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31 January 2018

Justice Rachel Pepper
Chair
Scientific Inquiry into Hydraulic Fracturing in the Northern Territory
GPO Box 4396
Darwin, NT 0801, Australia

Email: fracking.inquiry@nt.gov.au

Dear Justice Pepper,

The Australian Petroleum Production & Exploration Association welcomes the opportunity to comment on the Draft Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (the Draft Report).

An onshore gas industry in the Northern Territory can bring significant economic and social benefit to the region. Importantly many of these benefits will be in remote communities. These benefits will not only be jobs, but also in the form of opportunities for partnerships in development, improving infrastructure and investment potentials. APPEA members are committed to building long-term relationships and being active members of the community.

The Draft Report has investigated a broad range of concerns with developing an onshore gas industry in the Territory. All of the issues raised can be mitigated or completely removed by creating and maintaining proactive and collaborative partnerships, holding an unwavering dedication to high performance standards, and implementing a robust and efficient regulatory regime. We are committed to working with the Northern Territory Government, the community and other stakeholders to ensure such a framework is maintained in the NT.

We agree with the Draft Report's finding that the exploration and appraisal phase of onshore gas development is vital in further developing our understanding of the region's environment, geology and water resources. This exploration activity is low-risk and should proceed while the recommendations of the Inquiry are considered and implemented.

The industry supports robust, effective and efficient regulation and oversight. We believe that many of the Draft Report's recommendations are broadly appropriate to achieve this. However, in some cases, the recommendations are inconsistent with the very-small footprint and overall environmental impact of the industry and do not apply to other industries that may have higher environmental impacts.

Excessive and unnecessary costs that result from disproportionate regulation is a deadweight to the economy, sapping the strength of Territory businesses and undermining competitiveness.

It is essential that regulatory reforms are efficient, evidence-based, practical and cost-effective. Regulation can be developed that both meets these objectives and does so at least cost. APPEA does not believe that all options to achieve this have been adequately considered in the Draft Report. It is critical that proposed reforms to the NT's regulatory framework are considered in their entirety, and not only on a recommendation-by-recommendation basis. We note that two of the Panel's identified risks in its Background and Issues Paper are associated with the cost and complexity of the regulatory framework.

The Draft Report confirms that shale gas development would have significant economic, employment and societal benefits for the Territory. It is crucial that the Final Report is completed quickly to enable the Government to make important decisions about the Territory's social and economic future. Gas companies stand ready to invest billions of dollars in new projects in the Territory if the industry is allowed to resume exploration and appraisal activity.

Since publication of the Draft Report on 12 December we have reviewed your 120 recommendations in detail. We attach a detailed response for your consideration.

This Draft Report represents the culmination of a significant body of research and investigation into the potential for a natural gas industry in the Northern Territory. We wish to thank the panel members for their contributions of time and expertise. APPEA looks forward to the completion of the Inquiry's work.

We would welcome the opportunity to respond any questions panel members may have during the public hearings in Darwin next week.

Please contact Mr Adam Welch, Senior Policy Adviser, on [redacted] or [redacted] should you or your staff wish to discuss any aspect of this letter or the conclusion of your Inquiry process.

Sincerely,

Matthew Doman
Director – South Australia/Northern Territory

APPEA comment on recommendations of the Draft Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

No.	Recommendation	APPEA comment
Shale gas extraction and development		
5.1	That the Government mandate a code of practice setting out minimum requirements for the abandonment of onshore shale gas wells in the NT. The code must be enforceable and include a requirement that: • wells undergo pressure and cement integrity tests prior to abandonment, with any identified defects to be repaired prior to releasing the well for decommissioning; and • testing must be conducted to confirm that the plugs have been properly set in the well.	APPEA supports the development of codes of practice for the decommissioning (or abandonment) of shale gas wells in the NT. Codes of practice have been effectively implemented in other Australian jurisdictions, including Queensland where a wide range of onshore oil and gas wells are covered. Codes of practice are accepted as a normal part of industry operations, provided they reflect and address the underlying environmental risk, which in the case of properly constructed wells is very low.
5.2	That the Government mandate a program for the ongoing monitoring of abandoned shale gas wells in the NT. The program must include the ongoing monitoring of water quality by bores installed adjacent to the well and the results of such monitoring to be published in real-time.	A properly constructed and decommissioned well should ensure long-term well integrity and does not require regular monitoring. In simple terms, there should be nothing to monitor if a well is constructed and decommissioned properly. The relevance and cost must be considered with any level and frequency of monitoring. This recommendation is not risk-based, does not reflect the outcomes of recommendation 5.1 and may have unintended impacts. If a risk based monitoring program is to be developed, the following points should be considered: • the geological setting of the basin. Any specific risks can therefore be managed and monitored. • the requirements and outcomes achieved through decommissioning performed in accordance with the code of practice for abandonment of wells (Recommendation 5.1). • minimising clearing and land disturbance or other impacts required to manage risk.
5.3	That in consultation with industry and other stakeholders, the Government develop and mandate an enforceable code of practice setting out the minimum requirements that must be met to ensure the integrity of onshore shale gas wells in the NT. This code must require that: • all onshore shale gas wells (including exploration wells constructed for the purposes of production testing) be constructed to at least a Category 9 (or equivalent) standard, with cementing extending up to at least the shallowest problematic hydrocarbon-bearing, organic carbon rich or saline aquifer zone; • all wells be fully tested for integrity before and after hydraulic fracturing and the results be	APPEA supports the development of a new Code of Practice to manage risk across the well lifecycle similar to the Code of Practice for the construction and abandonment of petroleum wells and associated bores in Queensland. However, this recommendation is overly prescriptive and therefore fails to support requirements that are based on managing risk. Further, it does not support future innovation or continuous improvement that may produce an equal to or better risk management outcome. We disagree with regulations that prescribe well designs to a "minimum of Category 9" as this limits the technical flexibility to manage the risks associated with well

	independently certified, with the immediate remediation of identified issues required; • an ongoing program of integrity testing be established for each well during its operational life. For example, every two years initially for a period of 10 years and then at five-yearly intervals thereafter to ensure that if any issues develop they are detected early and • remediated; and • the results of all well integrity testing programs and any remedial actions undertaken be publicly reported.	construction across the variety of conditions faced in the NT. Consistent with the findings of the Draft Final Report, APPEA strongly recommends that exploration and appraisal drilling and completions activities be permitted to proceed under the current NT Petroleum Schedule. APPEA agrees that wells should be fully tested for well integrity but disagrees that independent certification is required. The industry has in place a barrier placement and verification process that verifies barriers at each relevant stage of well operations during well construction. The results of well integrity testing programs and remedial actions should be provided to Government. Government should make the outcomes publicly available.
5.4	That gas companies be required to develop and implement a well integrity management system for each well in compliance with ISO 16530-1:2017. That each well must have an approved well management plan in place that contains, at a minimum, the following elements: • consideration of well integrity management across the well lifecycle; • a well integrity risk management process that documents how well integrity hazards are identified and risks assessed; • a well barrier plan containing well barrier performance standards, with specific reference to protection measures for beneficial use aquifers; • a process for periodically verifying well barrier integrity through the operational life of the well and immediately prior to abandonment, and for reporting to the regulator the findings from integrity assessments; • characterisation data for aquifers, saline water zones, and gas bearing zones in the formations intersected during drilling; and • monitoring methods to be used to detect migration of methane along the outside of the casing.	APPEA supports the intention of this recommendation – which reflects current industry practice – and looks forward to working with the Government on implementation.
5.5	That the composition (inorganics, organics and NORMs) of flowback fluids, in addition to hydraulic fracturing fluids, be made publicly available.	APPEA supports the intention of this recommendation – which reflects current industry practice – and looks forward to working with the Government on implementation.
5.6	That in consultation with industry and the community, the Government develop a wastewater management framework for any onshore shale gas industry. Consideration must be given to the likely volumes and nature of wastewaters that will be produced by the industry during the exploration and production phases.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation. Any framework must be flexible to support the rapid deployment of technology and mobile infrastructure as

