Submission to

Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia 2017

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19 March 2018

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2. Executive Summary

Condor Energy Services Ltd (Condor) welcomes the opportunity to provide input to a further inquiry.

Condor hope the investigation will deliver the evidence and information needed to properly describe the risks associated with hydraulic fracturing and the regulatory mechanisms required to properly manage those risks.

The main points from our submissions are:

- Condor is committed to diligently managing the risks our activities pose to people, the environment and communities and as such has comprehensive risk management processes in place.

- The 2015 WA Standing Committee on Environment and Public Affairs report on '*Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas*' (Report 42) made two recommendations directly applicable to fracking companies and these have effectively been implemented by oil and gas operators and fracking providers in Western Australia.
  Additionally, many studies and inquiries have been conducted into hydraulic fracturing and these have consistently found that with proper regulation fracking can be conducted with a minimal and acceptable level of risk to people, the environment and communities.

- The Background and issues paper provided by this inquiry identified a number of environmental impact risks associated with hydraulic fracture stimulation. Condor and the broader onshore oil and gas industry in Australia are aware of these risks and have processes in place to manage these risks. In some areas there may be opportunity for Western Australia to adopt risk mitigation strategies already in place in other Australian jurisdictions or from New Zealand.

- The Western Australian moratorium on fracking has all but eliminated Condor's ability to provide well intervention services in Western Australia and this, in turn, has severely reduced Condor's use of local WA service providers and stopped Condor from taking on any additional WA workers to supplement its full-time workforce.
  Only the full lifting of the moratorium and a return to a state of low sovereign risk will allow Condor to participate in growing the WA economy.

3. Introduction

3.1 Condor Energy Services Ltd (Condor).

Condor is an Australian company with its head office in Perth and operations across Australia and New Zealand. Condor provide the oil and gas industry with a suite of well optimisation and intervention services, including; hydraulic stimulation (fracking), coiled tubing, wireline and cementing.

Condor employs approximately 40 people with extensive oil and gas field experience from Australia and internationally. Consequently, they have seen some of the best and worst safety, environmental and community practices in the industry. Additionally, Condor routinely employs young workers (both school leavers and university graduates) and also supplements its project teams with local workers including those from local indigenous communities.

In the four years since commencing operations in 2014, Condor has partnered with almost 20 oil and gas operating companies across Australia and New Zealand and has gained a reputation for superior service delivery including its management of safety, environmental, community and regulatory compliance matters.

3.2 Planning our activities

Condor's HSEQ (Health, Safety, Environment and Quality) management system is aligned to the requirements of; Australian and New Zealand Standard (AS/NZS) 4801 (Occupational health and safety management systems), Australian and New Zealand Standard AS/NZS ISO 9001 (Quality management systems), and Australian and New Zealand Standard AS/NZS ISO 14001 (Environmental management systems) which provide a continuous improvement framework based on a cycle of; Policy, Planning, Implementation, Measurement and evaluation, and Management review.

The planning phase includes risk management of all Condor activities and this is conducted in accordance with Australian and New Zealand Standard AS/NZS ISO 31000 (Risk Management). Additionally, planning includes compliance management where project specific compliance obligations are identified and incorporated into applicable policies, procedures and training. The compliance obligations include but are not limited to; statutory requirements, client HSEQ expectations, industry standards and community expectations.

4. Previous Inquiries

4.1 How Condor is implementing recommendations from previous inquiries

The Western Australian Standing Committee on Environment and Public Affairs report on '*Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas*' (Report 42) of November 2015 included twelve recommendations. Two of these recommendations directly related to how Condor's fracking activities.

The table below sets out the two recommendations applicable to Condor and how Condor has been compliant with these recommendations since it commenced operations in 2014.

