

ANNEXURE A1

To: **THE APPEAL AUTHORITY: THE HONOURABLE MINISTER OF ENVIRONMENT, FORESTRY & FISHERIES, REPUBLIC OF SOUTH AFRICA**

Application Reference Number: (12/3/236)

Ex Parte:

WILDOCEANS

APPELLANT

(A PROJECT OF WILDLANDS CONSERVATION TRUST)

APPEAL IN TERMS OF SECTION 43 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (NEMA): ENVIRONMENTAL AUTHORISATION IN TERMS OF REGULATION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998: ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

**PROPOSED EXPLORATION DRILLING –
Eni SOUTH AFRICA BV & SASOL AFRICA LIMITED**

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A. INTRODUCTION

1. This is an appeal against the environmental authorisation (“**authorisation**”) (Annexure “**A1**”) granted by the Deputy Director-General: Mineral Regulation, Department of Mineral Resources (“**DMR**”) on 26 August 2019 to Eni South Africa BV (“**Eni**”) & Sasol Africa Limited (“**SASOL**”, referred to collectively as “**Eni/SASOL**”) to undertake the list of activities specified in section 3 of the authorisation and as described in the Environmental Impact Assessment Report dated 14 December 2018, namely the exploration drilling programme in exploration block ER236 involving the drilling of up to six wells off the East Coast of South Africa (four within the northern area of interest and two within the southern area of interest) (“**offshore exploration drilling programme**”).
2. The authorisation was granted in terms of section 24 of the National Environmental Management Act, 1998¹ (“**NEMA**”) and the Environmental Impact Assessment Regulations, 2014² (“**EIA Regulations**”).
3. This appeal is brought in terms of the National Appeal Regulations, 2014.³
4. The appellant contends that the EIA process (including the EIA public participation process) was fatally flawed and procedurally unfair. The appellant also contends that the Final Environmental Impact Report (“**FEIR**”) was fatally flawed, and cannot serve as a lawful basis for an environmental authorisation decision.
5. The authorisation granted by the Deputy Director-General: Mineral Regulation of the DMR (“**the decision-maker**”) is thus defective and falls to be set aside in this appeal.
6. A failure to do so will render any appeal decision similarly flawed and subject to being set aside on review in Court.
7. The appellant made detailed legal and substantive submissions during the EIA process to the environmental assessment practitioner (“**ERM**”) appointed by Eni/SASOL. This

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² GNR.982 of 4 December 2014: Environmental Impact Assessment Regulations, 2014 (as amended).

³ GNR.993 of 8 December 2014: National Appeal Regulations (as amended).

included the appellant's *WILDOCEANS Submission ERM ENI ER 236 draft EIA Report (8 November 2018)*, and its contents should be read with this appeal memorandum as if specifically incorporated herein (attached hereto marked Annexure "A2"). This written submission contains the appellant's detailed comments on and objections to the application, and in turn inform the grounds for this appeal because the FEIR and related reports (including but not limited to the Oil Spill Modelling ("OSM") report, specialist impact assessment reports and Environmental Management Programme ("EMPr") did not deal with the issues raised in a lawful and/or meaningful manner. These written submissions are in turn supplemented by additional legal and substantive grounds of appeal, supported where appropriate by expert reports.

B. DECISION

8. The decision on authorisation provides that the following were 'key significant issues' that resulted in the decision-maker decision to approve Eni/SASOL's offshore exploration programme:

- In terms of the need and desirability of the project, where proposed exploration drilling becomes successful, the project may provide the opportunity to fulfil Operation Phakisa's aim to unlock the ocean's economy. The long-term benefits would include job creation, increase government revenues, economic growth and reduce dependence on the importation of hydrocarbons.
- The public consultation process undertaken by the EAP [environmental assessment practitioner] which includes undertaking several public consultation meetings, notifying I&APs [interested and affected parties], advertising the proposed project on (sic) various newspapers and subjecting Scoping and FEIR [environmental impact assessment report] reports to a 30-day commenting period, consulting with various state departments and organs of states, and addressing comments received from all I&APs, was found to be in line with the requirements of [the] EIA Regulations and related guidelines.
- The environmental attributes were clearly identified; and the potential impacts on biophysical and socio-economic environment identified and assessed.

