

### Scientific Inquiry into Hydraulic Fracturing Final Implementation Report

hydraulicfracturing.nt.gov.au







### **Chief Minister's Statement**

As we move to a net-zero world, the Northern Territory Government's number one priority is creating opportunities for Territorians. Along with our world-class renewable resources, our highly prospective onshore gas resources will support our energy security during the transition to renewables — and will improve living standards for all Territorians. We are careful and balanced in managing the transition so that we never lose sight of what makes the Territory the best place to live. That is why the Northern Territory Government has undertaken a very considered approach.

In 2018, the Scientific Inquiry into Hydraulic Fracturing, chaired by Justice Rachel Pepper, concluded in its final report that risks posed by the onshore gas industry, could be managed if all of the Inquiry's 135 recommendations were implemented.

Over the last four years, the Territory Government has been working to implement those recommendations by developing multiple safeguards for the regulation and monitoring of an onshore gas industry. That work has been overseen by Dr David Ritchie, who was a member of the original Inquiry panel. As Independent Officer, operating at arm's length from government, Dr Ritchie has provided regular published reports on how Government is progressing with this work. Dr Ritchie's remit has been to provide advice to my government that ensures an onshore gas industry that will be operating to world's best practice and, accordingly, we will deliver tough and uncompromising new measures that will safeguard the Territory's environment and culture. We now have a strong regulatory framework in place and a clear pathway that continues to ensure that Aboriginal people have a say.

A major part of the Government's response has been the Strategic Regional Environmental and Baseline Assessment (SREBA), which is the most comprehensive series of scientific studies on a region, ever conducted in the Northern Territory. This large body of data and research from the SREBA will be used to assess risks and help monitor and mitigate impacts on the Beetaloo region in the future. There are now much stronger environmental, cultural, social, economic and health protections in place than ever existed before the Inquiry was held.

Our Government will now move to carefully manage the onshore gas industry through our strengthened regulatory framework, ensuring greater transparency and accountability – and with Aboriginal people having a seat at the table. This means all applications made for gas production in the Beetaloo Sub-basin — subject to the industry's successful exploration and appraisal results — will go through a rigorous approval and monitoring process. We will also continually assess these reforms and be responsive to opportunities to refine or adapt as required. The new industry standards set the bar high with clear expectations and transparency for industry compliance.

As we move forward, I will continue to listen to and work with Territorians. Together, we will increase local job opportunities, expand the Territory's economy and maintain our unique culture and environment.

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Natasha Fyles Chief Minister of the Northern Territory

### Introduction

The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (the Inquiry), conducted by the Hon. Justice Rachel Pepper in 2017 and 2018, identified a variety of risks the onshore petroleum industry poses to the environmental, social, cultural and economic conditions of the Northern Territory (the Territory). The Final Report of the Inquiry recommended these risks could be mitigated to an acceptable level through the implementation of multiple safeguard actions.

Over the past 4 years, Northern Territory Government (NT Government) agencies have worked collaboratively to complete a meaningful agenda of system reform, implementing the transformative reforms set out in the Inquiry recommendations and establishing a new benchmark for industry. The Scientific Inquiry into Hydraulic Fracturing Final Implementation Report (the Final Implementation Report) sets out the actions the NT Government has taken to mitigate the risks associated with the development of the onshore petroleum industry in the Territory.

Full implementation of these actions has established a new benchmark for regulating and monitoring the onshore petroleum industry in the Territory.

Completing implementation signals the NT Government is transitioning its regulation of onshore petroleum activities and hydraulic fracturing in the Territory to business-as-usual arrangements. This means the NT Government will move its focus from system reform to ongoing regulation, monitoring and evaluation of the onshore petroleum industry. This will allow the NT Government to monitor that its reforms work in action and to be responsive to any opportunities to improve the regulation of the onshore petroleum industry.

### Final Implementation Report Structure - Chapters

This Report is structured to provide a detailed assessment of the Inquiry's findings. Outline the actions and mitigations, and outline the ongoing monitoring measures in place as the NT Government moves to business-as-usual regulation and monitoring.

The Table at Appendix 1, developed in consultation with the Independent Overseer, sets out the findings originally identified by the Inquiry and maps the relationship between the recommendations designed to mitigate them. Each chapter in this report reflects the implementation of many recommendations that mitigate the findings from the Inquiry, individually and in combination.

As a result, some mitigation strategies are detailed in multiple chapters of this Report. This means each chapter addresses the reforms implemented to mitigate the central risk outlined in the chapter, and can be read in isolation. As some of the Inquiry's recommendations were aimed to mitigate multiple risks, the same mitigation reforms may be included in multiple chapters, leading to some duplication of content. References to other chapters have been included to direct readers to a more detailed explanation of the reforms and reduce the repetitiveness and length of the report.

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### Background (The journey so far)

### The Inquiry

The NT Government announced a moratorium on hydraulic fracturing of onshore unconventional shale gas reservoirs in the Territory on 14 September 2016, and established the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (the Inquiry) on 3 December 2016.

Chaired by the Hon. Justice Rachel Pepper and comprising a multi-disciplinary team of eminent scientists, the Inquiry was tasked to investigate hydraulic fracturing and the risks associated with onshore petroleum industry development. This included risks to the environmental, social, cultural and economic conditions of the Territory, if and how these risks could be mitigated, and the ability of existing controls to effectively regulate the industry.

The Inquiry undertook extensive consultation, including receiving oral and written submissions from the public and industry stakeholders, visiting projects using hydraulic fracturing interstate and overseas, and analysing the best and most current scientific evidence available. On 27 March 2018, the Inquiry released its Final Report.

The Final Report contained 135 recommendations to mitigate the risks associated with onshore petroleum industry development to levels that would be acceptable for the Territory.

### Northern Territory Government Response the Implementation Plan

The NT Government formally accepted all 135 of the Inquiry's recommendations on 17 April 2018 (noting that three of the recommendations were split into two parts, resulting in a total of 138 recommendations for implementation). The NT Government committed to take the necessary time to review, consult, legislate and reform the regulatory framework to ensure that, in the event approval is granted to move to the production phase and production applications are considered, the framework is robust and ready to manage any onshore petroleum production activity. The NT Government's acceptance of the Inquiry recommendations in their entirety demonstrated an ability and willingness to regulate the onshore petroleum industry and engender greater community confidence, while mitigating the risks identified by the Inquiry, which were instrumental in informing the intent of the recommendations.

To deliver the new regulatory regime, the NT Government established a centralised unit in the Department of the Chief Minister and Cabinet (CM&C) to coordinate effective and timely implementation of the reforms recommended by the Inquiry. The NT Government released the Scientific Inquiry into Hydraulic Fracturing Implementation Plan (the Implementation Plan) on 17 July 2018. The Implementation Plan was developed in collaboration with relevant NT Government agencies, and outlined how the NT Government would fulfil the Inquiry recommendations, and at what stage of the reform process each action would occur.

In the Implementation Plan, the NT Government grouped the recommendations into six reform areas, all of which advanced the objective of building trust through transparency:

- Strengthening Regulation
- Ensuring Accountable Industry Practice
- Safeguarding Water and the Environment
- Respecting Community and Culture
- Maximising Regional Benefits and Local Opportunities
- Planning for Industry.

A steering committee of chief executives from relevant NT Government agencies guided the work of the Hydraulic Fracturing Inquiry Implementation Taskforce, overseeing the delivery of the Implementation Plan and reported to the NT Government on implementation progress.

Throughout the implementation process, the NT Government's progress was monitored and reported by the Independent Overseer, Dr David Ritchie, to ensure the approach to implementing each recommendation met the Inquiry's intent. Along the way, the Onshore Shale Gas Community and Business Reference Group, which was established to provide direct feedback and advice on the implementation of Inquiry recommendations, received updates and shared its advice on the delivery and execution of the recommendations.

Through these arrangements, NT Government agencies have worked collaboratively over the past 4 years to complete a meaningful agenda of system reform, implementing the transformative reforms set out in the Inquiry recommendations and establishing a new benchmark for industry. This included completion of 31 recommendations designed to mitigate the risks associated with petroleum exploration activities, which the Inquiry required to be completed before exploration activities could occur. The NT Government implemented these 31 recommendations and announced on 24 July 2019 that exploration activities could recommence.

In addition to delivering on the recommendations, the NT Government provided regular public updates via the Hydraulic Fracturing website to keep the community informed of its progress on implementation. This included regular community bulletins that provided information about the recommendations' status and opportunities for the community to engage. Fact sheets, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), were published in English and recorded in 17 Aboriginal languages to provide clear, factual and relevant information on topics connected with onshore petroleum industry development and hydraulic fracturing. These materials and status updates are available at hydraulicfracturing.nt.gov.au

Reporting during implementation focused on the NT Government's completion of individual recommendations to provide a clear picture of progress against the Implementation Plan. As this process reaches its conclusion, with all recommendations implemented, the NT Government will now focus on ongoing regulation and oversight of the onshore petroleum industry and hydraulic fracturing in the Territory, through the improved regulatory framework and the development of robust information to inform decision making which have been established to implement the Inquiry's recommendations.

The NT Government accepted all the Inquiry's recommendations based on the Inquiry's advice that accepting and implementing the recommendations in their entirety was required to reduce the risks associated with onshore petroleum industry development to acceptable levels and, in some instances, avoid them altogether. Before any production licence applications can be assessed, the NT Government has stated that it must be satisfied the reforms implemented over the past 4 years have achieved this objective.

The Final Implementation Report examines the risks identified by the Inquiry and explains how the implementation actions taken by the NT Government over the last 4 years have combined to mitigate these risks to acceptable levels.

The Inquiry recommendation dashboard remains available online at <u>hydraulicfracturing.nt.gov.au</u> to report the level of completion of individual recommendations.

## Completion of Implementation is not the end – ongoing regulation and oversight

The completion of the implementation stage for the Inquiry recommendations also marks the beginning of ongoing risk management of the onshore petroleum industry as part of everyday activity and regulation.

Noting that many of the reforms have been in operation and applied to the onshore petroleum industry's exploration activities since their implementation, regulation of the petroleum industry will now become business-as-usual for the Territory as the industry moves towards production. The NT Government has the responsibility to regulate and monitor the industry, and evaluate the effectiveness of the reforms implemented to address the Inquiry recommendations.

The NT Government has an ongoing role as the regulator for the onshore petroleum industry, which includes the assessment of any applications for petroleum production to make sure proponents meet the new industry standards and will continue to comply with the Territory's laws. As the regulator, the NT Government will monitor and report on industry compliance with the regulatory framework and pursue enforcement action when necessary.

The NT Government will also monitor and evaluate the effectiveness of the improved regulatory framework to ensure there is an ongoing process of quality assurance and that the reforms remain effective over time. The Monitoring and Compliance Strategy is scheduled for review by the Department of Industry, Tourism and Trade (DITT) and the Department of Environment, Parks and Water Security (DEPWS) in 2023, in light of the expanded range of enforcement powers and mechanisms introduced to the petroleum legislation. As the onshore petroleum industry develops and its likely scale becomes clear, the NT Government will also assess the ongoing need for additional regulatory reforms, such as the introduction of a single, separate and independent regulator for the onshore petroleum industry, and additional whistleblower protections.

The NT Government established the Strategic Regional Environmental Baseline Assessment (SREBA) to provide comprehensive and reliable data across six domains that address the substantial information gaps identified by the Inquiry. The studies produced detailed baseline information, detailed data and recommendations for monitoring indicators that the NT Government will use to assess project impacts and to develop monitoring plans.

The social, cultural and economic SREBA study provides a clear description of the emergent values and thresholds of community acceptance. The study identified ongoing opportunities to continue engagement and strengthen relationships with communities who may be impacted by onshore petroleum industry development. This includes establishing an ongoing monitoring program to monitor community sentiment, concerns and aspirations, and to continue to build on the existing knowledge base.

This report outlines the ongoing work the NT Government will undertake to ensure that its response to and regulation of hydraulic fracturing and the onshore petroleum industry continues to mitigate the risks identified by the Inquiry.

### Architecture of the Inquiry



### **Hydraulic Fracturing Inquiry - KEY DATES**

**14/09/ 2016.** Moratorium on hydraulic fracturing of onshore unconventional gas reservoirs in the Northern Territory announced.

**03/12/2016.** Scientific Inquiry into Hydraulic Fracturing in the Northern Territory established.

**03/12/2016 – 27/03/2018.** Inquiry Panel, led by the Hon. Justice Rachel Pepper, undertake extensive consultation, research and analysis.

**27/03/2018.** Scientific Inquiry into Hydraulic Fracturing in the Northern Territory Final Report released, making 135 recommendations.

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**17/04/2018.** Northern Territory Government accepts all the Inquiry's recommendations.

19/04/2018. Dr David Richie appointed independent Overseer.

**17/07/2018.** Scientific Inquiry into Hydraulic Fracturing Implementation Plan released, outlining Government's plan to fulfil the Inquiry's recommendations.

**03/05/2023.** Scientific Inquiry into Hydraulic Fracturing Final Implementation Report released.

### STAGE

Inquiry

Implementation

**17/07/2018.** First meeting of the Onshore Shale Gas Community and Business Reference Group.

**17/07/2018 - 31/12/2022.** Northern Territory Government agencies collaborate to implement program of reforms.

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Ongoing regulation and monitoring

**03/05/2023.** Northern Territory Government transitions to business-as-usual role of regulation, monitoring and evaluation of the industry.

### Glossary

Acronym	Full name
AAPA	Aboriginal Areas Protection Authority
AIS	Aboriginal Interpreter Service
AAPA	Aboriginal Areas Protection Authority
AIS	Aboriginal Interpreter Service
APPEA	Australian Petroleum and Production Exploration Association
CEO	Chief Executive Officer
CM&C	Department of the Chief Minister and Cabinet
CEIP	Community Engagement and Information Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth (indicating legislation administered by the Commonwealth Government)
DEPWS	Department of Environment, Parks and Water Security
DENR	Department of Energy and Natural Resources
DIPL	Department of Infrastructure, Planning and Logistics
DITT	Department of Industry, Tourism and Trade
DPIR	The former Department of Primary Industry and Resources, whose functions were transferred to the current Department of Industry, Tourism and Trade
DTF	Department of Treasury and Finance
EMP	Environment Management Plan
ESD	Ecologically Sustainable Development
GISERA	Gas Industry Social and Environmental Research Alliance
ICN NT	Industry Capability Network Northern Territory
ISAC NT	Industry Skills Advisory Council Northern Territory
KPI	Key performance indicator
NT	Northern Territory
NTCAT	Northern Territory Civil and Administrative Tribunal
NTEPA	Northern Territory Environment Protection Authority
SIA	Social Impact Assessment
SREBA	Strategic Regional Environmental and Baseline Assessment
WAP	Water Allocation Plan
WOMP	Well Operations Management Plan

Key Term	Definition
Activity permissioning plans	Plans for specific activities which are required for legislative approvals. For
Administrative review	Legal proceedings in which a court or tribunal considers the legality, validity or merits of a decision made by a public officer e.g. the decision of a Minister to grant a petroleum exploration permit.
Authority Certificate	A certificate issued by the Aboriginal Areas Protection Authority which evidences the presence of sacred sites within the area covered by the certificate.
Beetaloo Sub-basin	The Beetaloo Sub-basin is located 500 kilometres south-east of Darwin and covers 28,000 square kilometres. The Sub-basin is expected to contain significant natural gas reserves and is the focus of petroleum exploration in the Northern Territory.
Clean Energy Regulator	The independent statutory authority established to administer Commonwealth Government schemes for measuring, managing, reducing or offsetting Australia's carbon emissions.
Code of Practice	The 'Code of Practice: Onshore Petroleum Activities in the Northern Territory' (approved in July 2019 by the Minister for Environment and Natural Resources and the Minister for Primary Industry and Resources).
Controller of Water Resources	The person appointed under the <i>Water Act 1992</i> by the Minister of Environment, Climate Change and Water Security to administer specific statutory powers contained in the Act.
Decision-maker	For the purposes of this report, the person with the regulatory authority to make a decision about the onshore petroleum industry.
Flowback fluid	After hydraulic fracturing is complete, a portion of the hydraulic fracturing fluid will flow back up the wellbore and return to the surface. This return water is called 'flowback' and contains some of the hydraulic fluid that was used.
Hydraulic Fracturing Inquiry Implementation Taskforce	The taskforce established within the Department of the Chief Minister and Cabinet to coordinate the delivery of the Inquiry recommendations.
Implementation Plan	The Scientific Inquiry into Hydraulic Fracturing Implementation Plan, which the NT Government developed to plan its delivery of the Inquiry recommendations.
Independent Overseer	Dr David Ritchie was appointed the Independent Officer in 2018 to oversee the implementation of the recommendations. Dr Ritchie was a member of the Inquiry Panel that consulted widely with the Northern Territory community to hear their views on hydraulic fracturing.
	The role of the Independent Officer is to provide the Chief Minister and government with independent advice on how the implementation is progressing and being managed. The nature of this role requires the Independent Officer to remain at arms-length from day-to-day decisions and processes relating to implementation.

Key Term	Definition
Indigenous Protected Areas	Areas of land and sea managed by Aboriginal groups as protected areas for biodiversity conservation, in accordance with Traditional Owners' objectives, through voluntary agreements with the Australian Government. Indigenous Protected Areas are part of the National Reserve System.
Inquiry	The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory, conducted by the Hon. Justice Rachel Pepper in 2017 and 2018.
Interest holder	A person who holds a title or approval relating to petroleum activities, such as an exploration permit or production licence under the <i>Petroleum Act</i> 1984, or an environmental approval under the Petroleum (Environment) Regulations 2016. In this report, 'interest holder' is used interchangeably with proponent (see below for definition).
Land Councils	Aboriginal Land Councils established under the Aboriginal Land Rights (Northern Territory) Act 1976 (Cth)
National Water Initiative	The framework and principles agreed by all Australian governments in 2004 for the sustainable management of water resources.
Onshore petroleum industry	Industry participants and activities which involve exploration for and extraction and production of natural gas from onshore unconventional shale gas reservoirs in the Northern Territory. The nature of these reservoirs requires enhanced techniques (e.g. hydraulic fracturing) to produce the resource.
Petroleum Legislation	The suite of legislation and regulation which regulates the petroleum industry, including the <i>Petroleum Act 1984</i> , Petroleum Regulations 2020, and the Petroleum (Environment) Regulations 2016.
Plaintiff	A party who brings legal proceedings against another person.
Proponent	A project developer. In this report, 'proponent' refers to the developer of an onshore petroleum project, and may include an interest holder (see above for definition).
Royalties	Payments made to the NT Government, as the owner of petroleum resources, in consideration of a right granted to extract and remove this resource.
Territory	The geopolitical entity of the Northern Territory, which includes the landmass and population within its geographical boundaries.
Traditional Owners	Aboriginal groups and families with traditional ownership and custodianship of land, either as landowners under the <i>Aboriginal Land Rights (Northern</i> <i>Territory) Act 1976</i> (Cth) or native title holders under the <i>Native Title Act</i> <i>1993</i> (Cth)
Water Control Districts	Administrative boundaries for water planning and licensing in the Northern Territory, declared by the Minister for Environment, Climate Change and Water Security under the <i>Water Act 1992</i> .

#### Legislation

Aboriginal Land Rights (Northern Territory) Act 1976 (Cth)

Environmental Offences and Penalties Regulations 2011

Environment Protection Act 2019

Environment Protection and Biodiversity Conservation 1999 (Cth)

Environment Protection Regulations 2020

Inquiries Act 1945

Native Title Act 1993 (Cth)

Northern Territory Aboriginal Sacred Sites Act 1989

Northern Territory Environment Protection Authority Act 2012

Petroleum Act 1984

Petroleum Regulations 2020

Petroleum (Environment) Regulations 2016

Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2010

Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations 2011

Water Act 1992

Water Regulations 1992



# 1. Strengthening the regulatory environment

Separation of environmental and industry regulatory powers MITIGATION

Strengthened regulatory powers, offences and penalties

Mandatory consultation on land releases

'Fit and proper person' test for petroleum permits and licences

Environmental 'chain of responsibility' laws

Widened standing for administrative review of key decisions

**Dedicated hotline for anonymous** non-compliance reporting

**Community Engagement and Information Program** 

Land access agreements with minimum landholder protections

Cost recovery and financial assurance

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### 1.1 Context

### 1.1.1 Role of the Inquiry

By establishing the Inquiry, the NT Government acknowledged community concerns about the risks of hydraulic fracturing and the development of an onshore petroleum industry in the Territory, and the need for a better understanding of these risks and how they can be mitigated.

The Inquiry was established in accordance with the provisions of the *Inquiries Act 1945*. The Inquiry was directed to assess and determine:

- the nature and extent of the risks associated with hydraulic fracturing of onshore unconventional shale gas reservoirs and its associated activities on the environmental (aquatic, terrestrial and atmospheric), social, cultural and economic conditions of the Northern Territory
- whether these risks can be mitigated to an acceptable level
- if they can, by what methodology or methodologies these risks can be mitigated
- whether the existing regulatory framework is sufficient to implement these methodologies and, if not, what changes need to be made.

### 1.1.2 Inquiry findings on the Territory's petroleum industry regulations circa 2018

Based on the submissions it received, the Inquiry found public sentiment tended towards distrust in the NT Government to make decisions in the best interests of the community and a lack of confidence in the regulatory framework at the time as it applied to hydraulic fracturing and the onshore petroleum industry. It was also evident in the submissions received that the onshore petroleum industry had very little social licence to operate in the Territory. The Inquiry noted from a report it had commissioned at the outset of the Inquiry that this low trust of the unconventional petroleum industry was part of a worldwide phenomenon.<sup>1</sup> The Inquiry found that community concerns about the previous regulatory framework were justified; and the risk of using this framework to regulate a developing onshore petroleum industry was such that it could not adequately manage key issues raised by the Inquiry, such as:

- environmental protection, including the protection of water, land, and air
- remediation and rehabilitation of any environmental damage caused by hydraulic fracturing and associated activities, paid for by the entity that caused the harm
- balancing the rights of landowners, occupiers and Traditional Owners with those of petroleum companies.

Prior to the Inquiry, there was limited accountability or transparency on how the onshore petroleum industry was regulated in the Territory. Although proponents' approved Environment Management Plans (EMPs) were published, as were the reasons for the decisions relating to EMPs, the community did not have an opportunity to comment on EMPs. Transparency mechanisms were limited only to the titling process. There were also limited opportunities for the review of NT Government decisions made in relation to the onshore petroleum industry.

Prior to the Inquiry, the Minister for Resources was responsible for regulating both environmental protection and industrial operations for the onshore petroleum industry. The Inquiry found this contributed to the risk and perceptions of regulatory capture, due to the responsibility for environmental and operational regulation sitting with the same Minister and department. The Inquiry found the regulatory framework did not provide sufficient tools, powers or functions to separate these regulatory responsibilities and reduce the risk of the regulator being perceived as inappropriately aligned with the onshore petroleum industry, and therefore reluctant to regulate against the industry's interests.

<sup>1</sup> Centre for Social Responsibility in Mining, Sustainable Minerals Institute and the University of Queensland, (2018) *Final Report: A framework for Social Impact Assessment of shale gas development in the Northern Territory*, p63 Prior to the Inquiry, principles of ecologically sustainable development (ESD) were only required to be considered when the Minister approved an EMP under the Petroleum (Environment) Regulations 2016. The Inquiry determined this was not sufficient and that the principles of ESD needed to be operationalised for key decisions under the **Petroleum Act 1984** and the Petroleum Regulations 2020 – including the grant of petroleum titles.

At the time of the Inquiry there was no legislative requirement for land access agreements to be in place between petroleum companies and pastoralists; rather there was a process that encouraged agreement including mediating an agreement through a land access panel which was made up of representatives of relevant NT Government agencies, the Australian Petroleum Production and Exploration Association (APPEA) and the Northern Territory Cattlemen's Association. The Inquiry found there was tension and unease about this process and that the process was generally considered by pastoralists to be inadequate. The Inquiry determined that the rights of pastoralists and petroleum companies were not appropriately balanced and that, if agreements were reached, they lacked sufficient protections and benefits for pastoralists including compensation or consultation to minimise disturbance to pastoral activities. The Inquiry also found the costs to seek legal advice about such agreements could be prohibitive.

Prior to the Inquiry, there was no legislative requirement for the Minister for Resources to consult with the community before releasing land for exploration, no requirement to publish the reasons for deciding to release land, and no right for members of the community to seek a review of the decision made. The former Department of Primary Industry and Resources (DPIR) did have policies in place for undertaking land release activities that sought comments from persons with an interest in the land, which were then provided to the Minister, but these were not legislated or prescriptive processes. Additionally, the tools available to the then-DPIR under the *Petroleum Act 1984* to regulate the industry were inadequate and did not support a modern and robust regulatory framework. The Inquiry found the legislative framework provided for offences and infringement notices, but offered little in the way of nuanced regulatory measures to obtain and restore compliance, including suitably proportionate enforcement tools. The Inquiry recommended additional enforcement powers and mechanisms be made available to enable action to be taken proportionate to the risk posed by any non-compliance.

To earn and maintain public trust, it is essential that governments are unbiased, transparent, and act democratically. This includes demonstrating the government's ability to regulate industries effectively and fairly, for example by taking appropriate compliance and enforcement action when necessary. The Inquiry noted that it is incumbent on the NT Government to create a policy and regulatory regime that strikes the right balance between attracting petroleum companies to the Territory to explore for and extract petroleum and, on the other hand, ensuring that such development is regulated effectively and in accordance with community expectations over time.

Of particular note is that the Inquiry made 58 separate recommendations in relation to issues and risks generated by the distrust in government and its ability to regulate the onshore petroleum industry. These recommendations aimed to deliver a robust regulatory framework that would be able to endure over time and anticipate future needs to provide confidence to the community that the industry will be appropriately regulated into the future.

### 1.2 Reforms implemented to mitigate the risks

### 1.2.1 Regulation and the integrity of decision-making

A robust regulatory framework is the principal way for the NT Government to ensure that the development of an onshore petroleum industry, including the operation, closure and post-closure monitoring of projects, occurs in a way that protects human safety and the environment and meets community expectations. A strengthened regulatory regime also ensures the integrity and accountability of NT Government decision-making processes.

Since the release of the Inquiry's Final Report in 2018, the NT Government has completed a significant system reform agenda to implement the Inquiry recommendations and address the risks associated with distrust in relation to the regulation of the onshore petroleum industry. This integrated package of legislative reforms has increased accountability, integrity and the ability for public scrutiny of NT Government decisions relating to the onshore petroleum industry.

The reforms have produced a post-Inquiry regulatory environment that is considerably different to that in place at the outset of the Inquiry. The reform program included four stages of legislative amendment, the creation of new policies and processes, and the publication of various supporting materials such as guidance notes and a Code of Practice. These combined efforts have now established a best practice regulatory environment where there is clear guidance and expectations for potential industry activity, in which the broader community can be confident that the NT Government has listened and responded to concerns.

To improve the community's faith in the NT Government's ability to regulate the onshore petroleum industry and enforce compliance, a suite of new compliance and enforcement measures were also introduced to strengthen and build public confidence in the regulatory framework.

### 1.2.1.1 Approvals under the Petroleum Act 1984 and the Environment Protection Act 2019

To ensure the independence and accountability of regulators for the onshore petroleum industry, the NT Government transferred responsibility for environmental regulation of the onshore petroleum industry to the Minister for Environment, Climate Change and Water Security, while the Minister for Mining and Industry retains all other regulatory powers under the Petroleum Act 1984. This separation of regulatory powers for the onshore petroleum industry is designed to secure the independence of decision-making by removing the potential for regulatory conflict arising from a decision-maker holding responsibilities for both environmental regulation and industry development. Separating these functions reduces the risk of the NT Government being the subject of undue influence by the onshore petroleum industry in decisions relating to environmental regulation. The Minister for Environment, Climate Change and Water Security has been the decision-maker for all EMP approvals since February 2019.

Amendments to the Petroleum Act 1984 and the Petroleum (Environment) Regulations 2016 introduced a 'fit and proper person' test to ensure the Minister for Mining and Industry only grants permits and licences to appropriate persons, after taking into account a range of matters relevant to determining if a person is appropriate to hold a permit or licence under the Act. These matters include the person's character, past compliance with regulations, technical competence, and any previous bankruptcy, fraud or dishonesty. Mandatory consideration of criteria about the appropriateness of the applicant to hold a permit or licence under the Petroleum Act 1984 aims to ensure the Territory develops a safe and compliant onshore petroleum industry by preventing proponents who are unlikely to respect and uphold Territory laws benefitting from the extraction of Territory resources.

The Minister for Mining and Industry must also consider the principles of ESD when making a number of decisions under the *Petroleum Act* **1984**, including the approval of Well Operations Management Plans (WOMPs). This means that the protection of the environment (water, land and air) from the risks associated with hydraulic fracturing is a consideration in all key decisions under the *Petroleum Act* **1984**, the Petroleum Regulations 2020, and the Petroleum (Environment) Regulations 2016.

The Territory's environmental impact assessment framework has also been substantially revised through the repeal of the **Environmental Assessment Act 1982** and introduction of the **Environment Protection Act 2019**. These reforms provided the Northern Territory Environment Protection Authority (NT EPA) with an improved regulatory framework to independently consider significant impacts through project-level assessments and strategic assessments of a larger development area. The *Environment Protection Act 2019* introduced a new 'environmental approval' to which the Minister for Environment, Climate Change and Water Security may attach conditions to manage the risk of significant impacts for approved projects. At the time of preparing this report, no petroleum activities had been referred to the NT EPA for environmental impact assessment.

The Northern Territory Environment Protection Authority Act 2012 was also amended to provide a mechanism by which any Minister can seek specific advice about proposals, policies, plans and other measures to protect the environment. These reforms have been used by the Minister to request the NT EPA provide advice on all EMPs under assessment to inform EMP approval decisions, with the NT EPA's advice to the Minister being published.



#### Assessing cumulative impacts

The NT Government implemented a series of reforms and commissioned independent analysis to make sure the cumulative impacts of onshore petroleum industry development are considered in the environmental assessment process.

The Strategic Regional Environmental Baseline Assessment (SREBA) provided new environmental baseline data to enhance the assessment of environmental impacts from onshore petroleum industry activities. This detailed information strengthens the data available to design and plan future development and assess the cumulative impacts of onshore petroleum industry development for the Beetaloo Subbasin region. See **Chapter 2 – Addressing a lack of knowledge** for more information about SREBA.

The NT Government has ensured the cumulative impacts of onshore petroleum industry activities are assessed by removing the caveat 'as far as practicable' from the regulatory requirement for EMPs to assess impacts cumulatively. Proponents must include in their EMP an assessment of cumulative impacts, including the impacts of their project in conjunction with petroleum exploration and production activities, or the exploration and extraction of minerals. This removes any doubt that cumulative impacts and risks need to be considered in an EMP and ensures that this information is provided for consideration by decision-makers and the community.

New and amended legislation enables the assessment of impacts to the environment and water resources at a regional scale. The revision of the Territory's environmental impact assessment framework and introduction of the *Environment Protection Act 2019* provided a new regulatory framework for assessing the impacts of a broad policy or work program, rather than assessing all projects and their impacts individually. Water Allocation Plans (WAPs) in the *Water Act 1992* inform decisions about granting or refusing water extraction licenses by considering the impact of extraction to the relevant basin and to the availability of water for other purposes. A WAP is being developed for the Georgina and Wiso Basins, covering areas of prospective production in the Beetaloo Sub-basin.

#### 1.2.1.2 Changes to petroleum regulations

Implementing a host of legislative changes required a complementary revision of associated regulations and the administration of the framework to support and give practical effect to the legislation.

The Petroleum (Environment) Regulations 2016 were amended to improve the transparency of and opportunity for public comment on EMPs. The regulations improve transparency by requiring all draft EMPs for the drilling of petroleum wells and hydraulic fracturing activities to be advertised for a 28-day public comment period. Any comments received must be published online and considered by the Minister for Environment, Climate Change and Water Security before making a decision on the draft EMP. Amendments to the Petroleum (Environment) Regulations 2016 that were designed to improve public confidence in the regulatory regime include the publication of:

- full EMPs for drilling and hydraulic fracturing activities for public comment
- all public comments on drilling and hydraulic fracturing EMPs
- all approved EMPs
- reportable and recordable incidents and associated reports
- annual environment performance reports provided by interest holders, outlining compliance with approved plans
- interest holder reports about flowback fluids and produced water

- annual greenhouse gas emissions reports from interest holders
- environmental monitoring results
- hydraulic fracturing fluid risk assessments
- drilling waste assessments.

