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Re. THE GREEN CONNECTION - COMMENTS ON TOSACO BLOCK 1 DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT
PASA Reference: 12/3/362

Contents

1.

A. INTRODUCTION

These comments are submitted on behalf of the Green Connection, a registered non-governmental organisation, that believes that economic growth and development, improvement of socio-economic status and conservation of natural resources can only take place within a commonly understood framework of sustainable development. Green Connection aims to provide practical support to both the government and non-governmental/civil society sectors, which are an integral part of sustainable development.

2.

B. POINT *IN LIMINE 1* - ACTIVITY IN RESPECT OF WHICH AUTHORISATION IS APPLIED FOR IS NOT AN EXPLORATION OPERATION

It is submitted that the activities in respect of which Tosaco seeks environmental authorisation do not fall within National Environmental Management Act[1] (NEMA) Listing Notice 2 activity 18,[2] which requires environmental authorisation for activities (including the operation of the activity) which require an exploration right as contemplated in s79 of the Mineral and Petroleum Resources Development Act[3] (MPRDA).

3.

Determining whether the proposed activity falls within NEMA Listing Notice 2 activity 18 thus requires a consideration of what activities require an exploration right under s79 of the MPRDA. Section 79 deals with exploration right applications, while section 80 provides that the Minister (DMRE) must grant an exploration right if (among other things) the applicant has the financial resources and technical ability to conducted the proposed **exploration operation.**

4.

Section 1 of the MPRDA defines '**exploration operation**' as meaning:

> The re-processing of existing seismic data, acquisition and processing of new seismic data or any other related activity to define a trap to be tested by drilling, logging and testing, including extended well testing, of a well with the intention of locating a discovery.

[1] 107 of 1998.
[2] GNR.984 of 4 December 2014.
[3] 28 of 2002.

Within the context of this definition, exploration necessarily includes the re-processing of existing seismic data, acquisition and processing of new seismic data or any other related activity to define a trap to be tested by drilling, logging and testing, including extended well testing, of a well with the intention of locating a discovery.

5.

Badenhorst and Mostert point out that the definition [of 'exploration operation']:

> …contains four elements. First, it requires activities, including re-processing of existing seismic data, acquisition and processing of new seismic data or other related activities. Second, these activities must be conducted with the purpose of defining a trap. Third, the trap must be tested by drilling, logging and testing (including extended well testing) of a well. Finally such testing must be conducted with the intention of locating a discovery.[4]

6.

The draft EIA report states that Tosaco is proposing to undertake the reprocessing of approximately 5000km of existing seismic lines taken previously in Block 1, as well as approximately 750 km^2 of 3D seismic data previously undertaken. Additional 3D seismic surveys may be conducted over an area of approximately 1340 km^2 should the analysis of the existing data indicate that this will be beneficial, and would take about 4 months to complete.[5] However, '*the current programme does not include any provision for exploration drilling*'.[6]

7.

Given that Tosaco's 'current programme' does not include any provision for exploration drilling, logging and testing of a well with the intention of locating a discovery, it is submitted that the proposed activity does not constitute an 'exploration operation' as defined in the MPRDA, and as a consequence the activities as proposed by Tosaco do not require an exploration right as contemplated in s79 of the MPRDA. It follows that the activity in respect of which authorisation has been applied for also does not apply.

8.

In its response to the Green Connection's comments on the Draft Scoping Report (DSR), EIMS acknowledge that the '*definition of exploration operation does refer to the definition of a trap to be*

[4] Mineral & Petroleum Law of South Africa (Juta), at p19-20.
[5] Draft EIA report, p19.
[6] Draft EIA report, p17.

tested by drilling, of a well with the intention of making a discovery'.[7] EIMs go on to state that, at this stage, the intention is to first identify whether there would be any merit in conducting further exploration activities, which would then include drilling. EIMs state that '*[a]s such, it is understood that there is currently no concrete intention to conduct such drilling. EIMs is conducting the impact assessment on the basis of the activities proposed by the applicant*'.

9.

This explanation does not address the issue raised by the Green Connection, namely that the activities in respect of which environmental authorisation has been applied for do not constitute 'exploration operations' given that proposed re-processing of existing seismic data and acquisition and processing of new seismic data is not being carried out to define a trap to be tested by drilling, logging and testing, including extended well testing, of a well with the intention of locating a discovery: Tosaco currently has no intention of conducting exploration drilling.

10.

In light of the above, it is submitted that the proposed activities that Tosaco seeks environmental authorisation for do not trigger EIA Listing Notice 2 activity 18, and that as a consequence environmental authorisation should be refused.

11.

C. POINT *IN LIMINE 2:* EIA APPLICATION PROCESS IRREGULAR

It is submitted that the EIA process has been tainted by an irregular pre-application meeting between the Petroleum Agency of South Africa (PASA) and the EIA consultants, by an irregular decision made by PASA at this meeting regarding specialist studies required, by the environmental authorisation application being irregularly submitted to PASA and not the competent authority, and by specialist assessments being conducted prior to the EIA phase. These irregularities, which we detail below, are prejudicial to I&APs and violate the right of I&APs to procedurally fair decision-making.

12.

Pre-application meeting with PASA irregular

Minutes of a *PASA Pre-Application Meeting* held on 3 Feb 2021 show that the meeting was attended by three representatives of PASA and two representatives of EIMS, and that the minutes were also distributed to Tosaco's Lawrence Mulaudzi.

[7] EIMS response to the Green Connection comments on the Draft DSR, at p4 – 5.

13.

No representative of the competent authority (i.e. the DMRE) was present at this meeting.

14.

In terms of the NEMA Environmental Impact Assessment (EIA) Regulations,[8] a competent authority (i.e. the DMRE in this instance) is empowered to advise or instruct the proponent or applicant of the nature and extent of any of the processes that may or must be followed or decision support tools that must be used in order to comply with NEMA and the EIA Regulations.[9]

15.

No provision is made in the EIA Regulations for a pre-application meeting to be held with PASA. This irregularity is compounded by the fact that PASA is an agency designated by the Minister to (among other things) promote offshore exploration for and production of petroleum.[10] As a result, this pre-application meeting was held *ultra vires* the enabling provisions of NEMA and the EIA Regulations applicable at the time, with an agency with the statutory mandate to promote offshore exploration for and production of petroleum.

16.

Decision on sufficiency of expert reports irregular

Importantly, the minutes of this pre-application meeting show that PASA made an important decision decision regarding the nature and extent of the EIA process to be followed:

> 4.3 It was confirmed that for the assessment of the contingent 3D seismic survey activities, EIMS proposed that a marine ecology and fisheries assessment be undertaken to assess the impacts of the proposed seismic activities within the block.
>
> PN [Phuti Seanego of PASA] confirmed that these activities would be sufficient for the assessment of the proposed activities considering that no drilling is proposed.

17.

It is submitted that PASA was acting *ultra* vires the empowering provisions of NEMA and the EIA Regulations by making this decision regarding what specialist studies should be undertaken. Insofar as this decision may be considered advice or an instruction regarding the nature and extent of the EIA

[8] GNR.982 of 4 December 2014 (as amended at time).
[9] Regulation 8.
[10] MPRDA, section 71(a).

process to be followed, it is the DMRE as the competent authority that is empowered to make this decision (and not PASA).[11] As a consequence of this unlawful decision, the specialist studies were limited to the two specialist studies proposed by EIMs, with no opportunity given to I&APs to comment on or influence this decision.

18.

EIA Application to PASA irregular

According to the DSR and draft EIA Report, Tosaco submitted an application for environmental authorisation to PASA on 17 March 2021.[12] For the reasons set out below, it is submitted that the submission of the environmental authorisation application to PASA was *ultra vires* the enabling provisions of NEMA and the EIA Regulations applicable at the time the application was made.

19.

In terms of the EIA Regulations applicable at the time, an application for an environmental authorisation must be made to the competent authority referred to in regulation 5. The EIA Regulations provide further that if the Minster responsible for mineral resources has delegated any powers or duties of a competent authority in relation to an application, the application must be submitted to the person or authority to whom the powers had been delegated, and that if the Minister responsible for mineral resources is the competent authority in respect of an application, the application must be submitted to the relevant office of the Department responsible for mineral resources as identified by that Department.

20.

In terms of the Listing Notice 2 of 2014, the Minister responsible for mineral resources was identified as the competent authority where the listed activity is or is directly related to (among other things) exploration of a petroleum resource. Section 42B of NEMA provides that the Minister responsible for mineral resources may in writing delegate a function entrusted to him/her in terms of the Act to the Director-General of the Department of Minerals and Energy; or any officer in the department of Minerals and Energy. It is relevant to note that s42B of NEMA does not empower the Minister responsible for Mineral Resources to delegate a function to state-owned agencies or companies, such as PASA. It is also relevant to note that s42B of NEMA also does not include a power to subdelegate.[13]

[11] MPRDA, section 71(i).
[12] Draft EIA Report, p1.
[13] Unlike s42(2)(d) of NEMA, which specifically provides that the Minister responsible for environmental matters may delegate a power or duty vested in him/her to the Director General, an MEC, the management authority of

At the time the application was made by Tosaco, PASA was not acting under any lawful delegation by the Minister. Accordingly, it was irregular and procedurally unfair for the application to have been made to PASA.