Recommendation	Condor's implementation
Recommendation 7: The Committee recommends that the Government ban the use of benzene, toluene, ethylbenzene and xylene during any hydraulic fracturing operations undertaken in Western Australia	All hydraulic fracturing fluids used by Condor since it commenced operations in 2014 have been independently tested and confirmed that BTEX (benzene, toluene, ethylbenzene and xylenes): 1. is below the detectable limit, and/or 2. complies with the ADWG (Australian Drinking Water Guidelines).
Recommendation 8: The Committee recommends that the Department of Mines and Petroleum's policy of public disclosure of chemicals used in any hydraulic fracturing activity be formalised in subsidiary legislation.	Since commencing operations in 2014 Condor has provided all its clients with chemical disclosure information for all the hydraulic fracturing fluids used. This has enabled the clients to meet or exceed extant statutory chemical disclosure requirements.

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5. Economic impact of a frac moratorium

While Condor is relatively small company (~40 employees) we have typically employed additional contract and/or casual workers from local communities to deliver our hydraulic fracturing projects.

The WA fracking moratorium has limited Condor to a small number of very small scale (i.e. 4-5 workers for 1-2 weeks) well intervention activities in WA. This significantly reduced scale has meant that Condor has not had to supplement its workforce with WA locals and that Condor has used far less local WA services (i.e. logistics, accommodation, maintenance and repair, etc.) and therefore contributed far less to the WA economy and WA communities.

5.1 Young workers

Condor has and will continue to provide opportunities for young workers (i.e. school leavers) to get a start in the oil and gas industry as fracture stimulation equipment operators. Since Condor commenced operation in 2014, a number of these younger workers have now progressed to more senior positions.

5.2 Indigenous involvement

During a hydraulic fracturing project in north-west Western Australia, Condor collaborated with the oil and gas operating company and traditional owners to maximise opportunities for indigenous employment on the project.

Condor is actively involved in CEBAC (Cooper Eromanga Basins Aboriginal Conference), a tripartite (South Australian Government, oil and gas industry and traditional owners) organisation seeking to increase aboriginal involvement in the oil and gas industry, at both the individual and business level, in the Cooper and Eromanga Basins. Only the lifting of the WA fracking moratorium will allow Condor to leverage from this South Australian experience and contribute to the development of similar indigenous engagement activities in Western Australia.

Only the full lifting of the WA fracking moratorium and a return to state of low sovereign risk will allow the WA onshore oil and gas industry to resume activity and allow Condor, and the broader onshore oil and gas industry, to fully contribute to the WA economy and communities.

6. Risk of environmental impacts associated with hydraulic fracture stimulation

The Background and Issues Paper provided by this inquiry included the following potential environmental impacts to be assessed in the inquiry:

Land	Air	Water	Social Surrounds
Terrestrial Environmental quality	Greenhouse gas emissions	Quality	Aboriginal heritage
Biodiversity	Air pollutants	Quantity	Amenity and aesthetic enjoyment
Beneficial use		Beneficial use	Public safety
			Seismicity

Condor's response to each of these risks is set out in the following sections.

7. Land Impacts

Land Impacts	Potential Risks	Condor Response
Terrestrial Environmental quality	Hydraulic fracturing and its associated activities could have an impact on soil quality. This could result from: 1. the spillage of chemicals used during hydraulic fracturing; or 2. the spillage of flowback water. This could also indirectly impact the health of people, plants and animals.	**1. The spillage of chemicals used during hydraulic fracturing** As with operations in mining, agriculture, transport and many other activities conducted every day in Australia there is a risk that chemicals may spill onto the ground. Condor's risk management processes address the risk of chemical spill. The risk controls applied by Condor are in line with statutory obligations and industry expectations (which often exceed statutory obligations). This includes but is not limited to: All chemicals transported and stored by Condor are: 1. Kept in containers compliant with the Australian Dangerous Goods Code. 2. Stored on bunds or in bunded storage containers that are compliant with the spill containment requirements of the Department of Mines and Petroleum, 2010, Storage and handling of dangerous goods — code of practice. An example of good industry practice around chemical management and spill prevention/response includes Condor's hydraulic fracturing operations at Todd Energy's multi-well sites in the Taranaki region of New Zealand. Condor has conducted hydraulic fracturing at a number of Todd Energy well sites since late 2016 including: Mangahewa D site: https://goo.gl/maps/s9n1NR69hfx Mangahewa C site: https://goo.gl/maps/aZzBQcbmQhr