Amendments to the Petroleum (Environment) Regulations 2016 require the Minister to publish written notices of reportable incidents, final reports about reportable incidents, and reports about recordable incidents within 2 business days of the Minister receiving the notice or report.

Amendments to the Petroleum Act 1984 and the Petroleum (Environment) Regulations 2016 also created the power for the ministers for Mining and Industry and Environment, Climate Change, and Water Security to establish a code of practice for onshore petroleum activities. The 'Code of Practice: Onshore Petroleum Activities in the Northern Territory' (Code of Practice) was approved in June 2019. Under the Petroleum (Environment) Regulations 2016, all EMPs and WOMPs submitted for approval must now demonstrate compliance with the Code of Practice and other requirements of the Petroleum (Environment) Regulations 2016. The Code of Practice provides minimum standards to which the onshore petroleum industry in the Territory must adhere. The Code of Practice draws on world-leading methods to set standards that address a broad range of environmental risks identified in the Inquiry. The Code of Practice identifies requirements for reporting in relation to matters such as water and wastewater.

Subsequent amendments to the *Petroleum Act* **1984**, the Petroleum Regulations 2020, and the Petroleum (Environment) Regulations 2016 further strengthened the role of the Code of Practice. The amendments introduced compliance with an approved Code as an approval criterion for a permissioning plan, and provided that approved Codes are admissible in proceedings for an offence against the petroleum legislation as evidence of compliance.

#### 1.2.1.3 Water regulation and licensing

The NT Government completed significant reforms to the Water Act and the regulation of water use by the petroleum industry. As the key concern raised by the community, the reforms deliver on Inquiry recommendations designed to mitigate risks to the Territory's water resources, which are essential to local communities, coexisting industry and cultural use by Aboriginal people.

Amendments to the Water Act removed a provision which exempted mining and petroleum activities from the licensing and permitting requirements of the Act, ensuring applications for water resources to support onshore petroleum activities are transparently assessed and managed in accordance with the Act and related policies. These same amendments also saw the commencement of new compliance and enforcement tools and a substantive increase in penalties for breaches of the Water Act commensurate with community expectations. Further reforms to the Act to prohibit surface water take and waste water disposal, among other things were also commenced and now apply to the petroleum sector.

The Daly Roper Beetaloo Water Control District was declared on 20 July 2018, and extended on 19 October 2022 to encapsulate water resources in the Beetaloo region, to ensure any bore drilling or water extraction in this area was captured under the permit and licensing regime. The declaration of a Water Control District enables the development of Water Allocation Plans (WAPs). WAPs are based on the protection and preservation of environmental and cultural values, and set limits and rules for water allocation that are tailored to the region and its water resources. Decisions about water extraction licences must be made in accordance with the relevant WAP.

The WAP for the Georgina and Wiso basins closed to public consultation in December 2022. The draft WAP protects the vast majority of the water resources to ensure maintenance of environmental and cultural uses and allocates a proportion of water resources for drinking water, water for stock use and water for commercial uses, including a limited allocation for petroleum. The Plan also provides for trade and reserves water for Aboriginal economic development.

For more information about reforms to the water planning and licensing framework, and other initiatives to reduce the risks to water resources, see *Chapter 3: Safeguarding water resources*.

#### 1.2.1.4 Land access and availability

Amendments to the *Petroleum Act* **1984** enabled regulations to be drafted to introduce a comprehensive land access scheme.

The resulting scheme was introduced by the commencement of the Petroleum Regulations 2020 on 1 January 2021. The scheme introduced a comprehensive statutory requirement and process for land access agreements, including:

- a requirement to notify pastoralists and provide information about all petroleum activities occurring on their land, including airborne surveys, to establish a basis for negotiation
- 25 standard minimum provisions to be included in all land access agreements before they can be approved by the Minister, including compensation for damage and deprivation of the use of the land, and for every well drilled on the land
- a legal requirement for the petroleum company to pay the reasonable costs incurred by the pastoralist in seeking advice in relation to the land access agreements, to ensure the power imbalance is appropriately addressed.

The Petroleum Reserved Block Policy was introduced in July 2019 to define areas where onshore petroleum activity may be prohibited. The policy guides the declaration of reserved blocks under the *Petroleum Act 1984* through defined categories and sets the framework for ongoing negotiation with existing exploration permit holders to relinquish the relevant portion of their permit area. See *Chapter 4: Protecting landscapes* for more information on the Reserved Block Policy.

#### 1.2.1.5 Financial assurance

Amendments to the **Petroleum Act 1984**, the Petroleum Regulations 2020 and the Petroleum (Environment) Regulations 2016 established a comprehensive financial assurance framework to introduce new environmental and petroleum infrastructure decommissioning securities and insurance requirements for onshore petroleum operations. The amendments also introduced an orphan well levy and fund to enable the government to monitor orphan wells, as well as take action as required to secure the integrity of orphan wells. The reforms ensure that the NT Government is sufficiently resourced to take action in the event a proponent fails to perform their obligations.

### 1.2.1.6 Administrative review of NT Government decisions

Further amendments to the Petroleum Act 1984 and Petroleum (Environment) Regulations 2016 empower the community to challenge the legality of decisions by introducing open standing for judicial review of a wide range of administrative decisions made under the Act and Regulations. In addition, third party rights to merits review were introduced for key decisions under the Petroleum Act 1984 and the Petroleum (Environment) Regulations 2016. Where a decision made under the *Petroleum Act 1984* may be subject to judicial review, any person may apply to the Supreme Court to seek this review. For the purposes of the *Petroleum Act 1984*, the Supreme Court may conduct a judicial review of a decision made by a public officer, including a minister or employee of the NT Government. The Supreme Court determines whether the decision was validly made according to the law, and considers matters including:

- whether the decision-maker held the necessary power to make the decision
- whether the decision-maker considered all the matters they were required to consider then they made the decision

Merits review is available for certain decisions made under the *Petroleum Act* 1984 and the Petroleum (Environment) Regulations 2016. Merits review involves the Northern Territory Civil and Administrative Tribunal (NTCAT) determining whether the decision was correct and preferable in the circumstances.

The following parties can apply to (NTCAT) for merits review:

- persons who have made a genuine and valid submission through specific consultation processes which result in a Ministerial decision
- persons directly affected by the decision e.g. landholders, occupiers, or proponents
- Aboriginal land councils specific Ministerial decisions affecting land within the land council's jurisdiction
- relevant registered Native Title Prescribed Bodies Corporate
- registered claimants under the Native Title Act 1993 (Cth).

### 1.2.1.7 Cost rules for public interest proceedings

Cost rules were also amended so that plaintiffs bringing litigation in the public interest may not be subject to a costs order.

Increasing the availability and removing barriers to public interest litigation ensures there is an appropriate level of scrutiny over NT Government decision-making and onshore petroleum industry conduct, and provides more accessible legal avenues to challenge invalid, incorrect or inappropriate decisions and breaches of regulations.

### 1.2.1.8 Consideration of an independent regulator

In October 2021, the NT Government determined that the onshore petroleum industry in the

Territory was not yet mature enough to support implementation of a tiered regulatory model, whereby companies with a demonstrated record of good governance and compliance require a lower level of monitoring, with a corresponding reduction in regulatory fees. The NT Government determined that all petroleum interest holders will require a high level of monitoring for at least 5 years from the recommencement of exploration activity in February 2019.

The NT Government has considered the current need for a separate onshore petroleum industry regulator that is independent of the NT Government, and has determined such a regulator is not required at present given the size and status of the onshore petroleum industry in the Territory. The newly implemented framework addresses a number of the key risks identified by the Inquiry associated with perceptions of regulatory capture. In particular, reforms to the regulatory framework for the onshore petroleum industry have achieved the legal separation and independence of regulatory processes for the environmental management of the onshore petroleum industry, as outlined in **section 1.2.2.1**.

Introducing a new independent regulator would prematurely displace these arrangements before the likely scale of the onshore petroleum industry and need for an independent regulator is known. As part of its ongoing monitoring and risk management, the NT Government will review the regulatory framework within 3 years, or sooner should the level of production activity warrant it. The review will consider whether the current regulatory arrangements continue to be adequate to ensure the independence, accountability, and capacity of regulators for the onshore petroleum industry.

### 1.2.2 Compliance and enforcement

The Inquiry determined the range of regulatory tools available to the then-DPIR under the **Petroleum Act 1984** was inadequate and did not support a modern and robust regulatory framework necessary for the emerging onshore petroleum industry. The Inquiry found that the legislative framework provided for offences and infringement notices, but not much more. The Inquiry recommended a range of enforcement powers and mechanisms be provided to enable action to be taken that is proportionate to the risk posed by any non-compliance.

#### 1.2.2.1 Strengthened penalties and offences

Amendments to the *Petroleum Act 1984*, Petroleum Regulations 2020, and the Petroleum (Environment) Regulations 2016 enabled a more rigorous legislative framework by providing strong deterrents for noncompliance. The increased penalties and offences in the legislation are now comparable with or exceed penalties across all Australian jurisdictions to reflect the severity of the offences and to act as an effective deterrent. The amendments allow inspectors to be appointed under the **Petroleum Act 1984** and grant inspectors broad powers to enter areas where onshore petroleum activities are occurring to inspect the land and operations and issue directions to prevent, manage or remediate environmental harm or to perform good industry practice. The chief executives of DITT and DEPWS were also provided broader powers to ensure that petroleum companies are compliant with Territory laws.

#### 1.2.2.2 Monitoring and compliance strategy

The former DPIR and Department of Environment and Natural Resources (DENR), as the agencies responsible for regulation of any onshore petroleum industry activity at the time, published a joint Monitoring and Compliance Strategy for the onshore petroleum industry in July 2019. The Strategy outlines a targeted and proportional approach to compliance and enforcement.

DITT and DEPWS will review and update their shared Monitoring and Compliance Strategy in 2023 to ensure a targeted and proportional approach to compliance and enforcement is implemented, and that the strategy aligns to the petroleum legislation amendments of late 2022.

### 1.2.2.3 Chain of responsibility laws

Amendments to the *Environment Protection Act 2019* introduced environmental 'chain of responsibility' laws. In the event a proponent company fails to comply with statutory environmental obligations, chain of responsibility laws allow the NT Government to redirect compliance action to individuals or companies who were not the statutory obligation holder themselves, but who had the power to influence decisions and ensure compliance, such as chief executive officers or parent companies.

These reforms position the Territory as a world leader in the regulation of industry and its environmental obligations, and among a small group of Australian jurisdictions pursuing these enhanced compliance measures. Minor amendments to the Environment Protection Regulations 2020 will occur in 2023 to ensure these laws can be applied in relation to petroleum interest holders who owe environmental obligations under the *Petroleum Act* **1984.** 

### 1.2.2.4 Civil enforcement

Amendments to the *Petroleum Act* **1984** and the Petroleum (Environment) Regulations 2016 enable the Territory community to take effective action in the event of a regulatory breach. Interested and affected persons can apply to the Supreme Court to remedy or restrain a potential or actual breach of environmental obligations under the Act and Regulations.

Amendments to the *Petroleum Act* **1984** and the Petroleum (Environment) Regulations 2016 enable the Territory community to take effective action in the event of a regulatory breach. Interested and affected persons can apply to the Supreme Court to remedy or restrain a potential or actual breach of environmental obligations under the Act and Regulations.

For the purpose of civil enforcement proceedings, an 'affected person' is someone whose interests are directly affected by the alleged regulatory breach. This may include landowners, Traditional Owners, native title holders, or pastoral leaseholders.

An 'interested person' is someone who:

- has engaged in a series of environmental protection, conservation or research activities in the 2 years immediately before the application is commenced in the Supreme Court, and
- resides, or ordinarily resides, in the Territory.

An interested person may also be an organisation which has objectives or purposes including environmental protection, conservation and research, and is incorporated or regularly operates in the Territory.

#### 1.2.2.5 Reverse onus of proof

Amendments to the *Petroleum Act* **1984** introduced new environmental offences, as well as defences available to proponents who are prosecuted for these offences. The amendments apply a reversed onus of proof when a proponent seeks to rely on these defences, which requires the defendant proponent to produce evidence or positively prove that the defence applies to their case.

For example, if a proponent relies on the defence that they exercised due diligence to prevent environmental harm, the proponent must prove on the balance of probabilities that they took reasonable steps and exercised due diligence.

The reversed onus of proof recognises proponents have significant information and data about their operations, including reports generated to satisfy reporting obligations under Territory legislation. This provides an evidence base for proponents to make a case about whether their conduct meets the requirements for a defence. Where proponents do not seek to rely on a defence, the burden remains with the prosecution to prove the proponent committed an offence under the legislation.

These amendments are consistent with the *Environment Protection Act 2019,* which requires defendants to prove a defence applies to their case in prosecutions for environmental offences.

### 1.2.3 Petroleum Reserved Block Policy

Removing valuable community assets from the pool of land where onshore petroleum activities can occur ensures the community can be confident that onshore petroleum industry activities will not occur on land that is important to Territory communities.

The NT Government published the Petroleum Reserved Block Policy in July 2019, which identifies that 49% of the Territory's landmass meets the criteria for declaration as a reserved block on which petroleum activities cannot occur. The categories of land for reserved blocks are:

- 1. parks and reserves
- 2. towns and residential areas
- 3. areas of high conservation value
- 4. Indigenous Protected Areas
- 5. areas of cultural significance
- 6. areas of high tourism value
- 7. areas with no petroleum potential.

The Policy contains a staged process for declaring areas to be part of the reserved block. Stages 1 and 2 were completed with the declaration of areas where there was no granted exploration permit and the declaration of parks and reserves.

Declarations over land where there is a granted exploration permit are ongoing in Stage 3, requiring negotiation with permit holders to relinquish part of their title area.

Stage 4, the declaration of land subject to the *Aboriginal Land Rights (Northern Territory) Act* 1976 (Cth), is also an ongoing process of consideration and negotiation. Support from the relevant Aboriginal land council is required for these areas to be declared.

45 reserved blocks have already been declared through Stages 3 and 4, and 189 reserved blocks declared in total across the Northern Territory. As of November 2022, 20.76% of the Territory's land mass has been reserved from petroleum activities.

#### 1.2.4 Social, Cultural and Economic Strategic Regional Environmental Baseline Assessment (SREBA)

Prior to the Inquiry, there were limited regulatory and policy provisions in place regarding the potential social impact of any onshore petroleum industry in the NT. To understand which social impacts are a priority for those living in the Territory, the Inquiry identified the need for a strategic Social Impact Assessment (SIA) to identify the community's priorities. In response, the NT Government conducted a social, cultural and economic SREBA for the Beetaloo Subbasin region. As explained in **Chapter 2:** Addressing a lack of knowledge, the SREBA study delivered comprehensive social, cultural and economic baseline information that will enable interested parties, including the regulators, to appropriately identify and manage impacts as activity progresses. The SREBA provides extensive information that will inform the NT Government's baseline understanding of life and livelihoods in the Beetaloo Sub-basin region as a reference point for ongoing monitoring, particularly in relation to potential onshore petroleum industry development.

The study focused on the wellbeing of people and communities in terms of:

- cultural identity
- local economies
- strong voices
- living environment
- healthy country
- infrastructure and services.

Quantitative and qualitative data was collected from communities and outstations, pastoral stations, and industry organisations and networks to ensure the full range of interests and concerns were represented in the regional baseline data.

For more information about the SREBA studies, see *Chapter 2: Addressing a lack of knowledge.* 

### 1.2.5 Whistleblower protections

The Inquiry acknowledged there were potential risks associated with whistleblowing for those who exposed wrongdoing within the onshore petroleum industry, which reduced the likelihood that those with information about non-compliance would make a report. The Inquiry noted valuable information in relation to industry compliance may be brought to the attention of regulators through industry associates and locals on the ground, and that protections must exist to allow any such whistleblower to remain anonymous.

To address the need to provide a safe and secure option for reporting valuable information in relation to non-compliance within the onshore petroleum industry, the Onshore Gas Non-compliance Hotline was introduced in November 2018 to facilitate anonymous reporting. The hotline is an avenue for members of the community to report instances where they may be concerned about the industry's compliance with the law. The hotline is operated externally to the NT Government by a professional inbound call centre service and refers any reports of non-compliance directly to CM&C. Reports are triaged by CM&C and referred to the responsible agency for investigation and case management, with strict timeframes attached to managing reports from the hotline. The call centre service operating the hotline also operates the Pollution Hotline on behalf of the NT EPA. The hotline's script was updated to provide full disclosure for callers on how information would be used, and the Operational Protocol of the hotline were updated to provide clearer direction on management of any reports received.

Since the Inquiry, both the NT and Australian governments have enacted additional legislative protections which support and protect the rights of whistleblowers. Although the legislative protections are not specific to the onshore petroleum industry, coupled with full disclosure of how information will be used when contact is made with the Onshore Gas Non-Compliance Hotline, the NT Government considers they provide a safe, secure and anonymous option for reporting valuable information about non-compliance within the Territory's onshore petroleum industry.

#### 1.2.6 Community consultation

The Inquiry concluded a mechanism was required to ensure the community, petroleum industry, businesses, and other key stakeholders are able to provide input into the implementation process and to hold the NT Government to account regarding implementation of the Inquiry recommendations across the stages of system reform. A series of reference groups were established to facilitate this input and to improve engagement with key stakeholders in the Territory community on the development of an onshore petroleum industry.

In 2018, the Onshore Shale Gas Community and Business Reference Group (Reference Group) was established to provide direct feedback and advice to the Hydraulic Fracturing Inquiry Implementation Taskforce, ensuring stakeholders had oversight and input into the development and execution of the Implementation Plan throughout stages 1, 2 and the initiation of stage 3. The Reference Group held eight meetings and concluded in December 2020, with the view that engagement and oversight through the final stage of Inquiry implementation would continue directly through existing and newly established targeted working and reference groups, in addition to extending the independent oversight role of Dr David Ritchie until the completion of implementation.

The Minister for Environment established the Beetaloo Regional Reference Group (BRRG) in October 2020 as a consultative forum for communication with key regional stakeholders based in the Beetaloo Sub-basin region, comprising of representatives of regional stakeholders. The BRRG provided guidance and community feedback on the implementation of the development of the Georgina Wiso Basin WAP, the SREBA studies in the Beetaloo Sub-basin, and on community sentiment.

Throughout the implementation process, the NT Government conducted an extensive program of consultation with specific interest groups, including industry, pastoralists, Aboriginal stakeholders, Aboriginal Land Councils, and environmental groups. This ongoing, targeted consultation related to specific reforms and sought feedback from affected parties to determine the optimum way forward to implement the Inquiry recommendations. The NT Government also conducted public consultation for:

- environmental chain of responsibility laws
- water policy development
- the Code of Practice: Onshore Petroleum Activities
- declaration of reserved blocks under the Petroleum Act 1984
- the draft EMP content guideline
- greenhouse gas and biodiversity offsets policies.

The substantial and ongoing consultation process provided opportunities for community input and feedback on NT Government policy developed to implement the Inquiry recommendations.

### 1.2.7 Upholding the rights of Aboriginal people

One aspect of the concern identified by the Inquiry, with the NT Government as the regulator of the industry, was the risk that the regulatory framework may not uphold the rights of Aboriginal people. The Inquiry found that distrust in the NT Government and a poor perception of its ability to regulate the petroleum industry may result in Aboriginal people seeking legislative redress to limit onshore petroleum industry development on their country.

A critical role of the regulatory framework that has been implemented, therefore, is ensuring consultation processes are trustworthy and address the fears and concerns raised by Aboriginal people. In addition, effective and appropriate access to information, that enables Aboriginal people to make well-informed decisions, is critical to ensuring engagement in the regulatory process.

### 1.2.7.1 Trusted information for Aboriginal communities

The Inquiry concluded some Aboriginal people may feel concerned or marginalised by an encroaching

industry and the effects on their cultural, physical and mental wellbeing, and that they may seek legislative redress to limit the development of any onshore petroleum industry on their country. The Inquiry found these concerns may stem from the broader community receiving inadequate information about the onshore petroleum industry and its potential impacts. Communicating complex information about the onshore petroleum industry and hydraulic fracturing is challenging and, prior to the Inquiry, information gaps existed which allowed misinformation to emerge.

To address the information gaps that existed prior to the Inquiry, a number of practical actions were taken in the first instance including through the Aboriginal Information Program. The CSIRO worked collaboratively with land councils to identify information requirements and develop factsheets with clear, factual and relevant content for translation into languages of potentially-affected local Aboriginal communities. Translated audio files about groundwater, methane and shale gas were made publicly available, and will remain available, on the Hydraulic Fracturing Implementation website at hydraulicfracturing.nt.gov.au

To ensure best practice in working with Aboriginal communities, the NT Government designed the Principles of Engagement when using Aboriginal Interpreters in consultation with the Aboriginal Interpreter Service (AIS). The principles provide guidance regarding the use of interpreters, including recommending interpreters are used and supported in order to improve public understanding of onshore petroleum industry activities in negotiations and consultations. The use of interpreters also enhances the two-way dialogue between Aboriginal communities and petroleum industry proponents by ensuring Aboriginal people can clearly communicate questions, concerns and important information to proponents. The principles are available on the Hydraulic Fracturing Implementation website at hydraulicfracturing.nt.gov.au and are additionally linked to key resource sites to ensure they are accessible to all stakeholders.

In addition to fact sheets and guidance on the use of interpreters, and in response to the ongoing need for engagement, dialogue and the provision of information to Aboriginal community members, the Community Engagement and Information Program (CEIP) was established to provide accurate, trusted and accessible information to Aboriginal communities in order to understand consequences of onshore petroleum industry activities and to enable informed decision-making. The program is ongoing and is being delivered by CSIRO as an independent third party through an initial fiveyear funded arrangement. Through community engagement, the CEIP identifies information gaps and develops resources in the form and to the extent requested by Aboriginal communities, in collaboration with Aboriginal land councils and the Aboriginal Areas Protection Authority (AAPA). Establishment of the program included an ethics clearance process through CSIRO, with regular reviews in place to ensure ongoing appropriate and effective program delivery. In addition, several findings from the social, cultural and economic study recommend tangible approaches to maintain open dialogue and information exchange with affected people, including Aboriginal community members.

#### 1.2.7.2 Protecting sacred sites

Amendments to the Petroleum (Environment) Regulations 2016 mandated that petroleum industry proponents must hold an Authority Certificate, issued by AAPA, before an EMP can be approved by the NT Government. This requirement applies to all petroleum industry proponents, including those conducting conventional petroleum exploration and production without hydraulic fracturing. If proponents do not have an Authority Certificate, their EMP cannot be approved and the proponent cannot commence works. This amendment removed the risk of petroleum companies impacting sacred sites by operating without an Authority Certificate.

Refer to **Chapter 8: Embedding Aboriginal people and their culture** for more information.

### 1.2.8 Cost recovery

Prior to the Inquiry, fees and charges under the **Petroleum Act 1984** and Petroleum Regulations 2020 did not recover the full costs of delivering regulatory services to the onshore petroleum industry. The Inquiry concluded a key component of a robust regulatory regime is an adequately resourced regulator and that, given the benefit of regulatory activities goes primarily to petroleum companies, the regulation of any onshore petroleum industry in the Territory should be conducted on a full cost recovery basis.

Recovering the cost of regulatory activities servicing the onshore petroleum industry ensures the NT Government can adequately resource regulation into the future.

#### 1.2.8.1 Interim framework for cost recovery

In response to initial concerns that government resourcing was impacting on assessment and approval processes, the NT Government approved additional funding to relevant regulatory agencies to allow industry to undertake exploration in 2019. The Department of Treasury and Finance (DTF) subsequently developed an interim cost recovery framework to address immediate cost pressures, while a full cost recovery framework was developed.

On 22 October 2019, the NT Government approved the interim cost recovery framework (interim framework) which increased exploration permit annual rental fees from 80 to 220 revenue units (a 275% increase) and application fees for retention and production licences from 3450 to 7260 revenue units (a 201% increase).

The increased charges took effect on 1 January 2020, and regulatory agencies were appropriated a share of the estimated fees for 2019-20 and 2020-21. This was subsequently extended to 30 June 2023.

#### 1.2.8.2 Full regulatory cost recovery framework

In 2022, amendments to the *Petroleum Act* **1984** and the Petroleum Regulations 2020 implemented the full cost recovery framework.

The cost recovery framework introduced new and revised fees and charges for the onshore petroleum industry, including:

- increases to application fees for petroleum exploration permits and production licences
- new fees for the assessment of permissioning plans and EMPs
- a new monitoring and compliance levy.

The charges are estimated to recover an average of \$6.2 million per annum over the first three years of operation.

Costings are based on the delivery of regulatory services by DITT and DEPWS under the **Petroleum Act 1984**. The proposed framework is designed to achieve full cost recovery over the medium term and allow these agencies to administer a robust regulatory regime, in accordance with the Inquiry recommendations.

Consultation on the preferred approach to cost recovery occurred in early 2022 through the release of a discussion paper to key stakeholders, such as industry participants, land councils, local governments, pastoralists, and environmental interest groups.

The new and revised fees and charges will apply from the commencement of the amendments, with the exception of the monitoring and compliance levy, which will be payable annually from 1 July 2023.

These arrangements address issues of trust by demonstrating the NT Government's commitment to implementing full cost recovery arrangements. The risk of an inadequate regulatory framework is reduced as the new charges will ensure that DITT and DEPWS are adequately funded to perform their regulatory responsibilities, with costs met by industry rather than the taxpayer.

#### 1.2.8.3 Cost recovery for the SREBA

The SREBA for the Beetaloo Sub-basin was completed at the end of 2022, with actual expenditure related to commissioning the baseline assessments and studies estimated to be \$10 million.

The costs of SREBA will be recovered from the petroleum industry through the new monitoring and compliance levy introduced in 2022 via amendment to the Petroleum Act 1984 and the Petroleum Regulations 2020. The monitoring and compliance levy will recover the costs of DITT and DEPWS undertaking monitoring and compliance activities, with payments to be based on the nature and scale of operations that interest holders are approved to carry out. Where petroleum activities are approved in the Beetaloo Sub-basin, the levy will be subject to an uplift of revenue which will be allocated towards cost recovery for the SREBA (the Beetaloo Uplift). The Beetaloo Uplift will ensure a certain amount of funds received through the monitoring and compliance levy are directed to paying the cost of the SREBA studies.

Over the next 3 years, the Beetaloo Uplift is expected to recover approximately \$600,000 per annum. The total SREBA cost of \$10 million will be recovered over a 10-year time period, with annual adjustments to reflect government borrowing costs. These arrangements reduce the Inquiry's identified risk of mistrust in government by demonstrating implementation of the NT Government's commitment to recover costs from industry.

### 1.3 Ongoing monitoring, reporting and review

#### 1.3.1 Monitoring and reporting activities

The findings from each SREBA study can be used to inform the development of a regional monitoring and reporting framework for the Beetaloo Sub-basin region. The social, cultural and economic baseline report provides a detailed framework for a longterm participatory regional monitoring process. Data collection from annual updates of publicly available data and qualitative surveys will address the core values identified through the SREBA study. Monitoring and reporting activities will be guided by an oversight committee, and options to involve local Aboriginal rangers in regional monitoring activities will be explored to enhance community trust in the monitoring process.

The NT Government has a 5-year agreement with CSIRO to deliver the CEIP through a dedicated full-time position based in the Territory, with the appointment of the CSIRO program lead in April 2022. As part of this agreement, an annual formal review of the program performance and delivery will occur to ensure the program continues to meet the following key outcomes:

- providing ongoing independent monitoring of community concerns through engagement
- listening and responding to those concerns with the provision of information
- complementary outcomes in relation to the broader social, cultural and economic SREBA monitoring activities.

DEPWS will also monitor community feedback through existing mechanisms such as public submissions for the EMP approval process under the Petroleum (Environment) Regulations 2016, and for proposals assessed by the NT EPA.

Over the next 24 months, DEPWS, DITT and CM&C will monitor the ongoing effectiveness of the legislative levers and the Onshore Gas Non-compliance Hotline for reporting valuable information on non-compliance within the Territory's onshore petroleum industry, including the ability for a person to raise concerns for investigation while remaining anonymous, and consider new or additional mechanisms if necessary.

Onshore petroleum industry proponents will submit compliance reports to the

NT Government regarding:

- reportable and recordable incidents
- annual environmental performance and compliance with approved plans
- flowback fluid and produced water
- annual greenhouse gas emissions
- environmental monitoring results
- hydraulic fracturing fluid risk assessments
- drilling waste assessments
- waste and wastewater.

#### 1.3.2 Regulatory review

It is appropriate for the regulatory framework to be reviewed at an agreed time in the future, as part of the NT Government's ongoing commitment to evaluation. Regulatory review will consider whether the regulatory model in place for managing the NT's onshore petroleum industry remains effective in the future context of the industry's size and complexity, and the ability of the regulatory framework to continue to effectively and efficiently manage the industry.

As part of its ongoing monitoring and risk management, the NT Government will review the regulatory framework within 3 years, or sooner should the level of production activity warrant it. The review will consider whether the current regulatory arrangements continue to be adequate to ensure the independence, accountability, and capacity of regulators for the onshore petroleum industry. This will inform decisionmaking about the need for a separate, independent regulator for the onshore petroleum industry.

In 2023, DITT and DEPWS will review and update the monitoring and compliance strategy for onshore petroleum in light of the expanded range of enforcement powers and mechanisms introduced to the *Petroleum Act 1984*, the Petroleum Regulations 2020 and the Petroleum (Environment) Regulations 2016. Both departments will conduct a joint review the Code of Practice to ensure clarity and certainty for regulators and interest holders in light of additional regulatory amendments since its publication.

DITT will continue the implementation of the Petroleum Reserved Block Policy, including negotiating with permit holders to secure the relinquishment of blocks within their title area, allowing the Minister for Mining and Industry to declare them as reserved blocks. The declaration and refinement of reserved blocks will be informed by baseline information captured in the SREBA studies.

To ensure cost recovery fees and charges remain aligned to actual industry activity and regulatory costs, the fees and charges will be reviewed on a 3-yearly basis. This includes review of the monitoring and compliance levy and subsequent Beetaloo Uplift. The Beetaloo Uplift will also be adjusted annually to reflect government borrowing costs.

The NT Government will reconsider whether a tiered regulatory model for the onshore petroleum industry is required once the industry has matured and demonstrated a consistent record of good governance and compliance.

### 1.3.3 Information and data

NT Government decisions relating to EMPs and environmental approvals are available on the DEPWS website at **depws.nt.gov.au** 

Industry compliance reports are also available on the DEPWS website.

Data collected from the monitoring process is publicly available through the Petroleum Onshore Information Northern Territory (POINT) portal at **point.nt.gov.au** 

Calls can be made anonymously to the Onshore Gas Non-Compliance hotline. The 24 hour, toll free hotline can be contacted on 1800 413 889.

Fact sheets, audio files in Aboriginal languages and the Principles of Engagement when using Aboriginal Interpreters are available at hydraulicfracturing.nt.gov.au

### Summary

- The NT Government has significantly reformed the regulatory framework governing the onshore petroleum industry, in line with the Inquiry recommendations.
  - The reform program ensures the NT Government can effectively regulate the onshore petroleum industry to reduce the likelihood that the risks identified by the Inquiry will materialise.
- The Territory community can be confident the regulatory reforms have improved the NT Government's ability to regulate the onshore petroleum industry and includes mechanisms to monitor the ongoing effectiveness of these reforms.

# 2. Addressing a lack of knowledge

Strategic Regional Environmental Baseline Assessment (SREBA)

VEVEO



MITIGATION
#### 2.1 Context

The Inquiry heard inadequate pre-development assessment and environmental baseline data is one of the biggest issues for environmental regulation and management for existing onshore petroleum industries, such as those experienced in Queensland and in the United States. Concerns about a lack of baseline data were also raised in submissions to the Inquiry.

In 2018, the Inquiry identified significant risks to evidence based decision-making without adequate pre-development assessment and environmental baseline data, and found there was inadequate information about the long-term risks of hydraulic fracturing. This limited the NT Government's ability to quantify and appropriately regulate the long-term risks associated with hydraulic fracturing and the development of an onshore petroleum industry.

