the extractive industries in the NT. A statistical technique called structural equation modelling was used to establish the relative importance of these key drivers in the NT data. To do this, a comprehensive model of trust and social acceptance of extractives was developed by CSIRO at the national level and then this model was applied to the NT data. At both the national and NT level, the model performed very well, predicting more than half the variation in 1) individual levels of trust in the mining industry, 2) perceptions of benefits over impacts, and 3) respondents' overall social acceptance of the industry in the Northern Territory (57%, 57%; and 67% respectively; see Figure 5 below).

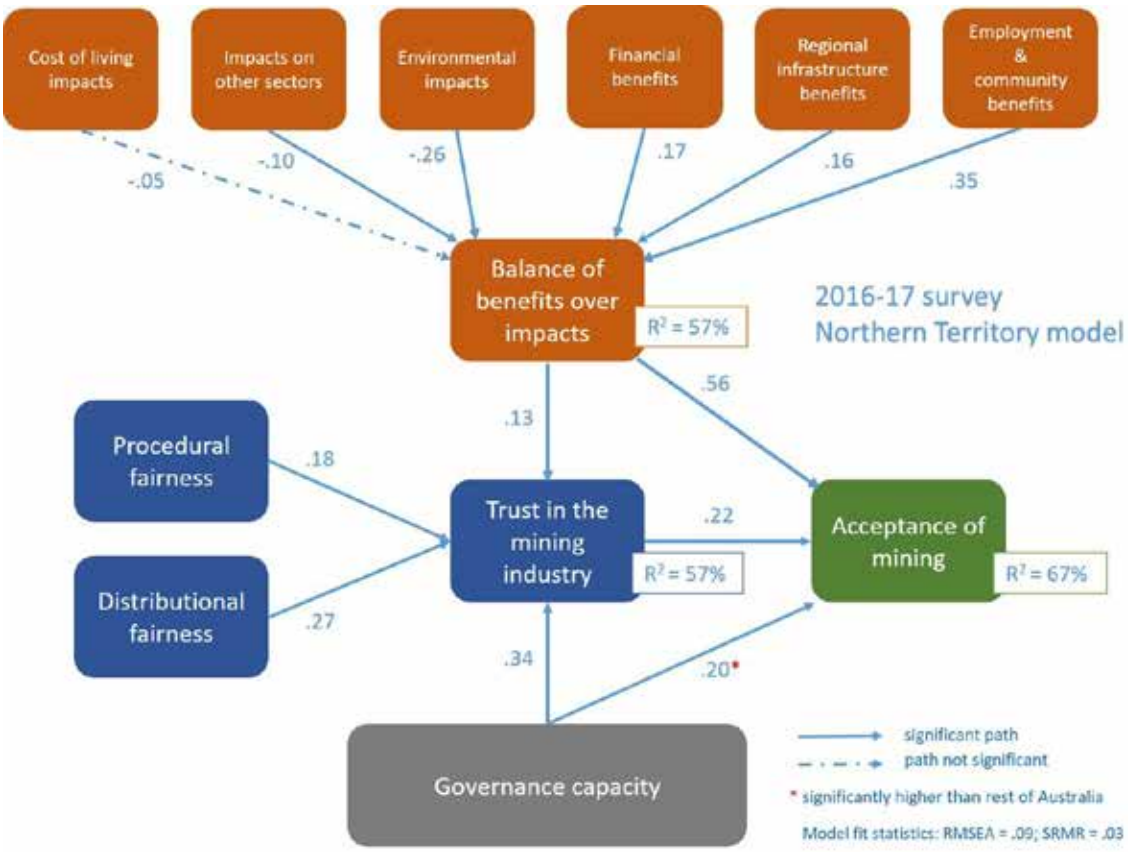

Figure 5 Comprehensive model of NT data predicting trust and acceptance of the extractive industries
(higher numbers indicate stronger relationships, a positive value indicates more of one variable leads to higher levels of another variable)

For residents of the NT, good governance was significantly more important for social acceptance of the extractives than for residents in the rest of Australia. Governance was approximately as important as trust in the mining industry as a direct predictor of social

acceptance, and it was also an important predictor of trust in the mining industry. Thus governance has both direct and indirect effects on social acceptance of extractives.

Trust in the mining industry is also influenced by perceptions of procedural and distributional fairness. Since both of these are rated unfavourably in the NT, improving these perceptions of fairness are also opportunities for improving trust in, and social acceptance of, extractives in the NT.

However, the most important predictor social acceptance was perceived balance of benefits over impacts of mining, or its value proposition for the Territory and its people. Like the rest of Australia, perceived employment from extractives and financial community benefits was the highest predictor of 'balance of benefits over impacts' variable. The balance of benefits over impacts with respect to extractives was viewed quite positively in the NT, in line with the national average. Only residents of WA rated this ratio of impacts to benefits significantly more positively than residents of the NT.