21.

It is relevant to note that the EIA Regulations were subsequently amended to make provision for the submission of environmental authorisation applications to the designated agency (PASA) where such applications relate to petroleum resources.[14] However, this amendment was not in force at the time of the application (the amendment took effect on the date of publication of the amendment, namely 11 June 2021, and applies to applications submitted on or after that date).[15] The fact that this provision required an amendment to the EIA Regulations clearly supports the Green Connection's submission that Tosaco's environmental authorisation application was improperly and irregularly submitted to PASA on 17 March 2021 (i.e. was *ultra vires* the enabling provisions of NEMA and the EIA Regulations applicable at the time, which continue to apply to the application in terms of the transitional provisions contained in the amendment Notice[16]).

22.

Conducting specialist assessments prior to EIA phase irregular

In addition to an unlawful decision having been made in the pre-application meeting held between PASA and EIMs regarding what specialists studies were to be undertaken in the EIA, these studies were irregularly conducted prior to the EIA phase of the environmental authorisation process, effectively preventing I&APs from commenting on the specialists studies to be undertaken, the aspects to be assessed by specialists, and the proposed method for assessing all aspects to be assessed by specialists.

23.

With regard to Scoping and Environmental Impact Reporting (S&EIR) processes:

- The EIA Regulations do not make provision for conducting specialist studies during the scoping phase. A scoping report must contain all the information set out in Appendix 2 to the EIA

a protected area, or any organ of state (by agreement with that organ of state). In terms of s42(2)(a) this delegation must be in writing and may include the power to subdelegate.

[14] GN517 of 11 June 2021. See regulation 6(5)(b) of the amended EIA Regulations.

[15] GN517 of 11 June 2021 section 31(1) states that '…the amendments contained in this Notice will apply to applications submitted on or after the date of publication of this Government Notice in the Government *Gazette'.*

[16] GN517 of 11 June 2021, section 30(1).

Regulations.[17] Appendix 2 indicates that a scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must (among other things) include a plan of study for the environmental impact assessment process **to be** undertaken, including aspects **to be** assessed by specialists, and a description of the proposed method for assessing the environmental aspects including all aspects **to be assessed** by specialists.[18] It is submitted that the EIA Regulations read with Appendix 2 clearly do not envisage specialist studies being conducted during the scoping phase, but rather that the scoping report should set out relevant information relating the assessment to follow, including the consultation process to be undertaken.

- In contrast, the EIA Regulations do make provision for conducting specialist studies during the environmental impact reporting phase. An EIA report **inclusive of any specialist reports** must be submitted to the competent authority (i.e. the DMRE).[19] The EIA report must contain all the information set out in Appendix 3 to the EIA Regulations,[20] and specialist reports must contain all information set out in Appendix 6 to the EIA Regulations.[21] Appendix 3 indicates that an EIA report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include (among other things) a summary of the findings and recommendations of any specialist report complying, and an indication as to how these findings and recommendations have been included in the final assessment report.[22]

24.

While the plan of study included in the DSR indicates that EIA phase specialist studies 'will be undertaken as part of the EIA phase of the project',[23] these studies were conducted prior to EIA phase (and in fact pre-dated the scoping phase). This is evident from the specialist studies annexed as appendices to the DSR, namely the *Marine Faunal Impact Assessment* (dated February 2021) and the *Specialist Fisheries Assessment* (dated March 2021). The DSR indicates that these specialists studies '*involved the gathering of data relevant to identifying and assessing preliminary environmental*

[17] Regulation 21(3).
[18] GN982, Appendix 2, section 2(h)(iii) and (iv).
[19] Regulation 23(1)(a).
[20] Regulation 23(3).
[21] Regulation 23(5).
[22] Appendix 3, section 3(k). Specialists are also referred to in sections 3(m) and (o).
[23] DSR, p145.

impacts that may occur as a result of the proposed project. These impacts were assessed according to pre-defined impact rating methodology (Section 9.1)'.[24]

25.

It is submitted that conducting these specialist studies (inclusive of 'preliminary' assessment of identified impacts) prior to the EIA phase of the environmental authorisation process is irregular, and taints the procedural fairness of the S&EIR process by effectively precluding I&APs from commenting on what specialists studies should be undertaken, the aspects to be assessed by specialists, and the proposed method for assessing all aspects to be assessed by specialists. Instead, PASA and EIMS had already decided (in the absence of any input from I&APs) what specialist reports would be conducted, and the specialist reports submitted prior to the EIA phase had already concluded that the proposed seismic survey would not impact significantly on marine fauna and fisheries. For example:

- The February 2021 *Marine Faunal Specialist Assessment* rated the significance of preliminary impacts identified as negligible, very low or low. It stated further that if all environmental guidelines, and appropriate mitigation measures recommended are implemented, '*there is no reason why the proposed seismic survey should not proceed*'.[25] Various and detailed recommendations to mitigate potential impacts were also included in the report.
- The March 2021 *Specialist Fisheries Assessment* included a section on small-scale fishers, and stated that the small-scale fisheries rights cover the nearshore area (i.e. within close proximity of the shoreline) and are unlikely to extend more than 3 nautical miles from the coast, and stated that *'[t]here is no impact of temporary exclusion of fishing operations expected, as the proposed seismic acquisition area lies beyond the expected range of the linefish and rock lobster catch areas'*.[26]

26.

It is hardly surprising that the two specialist studies subsequently attached as appendices to the EIA report were not materially different to the versions attached to the DSR. As far as we can tell, the *Marine Faunal Specialist Assessment* is substantially the same, save for the date of the report having been changed from February 2021 to July 2021.[27] The *Specialist Fisheries Assessment* retains the same

[24] DSR p5.
[25] Marine Faunal Specialist Report (February 2021), p161 section 5.2.
[26] Specialist Fisheries Assessment (March 2021), p56, section 4.2.10.
[27] The report has the identical number of pages and sections (although in the July 2021 some of the page numbers in the Contents page have changed – however the related pages are still the same and bear the same page number). No changes are indicated for example by highlighting changed sections, or using different coloured font. Various pages sampled by the writer appeared to be identical.

report date and is materially the same, but includes some additional information in relation to small-scale fisheries, rock lobster fisheries, abalone ranching, beach-seine and gill net fisheries and seaweed harvesting. This study makes an immaterial concession by assuming that linefish operations could be within the range of the nearshore extent of the proposed 3D seismic survey, but nevertheless concludes that '[t]he impact of temporary exclusion to small scale fishing operations is expected to be of overall LOW NEGATIVE significance'.[28]

27.

Synthesis

It is submitted that the environmental authorisation process has been tainted with irregularity as a result of:

- an *ultra-vires* pre-application meeting between PASA and the EIA consultants;
- an *ultra vires* decision by PASA at this pre-application meeting that specialist studies could be limited to a marine ecology and fisheries assessment;
- the environmental authorisation application being irregularly submitted to PASA and not the competent authority; and
- two specialist assessments being conducted prior to the EIA phase.

28.

These irregularities have resulted in material prejudice to I&APs, rendering their right to participate in decision-making meaningless.

29.

It is submitted that these irregularities constitute fatal flaws in the environmental authorisation process, and that the competent authority should as a consequence refuse to grant authorisation.

30.

In the event that the DMRE decides to consider Tosaco's environmental authorisation application notwithstanding the fatal flaws described above, the Green Connection sets out its further comments on the environmental authorisation application below.

[28] Draft EIA version of Specialist Fisheries Assessment, p59, section 4.1.10.

31.

D. NO ACOUSTIC MODELLING CONDUCTED

It is submitted that the environmental impact assessment undertaken is fatally flawed on the basis that no acoustic modelling has been conducted in respect of the proposed 3D seismic survey.

32.

Tosaco seeks environmental authorisation to, among other things, conduct an additional 3D seismic survey over an area approximately 1 340 km^2.[29]

33.