The Inquiry made 20 separate recommendations to improve the collection of data before, during and after petroleum activities to support evidence based decision-making by the regulators.

Establishing robust, regional-level pre-development baseline information was an essential step for the NT Government to mitigate the environmental, social and economic risks that onshore petroleum industry development posed to the Territory. By collecting this baseline data, the NT Government identified key regional environmental and community sensitivities so these issues can be investigated, represented in industry modelling, monitored and, where possible, resolved.

As a key risk that affects the NT Government's ability to mitigate the other risks discussed in this report, many of the actions discussed in this chapter will feature throughout the report.

## 2.2 Reforms implemented to mitigate the risks

The NT Government has completed a comprehensive reform program to implement the Inquiry recommendations and address the

risks caused by the lack of pre-development assessment and environmental baseline data. The reforms included the completion of a Strategic Regional Environmental Baseline Assessment (SREBA) for the Beetaloo region, amending the Petroleum (Environment) Regulations 2016, and the development of a detailed and prescriptive Code of Practice.

Additionally, since the Inquiry the Australian Government has undertaken the Geological and Bioregional Assessment (GBA) program, with the Beetaloo Sub-basin as one of three study regions. The purpose of the GBA program was to provide transparent scientific information relating to the potential impacts (on 'Protected Matters' in the context of the EPBC Act) within regions of current or future onshore gas and coal developments. Due to a strong collaboration between relevant Commonwealth and NT Government agencies, the GBA program was carefully targeted to address knowledge gaps identified by the Inquiry, and was complementary to planned research to be undertaken through the SREBA.

In combination, the SREBA and Beetaloo GBA programs represent an investment of approximately \$30 million in baseline data collection and improving understanding of many aspects of the Beetaloo region relevant to assessing and managing potential impacts of onshore petroleum development.

### 2.2.1 Strategic Regional Environmental Baseline Assessment (SREBA)

The SREBA was established to address substantial information gaps identified by the Inquiry. The primary purpose of the SREBA was to provide comprehensive and reliable data and information for the Beetaloo Sub-basin to enable the robust assessment of risks and evidence based decisionmaking regarding the development of the onshore petroleum industry in the region. The information provided by the SREBA will enhance project-level assessment, as well as the regional-level assessment of cumulative impacts from likely onshore petroleum industry development scenarios. The NT Government, with assistance from external subject matter experts, developed the SREBA Framework to articulate the requirements of the Inquiry into more detailed technical guidance on how baseline studies should be undertaken. The SREBA Framework sets out 6 domains for the studies undertaken in the Beetaloo Sub-basin region:

- water quality and quantity
- aquatic ecosystems
- terrestrial ecosystems
- greenhouse gas emissions
- environmental health
- social, cultural and economic studies.

The requirements for each domain are informed by other relevant recommendations of the Inquiry, as well as the NT Government's legislative, regulatory and planning requirements relevant to the potential development of the onshore petroleum industry. The baseline studies were further guided by detailed Scopes of Work for each domain, which were targeted to the specific character of the Beetaloo region. The Framework was subject to public consultation before finalisation, and both the Framework and Scopes of Works were made publicly available.

The SREBA commenced in 2020, although planning, stakeholder consultation and initial implementation of the SREBA studies was substantially hampered by the COVID-19 pandemic, particularly in 2020 when most of the Beetaloo region was isolated within biosecurity zones. Data collection for most studies was therefore undertaken during 2021 and/ or 2022. While the geologically-defined Beetaloo Sub-basin covers an area of 28,000km<sup>2</sup>, most of the baseline studies were undertaken in a much larger area encompassing the Sub-basin in order to provide the required regional context and recognising the potential for impacts to propagate outside the Subbasin (for example the ecological studies covered an area of 86,400km<sup>2</sup>). The subject matter scope and geographic extent of the SREBA is without precedent in the Territory, and possibly Australia.

The Department of Environment, Parks and Water Security (DEPWS) has the foremost subject matter expertise and relevant Northern Territory experience for the water and ecological study domains, and so led three baseline studies (with additional external expertise as required). The other study domains were contracted to external research agencies and consultants, including the University of Queensland for the social, cultural and economic studies.

A Beetaloo Regional Reference Group (BRRG) was established by the Minister for Environment in October 2020. The BRRG was established as a consultative forum for community views and to provide guidance to the NT Government on the SREBA studies undertaken in the region. The BRRG consists of representatives from key stakeholder groups in the region, including: Roper Gulf Regional Council, Barkly Regional Council, Katherine Town Council, the Northern Land Council, Northern Territory Farmers' Association, the Sturt Plateau Best Practice Group, Sunrise Health Services, Territory Resource Services Association and Territory Natural Resource Management.

Each SREBA study domain has produced a detailed Baseline Report (and in some cases multiple sub-project reports). These are summarised and synthesised in a Beetaloo SREBA Regional Report, which identifies emergent themes and issues from the multiple baseline studies and discusses the application of the SREBA findings. A data management system has been designed specifically to manage the diverse outputs from the SREBA studies, and a SREBA Data Catalogue will provide searchable public access to all the data, reports and information from all the SREBA studies, except where there are access restrictions due to identified sensitivities.

The key findings from the SREBA baseline studies are summarised below, with a more comprehensive description available in the Regional Report.

#### 2.2.1.1 Water quality and quantity

The water quality and quantity studies included:

- a detailed gap analysis of water-related information for the Beetaloo Sub-basin
- establishment of new water monitoring bores in poorly studied western parts of the Sub-basin
- drilling for additional new water monitoring bores to fill information gaps in other parts of the Sub-basin
- testing of an extensive array of existing bores for water quality
- establishment of baselines of groundwater chemistry and groundwater levels
- characterisation of groundwater connectivity, flows and aquifer parameters
- characterisation of groundwater and surface water interactions and recharge and discharge processes for regional aquifers overlying the Beetaloo Sub-basin.

There is now a very large body of data and research findings relating to water resources in the Beetaloo Region and, in particular, to the groundwater resources in the Cambrian Limestone Aquifer (CLA). The CLA is the main source of groundwater for extractive use in the region, including stock and domestic use. Base flow from this aquifer sustains perennial flows in the Roper and Flora rivers, and supports groundwater-dependent ecosystems such as those in Elsey National Park near Mataranka. Potential impacts on this aquifer from overextraction or contamination is at the core of community concern about onshore petroleum development and hydraulic fracturing.

Scientific understanding has increased greatly in the past decade and since the Inquiry, partly due to the SREBA but also through the GBA program, GISERA and other research projects. While deeper aquifers are less well known, this is not a barrier to sustainable water allocation as these are likely to be used only by the onshore petroleum industry, and to a limited extent. A sound conceptual understanding of the geology and hydrostratigraphy of the Beetaloo Sub-basin has been developed, and this is very important to minimising any risks from hydraulic fracturing. The CLA is generally isolated from deeper aquifers by extensive aguitards (basalts and the Cox Formation), but there are restricted areas where it is potentially in contact with deeper aquifers. While there is vertical structuring within the CLA, a precautionary approach for risk management purposes is to assume a high degree of connectivity throughout the CLA and its sub-units. Two primary regional groundwater flow systems within the CLA overlying the Beetaloo Sub-basin have been identified, separated by the Birdum Fault, which discharge into the Roper and Flora River discharge zones. This understanding, in addition to variations in climate and recharge rates, form the basis for delineating boundaries of water allocation plans relating to the groundwater resources.

Groundwater levels have been measured in bores across the water study area and the groundwater height, and depth to groundwater, mapped. The regional groundwater level is deep below the surface over most of the Beetaloo Sub-basin (up to >100 m below ground level) and is overlain by a thick layer of Cretaceous sediment, which means that there are no groundwater-dependent ecosystems dependent on the regional aquifer within the Sub-basin, and no permanently flowing streams.

Groundwater velocities have been modelled and are low (<0.1 m/year) across most of the CLA and all of the Beetaloo Sub-basin. Even considering limitations in this modelling, it is unlikely that groundwater flow velocities exceed 1 m/year over the Beetaloo Sub-basin because the hydraulic gradients are not sufficient to drive greater velocities. Higher groundwater velocities (>10 m/year) occur very close to groundwater discharge areas (north of the Sub-basin boundaries). This information is very important in considering the risks of aquifer contamination associated with any gas well integrity failure. Groundwater monitoring bores in the region show three common groundwater level fluctuation patterns and are very important for understanding aquifer recharge. A seasonal recharge response occurs in the northern part of the study area (Daly Basin), mostly beyond the northern extent of the Beetaloo Sub-basin. Further south, there is episodic recharge when there is a wet season with sufficiently intense rainfall to induce recharge, or gradual storage changes over long periods. Overall, groundwater monitoring data indicates a prolonged period of increasing groundwater levels.

Estimates of recharge for the region have been obtained from four methods, the most quantitatively accurate (and most conservative) using the Daly Roper (DR2 2020) model developed by DEPWS. This model is constructed specifically for the region, supported by the most current conceptualisation of the entire connected water resource, and calibrated to observed groundwater levels and river discharges. This provides estimates of annual average and median wet season recharge for the four water allocation planning management areas relevant to the SREBA area.

The CLA overlying the Beetaloo Sub-basin has two main discharge areas at the Flora River and Roper River, near the communities of Djarrung and Mataranka. Environmental tracer studies support the assumption that groundwater discharge at the Roper River discharge area is overwhelmingly derived from the CLA. Multiple lines of evidence indicate that groundwater discharge at the Roper River is mostly sourced from groundwater originating relatively close to the river. Groundwater originating from deeper formations or from areas of the CLA flowpath further to the south (overlying the Beetaloo Sub-basin) are likely only a minor portion of the total discharge at the Roper River. Mechanisms at the Flora River discharge area are mostly the same as at the Roper River. There are some other springs around the margin of the study area at which groundwater discharge occurs, but not all of these springs are sourced from the CLA, or are likely to be affected by groundwater extraction within the Sub-basin.

A large dataset of groundwater quality data has been compiled from across the SREBA (and extended water study) region. This provides a broad-scale overview of water quality trends across the CLA, and is an important baseline for ongoing monitoring of water quality associated with onshore petroleum development.

There are no perennially flowing waterways overlying the Beetaloo Sub-basin because there are no groundwater discharge areas, due to the depth of the regional water table. However, some longlasting waterbodies may be maintained by localised perched groundwater systems that exist above, and are separate from, the regional water table.

The Daly-Roper model (DR) is a coupled numerical surface water-groundwater flow model that covers the portion of the CLA that is connected to the major drainage systems of the Daly and Roper River, and was mostly recently updated in 2020 ('DR2'). Peer review of DR2 found the model classification to be Class 2-3 and also noted that DR2 was a "leading example of best practice". Based on the data and improved knowledge arising from the SREBA, the water model will be updated to DR3 for use in future water planning and licensing in this region.

In combination, these studies have resulted in a greatly improved understanding of the hydrogeology and water resources of the Beetaloo region. This will allow for evidence-based sustainable groundwater allocation for any onshore petroleum development (and all other beneficial uses); and robust assessment of any project level and cumulative risks to these water resources from future development proposals.

#### 2.2.1.2 Aquatic ecosystems

The aquatic ecosystems studies included:

- mapping and classification of surface aquatic ecosystems
- description of assemblages of aquatic biota and evaluation of environmental determinants

- targeted surveys for some threatened aquatic species
- identification of aquatic refugia and aquatic ecosystems of high ecological value
- surveys of subterranean aquatic fauna (stygofauna) and description of distribution patterns
- description of suitable indicators and methods for regional monitoring.

Systematic biodiversity surveys and regional mapping have greatly increased knowledge of the aquatic ecosystems in the Beetaloo region.

Surface aquatic ecosystems in the SREBA area have been mapped using satellite imagery and a range of other data sources. These cover 12% of the study area, the majority of which (90%) are floodplain systems, and the remainder palustrine (9%), riverine (1%) and lacustrine (0.01%) systems. Mapped streams have a total length of 13,787 km within the study area, of which almost 15% are classified as major streams. Twenty-two spring locations have been identified within the study area, primarily around its margins.

Mapping and field surveys identified aquatic refugia at 89 point locations across the study area, of which 37 have permanent or near-permanent surface water.

Systematic surveys at 44 sites across the study area identified 291 species of aquatic fauna, including fish, aquatic and semi-aquatic reptiles, molluscs, crustaceans, water bugs, mayflys, midges and aquatic beetles. When data from all sources are combined (including plants and frogs), a total of 400 species associated with surface water habitats were identified in the study area.

Most sites with high fish species richness occurred along the northern margin of the study area, and fish diversity in the study area centres on the perennial reaches of the upper Roper River. Waterbodies throughout most of the study area feature a sub-set of common, widespread fish species, and species richness decreases as connectivity decreases in upstream waterholes. The spatial pattern for all aquatic species mirrors the pattern for fish, with highest diversity along the northern margin of the study area, and low total richness throughout the majority of the region. Waterbodies within the Subbasin generally have low fish species diversity and a widespread, disturbance-tolerant invertebrate community.

Four threatened aquatic fauna species occur in the study area, the most notable being the Gulf Snapping Turtle and Largetooth Sawfish in the upper Roper River.

Multiple lines of evidence indicate that the highest conservation values for surface aquatic biodiversity occur in the northern margin of the study area, and largely align with the Mataranka Thermal Pools Site of Conservation Significance. Nevertheless, refugia throughout the region are important for the maintenance of aquatic biodiversity, which also requires maintaining connectivity between refugia. Waterbodies on intermittent systems in the region also have high conservation value as waterbird habitat.

Stygofauna comprise aquatic taxa occurring in groundwater aquifers and subterranean water bodies. The SREBA completed the most detailed study of subterranean biodiversity in the Territory to date, and significantly increased knowledge of stygofauna assemblages in the CLA south of Katherine.

Stygofauna were detected in 23 of the 66 groundwater bores that were sampled, and at least 28 species-level taxa were detected. The fauna is strongly dominated by crustaceans, particularly copepods and decapods. The known stygofauna of the study area now conservatively stands at 38 species-level taxa, 34 of which occur in the Tindall Limestone formation. Only a single stygofauna species (*Parasia unguis*) was recorded in the Wiso basin, while five species were recorded from the Georgina Basin, with four of these recorded only within that Basin. Using eDNA sampling, the shrimp *Parisia unguis* was detected in half the bores sampled and this species has a broad distribution in the CLA, including in the Georgina and Wiso Basins. The highest diversity, site richness and frequency of occurrence of stygofauna came from the Tindall Limestone in the northeast of the study area (which is mostly to the north of the Sub-basin), where 26 of the 28 taxa detected during the survey were recorded.

The data suggest stygofauna are most abundant in aquifers with a relatively shallow depth to groundwater, well-developed superficial karst features, and transmissive and interconnected saturated habitat space. Annual recharge into the aquifer may be important to stygal ecosystems to maintain suitable groundwater quality and to provide primary trophic level inputs to subterranean food webs.

The aquatic ecosystem baseline report identified appropriate methods and sites for ongoing monitoring of the health of aquatic ecosystems within the Beetaloo region.

#### 2.2.1.3 Terrestrial ecosystems

The terrestrial ecosystems studies included:

- regional vegetation mapping
- comprehensive regional surveys for flora and fauna
- targeted surveys for selected threatened species and development of spatial distribution models
- description of regional biogeographic patterns for terrestrial biodiversity
- identification of areas of high conservation value
- evaluation of the sensitivity of significant ecological values to development
- description of suitable indicators and methods for regional monitoring.

Regional vegetation mapping and systematic flora and fauna surveys have greatly increased knowledge of the terrestrial ecosystems in the Beetaloo region. Flora surveys contributed 15,419 new plant records for the study area. The number of plant taxa (described at least to species level) known from the study area is 1,818, with 1,093 plant taxa recorded in the Sub-basin. Based on analysis of floristic data, plus interpretation by botanical experts, 51 vegetation communities have been described in the study region. These have been aggregated into 21 broad vegetation groups that have been mapped across the study area from remote imagery, other spatial data and data from nearly 13,000 on-ground sites.

Despite the size of the study area and the relatively high total richness of plant species occurring within it, no plants are endemic to the region, and only two threatened plant species were recorded in the study area. Four other plant species were considered significant as they have restricted ranges within their total distribution. The wetland habitat of most of these significant species reinforces the high conservation value of these restricted parts of the landscape. No geographic areas of high conservation value were identified in the region on the basis of plant biodiversity. Disturbance was prevalent across all broad vegetation groups, despite site selection being biased towards 'best on offer' condition, and was variously associated with fire, cattle, pigs and weeds.

Seven of the vegetation communities were identified as potential groundwater-dependent ecosystems, at varying levels of certainty. In areas mapped as potential groundwater-dependent ecosystems where depth to regional aquifers is relatively deep, vegetation may be accessing a shallower perched groundwater system. Five broad vegetation groups (comprising 25 vegetation communities) were identified as having high ecological value. The majority of these occur around the northern and north-eastern margins of the study area, although the *ephemeral wetland* broad vegetation group occurs at scattered locations throughout the Sub-basin.

A total of 354 vertebrate species were recorded from all surveys and incidental observations during the SREBA and GBA Program, including 14 amphibian species, 202 bird species, 39 mammal species and 99 reptile species. Including other sources, a total of 512 vertebrate species have been recorded in the study area. The ant fauna in the region is extraordinarily diverse, with 748 ant species recorded, a high proportion of which have not been previously collected.

Nine birds, one invertebrate, six mammals and four reptile species that occur in the study region are listed as threatened, and twenty species are listed as migratory under the EPBC Act. At a regional scale, the study area has relatively high total vertebrate species richness. However, no terrestrial vertebrate species are endemic to the study area.

Riparian and swamp habitats have high value for bird diversity, facilitating the occurrence of more tropical bird assemblages into lower rainfall areas and the maintenance of bird diversity in the study area during dry periods. No other broad vegetation groups were identified has having notably high value for terrestrial faunal biodiversity.

Targeted surveys were undertaken for the threatened Crested Shrike-tit, Gouldian Finch, Greater Bilby, Ghost Bat and Plains Death Adder. Northern Brushtail Possum, Mertens' Water Monitor, Mitchell's Water Monitor and Yellowspotted Monitor were also sampled during regional surveys. Sufficient data were collated to develop spatial distribution models for the Gouldian Finch, Crested Shrike-tit, Greater Bilby and Yellow-spotted Monitor, and potential Ghost Bat roosting habitat was also mapped.

Over 7000 records of 81 waterbird species from the study area were collated, and a total of 55 wetland sites were surveyed for waterbirds. All large-scale waterbird breeding events recorded from the study area, and the largest congregation of waterbirds, were from Lake Woods and nearby waterholes on Newcastle Creek. This area also has the highest concentrations of records of migratory shorebirds. Smaller persistent wetlands in the Newcastle Creek drainage system and on the Sturt Plateau support small-scale waterbird breeding events and are likely to be refuges for waterbird persistence during dry periods.

The main terrestrial biodiversity values within the study area were identified as:

- previously identified Sites of Conservation
  Significance (Mataranka Thermal Pools and Lake
  Woods/Longreach Waterhole)
- high value vegetation types
- important habitat for waterbirds and threatened species.

Habitats for waterbirds and other significant plant and animal species associated with aquatic environments are spatially restricted. Habitat for the threatened Crested Shrike-tit, Gouldian Finch and Common Brush-tail Possum occurs in extensive woodland communities across much of the study area, including inside the Sub-basin. In contrast, habitat for Greater Bilby and Ghost Bat occurs outside of the Sub-basin, to the south-west and north respectively.

Many of the identified threats to these biodiversity values are already present in the landscape (habitat degradation, fragmentation and loss; competition



and predation; invasive plants) but could potentially be exacerbated by onshore petroleum development. Others key potential threats from large-scale onshore petroleum development are changes in surface water hydrology, reduction in groundwater availability, and contamination of surface or ground water. Additionally, predicted changes under climate change scenarios — particularly increasing number of very hot days and increasing evapotranspiration rates — may reduce the resilience of terrestrial biodiversity in the study area, particularly species with a requirement for persistent water or climatebuffering habitats.

Monitoring was assessed as being effective and feasible for:

- the spatial extent of high- and moderatevalue broad vegetation groups
- waterbird habitat condition
- bird fauna of riparian and swamp habitats
- landscape fire regimes
- vegetation clearing and fragmentation.

There are established methods for monitoring these attributes that would be likely to provide sufficient data for monitoring of change over time in relation to potential impacts from onshore petroleum development.

#### 2.2.1.4 Greenhouse gas emissions

The Methane and greenhouse gas baseline study consisted of three elements.

- Mobile surveys to establish the baseline methane concentrations across three different seasons.
- **2.** Identification of geological seeps and reference sites.
- **3.** Collation of information produced by NT and national programs and researchers to estimate the emission rates of the current main sources of emissions.

A series of mobile surveys across varying seasons and years using optical gas analysers has established a "pre-development" baseline for ambient methane concentrations in the Beetaloo Basin. Overall, the background methane concentrations measured within the study area is closely aligned with the national reference value and trend for Australia.

The main sources of elevated methane concentrations detected during the surveys were cattle, fires and towns/fuel stations. An inventory of the estimated emission rates for each identified source and sink for the study area has been compiled.

There was no evidence from survey data of elevated methane levels associated with potential geological seep targets other than at Clints Gorge on Tanumbirini Station, where methane and ethane were recorded bubbling from hot springs. This area warrants further monitoring and investigation, and consideration during site-specific risk assessment for any proposed onshore petroleum activities nearby.

Currently the most practical and effective method of monitoring regional methane concentrations for the Beetaloo region is through periodic mobile surveys, possibly supported by targeted deployment of longterm autonomous emission monitoring stations.

#### 2.2.1.5 Environmental health

The Environmental Health domain consists of a set of four studies: Population Health, Air Quality, Soil Quality and Water Quality.

- The Population Health study aimed to set a baseline of the current health status of the population in the region and identify relevant indicators for monitoring change over time.
- The Water Quality study within the Environmental Health domain conducted a review and gap analysis, with a human health lens, of the water quality studies undertaken and data developed through the GBA program, GISERA research and the SREBA Water Quality and Quantity projects.

- The Soil Quality study reviewed and conduct a gap analysis of the studies undertaken through the GBA and GISERA programs and any other relevant work, and DEPWS data holdings, to establish a risk assessment framework and identify information gaps.
- The Air Quality study aimed to establish a baseline of air quality at selected sites in the region, and to develop a methodology for a future monitoring program.

#### **Population Health**

A review of literature was undertaken to build understanding in relation to health issues potentially associated with onshore petroleum activity. The findings of the literature review were then used to identify relevant health indicators that may be applicable in the context of the demographics of the Beetaloo region. The available baseline information on relevant health indicators for the region was then reviewed.

An outline monitoring plan was developed for the relevant health indicators. It was recommended that stakeholders be further engaged to refine and agree on the indicators prior to finalising an implementable monitoring plan.

#### Water quality

Existing groundwater and surface water quality data from the study area were collated, summarised and reviewed in the context of implications for human health. Metal concentrations are generally low and remain below the health and aesthetic guidelines across the study area. Nutrient concentrations are also generally low and remain below the health and aesthetic guideline values across the study area, except for sulfate and chloride which exceeded health guidelines.

Routine groundwater quality monitoring data from water supplies at serviced townships and Aboriginal communities within the study area shows none of these water supplies exceed Australian drinking water health guidelines, except for some aesthetic guidelines that affect palatability. An environmental risk assessment was undertaken during the GBA Program of 116 chemicals associated with drilling and hydraulic fracturing operations in the Beetaloo region, of which 33 were of potentially high concern. Future groundwater monitoring programs aimed at detecting contamination from onshore petroleum activities should be informed by identified chemicals of potential concern.

There are limited surface water quality data from the region, apart from field quality parameters. To improve the baseline of surface water quality analysis, it was recommended that Australian Drinking Water Health and Aesthetic guideline analytes be added to future monitoring programs. Given the potential for surface water to be used for agriculture and cultural uses by local communities, some surface water locations have been identified as being potentially vulnerable to human health risks, should there be any contamination resulting from onshore petroleum development.

#### Soil quality

Existing information on soil types in the Beetaloo region was collated and reviewed. The dominant soil types in the region were identified and representative soil types selected for characterisation, in order to identify those soils that may be sensitive to impact or adverse effects from onshore petroleum activities.

Chemicals approved for use in hydraulic fracturing in the Territory were reviewed. An assessment of chemicals of concern and potential hazards to soil, such as the likelihood of transportation through the soil, was then conducted in order to inform the development of a risk assessment framework. Based on the soil characterisation information, risk ratings were developed for three categories of potential risks to soil from unconventional onshore petroleum operations; these risk ratings were then combined for an overall risk score for each soil type. These risk ratings can be spatially portrayed as a soil risk map for the study area. Based on the soil risk assessment process, a monitoring and management plan for soils was developed. The plan is designed to provide a guide for the site-specific management and monitoring of soils with the development of unconventional onshore petroleum operations in the Beetaloo area, and to assist in maintaining consistency across individual approvals and licensing processes.

#### Air quality

Five air quality monitoring stations were installed in the region as part of the Beetaloo SREBA. Monitoring will be undertaken for a period of at least 12 months, which is considered the minimum to characterise the baseline environment throughout all seasons. The following parameters are being monitored:

- deposited dust using dust deposition gauges (DDG)
- suspended particulate matter (PM2.5, PM10) using a real time light scattering device
- gases (NO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S, VOCs and aldehydes) using passive sampling methods
- meteorological parameters (wind speed, wind direction, temperature, humidity and rainfall).

While compliance monitoring for future onshore petroleum activities is expected and would be the responsibility of the proponent, additional regional baseline monitoring is valuable for ensuring human health and environmental impacts are minimised and so that communities are aware of their air quality environment.

#### 2.2.1.6 Social, cultural and economic studies

The social, cultural and economic SREBA studies involved the collection of baseline data and a Strategic Regional Assessment for communities within and proximate to the Beetaloo Sub-basin to:

• develop an understanding of the social, cultural and economic conditions across the region

- identify aspects that may be sensitive to development
- consider the potential cumulative impacts of multiple projects.

The social, cultural and economic studies drew on publicly available data and relied on high levels of participation by community residents, pastoralists, and stakeholder groups to ensure that the selected indicators provide a clear picture of communities, which are complex adaptive systems that cannot be understood by indicators alone. The social, cultural and economic studies are intended to be the starting point for ongoing conversations and community involvement in planning for future development in the Beetaloo region.

The summary findings concluded that:

- Onshore petroleum development is taking place in a very low trust environment. Most people interviewed have very low trust in the petroleum industry to adhere to best practice and very low trust in the government's ability to regulate the industry effectively. Low trust translates to calls for "careful" development, for "watchdog" mechanisms including independent oversight and inspections, and high levels of transparency and accountability. In the eyes of the people, the industry must "earn the right to self-regulate".
- Just as there is biophysical diversity, the Beetaloo region is socially, culturally, and economically diverse. Diversity is a highly valued characteristic of the region and is associated with resilience and connection. People in the Beetaloo region want to preserve social, cultural and economic diversity, (which is inextricably linked with ecological diversity). Some suggestions for preserving diversity in the region include through the maintenance of Aboriginal languages and culture, protection of existing and future industries and economic opportunities, and enhanced opportunities for employment and training.

- There is high and widespread concern for aquatic ecosystems (including subterranean) and water sources as underpinning life and livelihoods. Most of the opposition to the industry is based on this concern.
- Many Beetaloo residents are highly committed to and/or invested in 'place'. They will not or cannot simply leave if their lifestyle changes unfavourably or if impacts become unacceptable. They feel they are disproportionately vulnerable and carry a greater burden of risk.
- Almost everyone supported development opportunities that can help facilitate the aspirations of local Aboriginal people to build greater economic self-sufficiency, but designing the pathways for doing so should be community-specific and Aboriginal controlled.
- Onshore petroleum and any other (mining) industry development should be "balanced" and able to exist alongside existing industries. It should not detract from existing industries and regional identity, or compromise future economic opportunities. Meanings of 'minimal harm' need to be negotiated and defined.
- Most people would feel more comfortable if there were Aboriginal rangers and custodians "keeping an eye on" the condition of country and actively involved in environmental monitoring and land management. Although concerns were raised regarding funding arrangements, recruitment and allocation and prioritisation of tasks, Pastoralists saw opportunities for mutual benefits and for greater collaboration and expressed a general willingness to cooperate with Aboriginal ranger groups.
- Many people did not feel they have been consulted adequately. There is not widespread understanding of what onshore petroleum development will look like, or what impacts it may have for the region.

It is felt that only those directly impacted have had the industry explained to them. There is a desire for more "neutral", "factual" information.

- Even some of the people who have been highly engaged feel conflicted or confused because they are hearing "two very different sides to the story". It was explained how information is needed that can empower local people to raise their concerns or to make suggestions for how to improve practices.
- There are pockets of strong voices, but no collective voice or representation of all the interests in the Beetaloo region. People in the region would like to see governance mechanisms that are "truly representative" of the interests of the region and facilitate meaningful dialogue about development opportunities and concerns.
- The importance of communication with all stakeholders was a strong and common theme – not just consultation with those directly impacted when lodging an EMP or as part of an approvals process. It was suggested that there needs to be regular and openly available updates provided on project/s and more effort in establishing relationships with neighbours and other affected stakeholders.
- Representative organisations play an important role disseminating information to their members and putting their interests forward, but it is not enough to engage through these groups alone, as there can be very different experiences, and expectations for the onshore petroleum industry within the groups. There were suggestions of establishing a multi-stakeholder representative body for the Beetaloo region, and a separate cultural authority body.
- There are differences in community structures and functions, and leadership capacities, which will determine communities' abilities to respond to onshore petroleum development opportunities and challenges.

 Baseline trends show improvements in some areas such as education levels and housing quality, but not in others such as crime and alcohol. There is variation in the collection and reporting of data over time, which makes it difficult to detect consistent trends. This variation is thought in part to result from data quality issues – low response rates to census, low numbers make reporting at community level difficult for privacy reasons.

Not only have the social, cultural and economic studies been useful for generating knowledge and establishing an understanding of community concerns, they have also created partnerships and relationships between a range of stakeholders interested in the outcomes of the studies and the onshore petroleum industry. However, the relationships and conversations started through these studies do not end with their completion. The insights these studies bring provide the basis for an ongoing regional monitoring framework involving multiple stakeholders. The monitoring program should not only aim to deliver reliable and valid findings but be considered independent and trusted by the community, focusing on what communities consider is important.

#### 2.2.1.7 Emergent regional values

The strongest theme emergent from each of the SREBA baseline studies was the importance of water within the landscape. Most of the high ecological values identified during the studies were associated with sites or ecosystems that depend on either groundwater or surface water, and this is mirrored by the importance of these water resources both culturally and economically. This emergent theme from the SREBA studies is not new or surprising, but the SREBA provides additional data and knowledge to more fully enunciate water-related values.

Based on the outcomes from the biophysical SREBA studies, the water-related places of the highest environmental value have been described and mapped. Areas of outstanding value are the Roper Discharge zone near Mataranka and the Lake Woods / Longreach Waterhole wetlands near Elliott. Areas of high value include the Cambrian Limestone Aquifer, and a collection of surface water ecosystems including groundwater-dependent vegetation communities and aquatic refugia scattered throughout the study area and Subbasin. Based on the information collated during the SREBA, some recommendations for regulatory controls and ongoing monitoring are made, which may minimise the potential risks to these sites and values from onshore petroleum development.

There are a broad variety of values in the Beetaloo region that are not directly water-related, including ecological, cultural, social and economic values. Many of these values are at least partly captured in the concept of 'healthy' ecosystems, which are largely structurally intact, where biodiversity and ecosystems functions are maintained, and where there is access to land by traditional custodians for cultural practices. Some potential applications of the SREBA outputs to help protect these values are described.



The social, cultural and economic studies provide a clear description of the emergent values and thresholds of acceptance. Through the findings and recommendations, including the regional monitoring framework, the studies detail ongoing opportunities to continue to engage and strengthen the relationships with communities potentially impacted by onshore petroleum development, to establish an ongoing monitoring program in the context of community concerns and aspirations and to continue to build on the knowledge base.