	That the absence of any treatment and disposal facilities in the NT for wastewater and brines produced by the industry be addressed as a matter of priority.	well as existing options such as transportation to licensed waste management facilities. The Draft Final Report clearly states that that the exploration and appraisal phase of onshore gas development is low risk and it should therefore be able to proceed while the Government implements recommendations from the Inquiry.
5.7	That in consultation with industry and the community specific guidance be implemented by the Government, drawing on protocols and procedures developed in other jurisdictions, for the characterisation, segregation, potential reuse and management of solid wastes produced by the shale gas industry.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation.
5.8	That to minimise the risk of occurrence of felt seismic events during hydraulic fracturing operations, a traffic light system for measured seismic intensity, similar to that in place in the UK, be implemented.	APPEA supports the intention of this recommendation but notes that global data and studies demonstrate that the risk of induced seismicity resulting from hydraulic fracturing is very low. APPEA would support a program to determine background or baseline seismicity levels and monitor the occurrence of seismicity during stimulation operations to inform a risk based approach to management. An independent body or consortium such as Geoscience Australia, NTGS and/or CSIRO could undertake this work.
Water		
7.1	That before any production licence is granted to extract onshore shale gas, the Water Act be amended to require gas companies to obtain water extraction licences under that Act. That the Government introduce a charge on water in the NT for all onshore shale gas activities.	APPEA supports the intent of this recommendation to create transparency about onshore gas activity water usage and to ensure water used by the industry is appropriately valued. However, we consider that for holistic water management to be achieved it is necessary that all major water users are required to obtain water extraction licenses and to report usage, and that if a user pays system is introduced it is equitably applied to all water users. We note that, as highlighted in a comparative impacts study by EcOz submitted to this Inquiry[1], water use by the onshore gas industry is very low compared to other industries.
7.2	That the Government request the Australian Government to amend the EPBC Act to apply the 'water trigger' to all onshore shale gas development.	This is a matter for the Australian Government, however there is no evidence that the water trigger has been effective in either mitigating risk or increasing community comfort. The Productivity Commission[2] has observed: "*The water trigger amendment (in combination with the prohibition on use of bilateral approval agreements) imposes an extra layer of regulation on affected proponents. Further,*

[1] Submission #302
[2] Productivity Commission 2013, *Major Project Development Assessment Processes*, Research Report, Canberra.

		it is not obvious that existing laws are deficient or that the particular legislative amendment adopted by the Australian Government is the best approach to deal with any identified gap in the regulatory framework."
7.3	That the Government develop specific guidelines for human and environmental risk assessments for all onshore shale gas developments consistent with the National Chemicals Risk Assessment framework, including the national guidance manual for human and environmental risk assessment for chemicals associated with CSG extraction.	APPEA supports human and environmental risk assessments as part of the approvals process. Best practice national and international guidance, including the National Chemicals Risk Assessment framework, the national guidance manual for human and environmental risk assessment for chemicals associated with gas extraction, are already used in other jurisdictions, as recognized in the Draft Report.
7.4	That a strategic regional environmental and baseline assessment (SREBA), including a regional groundwater model, be developed and undertaken for any prospective shale gas basin before any production licences are granted for shale gas activities in that basin, commencing with the Beetaloo Sub-basin.	APPEA supports relevant baselines studies prior to the production phase and therefore supports the intention of this recommendation. However, the recommendation needs to link to the "production phase" or "granting of approvals for a production development" – not grant of a production license, which is not an approval for actual production and development activity. Implementation of this assessment should be done in parallel with exploration and appraisal of shale gas resources, activities that are crucial to provide relevant data. APPEA looks forward to working with the Government on implementation of this recommendation.
7.5	That the use of all surface water resources for all onshore unconventional shale gas hydraulic fracturing in the NT be prohibited.	This recommendation is not consistent with other recommendations such as 7.8, which seek to manage risks by allowing decisions whether to undertake an activity or not to be based on location specific scientific assessments and data. Evidence presented to the Panel demonstrates that the onshore gas industry is not a significant user of surface water resources. No evidence has been presented that our incidental surface water use impacts the environment or other water users. We therefore do not support this recommendation. Overall water use by our industry will be covered by inclusion in the Water Act and other comprehensive environmental approval processes.
7.6	That in relation to the Beetaloo Sub-basin: • the Daly-Roper WCD be extended south to include all the Beetaloo Sub-basin; • a separate WAP be developed for the northern and southern regions of the Beetaloo Subbasin; • the new northern Basin WAP provide for a water allocation rule that restricts the consumptive use to less than that which can be sustainably extracted without	APPEA supports the intention of this recommendation – which should apply to all significant water-using industries – but we are concerned at the detail of its implementation. No clear case is made as to why extension of the Daly-Roper WCD is necessary. It is important to note that the industry does not require a perpetual licence for water use during the production phase. This is more critical for other industries that

	having adverse impacts on other users and the environment; and • the southern Basin WAP prohibits water extraction for shale gas production until the nature and extent of the groundwater resource and recharge rates in that area is quantified. That in relation to other shale gas basins with similar or greater rainfall than the Beetaloo Sub-basin, WCDs be declared and WAPs be developed to specify sustainable groundwater extraction rates for shale gas production that will not have adverse impacts on existing users and the environment. That in relation to other potential shale gas basins in semi-arid and arid regions, all groundwater extraction for any shale gas production be prohibited until there is sufficient information to demonstrate that it will have no adverse impacts on existing users and the environment.	depend on sustained extraction over long period of time such as agriculture or town supply. The evidence obtained by the Panel indicates that the onshore gas industry is a very small user of water and our volume of water consumption is not likely to impact on sustainable yields. APPEA looks forward to working with the Government on implementation.
7.7	That the following measures be mandated to ensure that any onshore shale gas development does not cause unacceptable local drawdown of aquifers: • the drilling of onshore shale gas petroleum wells within 1 km of existing or proposed groundwater bores be prohibited unless hydrogeological investigations and groundwater modelling indicate that a different distance is appropriate, or if the landholder is in agreement with a closer distance; • additional information on the aquifer characteristics is obtained as a result of the regional environmental and baseline assessment recommended in Section 7.4.1; • relevant WAPs include provisions that adequately control both the rate and volume of water extraction by the gas companies; • gas companies be required, at their expense, to monitor drawdown in local water supply bores; and • companies be required to 'make good' any problems if this drawdown is found to be excessive (that is greater than 1 m).	APPEA supports the intention of this recommendation to protect existing water supply bores from a loss of productivity, but we are concerned at some of its prescriptive elements. It is important to note that 1m drawdown is not indicative of a potential impairment to a water supply bore. The Queensland Government has set a 5m drawdown as a conservative trigger for make good agreements. **Suggested alternative:** *That the following measures be mandated to ensure that the gas production phase for an onshore gas development does no cause an adverse drawdown of aquifers:* • *the drilling of a water supply bore field must not occur within 1 km of an existing and active groundwater supply bore unless hydrogeological investigations and groundwater modelling indicate that a different distance is appropriate, or if the landholder is in agreement with a closer distance.* • *additional information on the aquifer characteristics is obtained as a result of the regional environmental and baseline assessment recommended in Section 7.4.1* • *relevant WAPs include provisions that adequately control both the rate and volume of water extraction by the gas companies to manage risk.* • *gas companies be required to monitor drawdown in local water supply bores; and*