It is stated in the draft EIA report that '*[d]uring seismic surveys high-level, low frequency sound pulses are generated by an acoustic instrument towed behind a survey vessel, just below the sea surface. The sounds are directed towards the seabed and the seismic signal is reflected by the geological interfaces below the seafloor*'[30]. It is stated further in the draft EIA report that:

> The proposed survey would involve a **seismic sound source (airgun array)** and multiple hydrophone streamers, which would be up to **10,000 m long**. The streamers would be towed at a depth of 9 m to 10 m below the surface and would not be visible, except for the tail-buoy at the terminal end of the cable. **The sound source or airgun array would be towed 80 – 150 m behind the vessel at a depth of between 5 – 25 m below the surface**…
>
> **Each triggering of a sound pulse is termed a seismic shot**, and these are **fired at intervals of 10 – 20 seconds** and **at an operating pressure of between 2 000 to 2 500 psi and a volume of 3 000 to 5 000 cubic inches**. Each seismic shot is usually only between 5 and 30 milliseconds in duration, and despite peak levels within each shot being high, the total energy delivered into the water is low.
>
> Airguns have most of their energy in the 5-300 Hz frequency range, with the optimal frequency required for deep penetration seismic work being 50-80 Hz. The maximum sound pressure levels at the source of airgun arrays in use today in the seismic industry are typically around 220 dB re 1µPa at 1 m, with the majority of their produced energy being low frequency of 10-100 Hz. The location where this level of sound is attained is directly beneath the airgun array, generally near its centre, but **the exact location and depth beneath the array are dependent on the detailed makeup of the array, the water depth, and the physical properties of the seafloor**. However, **based on analogue sound sources, sound levels for the seismic survey can notionally be expected to attenuate below 160 dB less than 1 325 m from the source array**. [31] (emphasis added)

34.

The draft EIA report does not indicate what specific array Tosaco is intending to use, or what the

[29] Draft EIA Report, p19.
[30] Draft EIA report, p17.
[31] Draft EIA report, p19.

'analogue sound sources' referred to in the draft EIA report are (the specific or range of 'analogue' sound sources referred to are not revealed or described). The basis on which the analogue sound sources are used to predict potential impacts is therefore unclear and unsubstantiated.

35.

The draft EIA report goes on to state that:

> The **airguns used in modern seismic surveys produce some of the most intense non-explosive sound sources used by humans in the marine environment** (Gordon et al. 2004). However, the **transmission and attenuation of seismic sound is probably of equal or greater importance in the assessment of environmental impacts than the produced source levels themselves, as transmission losses and attenuation are very site specific, and are affected by propagation conditions, distance or range, water and receiver depth and bathymetrical aspect with respect to the source array**. In water depths of 25 - 50 m airgun arrays are often audible above ambient noise levels to ranges of 50 - 75 km, and **with efficient propagation conditions such as experienced on the continental shelf or in deep oceanic water, detection ranges can exceed 100 km and 1,000 km**, respectively (Bowles et al. 1991; Richardson et al. 1995; see also references in McCauley 1994). The **signal character of seismic shots also changes considerably with propagation effects**. **Reflective boundaries include the sea surface, the sea floor and boundaries between water masses of different temperatures or salinities, with each of these preferentially scattering or absorbing different frequencies of the source signal**. This results in the received signal having a different spectral makeup from the initial source signal. **In shallow water (<50m)** at ranges exceeding 4 km from the source, signals tend to increase in length from <30 milliseconds, with a frequency sweep of between 200 – 500 Hz and a longer rise time….
>
> In contrast, **in deep water received levels vary widely with range and depth of the exposed animals, and exposure levels cannot be adequately estimated using simple geometric spreading laws** (Madsen et al. 2006). These authors found that the received levels fell to a minimum between 5 - 9 km from the source and then started increasing again at ranges between 9 – 13 km, so that **absolute received levels were as high at 12 km as they were at 2 km**, with the complex sound reception fields arising from multi-path sound transmission.[32] (emphasis added)

It is stated further that:

> **3D seismic surveys are conducted on a very tight survey grid, typically over a smaller area** within which promising petroleum prospects are suspected, **the acoustic impact within the localised area persists for longer relative to that experienced within a particular location during a widely spaced 2D survey**. Although the overall duration of a 3D survey is not necessarily longer than for a 2D survey, **the impact of seismic noise will be locally somewhat higher for a 3D survey compared to a 2D survey**. 2D surveys in contrast tend to be conducted over a larger area, and the spatial extent of the impact may thus be higher for 2D surveys.[33] (emphasis added)

[32] Draft EIA Report, p144.
[33] Draft EIA Report, p145.

36.

It is evident from the above that there is no doubt that the high-level, low frequency sound pulses generated by an acoustic array will have sound impacts on the receiving marine environment (and more so than 2D seismic surveys), and that the transmission and attenuation of seismic sound is of equal or greater importance in the assessment of environmental impacts than the produced source levels themselves given that transmission losses and attenuation are very site specific, and are affected by propagation conditions, distance or range, water and receiver depth and bathymetrical aspect.

37.

Notwithstanding the above, no acoustic modelling has been conducted in the area earmarked for the 3D seismic survey.

38.

Instead, analogue information appears to have been drawn from published literature, as well as '*sound transmission loss modelling undertaken for a licence block on the Agulhas Bank, where the shallowest point modelled was at similar depth to that of the proposed 3D survey area in Block 1'*.[34] The Agulhas Bank stretches from off the Cape peninsular to Port Alfred. Apart from the shallowest point modelled reportedly being at a similar depth to that of the proposed 3D survey area in Block 1, it is difficult to see how this modelling of possibly different sound arrays, in a different region, with different water temperatures and currents, and different habitats and bathymetry, can be sufficiently 'analogous' to serve as a reliable basis for impact assessment and decision-making. Nor is this explained in the draft EIA report.

39.

By contrast, it is pointed out that in respect of a reconnaissance permit application currently being made by Spectrum for permission to conduct a multiclient 2D seismic survey in various blocks of the West Coast (including portions of Block 1), the environmental management plan (EMP) published for public comment includes an underwater acoustics modelling study.[35]

[34] Draft EIA Report, p145.

[35] Proposed Speculative 2D Seismic Survey off the West Coast of South Africa: Environmental Management Plan, PASA Ref. 12/1/033, by SLR for Spectrum. See for example Executive Summary pi-ii, and Appendix 4 *Sound Transmission Loss Modelling Study.*

40.

In his assessment of the impact of seismic surveys on South African Fisheries, Russell[36] points out that '*there is no such thing as a typical seismic survey: research indicates precise responses to air gun and seismic survey noise are species specific and dependent on the actual noise exposure regime'.*[37] Russell states further that:

> Operational aspects such as the "zones of effect" (specific for each airgun signal), how many and how widely spaced they are; the depth and size of the prospecting area; particulars for the data acquisition; and duration of the survey, all need to be incorporated in the planning phase to give some idea of the full impact of a specified seismic survey. **Risk assessments should include characteristics of the specific survey to be used, modelling of probable noise propagation in the area to be surveyed and knowledge of the species present and awareness of their biology**.[38] (emphasis added)

41.

In *Earthlife Africa Johannesburg v Minister of Environmental Affairs* 2017 (2) SA 519 GP, the High Court gave judicial recognition to a climate change assessment being a relevant factor which must be considered before granting environmental impact authorisations, despite this not being specified in the regulatory framework. Following this reasoning, it is submitted that acoustic sound modelling is required in this EIA in order to more reliably assess the potential significance of the proposed 3D seismic survey on the targeted seismic survey area.

42.

For the reasons set out above, the Green Connection submits that the draft EIA report is fatally flawed in the absence of a technology-specific acoustic sound modelling conducted in the proposed 3D seismic survey area, and that environmental authorisation should accordingly be refused. Should an environmental authorisation be granted in the absence of such acoustic sound modelling, the authorisation decision itself will be vulnerable to being set aside on review for failing to take a relevant factor into account.

43.

E. INFORMATION GAPS AND SCIENTIFC UNCERTAINTY

It has been pointed out earlier in these comments that the specialist studies undertaken in respect of

[36] Russell, D. 'Assessing the Impact of Seismic Surveys on South African Fisheries' (5 April 2018). Available online at: www.rfalliance.org.za/wp-content/uploads/2018/10/Assessing-Impact-of-Seismic-Surveys-on-South-African-Fisheries-April-2018.pdf (last accessed 31 August 2021).
[37] Russell, p5.
[38] Russell, p5.

the proposed 3D seismic survey were irregularly carried out prior to the impact assessment phase of the EIA (see paragraph), and that, save for some additional information added to the fisheries study, the reports annexed to the Draft EIA Report are substantially the same.

44.