Regarding perceived costs, the impacts of mining on living costs was seen as relatively high in the NT, but it was not a significant predictor of the perceived benefits over impacts and so it is less important for overall social acceptance than other impacts. The most important negatively perceived impact related to the environment, which were also seen as relatively high in the NT. This means the environment is an important issue for social acceptance of mining in the NT.

3.3 Inequality in the NT

In addition to community sentiment analyses for the NT, CSIRO also calculated a measure of socio-economic inequality for the NT based on census data collected in 2006 and then 2016. The gini co-efficient is intended to represent the income or wealth distribution of a nation's residents, and is the most commonly used measure of inequality. With respect to SLO in the NT, the level of inequality across the Territory speaks to potential social divisions that may be exacerbated by resource development, or positively affected by it, depending on how development progresses. For those residents that already perceive low distributional fairness in the way the industry operates, low levels of community, family and personal economic benefit form extractives, and high levels of impact on the environment, for

example, high levels of general inequality may interact with these perceptions of the industry to undermine levels of acceptance of the industry (i.e. it's SLO).

For interpretation, it is important to note that there are no clear thresholds for what represents very high or low inequality and that the colours used in the following figures are used for illustration purposes only. Calculations of the gini co-efficient were based on total family income, regardless of employment status and includes both couple and one parent families with children.[1] The gini co-efficient varies between 0 and 1, where the closer to 1 the co-efficient is, the more unequal the income distribution is.[2]

Figure 6 illustrates the gini-co-efficient across the NT by Local Government Area (LGA) for the 2006 and 2016 census data sets. The Beetaloo Basin location is marked. It appears that across most of the NT, and for the LGA within which the Beetaloo Basin is located, has increased over the preceding six years.

Figure 7 reflects the change in gini co-efficient over this time. Only Katherine has seen little change in levels of inequality in this period, with all other LGAs in the NT experiencing growing levels of family income inequality in this time.

[1] For the highest income bracket the open-ended class median is calculated based on the algorithm described by Parker and Fenwick (1983). By using the Parker and Fenwick (1983) method, truncation error is avoided (c.f. Fleming and Measham, 2015).

[2] It is also important to note that calculations are based on available data, and census data collection methods disproportionately exclude Aboriginal Australians in remote Australia.

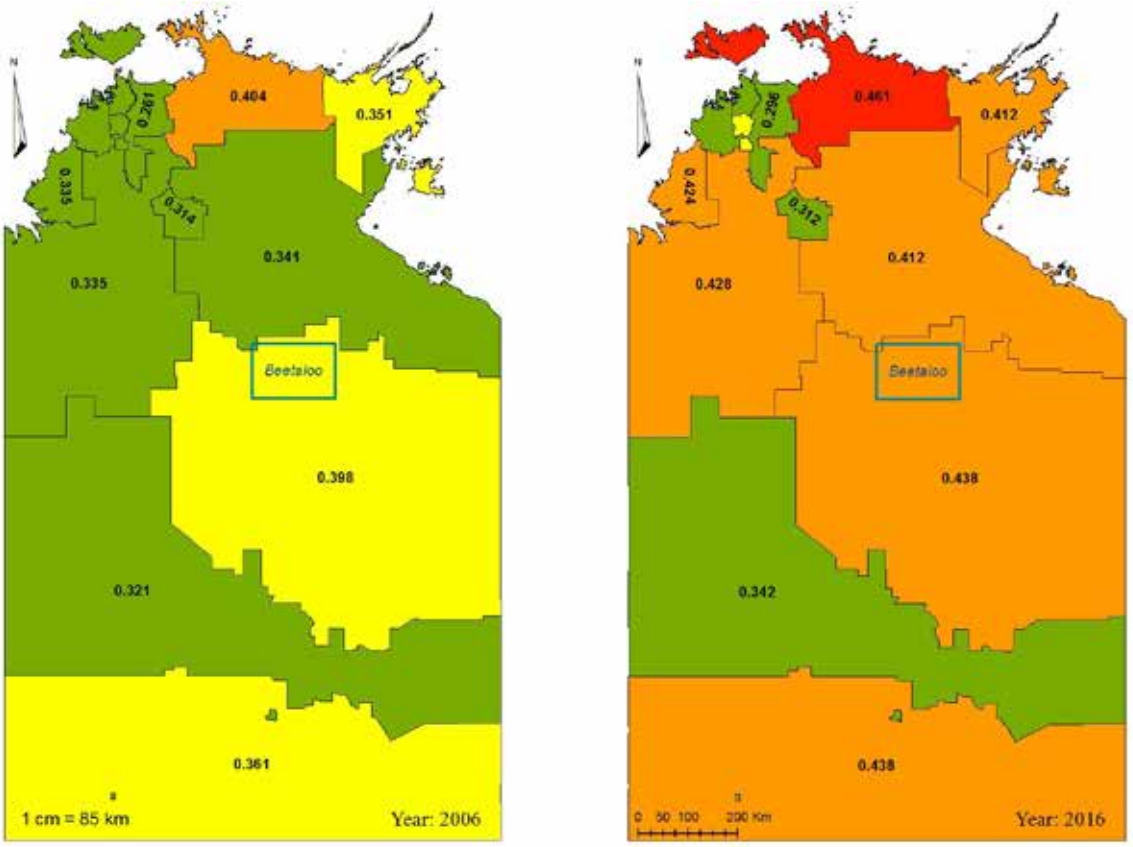

Figure 6 Local Government Areas coefficient of inequality in 2006 and 2016 (calculations based on 2016 Census data). Data sources: (Australian Bureau of Statistics, 2016; Geoscience Australia, 2017)