		• *companies be required to 'make good' if drawdown is found to affect water supply (i.e. trigger greater than 5 m).*
7.8	That reinjection of wastewater into deep aquifers and conventional reservoirs should be prohibited until comprehensive geotechnical investigations are undertaken to show that no seismic activity will occur.	Reinjection of large volumes of wastewater is not common in the Australian onshore gas industry. We agree it should not occur until comprehensive geotechnical investigations are undertaken. APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation.
7.9	That the following information about hydraulic fracturing fluids must be reported and publicly disclosed about hydraulic fracturing fluids prior to any hydraulic fracturing for onshore shale gas: • the chemicals to be used; • the purpose of the chemicals; • how the chemicals will be managed on-site, including how spills will be prevented and if spills do occur how they will be remediated and managed; and • the laws that apply to the management of the chemicals and how they are enforced. That the following information about flowback and produced water be reported and publicly disclosed: • the chemicals and NORMs found; • how and where the chemicals and NORMs will be managed, transported and treated, including how spills will be prevented and if spills occur, how they will be remediated and managed; and • the laws that apply to the management of the chemicals and NORMs and their enforcement.	APPEA supports public disclosure of chemicals used in hydraulic fracturing fluids as is common practice in other jurisdictions and is required by Schedule 1 (1)(d) of the *Petroleum (Environment) Regulations 2016.* This requires an EMP for hydraulic fracturing to detail the chemicals or other substances that may be in, or added to, any treatment fluids to be used for the activity. The EMP is made publicly available and a Chemical Disclosure Report is published on the regulators (DPIR) website. APPEA suggests that information on flowback and produced water composition be similarly submitted to government and publicly disclosed on a government website or as part of a government annual report.
7.10	That in order to minimise the risk of groundwater contamination from leaky gas wells: • all wells to be hydraulically fractured must be constructed to at least Category 9 or equivalent and tested to ensure well integrity before and after hydraulic fracturing, with the results certified by the regulator (see also Recommendations 5.3 and 5.4); • a minimum offset distance of at least 1 km between water supply bores and well pads must be adopted unless specific site-specific information is available to the contrary (see also Recommendation 7.7); • a robust and rapid wastewater spill clean up management plan must be prepared for each well pad to ensure immediate remediation in the event of a spill: and	APPEA agrees with the following comments from Origin on this recommendation: *As per our feedback on Recommendation 5.3 we support, in principle, the development of a code of practice for well design, construction and testing to ensure the protection of aquifers, however, we consider it overly prescriptive to prescribe "Category 9" as a standard across all plays in the Northern Territory.* *Origin also supports the principle of transparency with regards to baseline and monitoring data availability as recommended by the Panel. The monitoring program and monitoring wells within that program should be fit-for-purpose, site specific and designed in conjunction with the WAP and SREBA that will be required under other recommendations. There will likely be reporting requirements under the WAP and/or SREBA and these would be preferred to prescription regarding 'real-time' and 'publicly available' as there will likely be practical*

	• real-time publicly available groundwater quality monitoring must be implemented around each well pad to detect any groundwater contamination. Multilevel observation bores must be used to ensure full coverage of the aquifer horizon, with a level of vertical resolution sufficient to be able to identify the location of any leak.	*challenges to real-time streaming of large volumes of uninterpreted and uncollated data direct to the public. We therefore request the Panel maintain an objective- or outcome-based focus for the monitoring recommendation.* *Furthermore, we request that an appropriate offset distance is recommended rather than mandated. For existing bores on pastoral stations, compensation for use of an existing bore, or a request for a new bore should be agreed through land access negotiations. We anticipate that, typically, new supply water supply bores will be required in the Beetaloo for gas exploration and development, and suggest that bores constructed for this purpose are exempt from any minimum offset recommendation.*
7.11	That to reduce the risk of contamination of surface aquifers from on-site spills of wastewater: • the EMP for each well pad must include an enforceable wastewater management plan and spill management plan, which must be approved prior to the commencement of hydraulic fracturing; • enclosed tanks must be used to hold all wastewater; • the well pad site must be treated (for example, with a geomembrane) to prevent the infiltration of wastewater spills into underlying soil and thence into to an aquifer; and • a real-time publicly accessible monitoring program for each well pad must be established.	APPEA supports objective and risk based regulation such as is established under the NT *Petroleum (Environment) Regulations 2016* and similar legislation in other state and Commonwealth jurisdictions. By introducing prescriptive management measures, this recommendation neglects consideration of the nature and scale of the activity and inhibits innovation in environmental management. The *Petroleum (Environment) Regulations 2016* require an Environmental Management Plan to be in place prior to undertaking a regulated activity. The EMP must demonstrate that the activity will be carried out in a manner by which the environmental impacts and risks of the activity will be reduced to ALARP and acceptable levels. This inherently includes the management of site wastewater to reduce the risk of surface water contamination from spills and contingency measures for if a spill were to occur. The suggested management requirements may be appropriate for a number of regulated activities, however there may be instances where alternate management measures could appropriately manage the impacts and risks to ALARP and acceptable levels while providing a better environmental outcome or lower cost.
7.12	That the Government undertake a review to determine: • whether restrictions need to be placed on the transport of hydraulic fracturing chemicals and wastewater during the wet season, particularly on unsealed roads; and • whether rail transport of some or all of the hydraulic fracturing chemicals and other consumables required should be used.	The transportation of chemicals is already heavily regulated to manage risks both to safety and the environment. Any shale gas industry will be a very minor transporter of chemicals. For example, according to analysis of Australian Bureau of Statistics data by ERM Group, chemical additives used for hydraulic fracturing in the CSG industry represent significantly less than one tenth of one percent of chemicals transported by road in Australia. Any Government review of its policies in this area it should consider all industries that transport chemicals across the Territory.

7.13	That the reinjection of treated or untreated wastewaters (including brines) into aquifers not be permitted until detailed investigations are undertaken to determine whether or not the risks associated with this practice can be managed to acceptable levels.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation. Treated wastewater is improved to a level to permit its beneficial use, including is some cases in Queensland to replenish depleted aquifers. Treated wastewater should therefore be permitted to be reinjected.
7.14	That gas companies must submit details of all known fault locations and geomechanical planning to the regulator.	This recommendation reflects current industry practice and is supported. The Panel has assessed this risk as low. Any risk of induced connectivity between shallow aquifers and hydraulically fractured zones in the Beetaloo is highly unlikely.
7.15	That appropriate site-specific modelling of the local groundwater system must be undertaken before any water is extracted for the purposes of onshore hydraulic fracturing for shale gas in order to ensure that there are no unacceptable impacts on groundwater quality and quantity.	APPEA supports the intention of this recommendation – which reflects current practice – and looks forward to working with the Government on implementation.
7.16	That the discharge of shale gas hydraulic fracturing wastewater (treated or untreated) to either drainage lines, waterways, temporary stream systems or waterholes not be permitted.	Refer our comments on 7.13. APPEA supports the intention of this recommendation, but treated wastewater should be permitted to be discharged.
7.17	That to minimise the adverse impacts of onshore shale gas infrastructure (roads and pipelines) on the flow and quality of surface waters, the Government must ensure that: • landscape or regional impacts are considered in the design and planning phase of development to avoid unforeseen consequences arising from the incremental (piecemeal) rollout of linear infrastructure; and • roads and pipeline corridors must be constructed to: o minimise the interference with wet season surface water flow paths; o minimise erosion of exposed (road) surfaces and drains; o ensure fauna passage at all stream crossings; and o comply with relevant guidelines such as the International Erosion Control Association Best Practice for Erosion and Sediment Control and the Australian Pipeline Industry Association Code of Environmental Practice 2009.	APPEA supports Government strategy development to ensure infrastructure needs are sustainably and optimally constructed.
7.18	That the Beetaloo Sub-basin SREBA should take into account all groundwater dependent ecosystems in the Roper River region.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation. Regardless, groundwater dependent

		ecosystems would be covered by any EIS undertaken prior to development.
7.19	That the Beetaloo Sub-basin SREBA should take into account all subterranean aquatic ecosystems in the Roper River region.	Refer to 7.18 above. Shale gas development does not require de-watering. Such studies may however be warranted for mining or other developments that dewater such shallow aquifers as part of their activities. Recommendations 7.1, 7.5 and 7.6 already propose to mitigate the risk of impact from unsustainable water take recognising any shale gas industry will be a minor user of water and the take limited in duration (not perpetual).
Land		
8.1	That strategic regional terrestrial biodiversity assessments are conducted as part of a SREBA for all bioregions prior to any onshore shale gas production, with all onshore shale gas development excluded from areas considered to be of high conservation value. The results of the SREBA must inform any decision to release land for exploration as specified in Recommendation 14.2 and be considered by the decision-maker in respect of any activity-based EMP.	APPEA recognises that a strategic regional biodiversity assessment will be required for the EMP for the production phase of an onshore shale gas project. However, relying upon a SREBA when considering release of land for exploration (Recommendation 14.2) is not necessary given the acknowledged small impacts of exploration. This requirement would lead to significant delays in the development of the gas industry in the NT. It is estimated that to complete a SREBA with a strategic regional biodiversity assessment will take some three to five years to complete. Further, SREBAs cannot be effectively undertake prior to exploration. These assessments require knowledge of the target resource and potential scale of developments as well as a range of surface and subsurface data. This is data that can only be collected <u>during</u> exploration and appraisal. Refer our response to 7.4.
8.2	That a baseline assessment of all weeds within a permit area be conducted prior to any onshore shale gas exploration or development and that ongoing weed monitoring be undertaken to inform any weed management measures necessary to ensure no incursions or spread of weeds. Gas companies must have a dedicated weeds officer whose role is to monitor well pads, roads and pipeline corridors for weeds.	APPEA supports the intention of this recommendation – which reflects existing industry practice – and looks forward to working with the Government on implementation. The industry has a strong track record of high standards and performance in this area. The requirement for a dedicated weeds officer is an overly prescriptive recommendation that is not supported by industry.
8.3	That gas companies be required to have a weed management plan in place prior to entering onto a petroleum permit. The plan must be consistent with all relevant statutory weed management plans and relevant threat abatement plans established under the EPBC Act.	APPEA supports the intention of this recommendation – which reflects existing industry practice. This recommendation is captured under the existing regulatory framework. The *Petroleum (Environment) Regulations 2016* require an Environmental Management Plan to be in place prior to undertaking a regulated activity. The EMP must demonstrate that the activity will be carried out in a manner by which the environmental impacts and risks of the activity will be