#### 2.2.1.8 Application of the SREBA

#### **Risk assessment**

There have been two substantial risk assessments undertaken relating to potential impacts from onshore petroleum resource development in the Northern Territory, and more specifically the Beetaloo Sub-basin: as a key component of the Scientific Inquiry (published in 2018), and as the final, integrative stage of the Beetaloo GBA Program (published in 2021). The SREBA does not remake those risk assessments, but rather provides additional data and understanding to address knowledge gaps or uncertainties identified during those assessments.

The GBA Program developed a novel approach using causal networks to assess the regional-scale risks of unconventional petroleum development in the Beetaloo region. The causal network developed for the Beetaloo Basin captures the relationships between unconventional petroleum resource development activities and the complex and interconnected nature of the natural environment in the assessment region. The GBA assessment identified no pathways of potentially high concern between unconventional petroleum resource development and water and the environment in the Beetaloo region. All potential impacts could be mitigated through compliance with existing regulatory and management controls, with a high degree of confidence. The SREBA (along with other very recent studies) has developed substantial

additional data and understanding relating to the natural environment in the Beetaloo region to that available during development of the GBA impact assessment. There is considerable value in incorporating this additional data into the Beetaloo GBA causal network and further developing this as an operational tool that can be applied during the environmental impact assessment process for future onshore petroleum development.

#### Enhanced protection for key values

Synthesis of the data and information collected during the SREBA has identified some areas within the Beetaloo region of outstanding or high environmental value. Consideration of these values and the risk assessments previously undertaken for onshore petroleum development in this region suggest a number of measures that will strengthen the protection of these high-value areas, and increase community confidence that these values will be effectively protected. These build on regulatory measures already implemented in response to Inquiry recommendations.

#### **Regional monitoring**

One of the purposes of the SREBA was the collection of baseline data to provide a reference point for ongoing monitoring. Monitoring the impact of any major onshore petroleum development in the Beetaloo region is essential for testing whether the previous assessment of risks was accurate, that mitigation measures and regulatory controls are effective, and to trigger and inform appropriate corrective measures if unacceptable impacts occur. While the regulatory regime for onshore petroleum activities has numerous requirements for projectscale monitoring, additional regional-scale monitoring is required to detect the cumulative impacts of multiple projects or indirect impacts of projects that occur distant from their footprint.

The findings from each SREBA domain can be used to inform the development of a regional monitoring and reporting framework for the Beetaloo region. The social, cultural and economic baseline report provides a detailed framework for a long-term participatory regional social impact monitoring that also satisfies Recommendation 12.7 of the Inquiry.

### Environmental impact assessment and area-based assessment

Information from the SREBA studies will be accessed and used by relevant stakeholders and the regulator in the context of impact assessments, both at a project level and to assess the cumulative impacts of multiple projects in the Beetaloo region.

The conventional approach to environmental assessment and regulation for onshore petroleum activities (as for other development proposals) is on a project-by-project basis, where a project is typically at the scale of an individual well or well pad. The Inquiry had a strong interest in the potential for regional or area-based assessment for the development of onshore petroleum resources in the NT, primarily because of the anticipated scale of development, use of water, and extent of infrastructure required to extract and produce the gas. The SREBA in itself satisfies many of the requirements of an area-based assessment, and provides a strong basis for any formal strategic regional assessment, if that is required in the future, once the timing and scale of development is known.

#### Data management

The Beetaloo SREBA collected very large amounts of data, adding to existing data from a wide variety of sources. The value of the SREBA will be maximised by ensuring these data are readily available to all potential users, including regulators, industry and the public. A data management system has been developed specifically to encompass the diverse data and information collected through the SREBA and all SREBA data and reports are publicly accessible through the SREBA Data Catalogue, except where access is restricted due to cultural sensitivities or privacy requirements.

Data collection in the Beetaloo region will not cease with the completion of the SREBA. Relevant data will continue to be collected through mandated monitoring programs, investigations associated with project-level environmental impact assessment, research projects supported by GISERA, and other activities. While the SREBA studies represent a 'snapshot' baseline at a particular time, it is important that relevant data from the Beetaloo continue to be captured and effectively curated, both to add to baseline understanding of the region and to track changes over time.

#### 2.2.1.9 Recommendations

The SREBA was a set of studies to address knowledge gaps and establish appropriate baselines against which the potential impacts of proposed onshore petroleum activities may be assessed. The baselines can also assist in the design and planning of future development, particularly at a regional scale, in order to minimise impacts. A SREBA was not in itself a risk assessment process, but provides appropriate information to allow government, regulators and industry to apply robust risk assessment. Nevertheless, synthesis and reporting of the SREBA studies has highlighted a number of potential measures that can maximise the value obtained from the SREBA (as well as the related work undertaken for the GBA Program), as outlined below.

- 1. Engage with the Australian Government and CSIRO to incorporate additional data and knowledge obtained through the SREBA into the existing GBA Beetaloo causal network and to update the impact assessment, with additional endpoints, nodes and links where required.
- 2. In collaboration with CSIRO, develop the GBA Beetaloo causal network and user interface further as an operational tool that can be applied during the impact assessment and approval process for future onshore petroleum development in the Beetaloo Sub-basin.
- Implement the measures outlined in section 10.2 of the Regional Report to minimise risks to the areas identified as having outstanding

and high environmental value, and increase community confidence that these values will be protected.

- 4. Implement a regional monitoring program, as outlined in section 12.2 of the Regional Report, to ensure that longer-term and cumulative impacts of a gas-field scale development in the Beetaloo Sub-basin are adequately monitored and transparently reported. This would include both long-term participatory regional social impact monitoring that satisfies Recommendation 12.7 of the Inquiry, and long-term monitoring of selected biophysical indicators.
- 5. Maintain a data management platform and associated publicly accessible interface that captures and curates the data and information collected during the SREBA, data collected in the future through regional monitoring programs, and other relevant data (such as GISERA research projects, project-scale monitoring and other environmental investigations).

#### 2.2.2 Reforms to Environment Management Plans (EMPs)

Amendments to the Petroleum (Environment) Regulations 2016 strengthened requirements for petroleum industry proponents to provide information in project EMPs that will build knowledge about the project-specific impacts and inform decision-making.

The Petroleum (Environment) Regulations 2016 require all EMPs to include a description of the existing environment, informed by baseline field studies to identify sensitive environmental receptors, such as riparian zones, habitat for listed species and archaeological heritage. This information forms the basis of risk and impact assessments, and the demonstration that all risks and impacts can be managed at levels that are acceptable and as low as reasonably practicable. The SREBA studies have significantly enhanced the ability of interest holders to identify and assess risks and impacts, and for NT Government regulators to undertake a robust decision-making process to mitigate risks to the environment associated with onshore petroleum industry development.

Proponents are now required to include information in an EMP about hydraulic fracturing fluids and additives, and must submit reports to the Minister for Environment, Climate Change and Water Security on flowback fluid and produced water within 6 months of the flowback or production occurring. These reports will be published online within 5 business days of their receipt.

Amendments to the Petroleum (Environment) Regulations 2016 strengthened the role of the Code of Practice in the EMP process. EMPs submitted for approval must demonstrate compliance with the Code of Practice, including requirements for the collection of baseline data and ongoing monitoring of weeds, rehabilitation success, groundwater quality and bushfire fuel loads to inform ongoing risk management. See **Chapter 3: Safeguarding water resources** for more information about the Code of Practice.

In 2018, the NT Government amended the Petroleum (Environment) Regulations 2016 to remove the caveat 'as far as practicable' from the requirement for EMPs to assess the cumulative impacts and environmental risks of regulated activities in conjunction with other activities or events associated with other petroleum exploration or production, or the exploration or extraction of minerals. This change reflects the improved availability of baseline data that supports the assessment of cumulative impacts and strengthens the requirement for proponents to conduct this assessment.

## 2.3 Ongoing monitoring, reporting and review

#### 2.3.1 Monitoring and reporting activities

Information from the SREBA studies can be used to consider and formulate an ongoing regional monitoring and reporting framework to adequately monitor and transparently report longer-term and cumulative impacts of onshore petroleum activities, taking into account the findings from each of the study domains and noting the complexity and resourcing requirements. The baselines established through SREBA can also assist in the design and planning of future development, particularly at a regional scale, in order to minimise the risks identified by the Inquiry.

The social, cultural and economic SREBA study captured baseline information and provided recommendations for ongoing monitoring of social, cultural and economic impacts that can be monitored, measured and reported over time, providing an evidence base for addressing negative impacts and enhancing positive impacts in the region. The monitoring framework will need to collect and evaluate data to address the core values identified through the SREBA study. The framework will be participatory in its approach, and need to ensure a clear oversight structure is in place to safeguard the integrity of processes used for monitoring, evaluation and communication of data. Options to involve local Aboriginal rangers in regional monitoring activities will be explored to enhance community trust in the monitoring process.

#### 2.3.2 Regulatory review

Following the regulatory separation and transfer of responsibilities for environmental management from the Minister for Resources to the Minister for Environment, Climate Change and Water Security, the environmental regulation of onshore petroleum activities is the responsibility of DEPWS, while other aspects of petroleum regulation (including titles, wells and surface infrastructure, and petroleum resource management) are the responsibility of DITT.

Both Departments will continue to work collaboratively to regulate the onshore petroleum industry, and ensure any code (or codes) of practice adopted under the petroleum legislation is contemporary to ensure advances in processes or technology that can improve the collection or assessment of data, including baseline or ongoing methane monitoring, are considered and incorporated as appropriate.

#### 2.3.3 Information and data

The individual SREBA studies, including technical reports and the data catalogue, are all available at depws.nt.gov.au/sreba



#### Summary

- Prior to the Inquiry, there was limited knowledge about certain environmental characteristics in the Territory, which prevented the NT Government from understanding and mitigating risks to the environment and to human health.
- The SREBA studies have produced a baseline understanding of water quality and quantity, aquatic ecosystems, terrestrial ecosystems, greenhouse gas emissions, environmental health, and social, cultural and economic conditions in the Beetaloo Sub-basin region.
- This information improved the NT Government's knowledge of the region and will enable effective assessment and monitoring of environmental impacts from the onshore petroleum industry.

nplementation Repo

# 3. Safeguarding water resources

Water allocation plans and water licensing MITIGAT

SREBA (water quality and quantity studies)

Reforms to the Petroleum (Environment) Regulations 2016

Restrictions on the transport of chemicals

Scientific Inquiry into Hydraulic Fracturing Final Implementation Report, Northern Territory Government, 2023

#### 3.1 Context

The Inquiry noted water was the key concern raised in the community consultations and in the submissions received by the Inquiry. Concern focused on competition between the onshore petroleum industry and other water users, and the potential impacts of contamination of water resources. The Inquiry found that risks to water resources were multi-faceted and could involve contamination of surface or groundwater through pathways such as spills during transport, leaky wells or surface infrastructure (including pipes), reinjection of treated or untreated wastewater into aquifers, or induced connectivity between shale rock formations and aquifers. The Inquiry also found risks associated with the flow of surface or groundwater from seismic activity, the effects of infrastructure such as roads and pipelines impacting the distribution of surface water across the landscape, and the impact of planned or accidental discharge of produced water.

These impacts in turn create risks to:

- water use by coexisting industries such as agriculture, fishing and tourism
- water use by communities on a local and regional scale, including risks to human health resulting from poor quality water supply
- water use by Aboriginal people for cultural purposes.

Prior to the Inquiry, there were no specific and prescriptive requirements regarding water monitoring in relation to onshore petroleum activities.

The Inquiry made 31 separate recommendations concerning water-related issues and risks. These recommendations were designed to work together to not only reduce the risk of contamination, but to provide a comprehensive early warning system to identify any impacts on water quality so they can be addressed immediately.

## 3.2 Reforms implemented to mitigate the risks

#### 3.2.1 Legislative reform

The NT Government has completed an extensive program of reforms for water regulation. The resulting regulatory framework is a significant improvement for the planning, licensing and regulation for the Territory's water resources compared to the system that existed in 2018.

Prior to the Inquiry, regulation of the impact of onshore petroleum activities on water resources was limited to approvals under the **Petroleum Act 1984** and the (then) relatively new Petroleum (Environment) Regulations 2016, administered by the then-DPIR. The Petroleum (Environment) Regulations 2016 introduced a general requirement for an EMP to identify and assess all environmental impacts and risks, and demonstrate how the impacts and risks would be managed to levels that are acceptable and as low as reasonably practicable.

Under the previous regime, petroleum activities were exempt from the licensing and permitting requirements of the *Water Act 1992*, and any publicly available information on water use or water requirements of the onshore petroleum industry was limited to requirements in the petroleum regulatory framework. Although the water requirements of the mining and petroleum industries were considered as part of water allocation planning in the *Water Act* **1992**, appropriate planning was hampered by a lack of clear information regarding existing water usage and future water requirements for these industries.

The absence of charges for water usage in the Northern Territory was seen by the Inquiry as potentially contributing to the inefficient use of the water resources by the onshore petroleum industry and contrary to the best practices outlined in the National Water Initiative.

#### 3.2.1.1 Water Act 1992

There have been significant legislative and policy reforms to the Territory's water management framework since the Inquiry was finalised, including reforms to consolidate responsibility for environmental management of the Territory's water resources as they apply to the onshore petroleum industry with environmental regulators, including the Controller of Water Resources and DEPWS. This occurred through the transfer of responsibility for the Petroleum (Environment) Regulations 2016 from the DITT to DEPWS and amendments to the Water Act 1992 to remove exemptions for the onshore petroleum industry from the water extraction licensing requirements of that Act. This ensures the risks and impacts of groundwater extraction from onshore petroleum activities are transparently considered within the appropriate regulatory, policy and planning process established by the Water Act 1992. It also provides for public access to extraction decisions, licences granted and the conditions imposed under those licences.

Amendments to the *Water Act 1992* were passed in 2018, to remove a provision that exempted mining and petroleum activities from licensing and permit requirements under the Act. This means licence applications for water to support petroleum activities must be assessed under the Act, and in accordance with the allocation policies and protections to river flows and groundwaterdependent ecosystems that apply to all licensing decisions in the Northern Territory.

The *Water Act* **1992** establishes a framework to licence and manage the use of water resources. The Daly Roper Beetaloo Water Control District was declared on 20 July 2018 to ensure any bore drilling or water extraction in this area was captured under a permit or licensing regime. The Daly Roper Beetaloo Water Control District was extended by declaration on 19 October 2022 to encapsulate the water resources in the Beetaloo region where onshore petroleum industry activities are likely to occur.

Declaring a Water Control District enables the NT Government to develop Water Allocation

Plans (WAPs), which apply specific rules for water permit and licence decisions that are tailored to the region and its water resources. WAPs enhance water resource protections by providing a statutory mechanism to manage and share water resources in areas where there is (or likely will be) demand or competition for water. They are based on the protection and/or preservation of environmental and cultural values as their primary intent, and set the limits and rules for allocations to different beneficial uses in a region, including allocation limits to onshore petroleum activities. WAPs also provide for water to be reserved for future Aboriginal economic development. Decisions about water extraction licences must be made in accordance with the relevant WAP.

The declaration of the Daly Roper Beetaloo Water Control District in 2018 and its extension in 2022 were precursors to the development of relevant WAPs for the allocation of water resources in the Beetaloo Sub-basin. The WAP for the Georgina and Wiso Basins closed from public consultation in December 2022. The plan allocates water amongst declared beneficial uses and provides for the trading of water, which will take effect from the date of its Gazettal by the Minister for Environment, Climate Change and Water Security.

In addition to the allocation rules contained in the relevant WAP, granted licences are issued with conditions and requirements designed to protect water resources and the environment, including monitoring rules, extraction limits and extraction locations. Licences are also issued subject to allocations being able to be reduced in dry years in the Top End to maintain river flows and the ecosystems that rely on these flows.

Regulation of water extraction licence decisions under the **Water Act 1992** also means the public and neighbouring land owners are provided the opportunity to be informed and for their views to be considered in making a decision to grant a licence. Granted licences are published on the water licensing portal, which is available on the DEPWS website. Other reforms to the *Water Act* **1992** to address the concerns associated with onshore petroleum activities include amendments to:

- prohibit the disposal of wastewater to ground and surface water, including the prohibiting of reinjection of hydraulic fracturing wastewater into aquifers
- prohibit surface water extraction for petroleum activities
- impose limits on the granting of groundwater extraction licences within 1kilometre of designated types of bores
- significantly increase the range and value of penalties for offences under the Act.

An interim water charging framework for the onshore petroleum industry was established from 1 January 2023, following amendments to the Water Regulations 1992.

#### 3.2.1.2 Petroleum legislation

Over the past four years, the NT Government introduced a series of amendments to the *Petroleum Act* 1984, the Petroleum Regulations 2020, and the Petroleum (Environment) Regulations 2016 to enhance legislative requirements for water monitoring.

Amendments to the Petroleum (Environment) Regulations 2016 removed the caveat 'as far as practicable' from the requirement for an EMP to assess the cumulative impacts and environmental risks, including the risks to water resources, of regulated activities in conjunction with other petroleum exploration or production activities, or the exploration or extraction of minerals.

A range of reforms were made to the Petroleum (Environment) Regulations 2016 to better address risks to ground and surface water. These included requirements:

• for EMPs for drilling and hydraulic fracturing activities to be published for comment, including information about hydraulic

fracturing fluids and additives, increasing transparency and enabling stakeholders and the community to comment on how impacts and risks to water are proposed to be managed

- for interest holders to provide reports on flowback fluids and produced water for activities associated with hydraulic fracturing
- for interest holders to publicly disclose chemicals to be used in hydraulic fracturing and to conduct human health risk assessments on flowback fluid, produced water and hydraulic fracturing fluids
- to ensure only non-harmful drilling fluids are used when drilling through aquifers
- for the payment of environmental securities, which includes the cost of ensuring wastewater is disposed of in a manner that does not impact on groundwater or surface water and contamination is remediated.

Reports on flowback fluid and produced water must be submitted to the Minister for Environment, Climate Change and Water Security within 6 months of the flowback or production occurring. These reports will be published on the DEPWS website within 5 business days of its receipt.

#### Code of Practice: Onshore Petroleum Activities in the Northern Territory

Amendments to the Petroleum (Environment) Regulations 2016 created the power for the Minister to establish a code of practice for petroleum activities. The 'Code of Practice: Onshore Petroleum Activities in the Northern Territory' was approved in June 2019. Under the Petroleum (Environment) Regulations 2016, all EMPs submitted for approval must demonstrate compliance with the Code of Practice and other requirements of the Petroleum (Environment) Regulations 2016. The Code of Practice provides minimum standards that the onshore petroleum industry in the Northern Territory must adhere to. It draws on world-leading practice to identify standards to address a broad range of environmental risks identified in the Inquiry.

With respect to water quality and quantity, the Code of Practice:

- addresses the water drawdown impacts to other groundwater users by requiring well pads to be located no closer than 1 kilometre to an existing groundwater bore established for domestic or stock use
- addresses risks to water quality by specifying the analytes that should be assessed to determine potential for impact to surface or groundwater from contamination events, such as drilling fluids, drilling wastewater and hydraulic fracturing fluids and wastewater, and places limitations on drilling fluids to ensure they are not harmful to aquatic life
- includes requirements related to preventing contamination of surface water and groundwater quality, such as the requirement for use of secondary containment for all chemical and wastewater storage areas
- includes requirements for groundwater quality monitoring
- includes requirements for verification of petroleum well integrity and ongoing integrity monitoring
- includes requirements related to transport, storage, handling, use and disposal of chemicals and wastewater, including transport during the wet season on unsealed roads
- includes requirement to undertake monitoring of flowback fluid and produced water quality and flow, to support assessment of risks associated with a loss of containment event
- requires avoidance of sensitive habitat areas such as riparian zones and their buffers to the greatest extent possible when planning activities
- requires remediation and rehabilitation of all surface disturbance, to ensure potential impacts from sedimentation of waterways is minimised
- introduces minimum standards for the construction of wells.

The Code of Practice also establishes a requirement to store wastewater from hydraulic fracturing in enclosed tanks, to minimise the potential for fauna interaction with wastewater. Wastewater may only be placed in open tanks when undergoing treatment, such as evaporation, and must be enclosed prior to significant rainfall events.

#### 3.2.1.3 Well operations management plans

Under the petroleum legislation amendments, proponents must have an approved well operations management plan (WOMP) in place for each well before commencing any well-related operations. The WOMP must cover the entire life cycle of a well, including:

- drilling
- well construction
- operation
- well entry
- modification
- decommissioning
- post-decommissioning period.

This ensures the risks to the well's integrity are reduced as far as reasonably practicable over the life of the well.

Minor amendments to the Petroleum Regulations 2020 will occur in 2023 to establish the required content for permissioning plans, for example WOMPS, which will require the inclusion of postdecommissioning monitoring and maintenance plans, and seismicity management plans. The Minister for Mining and Industry issued a direction to all petroleum interest holders in November 2022 under section 71 of the *Petroleum Act* **1984**, directing them to comply with the Induced Seismicity Management Guideline. The Minister's letter foreshadowed the requirement to include a seismicity management system in a WOMP.

#### 3.2.1.4 Environment protection

Although not in direct response to the Inquiry, the NT Government's environmental impact assessment framework was also substantially reformed, resulting in the repeal of the *Environmental Assessment Act 1982* and introduction of the *Environment Protection Act 2019*. These reforms provided the independent NT EPA with an improved regulatory framework in which to consider significant impacts on the Territory's water resources. The **Environment Protection Act 2019** introduced a new environmental approval, containing conditions to manage significant impacts, which is granted by the Minister for Environment, Climate Change and Water Security at the completion of the assessment process. At the date of preparing this report, no onshore petroleum activities have been referred to the NT EPA for environmental impact assessment.

#### 3.2.1.5 Transport of dangerous goods

Laws regulating the transport of dangerous goods by road and rail are updated internationally and nationally every 2 years. Territory legislation had not been updated for several years. As a result, the transport of dangerous goods laws in the Territory had become out of date and inconsistent with the equivalent laws in all other Australian jurisdictions.

This presented a risk because dangerous goods, including chemicals used in the onshore petroleum industry, could have been transported in the Territory in a way that did not meet contemporary national and international best practice. Transport practices that do not meet best practice standards increase the risk of chemical spills and other events that are likely to contaminate water resources.

Amendments to the Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2010 and the Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations 2011 were passed in November 2022, ensuring requirements for the transport of dangerous goods, including chemicals used by the onshore petroleum industry, are consistent with other jurisdictions and reflect domestic and international best practice. These reforms ensure chemicals used in the onshore petroleum industry are transported safely to reduce the risk of spills and contamination to water resources.

The reforms introduced filling level requirements for tank vehicles to ensure the stability of vehicles while transporting dangerous goods, reducing the risk of vehicle rollover and potential spillage of its load. Restrictions on the location and circumstances in



which vehicles transporting dangerous goods can be parked, unloaded and have trailers detached further reduce the risk of spills and contamination to water resources.

In the event they arise, a suite of obligations were introduced to handle dangerous situations, including requirements for emergency plans to be activated and ensuring transport documentation is readily accessible to assist emergency responders. In the event of an emergency, such as a chemical spill, these reforms will reduce the risk of contamination to water resources by enabling a fast and effective containment response.

To ensure these new obligations will be enforced in practice, a new position was created in NT WorkSafe for an inspector who has expertise and experience in onshore petroleum industry activities. The addition of a new inspector will elevate NT WorkSafe's in-house capability as the Competent Authority to regulate work health and safety obligations in the onshore petroleum industry. In addition to worker health and safety, robust enforcement of these obligations reduces the risk of contamination of water resources resulting from spills during transportation.

#### 3.2.1.6 The 'water trigger' under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (the EPBC Act)

At present, large coal mining or coal seam gas developments that may have a significant impact on water resources must be assessed under the EPBC Act.

The Australian Government has committed to expanding the water trigger to include unconventional forms of gas extraction, including shale gas, as part of its response to the Independent Review of the EPBC Act by Professor Graeme Samuel AC in 2020. The NT Government will continue to engage with the Australian Government as it considers the expansion of the water trigger, as recommended by the Inquiry.

## 3.2.2 Strategic Regional Environmental Baseline Assessment (SREBA)

The SREBA water quality and quantity studies established a large body of data and research findings that have improved understanding of the hydrogeology and water resources of the Beetaloo region. In particular, the studies increased the scientific understanding of the region's main groundwater resources, the Cambrian Limestone Aquifer (CLA).

The water quality and quantity studies included:

- a detailed gap analysis of water-related information for the Beetaloo Sub-basin
- establishment of new water monitoring bores in poorly studied western parts of the Sub-basin
- drilling for additional new water monitoring bores to fill information gaps in other parts of the Sub-basin
- testing of an extensive array of existing bores for water quality
- establishment of baselines of groundwater chemistry and groundwater levels
- characterisation of groundwater connectivity, flows and aquifer parameters
- characterisation of groundwater and surface water interactions and recharge and discharge processes for regional aquifers overlying the Beetaloo Sub-basin.

The data and information generated by the water quality and quantity studies has informed the development of water allocation plans and will enable evidence-based decision making about sustainable groundwater allocations for onshore petroleum industry development, and for other beneficial uses. The new baseline information will also support the robust assessment of risks to water resources from individual projects and from cumulative development activities. Refer to **Chapter 2:** *Addressing a lack of knowledge* for more information about the work completed and findings from the water quantity and quality studies.

#### Orphan well monitoring program

In 2021, specialist petroleum engineers were recruited to develop and implement an orphan well monitoring program in the Northern Territory. Orphan wells are petroleum wells that were abandoned by previous petroleum industry operators and were not properly secured or remediated. The orphan well monitoring program will improve the management and monitoring of orphan wells and reduce the contamination risk they pose to the Territory's water resources. The program involves:

- analysis of all orphan wells using historical data
- desktop analysis to determine a preliminary risk rating for each well
- field inspections to determine the precise locations and comprehensive risk ratings for each well
- conducting barrier analysis
- undertaking remedial work and ongoing monitoring as required.

The NT Government has ensured that the orphan well monitoring program is sufficiently resourced to monitor and secure the integrity of wells into the future. Amendments to the **Petroleum Act 1984** introduced a new orphan well levy and fund to ensure the NT Government has sufficient resources to take appropriate action in a timely manner as required to secure the integrity of orphan wells.

## 3.3 Ongoing monitoring, reporting and review

#### 3.3.1 Monitoring and reporting activities

DITT will continue to focus on the integrity of wells and surface infrastructure as a key priority in its regulation of the onshore petroleum industry. The Orphan Well Program is now managed by the Energy Development Branch of the Mining and Energy Division of DITT as part of its businessas-usual activities. From the start of the 2023-24 financial year, the Orphan Well Program will be funded by industry, through cost recovery mechanisms and annual Orphan Well Levy payments.

DEPWS will continue to apply groundwater monitoring requirements, including any changes to the requirements pursuant to the upcoming independent assessment, to enable the rapid detection of impacts to these resources and identify any long-term changes in groundwater quality. This long-term monitoring also contributes to increased understanding of aquifers in the Beetaloo Sub-basin.

The NT Government also imposes monitoring obligations on petroleum interest holders, including requirements to monitor and report on:

- the amount of water extracted in accordance with water extraction licence conditions
- flowback fluids and produced water for activities relating to hydraulic fracturing
- groundwater pressure before, during and after hydraulic fracturing activities
- groundwater quality, from both impact and control bores
- where appropriate, monitoring of potential impacts to surface water.

The Code of Practice requires proponents to comply with the Preliminary Guideline for Groundwater monitoring bores for Exploration Petroleum Wells in the Beetaloo Sub-basin (the Guideline), finalised on 29 November 2018. The Guideline establishes requirements to monitor wells for leaks to prevent groundwater contamination.

NT WorkSafe will conduct ongoing monitoring of the transport of chemicals used by the onshore petroleum industry.

The SREBA findings, including information from the water quality and quantity study, can be used to inform the development of a regional monitoring and reporting framework for the Beetaloo region. A regional monitoring and reporting framework would enable the accurate monitoring and transparent reporting of longer-term and cumulative impacts from onshore petroleum industry development, including impacts to water resources.

#### 3.3.2 Regulatory review

DEPWS and DITT will continue to work collaboratively to regulate the onshore petroleum industry and will review the Code of Practice in 2023 to ensure it is contemporary and considers advances in processes or technology that can reduce risks to water resources.

The Minister for Environment, Climate Change and Water Security declares WAPs for a period of up to 10 years. The *Water Act* **1992** requires a statutory review of each WAP at 5 year intervals.

NT WorkSafe will use its representative status on the national Competent Authorities Panel to bring about change to Territory legislation regarding the transport of dangerous goods or the Australian Dangerous Goods Code if required. The international and national laws on the transport of dangerous goods by road and rail is updated every 2 years. Future updates to the corresponding Territory laws will occur on an ongoing basis.

DEPWS will procure an independent assessment of groundwater monitoring requirements to be completed prior to commencing production activities. This assessment will ensure the groundwater monitoring program remains effective and appropriate for production activities and continues to mitigate the impacts and risks identified during the Inquiry. As part of this review, an independent expert will consider the most appropriate early warning monitoring system for the Territory context, taking into account Inquiry recommendation 7.11 that referred to the standard to which petroleum wells are constructed and drilled, including experience to date.

#### 3.3.3 Information and data

WAPs are published on the DEPWS website, at <a href="https://depws.nt.gov.au">depws.nt.gov.au</a>

NT Government decisions relating to water licences are available on the water licensing portal on the DEPWS website.

NT Government decisions relating to EMPs and environmental approvals are available on the DEPWS website.

Industry compliance reports, including flowback fluid monitoring results, are available on the DEPWS website at <u>depws.nt.gov.au</u>

The SREBA water quantity and quality studies, including technical reports and the data catalogue, are available at <u>depws.nt.gov.au/sreba</u>



#### Summary

- The NT Government introduced regulatory reforms to improve the assessment and mitigation of risks to water resources from the onshore petroleum industry.
- New offences and increased penalties ensure the NT Government can take appropriate compliance and enforcement action against onshore petroleum industry proponents when required.
- The NT Government now has a better understanding of water resources in the Beetaloo Subbasin and will use new information to assess and monitor impacts on water resources.

# 4. Protecting landscapes

Mandatory consultation on land releases MITIGATION



**Road network upgrades** 

**Enforceable Code of Practice** 

**Mandatory Aboriginal Areas Protection Authority Certificate** 

#### 4.1 Context

In 2018, the Inquiry considered the development of an onshore petroleum industry to have the capacity to transform the landscape of the impacted regions and thereby potentially diminish the enjoyment of these unspoiled landscapes in the eyes of residents and tourists. As a result, the Inquiry made 13 separate recommendations in relation to issues and risks for landscapes.

The Inquiry found development of an onshore petroleum industry poses a risk to the integrity and character of the Northern Territory's landscape. This landscape is an essential element of the culture of Aboriginal Traditional Owners and is central to attracting tourists to regional areas of the Northern Territory. Traditional Owners' concerns included the potential for damage to and degradation of sacred sites and cultural landscapes, both above and below the ground. Identified adverse impacts to the unique wilderness value of the Territory which may damage the outback experience marketed by the tourism industry included:

- increased infrastructure
- increased noise
- increased light from flaring
- an unacceptable increase in heavy vehicle traffic.

## 4.2 Reforms implemented to mitigate the risks

#### 4.2.1 Legislative reform

#### 4.2.1.1 Petroleum legislation

Prior to the Inquiry, there was no requirement for the Minister for Mining and Industry to notify and consult with the community about the intention to release land for petroleum exploration, or consider those comments before making a decision. With no requirement to consult, there was also no requirement to publish any comments received in relation to the release of land.

Amendments introduced in 2020 to the *Petroleum Act* **1984** introduced a public notification and consultation process for the proposed release of land for petroleum exploration. This included a requirement for the Minister for Mining and Industry to publish a statement of reasons for why the blocks were determined to be appropriate for exploration. This provides the Minister the benefit of public submissions on whether development in the released blocks may impact unique wilderness values, the potential impact on landowners and occupiers, and consideration of sacred sites in the area.

As discussed in **Chapter 3: Safeguarding water resources**, amendments to the Petroleum (Environment) Regulations 2016 created the power for the Minister to establish a code of practice for petroleum activities. Under the Petroleum (Environment) Regulations 2016, all EMPs submitted for approval must demonstrate compliance with the Code of Practice and other requirements of the Petroleum (Environment) Regulations 2016.