In addition, these specialist reports appear to be primarily desktop studies. The *Marine Faunal Specialist Report* states as much, and is at least in part based on a 2001 generic EMPR:

> As determined by the terms of reference, this study has adopted a 'desktop' approach. Consequently, the description of the natural baseline environment in the study area is based largely on the baseline description provided in the Marine Faunal Assessment compiled in 2012 as part of the EIA for the Addendum to PetroSA's EMPr for 2D and 3D seismic surveying in Block 1, and the subsequent Marine Faunal Assessment compiled in 2012 as part of the EIA for well drilling by Cairn South Africa (Pty) Ltd. These reports in turn was based on a review and collation of existing information and data from the scientific literature, internal reports and the Generic Environmental Management Programme (EMPr) compiled for oil and gas exploration in South Africa (CCA and CMS 2001). Information on the baseline environment had been updated where appropriate. The information for the identification of potential impacts of seismic activities on marine fauna was drawn from various scientific publications, the Generic EMPR, information sourced from the Internet as well as Marine Mammal Observer close-out Reports. The sources consulted are listed in the Reference chapter.[39]

It is relevant to note that the 2001 EMPR was '*co-funded by the offshore prospecting operators and co-ordinated by the Petroleum Agency SA*'[40] and that the consultants were commissioned by PASA '*to draw-up this Generic Environmental Management Programme Report (EMPR) model in order to address concerns raised by industry regarding the time and cost incurred in compiling an EMPR for each individual prospect programme*'.[41] As a consequence this EMPR cannot be viewed as independent. Notwithstanding this, the generic Environmental Impact Report developed as part of this 2001 EMPR acknowledges regarding the impact of seismic activities on marine animals that *'[a] specific shortfall of information in this regard was identified on the West Coast*',[42] while the Baseline Environmental Report also developed as part of this 2001 EMPR cautions that *'[i]t should be noted that advances in technology are allowing oil and gas exploration activities to extend into deeper water environment (beyond the 10000 m isobath) and that very little information is available on biological communities in these areas'*.[43]

[39] Marine Faunal Specialist Report (July 2021), p2.
[40] Generic EMPR: Volume 1 - User Manual (2001), at pii.
[41] Ibid, p1-1.
[42] Generic EMPR: Volume 3 – Environmental Impact Report (2001), p2-3.
[43] Generic EMPR: Volume 2 – Baseline Environmental Report (2001), p2-3.

45.

The specialist studies conducted for the Tosaco EIA also acknowledge a lack of available data relating to the proposed 3D seismic survey area, and document a number of uncertainties.

46.

For example, the draft EIA report, DSR and/or *Marine Faunal Specialist Report* indicate that (among other things):

- A 2018 National Biodiversity Assessment for the marine environment points out that very few national IUCN Red List assessments have been conducted for marine invertebrate species to date owing to inadequate taxonomic knowledge, limited distribution data, a lack of systematic surveys and limited capacity to advance species red listing for these groups.[44]
- South Africa's seamounts and their associated benthic communities have not been extensively sampled by either geologists or biologists.[45]
- Leatherback turtles are indicated as the only turtle likely to be encountered in the offshore waters of west South Africa, and *'[t]heir abundance in the study area is unknown but expected to be low*'.[46]
- 33 species of whales and dolphins are known to occur in these waters, including the blue whale (critically endangered) and fin and sein whales (endangered). 17 species are listed as data deficient. '*The offshore areas have been particularly poorly studied with almost all available information from deeper waters (>200m) arising from historic whaling records prior to 1970. Current information on the distribution, population sizes and trend of most cetacean species occurring on the west coast of southern African is lacking. Information on smaller cetaceans in deeper waters is particularly poor and the precautionary principle must be used when considering possible encounters with cetaceans in this area*'. [47]
- While it is claimed that increasing numbers of southern right and humpback whales suggests that seismic surveys conducted over the past 17 years have not negatively influenced the distribution patterns of these two migratory species at least, *'[i]nformation on the population trends of resident species of baleen and toothed whales is unfortunately lacking, and the potential effects of seismic surveys on such populations remains unknown'*.[48]

[44] DSR, p58. Draft EIA Report, p59.
[45] DSR, p62. Draft EIA Report, p63.
[46] Draft EIA Report, p70.
[47] DSR, p72. Draft EIA Report, p73-74.
[48] *Marine Ecological Impact Assessment*, p159.

- While relatively low behavioural risks are expected for fish species at far field distances (thousands of metres) from a source location, '*as hearing sensitivity can vary with life-cycle stage, season, locality and duration of shooting…., it is difficult to determine with accuracy the impact of seismic sound on the behaviour of fish'.*[49]
- It is recognised that changes in spawning, migration and feeding behaviour of fishes in response to seismic shooting '*could indirectly affect fisheries through reduced catches resulting from changes in feeding behaviour, abundance and vertical distribution… Such behavioural changes could lead to decreased commercial catch rates if fish move out of important fishing grounds…. Reports on observed declines in catch rates differ considerably between studies, between target species and gear types used, ranging from no apparent reduction to an 83% reduction in bycatch in shrimp trawl… and typically persisting for a relatively short duration only (12 hours to up to 10 days)',* while the distance from the seismic source at which reductions in catch rates were measured '*also varied substantially between studies ranging from approximately 8 km to as much as 36 km… Airgun noise related to changes in prey and predator species of commercially important species could also play a role in affecting catch rates…. Information on feeding success of fish (or larger predators) in association with seismic survey noise is lacking'.*[50]
- It is reported that seismic activities have been '*predicted to possibly affect the migration patterns of tuna leading to substantially reduced catches of albacore and southern bluefin tuna in southern Namibia… In the Benguela region it has been suggested that the seasonal movement of longfin tuna northwards from the west coast of South Africa into southern Namibia may be disrupted by the noise associated with seismic surveys. Longfin and other tuna species migrations are known to be highly variable from year to year and are associated with prey availability and also favourable oceanographic conditions. While the potential exists to disrupt the movement of longfin tuna in the Benguela, this disruption, if it occurs, would be localised spatially and temporarily and would be compounded by environmental variability… As there is currently a dearth of information on the impacts of seismic noise on truly pelagic species such as swordfish and tuna…, links between changes in migration patterns and subsequent catches thus remains speculative*'.[51]
- It is stated that '*although the effects of airgun noise on spawning behaviour of fish have not been quantified to date, it is predicted that if exposed to powerful external forces on their migration paths or spawning grounds, they may be disturbed or even cease spawning altogether. The deflection from migration paths may be sufficient to disperse spawning*

[49] *Marine Ecological Impact Assessment*, p89.
[50] *Marine Ecological Impact Assessment*, p89.
[51] *Marine Ecological Impact Assessment*, p90.

aggregations and displace spawning geographically and temporally, thereby affecting recruitment of fish stocks. The magnitude of effect in these cases will depend on the biology of the species and the extent of the dispersion or deflection. Depending on the physical characteristics of the area, the range of the impact may extend beyond 30 km…, and could thus potentially affect subsequent recruitment of fish stocks if spawning is displaced geographically or temporally.'[52]

47.

The *Assumptions and Limitations* section of the draft EIA report also indicates that information gaps with regard to marine ecology, including:

- Details of the benthic macrofaunal communities and potentially vulnerable species in deep water habitats; and
- Current information on the distribution, population sizes and trends of most pelagic seabird, turtle and cetacean species occurring in South African water and the project area in particular.[53]

48.

With regard to fisheries, the same section of the EIA Report indicates that:

> *The effect of seismic sound on the CPUE* [catch per unit effort] *of fish and invertebrates have been drawn from the findings of international studies.* ***To date there have been no studies focused directly on the species found locally.*** *Although the results from international studies are likely to be representative for local species,* ***current gaps in knowledge on the topic lead to uncertainty when attempting to accurately quantify the potential loss of catch for each type of fishery. Research into the effects of seismic sound on marine fauna is ongoing.***'**[54] (emphasis added)

49.

A 2015 article by Hawkins *et al* (which study does not appear to have been considered in the *Marine* Ecology specialist report) identifies a number of information gaps relating to understanding the effects of noise on fishes and invertebrates.[55] This study notes that the expansion of shipping and aquatic industrial activities has lead to growing concerns about the effects of anthropogenic sounds on aquatic

[52] *Marine Ecological Impact Assessment*, p90.
[53] Draft EIA Report, p184.
[54] Draft EIA Report, p184.
[55] Hawkins *et al* 'Information gaps in understanding the effects of noise on fishes and invertebrates', Rev Fish Biol Fisheries (2015).

life, including sound from offshore oil exploration and production.[56] Among other things, the study makes the following relevant observations:

- There are '*very substantial gaps in our understanding of the effects of these sounds, especially for fishes and invertebrates. Currently, it is almost impossible to come to clear conclusions on the nature and level of man-made sound that have the potential to cause effects upon these animals'*.[57]
- While direct physiological impacts (such as mortality) of seismic impulses are likely limited to species close to seismic airgun arrays, '*research into the effects of acoustic noise exposure has examined only a fraction of fishes or invertebrates'*.[58]
- Furthermore, *'[m]any fishes, and at least some invertebrates, depend on sound to communicate with each other, detect prey and predators, navigate from one place to another, avoid hazards, and generally respond to the world around them'*.[59]
- While there is limited data on the effects of sound on mortality of fish, *'[t]he greater likelihood is that fishes and invertebrates will be injured by high intensity impulsive sounds with rapid rise times, and that some of these injuries could result in fatalities over the short term or over a longer term if animal fitness is compromised…. If an animal is injured it may be more susceptible to infection because of open wounds or a compromised immune system. Even if the animal is not compromised in some way, it is possible that the damage will result in lowering fitness, reducing the animal's ability to find food or make it more subject to predatio*n'.[60]
- Concerns include how anthropogenic sound can alter the general behaviour of fish and invertebrates given that they are '*likely to show behavioural responses to sounds at much greater distances from the sources than those that will result in physical injury. Changes in behaviour could have population level effects as a consequence of keeping animals away from preferred habitats, diverting them from migratory routes…, or interfering with reproductive behaviour'*.[61]
- In their review of studies on the behaviour of wild fishes in response to sounds, Hawkins *et al* point out that *'[s]uch studies have been confined to very few species and the data are often contradictory. There is a lack of information not only for immediate effects on fish that are close*

[56] Ibid, 39-64.
[57] Ibid, p39.
[58] Ibid, p49.
[59] Ibid, p52.
[60] Ibid, p54.
[61] Ibid, p54.

to a source but also on fish that are more distant'.[62]

- There '*is a particular need to investigate the propagation of sound and vibration through the seabed, as this is especially relevant to benthic fishes and invertebrates and for exposure to…. seismic airguns'*,[63] with many fish and invertebrates sensitive to particle motion rather than sound pressure.