		reduced to ALARP and acceptable levels. This inherently includes weed management and recognises the nature and scale of the activity and risk. Gas companies and gas developments are not exempt from the NT *Weeds Management Act 2013* and are therefore required to comply with relevant statutory weed management plans as they apply to land users. It is important to note that gas companies will only access around 1% of the land areas within a petroleum permit with the other 99% managed by others (landholders). This is why the relationship and operational understanding between companies and landholders is important.
8.4	That gas companies be required to comply with any statutory regional fire management plan. The fire management plan should: • address the impact that any onshore shale gas industry will have on fire regimes in the NT, and how those impacts should be managed; • establish robust monitoring programs for assessing seasonal conditions and fuel loads; • require that annual fire mapping be undertaken to monitor any increase in fire frequency due to any onshore shale gas development; • require baseline data to be established for at least the decade prior to commencement of any onshore shale gas development; and • require the implementation of management actions, such as prescribed fuel reduction burns at strategic locations, to reduce fuel loads and protect key values and assets if required on the basis of the annual fuel monitoring data.	APPEA supports the intention of this recommendation – which reflects existing industry practice. Gas companies will comply with any statutory regional fire management plan, but such plans should cover all industries and reflect underlying risk associated with those industries. Again, it is important to note gas companies will only access around 1% of the land area within a petroleum permit. The other circa 99% is under the control and management of others. The requirement for baseline data to be established for at least the decade prior to commencement of any onshore shale gas development is arbitrary and prescriptive and would seem unnecessary.
8.5	That as part of a SREBA, a study be undertaken to determine if any threatened species are likely to be affected by the cumulative effects of vegetation and habitat loss, and if so, that there be ongoing monitoring of the populations of any such species. If monitoring reveals a decline in populations (compared with pre-development baselines), management plans aimed at mitigating these declines must be developed and implemented.	These risks are assessed in any EIS undertaken prior to development. The cumulative effects of vegetation and habitat loss would be triggered by the EPBC Act. Land clearing is not just an issue for oil and gas – which has a small relative footprint compared to agriculture and other industries. Again, it is important to note gas companies will only access around 1% of the land area within a petroleum permit. The other circa 99% is under the control and management of others.

8.6	That the area of vegetation cleared for infrastructure development (well pads, roads and pipeline corridors) be minimised through the efficient design of flowlines and access roads, and where possible, the co-location of shared infrastructure by gas companies.	APPEA supports the intention of this recommendation – which reflects current industry practice. These issues would be addressed in any EIS undertaken prior to development. The submission and approval of the field development plan(s) is the process for ensuring that infrastructure needs are optimised and environmental impacts are reduced to ALARP and acceptable levels.
8.7	That well pads and pipeline corridors be progressively rehabilitated, with native vegetation re-established such that the corridors become ecologically integrated into the surrounding landscape.	APPEA supports the intention of this recommendation – which reflects current industry practice and is required in all other jurisdictions. The regulatory system should also be able to recognise progressive rehabilitation so that companies can allow the original use of the land to recommence as soon as possible.
8.8	That to compensate for any local vegetation, habitat and biodiversity loss, the Government develop and implement an environmental offset policy to ensure that, where environmental impacts and risks are unable to be avoided or adequately mitigated, they are offset.	APPEA supports the intention of this recommendation – which is required in other jurisdictions – and should apply to all industries.
8.9	That the Government consider the establishment and operation of local Aboriginal land ranger programs to undertake land conservation activities.	APPEA supports consideration of this recommendation. Land councils already have existing ranger programs in place which undertake land conservation activities.
8.10	That environmental legislation include a requirement for gas companies to identify critical habitats during corridor construction and select an appropriate mechanism to avoid detrimental impact on them.	APPEA supports the intention of this recommendation – which reflects current industry practice. Industry supports objective and risk based regulation such as is established under the NT *Petroleum (Environment) Regulations 2016* and similar legislation in other State and Commonwealth jurisdictions. The *Petroleum (Environment) Regulations 2016* require an Environmental Management Plan to be in place prior to undertaking a regulated activity. The EMP must demonstrate that the activity will be carried out in a manner by which the environmental impacts and risks of the activity will be reduced to ALARP and acceptable levels. This inherently includes the identification of critical habitats and selection of appropriate mechanisms to avoid detrimental impact.
8.11	That corridor widths be kept to a minimum, with pipelines and other linear infrastructure buried, except for necessary inspection points, and the disturbed ground revegetated.	APPEA supports the intention of this recommendation – which largely reflects current industry practice. Whilst this recommendation is reasonable for larger scale developments it should allow flexibility for short lengths of pipeline or other linear infrastructure within an operational area that may not require burial to manage environmental impacts and risks to ALARP and acceptable levels.

8.12	That directional drilling under stream crossings be used in preference to trenching unless geomorphic and hydrological investigations confirm that trenching will have no detrimental impact on water flow patterns and waterhole water retention timing.	APPEA supports the intention of this recommendation – which reflects current industry practice.
8.13	That roads and pipeline surface water flow paths minimise erosion of all exposed surfaces and drains, and comply with design for fauna passage.	APPEA supports the intention of this recommendation – which reflects current industry practice.
8.14	That all corridors be constructed to minimise the interference with wet season stream crossings and comply with relevant guidelines, such as the International Erosion Control Association Best Practice for Erosion and Sediment Control and the Australian Pipeline Industry Association Code of Environmental Practice 2009.	APPEA supports the intention of this recommendation – which reflects current industry practice.
8.15	That to minimise the impact of any onshore shale gas industry on landscape amenity, gas companies must demonstrate that they have minimised the surface footprint of development to ALARP, including that: • well pads are spaced a minimum of 2 km apart; and • the infrastructure within any development areas is not visible from major public roads.	APPEA supports objective and risk based regulation such as is established under the NT *Petroleum (Environment) Regulations 2016* and similar legislation in other State and Commonwealth jurisdictions. In this respect APPEA supports the first part of this recommendation to '*demonstrate that they have minimised the surface footprint of development to ALARP*'. However, APPEA does not support the prescriptive measures that follow which are unnecessary and inconsistent with the approach to other industries. The specific recommendation that infrastructure within any development area is not visible from major public roads is inequitable between industries (i.e. phone towers, power transmission lines, cattle handling facilities, railway lines, etc). It also does not take into account the short term nature of activities such as drilling and contradicts the Panel's own definition of acceptable landscape change as a result of shale gas development which is defined as '*minimal visibility of shale gas infrastructure from public roads in areas where development occurs' (p 187).* In relation to well pad spacing: APPEA agrees with the objective to minimise the surface footprint of development but the 2km separation requirement is arbitrary and overly prescriptive. There may be instances where the optimal pad location is less than 2 linear km in an effort to avoid a subsurface geohazard for instance (i.e. it may not be possible to drill wells in two directions away from the pad in the presence of a geohazard and therefore separate pads may be needed for that area to achieve compliance with recommendations regarding avoidance of geohazards for wells where hydraulic fracturing is proposed). Spacing should be based on area used rather than linear distance.