Land Impacts	Potential Risks	Condor Response
		As seen in the Google map images, these well sites are in pristine New Zealand dairy and sheep farming country, within a few hundred meters of rivers and streams, and in close proximity to residential properties. In these locations, avoidance of spills and appropriate spill response is a non-negotiable aspect of providing quality well services. Spill prevention and control is managed in accordance with the industry best practice and in compliance with Taranaki Regional Council – Guide to regulating oil and gas exploration and development activities under the Resource Management Act (2013) Condor employs the same diligence to spill prevention and control for its Australian operations as it does in these pristine New Zealand oil and gas fields. **2. The spillage of flowback water** Condor will not address this risk as management of flowback is not service Condor provides.
Biodiversity	Hydraulic fracturing and its associated activities could impact biodiversity. This could result from: 1. habitat loss or fragmentation from clearing for drill pads, roads and pipelines;	**1. Habitat loss or fragmentation from clearing for drill pads, roads and pipelines.** Condor will not address this risk as Condor does not provide these services.

Land Impacts	Potential Risks	Condor Response
	2. increased noise and light from operations; or 3. the spread of weeds and pests.	**2. Increased noise and light from operations** All of Condor's hydraulic fracturing activities in Australia have been conducted in accordance with applicable environmental approvals gained by the operating company, including those for noise and light. The sound pressure produced by Condor's hydraulic fracturing equipment is typically 100-108 dB (at 1m) depending on the specific equipment being used at the time. Without artificial noise dampening or attenuation due to vegetation or ground forms the noise from Condor's equipment will be reduced to less than the mandated level for 'noise sensitive premises: highly sensitive area' between 10pm and 7am in r. 8 of the WA Environmental Protection (Noise) Regulations 1997 at less than 1400m. Further, independent noise monitoring of Condor's hydraulic fracturing activities in New Zealand has shown that in real world conditions (i.e. some attenuation due to vegetation and ground form) Condor meets the applicable Taranaki region noise limits at 800m. **3. Spread of weeds and pests** As with operations in mining, agriculture, transport, recreational activities and many other activities conducted every day in Australia there is a risk of weed and pest transfer from one area to another. Where the risk of weeds and/or pests transfer has been identified Condor's risk management process provides for steps to eliminate or reduce this risk through inspecting and cleaning of vehicles, plant and equipment prior to and during movement. This is typically conducted in accordance with the Queensland Department of Agriculture and Fisheries guidance for 'Preventing weed spread'.

Land Impacts	Potential Risks	Condor Response
Beneficial use	Hydraulic fracturing and its associated activities may impact beneficial use by degrading or restricting access to land that would have been used for other productive purposes including agriculture.	Condor will not address this risk as it does not directly relate to the services Condor provides.

8. Air Impacts

Air Impacts	Potential Risks	Condor Response
Greenhouse gas emissions	A significant amount of greenhouse gases could be released during hydraulic fracturing and associated activities.	Condor will not address this risk as it does not directly relate to the services Condor provides.
Air pollutants	Air pollutants could be released during hydraulic fracturing and associated activities. This could result from the release of gases from the wells into the air, or fumes from drilling equipment and road traffic. This could impact the health of people and plants and animals.	1. Emissions from Condor's hydraulic fracturing plant and equipment. This equipment is powered by diesel engines. Emissions from non-road diesel engine emissions (except those used for underground mining) are unregulated in Australia (http://www.epa.nsw.gov.au/resources/air/140586NonrdDiesInfoRpt.pdf). Nonetheless, the Caterpillar diesel engines powering Condor's hydraulic fracturing plant are compliant with US Regulations for Emissions from Heavy Equipment with Compression-Ignition (Diesel) Engines (https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-heavy-equipment-compression). 2. Emissions from vehicles used to transport Condor's hydraulic fracturing plant and equipment and personnel to/from projects. All Condor vehicles (heavy and light) are locally purchased in Australia and comply with the Australian Design Rules and the applicable emission rules for: - Heavy vehicles (https://www.legislation.gov.au/Details/F2013C00048) - Light vehicles (https://www.legislation.gov.au/Details/F2012C00284) As a proportion of the overall heavy vehicle traffic used in Western Australia (i.e. freight logistics, recreation, agriculture, mining, etc.) hydraulic fracturing has been and is likely to