50.

An assessment of the impact of seismic surveys on South African Fisheries was also conducted by Russell[64] (this report also does not appear to have been considered in the specialist studies conducted for the EIA). Russel points out that:

> Seismic air gun arrays output a rather broadband low-frequency sound (i.e. not a single "tone" or "chord", but rather a noise composed of an undifferentiated range of tones). Peak output is generally in the range of 50Hz, with a secondary peak appearing in the 150-200Hz range, and continuing decreasing peaks up to almost 1kHz. **The end result of all this is that, given the relatively extreme source levels of airgun sound, even creatures whose hearing is not centred on the lower frequencies can hear and are affected by the sound of seismic surveys.**[65] (emphasis added)

51.

Russell goes on to point out that:

- Fish hearing via the inner ear is typically restricted to low frequencies, but that fish also receive low-frequency sound through their lateral lines to detect water movement relative to the fish. It is thought that the lateral lines functions in a variety of behavioural contexts, '*including prey localization, predator avoidance, communication during spawning, and navigation around obstacles. The relationship between the lateral line and the auditory system of fish is not fully understood and continues to be investigated*'.[66]
- Fish also respond to pressure gradients with their lateral lines and swim bladders, and have particle motion sensors. These systems are used to respond to subtle phase differences (for example to instantly join in schooling movements or to respond to disturbances caused by a food source). While all sound diminishes with distance, '*low-frequency sounds diminish more slowly, meaning their impact can last over longer distances than those of high-frequency sounds.*

[62] Ibid, p54-56
[63] Ibid, p57.
[64] Russell, D. 'Assessing the Impact of Seismic Surveys on South African Fisheries' (5 April 2018). Available online at: www.rfalliance.org.za/wp-content/uploads/2018/10/Assessing-Impact-of-Seismic-Surveys-on-South-African-Fisheries-April-2018.pdf (last accessed 31 August 2021).
[65] Russell, p4.
[66] Russell, p4.

Energy at low frequencies can travel great distances. Thus, there can be a larger potential range of impact to organisms whose hearing is tuned to lower frequencies, or who use low frequencies to communicate'.[67]

- Fish use sound to communicate, and sound may be related to reproduction and used as an escape response, while sound interception is used respond to the sounds of prey or predators: '*It is possible that man-made sound could mask or otherwise interfere with fish communication. The consequences of interruption of communication between fishes are essentially unknown*'.[68] Furthermore, '*[s]tudies indicate that behavioural and physiological reactions to seismic sounds may vary between fish species (for example, according to whether they are territorial or pelagic) and also according to the seismic equipment used. Because of the complexity of marine ecosystems, and because sea species respond to sound in ways well beyond current human understanding, ongoing research is required, and a common sense precautionary approach is needed'.*[69]
- Frequency ranges are also important, with larger whales '*likely the most susceptible to direct impact by relatively low frequency output of airguns, since they make the most use of low frequency bands themselves'*.[70]

52.

Russell summarises the potential impacts on South African fisheries as follows, with the following negative impacts identified:

- **Hake** – seismic surveys appear not to impact hake long term. With hake there is temporary behavioral disruption, Namibian hake longliners saying that after a seismic vessel goes past, **the hake disappears for around three days before they are able to start catching again.**
- **Small pelagic fishery** – seismic surveys **may have a significant impact, long surveys of around 6 months, and multiple survey cumulative impact particularly in 2013, may have cost the industry a lot of money.**
- **West coast tuna pole and line fishery** – impacts appear to be localized, disrupting fast swimming tunas migration flow by forcing them to move on. **But where there are cumulative impacts from repetitive surveys in the same area, as has occurred off Southern Namibia tuna fishing grounds, where catches have severely declined since 2011, and in 2017 dropped off to non-commercial catch rates, there is the ominous possibility that the tunas change their migration path. Environmental factors such as El Nino appear to also have contributed significantly, but combined with regular seismic surveys, the environmental signals are potentially devastating**….
- **Squid** – serious scientific concerns about the impact of low frequency seismic sound on squid. **Appears to be a drop in squid jig catches with seismic surveys**.

[67] Russell, p5.
[68] Russell, p5.
[69] Russell, p5.
[70] Russell, p5.

- **Rock lobster** – no significant drop in catches, but need research on different life history stages, which have different levels of sensitivity to airgun sound. **Findings among related species show that egg development among specific crustaceans may be retarded, metabolic rates increased and internal organs damaged following exposure to high amplitude anthropogenic sound**.[71]

53.

Notwithstanding the lack of baseline data from the area in question and the scientific uncertainty acknowledged in the EIA reports and described in other articles, the EIA rates all potential impacts as (very) low to low (especially after mitigation). In its response to the Green Connection's comments on the DSR, EIMS simply indicate that the conclusions and significance ratings contained in the specialist reports are in line with similar specialist studies undertaken for seismic surveys over the past 10 years,[72] and that *'[b]ased on discussions with the relevant specialist and with due consideration of the extent, duration, and magnitude of the proposed exploration activities it is understood that there is adequate information to be able to make a reasonable assessment of the likely impacts'*.[73]

54.

The Green Connection submits that in light of the data and information gaps and lack of certainty, insufficient data is available to draw credible conclusions regarding the significance of seismic survey impacts on marine fauna and fisheries, and that as a consequence the draft EIA report does not contain sufficient information necessary for the competent authority to consider and come to a decision on the applicaiton. In the Green Connection's view, a proper application of the precautionary approach[74] should result in the EIA indicating that insufficient data is available to rate the significance of the potential impacts (rather than acknowledging the gaps and uncertainty, but forging ahead to nevertheless rate the significance of impacts as low to very low). Accordingly, the Green Connection submits that the proposed 3D seismic survey should not be authorised in the absence of baseline data relating to the proposed 3D seismic survey area, and until such time as the various uncertainties relating to the significance of impacts of 3D seismic surveys on marine fauna have been clarified and information gaps filled.

[71] Russell, p6.
[72] EIMS response to the Green Connection comments on the Draft DSR, at p12.
[73] Ibid, at p13.
[74] Section 2(4)(a)(vii) of NEMA stipulates that sustainable development requires the consideration of all relevant factors, including that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and action.

55.

F. MPAs, EBSAs, CBAs, ESAs and VMEs

Block 1 and/or the proposed seismic survey area intersects Marine Protected Areas (MPAs), provides habitat or migratory routes to a number of critically endangered, endangered or threatened species, and also includes Ecologically or Biologically Significant Areas (EBSAs), Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs) and Vulnerable Marine Ecosystems (VMEs).

56.

For example, the draft EIA Report indicates that:

- Seamounts provide an important habitat for commercial deep water fish stocks such as Patagonian toothfish, which aggregate around these features either for spawning or feeding. '*Consequently, the fauna of seamounts is usually highly unique and may have a limited distribution restricted to a single geographic region, a seamount chain or even a single seamount location. As a result of conservative life histories… and sensitivity to changes in environmental conditions, such biological communities have been identified as Vulnerable Marine Ecosystems (VMEs). They are recognised as being particularly sensitive to anthropogenic disturbance (primarily deep-water trawl fisheries and mining), and once damaged rare very slow to recover, or may never recover*'.[75]
- The fish most likely to be encountered on the shelf and in the offshore waters of Block 1 are large migratory pelagic species, such as tuna, billfish and sharks, '*many of which are considered threatened by the International Union for the Conservation of Nature (IUCN), primarily due to overfishing*'.[76]
- Leatherback turtles are indicated as the only turtle likely to be encountered in the offshore waters of west South Africa, and *'[t]heir abundance in the study area is unknown but expected to be low*'.[77] Leatherback turtles are listed as 'critically endangered' by the IUCN, and '*are in the highest categories in terms of need for conservation in CITES… and CMS'*. The 2017 South African lists of Threatened and Endangered Species (TOPS) similarly list the species as 'critically endangered', while the National Assessment listed them as 'endangered'. '*South Africa is thus committed to conserve these species at an international level*'.[78]

[75] Draft EIA Report, p62.
[76] Draft EIA Report, p68.
[77] Report, p70.
[78] Draft EIA Report, p70.