8.16	That the Government assess the impact that all heavy-vehicle traffic associated with any onshore shale gas industry will have on the NT's transport system and develops a management plan to mitigate such impacts. Consideration must be given to: • forecast traffic volume and roads used; • the feasibility of using the existing Adelaide - Darwin railway line to reduce heavy-vehicle road use; and • road upgrades.	APPEA supports the intention of this recommendation – which reflects current industry practice and was addressed in our earlier submissions to this inquiry. These issues would be addressed in any EIS undertaken prior to development.
Greenhouse Gas Emissions		
9.1	That to reduce the risk of upstream methane emissions from onshore shale gas wells in the NT the Government implement the US EPA New Source Performance Standards of 2012 and 2016.	As is the case across Australia, the industry will work with the government to ensure that our activities minimise methane emissions. APPEA notes that methane emissions represent lost revenue for industry and lost royalties for governments, which already provides significant incentives to cost effectively reduce emissions. Comprehensive measurement, monitoring, reporting and compliance arrangements are already in placed through the National Greenhouse and Energy Reporting System (NGERS) and Safeguard Mechanism legislative frameworks.
9.2	That a code of practice be developed and implemented for the ongoing monitoring, detection and reporting of methane emissions from onshore shale gas fields and wells once production of any onshore shale gas commences.	As noted above, comprehensive measurement, monitoring and reporting arrangements are already in placed through the NGERS framework. Any code of practice developed in this area should be consistent and complement the national emissions monitoring and reporting requirements associated with NGERS.
9.3	That baseline monitoring of methane concentrations be undertaken for at least one year prior to the commencement of shale gas production on a production licence.	Baseline monitoring undertaken prior to the granting of a Production Licence should be sufficient to meet the objectives of this recommendation. To require this data to be collected after the grant of a PL will result in unnecessary delays to the commencement of gas production.
9.4	That baseline and ongoing monitoring be the responsibility of the regulator, undertaken by an independent third party, and funded by industry.	Industry supports this recommendation and will work with government to ensure that any baseline and ongoing monitoring is efficient, transparent and cost-effective.
9.5	That all monitoring results should be published online on a continuous basis in real time.	As noted above, comprehensive measurement, monitoring and reporting arrangements are already in placed through the NGERS framework. Experience shows that real time publishing of field methane measurement of monitoring results is not realistic. In addition to the volume of real-time data being unmanageable, it would not allow for appropriate quality assurance and interpretation prior to external release. We request that "in real time" is removed and replaced with "routine and regular summary reporting of data and interpretations through NGERS".

9.6	That once emission concentration limits are exceeded, the regulator must be notified, investigations must be undertaken to identify the source(s) of the excess levels, and makegood provisions be undertaken by industry where necessary. These measures are to be the responsibility of industry.	This recommendation is already in place through the NGERS legislative framework and the requirements of the Safeguard Mechanism administered by the Clean Energy Regulator.
9.7	That the action framework outlined in Table 9.10 of the draft Final Report be implemented to mitigate any supplementary risks that may prevent the achievement of lower levels of fugitive methane emissions.	Industry remains committed to reducing fugitive methane emissions. APPEA notes that methane emissions represent lost revenue for industry and lost royalties for governments, which already provides significant incentives to cost effectively reduce emissions. We will work with government to ensure that the objectives of this recommendation are met.
	Public Health	
10.1	That formal site or regional-specific HHRA reports be prepared and approved prior to the grant of any production licence for the purpose of any shale gas development. Such HHRA reports to address the potential human exposures and health risks associated with the exploration for, and the production of, any shale gas development, off-site transport, and the decommissioning of wells, as recommended in NCRA guidance. The HHRA reports must include risk estimates assessments of exposure pathways that are deemed to be incomplete.	To ensure that all risks are assessed and appropriately manages, APPEA supports HHRA's undertaken in accordance with best practice national and international guidance. It is important that the area specific to the HHRA is clearly defined and agreed with regulators. As noted in other recommendations, it is important that the Final Report clarifies that the grant of Production Licence does not provide authority to conduct activities.
10.2	That to better inform the human health risk assessments, the following knowledge gaps must be addressed and published: • contemporary knowledge of the chemicals proposed to be used in hydraulic fracking fluids for onshore shale gas extraction in the NT; • details of the chemical composition of flowback and produced water in the NT; and • the proposed methods of treatment and/or disposal of flowback and produced water.	This recommendation is good practice and is supported by industry.
10.3	That in consultation with industry, landowners and local communities, the regulator set appropriate setback distances to minimise risks identified in HHRA reports, including potential pathways for waterborne and airborne contaminants, for all shale gas development (exploration and production). Such setback distances to be not less than 1,600 m.	Industry supports the adoption of setback distances where HHRA reports determine their use as a key control in minimising any identified risks. Setback distances should be informed by the site and regional-specific HHRA's on a case by case basis, in accordance with the principles of outcome-based regulation, rather than prescribing an arbitrary distance of 1,600m.

	Aboriginal people and their culture	
11.1	That gas companies be required to obtain an Authority Certificate before undertaking any onshore shale gas activity.	This recommendation is already a standard practice undertaken by APPEA members.
11.2	That AAPA: • be provided with a copy of any application to conduct hydraulic fracturing for onshore shale gas under petroleum environment legislation at an early stage of the assessment and approval process; • be given an adequate opportunity to explain the application to custodians; and • be given an adequate opportunity to comment on the application and have those comments considered by the decision-maker.	This recommendation would present duplication with the existing processes undertaken through agreements with Land Councils and Traditional Owners and sits outside the role of AAPA as an independent statutory authority under the Sacred Sites Act. APPEA suggests that this recommendation is removed.
11.3	That legislation for the protection of sacred sites be amended so that sub-surface formations can be included as a sacred site or a feature of a sacred site.	During consultation, Traditional Owners are the very people who direct us where to and where not to go. Their cultural knowledge takes into account sacred sites and other sites of significance, both surface and sub-surface.
11.4	That gas companies be required to provide a statement to native title holders with information of the kind required under s 41(6) of the Land Rights Act for the purposes of negotiating a petroleum exploration agreement under the future act provisions of the Native Title Act.	This recommendation is already a standard industry practice.
11.5	That interpreters be used at all consultations with Aboriginal people for whom English is a second language. Interpreters must be appropriately supported to ensure that they understand the subject matter of the consultation.	This recommendation is already a standard industry practice and is undertaken in consultation with the land councils and traditional owners specific to community consultation requirements.
11.6	That Land Councils, AAPA, and the Government cooperate to ensure that reliable, accessible (including with the use of interpreters), trusted, and accurate information about any onshore shale gas industry is effectively communicated to all Aboriginal people that will be affected by any onshore shale gas industry. That the gas industry fund the design and delivery of any information programs.	Industry supports traditional owners being accurately informed of the onshore shale gas industry. Considerable effort has, and will continue to be made by industry, to ensure information is delivered in appropriate formats.
11.7	That Land Councils, traditional Aboriginal owners and gas companies consider making all, or if this is not appropriate, part, of negotiated petroleum exploration agreements publicly available.	As is the case with the pastoral land access agreements, industry supports making agreements publicly available provided that the other party agrees.
11.8	That a comprehensive assessment of the cultural impacts of any onshore shale gas development be completed prior to the grant of any production licence. The cultural assessment must:	This recommendation is standard industry practice. Cultural impacts are identified and assessed through the exploration phase via the processes prescribed in exploration agreements. This ensures land councils,

