

MODELLING SOCIAL-ECOLOGICAL RISKS OF SHALE GAS DEVELOPMENT IN THE CENTRAL KAROO

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ABSTRACT

Three plausible scenarios for shale gas development in the Central Karoo were developed, and the risks associated with each development scenario assessed by experts across seventeen strategic issue topics. Risk, before and after mitigation, was determined by the collective consideration of the consequence of an impact and its likelihood of occurrence. Risk profiles were generated for spatially explicit impacts in distinguishable receiving environments, and overlaid to create a composite social-ecological risk model. The risk model illustrates the evolution of the cumulative risks across the scenarios, representing the full life-cycle of shale gas development, and the efficacy of mitigation in reducing risks. Given the expanse of the study area (171 811 km²) and the relatively small physical surface footprint of shale gas development activities, mitigation best-practice can be best achieved by the application of the mitigation hierarchy, prescribing avoidance of impacts first. This may be best achieved by effective project planning, especially by siting surface infrastructure to not coincide with critical environmental features. The results of the risk modelling suggest that the cumulative risks of shale gas development, at the large-scale gas production scenario end, may be near to exceeding developmental thresholds that could result in unacceptable changes to the social and ecological integrity of the Central Karoo. However, risks can be effectively reduced and moderated through adequate planning, best-practice mitigation, good governance - and the institutional capacity to enforce it.