The risk of land subsidence caused by drilling and the hydraulic fracturing process has been mitigated through requirements of the Petroleum (Environment) Regulations 2016 to assess and manage all environmental impacts and risks, and requirements in the Code of Practice for:

- planning and site selection to consider measures to avoid interference with wet season flows and fauna passage, and minimise impacts from erosion and sedimentation. EMPs are required to include an Erosion and Sediment Control Plan consistent with best practice guidance from the International Erosion Control Association
- EMPs to include a risk assessment for any proposed transport of chemicals or wastewater on unsealed roads during the wet season.

The Code of Practice also reduces the risks to landscape amenity by:

- requiring a WOMP that includes hydraulic fracturing stimulation to take into account the location and characteristics of known geohazards (including faults and other geological hazards) and any other wells located near the well to be hydraulically fractured
- requiring site selection and layout to reduce impacts on existing landscape amenity by:
  - minimising the surface footprint of all aspects of development
  - ensuring that infrastructure located in proximity to major public road or locations with high existing amenity value is designed and located to minimise long-term amenity impact
  - spacing well pads a minimum of 2 kilometres apart when targeting a continuous resource, unless specific site constraints (such as geohazards, environmental values, cultural heritage and existing land use) require spacing of less than 2 kilometres to reduce environmental risks and impacts on cultural heritage and other land users as far as is reasonably practicable
  - ensuring there is little to no visibility of well pads and well infrastructure (postdrilling) from any major roads that exist at the time the well pad is constructed.

#### Amendments to the *Petroleum Act* **1984** also introduced requirements for the payment of an environmental security as part of approval processes. Securities ensure the NT Government has access to funds to address environmental impacts that arise from petroleum operations but are not appropriately remediated and rehabilitated.

As discussed in *Chapter 3: Safeguarding water resources*, further amendments to the Petroleum Regulations 2020 will occur in 2023 to establish the required content for permissioning plans, such as WOMPs, which will require the inclusion of seismicity management plans.

#### 4.2.1.2 Environmental legislation

The NT Government undertook significant reforms to the Territory's environmental impact assessment framework by repealing the **Environmental Assessment Act 1982** and introducing the **Environment Protection Act 2019.** These reforms continue to ensure significant impacts on the Territory's landscapes are considered by the independent NT EPA within an improved regulatory framework. When approval is granted by the Minister at the completion of the assessment process, the new environmental approval contains conditions requiring project proponents to manage significant impacts.

#### 4.2.2 Petroleum Reserved Block Policy

Prior to the Inquiry, reserved blocks (areas where petroleum activity was prohibited) could be declared under the **Petroleum Act 1984**, but there was no comprehensive policy guiding how areas that should not be subject to petroleum activities were identified and categorised.

The NT Government introduced the Petroleum Reserved Block Policy in July 2019. The Policy guides the declaration of reserved blocks under identified categories, including:

- parks and reserves
- towns
- areas of high conservation value
- Indigenous Protected Areas
- areas of cultural significance
- areas of high tourism value.

Under the policy, 49% of the Territory's land mass will be covered by a declared reserved block. Before the policy was introduced, only 2.05% of the Territory's land mass was reserved from petroleum activities. As of November 2022, 20.76% of the Territory's land mass has been reserved from petroleum activities.

The NT Government continues to negotiate with onshore petroleum companies to relinquish identified areas from their permits where petroleum interests were previously granted, and a number of companies have agreed to relinquish identified areas through this negotiation process. This negotiation process has secured the relinquishment of the Bullwaddy Conservation Reserve, the Town of Daly Waters, the Rocky Hill Bore Field, and the Dulcie Range and surrounds from petroleum permit holdings.

The declaration of land subject to the **Aboriginal Land Rights (Northern Territory) Act 1976** (Cth) is also ongoing. These areas will be declared once the declaration receives the support of the Territory's Aboriginal land councils.

#### 4.2.3 Protecting sacred sites

In the Territory, the primary mechanism for protecting sacred sites from damage associated with development is for project developers (proponents) to obtain and comply with an Authority Certificate issued by the Aboriginal Areas Protection Authority (AAPA) under the **Northern Territory Aboriginal Sacred Sites Act 1989** (Sacred Sites Act). An Authority Certificate is issued following consultation with custodians of sacred sites, and may include conditions that restrict works in some places to protect sacred sites.

While this mechanism has existed since 1989, prior to the Inquiry it was not mandatory for proponents to obtain an Authority Certificate. The Inquiry found although Authority Certificates have been considered a key requirement of broader environmental assessments, they were not necessarily obtained. The Inquiry also identified uncertainty about whether sub-surface features of sacred sites were protected by the Sacred Sites Act.

Legal advice received by AAPA confirmed the Sacred Sites Act covers sites both on the surface of the land and in the sub-surface. Following consultation with land councils, AAPA determined that existing legislative protections were sufficient to protect subsurface features of sacred sites. To strengthen this protection and mitigate risks to sacred sites, AAPA's administrative processes also take into account the potential for impacts to sub-surface features of any sacred sites by requiring the following information in an Authority Certificate application, as outlined in guidance for petroleum applicants:

- the subject area must include areas of proposed sub-surface works
- details of potential direct and indirect impacts to sacred sites, including seismic activity and potential changes to groundwater.

This information enables AAPA to effectively consult with custodians about potential impacts to subsurface features of sacred sites and lowers the risk of damage to those features.

Amendments to the Petroleum (Environment) Regulations 2016 mandated that an Authority Certificate, issued by AAPA, must be held by petroleum interest proponents before an EMP can be approved by the NT Government. If proponents do not have an Authority Certificate, their EMP cannot be approved and the proponent cannot commence works. This requirement applies to all petroleum interest holders, including those conducting conventional petroleum exploration and production that does not involve hydraulic fracturing. This amendment removed the risk of petroleum companies impacting sacred sites by operating without an Authority Certificate.

AAPA has tightened administrative processes for Authority Certificate applications relating to petroleum activities and provided written guidance to petroleum applicants since May 2021. This has made the application process clearer and more transparent.

As long as proponents comply with the terms of an Authority Certificate, the risk of adverse impacts to sacred sites is minimised and the certificate holder is indemnified against prosecution under the Sacred Sites Act. Compliance benefits the certificate holder by providing legal certainty.

The regime for sacred site protection provides a clear framework for consultation and protection of cultural values, setting a benchmark above current national standards. The integrity of this process and its ability to mitigate the risks to sacred sites was demonstrated by the rejection of one EMP for conventional petroleum exploration in Central Australia. The application was rejected because the Authority Certificate contained conditions that restricted the petroleum company's ability to conduct the works proposed in the EMP. In this case the Minister decided sacred site protections prevented approval of the EMP.<sup>2</sup> This decision has prevented damage to Aboriginal sacred sites.

The DEPWS and AAPA have agreed an administrative process under which all draft EMPs submitted for assessment are provided to AAPA for review and comparison with existing Authority Certificates or applications for new Authority Certificates.

The Petroleum (Environment) Regulations 2016 amendment and the associated administrative processes address the risk that sacred sites and cultural landscapes are degraded and damaged both above and below the ground from petroleum activities.

#### 4.2.4 Road upgrades and reforms

At the time of the Inquiry, major public roads in the Beetaloo Sub-basin were either single lane gravel roads or sealed in small, intermittent sections. These roads pass through small regional and remote towns, provide access to nearby pastoral properties and Aboriginal communities, and experience low volumes of traffic.

The Inquiry identified the risk that, without consultation to determine road use and infrastructure requirements and resulting upgrades to relevant standards and guidelines, the development of the onshore petroleum industry would:

- lead to heavy vehicle use which negatively impacts landscape amenity and communities
- allow development without short and long-term benefits flowing to the local communities and regions.

The Inquiry anticipated development of an onshore petroleum industry focused on the Beetaloo Subbasin resources would significantly increase road traffic in the area, with more trucks and road trains transporting resources to and from petroleum project sites, as well as vehicles transporting workers between project work sites and supporting infrastructure such as regional airstrips, worker camps and other facilities. Even before the development of an onshore petroleum industry, the initial condition of the Territory's road network stood as a major impediment to the expansion and efficiency of existing industries located in and around the Beetaloo Sub-basin. This inadequacy of the existing road network was considered to intensify the risk that increased heavy vehicle traffic would negatively impact the amenity of the regional landscape and increase the cost of maintaining public road infrastructure.

In response to the risks associated with increased vehicle traffic, the Inquiry highlighted an opportunity for the NT Government to develop policy options and processes to require petroleum companies to contribute to the ongoing maintenance of the region's roads. The Inquiry also identified a need for road use agreements between petroleum companies and NT Government road authorities that address potential safety issues, ensure monitoring for compliance and include reporting requirements. These matters were addressed through the

<sup>2</sup> The Hon Eva Lawler MLA, Minister for Environment, Refusal notice and statement of reasons (10 January 2022) https://depws.nt.gov.au/\_\_data/assets/pdf\_file/0017/1081421/ministerial-refusal-notice-and-sor-central-ctp5-2-zevon-seismic-program.pdf imposition of a requirement on proponents to conduct social impacts assessments (including traffic studies) prior to production approvals being granted. To support this approach, regional indicators were established as part of the baseline data compiled by the NT Government under the SREBA (See **Chapter 2:** *Addressing a lack of knowledge*).

In response to the Inquiry, the NT Government commissioned independent studies to forecast traffic demand based on development scenarios in the Beetaloo Sub-basin. These studies have now provided sufficient baseline data on projected future traffic demand. Consultation with onshore petroleum industry representatives and both NT and Commonwealth agencies identified a priority list of immediate to short-term (0–5 years) road upgrade projects within the Beetaloo Sub-basin, as well as longer-term (over 5 years) priorities. The shortterm projects are now funded under the NT Gas Industry Roads Corridor Investment Strategy, while the longer-term projects remain a consideration for future funding negotiation.

This new baseline data and priority projects list assisted the NT Government to secure \$367 million of joint funding with the Commonwealth Government to improve the Carpentaria Highway, Buchanan Highway, Western Creek Road and Gorrie/Dry River Road, as well as deliver flood immunity and shoulder-widening upgrades to the Stuart Highway. These upgrades will provide a twolane sealed road over approximately 305 kilometres of public road network through the Beetaloo Sub-basin to ensure the road network can safely accommodate additional heavy vehicle demand from the onshore petroleum industry prior to any significant increase in traffic occurring.

Although the planned road upgrades will significantly reduce the level of maintenance required for heavy vehicle use under a high growth scenario for the first 10 to 15 years after completion, maintenance costs will be recovered from onshore petroleum industry proponents. The NT Government will apply a charging model to heavy vehicle based on their weight and distanced travelled, providing a transparent system that is applied equitably across all industries, including the onshore petroleum industry, while accurately reflecting each industry's impact on the road network. This model reflects the national system for heavy vehicle charging, which was agreed by and is being implemented through the Infrastructure and Transport Ministers' Council. Revenue generated through charges on heavy vehicles will ensure road maintenance costs are paid by road users proportionate to their use of and impact on the road network. The timing for national road reforms appears to coincide with when major developments could be expected in the Beetaloo Sub-basin.

The NT Government's assessment of EMPs submitted by onshore petroleum industry proponents includes examining a project's proposed road use activities, risks to existing and future transport infrastructure, and risks to road use safety. The Department of Infrastructure, Planning and Logistics (DIPL), as the agency with responsibility for road infrastructure and maintenance, will continue to liaise directly with proponents to ensure appropriate mitigation and monitoring measures are in place prior to approval of the EMP. Approvals may also include conditions for DIPL to review engineering and design proposals for roads upgrades and to monitor and accept construction works. Continuity of this assessment process supports NT Government action to mitigate the risk of an unacceptable increase of heavy vehicles on roads as a result of onshore petroleum industry development.

## 4.3 Ongoing monitoring, reporting and review

#### 4.3.1 Monitoring and reporting activities

The NT Government monitors progress on road upgrades in the Beetaloo Sub-basin through the dedicated DIPL project team established to deliver this program as part of its regular project milestones reporting to the Commonwealth Government. On completion of the road upgrade program, the NT Government will monitor the effectiveness of road upgrades and plan for maintenance activities using its existing traffic count program. Ongoing or intermittent reports of road faults and conditions in the Beetaloo Sub-basin area will be continually monitored, reported and actioned through the existing NT Government 'Report a road fault' website. NT Government decisions relating to EMPs and environmental approvals are available on the DEPWS website at **depws.nt.gov.au** 

Industry compliance reports are available on the DEPWS website at **depws.nt.gov.au** 

#### 4.3.2 Regulatory review

Following the implementation of Inquiry recommendation 14.34, the environmental regulation of onshore petroleum activities is the responsibility of DEPWS, while other aspects of onshore petroleum regulation, including titles, wells and surface infrastructure, and petroleum resource management, remains the responsibility of DITT.

AAPA has established a compliance team whose functions include auditing activities associated with the onshore petroleum industry. The first audits were undertaken in mid-2022, focusing on 2 petroleum-related Authority Certificates.

In response to community and custodian concerns, the AAPA has increased requirements for information on potential direct and indirect impacts on waterways from activities included in an application for an Authority Certificate. AAPA continues to strengthen its approach to protect water-related sites from damage resulting from development activities and will sustain the rigour in which EMPs, including those relating to petroleum activities, are assessed.

#### 4.3.3 Information and data

Regulatory review and ongoing monitoring of landscape risks and impacts are supported by baseline information captured by the SREBA, particularly in the terrestrial ecosystems study. Information and data from this study is available at <u>depws.nt.gov.au/sreba</u> and will be maintained for currency as outlined in the relevant studies.

#### **Summary**

- The NT Government reformed the regulatory framework for the onshore petroleum industry to mitigate risks to landscapes.
- New policy ensures areas that are important to Territorians for their cultural, environmental, and tourism value, including areas where people live, will not be available for onshore petroleum industry activities.
- Road infrastructure upgrades will ensure the Territory's road network can accommodate additional heavy vehicle activity.

# 5. Preserving the natural environment

New environmental approvals system MITIGAT

**Enforceable Code of Practice** 

SREBA (aquatic ecosystems; terrestrial ecosystems studies)
# 5.1 Context

The development of an onshore petroleum industry was identified by the Inquiry as having the potential to damage the health, biodiversity and management of aquatic and terrestrial ecosystems. These impacts are distinct to those discussed in **Chapter 3:** Safeguarding water resources and **Chapter 4: Protecting landscapes,** although they are likely to occur as the result of the risks outlined in those chapters materialising. The risks discussed in this chapter are those which, if they eventuated, would impact the ecosystems which exist within and are supported by water resources and landscapes.

The risks include the potential for adverse impacts to aquatic ecosystems and biodiversity caused by excessive extraction and unacceptable contamination of surface and groundwater. Risks to terrestrial ecosystem health include an unacceptable increase in the spread and impact of invasive pests such as weeds and feral animals including nonnative insects, loss of native vegetation and changes to fire regimes.

Infrastructure associated with onshore petroleum industry development also poses a risk to ecosystem health. The construction of roads, pipelines and well pads in inappropriate locations may disrupt the natural movement of water and nutrients across landscapes, including the acceleration of erosion.

The Inquiry noted impacts to the natural environment from the development of an onshore petroleum industry are likely to be cumulative. As such, the risk of cumulative impacts must be assessed, taken into account during planning and development at both a project and regional level, and properly mitigated.

The Inquiry made 28 separate recommendations in relation to issues and risks for the natural environment.

# 5.2 Reforms implemented to mitigate the risks

## 5.2.1 Legislative reform

### 5.2.1.1 Petroleum legislation

The NT Government transferred administration of the Petroleum (Environment) Regulations 2016 to the Minister for Environment, Climate Change and Water Security. The Petroleum (Environment) Regulations 2016 require an EMP to identify and assess all environmental impacts and risks and demonstrate how the impacts and risks will be managed to levels that are acceptable and as low as reasonably practicable. This includes risks to the natural environment from onshore petroleum activities.

As discussed in *Chapter 3: Safeguarding water resources*, amendments to the Petroleum (Environment) Regulations 2016 created the power for the Minister to establish a Code of Practice for petroleum activities. Under the Petroleum (Environment) Regulations 2016, all EMPs must demonstrate compliance with the minimum standards contained in the Code of Practice, which are based on world-leading practice and address a broad range of environmental risks identified by the Inquiry.

With respect to risks to the natural environment, the Code of Practice:

- requires the development of project-specific weed management plans that comply with the 'NT Weed Management Planning Guide: Onshore Petroleum Projects' specifically developed for the petroleum industry. These obligations include requirements to undertake baseline weed studies to ensure adequate understanding of the weeds at sites and to inform the development of the site-specific weed management plans
- requires the development and implementation of site-specific fire management plans

- incorporates a range of requirements specifically designed to address impacts to water resources from contamination and extraction, which will also work to address risks to aquatic ecosystems and biodiversity (see Chapter 3: Safeguarding water resources)
- requires wastewater management plans, spill management plans, enclosed tanks to hold wastewater during the wet season, and for well sites to be bunded and lined to prevent spills
- requires environmental sensitivities be considered when undertaking planning for the location of onshore petroleum activities, including matters under the published Land Clearing Guidelines
- requires site and route selection to minimise interference with wet season water flows and exposure of infrastructure to flooding
- requires a rehabilitation plan, including requirements for the rehabilitation of significantly disturbed areas, prior to release of environmental securities.

As discussed in *Chapter 2: Addressing a lack of knowledge*, the NT Government removed the caveat 'as far as practicable' from the requirement under the Petroleum (Environment) Regulations 2016 for an EMP to assess the cumulative impacts and environmental risks of regulated activities in conjunction with other development activities. This removed any doubt that cumulative impacts and risks need to be considered in an EMP.

## 5.2.1.2 Environmental legislation

The NT Government introduced substantial reforms to the environmental impact assessment framework, repealing the *Environmental Assessment Act 1982* and introducing the *Environment Protection Act 2019*. These reforms provided the independent NT EPA within an improved regulatory framework in which to consider significant impacts on the Territory's natural environment. The *Environment Protection Act 2019* introduced a new environmental approval, containing conditions to manage significant impacts, which is granted by the Minister for Environment, Climate Change and Water Security at the completion of the assessment process. To date, no petroleum activities have been referred to the NT EPA for environmental impact assessment.

To support the *Environment Protection Act 2019*, the NT EPA has prepared the 'NT EPA environmental factors and objectives' guidance. This document organises and systemises information about the environment and enables effective environmental impact assessment and reporting within a holistic view of the environment. The factors are separated into a range of themes across the natural, social and economic environments, and are supported by specific objectives for each factor. The factors and objectives, and their application to onshore petroleum activities, are included in an EMP Content Guideline for the onshore petroleum industry to ensure these are considered during impact assessment.

The NT Government investigated opportunities to improve the assessment of cumulative impacts on terrestrial ecosystems through areabased or regional assessment to improve the regulators' ability to assess cumulative impacts. The Environment Protection Act 2019 provides opportunities for interest holders to undertake strategic environmental assessments, through which the Minister for Environment, Climate Change and Water Security may approve a scope of acceptable works and activities for a particular area. This process can reduce the regulatory burden for project proponents who propose works which are within the scope of activities that have been assessed and approved, but also improves the assessment of cumulative impacts of multiple projects occurring within an area.

### 5.2.1.3 Water Act 1992

Amendments to the Water Act 1992 removed a provision that exempted mining and petroleum activities from water licensing and permit requirements. This means water use to support petroleum activities must be assessed and licensed under the Water Act 1992, in accordance with the allocation policies and protections to river flows and groundwater-dependent ecosystems that apply to all licensing decisions in the Territory. Licences are granted with conditions and requirements that protect water resources and the environment through monitoring rules and limits on extraction volumes and locations. Licences in the Top End region are issued subject to the NT Government reserving the ability to reduce allocations in dry years to maintain river flows and the ecosystems that rely on these flows.

Decisions made by the Controller of Water Resources about water licences, including Notices of Intention to make a Decision, are published as Notices of Decisions. Publication of these decisions informs neighbouring landowners and the public about the decisions and provides an opportunity to raise concerns and launch appeals.

The *Water Act* **1992** establishes a water allocation planning framework, in which WAPs are a statutory mechanism to manage and share water resources in areas where there is (or is likely to be) demand or competition for water and are based on the protection and preservation of environmental and cultural values as their primary intent. WAPs set limits and rules for allocations to different beneficial uses in a region, including allocation limits to petroleum activities. WAPs also reserve water for future Aboriginal economic development.

WAPs are developed within water control districts. The Daly Roper Beetaloo Water Control District was declared on 20 July 2018 to ensure any bore drilling or water extraction was captured under a permit and/or licensing regime. The water control district boundaries were extended to include the Georgina Basin and part of the Wiso Basin via a new declaration on 19 October 2022. The WAP for the Georgina and Wiso Basins closed from public consultation in December 2022. The plan allocates water amongst declared beneficial uses and provides for the trading of water, which will take effect from the date of its Gazettal by the Minister for Environment, Climate Change and Water Security.

# 5.2.2 Strategic Regional Environmental Baseline Assessment (SREBA)

The Inquiry identified substantial gaps in the information required to manage risks to the natural environment posed by the onshore petroleum industry. The SREBA was established to address these information gaps. Of the 6 study domains set out in the SREBA Framework, the studies on water quality and quantity, aquatic ecosystems, and terrestrial ecosystems produced a large body of data and research findings to address the information gaps for managing risks to the natural environment:

- The water quality and quantity studies improved understanding of the hydrogeology and water resources of the Beetaloo region, and particularly for the region's main groundwater resource, the Cambrian Limestone Aquifer (CLA)
- The aquatic ecosystems studies established biodiversity surveys and regional mapping, and identified appropriate methods and sites for ongoing monitoring of aquatic ecosystem health in the Beetaloo region
- The terrestrial ecosystems studies established regional vegetation mapping and systematic flora and fauna surveys, and identified effective and feasible monitoring activities.

The baseline information produced by these studies provides valuable data against which the impacts of any onshore petroleum industry activities, and other future development, can be assessed. The information generated by these studies will improve the NT Government's ability to assess project-level and cumulative risks to the natural environment associated with development in the Beetaloo Sub-basin, and make evidence-based decisions to mitigate these risks.

Refer to **Chapter 2:** *Addressing a lack of knowledge* for more information about the work completed and findings from the water quantity and quality studies.

# 5.3 Ongoing monitoring, reporting and review

# 5.3.1 Monitoring and reporting activities

Under the Code of Practice, petroleum interest holders must conduct groundwater monitoring and reporting to enable rapid detection of impacts to these resources, as well as any long-term changes in groundwater quality. The long-term monitoring also contributes to increased understanding of aquifers in the Beetaloo Sub-basin. Groundwater monitoring includes:

- water pressure before, during and after hydraulic fracturing activities
- water quality, from both impact and control bores.

The Code of Practice requires interest holders to monitor and report on other environmental indicators as a condition of licences and approvals, including:

- the amount of water extracted in accordance with water extraction licence conditions
- flowback fluids and produced water for activities relating to hydraulic fracturing, including a full human health risk assessment relating to any chemical found in the flowback fluid
- greenhouse gas emissions released during conduct of onshore petroleum activities
- the environmental performance of an activity in accordance with the approved EMP
- compliance with commitments made in an approved EMP

• the potential impacts to surface water associated with the interest holder's activities, where relevant.

## 5.3.2 Regulatory review

Both DEPWS and DITT are working collaboratively to regulate the onshore petroleum industry. Together, the departments will ensure the Code of Practice is contemporary to ensure advances in processes or technology that can reduce risks to the natural environment are considered and incorporated as appropriate.

Both departments will review the Code of Practice in 2023 to ensure it considers advances in process and technology and provides certainty for regulators and interest holders.

DEPWS will procure an independent assessment of the groundwater monitoring requirements under the Code of Practice, for completion prior to commencement of production activities. This assessment will ensure the groundwater monitoring program remains effective and appropriate for production activities and continues to mitigate the impacts and risks identified during the Inquiry.

WAPs are subject to declaration periods up to 10 years. DEPWS will conduct statutory reviews of declared WAPs in 5 year intervals.

# 5.3.3 Information and data

NT Government decisions relating to water licences are available on the water licensing portal on the DEPWS website. WAPs are published on the DEPWS website at depws.nt.gov.au

NT Government decisions relating to EMPs and environmental approvals are available on the DEPWS website.

Industry compliance reports are available on the DEPWS website.

The baselines and datasets established through the SREBA studies have been used to formulate ongoing monitoring plans for the water quality and quantity, and terrestrial ecosystems domains. Information and data from these studies is available at <u>depws.nt.gov.au/</u> sreba

# Summary

- Regulatory reforms have strengthened the assessment of impacts and risk to the natural environment.
- The Code of Practice for the onshore petroleum industry sets best practice standards to reduce impacts to the natural environment, which can be enforced by the NT Government.
- Studies on the aquatic and terrestrial ecosystems in the Beetaloo Sub-basin produced a new, Territory first level of knowledge about the natural environment in the region and will ensure potential impacts from any onshore petroleum industry can be fully assessed and monitored.

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# 6. Improving the health of local communities

**Enforceable Code of Practice** MITIGATION

SREBA (environmental health; social, cultural and economic studies)

Orphan well monitoring program



# 6.1 Context

The Inquiry identified the development of an onshore petroleum industry had the potential to create adverse impacts to human health. These impacts include both physical harm and the potential for diminished mental health and wellbeing.

Adverse impacts to human health may arise from chemical contamination to aquifers, as a source of drinking water, at a concentration that is potent enough to cause harm to the people who drink that water. Air pollutants associated with onshore petroleum industry activities also create a risk of both short-term impacts to human health and longer-term illness.

Water contamination and air pollution may arise in various scenarios, including:

- leaks from production wells
- leaks from abandoned wells
- on-site and off-site spills of hydraulic fracturing chemicals and wastewater, including from road, rail and pipeline transport
- reinjection of treated or untreated chemicals and wastewater from pipelines
- intentional or unintentional discharge of partially treated or untreated wastewaters
- dust and/or diesel fumes from petroleum project site preparation activities.

Risks to the mental health and wellbeing of people in local communities may materialise from changes to and concerns about the natural environment and amenity of the local area, and new pressures on livelihoods and lifestyles in regions affected by onshore petroleum industry development.

The Inquiry made 20 separate recommendations in relation to issues and risks to the health of local communities.

# 6.2 Reforms implemented to mitigate the risks

The Inquiry made recommendations for:

- the public disclosure, management and handling of hydraulic fracturing fluids and flowback waters
- the ongoing demonstration of well integrity throughout the lifecycle of a well
- minimising the risk of groundwater contamination from leaky wells to reduce the risks to the health of local communities.

The NT Government has completed a comprehensive system reform agenda to implement the Inquiry recommendations and address the risks to the health of local communities from onshore petroleum industry activities. That program included data collection and the development of legislative amendments, the Code of Practice, baseline information and the orphan well monitoring program.

## 6.2.1 Legislative reforms

Legislative amendments have created new obligations for proponents to provide information about their practices and the associated impacts, as well as requirements for infrastructure to be constructed in a way that minimises the risk of impacts to human health.

Prior to the Inquiry, interest holders were required to include human health risk assessments in EMPs for drilling and hydraulic fracturing activities to demonstrate the impacts to human health could be managed to levels that were acceptable and as low as reasonably practicable. There was no requirement to publicly disclose information about the composition of flowback or produced water from petroleum activities, and there was no specific wastewater management framework for the industry. Since 2019, and prior to the legislative amendments detailed below, the Minister for Environment, Climate Change and Water Security has imposed an approval condition on EMPs requiring a chemical risk assessment to be undertaken for hydraulic fracturing fluids. Chemical risk assessments are made public with all EMP content to provide full disclosure to the community.

Subsequent amendments to the Petroleum (Environment) Regulations 2016 clarified the requirements for human health risk assessments, including that interest holders must prepare and submit human health risk assessments on flowback fluid, produced water and hydraulic fracturing fluids in accordance with the following national guidelines:

- Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards, published by the Environmental Health Standing Committee
- National Environment Protection (Assessment of Site Contamination) Measure 1999, published by the National Environment Protection Council
- National Chemical Risk Assessment Guidance Manual, published by the National Environment Protection Council.

The amendments also require interest holders to publicly disclose chemicals to be used in hydraulic fracturing and to ensure only non-harmful drilling fluids are used when drilling through aquifers. Reports on flowback fluid and produced water must be submitted to the Minister for Environment, Climate Change and Water Resources within 6 months of the flowback or production occurring, and are published within 5 business days of receipt.

As discussed in **Chapter 3: Safeguarding water resources**, amendments to the Petroleum (Environment) Regulations 2016 created the power for the Minister to establish a Code of Practice for onshore petroleum industry activities. The Petroleum (Environment) Regulations 2016 require all EMPs to demonstrate compliance with the minimum standards contained in the Code of Practice, which are based on world-leading practice and address a broad range of environmental risks identified by the Inquiry.

With respect to risks to human health, the Code of Practice:

- requires secondary containment of hazardous substances to reduce risks to human health and the environment
- imposes control measures to minimise interactions between human receptors and drilling fluids
- includes requirements for the transport, handling, storage, use and disposal of chemicals and wastewater, including specific requirements during the wet season
- mandates that all petroleum infrastructure is set back a minimum of 2 kilometres from existing or proposed dwellings where people reside or work, schools and associated playgrounds, permanent sporting facilities, hospitals and community medical facilities
- mandates minimum distances between petroleum wells and existing groundwater bores for domestic or stock purposes
- sets out requirements for ongoing methane leak detection from petroleum wells
- sets out requirements to consider traffic impacts on other road users
- imposes requirements for well decommissioning that work to prevent decommissioned wells from contaminating the environment.

The NT Government removed the caveat 'as far as practicable' from the requirement under the

Petroleum (Environment) Regulations 2016 for an EMP to assess the cumulative impacts and environmental risks of regulated activities in conjunction with other development activities. This includes the assessment of cumulative impacts to human health from onshore petroleum industry activities, which will enable more informed decisionmaking that considers any impacts to human health which may arise over time as a result of impacts from multiple development projects.

Petroleum legislation amendments require proponents to have an approved WOMP in place for each well before commencing any wellrelated operations. The WOMP must cover the entire lifecycle of a well, including drilling, well construction, operation, re-entry, modification, decommissioning and the post-decommissioning period. More information about WOMPs is contained in **Chapter 3: Safeguarding water resources**.

Measures introduced to manage impacts to ground and surface water quality identified in **Chapter 3: Safeguarding water resources** also mitigate risks to human health from the contamination of ground and surface water.

# 6.2.2 Strategic Regional Environmental Baseline Assessment (SREBA)

## 6.2.2.1 Environmental health study

The environmental health SREBA consisted of 4 distinct studies:

- the Population Health study set a baseline of the current health status of the population in the region and identify relevant indicators for monitoring change over time
- the Air Quality study established a baseline of air quality at selected sites in the region, and to develop a methodology for a future monitoring program.

- the Soil Quality study reviewed and conduct a gap analysis of the studies undertaken through the GBA and GISERA programs and any other relevant work, DEPWS data holdings, to establish a risk assessment framework and identify information gaps.
- the Water Quality study within the Environmental Health domain conducted a review and gap analysis, with a human health lens, of the water quality studies undertaken and data developed through the GBA program, GISERA research and the SREBA Water Quality and Quantity projects.

These studies produced baseline information and recommendations to monitor risks and changes to human health in the Beetaloo region, as the onshore petroleum industry and other development occurs over time.

See **Chapter 2: Addressing a lack of knowledge** for more information about the environmental health studies.

## 6.2.2.2 Social, cultural and economic study

The NT Government recognises the social, cultural and economic conditions of a community, and changes to those conditions, affect the mental health and wellbeing of its residents. The social, cultural and economic SREBA study provided a better understanding of community expectations in the form of baseline values, indicators and key community profiles to inform future industry planning and development to protect values, build on existing strengths and address areas that are sensitive to development.

See **Chapter 2: Addressing a lack of knowledge** for more information about the social, cultural and economic studies.