		remain for some time a relatively small contributor. For example, a medium to large hydraulic fracture project in WA may require 25-35 heavy vehicle movements to and from the project site.

9. Water Impacts

Water Impacts	Potential Risks	Condor Response
Quality	**1. Groundwater** Hydraulic fracturing and its associated activities could impact groundwater quality. This could result from: - leakage of wells due to a failure in well integrity, or degradation over the life of the well; - spillage of chemicals, flowback water or brines produced from water treatment; - on-site spills resulting from the overtopping of water storage tanks due to extreme weather events; - spills from the transportation of chemicals; - induced connectivity between hydraulically fractured shale and aquifers; or - reinjection of treated water.	**1. Impact on ground water** ***Leakage of wells due to a failure in well integrity, or degradation over the life of the well;*** Condor will not address well integrity risk as it does not directly relate to the services Condor provides. ***Spillage of chemicals, flowback water or brines produced from water treatment;*** As described in Para 6 (Land Impacts) above, Condor employs rigorous risk management processes and comply with industry standards and statutory requirements to reduce the likelihood of spills. ***On-site spills resulting from the overtopping of water storage tanks due to extreme weather events*** Condor will not address the risk associated with overtopping of water storage tanks as it does not directly relate to the services Condor provides. ***Spills from the transportation of chemicals;*** As described in Para 6 (Land impacts) above, when transporting chemicals Condor complies with the Australian Dangerous Goods Code to reduce the likelihood of a spill and to provide for effective response should one occur. ***Induced connectivity between hydraulically fractured shale and aquifers;*** It is Condor's understanding that induced connectivity between hydraulically fractured shale

Water Impacts	Potential Risks	Condor Response
	2. Surface Water Hydraulic fracturing and its associated activities could impact surface water quality. This could result from: - spillage of chemicals, flowback water or brines produced from water treatment; - on-site spills resulting from the overtopping of water storage tanks due to extreme weather events; or - spills from the transportation of chemicals. - This could also impact the health of people and terrestrial and aquatic plants and animals.	and aquifers is a very low risk. This is supported by the conclusion at sub-para 6 of the Journal of Petroleum Technology, Vol 64, Issue 04 (April 2012) article: Hydraulic Fracturing 101: What Every Representative, Environmentalist, Regulator, Reporter, Investor, University Researcher, Neighbor, and Engineer Should Know About Hydraulic Fracturing Risk by George E. King. ***Reinjection of treated water.*** Condor will not address the risk associated with reinjection of treated water as it does not directly relate to the services Condor provides. **2. Impact on surface water.** ***Spillage of chemicals, flowback water or brines produced from water treatment*** The risk of chemical spill is addressed above in Para 6 (Land impacts). ***On-site spills resulting from the overtopping of water storage tanks due to extreme weather events*** Condor will not address the risk associated with overtopping of water storage tanks as it does not directly relate to the services Condor provides. ***Spills from the transportation of chemicals*** As described in Para 6 (Land impacts) above, when transporting chemicals Condor complies with the Australian Dangerous Goods Code to reduce the likelihood of a spill and to provide for appropriate response should one occur

