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Endangered Wildlife Trust
Perspective on South Africa's unconventional shale gas exploration and extraction

What is Hydraulic Fracturing?

According to the Strategic Environmental Assessment (SEA) report commissioned by the Department of Environmental Affairs (DEA), hydraulic fracturing (or fracking as it is commonly known) is a process to extract an "unconventional resource", namely methane gas that is trapped in shale or other geological deposits that have low permeability. Hydraulic fracturing is the process used to harvest the gas from these deposits[1]. The Geological Society of America describes this process as the injection of water, sand and chemicals into a well drilled into the gas bearing rock under high pressure. This action causes cracks in the rock formation thereby releasing gas which can then be harvested[2]. For more information see here.

Hydraulic fracturing is of concern to the Endangered Wildlife Trust (EWT) due to the fact that its impacts on the environment are relatively poorly understood. As a scalable activity, it has the potential to pollute water resources and lead to significant habitat transformation and fragmentation. Inadequate regulation and poor compliance monitoring will exacerbate the likelihood of these impacts.

Our Position

The EWT's mission is to conserve threatened species and ecosystems in southern Africa to the benefit of all people. The extraction of unconventional shale gas has come under scrutiny due to the potential environmental risks associated with the process. Although the successful extraction of shale gas would clearly increase South Africa's energy resources, the EWT believes that the potential economic benefit does not outweigh the environmental risks and other associated negative impacts.

The EWT encourages the use of a more diverse mix of energy sources than South Africa presently employs, particularly one that reduces our reliance on coal and reduces our carbon footprint. In saying that, we recognise that there are multiple risks and impacts associated with large-scale fracking on the environment, water and livelihoods, and that there is a lack of confidence with respect to the South African government's ability to mitigate the risks associated with fracking. Given these circumstances, **the EWT does not support the exploration for, or production, of shale gas in South Africa, including the use of hydraulic fracturing (fracking)** in attaining a more diverse mix of energy sources[3] [4] [5].

The EWT supports the precautionary principle (as defined in the National Environmental Management Act No. 107 of 1998) when dealing with uncertainty around impacts and risks

associated with shale gas mining and associated techniques, such as fracking, in South Africa. We are not convinced that this principle has been adequately integrated into decision making with respect to hydraulic fracturing.

Given the close ties between energy, water and food security – and the urgent requirement to protect the resilience of our ecosystems, natural capital and ecological infrastructure in an era of uncertain climate scenarios – we argue that the country can, and should, develop an alternative energy vision that excludes the use of shale gas[6]. Please refer to Annexure 1 for further technical detail and supporting documentation.

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The EWT bases its perspectives on the best available information and data available at the time. Our positions and opinions may change as more information and data become available.

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ANNEXURE 1: BACKGROUND INFORMATION TO SUPPORT OUR POSITION

1. Environmental risks

- Claims that shale gas (natural gas that is trapped within shale formations) represents a lower-carbon fossil fuel than coal cannot be proven without a full life-cycle evaluation. This would, for example, include incidental emissions that my occur as result of low levels of methane leakage levels during hydraulic fracturing operations (the process used to extract shale gas) and may nullify any emission advantage over coal[7] [8].
- The combustion of natural/shale gas is still high-carbon compared to renewable sources of energy[9].
- The demonstrated negative impacts associated with unconventional shale gas exploration and exploitation and its ancillary activities may pose unacceptably high risks to people and the environment. These impacts include, but are not limited to, air and water pollution, aquifer contamination, lowering of the water table, habitat loss, disruption of ecosystem services, and loss of natural resources[10] [11] [12] [13] [14] [15] [16] [17].
- South Africa's freshwater resources cannot sustain the high water demands of shale gas exploration and exploitation, even during non-drought years. This will be exacerbated in the light of increasing climate change impacts[18] [19] [20] [21] [22].
- There is a high risk of surface and groundwater contamination. This can occur at various stages of the process, including those of well construction, hydraulic fracturing and gas production processes, and after well abandonment[10] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32].
- There is no long term data available on the cumulative effects of hydraulic fracturing over large areas (such as habitat fragmentation, lowering of the water table levels and long term impacts on livelihoods on communities)[10] [33].
- There is a paucity of inputs for establishing a sufficiently comprehensive baseline of resources and biodiversity. This severely hampers the capacity for the state and other role players to scientifically monitor and evaluate the impacts of the industry's operations[34] [35] [36].
- There is no strategic environmental risk assessment, or cost-benefit analysis, for those exploratory prospecting applications outside the Karoo. The situation is both concerning and confusing.
- There is insufficient capacity, especially in rural areas, to deal with the waste generated as a result of hydraulic fracturing and wastewater treatment. This presents major challenges to companies involved in hydraulic fracturing[37] [38].