	• be designed in consultation with Land Councils and AAPA; • engage traditional Aboriginal owners, native title holders and the affected Aboriginal communities, and be conducted in accordance with world leading practice; and • be resourced by the gas industry.	traditional owners and communities are engaged and informed of project activities with sacred site clearances and certifications undertaken specific to activity. This process ensures traditional owners are informed and aware of cultural impacts to allow a fully informed decision regarding the grant of consent for a production licence to be made.
Social impacts		
12.1	That as part of any strategic SIA, early and adequate consultation be undertaken on road use and related infrastructure requirements that result in realistic road upgrade and work schedules to support the required transport infrastructure for any unconventional shale gas industry and other users.	As part of an EIS for a development phase, a full social impact assessment is undertaken. This includes working closely with local stakeholders to identify and mitigate road use impacts.
12.2	That gas companies ensure the provision of adequate and sustainable funding to ensure the identified infrastructure requirements are met and maintained appropriately.	As part of an EIS for a development phase, a full social impact assessment (SIA) is undertaken. This includes working closely with local stakeholders to identify and mitigate road use impacts. Any funding should be linked to the impact of industry activities and the benefits derived by other infrastructure users.
12.3	That consideration be given to the development of road use agreements between gas companies and local councils that include safety considerations and ensure monitoring for compliance, including reporting requirements.	As part of an EIS for a development phase, a full SIA is undertaken. This includes working closely with local stakeholders to identify and mitigate road use impacts.
12.4	That gas companies be required to work closely with the Government and local communities early in any onshore shale gas development projects to ensure that any potential impacts on services are mitigated.	As part of an EIS for a development phase, a full SIA is undertaken. This includes working closely with local stakeholders to identify and mitigate impacts on services. Evidence provided to the Inquiry by APPEA and industry proponents demonstrates the positive benefits for regional services from the development of an onshore gas industry.
12.5	That any strategic social impact assessment anticipate the long-term impacts and requirements for housing (not just through construction phase) to adequately mitigate the risk of inflated real estate prices and shortages within a community.	As part of an EIS for a development phase, a SIA is undertaken. This includes working closely with local stakeholders to identify and mitigate housing impacts across the different stages of activity.
12.6	That in consultation with local communities, Aboriginal Land Councils, local government, and the Government, gas companies be required to provide accommodation, whether temporary or permanent, which must be completed prior to the construction/development phase.	Industry will consider appropriate mitigation initiatives where this is identified as an issue through the EIS development phase SIA.
12.7	That there be a minimum standard set for gas companies to source goods, services and workers from local communities. This should include ensuring training programs are developed for Aboriginal and other local workers to develop the necessary skill sets and to improve their	Industry will work with government and relevant bodies, for example ICN-NT and NTIBN, to support and nurture local content opportunities where appropriate and possible.

	opportunities for local employment in any onshore shale gas industry.	
12.8	That gas companies use a range of mediums to proactively work with local businesses to ensure they are able and adequately skilled to compete for contracts. They should follow the steps outlined above by the Queensland Gasfields Commission to assist them to be ready to participate in any economic opportunities that may emerge.	Industry has and will continue to work with government and relevant bodies, for example ICN-NT and NTIBN, to support and nurture local content opportunities where appropriate and possible.
12.9	That the Government regulate to ensure that existing and future users of land can continue to enjoy their rights and interests in the land, including a mechanism to compensate for, among other things: • loss of use of surface area where infrastructure is installed; • diminution of the use made or that may be made of the land or any improvement on it; • severance of any part of the land from other areas of the landholder's property; and • any cost, damage or loss arising from the carrying out of activities on the land.	This recommendation is not necessary as it is already a standard practice to meet the requirements for compensation in the Petroleum Act through the execution of land access agreements with pastoralists prior to activities being undertaken. The agreements capture all aspects of access requirements specific to each activity including agreed compensation. APPEA recommends that this recommendation be removed for the Final Report.
12.10	That gas companies be required to establish a relationship with communities to determine how to best facilitate community cohesion on an individual and collective level. This should be done in consultation with Aboriginal land councils and local councils, to ensure that the needs of all parties are accommodated.	This is already being undertaken with ongoing community and stakeholder engagement through the exploration phase. This will continue into the appraisal and development phases, should activity be permitted to re-commence.
12.11	That gas companies must develop and implement a social impact management plan which details how they will optimise the relationship with the community prior to any onshore shale gas development. This plan must be developed in consultation with Aboriginal land councils and local councils to ensure that it meets community needs and be presented to the regulator for approval prior to any production approval being granted.	This recommendation is standard industry practice. As part of an EIS for a development phase, a full SIA is undertaken. This informs the development of social impact management plans.
12.12	That gas companies be required to develop a social impact management plan that outlines how they intend to develop and continue their SLO within each of the communities they will operate in. This should be developed in conjunction with any SIA, and introduced as early as possible, preferably in the exploration phase, to ensure that any potential changes can be flagged in advance to allow communities time to adapt and prepare for the changes.	Community engagement occurs and is ongoing through all phases and is scaled depending upon the impact of the proposed activity. A SIA is conducted as part of the EIS process in the development phase.

12.13	That a strategic SIA, separate from an Environmental Impact Statement, be conducted in advance of any onshore shale gas development, during the exploration phase. Such SIAs must be conducted holistically to anticipate any expected impacts on infrastructure and services, and to mitigate potential negative impacts, and be funded by industry.	Community engagement occurs and is ongoing through all phases and is scaled depending upon the impact of the proposed activity. Many of the potential impacts on infrastructure and services during development are not known until the completion of the exploration and appraisal phases. As part of an EIS for a development phase, a full social impact assessment would be undertaken.
12.14	That early engagement and communication of the findings of the strategic SIA be systematically undertaken with all potentially affected communities and with all levels of government to ensure that unintended consequences are limited and shared understanding of roles and responsibilities, including financial responsibilities, can be developed.	Engagement with the community and governments occurs and is ongoing through all phases and is scaled depending on the impact of the proposed activity.
12.15	That ongoing monitoring and measurement of social and cumulative impacts be undertaken with the results publicly available.	Industry continues to support the GISERA model being introduced to the Northern Territory. Data should be collated and published by Government to ensure independence.
12.16	That in order to operationalise an SIA framework in the NT the Government should make the following structural reforms: • introduce mechanisms for strategic assessment, either through a Strategic Assessment Agreement under the EBPC Act, or through reforms proposed in the 2015 Hawke Report. A strategic SIA is needed to decide if any onshore shale gas industry should go ahead, and if so, under what conditions; • establish or enhance an independent authoritative body, such as the EPA or a newly established independent regulator (see Chapter 14), with powers to request information from, and to facilitate the collaboration between individual gas companies, and between gas companies, government agencies (including local government), communities and landholders; • establish a long-term participatory regional monitoring framework, overseen by the EPA or the independent regulator, with secure funding (raised from industry levies) and able to endure multiple election cycles; and • establish periodic and standardised reporting to communities on the social, economic and environmental performance of the industry through either the independent regulator or a specialised research institution. This	Industry supports sensible collaboration between Government and gas companies in the development of the industry. We also support clear and transparent communication on our activities in the communities in which we operate. We look forward to working with the Government and other stakeholders to ensure that an equitable, efficient and cost-effective regulatory framework is in place for the onshore petroleum industry.

	includes information from the monitoring of key indicators, and an industry-wide complaints and escalation process.	
Economic impacts		
13.1	That in developing its budget the Government consider the source of royalty revenue to ensure that regions that are the source of taxation revenue benefit from any onshore shale gas extraction activity that has occurred in that region.	This is a matter for the Government to consider how it distributes royalty revenue to benefit all Territorians, as owners of the Territory's natural resources.
13.2	That the Government work with stakeholders and gas companies to ensure that there is early knowledge of the labour and skills required for all phases of any onshore shale gas development to maximise local employment.	Industry has, and will continue to, work closely with the Government and other key stakeholders to provide timely and accurate information on labour and skills requirements and opportunities.
13.3	That the Government work with gas companies, training providers, local workers, job seekers, Land Councils and local Aboriginal corporations and communities to maximise opportunities for local people to obtain employment during all phases of any onshore shale gas development.	Industry has, and will continue to, work closely with the Government and other key stakeholders to provide timely and accurate information on labour and skills requirements and opportunities.
13.4	That the Government ensure that training providers and gas companies collaborate so that skill requirements are clearly understood by training providers, and that trainees acquire appropriate skills.	Industry has, and will continue to, work closely with the Government and training providers to provide timely and accurate information on labour and skills requirements and opportunities.
13.5	That the Government work with gas companies and local suppliers to ensure there is early knowledge of local supply and service opportunities for all phases of any onshore shale gas development.	Industry has and will continue to work with government and relevant bodies, for example ICN-NT and NTIBN, to identify, support and nurture local content opportunities wherever appropriate and possible. For example, APPEA members engage regularly with members of organisations such as the NT Chamber of Commerce and the Katherine Mining Services Association to communicate potential supply chain opportunities.
13.6	That the Government work with gas companies and local suppliers (regional and Territory wide) to identify immediate supply opportunities and to map future potential supply opportunities. This should be done in consultation with the ICN-NT and the Chamber of Commerce.	Industry has and will continue to work with government and relevant bodies, for example ICN-NT and NTIBN, to support and nurture local content wherever appropriate and possible. For example, APPEA members engage regularly with members of organisations such as the NT Chamber of Commerce and the Katherine Mining Services Association to communicate potential supply chain opportunities.
13.7	That the Government work with gas companies, Land Councils, local Aboriginal corporations, Aboriginal communities, and businesses to identify local supply and service opportunities to keep sustainable economic benefits on country.	Industry has and will continue to work with government and relevant bodies such as the NTIBN, to support and nurture local content on country wherever appropriate and possible.