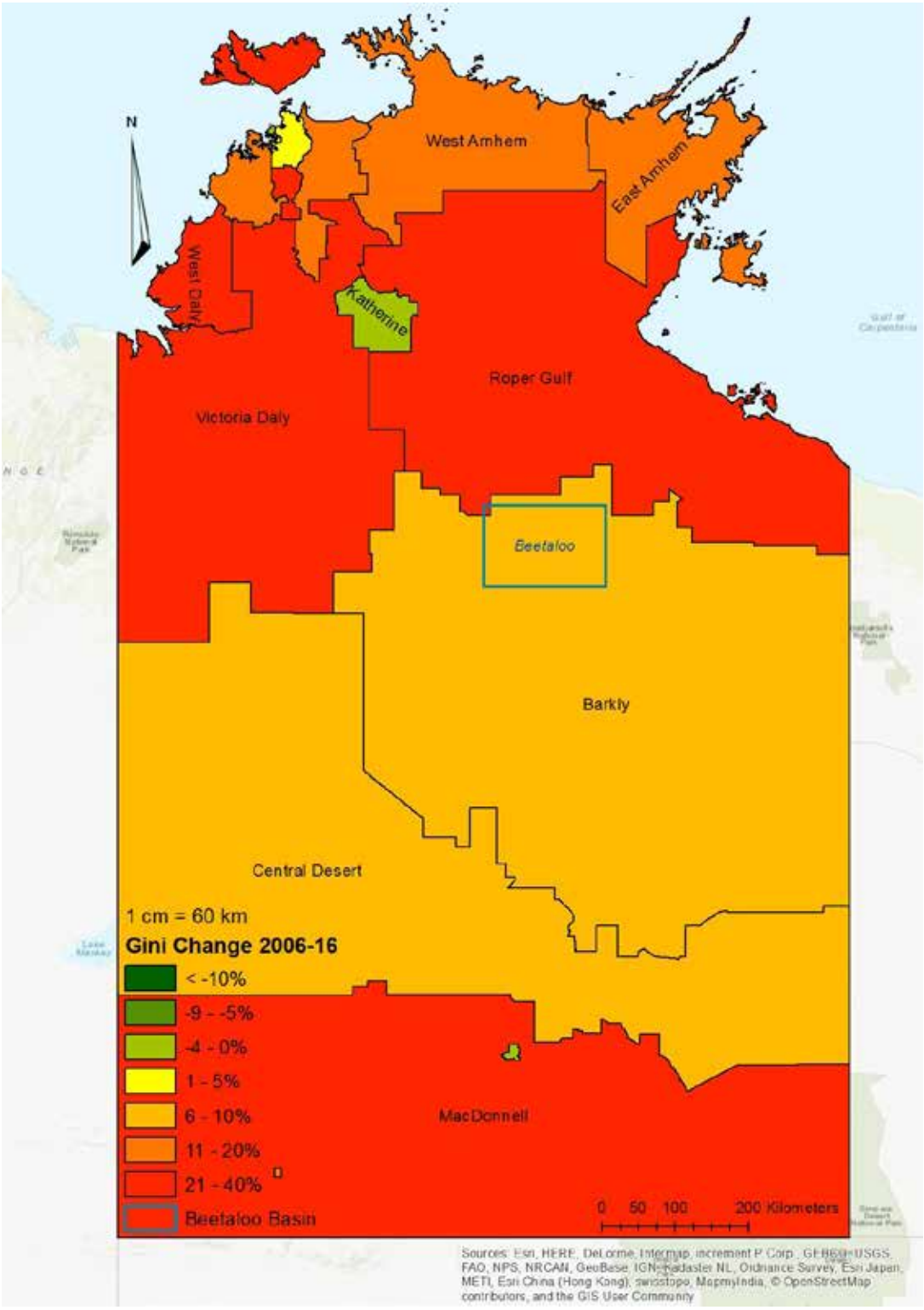

Figure 7 Inequality (Gini) coefficient change in Local Government Areas, 2006 – 2016 (calculations based on 2016 Census 2016). Data sources: (Australian Bureau of Statistics, 2016; Geoscience Australia, 2017)

3.4 Community and company perspectives: interviews and fieldwork

In order to ground the data presented above in a more local context, a range of stakeholder engagement activities were conducted as part of the broader scope of work that this SLO report sits within. The authors of this report conducted a limited number of interviews and discussions with industry and government stakeholders, and used the outputs from community engagement activities conducted in the NT by University of Queensland (UQ) researchers, to inform the following section. These data collection activities are limited, as reflecting the challenges of conducting primary research in remote Australia and the scope of CSIRO's component of work. The purpose of this section, therefore, is to provide some context for the data included above, while acknowledging the clear limitations of the engagement conducted within the scope of this project and development of this SLO report more specifically.