Quantity	Hydraulic fracturing and its associated activities might impact water quantity due to the amount of water required for the hydraulic fracturing processes. This could impact plant and animal habitats through a decrease in water availability.	Condor will not address this risk as the oil and gas operator company provides the water used for hydraulic fracturing.
Beneficial use	Hydraulic fracturing and its associated activities could impact other beneficial uses of water due to competition for water or loss of utility due to contamination.	Condor will not address this risk as the oil and gas operator company provides the water used for hydraulic fracturing

10. Social Surrounds Impacts

Social Surrounds Impacts	Potential Risks	Condor Response
Aboriginal heritage	Hydraulic fracturing and its associated activities could impact Aboriginal heritage through the alteration or degradation of the environment. This could result from: - damage to sites of cultural significance; or - loss of bush tucker or bush medicine.	It has been Condor's experience in Western Australia (and other Australian states) that the oil and gas operating company manages compliance with the WA Aboriginal Heritage Act 1972 and that this will include but is not limited to surveys to establish whether there are areas of Aboriginal cultural significance prior to developing a well site and where necessary protecting these through; fencing, signs, inductions for workers and cultural heritage education provided by traditional owners.
Amenity and aesthetic enjoyment	Hydraulic fracturing and its associated activities could impact the amenity of the local area. This could result from: - increased noise and dust from construction,	***Increased noise and dust from construction, operation and transport*** As described in para 7 (Air impacts) above, a typical hydraulic fracture project in Western Australia may require 25-35 heavy vehicle movements to and from the wells site. Where community consultation identifies a risk of reduced community amenity steps can be taken to mitigate this. For example – Condor's hydraulic fracturing operations in New Zealand typically have black-out periods (see Appendix VI, section 29-31 of the Taranaki Regional Council – Guide to regulating oil and gas exploration and development activities under the Resource Management Act (2013))

Social Surrounds Impacts	Potential Risks	Condor Response
	operation and transport; - increased light from construction and operation; - loss of visual amenity arising from infrastructure; or - damage to recreational sites.	where heavy vehicle movements associated with hydraulic fracturing are prohibited to reduce traffic and associated impacts on small country roads during specified hours. Similar traffic risk mitigation strategies could be employed in Western Australia. ***Increased light from construction and operation*** While hydraulic fracturing is typically conducted during daylight hours, operations may be conducted at night and this will require artificial lighting. All Condor hydraulic fracturing plant and equipment is fitted with task specific lighting rather than general flood lighting. As has been the practice for some years on mine sites, industrial facilities and oil and gas construction sites (i.e. Gorgon project on Barrow Island) much can be done to mitigate the risk of work related lighting negatively impacting on fauna. ***Loss of visual amenity arising from infrastructure*** Loss of visual amenity caused by hydraulic fracturing will only be temporary as it is an activity that typically takes from a few days to a few weeks to complete. ***Damage to recreational sites*** Condor will not address this risk as the oil and gas operator company consults with communities and other stakeholders during the selection of the location of well sites.

Public safety	Hydraulic fracturing and its associated activities could impact public safety through transport accidents and accidents on site.	As described above a typical hydraulic fracturing activity in Western Australia may require 25-35 heavy vehicle movements to a well site during project set up and a similar number during project demobilization. Additionally, if the hydraulic fracturing workforce are not accommodated at the wellsite they may require transport to and from the well site each day. During hydraulic fracturing operations Condor has conducted in Western Australia this has usually been done using a bus – specifically to reduce the number of vehicle movements and the impact on local communities.
Seismicity	Hydraulic fracturing could induce seismic events that impact local infrastructure and safety.	It is Condor's understanding that seismic events have been attributed to water re-injection (see A Historical Review of Induced Earthquakes in Texas) rather than with hydraulic fracturing itself (see Hydraulic Fracturing 101: What Every Representative, Environmentalist, Regulator, Reporter, Investor, University Researcher, Neighbor, and Engineer Should Know About Hydraulic Fracturing Risk).