# 6.2.3 Social licence to operate

The Inquiry noted concerns that the development of any onshore petroleum industry in the Territory

could affect the overall character and cohesion of communities, and that it may also affect people's relationships, mental health, and sense of identity and place. The Territory is a diverse geographical area with distinct differences between communities. Some communities are rich in assets and services. while residents in other communities need to travel to access services. The Inquiry highlighted the potential for community cohesion to be disrupted if some communities were to receive positive benefits from moving to the production phase and others do not progress to this stage. This will need to be managed with sensitivity and monitored over time through the implementation of ongoing participatory community engagement, including social impact assessments where required.

While it is the responsibility of industry to negotiate local and regional support for their activities, the NT Government will continue to work with industry in areas where it moves into the production phase. The NT Government will ensure that people have access to information regarding the impact of industry development on their communities, opportunities to participate in ongoing monitoring, and appropriate arrangements to raise concerns and maximise opportunities to improve community outcomes.

The combined regulatory, policy and assessment activities in place, in addition to the baseline information outlined in the social, cultural and economic SREBA studies, will ensure that the community, onshore petroleum industry, businesses and other key stakeholders are involved and can contribute to the development of the industry in the NT and in doing so increase trust and confidence in the Government's capacity to regulate it.

#### 6.2.3.1 Social impact assessment

The Petroleum (Environment) Regulations 2016 require the identification and assessment of all environmental impacts and risks associated with proposed activities. If there are potential impacts to social values, interest holders are required to address these impacts in an EMP. Depending on the scale of the impacts or the level of risk, a full social impact assessment may be required.

This approach provides for the development and implementation of measures to address impacts and risks through the EMP approval process, which may require a Social Impact Management Plan if the regulator considers a significant impact is likely. The Petroleum (Environment) Regulations 2016 require ongoing engagement with identified stakeholders throughout the life of an EMP.

To support the Environment Protection Act 2019, the NT EPA has prepared the 'NT EPA environmental factors and objectives', which organise and systemise information about the environment to enable effective and holistic environmental impact assessment and reporting. The factors are separated into themes across the natural, social and economic environments. Each factor is supported by specific objectives. The factors include objectives relating to culture, heritage and economic welfare, amenity and benefit. The NT EPA has consulted on specific draft guidance for the Culture and Heritage' factor and is preparing draft guidance for the 'Communities and economy' factor. This detailed guidance will set out clear expectations for the content of social impact assessments regarding these environmental factors.

DEPWS revised the 'Environment Management Plan Content Guideline – Onshore Petroleum Regulated Activities' in 2021 to set out clear expectations for the content of social impact assessments and social impact management plans. The Guideline adopts the NT EPA's environmental factors and objectives by including a table of 'environmental factors and indicative environmental values potentially relevant to onshore petroleum activities', which must be addressed in the preparation of an EMP for onshore petroleum industry activities. The guideline was revised in 2022 to clarify the obligations of interest holders in undertaking social impact assessments.

#### 6.2.3.2 Improved information provision

The NT Government established the CEIP to provide accurate, trusted and accessible information about the onshore petroleum industry and hydraulic fracturing to Aboriginal communities, building on work commenced by the Aboriginal Information Program. The CEIP will be conducted over 5 years to facilitate community understanding of the consequences of the onshore petroleum industry and to support their informed decision-making about proposed petroleum industry projects. Through community engagement, the program will identify information gaps and develop resources in a form and to the extent requested by Aboriginal communities, in collaboration with the Territory's land councils and AAPA.

To ensure best practice in working with Aboriginal communities, the NT Government designed the *Principles of Engagement when using Aboriginal Interpreters* in consultation with the AIS. The Principles provide guidance regarding the use of interpreters to improve Aboriginal people's understanding of onshore petroleum industry activities in negotiations and consultation, and to ensure Aboriginal people can communicate their questions and concerns to proponents.

Improving the provision of information to Aboriginal people ensures Aboriginal people understand the potential risks associated with proposed onshore petroleum activities and can communicate their points of view to proponents during consultation. This improves the dialogue between Aboriginal people and project proponents to create a shared understanding of priorities, including the proponent's understanding of the culture and aspirations of the Aboriginal communities with whom they negotiate. As identified through the social. cultural and economic SREBA studies. ensuring communities are supported and engaged in decision-making about the onshore petroleum industry is essential to their health and wellbeing by preventing communities being marginalised from their decision-making rights.

See Chapter 8: Embedding Aboriginal people and their culture for more information about the CEIP and the Principles of Engagement when using Aboriginal Interpreters.

# 6.3 Ongoing monitoring, reporting and review

## 6.3.1 Monitoring and reporting activities

The NT Government has implemented measures to monitor the onshore petroleum industry and impacts to human health, and to review the effectiveness of the reforms.

DEPWS will continue to monitor community feedback on onshore petroleum industry development and projects through submissions and responses to EMPs assessed under the Petroleum (Environment) Regulations 2016 and for proposals assessed by the NT EPA.

DITT will continue to monitor and maintain the integrity of orphan wells in the Territory through the orphan well monitoring program to prevent any contamination of water resources from well leaks, which may cause harm to human health. Specialist petroleum engineers will identify and locate orphan wells, analyse their level of risk, and undertake remediation work and ongoing monitoring as required. See **Chapter 3: Safeguarding water resources** for more information about the orphan well monitoring program.

Onshore petroleum industry proponents are required to monitor and report on:

- flowback fluids and produced water for activities relating to hydraulic fracturing, including a full human health risk assessment relating to any chemical found in the flowback fluid
- greenhouse gas emissions released during conduct of onshore petroleum activities
- compliance with commitments made in an approved EMP.

Information from the SREBA studies will be used to consider and formulate an ongoing regional monitoring plan, taking into account the findings from each of the study domains and noting the complexity and resourcing requirements. The baselines established through SREBA can also assist in the design and planning of future development, particularly at a regional scale, in order to minimise the risks identified by the Inquiry.

The CEIP is one of the key mechanisms to provide ongoing monitoring of community concerns with development of the onshore petroleum industry. In addition to assisting Aboriginal communities to make informed decisions about the onshore petroleum industry and proposed projects, an independent dialogue can support industry to build and maintain its social responsibility to operate and increase community confidence and trust in the NT Government's ability to regulate the petroleum industry. This dialogue will support community wellbeing and ensure any issues which arise can be addressed in a timely manner.

## 6.3.2 Regulatory review

DEPWS is responsible for the environmental regulation of onshore petroleum activities, while other aspects of petroleum regulation (including titles, wells and surface infrastructure, and petroleum resource management) remain the responsibility of DITT.

Both departments will continue to collaborate on regulating the onshore petroleum industry, and ensure any Code of Practice adopted under the petroleum legislation is contemporary by considering and incorporating advances in processes or technology



that can reduce risks to the health of local communities. DITT and DEPWS will conduct a joint review the Code of Practice in 2023 to ensure it considers contemporary technology and processes, providing certainty for regulators and interest holders.

## 6.3.3 Information and data

The environmental health SREBA studies established baselines and provided detailed datasets for the ongoing monitoring of the environmental health indicators in the Beetaloo Sub-basin region. Information from the baseline studies has been used to formulate ongoing monitoring plans for the health of local communities. Information and data from the SREBA studies is available at depws.nt.gov.au/sreba

Proponents produce human health risk assessments, social impact assessments, and chemical risk assessments as part of their EMP and applications for environmental approvals. EMPs and NT Government decisions relating to EMPs can be viewed on the DEPWS website, at <u>depws.nt.gov.au</u>

Industry compliance reports, including flowback fluid monitoring results, are available on the DEPWS website.

The Principles of Engagement when using Aboriginal Interpreters are available at hydraulicfracturing.nt.gov.au



# Summary

- Regulatory reforms require proponents complete human health risk assessments on flowback fluid, produced water and hydraulic fracturing fluids, and to only use non-harmful chemicals when drilling through aquifers.
- The Code of Practice includes enforceable standards for preventing the release of chemicals and greenhouse gases which may pose a risk to the health of nearby populations.
- Environmental health studies established monitoring stations and population health indicators to monitor human health and detect any impacts from the onshore petroleum industry.
- The orphan well monitoring program and WOMPs will ensure the integrity of both operational and orphan wells is monitored, and any leaks are detected and remediated to prevent harm to human health.

# 7. Mitigating the contribution to climate change

SREBA (greenhouse gas studies)

MITIGATION

Greenhouse Gas Emissions Management for New and Expanding Large Emitters Policy

> Specific obligations for the onshore petroleum industry to manage greenhouse gas emissions

> > Greenhouse Gas Emissions Offsets Policy

Scientific Inquiry into Hydraulic Fracturing Final Implementation Report, Northern Territory Government, 2023

# 7.1 Context

It is well evidenced and recognised that climate change is occurring as a result of a human-induced increase in the concentration of greenhouse gases in the earth's atmosphere. The NT Government acknowledges this fact and has committed to ambitious emissions reduction targets and actions.

The extraction and use of natural gas by the onshore petroleum industry and downstream consumers results in greenhouse gas emissions, such as methane and carbon dioxide. This is the result of both the intentional and unintentional release of greenhouse gases during the exploration, production, processing, transport, storage, transmission and distribution phases of the natural gas life cycle. Energy is required to produce, process and transport natural gas, which emits additional greenhouse gas emissions. The use of natural gas, by its combustion, also emits carbon dioxide.

The full scope of greenhouse gas emissions from the onshore petroleum industry is termed the 'life cycle' of emissions, which considers emissions from:

- upstream processes such as gas extraction and production
- midstream processes such as transport of gas
- downstream processes such as gas usage by the consumer.

Before the Inquiry, there was a risk that the development of an onshore petroleum industry would result in excessive greenhouse gas emissions across all stages of the industry life cycle. This risk included:

- the excessive release of greenhouse gases during the extraction, processing, transport, distribution, and consumption of natural gas from sources such as wellheads, pipelines and compression stations
- excessive methane emissions from postproduction wells
- increased global emissions resulting from the end-use combustion of gas.

The Inquiry made 14 separate recommendations relating to issues and risks generated by the contribution to climate change.

# 7.2 Reforms implemented to mitigate the risks

Since the Inquiry, the NT Government has taken significant action to address climate change. The NT Government has committed to the target of net zero emissions by 2050 and 50% renewable energy from grid-connected installations by 2030, and released the Climate Change Response and Threeyear Action Plan to set out how these targets will be achieved. To progress these targets and implement Inquiry recommendations, the NT Government has undertaken a number of legislative, policy and administrative reforms to reduce the risks associated with greenhouse gas emissions and climate change from the development of an onshore petroleum industry.

# 7.2.1 Legislative reform

## 7.2.1.1 Petroleum legislation

As discussed in *Chapter 3: Safeguarding water resources*, the NT Government amended the Petroleum (Environment) Regulations 2016 to include powers to establish codes of practice for onshore petroleum industry activities. The Petroleum (Environment) Regulations 2016 require all EMPs submitted for approval to demonstrate compliance with the Code of Practice, which draws on world-leading practice and addresses a broad range of environmental risks identified in the Inquiry.

With respect to greenhouse gas emissions, the Code of Practice:

- requires onshore petroleum interest holders to prepare a methane emissions management plan
- requires onshore petroleum interest holders to undertake regular leak detection for methane

- requires onshore petroleum interest holders to provide an annual report to DEPWS on greenhouse gas emissions, irrespective of whether they reach the threshold for reporting annual emissions to the Clean Energy Regulator
- sets minimum requirements for well decommissioning that work to prevent methane leaks from decommissioned wells.

As discussed in *Chapter 3: Safeguarding water resources*, the NT Government introduced requirements for proponents to have an approved WOMP in place for each well before commencing any well-related operations. The WOMP must cover the entire lifecycle of a well, including drilling, well construction, operation, re-entry, modification, decommissioning and the post-decommissioning period. WOMPs reduce the risk of operational or orphan wells integrity diminishing and releasing of greenhouse gases to excessive levels.

The Petroleum Regulations 2020 will be amended in 2023 to establish the required content for permissioning plans, such as WOMPs, which require the inclusion of post-decommissioning monitoring and maintenance plans.

The NT Government removed the caveat 'as far as practicable' from the requirement under the Petroleum (Environment) Regulations 2016 for an EMP to assess the cumulative impacts and environmental risks of regulated activities in conjunction with other development activities. This ensures the cumulative impacts of greenhouse gas emissions are assessed as the onshore petroleum industry develops and alongside existing and future development.

### 7.2.1.2 Environment legislation

In 2019, the NT Government transferred administration of the Petroleum (Environment) Regulations 2016 to the Minister for Environment, Climate Change and Water Security. The Petroleum (Environment) Regulations 2016 require an EMP to identify and assess all environmental impacts and risks and demonstrate how the impacts and risks will be managed to levels that are acceptable and as low as reasonably practicable. This includes risks associated with greenhouse gas emissions from the onshore petroleum industry.

The NT Government repealed the *Environmental Assessment Act 1982* and introduced the *Environment Protection Act 2019* to strengthen the Territory's environmental impact assessment framework. The new legislation establishes a comprehensive environmental impact assessment framework by requiring the NT EPA to consider the impacts of a changing climate, which includes considering greenhouse gas emissions, as part of the environmental impact assessment process. The NT EPA is developing guidance for the atmospheric processes environmental factor to explain how and when greenhouse gas emissions are considered during environmental impact assessment under the *Environment Protection Act 2019*.

The Minister for Environment, Climate Change and Water Security may attach conditions to manage greenhouse gas emissions to the EMP approval under the Petroleum (Environment) Regulations 2016, or to an environmental approval for a project assessed under the *Environment Protection Act 2019*.

## 7.2.2 Policy development

The NT Government developed a number of policies to support the regulation of greenhouse gas emissions under the *Environment Protection Act* **2019** and the Petroleum (Environment) Regulations 2016.

### 7.2.2.1 Greenhouse Gas Emissions Management for New and Expanding Large Emitters policy (the Large Emitters Policy)

The Large Emitters Policy applies to new and expanding projects which meet or exceed emissions thresholds:

- For industrial projects 100,000 tonnes of carbon dioxide equivalent (tCO2-e) in any financial year over the life cycle of the project
- For land use projects 500,000 tCO2-e generated from a single clearing action, or cumulatively from multiple land clearing actions on a property over time.

Projects which are required to obtain an environmental approval and which meet one of the thresholds are covered by the policy. Proponents for these projects must develop a Greenhouse Gas Abatement Plan (GGAP) to demonstrate how emissions will be managed and reduced. The Large Emitters Policy provides flexibility for how proponents achieve emissions reductions.

The Large Emitters Policy establishes net zero emissions by 2050 as the default expectation for project emissions targets, and GGAPs must include overarching and interim emissions reduction targets in line with this trajectory.

The Large Emitters Policy applies to onshore petroleum exploration and production activities. The Minister for Environment, Climate Change and Water Security has approved a number of GGAPs for petroleum exploration activities where those activities are expected to exceed the emissions threshold. The Large Emitters Policy works in tandem with Australian Government emissions reduction measures. Proponents are required to report their emissions to the Australian Government if they exceed legislated thresholds under the National Greenhouse and Energy Reporting Scheme.

# 7.2.2.2 Managing greenhouse gas emissions from onshore petroleum activities

Building on the Large Emitters Policy, the NT Government has established the Management of Greenhouse Gas Emissions from the Onshore Gas Industry Policy Statement. The NT Government will require all petroleum interest holders seeking production stage approvals to prepare and submit a GGAP which outlines the interest holder's proposed actions to achieve net zero emissions by 2050 (at a minimum), regardless of whether an interest holder's emissions reach the threshold established by the Large Emitters Policy. The threshold in the Large Emitters Policy will continue to apply to the onshore petroleum industry when seeking approvals for exploration activities, including appraisal.

Requirements to submit a GGAP will be reflected in regulatory decisions made under the *Environment Protection Act 2019* and the Petroleum (Environment) Regulations 2016. The commitments made in a GGAP will be the subject of appropriate environmental authorisation conditions. Regulators will undertake compliance and enforcement activities in relation to these conditions, in accordance with regulatory powers and responsibilities.

The NT Government will amend the legislative framework for the onshore petroleum industry to incorporate the requirements of the policy.

The policy, and its enactment through regulation, will establish more certain and stringent obligations for greenhouse gas emissions reductions for the onshore petroleum industry compared to other industry in the Territory, as it requires all production activities to commit to and take action to achieve net-zero emissions targets.

### 7.2.2.3 Greenhouse Gas Emissions Offsets Policy (the Emissions Offsets Policy)

The Emissions Offsets Policy provides for the consistent and transparent use of emissions offsets as a last resort to compensate for project emissions that cannot be avoided or mitigated. The NT Government may apply offsetting conditions to environmental approvals.

The policy sets out the high-integrity offset units the NT Government will accept to satisfy offsetting requirements, and creates a hierarchy prioritising local offset units before obtaining interstate and international offsets.

# 7.2.2.4 Cooperation with the Australian Government

In addition to achieving national emissions reduction targets, the Australian Government has an important role to play in helping ensure there is no net increase in the life cycle greenhouse gases emitted in Australia from any onshore petroleum industry activity in the Territory. The Northern Territory and Australian Government have different regulatory responsibilities and schemes in relation to greenhouse gas emissions, with the NT Government only able to address greenhouse gas emissions generated in the Territory.

The NT Government's regulatory and policy actions to address greenhouse gas emissions from the onshore petroleum industry have been discussed above. In addition, the NT Government is undertaking feasibility studies to develop the carbon sequestration industry in the Territory and developing an economy-wide emissions reduction strategy to outline plans to achieve the NT Government's net-zero by 2050 target. The NT Government will continue to work with petroleum industry stakeholders to pursue NT Government targets as well as proponents' own emissions reduction commitments. The NT Government continues to engage with the Australian Government and the Energy and Climate Ministerial Council (ECMC) on the implementation of Recommendation 9.8 and has negotiated a 10-year energy and emissions bilateral agreement to ensure reliable low-cost power and increase renewables penetration, create jobs and deliver emissions reductions through investment in renewables and low emissions technologies. The Australian Government implements a national scheme for the creation of Australia carbon credit units to provide an important institutional framework for the offsetting of greenhouse gas emissions.

As the NT Government is not able to address emissions generated outside the Northern Territory, the ECMC will be responsible for considering options for addressing Territory gas consumed elsewhere in Australia. Therefore, the majority of emissions generated by onshore petroleum resources produced in the Territory will be further considered by the ECMC. The Australian Government has committed to emissions targets for 2030 and 2050 and has passed reforms to its Safeguard Mechanism, which will commence on 1 July 2023. The reforms will require all new onshore petroleum entrants in the Beetaloo Sub-basin to have net zero scope 1 emissions from entry. These actions complement the approach to greenhouse gas emissions taken by the NT Government and consideration by the ECMC of scope 2 and 3 emissions.

The requirements of the NT Government's Management of Greenhouse Gas Emissions from the Onshore Gas Industry Policy Statement complement the Australian Government's reforms to the Safeguard Mechanism, and ensure a comprehensive and stringent approach to managing greenhouse gas emissions from onshore petroleum production in the Territory.

# 7.2.3 Strategic Regional Environmental Baseline Assessment (SREBA)

The Inquiry identified gaps in the information required to manage risks associated with greenhouse gas emissions from the onshore petroleum industry. The methane and greenhouse gas emissions study consisted of three elements:

- Mobile surveys to establish predevelopment baseline methane concentrations across three different seasons
- Identification of geological seeps and reference sites
- Collation of information produced by Territory and national programs and researchers to estimate the emission rates for the current main emissions sources.

This information provides a baseline against which changes to emissions in the Beetaloo region can be monitored, and project-level and cumulative impacts to regional emissions can be assessed.

#### See Chapter 2: Addressing a lack of knowledge

for more information about the methane and greenhouse gas emissions studies and findings.

# 7.2.4 Orphan well monitoring program

The orphan well monitoring improves management and monitoring of orphan wells and reduces the risk that orphan wells will deteriorate and leak greenhouse gases into the atmosphere.

The program involves:

- analysis of all orphan wells using historical data
- desktop analysis to determine a preliminary risk rating for each well
- field inspections to determine the precise locations and comprehensive risk ratings for each well
- conducting barrier analysis

• undertaking remedial work and ongoing monitoring as required.

See **Chapter 3: Safeguarding water resources** for more information about the orphan well monitoring program.

# 7.3 Ongoing monitoring, reporting and review

# 7.3.1 Monitoring and reporting activities

DITT will continue to focus on the integrity of wells and surface infrastructure as a key priority in its regulation of the onshore petroleum industry. The Orphan Well Program is now embedded in the Energy Development Branch of the Mining and Energy Division of DITT, with its activities continuing as business-as-usual activities. From the start of the 2023/24 financial year, the Orphan Well Program will be funded by industry, through cost recovery mechanisms and annual Orphan Well Levy payments, to ensure the program's ongoing financial sustainability and continuity of well monitoring, leak detection, and remediation.

The NT Government requires onshore petroleum industry proponents to monitor and report their annual greenhouse gas emissions.

# 7.3.2 Regulatory review

The environmental regulation of onshore petroleum activities is the responsibility of DEPWS, while other aspects of onshore petroleum regulation (including titles, wells and surface infrastructure, and petroleum resource management) remain the responsibility of DITT.

Both departments will review the Code of Practice in 2023 to ensure it considers advances in processes and technology, providing clarity and certainty for regulators and petroleum interest holders. The Large Emitters Policy and Emissions Offsets Policy will be reviewed in 2023 and 2024 respectively, taking into consideration developments in international obligations and Australian Government policy.

# 7.3.3 Information and data

The SREBA greenhouse gas emissions study captured baseline information about existing emissions sources in the Beetaloo Sub-basin region, including their location, ambient rate, and seasonal changes. The study also included the development of indicators and methods to monitor greenhouse gas emissions as the petroleum industry develops in the region. For more information about the SREBA studies, see **Chapter 2: Addressing a lack of knowledge**.

Information from the greenhouse gas emissions SREBA study, including technical reports and the data catalogue, are available at <u>depws.nt.gov.au/</u> <u>sreba</u>

NT Government decisions relating to EMPs and environmental approvals are available on the DEPWS website at <u>depws.nt.gov.au</u>

The Northern Territory Climate Change Response: Towards 2050 and the Three Year Action Plan are available at <u>climatechange.nt.gov.au</u>

Industry compliance reports are available on the DEPWS website at <u>depws.nt.gov.au</u>

The Large Emitters Policy, Emissions Offsets Policy and the Management of Greenhouse Gas Emissions from the Onshore Gas Industry Policy Statement are available on the DEPWS website.

# Summary

- The NT Government requires proponents to report their greenhouse gas emissions and conduct regular leak detection activities.
- New policies require large emitters to submit a greenhouse gas abatement plan and to offset emissions when they cannot be avoided.
- The NT Government is working with the Australian Government to progress new emissions-reduction options, including options to reduce emissions from onshore petroleum industry activities.

# 8. Embedding Aboriginal people and their culture

**Community Engagement and Information Program** 



Principles of Engagement when using Aboriginal Interpreters

> Mandatory Aboriginal Areas Protection Authority Certificate

# 8.1 Context

The development of an onshore petroleum industry in the Territory has the potential to affect Aboriginal people who, as a distinct group of people, have performed ongoing land management practices over tens of thousands of years.

A number of risks that onshore petroleum industry development posed to Aboriginal communities are canvassed in *Chapter 6: Improving the health of local communities* and *Chapter 9: Enhancing the wellbeing of local communities*. However, the interaction between an onshore petroleum industry and the unique landholding and cultural rights of Aboriginal people raises distinct risks to Aboriginal people and their culture that need to be managed.

While the NT Government recognises the need for economic development in the Territory, development activities must only progress in a manner that upholds the rights of Aboriginal people. This includes the right of Aboriginal people to practice and maintain the health of their culture, which is inherently tied to the health of their country.

In 2018, the Inquiry concluded onshore petroleum industry development has the potential to adversely impact Aboriginal people and their culture, including disruptive effects to social cohesion in Aboriginal communities:

- the denial or restriction of access to and use of traditional lands, both during and after the development of any onshore petroleum industry, undermines the ability of Aboriginal people to maintain their cultural traditions relating to land across generations. This inter-generational passage of traditional knowledge is essential for the continued recognition of Aboriginal people's land ownership rights
- damage or disturbance to sacred sites or to the land, due to drilling and hydraulic fracturing of onshore shale gas formations and ancillary activities, may impact

Aboriginal culture, values and the traditions that connect land-owning groups with their country

- with the advent of the onshore petroleum industry, both Aboriginal and non-Aboriginal communities need to balance the project economic returns with concerns about potential impacts to their communities. In the context of Aboriginal communities, these concerns may include the potential impacts to traditional cultural practices. Statutory requirements to distribute financial benefits from petroleum agreements to traditional Aboriginal owners and native title holders, rather than the broader Aboriginal community in an affected area, may also create social tension. New stresses that are introduced into the social and cultural fabric of Aboriginal land-owning groups may disrupt social cohesion in Aboriginal communities
- misinformation about the onshore petroleum industry may occur among the broader community, which may produce increased tension within Aboriginal communities and heighten stress about decision-making and the distribution of benefits and opportunities
- statutory protections under the Aboriginal Land Rights (Northern Territory) Act 1976 (Cth) and Native Title Act 1993 (Cth), and the Northern Territory Aboriginal Sacred Sites Act 1989 do not give native title holders or the affected Aboriginal community a mechanism to develop an understanding of the scale and incremental nature of the onshore petroleum industry and its potential impacts. This may undermine the integrity of consultation with Aboriginal people and the right of Aboriginal people to make informed decisions, including exercising their veto right at the exploration stage.

The Inquiry outlined a range of risks relating to community concerns regarding readiness for any onshore petroleum activity, government's capacity to regulate the onshore petroleum industry and the impact on the people living in and around the Beetaloo region, specifically Aboriginal people in the region.

The Inquiry recommended that a strategic Social Impact Assessment (SIA) be conducted to generate and disseminate the information needed to allow for informed decisions about development that is consistent with the public interest. In addition, the Inquiry singled out the need for a Cultural Impact Assessment, distinct to the SIA process, to manage the set of risks specific to traditional owners and other affected Aboriginal people and their culture, which are particularly vulnerable to adverse impacts from the onshore petroleum industry.

The Inquiry also found that in order to provide the community with confidence in government's ability to regulate any onshore petroleum industry that the regulatory and policy frameworks needed to be strengthened, gaps in knowledge needed to be addressed and greater transparency was required to build trust in the community.

The Inquiry noted it is important for the NT Government to mitigate the risks associated with the onshore petroleum industry to uphold the rights and wellbeing of Aboriginal people. If these risks materialise, Aboriginal people who feel aggrieved or marginalised may rightfully exercise their legal rights to seek redress or challenge decisions made by the NT Government.

The Inquiry made 18 separate recommendations in relation to issues and risks to Aboriginal people and their culture.

# 8.2 Reforms implemented to mitigate the risks

## 8.2.1 Legislative reform

## 8.2.1.1 Environmental impact assessment

The NT Government introduced substantial reforms to the Territory's environmental assessment framework, resulting in the repeal of the *Environmental Assessment Act 1982* and introduction of the *Environment Protection Act 2019*. These reforms provided the independent NT EPA with an improved regulatory framework in which to consider significant impacts to social, cultural and economic matters, including cultural and other impacts to Aboriginal people. The *Environment Protection Act 2019* introduced a new environmental approval containing conditions to manage significant impacts which is granted by the Minister for Environment, Climate Change and Water Security at the completion of the assessment process.

The importance of community involvement in the environmental impact assessment process, particularly of Aboriginal people and communities, is expressly recognised in the objects of the **Environmental Protection Act 2019.** The Act requires proponents to consult with affected communities, including Aboriginal communities, on their proposals. Proponents must also address Aboriginal values and the rights and interests of Aboriginal communities. The NT EPA has published guidance for proponents on how to effectively engage with and consult stakeholders, including Aboriginal stakeholders.

The Petroleum (Environment) Regulations 2016 require EMPs for onshore petroleum activities that identify and assess all environmental impacts and risks, and demonstrate they can be managed at levels that are acceptable and as low as reasonably practicable. This includes the assessment and management of impacts and risks to Aboriginal people and their culture.

#### 8.2.1.1 Social impact assessment

Under the reformed legislation, the NT EPA was given explicit power to require a social impact assessment as part of a broader environmental impact assessment. This ensures that, where necessary, impacts to Aboriginal people and their culture will be assessed during the environmental impact assessment of a proposal under the **Environment Protect Act 2019.** 

To support the **Environment Protection Act 2019**, the NT EPA published the 'NT EPA environmental factors and objectives' guidance to organise and systemise information about the environment and enable effective environmental impact assessment and reporting within a holistic view of the environment. The factors are separated into a range of themes across the natural, social and economic environments, and supported by objectives for each factor. The factors include objectives specific to culture, heritage and economic welfare, amenity and benefit. The NT EPA is preparing guidance to provide proponents and the community with additional information about its expectations when considering its listed factors.

To support interest holders to develop EMPs under the Petroleum (Environment) Regulations 2016, DEPWS released the 'Environment Management Plan Content Guideline - Onshore Petroleum Regulated Activities' (2021) guideline. The guideline was informed by the NT EPA factors and objectives approach, and includes references to social impacts, including a table of 'environmental factors and indicative environmental values potentially relevant to onshore petroleum activities' which must be addressed in the preparation of an EMP. The guideline was revised in 2022 to clarify the obligations of interest holders in undertaking social impact assessments.

The *Environment Protection Act 2019* and Petroleum (Environment) Regulations 2016 are administered by the independent NT EPA and DEPWS respectively in a manner that requires interest holders to identify, assess and manage social impacts in a manner

commensurate with the nature and scale of the proposed activity and level of impact. This approach provides for the development and implementation of measures to address impacts and risks through the environmental approval process.

To ensure project proponents assess the cumulative impacts of onshore petroleum industry activities to Aboriginal people and their culture, the NT Government removed the caveat 'as far as practicable' from the requirement for an EMP to assess cumulative impacts and environmental risks of regulated activities in conjunction with other activities.

### 8.2.1.2 Enforceable Code of Practice

As discussed in **Chapter 3: Safeguarding water resources** and **Chapter 4: Protecting landscapes**, the NT Government strengthened the regulatory role of the Code of Practice by amending the **Petroleum Act 1984** and the Petroleum (Environment) Regulations 2016. The amendments provided a regulationmaking power to create and enforce a Code of Practice, which means a breach of the Code is an offence under the regulations. The Code of Practice contains standards which protect and reduce the risks of onshore petroleum industry activities to the natural environment, including water resources and landscapes.

These protections in turn reduce the risk of adverse impacts on the culture of Aboriginal people from environmental harm. In the event a proponent breaches the Code, the amendments enable the NT Government to respond in a timely manner with appropriate enforcement action. Amendments to the petroleum legislation also provided for approved Codes of Practice to be admissible in proceedings for offences against the petroleum legislation as evidence of the standard onshore petroleum industry proponents are to required meet.

# 8.2.1.3 Opportunities to lodge objections and seek review of decisions

The NT Government amended the **Petroleum Act 1984** and the Petroleum (Environment) Regulations 2016 to remove limitations on who is entitled to lodge an objection to the granting of an exploration permit. Removing the limitations for lodging objections has ensured any person may lodge an objection and raise their concerns about applications for the granting of an exploration permit, including any potential impacts to community wellbeing, and guarantees Aboriginal people can have their say about proposed onshore petroleum developments.

Further amendments to the *Petroleum Act* 1984 and Petroleum (Environment) Regulations 2016 empower the community to challenge the legality of decisions by introducing open standing for judicial review of a wide range of administrative decisions made under the Act and Regulations. In addition, third party rights to merits review were introduced for key decisions under the *Petroleum Act* 1984 and the Petroleum (Environment) Regulations 2016. For more information about seeking administrative review of decisions, see *Chapter* 1: *Strengthening the regulatory environment*.

## 8.2.1.4 Amended cost rules

Amendments to the **Petroleum Act 1984,** the Petroleum Regulations 2020 and the Petroleum (Environment) Regulations 2016 changed cost rules so litigation genuinely brought in the public interest may not be subject to a costs order. This reduces barriers to plaintiffs, including Aboriginal people, bringing litigation to remedy damage caused by onshore petroleum industry activities by reducing the risk of receiving a court order to pay the proponent's legal costs in the event the plaintiff is unsuccessful. Ensuring Aboriginal people can access legal remedies for damage to their culture, including damage to land and sacred sites, upholds the right to seek justice and protect cultural values.