A consolidated list of groups consulted in the course of the whole project is contained in the Coffey Social Impact Assessment report (Coffey, 2017). To inform the current SLO report, seven detailed discussions of approximately an hour duration were conducted with industry and government department representatives (Table 4 details CSIRO discussants by sector). These were not formal interviews, but used by the lead researcher to gain context and perspective on issues that are evident in the survey and economic data presented above. In addition, detailed interview notes were made available for use in this report by UQ researchers who engaged community members and other stakeholders in Boroloola and Elliot during their field work component (Table 5 details the location of UQ interviewees, and Table 6 the Indigenous status of UQ interviewees). Notes from five interviews conducted in Boroloola and three in Elliot were used in this report.

Table 4. Discussion participant sector and number of discussants

Participant	Organisations	Discussants
Industry company or representative body	5	9
State government department	1	1
Private sector company (non-gas)	1	1
Total	**7**	**11**

Table 5. Interviewee role by location

Interviewee	Borroloola	Elliot	Total
Small business employee	2	2	**4**
State government agency/service member	3	0	**2**
Local Indigenous leader	0	1	**1**
Total	**5**	**3**	**8**

Table 6. Indigenous status of interviewees by location

Interviewee	Borroloola	Elliot	Total
Indigenous	4	3	**7**
Non-Indigenous	1	0	**1**
Total	**5**	**3**	**8**

In conversation with a range of industry, community and government stakeholders in a NT gas industry, several key themes emerged that are relevant to SLO. These include that existing social challenge and tensions within and between Indigenous and non-Indigenous communities in the Beetaloo Basin, and for the NT more broadly, risk being further exacerbated by large scale development that is not carefully planned and managed. For example, as the gini co-efficient data presented above indicates, there is increasing inequality in family income in the NT; any potential royalty payment scheme for new development must be designed carefully to ensure that an industry sharing economic benefit with local Traditional Owners doesn't exacerbate underlying trends in family income inequality in novel ways.

The potential benefits of the gas industry developing at scale were discussed. For industry these are self-evident, but for communities these benefits were less clear. At a Territory level, community benefit is well understood in terms of various revenues, employment, and industry and government investment in infrastructure, to name a few. However, at local levels the potential balance of impacts and benefits was less clear and perhaps less equitable. While jobs and training are desirable for these communities, and companies expressed commitment to working with local communities in traditional and creative ways to deliver local benefit, the reality is complex. Careful thought and planning as to how local communities may participate in extractive roles in culturally appropriate ways, develop foundational capacity from which to build

these skills, and considering opportunities that align with cultural interests and values (e.g. environmental management through the ranger scheme) are important. Local community members expressed the fact that despite previous development initiatives in the past, local benefit had not be realised to any large degree.

Uncertainty was a dominant theme of conversation in discussion of SLO. The process of resource exploration and development is inherently uncertain as to its outcome and the shape of future projects. Managing this uncertainty is a genuine challenge in all communities engaged by the extractives industry, but particularly where 'fracking' is employed. Community, industry and government contributors indicated that popular culture material and information (e.g. the film Gasland) relating to the deployment of similar technologies in other places was influencing how communities were thinking about fracking technologies and potential impacts in their own country. Uncertainty was seen to lead to anxiety, which in turn resulted in a 'better safer than sorry' approach to its deployment in the NT among some communities and individuals. This was particularly the case as the technology relates to water quality and quantity in the NT.

Community members themselves expressed strong interest in resolving or at least addressing their uncertainty through accessing information from industry and government regarding deployment of hydraulic fracturing technologies in the Beetaloo Basin, but some expressed frustration that there appeared to be no one to ask. In contrast, it is clear that the industry representative body has been providing an opportunity for the general public in more populated centres of the NT to access such information from technical experts. There seems to be a gap in who is actively seeking information to resolve uncertainty and where this information is being made available, however, based on the limited consultation summarised in this report.

Companies conducting exploration or preliminary work in the Beetaloo Basin reported strong engagement locally with potentially affected community members and Traditional Owners. Companies indicated that where they were able to meet regularly with community members, discuss and explore uncertainties together and opportunities for future benefit, relationships were sound. Reflecting the role of 'contact quality' in previous SLO research, this demonstrates that while resource intensive, such efforts are effective in building mutual understanding if not acceptance. However, comments from community regarding the lack of engagement in areas alongside or even overlaying company tenements also demonstrates the need for broader, more inclusive definitions of who is 'community' in this context.