2. Economic considerations

- The economic benefits of shale gas are poorly understood. As such any inclusion of economic benefits in documents supporting fracking can only be regarded as unsubstantiated[39] [40] [41] [42].
- Through investments into shale gas the country is inhibiting and delaying progress towards more sustainable forms of energy[39] [43] [44].
- The opportunity costs of this activity have not been sufficiently explored in the South African context. An example can be found in the chapter on tourism in the SEA report recently commissioned by the CSIR which acknowledges the importance of tourism as a major and growing economic activity in the Karoo. However, the SEA does not explore tourism as an alternative development opportunity to hydraulic fracturing, subject to the same investment scenario[45].

3. Legislative and regulatory framework

- South Africa's current regulatory framework is insufficient to mitigate the high risks and uncertainties associated with shale gas exploitation. This is particularly pertinent when the use of hydraulic fracturing technology is employed. The EWT holds that the *Regulations for Petroleum Exploration and Production*, as published in Government Notice R466 in Government Gazette 38855, 2015 (hereafter the "Fracking Regulations"), are not stringent enough and do not provide adequate checks and balances to ensure sustainable development of the shale gas resource[46].
- The EWT notes its concerns that the Fracking Regulations may be unlawful, due to the enabling provisions in the Mineral and Petroleum Resources Development Act (Act 28 of 2002)(MPRDA), which provided the Minster of the Department of Mineral Resources with the power to create regulations, having been repealed before the Fracking Regulations were created[47] [48].
- The EWT notes further that uncertainty (and alleged unlawfulness) of certain provisions of the MRPDA and the regulations promulgated thereto – which are being used to govern shale gas exploration applications – are inadequate in terms of addressing and mitigating the cumulative impacts of shale gas exploration processes.
- The inadequate investment of state resources into the existing fracking SEA in the Karoo limits the value of the outcomes to appropriately inform policy and shale gas governance. In fact, the SEA is undermined by the approval of shale gas exploration rights prior its completion. Consequently, the results of the SEA will not govern these exploratory activities, which will take place over vast areas of the Karoo and elsewhere[49].
- Claims that shale gas is an interim or "bridge" fossil fuel are unfounded. There are no policy documents or legislative provisions in place to ensure that extracting shale gas will reduce the extraction of other fossil fuels, such as coal[50].

- Even with stringent regulations in place, there is a high probability of cumulative negative impacts. These impacts include increasing habitat fragmentation and biodiversity impacts regionally, bearing in mind that fracking takes place over a vast area. This will result in unavoidable negative ecosystem and community livelihood impacts[51], beyond the local level, which could be both long term and irreversible[52].

4. The Precautionary Principle

The EWT supports the precautionary principle and as such we are opposed to hydraulic fracturing. The onus should be further placed on authorities and proponents of the activity to:

- Provide clarity on how an increasing shift towards gas will meet South Africa's emissions reduction targets[53].
- Address the fact that South Africa does not need unconventional gas to meet the increasing energy demand in South Africa, as we have other viable and renewable energy options[53] [54] [55] [56].
- Address the gaps in the existing oil and gas policies and regulations, in water governance legislation and policies, waste management governance, and other relevant legislative frameworks.
- Provide a fully transparent, inclusive, scientifically robust and well-resourced SEA for exploratory prospecting applications outside the Karoo.
- Undertake an overdue Integrated Energy Plan review (in draft) to include the assessment of the most environmentally-friendly energy mix for the country.
- Engage in real, meaningful public participation – with an emphasis on transparency – above and beyond the limited legislative requirements in this regard, to ensure that affected parties' needs and concerns are legitimized, fully addressed and integrated into decision-making frameworks, such as the SEA[57].
- Provide evidence to civil society of the capacity and resources the state will provide to ensure the effective enforcement and compliance of the oil and gas industry[58] [59] [60] [38].
- Provide evidence to civil society on the state's willingness to heed the outcomes of the SEA even if these outcomes prove that shale gas mining will be detrimental to society and the environment. We propose that the SEA is independently reviewed and the results properly considered.
- Provide evidence to civil society that the state will ensure full mitigation of damages and pollution and full rehabilitation costs for ecosystem disruptions caused by shale gas industry operations[61].
- Provide a guarantee that threatened species, sensitive habitats and ecosystems and critical natural resources supporting livelihoods will be protected at all costs. The EWT maintains that sensitive and protected ecosystems must be considered as well-buffered excluded areas, and these areas should be regularly monitored by

relevant authorities who are equipped and have capacity to undertake such monitoring.

- Provide greater resources to all existing baseline and ongoing monitoring programmes in shale gas areas, including for biodiversity monitoring, civilian science monitoring and impact monitoring, and resource new monitoring programmes where there are still baseline gaps[46].
- Refer to Chapter 2 of the Constitution of the Republic of South Africa (Bill of Rights) in the absence of hard facts, where the fundamental rights of all South Africans are enshrined.

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