# 8.2.2 Improving information and engagement

Since accepting the recommendations of the Inquiry's Final Report, the NT Government has undertaken a range of actions to ensure that Aboriginal people are equipped with the information they need to contribute to decision-making about the development of an onshore petroleum industry.

# 8.2.2.1 Aboriginal Information Program and Community Engagement

In 2020 and 2021, CSIRO worked collaboratively with the Territory's land councils on the Aboriginal Information Program, identifying information requirements and developing fact sheets with clear, factual and relevant content. The AIS then translated this information into 17 Aboriginal languages.

Translated audio files about groundwater, methane and shale gas are now publicly available on the Hydraulic Fracturing Implementation website to use when engaging with Aboriginal people regarding onshore petroleum industry development and hydraulic fracturing in the Territory.

Improving the provision of information to Aboriginal people ensures that Aboriginal people have access to information in language that assists them to understand the risks associated with proposed onshore petroleum industry activities, fully exercise their rights to communicate their points of view to proponents during consultation, and make informed decisions about proposed development.

As part of the ongoing commitment to listening and bridging information gaps, the CEIP will provide accurate, trusted and accessible information about the onshore petroleum industry and hydraulic fracturing to Aboriginal communities. This program, led by CSIRO and funded by NT Government, assists local residents to understand consequences of onshore shale petroleum industry activities and enables informed decisions. Through community engagement, the program identifies information gaps and develops resources in a form and to the extent required by Aboriginal communities.

# 8.2.2.2 Guidance for engaging Aboriginal Interpreters

To ensure reliable and accurate information is delivered in Aboriginal languages, the NT Government developed the **Principles of Engagement when using Aboriginal Interpreters** (Principles) in consultation with the AIS to provide best practice guidance regarding the use of interpreters.

The Principles provide consistent guidance for those consulting with Aboriginal people, emphasise the importance of using interpreters when explaining complex scientific matters, and recognise the significance of respecting community and culture when consulting with Aboriginal people. The Principles are available on the Hydraulic Fracturing Implementation website and on key resource websites to ensure they are accessible to all stakeholders engaging with Aboriginal community members.

The use of interpreters when consulting and negotiating with Aboriginal people ensures that all parties can clearly communicate relevant information and their points of view. This is equally important to enable project proponents to develop an understanding about the respective culture, aspirations, and concerns of the Aboriginal communities with whom they negotiate as it is for Aboriginal people to receive information about proposed projects.

The NT Government recognises key authorities and stakeholders, including the land councils and the AAPA, have their own resources and expectations regarding culturally appropriate engagement with Aboriginal community members. The Principles are an additional level of guidance to support those specific resources and requirements.

### 8.2.2.3 Guidance on the negotiation process

Prior to the Inquiry, there was no requirement for project proponents to provide land councils with comprehensive information about their proposed project activities associated with their exploration permits and affecting land subject to the *Native Title Act 1993* (Cth). This tended to undermine the ability for native title holders to fully understand the nature of the development proposed.

In July 2019, the 'Right to Negotiate' flowchart was updated to provide guidance for proponents applying for exploration permits. The flowchart explains the negotiation process when the permit area includes land held under native title. In the event negotiation and an agreement is required under the Native Title Act 1993 (Cth), the flowchart directs the proponent to issue a notice to the relevant land council containing all the information required under section 41(6) of the Aboriginal Land Rights (Northern Territory) Act 1976 (Cth). This ensures land councils can provide sufficient information about proposed projects so native title holders can make informed decisions, enabling the relevant land council to negotiate agreements on their behalf.

# 8.2.2.4 Information about petroleum exploration agreements

The Inquiry found the confidentiality of petroleum exploration agreements contributes to communities' belief that Traditional Owners give consent without fully understanding the nature and impact of proposed works. The Inquiry recommended making all or part of petroleum exploration agreements publicly available to increase Aboriginal communities' understanding of the contractual obligations, and knowledge of and trust in any onshore petroleum industry.

The NT Government accepted this is ultimately a matter for the land councils, Traditional Owners and petroleum companies. The NT Government consulted land councils affected by existing

exploration permits and the Australian Petroleum and Production Exploration Association (APPEA) regarding this recommendation. The parties consulted advised they do not support making confidential Petroleum Exploration Agreements between Traditional Owners and exploration companies, which are agreed under the *Native Title Act 1993* or *Aboriginal Land Rights Act (Northern Territory)* 1976, publicly available. Based on this advice, the NT Government has taken no further action and petroleum exploration agreements will remain confidential.

# 8.2.2.5 Strategic Regional Environmental Baseline Assessment (SREBA)

The social, cultural and economic SREBA study addressed the substantial information gaps highlighted by the Inquiry. The study provides a point-in-time baseline of the social, cultural and economic conditions of the Beetaloo Sub-basin region, and considered the cumulative impacts of onshore petroleum industry development, the range of existing industries and future development possibilities. This study enabled respectful consultation to determine community expectations and empowered communities by developing a baseline understanding of life and livelihoods in the region, providing reference points for ongoing monitoring, particularly in relation to potential onshore petroleum industry development.

Respecting Aboriginal people's rights and ensuring their inclusion in decision-making about the development and planning process was a key objective of the social, cultural and economic SREBA study. The study plays an important role in supporting participatory decision-making about the future of the Beetaloo Sub-basin, and upholding the rights of Aboriginal people in the region. Community contribution to future discussions about development and planning, including recognition of rights, concerns, aspirations and values, will influence the decisions and plans about industry development. For more information about the social, cultural and economic SREBA study, see **Chapter 2:** *Addressing a lack of knowledge*.

# 8.2.3 Protecting sacred sites

The primary mechanism for protecting sacred sites from damage associated with development in the Territory is for a proponent to obtain and comply with an Authority Certificate, issued by AAPA under the **Northern Territory Aboriginal Sacred Sites Act 1989** (Sacred Sites Act). An Authority Certificate is issued following consultations with custodians of sacred sites, and may include conditions that restrict works in certain areas to protect sacred sites.

While this mechanism has existed since 1989, before the Inquiry it was not mandatory for proponents to obtain an Authority Certificate. The Inquiry found although Authority Certificates have been considered a key requirement of broader environmental assessments, they were not necessarily obtained. The Inquiry also identified uncertainty about whether sub-surface features of sacred sites were protected by the Sacred Sites Act, as discussed in **Chapter 4: Protecting landscapes**.



Amendments to the Petroleum (Environment) Regulations 2016 mandated that petroleum interest holders must hold an Authority Certificate, issued by AAPA, before an EMP can be approved by the NT Government. If proponents do not have an Authority Certificate, their EMP cannot be approved and the proponent cannot commence works. This requirement applies to all petroleum interest holders, including those conducting conventional petroleum exploration and production activities without hydraulic fracturing. This amendment removed the risk of petroleum companies impacting sacred sites by operating without an Authority Certificate.

AAPA tightened administrative processes for Authority Certificate applications relating to petroleum activities and have provided written guidance to petroleum applicants since May 2021. This improved the clarity and transparency of the application process.

As long as proponents comply with the terms of an Authority Certificate, the risk of adverse impacts to sacred sites is minimised and the certificate holder is indemnified against prosecution under the Sacred Sites Act. Compliance therefore benefits the certificate holder by providing legal certainty.

The regime for sacred site protection is recognised as providing a clear framework for consultation and protection of cultural values, setting a standard worthy of national adoption. The integrity of this process and its ability to mitigate the risks to sacred sites has been demonstrated by the rejection of one EMP relating to conventional petroleum exploration in Central Australia. This application was rejected because the Authority Certificate contained conditions that restricted the petroleum company's ability to conduct the works proposed in the EMP. In this case the Minister for Environment, Climate Change and Water Security decided that sacred site protections prevented approval of the EMP.<sup>4</sup>

# 8.2.4 Social licence to operate

The Inquiry noted concerns the development of the onshore petroleum industry in the Territory could affect the overall character and cohesion of communities, and may also affect people's relationships, mental health, and sense of identity and place. With the distinct differences between communities across the Territory and their sometime stark contrast in socio-economic status, there is potential for community cohesion to be disrupted. Careful management and continued monitoring of community cohesion will be required through implementation of ongoing participatory social impact assessments.

Although industry is responsible for negotiating local and regional support for their activities, the NT Government will work with industry in areas where it moves into the production phase. The NT Government will ensure people have access to information to allow for assessment of potential impacts of industry development on their communities, opportunities to participate in ongoing monitoring, and appropriate arrangements to raise concerns and maximise opportunities to improve outcomes.

# 8.2.5 Petroleum Reserved Block Policy

Prior to the Inquiry, reserved blocks (areas where petroleum activity was prohibited) could be declared under the *Petroleum Act 1984*, but there was no comprehensive policy guiding how areas that should not be subject to petroleum activities were identified or categorised.

The introduction of the Petroleum Reserved Block Policy in July 2019 set out the process for declaring reserved blocks under identified categories, including Indigenous Protected Areas, areas of cultural significance, and parks. The declaration of land subject to the *Aboriginal Land Rights (Northern Territory) Act* 1976 (Cth) is ongoing, and will occur when the declaration receives the support of the land councils in the Territory.

<sup>4</sup> The Hon Eva Lawler MLA, Minister for Environment, Refusal notice and statement of reasons (10 January 2022)

See **Chapter 4: Protecting landscapes** for more information about the Petroleum Reserved Block Policy.

# 8.3 Ongoing monitoring, reporting and review

## 8.3.1 Monitoring and reporting activities

The SREBA studies for the Beetaloo Sub-basin established baselines and provided detailed datasets for the ongoing monitoring of the social, cultural and economic conditions in the region with indicators and methods described for a regional monitoring framework. Information from the baseline studies has been used to formulate ongoing monitoring plans for each of the study domains.

Monitoring and reporting of impacts to social, cultural and economic values identified in the SREBA study will use annual updates of publicly available data and any comparable data sources, and through qualitative surveys conducted in communities. The information established by the SREBA studies can be used to inform the development of a regional monitoring and reporting framework. A regional monitoring and reporting framework will be participatory in its approach and guided by an oversight committee made up of senior figures from the NT Government, industries, and research and interest groups to safeguard the integrity of processes used for monitoring, evaluation and communication of data. Options to involve local Aboriginal rangers in regional monitoring activities will be explored to enhance community trust in the monitoring process. The CEIP will continue engagement and monitoring of community sentiment.

The social, cultural and economic SREBA study commenced the Cultural Impact Assessment process, with the onshore petroleum industry resourcing this work through the monitoring and compliance levy. Continued dialogue between traditional owners, native title holders, affected Aboriginal communities and the NT Government will support ongoing Cultural Impact Assessment through area-based assessment and regional monitoring processes.

The NT Government has existing mechanisms to monitor community sentiment as part of the EMP approval process under the Petroleum (Environment) Regulations 2016, and for proposals assessed by the NT EPA.

## 8.3.2 Regulatory review

AAPA has established a compliance team to audit activities associated with the onshore petroleum industry. The first audits were undertaken in mid-2022, focusing on 2 petroleum Authority Certificates.

DITT and DEPWS will review the Code of Practice to ensure it is clear and certain for regulators and interest holders and considers advances in technology and industry processes. The Code of Practice requires assessment of impacts and risks to be informed by baseline assessment of environmental sensitivities, which includes archaeological heritage.

## 8.3.3 Information and data

Fact sheets, audio files in Aboriginal languages and the **Principles of Engagement when using Aboriginal Interpreters** are available at <u>hydraulicfracturing.nt.gov.au</u> and will be updated as new or additional information is identified.

Information and data from the SREBA studies is available at <u>depws.nt.gov.au/sreba</u>

EMPs, including information provided for social impact assessments, can be viewed on the DEPWS website at <u>depws.nt.gov.au</u>

NT Government decisions in relation to EMPs are published on the DEPWS website.

Industry compliance reports are also available on the DEPWS website.

# Summary

- The NT Government is • conducting a program to improve information provision to Aboriginal communities about the onshore petroleum industry so Aboriginal people can make informed decisions about proposed projects on their land.
- **Proponents must** • obtain an Authority **Certificate from** AAPA, which provides information about any sacred sites in the proposed project area, as part of their EMP.
- Legislative reforms provide opportunities for Aboriginal people to lodge objections and seek administrative review of NT Government decisions relating to the onshore petroleum industry.



# 9. Enhancing the wellbeing of local communities

Enforceable Code of Practice MITIGATION

**Regional financial reporting** 

Land access agreements with minimum landholder protections

> SREBA (social, cultural and economic studies)

# 9.1 Context

Development in the Territory must be managed to ensure communities receive the maximum benefit while minimising any potential adverse impacts. The regions surrounding the Territory's gas reservoirs are home to communities, pastoralists, and Aboriginal landowners and native title holders. All of these groups deeply value their land, including its environmental health and amenity. The development of the onshore petroleum industry has the potential to adversely impact the ways these groups use, value and benefit from the land and natural environment around them. Any diminishment of these uses will have a corresponding impact on community wellbeing.

Concerns about access to land for petroleum exploration and extraction were raised during the Inquiry, particularly for Aboriginal people and pastoralists. These concerns include:

- the inability of pastoralists and native title holders to refuse access to their land for onshore petroleum industry activities
- the right of Aboriginal owners of land subject to the Aboriginal Land Rights (Northern Territory) Act 1976 (Cth) to veto proposed onshore petroleum projects only at the exploration stage
- the disparate negotiating position of Aboriginal landowners and native title holders compared to project proponents when negotiating land access agreements
- the need for restrictions on access to areas of particular environmental, cultural, tourism or agricultural significance.

There is a risk to the wellbeing of local communities in areas where onshore petroleum projects are developed if the concerns of local communities are not resolved. Negotiation processes must produce mutually beneficial conditions for permitting proponents to access landholders' property, including adequate compensation for access and any disturbance to the land or the landholders' use of the land. The long-term wellbeing of local communities may also be at risk if the onshore petroleum industry causes harm to the land and natural environment. In the event remediation of the land or compensation to landholders is inadequate, the diminished value of that land will impact their wellbeing and ability to derive different benefits from the land into the future. Diminished land value may be the result of reduced production, damaged amenity, or harm to its traditional and cultural value.

The Inquiry made 8 separate recommendations in relation to issues and risks to the wellbeing of local communities.

# 9.2 Reforms implemented to mitigate the risks

# 9.2.1 Legislative reform

## 9.2.1.1 Petroleum legislation

A suite of amendments to the *Petroleum Act 1984*, the Petroleum Regulations 2020 and the Petroleum (Environment) Regulations 2016 work together to strengthen protections for Aboriginal land-owners and pastoralists affected by onshore petroleum industry development.

The amendments removed limitations on who is entitled to lodge an objection to the granting of an exploration permit. Removing the previous limitation guarantees communities and landholders can have a say about proposed onshore petroleum industry activities, including objections based on concerns about land access and community wellbeing.

As discussed in **Chapter 1: Strengthening the regulatory environment,** the NT Government introduced open standing for judicial review and third-party merits review of key decisions made by the NT Government relating to the onshore petroleum industry. These amendments provide additional opportunities for oversight and scrutiny of NT Government decisions, as well as legal pathways to challenge decisions. In the event that a proponent breaches their environmental regulatory obligations, amendments to the **Petroleum Act 1984** and the Petroleum (Environment) Regulations 2016 enable interested and affected persons to apply to the Supreme Court to remedy or restrain a potential or actual breach. These amendments are consistent with existing provisions in the **Environment Protection Act 2019** and the EPBC Act.

Amendments to the *Petroleum Act* **1984** introduced new environmental offences, as well as defences available to proponents who are prosecuted for these offences. The amendments apply a reversed onus of proof when a proponent seeks to rely on these defences, which requires the defendant proponent to produce evidence or positively prove that the defence applies to their case.

The NT Government also amended cost rules so courts and tribunals have the discretion not to require public interest litigants to pay a security for costs during the litigation process or to pay the costs of the other party if they are unsuccessful. The amendments further reduce barriers to genuine public interest litigants, including third parties, who seek administrative review of NT Government decisions relating to the onshore petroleum industry.

As discussed in **Chapter 3: Safeguarding water resources**, the NT Government amended the Petroleum (Environment) Regulations 2016 to include powers to create and enforce a Code of Practice, which means a breach of the Code of Practice is an offence under the regulations. The amendments also provide that an approved Code of Practice is admissible in proceedings for offences against the petroleum legislation as evidence of the standards proponents are required to meet.

The NT Government removed the caveat 'as far as practicable' from the requirement under the Petroleum (Environment) Regulations 2016 for an EMP to assess the cumulative impacts and environmental risks of regulated activities in conjunction with other development activities. This removed any doubt that cumulative impacts and risks need to be considered in an EMP, including cumulative social impacts in the communities which may be affected.

## 9.2.1.2 Environment legislation

The NT Government repealed the **Environmental** Assessment Act 1982 and introduced the **Environment Protection Act 2019** to strengthen the Territory's environmental impact assessment framework. The **Environment Protection Act 2019** introduced a new 'environmental approval' containing conditions to manage any potential significant impacts. This approval is granted by the Minister for Environment, Climate Change and Water Security at the completion of the assessment process. The new legislation provided the independent NT EPA with explicit powers to require a social impact assessment as part of a broader environmental impact assessment for proposed projects.

To support the *Environment Protection Act 2019*, the NT EPA has prepared the 'NT EPA environmental factors and objectives' guidance, which organise and systemise information about the environment and enable effective and holistic environmental impact assessment and reporting. The factors are separated into themes across the natural, social and economic environments. Each factor is supported by specific objectives. The factors include objectives relating to culture, heritage and economic welfare, amenity and benefit.

The NT EPA is preparing guidance to provide proponents and the community with additional information about its expectations when considering the environmental factors. The NT EPA has also prepared 'Stakeholder engagement and consultation' guidance to provide clear information to proponents on the NT EPA's expectations for how effective stakeholder engagement is conducted and demonstrated for proposals subject to assessment under the **Environment Protection Act 2019**.

The Petroleum (Environment) Regulations 2016 require EMPs for onshore petroleum activities to

identify and assess all environmental impacts and risks, and demonstrate they can be managed at levels that are acceptable and as low as reasonably practicable. This includes the assessment and management of impacts and risks to communities.

To support interest holders to develop EMPs, the NT Government released the 'Environment Management Plan Content Guideline – Onshore Petroleum Regulated Activities' in 2021. The guideline was informed by the NT EPA environmental factors and objectives, and includes references to social impacts. This includes a table of 'environmental factors and indicative environmental values potentially relevant to onshore petroleum activities', which must be addressed in the preparation of an EMP. The guideline was revised in 2022 to clarify the obligations of interest holders in undertaking social impact assessments.

The *Environment Protection Act 2019* and Petroleum (Environment) Regulations 2016 require interest holders to identify, assess and manage social impacts in a manner that is commensurate with the nature and scale of the proposed activity and level of impact. This approach provides for the development and implementation of measures to address impacts and risks through the EMP approval process, which may require a social impact management plan if the regulator considers a significant impact is likely. The Petroleum (Environment) Regulations 2016 require ongoing engagement with identified stakeholders throughout the life of an EMP.

# 9.2.2 Benefits for regional communities

The NT Government is mindful that the development of an onshore petroleum industry must provide benefits to communities directly affected by its activities.

The NT Government is developing a new financial reporting system that compares the level of onshore petroleum industry activity and revenue sourced from a region against expenditure in the region. The new budgetary reporting system will allow the NT Government to ensure communities affected by onshore petroleum industry development benefit from these activities. Expenditure will support the priorities of local communities in accordance with:

- the Regional Development Framework, which enables regional committees to set local priorities, goals and actions and to advise the NT Government's decision-making and investment priorities
- Local Decision Making agreements, which facilitate the progressive transition of service-delivery and decision-making to local governance structures in Aboriginal communities through agreed roles, responsibilities and actions, and based on community aspirations.

The NT Government introduced amendments to the *Petroleum Act 1984* and the Petroleum Regulations 2020 to better protect the interests of pastoral leaseholders, as an industry that will co-exist with any onshore petroleum industry and a major source economic activity in regional communities. These amendments included statutory land access agreements and a mandatory requirement to pay compensation to pastoral leaseholders for damage caused to their landholding, deprivation of the use of the land, and for every well drilled on the land.

More information about these reforms is in **Chapter 10: Ensuring local communities receive economic benefits**.

# 9.2.3 Land access agreements

At the time of the Inquiry there was no legislated requirement for land access agreements between petroleum companies and pastoral leaseholders. Instead there was a process which encouraged agreement including mediating an agreement through a land access panel made up of representatives from NT Government departments and the Northern Territory Cattlemen's Association. The Inquiry made a range of recommendations to protect the interests of the community around the shared use of land. The NT Government introduced powers in the **Petroleum Act 1984** to create regulations establishing a comprehensive land access scheme. The Petroleum Regulations 2020 came into effect in June 2020 and introduced a statutory requirement and process for land access agreements, including compensation for damage and deprivation of land, as well as mandatory minimum compensation paid for every well drilled.

## See Chapter 1: Strengthening the regulatory

**environment** for more information about land access agreements and minimum compensation requirements.

## 9.2.4 Petroleum Reserved Block Policy

Prior to the Inquiry, reserved blocks (areas where petroleum activity was prohibited) could be declared under the *Petroleum Act* 1984, but there was no comprehensive policy guiding the identification or categorisation of areas that should be reserved from petroleum industry activities.

The NT Government introduced the Petroleum Reserved Block Policy in July 2019. The Policy guides the declaration of reserved blocks under identified categories, including:

- parks and reserves
- towns
- areas of high conservation value
- Indigenous Protected Areas
- areas of cultural significance
- areas of high tourism value.

The NT Government continues to negotiate with onshore petroleum companies to relinquish identified areas from their permits where petroleum interests were previously granted, and a number of companies have agreed to relinquish identified areas from their permits through this negotiation process. The declaration of land subject to the *Aboriginal Land Rights (Northern Territory) Act* **1976** (Cth) is also ongoing. These areas will be declared once the declaration receives the support of the Territory's Aboriginal land councils.

#### See Chapter 1: Strengthening the regulatory

**environment** for more information about the Petroleum Reserved Block Policy.

# 9.2.5 Strategic Regional Environmental Baseline Assessment

The NT Government established the SREBA to address the substantial information gaps identified by the Inquiry.

The social, cultural and economic SREBA study was designed to identify community expectations and values. The study will ensure future development is better informed to protect values, build on existing strengths and address areas that are sensitive to development.

The studies provide a clear description of the emerging values and thresholds for acceptance of onshore petroleum industry development. Through the findings and recommendations, including the regional monitoring framework, the studies detail ongoing opportunities to continue to engage and strengthen the relationships with communities potentially impacted by onshore petroleum development, establish an ongoing monitoring program in the context of community concerns and aspirations and continue to build on the knowledge base.

See **Chapter 2: Addressing a lack of knowledge** for more information about the social, cultural and economic SREBA study.

## 9.2.6 Social licence to operate

Since the Inquiry handed down its recommendations in 2018, the NT Government has undertaken a

substantial reform agenda across departments to implement all recommendations. The regulatory framework for the onshore petroleum industry has been strengthened to mitigate the risks identified by the Inquiry to an acceptable level. It is anticipated these changes will increase community confidence by demonstrating the NT Government has the ability to appropriately regulate the onshore petroleum industry.

Inadequate information and consultation processes involving Aboriginal communities are likely to produce an imbalance of power in favour of onshore petroleum industry proponents. To address the potential for this power imbalance, a number of initiatives were taken to create greater access to independent information in a form that ensured Aboriginal people are able to make more informed decisions.

To address the information gaps that existed prior to the Inquiry, a number of practical actions were taken in the first instance including through the Aboriginal Information Program, the CSIRO worked collaboratively with land councils to identify information requirements and develop factsheets with clear, factual and relevant content for translation into languages of local Aboriginal communities which may be affected by onshore petroleum industry development and hydraulic fracturing.

Translated audio files about groundwater, methane and shale gas are now publicly available on the Hydraulic Fracturing Implementation website to use when engaging with Aboriginal people regarding onshore petroleum industry development and hydraulic fracturing in the Territory.

The Community Engagement and Information Program (CEIP), delivered through the CSIRO will continue to deliver accurate, trusted and accessible information about the onshore petroleum industry and hydraulic fracturing to Aboriginal communities over the coming years. Through the provision of independent scientific information, the CEIP ensures Aboriginal people are provided with the requested information to understand the risks associated with proposed onshore petroleum industry activities and can fully exercise their decision-making rights. These rights are upheld by building the capacity of Aboriginal people to communicate their points of view to proponents during consultation and to make informed decisions about proposed development. It is essential that Aboriginal people are empowered to make decisions about proposed projects on their country.

The NT Government developed the **Principles** of **Engagement when using Aboriginal Interpreters** (the Principles) in consultation with the AIS. The Principles recommend and provide guidance for the use of interpreters when consulting with Aboriginal people.

The NT Government recognises key authorities and stakeholders, including land councils and AAPA, have their own resources and expectations regarding culturally appropriate engagement with Aboriginal community members. The Principles are an additional level of guidance to support those specific resources and requirements.

Ensuring Aboriginal people can communicate clearly during consultation is essential to informed decisionmaking about proposed onshore petroleum industry projects. The wellbeing of Aboriginal communities can be supported by creating an open and shared dialogue between Aboriginal people and project proponents, enabling all parties to communicate and resolve concerns, develop shared goals and negotiate mutually beneficial outcomes.

For more information about the CEIP and the Principles, see **Chapter 8: Embedding Aboriginal people and their culture**.
# 9.3 Ongoing monitoring and reporting

#### 9.3.1 Monitoring and reporting activities

The petroleum legislation requires a statement of reasons to be published for a range of decisions made under the legislation. This provides the community an opportunity to review decisions and be satisfied that criteria designed to protect the wellbeing of communities were considered, or seek administrative review of decisions where they are not satisfied the decision was made correctly.

DTF is designing improved budget reporting by region to provide an additional tool to monitor NT Government spending in regional areas. Monitoring and evaluation is embedded in each Local Decision Making agreement to assess progress against agreement outcomes and implementation plans, including timeframes for review and key roles and responsibilities. This will assist the NT Government to monitor whether expenditure in regions is progressing community priorities.

The Petroleum Regulations 2020 provide a process for the Northern Territory Civil and Administrative Tribunal to make a determination about land access agreements in the event of an impasse between the proponent and pastoralist. DITT reviews these decisions following their publication and ensures the regulations are working appropriately (including that parties negotiate and mediate in good faith). The ministerial approval process for land access agreements and their registration on the Land Access Register also allow DITT to review the agreements to ensure they meet minimum legislative protections.

The NT Government will conduct ongoing monitoring against the baselines established by the social, cultural and economic SREBA study. Monitoring of impacts to social, cultural and economic values will use annual updates of publicly available data and any comparable data sources, and through qualitative surveys conducted in communities. The information established by the SREBA studies can be used to inform the development of a regional monitoring and reporting framework which is participatory in its approach and guided by an oversight committee of senior figures from the NT Government, industries, and research and interest groups to safeguard the integrity of processes used for monitoring, evaluation and communication of data. Options to involve local Aboriginal rangers in regional monitoring activities will be explored to enhance community trust in the monitoring process.

DEPWS will monitor community sentiment as part of the EMP approvals process under the Petroleum (Environment) Regulations 2016, and for proposals assessed by the NT EPA. In addition, the CEIP will monitor community concerns to identify issues regarding the onshore petroleum industry's engagement with the community.

#### 9.3.2 Information and data

NT Government decisions for environmental approvals and EMPs, and EMP documents submitted by proponents, are available on the DEPWS website at **depws.nt.gov.au** 

Statements of reasons for decisions made under the *Petroleum Act* 1984 are available on the DITT website at industry.nt.gov.au

Information and data from the SREBA studies is available at <u>depws.nt.gov.au/sreba</u> and will be updated as required to ensure currency.

## Summary

- The NT Government will monitor revenue generated from onshore petroleum industry activities against expenditure in a region. Expenditure will be guided by Local Decision-making agreements and the Regional Development Framework to advance community priorities.
- Onshore petroleum industry proponents must identify, assess and manage any social impacts from their project.
- Proponents must negotiate land access agreements with pastoral lessees and pay minimum compensation amounts.
- The social, cultural and economic study ensures future development is sensitive to community expectations and values.

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# 10. Ensuring that local communities receive economic benefits

MITIGA

Mandatory minimum compensation for pastoral lessees

Land access agreements with minimum landholder protections

Support for Territory businesses

**Regional financial reporting** 

**Coordinated infrastructure planning** 

#### 10.1 Context

Alongside the potential opportunities for local communities, the development of an onshore petroleum industry poses a corresponding risk that these communities will not receive economic benefits and will instead be economically disadvantaged.

Without appropriate NT Government action to create local economic opportunities, the development of an onshore petroleum industry could occur without short and long-term benefits flowing to the local communities affected. Even if economic benefits are realised, there is a risk these benefits would not outweigh any economic detriment caused by onshore petroleum industry activities. Potentially, any adverse impacts to terrestrial ecosystems would be detrimental to industries that co-exist with the onshore petroleum industry, such as agriculture, pastoralism, and fishing. Industrial development for the onshore petroleum industry could diminish perceptions of the outback experience and pose a risk to the local tourism industry.

The Inquiry received several submissions regarding the potential for rents and housing prices to rise and fall sharply with a 'boom and bust' cycle and expressing concerns price rises would squeeze many local residents out of the housing market. Residents may have otherwise chosen to leave a particular region because of the presence of an onshore petroleum industry and its potential impacts, including impacts to the amenity of their local area. The Inquiry concluded there is also a risk of social division in communities where the benefits and opportunities associated with any onshore petroleum industry may not be equitably distributed.

The Inquiry made 26 separate recommendations in relation to issues and risks that local communities will not receive economic benefits.

# 10.2 Reforms implemented to mitigate the risks

#### 10.2.1 Impacts to co-existing industries

#### 10.2.1.1 Pastoral industry

The pastoral industry is one of the oldest industries in the Territory, and is the main industry operating in the regional and remote areas where onshore petroleum industry development is anticipated. The Inquiry heard concerns from industry bodies that the previous regulatory framework did not adequately protect the interests of pastoralists.

The previous regulatory framework allowed pastoral lessees to seek compensation for the impact of petroleum activities. Section 81(1) of the **Petroleum Act 1984** entitled lessees to compensation for "deprivation of use or enjoyment of the land, including improvements on the land; and damage, caused by the permittee or licensee, to the land or improvements on the land". If the lessee and petroleum company could not reach an agreement regarding compensation, either party could refer the matter to the Northern Territory Civil and Administrative Tribunal. Pastoralists bore the responsibility of claiming compensation by lodging a claim with the petroleum company within three years.

The NT Government introduced amendments to the *Petroleum Act 1984* and the Petroleum Regulations 2020 to mitigate the risks to the pastoral industry, which will need to co-exist with any onshore petroleum industry. The amendments strengthened protections for pastoralists by requiring petroleum industry proponents to negotiate a land access agreement with the landholder, which must include standard minimum protections outlined in the Petroleum Regulations. The amendments also implemented requirements for proponents to pay compensation to all landholders, including pastoral lessees, for damage and deprivation of their interests and for every well drilled on their land.

#### 10.2.1.2 Business opportunities

The NT Government improved information provision to industry regarding proponents' future economic development activities through the Onshore Gas Supply Chain Working Group. This formal industry and government forum was established to realise local economic benefits for the Territory. The group meets on a quarterly basis with a goal of ensuring economic opportunities are understood and opportunities for local business are maximised.

The NT Government worked in consultation with the Onshore Gas Supply Chain Working Group and industry stakeholders to identify, plan, and implement actions to maximise economic opportunities in local employment and skills, and for local business.

These actions included:

- local benefit reporting by proponents
- developing an annual local benefit report
- NT Government initiatives in business development, training programs and grants across business development, and employment
- NT Government-funded studies and reports such as the Northern Territory Beetaloo
   Skills Audit undertaken with the assistance of the Industry Skills Advisory Council NT (ISAC NT). This report will be delivered in 2023 and will identify potential gaps in skills needs in the Territory to focus on future training needs and identify alignment with existing capability identified in the Northern Territory Onshore Gas Support Industry – Statement of Capacity 2020
- engaging with industry to understand requirements, expectations and skills. This information will form the next level of detailed engagement with regional businesses and stakeholders
- working with the Australian Government and Barkly Regional Council to implement the Barkly Regional Deal.