All stakeholders engaged discussed the role of government as being critical to how the industry does or does not progress. There was a perception that government and its departments had been largely absent from the discussion about gas development in the NT for some time, but that greater involvement was not only welcome but vital to meet the challenges communities in particular face. This is again reflective of the NT specific data modelling described above, with articulated the role that faith in governance plays in directly and positively predicting acceptance of the extractive industries in the NT; without clear boundaries around development activity that reassures communities that the government is actively protecting their interests, community members indicated they would find it difficult to build trust in government, industry or the technologies it uses.

Constructively, many interviewees discussed ways in which government could be more effective for all stakeholders in the NT gas industry. First, that regulation should be creative, modern, and learn from the experiences of other jurisdictions to create a NT relevant framework for gas development. It should reflect the needs of stakeholders to articulate and share their perspectives without regulating too closely the process by which this takes place. Second, the need for careful and deliberate planning was expressed. 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 important here. What services will be required to build the capacity of community members for work and participation in new opportunities, services to support a potential influx of construction personnel, how community dynamics may change were all areas that were seen to be important in managing SLO issues through good planning. Third, there was a desire from community and from some industry participants, for government to play a more active role in engaging community. While trust needs to be established in government in this role for messages to be heard, the government was viewed as important in helping to manage perceptions of agenda-driven information provision by industry and also anti-development groups.

Clear in all of the conversations feeding into this report was a need to develop ‘the NT way’ in managing the gas industry should the moratorium be lifted. While there is much to be learned from the experiences of all actors and stakeholders in other jurisdictions that have experienced the growth of gas development, there was a clear feeling that the NT has some unique characteristics and cultural norms that mean these lessons are not able to be directly applied without reflection. However, research on SLO in many contexts around the world demonstrates

that there are usually many more similarities across contexts and commodities in the way community acceptance is developed and maintained over time, than there are differences. More likely, the issues of relevance to communities (e.g. water quantity and quality) and the factors that are known to be important in building trust and acceptance (e.g. procedural and distributional fairness, contact quality) will also be central in the NT, but how strategies for their development and engagement plans are executed would benefit greatly from contextualisation.

4 Limitations of this report

There are a number of limitations with the current report. Two of these are detailed below to provide a constructive context for future work around SLO in the Beetaloo Basin and NT more generally.

Availability of data

The national survey dataset held by CSIRO contains 8,020 responses yet only 227 of these come from the NT. While this is certainly enough data to conduct the analyses provided in this report, it lacks face validity when speaking to the broader social context of the NT. In addition, none of these 227 NT respondents reported their location as being in the Beetaloo Basin. This is not surprising given the CSIRO survey was not conducted to meet the needs of the NT Fracking Inquiry, it speaks to a broader issue of data availability from regional and remote Australia. It is very difficult and expensive to collect meaningful amounts of quantitative or qualitative data from the NT. However, SLO is about voice and agency of community, and gaps in data that allow meaningful research around SLO in specific regions are a denial of voice and agency for those that are excluded.

Engagement of community members

The number of community members engaged for this report is small. While in part this reflects the scope for this particular component of work, it also reflects the difficulty in engaging community members in remote Australia in meaningful ways. Genuine research regarding SLO involves placing the community member at the centre of the research process and ensuring that participation has real benefit and no greater risk for them than they experience in their day to day lives. For Indigenous community members, these concerns are even greater and must also be considered within a context of existing and past research of this group of Australians which is extensive. Any primary research in this area must reflect a longer term commitment to listen and respond to what is said by community, to be transparent about the purpose of the work and that the research framework they are being asked to participate in is worthy of their trust and time.

Future research

Future research or work in the area of SLO must consider these two critical areas if it is to be successfully conducted. A value proposition for participation should be established that reduces

the number of times community members are engaged to provide the same information to external actors, that reflects real and immediate benefit for them as participants, and is appropriate to culture and norms regarding sharing of information. The NT, however, is a place that would benefit strongly from high quality provision of data in different forms for the purpose of understanding SLO for the gas industry, and other industrial activities that intersect with community member's lives. Such a framework of research may also be deployed to explore the views of Territorians about a range of other issues that are important to their lives, like provision of government services, where voice and agency are also less than optimal for many people living outside of the major NT population centres.

5 Measuring and monitoring SLO in the Beetaloo Basin and NT

Measuring and monitoring community sentiment in the Beetaloo Basin, and the NT more broadly, regarding gas development in a meaningful way is critical. Such an activity has value for the straight forward reason that community voice is often largely absent from discussions and decision making processes that shape development trajectories in the extractive industries, and this lack of voice is at the heart of much community-company conflict. Legislated and 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 often regularly asking the same communities similar questions over time. Our own practice, supported by 'listening tours' conducted by the Queensland Resources Council (QRC, 2016), would suggest 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 they themselves have little knowledge of. By successfully measuring and modelling the critical elements leading to social acceptance, companies can also prioritise their activities and investment in a way that maximises the creation of trust between an operation and the communities it works alongside. This also allows communities, companies and government stakeholders to engage with each other on the issues that matter before they reach a critical point and lead to conflict.

