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President

Dr Alan Finkel AM FTSE

Dr Allan Hawke AC

Hydraulic Fracturing Inquiry

GPO Box 4396

DARWIN NT 0801

30 May 2014

Dear Dr Hawke

Inquiry into Hydraulic Fracturing in the Northern Territory

The Australian Academy of Technological Sciences and Engineering¹ (ATSE) welcomes the opportunity to respond to the Inquiry.

The Australian Council of Learned Academies (ACOLA) which combines the four Learned Academies (Australian Academy of Science, Academy of Social Sciences in Australia, Australian Academy of the Humanities and the Australian Academy of Technological Sciences and Engineering) published a Report in June 2013 on shale gas in Australia, titled: *Engineering Energy: Unconventional Gas Production – a study of shale gas in Australia*². Please find a copy of the report enclosed. ATSE provided project services on behalf of the ACOLA Secretariat and the Chair and Deputy Chair of the report are ATSE Fellows. It is in this context that ATSE provides the report.

The ACOLA Report reviewed the range of issues facing shale gas development in Australia and made 51 key findings considering the potential environmental, social and economic impacts of an Australian shale gas industry (under its terms of reference, the Report did not make 'recommendations'³). The ACOLA Report also addressed the potential impact of hydraulic fracturing, the regulation of fracking chemicals, and the use of groundwater, brackish water and produced water for fracking operations.

Whilst shale gas exploration is still at an early stage, Australia needs to act quickly to assess its shale gas reserves and resources, as well as consider the potential social, economic and environmental impact of shale gas production - including the benefits and the challenges. Due to the manner in which shale gas is produced, there is potential for shale gas exploration and extraction to have an impact on the landscape and biodiversity in Australia.

¹ ATSE advocates for a future in which technological sciences, engineering and innovation contribute significantly to Australia's social, economic and environmental wellbeing. The Academy is empowered in its mission by some 800 Fellows drawn from industry, academia, research institutes and government, who represent the brightest and the best in technological sciences and engineering in Australia. The Academy provides robust, independent and trusted evidence-based advice on technological issues of national importance. ATSE fosters national and international collaboration and encourages technology transfer for economic, social and environmental benefit. www.atse.org.au

² <http://acola.org.au/index.php/projects/securing-australia-s-future/project-6>

³ Recommendations were developed by the Office of the Chief Scientist in consultation with relevant government departments and can be found here: <http://www.chiefscientist.gov.au/wp-content/uploads/shalegas-recommendationsFINAL.pdf>

There are many processes that occur during a shale gas fracking operation which have the potential to impact the environment; however the Review was of the opinion that most if not all of these impacts can be managed. Nonetheless if not adequately managed, the clearing of land to establish drill sites, levelling of the site, and establishment and construction of access roads can result in impacts on soil, increased fire risk, spread of invasive species and fragmentation of patches of native vegetation, habitats and landscape function. Other potential environmental impacts on the landscape may include impacts to surface and ground water systems, ecosystems, and induced seismicity. Research into Australia's sedimentary basins and related water resources, landscapes and ecosystems, and how best to monitor them, will be essential to ensure careful management of shale gas production and minimisation (and avoidance) of potential impacts.

ATSE notes that the Inquiry terms of reference will examine the *potential for multiple well pads to reduce or enhance the risks of environmental impacts*. The ACOLA Report notes that the footprint of shale gas operations can be minimised through measures such as the use of multiwall drilling from a single pad. The report highlights that shale gas well pads will need power facilities, gas treatment and compression facilities, and facilities to safely store water and proppants, as well as additional infrastructure such as pipeline infrastructure, gas processing plants, worker accommodation and offices, storage facilities, and telecommunication infrastructure. Such infrastructure could also have associated environmental impacts.

The ACOLA Report notes that if a commercially viable gas is to be developed in Australia with minimal impact, it will be important to acknowledge co-use landscapes and it will be essential to have a whole-of-system framework in managing the impacts of multiple land uses. It will be important to begin to undertake research and collect baseline information on ecological systems, groundwater chemistry, methane emissions, landscape changes and seismic activity. The ACOLA Report noted that the baseline information will need to be at a level of resolution and accuracy that will enable any potential future impacts of shale gas activities to be identified at an early stage. Such baseline information could also assist with rehabilitation of the land and monitoring of well closure.

While the Inquiry addresses some of the key issues related to hydraulic fracturing for unconventional gas, ATSE considers that other issues likely to be raised will include human health, greenhouse gas emissions and gaining and retaining the social licence to operate. Information on these issues and further issues related to the Inquiry's terms of reference are available in the ACOLA Report.

Should you require further information, the contact at ATSE is Dr Lauren Palmer (Senior Research and Policy Officer) on (03) 9864 0903 or via email at Lauren.Palmer@atse.org.au.

Yours faithfully



Dr Alan Finkel AM FTSE
President