- A number of conservation areas and a MPA exist along the coastline of the Western Cape. The DSR states that '*the only conservation area in the vicinity of the project area in which restrictions apply is the McDougall's Bay rock lobster sanctuary near Port Nolloth… The Orange River Mouth wetland located at the northern corner of Block 1 provides and important habitat for large numbers of a great diversity of wetland birds and is listed as a Global Important Bird Area (IBA)…. The area was designated as a Ramsar site in June 1991, and processes are underway to declare a jointly-managed transboundary Ramsar reserve. Various Marine IBAs have also been proposed in South African and Namibian territorial waters, with a candidate trans-boundary marine IBA suggested off the Orange River mount…. Block 1 lies south of the Atlantic Southeast 21 marine IBA and overlaps with the candidate Orange River Mouth Wetland IBA*.'[79]
- Block 1 overlaps with the Orange Shelf Edge and Namaqua Fossil Forest MPA.[80] According to figure 84,[81] the proposed 3D seismic survey area overlaps part of the Namaqua Fossil Forest EBSA. The fossilized trees '*are not known to be found anywhere else in our oceans and are valuable for research into past climates. In 2014 this area was recognised as globally important and declared as an EBSA. The 1 200 km^2 MPA protects the unique fossil forests and the surrounding seabed ecosystems and including a new species of sponge previously unknown to science*'.[82]
- A number of 'endangered' and 'vulnerable' ecosystems types are currently not well protected. '*Currently… most of the Southern Benguela Sandy Shelf Edge and Southeast Atlantic Upper- and Mid-Slope are poorly protected… whereas the Southeast Atlantic Lower Slope receives no protection at all*'.[83]
- '*As part of a regional Marine Spatial Management and Governance Programme (MARISMA 2014-2020) the Benguela Current Commission (BCC) and its member states have identified a number of EBSAs… with the intention of implementing improved conservation and protection measures within these sites'*. 3 trans-boundary EBSA's are shared with Namibia. '*The principal objective of these EBSAs is identification of features of higher ecological value that may require enhanced conservation and management measures. They currently have no legal status*'.[84]
- Regarding EBSA's, Figure 86 indicates critical biodiversity areas and an ESA in the proposed 3D seismic survey area. The DSR indicates that '*Future activities that may be prohibited in the conservation zone of these EBSAs includes mining construction and operations, although non-*

[79] Draft EIA Report, p125.
[80] Draft EIA Report, p125.
[81] Draft EIA Report, p127.
[82] Draft EIA Report, p125.
[83] DSR, p113. Draft EIA Report, p127.
[84] Draft EIA Report, p128.

*destructive or highly localised prospecting activities may be conducted in the impact management zone. Block 1 and the proposed 3D survey area overlaps with the southern portion of the Namaqua Fossil forest EBSA biodiversity conservation zone in which non-destructive exploration and destructive localised impacts such as exploration wells will be conditionally permitted, but petroleum production is considered incompatible**.** It must be noted however, however, that the EBSA Zone boundaries are subject to ongoing revision based on discussions with the National EBSA Working Group. These zones have been incorporated into the most recent iteration of the national Coastal and Marine Critical Biodiversity Area (CBA) Map… released on 26 February 2021 (Figure 86). This indicates that CBA1 and CBA2 regions extend south and offshore of the Namaqua Fossil Forest MPA and across the proposed 3D survey area. CBA 1 indicates irreplaceable or near-irreplaceable sites that are required to meet biodiversity targets with limited, if any, option to meet targets elsewhere, whereas CBA 2 indicates optimal sites that generally can be adjusted to meet targets in other areas. Ecological Support Areas (ESAs) represent EBSAs outside of MPAs and not already selected as CBAs. Sea-use within the CBAs and ESAs reflect those specified by the EBSA biodiversity conservation and management zones described above'*.[85] (emphasis added)

57.

In its comments on the DSR, the Green Connection submitted that in light of the data and information gaps and lack of certainty acknowledged in the DSR, and having regard to these EBSAs, CBAs, ESAs and VMEs located in the proposed seismic survey area, the proposed 3D seismic survey should not proceed until sufficient knowledge and information is available (properly applying the precautionary approach).

58.

In its response to the Green Connection's comments on the DSR, EIMS attempt to side-step the importance of these areas by pointing out that *'CBAs and EBSAs currently carry no legal status'* but that '*despite this, the [marine ecology] specialist has assessed the impacts on the various organism groups and identified mitigation measures that reduce the residual risk of the proposed activities, despite the information gaps. As such, the mitigation measures proposed provide the necessary risk averse and cautious approach'.*[86]

[85] Draft EIA Report, p129.
[86] EIMS response to the Green Connection comments on the Draft DSR, at p13.

59.

For the reasons set out in paragraph E above, the Green Connection contests the assertion that a proper assessment of the impacts on various organism groups could be conducted 'despite the information gaps', or that the mitigation measures constitute a risk averse and cautious approach to the assessment of impacts where there are significant information gaps, as well as scientific uncertainty regarding the impacts of 3D seismic surveys on marine fauna.

60.

With regard to the statement made by EIMS that CBAs currently carry no legal status, it is submitted that EBSAs, CBAs, ESAs and VMEs merit special consideration, and that adverse impacts on such areas and ecosystems should be avoided. Among other things, it is relevant to note that the National Environmental Management: Biodiversity Act (NEMBA)[87] requires the State, in fulfilling the rights contained in section 24 of the Constitution, to manage, conserve and sustain South Africa's biodiversity and its components and genetic resources, and to implement NEMBA to achieve the progressive realisation of those rights.[88] Exercising powers contained in section 38 of NEMBA, the Minister responsible for environmental affairs published a National Biodiversity Framework (NPF).[89] The NBF indicates that its purpose is (among other things) to provide a framework for conservation and development, and that there is need to achieve economic growth in a way that allows for the continued functioning of ecosystems and persistence of the natural resource base. The NBF indicates that sustainable development depends on where and how development takes place, and states that development is not sustainable if it results in (among other things) *'loss and degradation of habitat in threatened ecosystems and* ***critical biodiversity areas'***.[90] Consideration of the sustainability of a proposed activity thus requires consideration of the risk of loss or degradation in such threatened ecosystems and critical biodiversity areas.

61.

The Green Connection submits that the presence of these EBSAs, CBAs, ESAs and VMEs located in the proposed seismic survey area are relevant factors that have to be taken into account by the competent authority when making its decision on authorisation, and that it must do so in a manner that meets its duty to fulfil the rights contained in section 24 of the Constitution by managing, conserving and sustaining South Africa's biodiversity and its components and genetic resources. The Green

[87] 10 of 2004.
[88] Section 3.
[89] GN 813 of 3 August 2009: National Biodiversity Framework.
[90] Section 1.1.

Connection submits further that it is inappropriate to authorise 3D seismic surveys in such environmentally sensitive areas (which surveys could result in subsequent invasive exploration and production drilling activities, with additional significant risks to these areas). Accordingly, it is submitted that the environmental authorisation application should be refused.

62.

G. NEED AND DESIRABILITY

The NEMA EIA Regulations indicate that the objective of the EIA process is to (among other things) describe the need and desirability for the proposed activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report,[91] and an EIA report must contain a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.[92]

63.

As was pointed out in the Green Connection's comment on the DSR, a distinction is drawn between the 'general purpose and requirements' of the proposed activity and 'need and desirability'. The 2017 *Guideline on Need and Desirability* states as follows:

> In order to properly interpret the EIA Regulations' requirement to consider "need and desirability", it is necessary to turn to the principles contained in NEMA, which serve as a guide for the interpretation, administration and implementation of NEMA and the EIA Regulations. With regard to the issue of "need", it is important to note that this "need" is not the same as the "general purpose and requirements" of the activity. While the "general purpose and requirements" of the activity might to some extent relate to the specific requirements, intentions and reasons that the applicant has for proposing the specific activity, the "need" relates to the interests and needs of the broader public.
> …
> The consideration of "need and desirability" in EIA decision-making therefore requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest. The government decision-makers, together with the environmental assessment practitioners and planners, are therefore accountable to the public and must serve their social, economic and ecological needs equitably. Ultimately development must not exceed ecological limits in order to secure ecological integrity, while the proposed actions of individuals must be measured against the short-term and long-term public interest in order to promote justifiable social and economic development – i.e. ensuring the simultaneous achievement of the triple bottom-line. Considering the merits of a specific application in terms of the need and desirability considerations, it must be decided which alternatives represent the "most practicable environmental option", which in terms of the definition in NEMA and the purpose of the EIA Regulations are that option that

[91] NEMA EIA Regulations, Appendix 3, section 2(1)(b).
[92] NEMA EIA Regulations, Appendix 3, section 3(f).

> provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long-term as well as in the short-term.[93] (emphasis added)

64.