		For example, APPEA members engage regularly with the Northern Land Council and participate in many forums/events to understand local Aboriginal supply chain capability.
13.8	That the Government assist regional businesses to obtain quality assurance certification and to partner with larger suppliers to encourage greater local supply, employment and knowledge transfer.	This is a matter for the Government. Industry will be pleased to work with the Government should this recommendation be adopted.
13.9	That the Government work with gas companies, peak bodies of affected industries, and affected stakeholders to identify and resolve potentially negative economic impacts of any onshore shale gas development on other industries.	While the economic impact assessment report for the Inquiry identified minimal negative economic impacts from onshore shale gas development on other industries, the gas industry will work with government and key industry stakeholder groups to understand their challenges and opportunities.
13.10	That the Government work with all levels of government, peak organisations, communities and gas companies to identify and manage infrastructure risks, including identifying options to fund any new infrastructure or upgrade existing infrastructure.	Industry has and will continue to work with government and relevant stakeholders, to understand the infrastructure opportunities and challenges associated with the development of the Territory's resources. As with most new or upgraded regional infrastructure initiatives, it is important to identify the often multiple beneficiaries of such infrastructure when determining appropriate funding mechanisms.
Regulatory reform		
14.1	That the Government design and implement a full cost recovery system for the regulation of any onshore shale gas industry.	APPEA agrees that industry should contribute to the cost of regulation. In other jurisdictions, such as South Australia, the cost of regulating a substantial onshore gas industry is covered by the exploration, production and retention license fees paid by leaseholders. However, we do not support the proposition that industry is the sole beneficiary of regulation and therefore should pay for full cost. The Government on behalf of the community is the owner of the Territory's natural resources and benefits substantially from their development through employment, local contracts, royalties, fees and other taxes. A balance is required in meeting the cost of regulation. The recommended approach is not consistent with the manner in which regulatory cost is apportioned to other industries. It is also not clear why full cost recovery should apply only to the onshore shale gas industry given the Inquiry's draft findings about its possible safe development. This would appear to be an additional cost for the shale gas industry in comparison to other primary industries in the NT with similar risk profiles.
14.2	That the Minister publish any proposed land release for any onshore shale gas exploration. That the Minister must consult with the community and stakeholders and consider any comments received in relation to any proposed land release.	APPEA supports consultation on acreage release. Identification of issues prior to release of land could be beneficial and could mitigate risk. This process is essentially a matter for Government but industry will work with the Government to enable these concerns to be addressed without introducing unnecessary cost or delays to the acreage release process.

	That the Minister be required to take into account the following matters when deciding whether or not to release land for exploration: • the prospectivity of the land for petroleum; • the possibility of coexistence between the onshore gas industry and any existing or future industries in the area; and • whether the land is an area of intensive agriculture, high ecological value, high scenic value, culturally significant or strategic significance. That the Minister publish a statement of reasons why the land has been released and why coexistence is deemed to be possible.	
14.3	That Government consider mechanisms, including an amendment to the Petroleum Act, to ensure that applications that are currently extant are not granted in relation to areas that are not prospective for onshore shale gas or where coexistence is not possible. Consideration must be given to areas of intensive agriculture, high ecological value, high scenic value, cultural significance and strategic significance.	This process is essentially a matter for Government but the intention of this recommendation is reasonable provided that there is certainty and clarity as to the values that would preclude co-existence. Determining commercial prospectivity may not be possible or achievable for government agencies in all areas. Industry looks forward to working with the NT Government to assist this consideration.
14.4	That the following areas must be declared reserved blocks under s 9 of the Petroleum Act, each with an appropriate buffer zone: • areas of high tourism value; • towns and residential areas (including areas that have assets of strategic importance to nearby residential areas); • national parks; • conservation reserves; • areas of high ecological value; and areas of cultural significance.	Thjs recommendation is consistent with the announced policy of the former NT Government, and would be supported by industry provided that certainty is provided in regard to the definition of “areas of high ecological value” and that boundaries of parks and reserves accurately represented land with those values. Industry looks forward to working with the NT Government to achieve this.
14.5	That prior to undertaking any onshore shale gas activity on a Pastoral Lease (including exploration), a land access agreement must be signed by the Pastoral Lessee and the gas company. That the land access agreement be required by legislation. That breach of the land access agreement will be a breach of the relevant approval giving rise to the petroleum activity being carried out on the land.	This is already a standard industry practice with land access agreements executed prior to activity commencing, as required through the existing NT Government approvals process. Industry is comfortable that the requirement for a land access agreement be legislated. Breach of access agreement (by either party) is a breach of an agreement between an operator and the pastoral lessee, and should not be linked to approvals. Rectification/remedies should be a matter for the operator and the pastoral lessee as per the terms of agreement.
14.6	That in addition to any terms negotiated between the pastoralist and the gas company, the statutory land access agreement must contain standard minimum protections for pastoralists.	This recommendation is already a standard practice with provisions agreed with pastoralists in executed land access agreements.

		Industry looks forward to working with the NT Government and the Pastoral industry to ensure that equitable, efficient and cost-effective land access agreements are in place for onshore petroleum activity.
14.7	That the Government consider implementing a mandatory minimum compensation scheme payable to Pastoral Lessees for all onshore shale gas production on their Pastoral Lease. Compensation should be by reference to the number of wells drilled on the Pastoral Lease and the area of land cleared and rendered unavailable to the Pastoral Lessee.	Refer our response to 14.6.
14.8	That the Government consider whether a royalty payment scheme should be implemented to compensate Pastoral Lessees for all new petroleum fields brought into production.	The distribution of the substantial royalty payments that the NT Government could receive from the onshore gas industry is a matter for the Government. APPEA believes that the existing royalty rate should continue to be applied.
14.9	That any person may lodge an objection to the proposed grant of an exploration permit. That the Minister must, in determining whether to grant or refuse the application, take into account the objections received, and that all objections received by the Minister be published.	APPEA continues to argue that standing be limited to proponents and directly or indirectly affected stakeholders. The invitation to non-impacted stakeholders, potentially including foreign residents or international activist groups, to intervene in NT processes is unnecessary and could result in significant delays and additional costs for no environmental or social benefit.
14.10	That the Petroleum Act be amended to require the Minister to take into account and apply the principles of ESD.	The principles of ESD are appropriately contained within the *Petroleum (Environment) Regulations 2016* and are expected to form a critical component of the proposed new Territory wide environmental protection regulation framework.
14.11	That the Minister must not grant an exploration permit unless satisfied that the gas company is a fit and proper person, taking into account, among other things, the company's environmental history and history of compliance with the Petroleum Act and any other relevant petroleum legislation. That the Minister's reasons for determining whether or not the gas company is a fit and proper person be published.	APPEA supports the objectives of including a 'fit and proper person' consideration. It is important that permit holders have the experience and expertise to undertake proposed exploration activity. Industry looks forward to working with the NT Government on implementation of this recommendation.
14.12	That Government develop a financial assurance framework for the onshore shale gas industry. The framework must: • be transparent and developed in consultation with the community and key stakeholders; • clarify the activities that require a bond or security to be in place and describe how the amount of the bond or security is calculated; and	Financial assurance frameworks vary across Australian and foreign jurisdictions. The intention of this recommendation is supported and industry looks forward to working with the NT Government to ensure that an equitable, efficient and cost-effective regime is in place.