The NT Government will work with the Onshore Gas Supply Chain Working Group to ensure the procurement process for the onshore petroleum industry produces local economic benefits. This work will include setting ongoing targets at agreed phases of development, noting NT Government targets and targets previously set by industry for local procurement.

The NT Government analysed literature and reviewed existing and historical practices to determine how to maximise broad-based local opportunities for business and workforce, and increase information sharing and engagement. The NT Government procured an Onshore Gas Support Industry – Statement of Capacity, published by the ICN NT in March 2020.

The NT Government undertakes ongoing consultation with the ICN NT and the Chamber of Commerce Northern Territory to conduct targeted local business capability assessments to support local engagement in the exploration procurement stage, and support Territory enterprises to understand opportunities in the petroleum sector.

The NT Government worked with Territory industries to co-develop a local benefit reporting mechanism which captures agreed local benefit objectives and effective performance measures, including specific outcomes for Aboriginal people. The NT Government has received commitment from currently active explorers in the Beetaloo Sub-basin to provide the NT Government with an annual local benefit report from the production phase summarising their commitment to local benefits and employment. Government will seek participation from other petroleum title holders as they become operational. The NT Government will publish an annual industry-level Local Benefit Report to share the results of this process.

Through existing Territory Business Centres and small business champions programs, the NT Government is assisting Territory businesses to take advantage of opportunities presented by the development of an onshore petroleum industry by assisting businesses prepare for quality assurance certification and align their capabilities with industry expectations. Ongoing government initiatives being implemented include business development, training programs and grants, including for Aboriginal businesses and Aboriginal people. Government will work with industry stakeholders, including the ICN NT, the ISAC NT and Chamber of Commerce NT, and through existing mechanisms to support the delivery of appropriate offerings.

The NT Government continues to help Territory businesses identify upcoming work opportunities by facilitating annual information sessions. This ensures businesses are ready to take advantage of opportunities and informs them of key criteria, such as pre-qualification and contract requirements, as well as the processes needed to register interest in project opportunities. This takes place with industry support and includes proponents, industry bodies such as ICN NT, Chamber of Commerce NT and the Energy Club. As required, information sessions are developed in consultation with proponents and other industry stakeholders.

#### 10.2.2 Shared financial benefits

# 10.2.2.1 Improved reporting of government revenue and expenditure

Another gap in the NT Government's previous regulatory and policy framework identified by the Inquiry was its limited ability to achieve economic benefits for local communities from the development of an onshore petroleum industry in their region.

The NT Government's budgetary and expenditure reporting system does not enable a comparison of revenue generated in different locations against expenditure in the same area. This prevents an assessment of whether communities affected by onshore petroleum industry development receive a commensurate level of economic benefit. As part of its implementation of reforms based on the **A** plan to fix the budget report, the NT Government is currently developing a new agency budget management system. This system will allow location details to be identified in reporting on revenue and expenditure, at a minimum down to the NT Government's regional areas comprising Top End, Greater Darwin, East Arnhem, Big Rivers, Barkly and Central Australia.

Implementation of the new budgetary system will enable consistent reporting of budgeted and actual expenditure by region across NT Government agencies. The NT Government will use this information as part of the annual budget process by comparing the level of onshore petroleum extraction activity and subsequent revenue sourced from a region against the level of government spending on services and infrastructure in that region. The NT Government can use this information to consider how petroleum industry revenue sourced from regions is spent, particularly for expenditure in regions where the revenue is sourced. Regional expenditure can then be informed by community priorities identified by the Regional Development Framework and Local Decision Making agreements.

#### 10.2.2.2 Regional Development Framework

The NT Government communicates, coordinates and delivers its regional development commitments in accordance with the Regional Development Framework.

The Regional Development Framework is designed to enable regions to shape their social and economic development priorities. This is facilitated by the framework's governance model, which connects regional committees with NT Government decisionmakers. Regional committees include representation from local government, land councils, regional business leaders, service providers and Aboriginal organisations, reflecting the breadth sought by the Inquiry recommendation. Regional committees are leading the development of Regional Economic Growth Plans, supported by the NT Government. The plans will:

- identify regional priorities for economic growth and implementation pathways and actions to deliver them
- advise government decision-making and investment priorities
- define the region's connection and contribution to the Territory's overall growth strategy
- set goals and actions that allow a region to prioritise what is most important and how they can be implemented to locally agreed timelines and delivery methods.

#### 10.2.2.3 Local Decision Making

Local Decision Making provides a pathway for Aboriginal communities and community representative bodies to have greater involvement, including control, over their identified needs and aspirations through the progressive transition of service delivery and decision-making to the local level.

Recent Local Decision Making agreements have included support for progressing community-led strategic priorities in areas such as infrastructure, housing, economic development opportunities, and community health and wellbeing.

The strategic priorities are enacted through individual implementation plans which establish specific actions, roles and responsibilities, and include monitoring and evaluation plans to measure outcomes. These agreed priorities will be used to inform NT Government spending in Aboriginal communities that are affected by the development of an onshore petroleum industry. A new budgetary reporting system, the Regional Development Framework and Local Decision Making Agreements, will inform NT Government funding to priorities in areas affected by the onshore petroleum industry.

#### 10.2.3 Infrastructure

Prior to the Inquiry, the NT Government did not have a coordinated planning and investment strategy for infrastructure to support onshore petroleum industry development. The Inquiry found failure to plan for infrastructure investment to support industry development would lead to adverse impacts to existing community and industry infrastructure users. The Inquiry recommended a coordinated approach to infrastructure should include options to fund new and upgraded infrastructure in anticipation of onshore petroleum industry development in the Beetaloo Sub-basin.

Since the Inquiry's Final Report was delivered in 2018, the NT Government established Infrastructure NT and the role of the Infrastructure Commissioner to deliver strategic infrastructure planning and development, which coordinates and aligns infrastructure needs with industry and population growth. The NT Infrastructure Framework takes a place-based approach by linking infrastructure planning with Local Decision Making and regional development strategies. Through the Framework, Infrastructure NT coordinates infrastructure planning and development in the Beetaloo Sub-basin in a way that meets the needs of regional communities and industry.

As part of the NT Government's coordination of infrastructure planning and investment, and its support of local communities and industries, the NT Government is working with the Australian Government and the Barkly Regional Council to implement the Barkly Regional Deal. This \$84.7 million agreement will deliver social and economic infrastructure projects, including youth infrastructure, multipurpose accommodation, ongoing funding for airstrips and new housing, as well as social and cultural programs for communities in close proximity to the Beetaloo Sub-basin. Infrastructure needs for the Big Rivers region are being pursued through the Big Rivers Regional Coordination Committee, membership of which comprises NT Government agencies and local government councils. NT Government membership in this committee provides a communication pathway for local priorities in the Big Rivers region and offers strategic oversight of infrastructure projects and opportunities in the region.

The NT Government has established baseline data on housing demand through the SREBA (see Chapter 2: Addressing a lack of knowledge for more details), the Bringing Land to Market Report, and data contained in the regional economic growth plans for the Big Rivers and Barkly regions. The NT Government used this baseline data to make investment decisions aimed at addressing housing needs, and will continue to use this information to support ongoing planning and investment decisionmaking in areas where increased demand occurs as a result of onshore petroleum industry development. Baseline data will also support the NT Government to assess project-specific impacts and requirements for housing outlined by petroleum industry proponents in EMPs.

The NT Government was successful in its submission to Infrastructure Australia to include 'enabling infrastructure for developing the Beetaloo Sub-basin' as a nationally significant project on the Infrastructure Priority List. The list informs Infrastructure Australia's guidance for the Australian Government on which infrastructure investments will deliver the best value for the community. Inclusion on the Infrastructure Priority List is a step towards securing funding for new and upgraded infrastructure to support the onshore petroleum industry in the Beetaloo Sub-basin.

The Australian and NT governments are jointly funding \$367 million for road upgrades to the Carpentaria Highway, sections of the Stuart Highway, Buchanan Highway, Western Creek Road and Gorrie/Dry River Road. The benefits of this program for the Beetaloo region and communities include:

- improved freight productivity and access to freight gateways for the pastoral and agricultural sectors
- improved road safety for all road users, in line with the NT Government's Towards Zero Road Safety Action Plan
- improved connectivity between people with jobs and services, and goods with markets
- improved flood immunity, thereby reducing annual road closures
- improved and more frequent access to health and social services for remote and Aboriginal communities.

#### 10.2.4 Social licence to operate

The Inquiry noted concerns the development of any onshore petroleum industry in the Territory could affect the overall character and cohesion of communities, and may also affect people's relationships, mental health, and sense of identity and place. With the distinct differences between communities across the Territory and their sometimes stark contrast in socio-economic status, there is potential for disruption of community cohesion which will need to be well managed and monitored over time through the implementation of ongoing participatory social impact assessment.

Although industry is responsible for negotiating local and regional support for their activities, the NT Government will work with industry in areas where it moves into the production phase. The NT Government will ensure, through the provision of baseline information from the SREBA studies, people have access to information to assess the impact of industry development on their communities, opportunities to participate in ongoing monitoring, and appropriate arrangements to raise concerns and maximise opportunities to improve outcomes. The NT Government continues to consider mechanisms to build relationships with community, including through ongoing engagement and monitoring of community sentiment, the planned monitoring framework outlined in the social, cultural and economic SREBA studies and the CEIP being delivered by the CSIRO (For more information on the CEIP, refer to **Chapter 1:** *Strengthening the regulatory environment*).

#### 10.2.4.1 Improving information provision

To assist communities to maintain social cohesion, the NT Government implemented programs aimed at improving information provision to Aboriginal communities.

In 2020 and 2021, CSIRO worked collaboratively with Aboriginal land councils on the Aboriginal Information Program. This work identified information requirements and developed fact sheets with clear, factual and relevant content. The AIS recorded the translated information in 17 Aboriginal languages, including communities with potential to be affected by onshore petroleum industry development and hydraulic fracturing. Translated audio files about groundwater, methane and shale gas are now publicly available on the Hydraulic Fracturing Implementation website for use by interested parties including Land councils, AAPA and stakeholders when engaging with Aboriginal people regarding onshore petroleum industry development and hydraulic fracturing in the Territory.

In consultation with AIS, CM&C developed the *Principles of Engagement when using Aboriginal Interpreters* (the Principles) to guide entities wishing to engage with Aboriginal people through the use of Aboriginal interpreters. The Principles provide consistent guidance for those consulting with Aboriginal people, emphasise the importance of using interpreters when explaining complex scientific matters, and recognise the significance of respecting community and culture when consulting with Aboriginal people. The Principles are available on the Hydraulic Fracturing Implementation website and are additionally linked to key resource sites to ensure they are accessible to all stakeholders engaging with Aboriginal community members.

#### 10.2.4.2 Social impact assessment

The *Environment Protection Act 2019* and Petroleum (Environment) Regulations 2016 require petroleum interest holders to identify, assess and manage social impacts in a manner that is commensurate with the nature and scale of the proposed activity and level of impact. This approach provides for the development and implementation of measures to address impacts and risks through the environmental approval processes, which may require a Social Impact Management Plan to address potential impacts. The Petroleum (Environment) Regulations 2016 require ongoing engagement with identified stakeholders throughout the life of an EMP.

The NT EPA has prepared the 'NT EPA environmental factors and objectives' guidance, which organise and systemise information about the environment to enable effective and holistic environmental impact assessment and reporting. The factors are separated into a range of themes across the natural, social and economic environments. Each factor is supported by specific objectives. The factors include objectives relating to culture, heritage and economic welfare, amenity and benefit.

The NT EPA is developing guidance for social impact assessment under the *Environment Protection Act 2019*. The NT EPA has consulted on its draft guidance 'Environmental Factor: Culture and Heritage' and is preparing draft guidance for its environmental factor 'Communities and economy'. This detailed guidance will clarify expectations for the content of social impact assessments regarding these environmental factors.

DEPWS revised the 'Environment Management Plan Content Guideline – Onshore Petroleum Regulated Activities' in 2021 to set out clear expectations for the content of social impact assessments and social impact management plans. This includes a table of 'environmental factors and indicative environmental values potentially relevant to onshore petroleum activities', which must be addressed in the preparation of an EMP for onshore petroleum industry activities. The guideline was further revised in 2022 to clarify the obligations of interest holders in undertaking social impact assessments.

# 10.3 Ongoing monitoring and reporting

#### 10.3.1 Monitoring and reporting activities

To ensure communities benefit from onshore petroleum industry activities, monitoring mechanisms are embedded across the programs that will support the fulfilment of local priorities.

DITT will monitor onshore industry activities and consult with stakeholders over the course of each phase of the industry's development to ensure local content outcomes and local economic and employment opportunities are being identified and realised during the development and operation of the industry.

Improved budget reporting by region will provide the NT Government with an additional tool for monitoring government spending.

The NT Government will ensure the needs of regions are appropriately considered as part of the Budget development process, using local priorities identified through the Regional Development Framework and Local Decision Making agreements, including offsetting any negative impacts due to onshore petroleum industry activity. Each Local Decision Making agreement has monitoring and evaluation embedded to assess progress against agreement outcomes and implementation plans, including timeframes for review and key roles and responsibilities. This will enable the NT Government to monitor the progress of local priorities.

Impacts to and demand on housing supply will be monitored by the Land Development Committee, which was established to continually monitor and review the implementation of the *Bringing Land to Market Report.* The Committee will ensure the report's recommendations are completed to support a growing Territory economy through the provision of sufficient titled land to meet future upswings in housing/land demand, including in the Beetaloo Sub-basin region. The NT Government will continue to monitor the Northern Territory Land and Property Transactions Report to analyse property sale price activity and transfer volumes in communities in the vicinity of the Beetaloo Sub-basin.

Proponents will submit annual local benefit reports from the production stage of the onshore petroleum operations, however DITT will encourage participation in the report from the earliest operational stage that is practicable. Reports will identify and report on commitments to local content activities, including identifying of outcomes in at least the following areas:

- workforce development
- employment
- Aboriginal employment
- local suppliers of goods and services
- Aboriginal suppliers of goods and services.

DITT will use information from proponents' reports to produce an annual Local Benefit Report, which will be publicly available. However, the proponent reports will not be made public due to commercial sensitivities.

DITT will also fund the publication of the first 3 aggregated annual onshore industry reports, which will be based on data from the annual local benefit reports provided by companies operating in the onshore petroleum industry. The annual report requirement will commence in the production stage of the onshore industry.

The ISAC NT plans to conduct the Northern Territory Beetaloo Skills Audit, which will seek to understand possible industry employment needs as the industry develops, gaps in Territory skills to fill employment needs, and identify training and other workforce solutions to fill those gaps. Information will also inform the design and delivery of related government support programs.

Infrastructure NT will continue its role in planning for, coordinating and aligning infrastructure needs in the Beetaloo Sub-basin with industry and population growth. Infrastructure NT will leverage existing arrangements with Australian Government agencies and other jurisdictions to champion the Territory's interests to prioritise, plan and deliver supporting infrastructure in the Beetaloo Sub-basin.

#### 10.3.2 Information and data

The NT Government will produce an annual Local Benefit Report which will be available to the public on the **depws.nt.gov.au/sreba** 

Fact sheets, audio files in Aboriginal languages and the **Principles of Engagement when using Aboriginal Interpreters** are available at **hydraulicfracturing.nt.gov.au** 

Proponents produce social impact assessments as part of their EMP and applications for environmental approvals. EMPs and NT Government decisions relating to EMPs and environmental approvals can be viewed on the DEPWS website at **depws.nt.gov.au** 

Submissions for environmental approvals under the *Environment Protection Act 2019* can be viewed on the NT EPA website at <u>ntepa.nt.gov.au</u>

Industry compliance reports are available on the DEPWS website at <u>depws.nt.gov.au</u>

# Summary

- The NT Government is working with industry groups to ensure Territory businesses and workers are ready to take advantage of opportunities in the onshore petroleum industry.
- The NT Government will monitor revenue generated from onshore petroleum industry activities against expenditure in a region. Expenditure will be guided by Local Decision-making agreements and the Regional Development Framework to advance community priorities.
- Coordinated infrastructure planning to support onshore petroleum industry development will also deliver infrastructure improvements to benefit regional communities and industries.

# Conclusion

The NT Government's commitment to implement the Inquiry recommendations through the Implementation Plan in 2018 required fundamental reforms involving major changes to the legislation governing environmental protection, management of natural resources and, specifically, regulation of the onshore petroleum industry.

The Implementation Plan reaffirmed the NT Government's role in implementation was to provide strong leadership and sound governance in order to:

- fundamentally re-set the regulatory environment
- increase baseline knowledge
- effectively assess, monitor and mitigate any risks
- set new standards for transparency in decision-making
- build trust through transparency.

In the five years since the Inquiry handed down its recommendations, the NT Government has undertaken a significant agenda of coordinated, cross-agency regulatory reform to reduce and mitigate the risks posed by the development of an onshore petroleum industry, leading to a best practice regulatory system and a Territory first single repository of baseline data through the SREBA studies to inform decision making.

This Final Implementation Report has detailed how the risks associated with the development of an onshore petroleum industry, as identified by the Inquiry, have been mitigated through the implementation of the Inquiry's recommendations, including how the context has changed in some instances since the Inquiry. The NT Government has considered the reforms in their entirety, as a holistic program that has fundamentally changed the system for regulating the onshore petroleum industry, their collective ability to effectively assess and mitigate the risks identified by the Inquiry, the development of a comprehensive knowledge base and the establishment of greater transparency and accountability in decision making and engagement.

The NT Government has considered advice from the Independent Overseer, Dr David Ritchie, throughout implementation to inform actions taken to mitigate various risks highlighted by the Inquiry. Dr Ritchie's final letter of 8 March 2023 is available on the Hydraulic Fracturing Implementation website at hydraulicfracturing.nt.gov.au

Having considered the system reform undertaken as a complete package, the NT Government is now satisfied that the risks identified by the Inquiry have been sufficiently mitigated, and is confident that applications for onshore petroleum production licences may now be accepted for consideration under the new regulatory regime.

The NT Government will continue its businessas-usual role of regulating the onshore petroleum industry, using the new regulatory framework implemented in response to the Inquiry's recommendations. The NT Government will undertake ongoing monitoring, reporting and review activities to ensure the reforms continue to mitigate these risks and enable effective regulation of and planning for the onshore petroleum industry.

The Hydraulic Fracturing Implementation website remains available to detail the completion of individual Inquiry recommendations and provide relevant reference points for further information about implementation.

# Appendix

The Independent Overseer identified a series of risks from the Inquiry's Final Report that needed to be addressed. The NT Government worked with the Independent Overseer to map these risks against the recommendations handed down by the Inquiry. The following table shows the relationship between a risk category, a set of risks and multiple recommendations from the Inquiry Final Report. It is the implementation of many recommendations that results in the mitigation of each risk individually and in combination.

# Strengthening the regulatory environment.

Inquiry findings	Mitigating recommendations
The risk of continued lack of trust towards the gas industry and a lack of faith in the Government's capacity to regulate any such industry.	R12.1, R12.2, R12.3, R12.4, R12.4, R12.5, R12.6, R12.16, R12.17, R12.18, R12.19, R12.20, R14.2, R14.3, R14.23, R14.24, R.14.25, R14.26, R14.27(a), R14.27(b), R14.28, R16.1, R16.4
The risk that the government is perceived to be subject to undue influence by the gas industry thereby leading to a loss of public confidence in the government and the democratic process.	R12.1, R12.7, R12.20, R14.34, R14.20, R14.21, R14.24, R14.30, R14.31, R14.32, R14.33, R16.4, R14.2, R14.3, R14.4, 14.5
The risk that, given the short-term nature of the political cycle, the long-term consequences of any onshore unconventional shale gas industry cannot be appropriately regulated.	R14.35, R14.21, R14.22, R14.24, R14.29, R14.1
The cumulative risk that Aboriginal people will seek legislative redress to limit the development of any onshore shale gas industry on their country.	R11.1, R11.2, R11.3, R11.4, R11.5, R11.6, R11.8
The risk of regulatory capture, whereby the regulatory body becomes inappropriately aligned with industry and becomes reluctant to regulate against the interest of any onshore unconventional shale-gas industry.	R14.12, R14.34, R14.35
The risk of the perception of regulatory capture which may have a tendency to undermine confidence in both the regulatory body and the government.	R14.30, R14.34, R14.35
The risk that access to justice by the public is denied or restricted by the regulatory framework.	R14.15, R14.16, R14.24, R14.31, R14.32
The risk that the regulatory framework does not adequately protect the environment (water, land, and air) from risks associated with hydraulic fracturing and its associated activities.	R14.11, R14.19, R14.30, R14.32, R14.33, R15.1, R15.2, R15.3, R16.1
The risk that the regulatory framework does not ensure adequate, or any, remediation and/or rehabilitation of any environmental damage caused by hydraulic fracturing and its associated activities.	R14.13, R14.14, R14.17, R14.18, R14.19, R14.20, R14.21, R14.22
The risk that the cost of any remediation and/or rehabilitation of environmental damage caused by hydraulic fracturing and its associated activities is not passed on, either in whole or in part, to the entity that caused the harm, but is passed on to the public.	R14.1, R14.14
The risk the regulatory framework does not appropriately balance the rights of landowners, occupiers, and traditional owners, with those of gas companies.	R14.4, R14.5, R14.6, R14.7, R14.8, R14.9, R14.10, R14.23, R14.24, R14.25, R14.27(a), R14.27(b), R14.31, R14.32
The risk of inadequate monitoring or enforcement of compliance with the regulatory framework. This may arise from, for example, inadequate resourcing of the regulatory agency, inadequate expertise, or inadequate training.	R14.1, R14.26, R14.30, R14.31, R14.32, R14.33
The risk that given its complexity, any regulatory framework that is developed is rushed and inadequate.	R16.2, R16.3

# Addressing a lack of knowledge.

### **Inquiry findings**

The risk to evidence-based decision making created by the lack of adequate pre-development assessment and environmental baseline data.

The risk that there is inadequate information about the long-term risks associated with hydraulic fracturing and its associated activities to develop a suitably robust regulatory framework.

## Safeguarding water resources.

#### Mitigating recommendations

R7.5, R7.8(a), R7.8(b), R7.10, R7.16, R7.19, R7.20, R8.1, R8.6, R9.3, R11.8, R12.1, R12.6, R12.20, R15.1

R7.5, R7.19, R14.19, R14.21, R14.22, R15.2, R15.3

The risk of adverse environmental impacts as a result of reduced water supply at a regional and/or local scale due to the large amounts of water being extracted for use in hydraulic fracturing (i.e. The risk to sustainable use of water of excessive extraction from surface and/or groundwater).	R7.1, R7.2, R7.3, R7.5, R7.6, R7.7, R7.8(a), R7.8(b), R7.16
The risk of adverse impacts arising from changes in the quality and/or quantity of water available on general amenity values (i.e. in national parks, rangelands and recreational fishing areas).	R7.1, R7.2, R7.3, R7.4, R7.6, R7.19
The risk of adverse impacts on human health due to changes to water quality, supply and distribution.	R7.4, R7.6
The risk that a reduction in either water quantity or quality may impair the traditional use and/or value of natural water bodies that are central to traditional land use (e.g. many sites of significance to Aboriginal people relate to water).	R7.5, R7.6, R7.8(a), R7.8(b), R7.19
The risk that changes to water quality, supply and distribution may have an adverse impact on industries that may coexist with the onshore unconventional gas industry (e.g. agriculture, pastoralism, fishing and tourism).	R7.1, R7.2, R7.7, R7.8(a), R7.8(b), R7.11
The risk of changes to surface or groundwater flows from seismic activity caused by hydraulic fracturing processes including reinjection of wastewaters.	R5.7, R7.9
The risk to water quality arising from unacceptable surface and groundwater contamination due to offsite spills of hydraulic fracturing chemicals and wastewater from road and rail transport.	R5.5(a), R5.5(b), R7.12, R7.14
Risks to surface-water quality (including cumulative effects) arising from: a) effects of linear infrastructure (roads, pipelines) on the quality and distribution of surface-water across the landscape b) changes to the timing and/or quality of surface water flows because of the planned or accidental discharge of produced water"	R5.5(a), R5.5(b), R5.6, R7.12, R7.17, R7.18, R7.19, R14.19, R14.21, R14.22
Risks to groundwater quality (including cumulative effects arising from: a) contamination from leaky production wells b) contamination due to leaky abandoned wells c) contamination due to spills of hydraulic fracturing chemicals and wastewater: on-site spills d) contamination due to offsite leaks of hydraulic fracturing chemicals and wastewater from pipelines e) contamination of aquifers due to reinjuection of treated or untreated wastewater into other aquifers f) contamination due to induced connectivity between hydraulic fractured shale rock formation and overlying aquifers g) contamination due to changed groundwater pressures	R5.1, R5.2, R5.3, R5.4, R5.5(a), R5.5(b), R7.4, R7.9, R7.10, R7.11, R7.12, R7.13, R7.15, R7.16, R14.19, R14.21

# **Protecting landscapes.**

## **Inquiry findings**

## Mitigating recommendations

The risk that the development of the unconventional gas industry will have an adverse impact on the iconic wilderness values which are central to the outback experience marketed by the tourism industry (e.g. the construction of pipelines and processing plants) and increased traffic, noise and light from flaring).	R8.15, R8.16, R14.2, R14.4
The risk that sacred sites and cultural landscapes are degraded and damaged both above and below the ground.	R11.1, R11.2, R11.3, R14.2, R14.4
The risk that the perception, by residents and tourists, that the NT is a place of largely unspoiled landscapes is diminished by unnacceptable landscape transformation.	R8.15, R14.4
The risk of unacceptable increase in heavy-vehicle traffic.	R8.16, R12.8, R12.9, R12.10
The risk of land subsidence caused by drilling and the hydraulic fracturing process.	R5.7, R7.15, R7.18

# Preserving the natural environment.

The risk to aquatic ecosystems and biodiversity created by excessive extraction from surface waters.	R7.5, R7.6, R7.7, R8.1, R8.6, R15.1
The risk to aquatic ecosystems and biodiversity created by excessive extraction from groundwaters.	R7.5, R7.7, R7.19, R8.1, R8.6, R15.1
The risk to aquatic ecosystems and biodiversity created by unacceptable contamination of surface waters (aquatic ecosystems).	R7.12, R7.13, R7.17, R15.1
The risk to aquatic ecosystems and biodiversity created by unacceptable contamination of groundwaters (groundwater dependent ecosystems).	R7.5, R7.19. R8.1, R8.6, R15.1
<ul> <li>The risk to overall terrestrial ecosystem health, including the provision of ecosystem services (including cumulative effects) created by the operation of a shale gas industry within a region including, but not limited to:</li> <li>a) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable increase in the spread or impact of weeds.</li> <li>b) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable increase in the spread or impact of exotic invasive ants.</li> <li>c) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable increase in the impact of feral animals.</li> <li>d) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable changes to fire regimes.</li> <li>e) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable changes to fire regimes.</li> <li>f) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable changes to fire regimes.</li> <li>f) The risk to overall terrestrial ecosystem health, including the provision of ecosystem services, created by unacceptable loss of native vegetation.</li> <li>f) The risk, created by infrastructure (e.g. well pads, roads and pipelines) required by an onshore gas industry, to overall terrestrial ecosystem health including the provision of ecosystem services."</li> </ul>	R8.2, R8.3, R8.4, R8.5, R8.6, R8.7, R8.8, R8.9, R8.10; R8.11, R8.12, R8.13, R8.14, R8.15, R14.19, 14.21

# Improving the health of local communities.

Mitigating recommendations
R12.1, R12.7, R12.16, R12.20, R13.1
R10.1, R11.8, R12.5, R12.16, R12.18
R12.1, R12.11, R12.16, R12.18
R.51, R5.2, R5.5(a), R5.5(b), R7.4, R7.9, R7.10, R7.11, R7.12, R7.13, R7.14, R7.17
R10.1, R7.10
R5.4, R9.4, R10.2, R10.2

# Mitigating the contribution to climate change.

The risk that greenhouse gases, including hydrocarbons (methane and ethane) and carbon dioxide, will be released during hydraulic fracturing and the associated activities, (e.g. from sources such as wellheads pipelines compression stations and final use).	R14.19, R14.21
The risk of excessive upstream fugitive emissions of methane and greenhouse gases to the atmosphere during upstream extraction, processing, transport and distribution.	R9.1, R9.2, R9.3, R9.5, R9.6
The risk of excessive emissions of methane and greenhouse gases to the atmosphere from post production wells.	R5.1, R5.2, R9.4, R14.13, R14.14
The risk that other (supplementary) risks may prevent lower levels of methane emission performance from being achieved.	R9.7
The risk of excessive emissions of lifecycle greenhouse gases, GHG (including methane).	R9.4, R9.8

# **Embedding Aboriginal people and their culture.**

Inquiry findings	Mitigating recommendations
The risk that the above and/or below-ground disturbance associated with drilling and hydraulic fracturing of onshore shale-gas formations will have an adverse impact on Aboriginal culture, values and the traditions that connect landowning groups with their country and sustain community cohesion.	R11.4, R11.5, R11.6, R11.8, R12.16, R12.18, R14.4
The risk that access to and the use of traditional lands will be denied or restricted by the presence of any onshore unconventional shale gas development.	R11.8, R12.16, R12.18
The risk that the development of any onshore shale gas industry could damage sacred sites.	R11.1, R11.2, R11.3, R14.4
The risk that Aboriginal people are not able to maintain their cultural traditions relating to land from one generation to the next.	R11.4, R11.5, R11.6, R11.8, R14.4
The risk that Aboriginal people may not be able to freely access traditional country both during and after the development of any onshore shale gas industry.	R11.5, R11.6, R11.8
The risk that any onshore shale gas industry will inject "stresses into the social and cultural fabric of land-owning groups".	R11.7, R11.8
The risk that development of onshore gas may have a disruptive effect on social cohesion in Aboriginal communities.	R11.4, R11.5, R11.6, R11.8, R12.16, 12.18, R13.1, R13.3
The risk that the statutory protections under ALRA, NTA, NTASSA do not give Native Title holders or the affected Aboriginal community a mechanism to develop an understanding of the scale and incremental nature of the onshore gas industry.	R11.6, R11.8, R14.19, R14.21
The cumulative risk that [if the above risks materialise] Aboriginal people will seek legislative redress to limit the development of any onshore shale gas industry on their country.	R11.1, R11.2, R11.3, R11.4, R11.5, R11.6, R11.8, R14.19

# Enhancing the wellbeing of local communities.

The risk that gas companies do not consult adequately with land owners, occupiers, or traditional owners, in gaining access to the land for exploration and extraction purposes.	R12.16, R12.18, R14.6, R14.10
The risk that gas companies and landowners, occupiers, and traditional owners, do not negotiate mutually beneficial conditions associated with any agreement permitting access.	R14.6, R14.8
The risk that compensation paid for access and/or disturbance to land will not be adequate.	R14.6, R14.8
The risk that, if there is any incident in the exploration, extraction or production of any gas, the land may not be properly remediated or the land owners, occupiers, or traditional owners may not be adequately compensated.	R14.6, R14.18, R14.19, R14.25

# Ensuring that local communities receive economic benefits.

Inquiry findings	Mitigating recommendations
The risk of an adverse impact on terrestrial ecosystems to industries that co-exist with the onshore unconventional gas industry such as agriculture, pastoralism, fishing and tourism.	R13.11, R13.12
There may be a risk that the development of the unconventional gas industry will have an adverse impact on the outback experience	R13.11
The risk that any economic benefits will not outweigh economic detriments (e.g. there may be an opportunity cost of investing in an onshore unconventional shale-gas industry rather than in renewable energy).	R13.11
The risk of residents leaving a particular region because of the presence of an onshore unconventional shale-gas industry.	R12.1
The risk that the development of the industry will occur without short and long-term benefits flowing to the local community.	R12.1, R12.8, R12.9, R12.10, R12.11, R12.12, R12.13, R12.14, R12.15, R13.1, R13.2, R13.3, R13.4, R13.5, R13.6, R13.7, R13.8
The risk of social division being created between those who benefit from the development of any onshore unconventional shale gas industry and those who do not.	R12.1, R12.16, R12.18, R12.19, R13.9, R13.10
The risk that the amenity of people will be adversely impacted by hydraulic fracturing and its associated activities.	R12.1, R12.5, R12.7



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