Given that exploration operations are intended to define traps to be tested by drilling of a well with the intention of locating a discovery (of hydrocarbons below the seabed), and which in turn would likely lead to production operations should commercially exploitable hydrocarbon resources be discovered, the Green Connection is of the view that addressing the need and desirability within the context of ecologically sustainable development requires at the very least an initial assessment and consideration of the environmental health and safety consequences of the project, including an assessment of need and desirability, throughout its life cycle[94] (rather than ring-fencing the assessment of impacts and the consideration of need and desirability to the reprocessing of seismic data and acquisition of new seismic data).

65.

This will necessarily entail a consideration of (among other things):

- Climate change impacts associated with exploration, production and use of hydrocarbons discovered in Block 1, including: its impact on South Africa's ability to meet its international responsibilities to address climate change; whether the proposed project promotes increased dependency on non-renewable hydrocarbon resources or reduces such resource dependency; and whether the exploration for and subsequent discovery of new hydrocarbon resources will impact positively or negatively on future generations of South Africans;
- Ecological and socio-economic impacts associated with a major oil spill (such as an uncontrolled wellhead blowout) during likely future exploration well drilling and testing and/or production activities, including potential impacts on small-scale fishers and coastal communities that depend on the ocean for their livelihoods; and
- Critical Biodiversity Areas and Ecological and Biologically Significant Areas located within Block 1 and within the proposed seismic survey area where '*petroleum production is considered incompatible*'.[95]

[93] DEA (2017) *Guideline on Need and Desirability*, Department of Environmental Affairs, at p 10.
[94] Section 2(4)(e) of NEMA stipulates that responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
[95] Draft EIA Report, p129. See also Figure 86, depicting Critical Biodiversity Areas and Ecological Support Areas in the proposed 3D seismic survey area.

66.

It is noted that EIMS limits the consideration of need and desirability to the exploration for oil and gas (excluding drilling), stating that the project '*will not, at this stage, involve the use of natural resources identified as part of the proposed exploration project*', while at the same time acknowledging that *'[t]he proposed project aims to identify oil and gas resources to be used in the energy production and/or processing or manufacturing of materials'*.[96]

67.

It is also noted that in relation to the question of whether a risk-averse and cautious approach was applied to socio-economic impacts, the draft EIA report indicates that '*[t]he level of risk is low as the project is not expected to have far reaching negative impacts on socio-economic conditions. Since the exploration activities will not include any drilling at this stage, a risk averse and cautious approach had been implemented to limit the impact on the surrounding environment'.*[97] It is difficult to see how this constitutes a proper application of the precautionary approach given that that the project aims to identify oil and gas resources to be used in the energy production and/or processing or manufacturing of materials.

68.

NEMA section 2(4)(a)(vii) stipulates that sustainable development requires the consideration of all relevant factors, including that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. It is submitted that ring-fencing the EIA application to exclude reasonably foreseeable future impacts (i.e. climate change impacts or catastrophic oil spill impacts that could arise from future hydrocarbon exploration drilling and production activities should commercially exploitable resources be discovered) is not a rational application of the 'risk-averse and cautious approach' required by NEMA in relation to need and desirability. The approach taken in the EIA artificially removes potentially significant life cycle impacts (in this context potential impacts associated with the exploration for and production of oil and gas resources) from consideration in the EIA, notwithstanding that the proposed exploration is aimed at identifying oil and gas resources to be used in (among other things) energy production, and notwithstanding that that future exploration drilling and ultimately production activities are likely to follow.

[96] Draft EIA Report, p30. See in particular items 1.6, 1.7.1 and 17.2 of Table 7
[97] Draft EIA Report, p35, item 2.6 and 2.6.3 of Table 7.

69.

In response to the above comments made in relation to the DSR, EIMS responded by pointing out that '*it cannot be said with absolute certainty that exploration drilling, let alone production activities, will be undertaken in the future. As such, it is not currently possible to address the need and desirability of such activities given that the specific details of these future activities are not known*'.[98] EIMS respond further by stating that the '*life-cycle of the current project is limited to the exploration activities as stated in the DSR and this will be the focus of the Scoping and EIA process. It is in our view premature to assess the likely impacts of further invasive exploration activities as the extent, duration, location and magnitude applicable to these activities is unknown at this stage. There is provision in law for these activities to be assessed on their merits as and when they are proposed*'.[99]

70.

The Green Connection submits that the EIA has failed to provide an adequate description of and motivation for the need and desirability of the proposed development in the broader sustainable development context or in the context of the preferred development footprint within the proposed 3D survey area. The EIA report fails to address need and desirability within the broader context of the global climate emergency (and South Africa's responsibilities to contribute towards global efforts to minimise greenhouse gas emissions), and fails to consider whether it is necessary and desirable to pursue additional oil and gas exploration having regard to significant gas discoveries made off the South Cape Coast (the Brulpadda exploration well was completed in 2018/2019, which was reported in the TEPSA draft Scoping Report as having been successful in yielding a significant gas condensate discovery[100]). The EIA report also fails to address need and desirability within the context of project's overall intention of identify oil and gas resources (a non-renewable natural resource) with a view to further exploration (invasive well drilling and testing) and production activities (which would inevitably follow should commercially exploitable oil and gas resources be identified). Exploration for (and ultimately production of) oil and gas resources will, in the Green Connection's view, exacerbate the increased dependency on the use of natural resources to maintain economic growth, and will in no way reduce resource dependency (i.e. de-materialised growth).

71.

In light of the above, the Green Connection submits that the need and desirability has not been adequality assessed, that the proposed and/or likely future exploration and production activities are

[98] EIMS response to Green Connection comments on DSR (3 May 2021), at p6.
[99] EIMS response to Green Connection comments on DSR (3 May 2021), at p6.
[100] TEPSA draft Scoping Report, p1.

not needed or desirable, and that environmental authorisation should accordingly be refused.

72.

H. NO GO OPTION

With regard to the 'no go alternative', the Draft EIA Report states as follows:

> The no go alternative would imply that no exploration activities are undertaken. As a result, the opportunity to identify potential oil and gas resources within the Block 1 and proposed 3D survey area would not exist. This will negate the potential negative and positive impacts associated with the proposed exploration activities.[101]
>
> and
>
> The no go alternative would imply that no exploration activities are undertaken and, as such, the negative impacts as stated above, would not materialise. However, conversely, this will negate the potential positive impacts associated with the proposed exploration activities, including:
>
> • The opportunity to identify potential oil and gas resources within the Block 1 and proposed 3D survey area; and
>
> • Provision of job opportunities (limited during the exploration phase).
>
> Since there are no mitigation measures, the impact significance will be LOW pre- and post-mitigation and final significance will be the same.[102]

73.

It is pointed out that while the EIA excludes from consideration the evaluation of impacts of exploration well drilling and future production activities, in relation to the 'no go alternative' the draft EIA Report asserts that '*potential positive impacts associated with the proposed exploration activities*' would be negated, namely the opportunity to identify potential oil and gas resources within Block 1 and the proposed 3D survey area, and the provision of job opportunities (indicated as 'limited' during the exploration phase). The Green Connection submits that this again highlights the contradictory approach taken in the EIA, namely to exclude potential impacts associated with likely future exploration drilling and production activities, but to refer to these very activities when (in this context) motivating that the 'no-go' option would negate the 'potential positive' impacts associated with the likely future oil and gas exploration and production activities.

74.

The Green Connection submits further that the potential positive impacts of the 'no go alternative'

[101] Draft EIA Report, p39.
[102] Draft EIA Report, p171.

have not been adequately identified or assessed. Selecting the 'no go' option would be consistent with the NEMA sustainable development principles that emphasise the need to avoid the disturbance of ecosystems, and to prevent negative impacts on the environment and people's rights.[103] It would also ensure that marine ecosystems in Block 1 would be protected, including the interdependence of these marine ecosystems. Selection of the 'no go' option would result in the avoidance of (for example, but not limited to):

- The negative impacts associated with 3D seismic surveys (such as ecosystem impacts and impacts on small-scale fishers whose livelihoods would be negatively impacted should the 3D seismic survey result in reduced catches); and
- The negative consequences that would arise should commercially exploitable oil and gas resources be discovered in the area, which consequences have not been assessed (such as climate change impacts associated with extraction and processing of fossil fuels, and the potentially catastrophic impacts associated with an uncontrolled wellhead blowout).

75.

The Green Connection persists with its view that the potential ecological and socio-economic risks associated with the proposed 3D seismic survey and likely future exploration drilling and petroleum production activities (having regard to the global climate emergency and the potentially devastating impacts of a catastrophic oil spill) require a proper assessment and consideration of the benefits of selection of the "no go option". The draft EIA report fails to do so, and as a result does not contain the information that is necessary for the competent authority to consider and come to a decision on the application. Accordingly, the Green Connection submits that environmental authorisation should be refused.

76.

I. FAILURE TO CONDUCT CLIMATE CHANGE ASSESSMENT

It is noted that the draft EIA report does not address climate change impacts associated with the exploration for and production of oil and gas in Block 1 (i.e. the extraction and use of greenhouse gas (GHG) emitting fossil fuels), nor does it address how climate change may impact on such exploration and production activities.