As requested by the panel, a process for measuring and monitoring SLO in the NT with respect to gas is detailed below, based on previous similar programs of work conducted by CSIRO:

5.1 Establishing trust in the framework

Measurement of SLO begins with understanding context and building trust in the measurement process. Establishing a trusted third party provider of this framework and measurement process is an important cue for community that the only interest being served by the collection of data is theirs; as a vehicle for their voice into the decision making context around gas development. To achieve this, funding arrangements and governance structures around collection and provision of community sentiment data must be established transparently, and any conflicts of interest (perceived or actual) explained, along with strategies to mitigate these.

Specifically, CSIRO conducts research activities with many companies, government departments and other actors in the resource extraction industry. How the organisation places the interests of community participants at the centre of its approach to human research is fundamental to the trust that it develops in new work that is initiated.

A chief mechanism for achieving this is having the independent CSIRO Human Research Ethics Committee review and approve the proposed research design. As with universities, CSIRO research that involves people can only proceed where it has ethical approval, and this approval comes with explicit conditions and provisions about the way that is must be executed that place the rights of participants first and ensures no harm will come to them. This is fundamentally important in building in establishing trust in the process. The ethics committee is then updated with any new information or developments as they arise through the initiation and execution of the research process to ensure that the conditions placed on the work are consistent with the needs of community members.

The boundaries of the measurement framework would also be established in this phase, determined ideally by the nature of the issues under investigation. In the case of SLO, this is a multi-scale issue. While members of communities in the Beetaloo Basin are clearly of central interest, community members in adjacent areas are important to include, as are residents in towns that will service the industry (e.g. Katherine, Tenant Creek), and Darwin. Sample sizes and emphasis may differ depending on location, but the social acceptance of the gas industry in the Beetaloo Basin is dependent on the views and experiences of people from all over the NT.

A CSIRO research team then works to understand the context in which this research is to be conducted in more detail. This stage involves:

- Meeting with key community stakeholders and understanding their value proposition for participating in the research process (i.e. why is it important to speak up about these topics? What do individuals and groups want in return for their participation? How can participation assist communities directly?)
- Building awareness of the intended program of work within the community more broadly through a range of communication channels (e.g. web site, radio, traditional media, social media, letterbox drops)
- Communicate how CSIRO does its work and protects the interests of community members that choose to participate

- Developing methodologies to ensure the research process is inclusive of all individuals and groups that choose to participate

5.2 Establishing the methodology

Once the context is understood clearly, the methodological tools required to provide voice to community members can then be developed. For the NT, this needs to be a mixed-methods approach. It is recommended that a survey methodology is used to collect most data within this framework, with the data collection method varied by social context.

Where literacy levels are sound and there is access to the internet, an online methodology may be used to collect the majority of data that will feed in to this SLO measurement and monitoring framework. The power of a survey methodology is that quality of data is generally higher and can be determined by researchers, data collection is more likely to be completed in private, and the data collected is quantitative allowing statistical analysis.

Where literacy levels are low and internet access is limited or non-existent, a different approach should be taken to ensure participants provide informed consent to participate, it is inclusive, and accurately reflects what people think. In this context then, two approaches are recommended. The first involves verbal completion of a stripped back survey instrument, facilitated by a trained researcher. This would involve the researcher asking questions of participants verbally, and inputting their response into a survey template using a tablet device. Data is then uploaded when the tablet comes into wifi range, or manually uploaded by the researcher. There are limitations in this approach and the selection of researchers and approach to data must be carefully conducted to reduce bias in its collection.

Where community members have little experience in completing surveys, low literacy levels or there are cultural reasons why survey methods are inappropriate or ineffective, a different approach must be taken. This approach should be developed with community members and not prescribed. For example, small group semi-structured discussions may be appropriate and effective to bring the voice of excluded and marginalised groups into a conversation about gas development. However, Aboriginal communities in particular are the subject of extensive research and engagement processes by many actors. A clear benefit for their participation must be developed in collaboration with these groups and a methodology for the inclusion of their voice developed by a trusted research agency, institution or other entity.

5.3 Conducting a benchmarking survey

It is important to understand not just what community members think about gas development but also why they think this way. As described in the literature review above, the mechanics of SLO are as important to understand as the baseline levels of each variable measured if an effective strategy for addressing concerns is to be developed. This requires the collection of a detailed baseline survey within the local and state populations, complemented by the more qualitative approach to groups where this is less appropriate.

In this survey, the following measures are recommended for inclusion:

- Demographic variables (age, gender, education, income, location, connection to place)
- Level of uncertainty around a range of potential positive impacts from gas development (e.g. employment, tax revenue, infrastructure development, local business benefits)
- Level of uncertainty around a range of potential negative impacts from gas development (e.g. impacts on ground and surface water, cultural heritage impacts, road traffic)
- (for local communities) experiences of interactions with existing companies in the gas industry, and other industries that also operate in the region
- Community wellbeing (e.g. life satisfaction, community suitability for a range of groups, affordability, amenity and liveability)
- Community expectations of companies operating in the gas industry
- Faith in governance institutions to protect the interests of community members
- Procedural and distributional fairness concerns
- Trust in a range of actors (e.g. the gas and other industries, government at different levels, small business owners, interest groups)
- Acceptance of a range of industries

It is recommended that key members of the community are supported to assist in encouraging members of their groups and networks to contribute their voices to this process. An incentive structure for participation that provides for community level rewards, rather than individual financial reward, should be strongly considered.