	• require the public disclosure of all financial assurances and the calculation methodology.	
14.13	That the government impose a non-refundable levy for the long-term monitoring, management and remediation of abandoned onshore shale gas wells in the NT.	The monitoring of wells is incorporated in company's well management plans. This recommendation should reflect the likelihood and impact of any future well-integrity issues. Any potential industry contributions should be offset against environment rehabilitation bonds, for example. The Government should not accept surrendered tenure without a certain integrity decommissioning process. If it is implemented, the cost should be consistent with the annual levy under the *Mining Management Act 2001 (NT).*
14.14	That all draft EMPs for hydraulic fracturing must be published and available for public comment prior to Ministerial approval. That all comments made on draft EMPs be published. That the Minister must take into account comments received during the public consultation period when assessing a draft EMP.	Industry conducts substantial and transparent stakeholder consultation when preparing EMP's for hydraulic fracturing and APPEA supports the intention of this recommendation. APPEA notes that processes already exist in the NT environmental regulatory regime for substantial public consultation for activities having a significant impact on the environment. We would be concerned at the potential for those opposed to any onshore gas developments in the Northern Territory to make vexatious objections to the Minister to attempt to 'veto by delay' legitimate applications to undertake regulated activities. There should be clear statutory timelines for all application, submission and decision making processes.
14.15	That all notices and reports of environmental incidents, including reports about reportable incidents under the Petroleum Environment Regulations, must be published.	APPEA supports a robust and transparent regulatory process with sensible reporting thresholds and definitions of environmental impacts. Such measures should apply to all industries likely to experience such incidents.
14.16	That the Schedule be repealed and replaced with legislation to regulate seismic surveys, drilling, hydraulic fracturing, and well abandonment prior to the grant of any production licence for the purpose of any onshore shale gas development.	APPEA continues to support replacing the Schedule with appropriate Regulations. We suggest amending this regulation as per below to clarify that the grant of a PL does not allow activity to take place and that exploration and appraisal activity can be undertaken while reforms are underway. *"...abandonment prior to the approval of any development activity..."*
14.17	That the Government develop and implement enforceable codes of practice with minimum, prescriptive, standards and requirements to give clarity to the regulatory framework.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation.
14.18	That the Minister must be satisfied that a gas company is a fit and proper person to hold a	See our response to recommendation 14.11. APPEA supports the objectives of including a 'fit and proper person' consideration. It is important that permit

	production licence prior to the licence being granted.	holders have the experience and expertise to undertake proposed production activity. Industry looks forward to working with the NT Government on implementation of this recommendation.
14.19	That, as part of the environmental assessment and approval process, the Minister be required to consider the cumulative impacts of any proposed onshore shale gas activity.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation. Cumulative impacts are not relevant to the limited activity which occurs during exploration phase but are appropriately considered in development and production approvals.
14.20	That the Government consider developing and implementing a regional or area-based assessment in the regulation of any onshore shale gas industry in the NT.	APPEA supports the intention of this recommendation and looks forward to working with the Government on implementation.
14.21	That the Petroleum Act and Petroleum Environment Regulations be amended to allow open standing to challenge administrative decisions made under these enactments.	APPEA continues to argue that standing be limited to proponents and directly or indirectly affected stakeholders. See our response to recommendation 14.9.
14.22	That merits review be available in relation to decisions under the Petroleum Act and Petroleum Environment Regulations including, but not limited to, decisions in relation to the granting of exploration permits and approval of EMPs. That the following third parties, at a minimum, have standing to seek merits review: • proponents (that is, gas companies) who are seeking a permit, approval, application, licence or permission to engage in onshore shale gas activity; • persons who are directly or indirectly affected by the decision; • members of an organised environmental, community or industry group; • Aboriginal Land Councils; • local government bodies; and • persons who have made a genuine and valid objection during any assessment or approval process. That an independent body, such as NTCAT, be given jurisdiction to hear merits review proceedings in relation to any onshore shale gas industry.	APPEA supports access to an administrative review to ensure that approval processes and laws have been applied correctly, but does not believe merit review should apply where those laws and processes have been adhered to. This reflects the recognition that the adversarial court process is not suitable for resolving and achieving a balance between many interests and issues especially in regard to scientific issues or the environment. The practical implication is that the approval process could be significantly longer, as the original decision is re-litigated in all aspects. This recommendation creates another powerful opportunity for green law-fare to delay and frustrate projects, as well also increasing costs for proponents and government.
14.23	Where litigation is brought genuinely in the public interest, that costs rules be amended to allow NT courts to not make an order for the payment of costs against an unsuccessful public interest litigant.	The definition of "genuinely in the public interest" is critical here. In many instances, costs are the only deterrent to vexatious actions from groups opposed to all development. Abuse of the legal process to frustrate and delay activities that have been granted legal approval must not be rewarded or encouraged.

14.24	That the Government develop and implement a robust and transparent compliance monitoring strategy, having regard to the principles set out in the ANAO Administering Regulation: Achieving the right balance guide, and the policy in SA.	APPEA supports the intention of this recommendation – which should apply to all regulated industries – and looks forward to working with the Government on implementation.
14.25	That the Government enact whistleblower protections. That a hotline be established to make anonymous reports about any onshore shale gas industry non-compliance and that such reports be investigated.	APPEA supports the intention of this recommendation but considers that a cost-effective and equitable whistleblower solution should encompass all compliance activities administered by the NT Government. No case has been made that this should uniquely apply to the onshore gas industry.
14.26	That the Government consider developing and implementing a tiered regulatory model such as the one in SA, whereby gas companies with a demonstrated record of good governance and compliance require a lower level of monitoring, with a corresponding reduction in regulatory fees.	The South Australian regulatory model works well in this regard and is supported in other jurisdictions.
14.27	That the Government enact a broader range of powers to sanctions, including but not limited to: • remediation orders; • enforceable undertakings; • injunctions; and • civil penalties.	This is a matter for Government consideration in respect of its oversight of all industries.
14.28	That the Government allow civil enforcement proceedings to be instituted to enforce potential or actual non-compliance with the legislation governing any onshore shale gas industry.	This appears to be consistent with other regulatory regimes in Australia, and should not uniquely apply to the onshore gas industry. However, the assertion at page 382 that costs will be a barrier to unmeritorious actions is arguably compromised by recommendation 14.23 that court can make an order that unsuccessful litigant does not have to pay if in the "public interest."
14.29	That the Government consider enacting provisions that reverse the onus of proof or create rebuttable presumptions for pollution and environmental harm offences for all regulated onshore shale gas activities.	APPEA does not believe that a sufficient case has been presented to the Inquiry to justify such a significant policy shift. EMP's are the appropriate risk management tool by which regulators can monitor, assess and prosecute against pollution and/or environmental harm. As the Australian Law Reform Commission states in its report on Traditional Rights and Freedoms[3]: *Reversal of the legal burden of proof on an issue essential to culpability in an offence arguably provides the greatest interference with the presumption of innocence, and its necessity requires the strongest justification.*
14.30	That penalties for environmental harm under the Petroleum Act and Petroleum Environment Regulations be reviewed and increased in line with leading practice.	This is a matter for Government consideration. Reference to other jurisdictions would be advised in ensuring that the right balance is struck.

[3] ALRC, Report 129, *Traditional Rights and Freedoms—Encroachments by Commonwealth Laws*, 2 March 2016

14.31	That in order to ensure independence and accountability, there must be a clear separation between the agency with responsibility for regulating any onshore shale gas industry and the agency responsible for promoting that industry.	The structure of the bureaucracy is a matter for government and the intention of this recommendation is understood. We support the existing regulatory model with the primary role of the NTDPIR in regulating industry. A single regulator, that regulates and grants approvals on all petroleum activities including shale gas activity, is favorable regulatory model. The Northern Territory Government should consider a regulatory framework similar to South Australia or Queensland, states with long experience of significant onshore gas activity.
14.32	That the Government develop and implement the reforms described in Option 1 and/or Option 2 above prior to any production licences being issued for any onshore shale gas activities in the NT.	APPEA supports reforms to move the NT to a best practice regulatory framework. It is critical that existing legislation and regulations remain in force in the interim to allow the legislative review process to be thorough and comprehensive without causing undue delays to the important exploration and appraisal activities and baseline studies. These activities and studies are needed to inform the potential for a viable onshore gas industry in the Northern Territory. Legislative reform should be complete prior to the final approval of any large-scale onshore gas development in the Northern Territory, however, it is not necessary for the reform process to be complete prior to the granting of a Production Licence (PL), which is simply a permit instrument that in, and of itself, grants no authority to undertake development activity. APPEA favours the single agency model referred to our response to 14.31. Industry looks forward to working with the NT Government to ensure that an equitable, efficient and cost-effective regulatory regime is in place for the onshore petroleum industry.
Strategic regional environmental and baseline assessment		
15.1	That a strategic regional environmental and baseline assessment (SREBA) be undertaken prior to the grant of any production licence for onshore shale gas.	APPEA supports the intention of this recommendation as is reflected in the independent baseline studies already underway supported by our member companies. We also support the implicit recognition that exploration activity can continue while such studies are completed. We caution that not all aspects and potential impacts are suitable for broad regional studies and should be addressed by targeted assessment of those specific activities.

ENDS.