[103] NEMA, s2(4)(a)(i) and (vii).

77.

The UN Framework Convention on Climate Change enjoins State Parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change.[104] Recently, the UN's Intergovernmental Panel on Climate Change (IPPC) issued a press release relating to its 6th Report, which states that '[t]*he report provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that* ***unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach***'.[105] Having regard to the global Climate Emergency[106] and South Africa's international commitment[107] to *'working with others to ensure temperature increases are kept well below 2°C above pre-industrial levels, which could include a further revision of the temperature goal to below 1.5°C in light of emerging science'*[108] by reducing GHG emissions, Tosaco's proposed exploration for offshore oil and gas resources would, if additional commercially viable resources are found and developed to production phase, inevitably add to the South Africa's overall GHG emissions (South Africa's energy sector currently contributes an estimated 84% percent to the country's overall GHG emissions).[109]

78.

In response to the above comments made in relation to the DSR, EIMS responded by pointing out that '*it cannot be said with absolute certainty that exploration drilling, let alone production activities, will be undertaken in the future. As such, it is not currently possible to address the need and desirability of such activities given that the specific details of these future activities are not known. On the basis of the exploration activities currently proposed it is unlikely that there will be significant climate change impacts*'.[110] EIMS respond further by stating that *'[w]hile it is acknowledged that the risks mentioned would need assessment, such assessment falls outside the scope and of the current application and would need to be assess* (sic) in *detail during subsequent Scoping and EIA processes, should drilling or production processes be proposed. The environmental consequences applicable to the planned exploration activities have been identified and assessed in the Scoping Report. There is provision in law*

[104] Article 3.3. Available online at: http://unfccc.int/resource/docs/convkp/conveng.pdf
[105] https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/
[106] https://www.unenvironment.org/explore-topics/climate-change/facts-about-climate-emergency
[107] As a party to the United Nations Framework Convention on Climate Change (UNFCC) that ratified the Kyoto Protocol and adopted the Paris Agreement.
[108] See for example South Africa's *Intended Nationally Determined Contribution (INDC)*, available online at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf
[109] https://www.climatelinks.org/resources/greenhouse-gas-emissions-factsheet-south-africa
[110] EIMS response to Green Connection comments on DSR (3 May 2021), at p10.

for future activities (including exploration drilling and production) to be assessed and decided upon, on their merits as and when they are proposed, and prior to commencement of such'.[111]

79.

The Green Connections stands by its assertion that as reasonably foreseeable future impacts that may become more significant when added to the existing and reasonably foreseeable GHG impacts arising from similar offshore oil and gas exploration and production activities in South Africa's exclusive economic zone, the impacts (including cumulative impacts[112]) of such GHG emissions should have been identified in the DSR, and the impact thereof assessed in the EIA phase. Tosaco should not be permitted to side-step such an assessment by conducting this EIA in a piecemeal fashion. It is submitted that it is relevant for the competent authority to consider these impacts at this stage in the EIA process, given that if the climate change impacts are found to be unacceptable there is no reason for Tosaco to be permitted to continue with the successive stages of exploration and production authorisation and permitting processes. The failure to do so unfairly prejudices I&APs opposed to further offshore oil and gas drilling operations, as by the time future applications are made and assessments conducted, significant time and resources will already have been expended by Tosaco (potentially shifting the balance of convenience in Tosaco's favour in future authorisation applications).

80.

It is submitted further that including an assessment of the reasonably foreseeable climate change impacts of Tosaco's offshore oil and gas exploration relating to probable future exploration drilling and production activities would also be consistent with the NEMA environmental management principles that emphasise the need to avoid the disturbance of ecosystems, and to prevent negative impacts on the environment and people's rights.[113] It would also be consistent with section 2(4)(e) of NEMA, which stipulates that responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

81.

Such an approach would also be consistent with the approach taken by High Court in *Earthlife Africa*

[111] Ibid, p10-11.

[112] 'Cumulative impact' is defined in the NEMA EIA Regulations as follows: 'in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.'

[113] NEMA, s2(4)(a)(i) and (vii).

Johannesburg v Minister of Environmental Affairs 2017 (2) SA 519 GP, which - in relation to the issue of whether or not a climate change impact was necessary for a proposed coal-fired power station - stated that '*a climate change impact assessment is necessary and relevant to ensuring that the proposed coal-fired power station fits South Africa's peak, plateau and decline trajectory as outlined in the [NDC] and its commitment to build cleaner and more efficient than existing power stations*'.[114] Following this reasoning, the Green Connection submits that is equally necessary and relevant to ensure that proposed exploration activities (including reasonably foreseeable future exploration well drilling and oil and gas production activities) fit South Africa's peak, plateau and decline trajectory as outlined in South Africa's updated Nationally Determined Contributions (NDCs).[115]

82.

The Green Connection also stands by its previous submission that the EIA should address the implications of climate change on oceans. The IPCC[116] has identified that coastal systems will experience climate change-related impacts due to sea level rise and associated storm swells. In addition, there is medium agreement that the Benguela system will experience changes in upwelling intensity as a result of climate change. The Green Connection submits that the EIA should therefore include a study on the potential impacts that changes in ocean currents, increased severity of storms etc. could have on future exploration and production drilling activities.

83.

For the reasons set out above, the Green Connection submits that as a consequence of the EIA failing to address climate change impacts associated with the exploration for and production of oil and gas in Block 1 (i.e. the extraction and use of greenhouse gas emitting fossil fuels) or the potential impacts of climate change on such exploration and production activities, the draft EIA report does not contain the information that is necessary for the competent authority to consider and come to a decision on the application. Accordingly, the Green Connection submits that environmental authorisation should

[114] At para 90.

[115] It is relevant to note that in 2021 South Africa published an update of its First NDC under the Paris Agreement for public comment, informed by the Talanoa Dialogue and IPCC special report on global warming of 1.5°C above pre-industrial levels. In terms of this update, South Africa commits to reducing the upper range of its 2025 and 2030 targets by 17% and 28% respectively. Among other things, the update indicates that South Africa will be finalising its Just Transition Plan, including pathways compatible with pursuing efforts to limit temperature increase to 1.5°C. South Africa's update of its first NDC is available online at: https://www.environment.gov.za/sites/default/files/reports/draftnationalydeterminedcontributions_2021updated.pdf

[116] https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap22_FINAL.pdf

be refused.

84.

J. FAILURE TO ASSESS CUMULATIVE IMPACTS OF OTHER SEISMIC SURVEYS

As mentioned earlier in these comments, a reconnaissance permit application is currently being made by Spectrum for permission to conduct a multiclient 2D seismic survey in various blocks of the West Coast (including portions of Block 1).[117]

85.

The draft EIA Report fails to mention this multiclient survey, or assess the potential cumulative impacts should the proposed Tosaco 3D seismic survey and proposed Spectrum 2D multiclient survey be conducted within the same period of time.

86.

Russell points out the following regarding cumulative impacts of seismic surveys:

> Controls also need to be put in place to reduce cumulative impacts – **in recent years off the South African coast multiple surveys were occurring at the same time, creating greater pressure on South African fisheries. It is important to ensure that an intensive period of seismic surveys is limited. Particularly if there is a risk of the sound source displacing a species from an important feeding or breeding area for a prolonged period, as impacts at the population level interrupting life functions such as spawning or migration patterns, could be significant.** Norway as an example has established management actions against seismic surveys on and close to spawning grounds and over well-established migration routes to spawning grounds.
>
> Building up in 2011 (13 months of seismic surveys), during 2012 (11 months of surveys), 2013 (29 months of surveys), and tailing off in 2014 (6 months of surveys), these were an abnormally large number of seismic surveys that occurred off the South African coast. These impacted mainly the West and South Coasts, which is where the bulk of South Africa's commercial fisheries sectors operate. **Single surveys generally seem to have limited impact, disturbing fish, and perhaps disrupting fishing for a few days, but cumulative impacts from so many surveys need assessment, and better management going forward so that they are spread to reduce negative impacts on sea life.**[118]

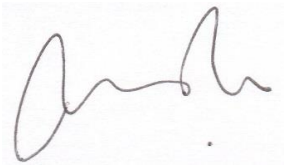
87.

The Green Connection submits that in the absence of the EIA addressing the cumulative impacts of seismic surveys being conducted in Block 1, the draft EIA report does not contain the information that is necessary for the competent authority to consider and come to a decision on the application.

[117] Proposed Speculative 2D Seismic Survey off the West Coast of South Africa: Environmental Management Plan, PASA Ref. 12/1/033, by SLR for Spectrum. See for example Executive Summary pi-ii, and Appendix 4 *Sound Transmission Loss Modelling Study.*
[118] Russell, p6.

Accordingly, the Green Connection submits that environmental authorisation should be refused.

Signed at Durban this 4th day of October 2021



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Adrian Leonard Pole