Data analysis may then be conducted, using an understanding of context developed through the engagement phase and the literature to guide the relationship tested. There are sophisticated methods available that allow the kind of analysis described in the literature review above that may be utilised in this process. The aim should always be to understand not just what community members think about particular topics or issues, but the mechanisms that underpin these perspectives. In SLO measurement and monitoring, the challenge is always to be thinking about

how data can continually and dynamically inform better practice rather than typical academic outcomes.

5.4 Accessing the data

The data collected is only effective in the context of SLO if it informs and supports better understanding within the relationships that constitute an SLO. To this end, feeding back results to community and other stakeholders in multiple ways, through multiple channels, in a language they can understand, is fundamentally important. Online platforms are very effective in providing data back to communities and stakeholders in an interactive and accessible form. The time between collection and provision should be as short as possible, even if that means staging the release of data as it is analysed. Other more traditional channels of communication are also effective and important, such as short graphical summaries of key themes in the data, bite sized segments of tailored for specific groups that may be designed as a postcard, or provision of embeddable charts for PowerPoint, are just a few examples of ways to enable community and stakeholders to access, digest and use the data collected. Examples of CSIRO work in this area are publicly accessible at https://research.csiro.au/localvoices/. This includes interactive data embedded in websites that allow community members to explore their own data for their area, explanation of key results in an accessible infographic format, and clear line of sight regarding who to contact if community have concerns or would like more information.

5.5 Reading the pulse of community

SLO exists in the dynamic everyday relationships that companies, government and citizens have with each other. Traditional forms of research in this area mismatch methodology to the phenomena being observed: A framework for measuring and monitoring SLO should seek to reflect the dynamism of these relationships through periodic data collection rather than static (i.e. yearly or biannually).

Depending on the nature of the issue or state of the relationship, this may vary between monthly and quarterly ‘pulse’ surveys. These pulse surveys should be much shorter than the baseline survey, taking less than five minutes to complete compared to best practice of around 20 minutes for a comprehensive baseline survey.

Pulse survey content is developed based on the key insights derived through the baseline survey, and may consist 8-10 items or questions completed online, by telephone or in person depending on group engaged and data collection processes employed.

Once enough pulse data has been collected over a period of time, longitudinal analysis of trends and patterns in the data may then be conducted to establish, for example, how effective government has been in building trust in the regulatory process, or the extent to which company engagement has increased reported knowledge of the industry and reduced local community uncertainty.

Typically, CSIRO conducts these types of measurement activities in a three-year cycle of activity, with a baseline survey followed by pulse surveys in the first year, continued pulse surveys for the balance of the three-year cycle and then a follow up baseline survey in year four.

5.6 Scaling data in a Territory based framework for SLO

For the NT, there is an opportunity to think about how a framework for SLO in gas may also be used as a framework for SLO across multiple industries and locations. Figure 8 illustrates how a system of scalable data collection may operate at a state or territory level. With consistent measures and methodologies, data collected at local community levels may be aggregated to provide basin or region level summaries, and then aggregated again to provide a Territory level summary of the current state of SLO. Integrating baseline and pulse data, this provides both the mechanism for improving SLO and the current level of each SLO attribute in close to real time to anyone that has an interest in it. Using contemporary technology platforms, these data may be made available in interactive dashboard formats through a secured or public web portal. By using the approach across multiple sectors, the per unit cost of data collected about gas may be reduced significantly.

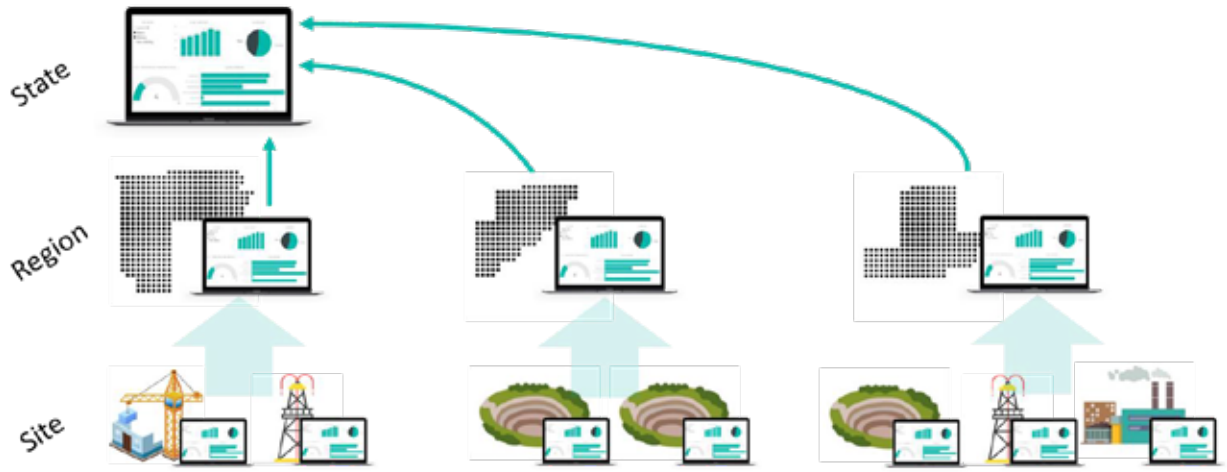

Figure 8. Illustrative example of how scalable data may work for SLO in the NT

5.7 Publication of results

Distinct from the publication of data for public and stakeholder consumption, the data itself should be published in a formal research output that is also available publically. This is important as it acts as a resource that sits behind the public facing measurement and monitoring framework, and provides confidence through peer review that the research is robust and has been tested independently.

5.8 The 'NT way'

Through establishing clear localised datasets, a NT framework for measuring and monitoring SLO, and Indigenous specific methods for reflecting the voices of remote and marginalised groups, it is then possible to create a context specific way of addressing SLO concerns. The information and importantly the process, of seeking and responding to community perspectives around gas development, provides the inputs required to create an 'NT way' for managing industrial development around gas and for other industries as well. There is a clear leadership role for the NT government here to establish this framework and support an agency or actor to conduct this work for the benefit and engagement of Territorians. This is challenging but required if trust in government is to be addressed meaningfully and the role that government may play in developing the gas industry in a manner that is acceptable to the citizens it represents. For industry, there is genuine challenge in making themselves somewhat vulnerable through such a framework and process. However, trust itself is dependent on vulnerability, and demonstrating that industry and

government is open to exploring and responding to challenging perspectives allows the establishment of an NT way for managing SLO that seeks to establish and develop trust between its key actors.

For regulators, this kind of framework provides invaluable input and guidance to provide to companies seeking to develop resources in the Territory and to inform a regulatory framework that is flexible and adaptive. It provides specific understanding about the mechanisms for building trust that engagement strategies should reflect (e.g. participation in decision making processes that affect communities), the issues that genuinely effect trust and acceptance of industry locally (e.g. it may be issues that are only evident through careful and sophisticated data analysis), and a way to determine the efficacy of regulated and suggested interventions by companies in their social context. These are not issues or processes that can be proscribed without sound data on which to base them, but through the collection of data across time in a framework such as the one described, this data is available to all and the rationale for action is clear and transparent.

6 Conclusion

Resources development is a complex and contested activity. Without local and broader community acceptance, or some kind of SLO, the development of an extractive industry is challenging. This is particularly the case for gas extraction utilising hydraulic fracturing technologies in a social context of uncertainty about the likely and potential impacts of these technologies on assets of significant community value, such as water quality and quantity in the NT. Yet there are clear markers in research examining SLO across multiple scales, commodities and jurisdictions that provide guidance around the issues that matter to communities and that drive the development of trust in an industry and its operators, and acceptance of their work.

Research presented in this report details the key drivers of trust and acceptance for the extractive industries. These include feeling heard, respected and involved in decision making processes (procedural fairness), feeling that the benefits (and impacts) of extraction are shared fairly (distributional fairness), that government has the capacity and will to ensure public interests are protected and industry held to account (governance capacity), that physical and social impacts are managed effectively and appropriately, and that interactions between company personnel and community members is a positive experience (contact quality). Analysis of family income inequality for the NT, calculated using 2006 and 2016 census data, revealed that the NT has declining family income equality. This is a baseline measure that allows for reflection on how the development of the gas industry may assist in redressing this trend, while the risks of exacerbating it were also discussed.

Engagement with industry, community and government stakeholders in the gas industry in the NT revealed that uncertainty about how the industry would look and fracking as a technology was a locus of attention for all of these stakeholders. There is a broad recognition that these technologies are not well understood beyond those that have been directly engaged by industry or have technical background. Reducing this uncertainty in a framework supported by government appears to be of real interest to most of those spoken with. And extending this, that government plays a more active and creative role in the discussion and engagement of these issues and the development of the industry itself.

Finally, there are well developed methods and models for measuring and monitoring SLO that may be applied to the NT. Key principles were described that should underpin such a framework,

including: independence and strong governance of any research, transparency of process and provision of data to all stakeholders, ensuring work is conducted under strict guidelines for ethical research practices, and that such research should aim to connect stakeholders through common understanding rather than isolate them in oppositional silos.

There is great opportunity for the NT to determine the conditions under which any future gas industry is developed, taking the best and most current lessons from other jurisdictions and defining 'the NT way' forward. With respect to SLO, an industry won't be possible without achieving some level of acceptance in local communities and 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 to influence development trajectories. Without these constructive mechanisms, communities and interest groups will find creative ways to achieve influence.

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