- The methodology used to assess and evaluate potential impacts has provided a comprehensive assessment and provided clarity on the significance of potential impacts before and after the implementation of mitigation measures.
 - The mitigation measures to address all potential identified environmental impacts during all phases of the proposed exploration activity were recommended and aligned with identified potential impacts.
 - The profile and details of the EAP with respect to the qualifications and experience in environmental impact assessments and related projects has given confidence in the EAP's ability and competence to carry out the EIA process.
 - Four project alternatives were identified during the EIA process, however not all alternatives are applicable due to the nature of [the] proposed exploration drilling programme. The applicant considered two alternatives i.e. technology and no-go alternatives. The drillship selected as the preferred option under technology alternatives, due to its ability to maintain position using DPS which allows for minimal subsea disturbance and its ability to operate without moorings, was found to be acceptable.
 - The FEIR/EMPR dated 14 December 2018 identified all legislation and guidelines that have been considered in the preparation of the FEIR.
9. The decision on authorisation provides under the heading 'key findings' that careful consideration of information submitted to the DMR 'have thus resulted to the following conclusions' (sic):
- All fundamental and procedural requirements prescribed in the applicable legislation have been satisfied.
 - **The majority of the potential impacts associated with the planned drilling programme on the marine environment were assessed and rated to have negligible to low significance post-mitigation. The potential impacts relating to unplanned events such as accidental spillages were assessed to have minor to moderate significance post-mitigation. The said potential risks were assessed and reduced to a level that is low as reasonably practicable.**
 - The proposed mitigation and management measures are aligned with the identified potential impacts. **Furthermore, the implementation of mitigation measures in**

all phases of the proposed exploration activity will ensure that the planned activity will not result in any detrimental impacts on the environment.

- The public consultation process undertaken by the EAP adhered to the minimum requirements as prescribed under Chapter 6 ‘Public Participation’ of the EIA Regulations and related guidelines. In this regard, **comments and issues related to the proposed exploration activity were addressed by the EAP** and in addition, mitigation measures to address potential impacts raised by the I&APs have been included in the EMPR.

10. The decision on authorisation concludes as follows:

- In view of the above, and having taken into consideration environmental management principles as set out in section 2 of NEMA, and information presented in the FEIR and EMPR... this Department is satisfied that the proposed activity will not be in conflict with the objectives of Integrated Environmental Management set out in Chapter 5 of [NEMA] and will not result to (sic) any detrimental risks to the environment and public.

C. SUMMARY OF APPEAL GROUNDS

11. The appellant contends as a point *in limine* that the EIA process was fundamentally flawed, with the Petroleum Agency South Africa (Proprietary) Limited (“PASA”) performing roles and making decisions in the NEMA EIA process that it is not empowered by law to perform and make. The role played by PASA in the NEMA EIA process infects the EIA process (including the public participation process) with illegality, and renders it procedurally unfair).

12. In the event that the appellant’s point *in limine* is not upheld in the appeal decision, the appellant contends further that the NEMA EIA public participation process was fatally flawed and procedurally unfair in a number of respects. Among other things:

- Requests for certain material information relating the EIA were denied, and responses to critical queries raised by the appellant to enable it to participate

- meaningfully in the public participation process (and to seek expert advice) were only provided after the close of NEMA commenting period;
- The appellant's detailed technical and legal submissions on the draft EIR were omitted from the FEIR, and were not taken into account when the FEIR (upon which the environmental authorisation depends) was finalised;
 - Meetings were held between ERM and PASA regarding the way forward with the EIA in light of this omission, without the appellant being notified or being afforded an opportunity to make representations to the decision-maker. As a consequence, the appellant's submission was incorrectly characterised as introducing no new information, and the serious flaws raised by the appellant were not addressed at all in the FEIR (which had already been finalised);
 - Additional information was introduced into the EIA process after the close of the commenting period by way of a peer review report by the Department of Environmental Affairs: Oceans & Coast ("DEA:O&C"), and meetings were held in this regard between ERM, ERM's peer reviewer, PASA and a representative of the DEA:O&C providing ERM and PASA an opportunity to influence and respond to this report. The appellant (and other I&APs) were not informed about this meeting or the report, no copy of the report was ever made available to the appellant (and other I&APs), and no opportunity was provided to the appellant (and other I&APs) to make representations relating to this report (which was subsequently relied upon by the decision-maker in granting environmental authorisation); and
 - Material information relied upon in the FEIR report for the mitigation of risks and potential impacts was not provided to the appellant (and other I&APs), including (but not limited to) an Oil Spill Contingency Plan.
13. The appellant also contends that the FEIR is fatally flawed, and cannot serve as a lawful basis for a reasonable and rational environmental authorisation decision. Among other things:
- The Oil Spill Modelling (OSM) report is fatally flawed in a number of material respects, especially in relation to worst case scenario predictions. A number of these flaws are highlighted in three expert reports commissioned by the appellant, and would have a significant impact on the outcome of the OSM. Glaringly, these expert reports illustrate that in relation to the OSM modelling of the consequences of a

catastrophic oil spill resulting from a wellhead blowout: no sensitivity analysis was conducted on the volume of oil that could realistically be released; the worst case scenario spill durations were in fact best case scenarios; extreme sea conditions that could prevent rapid and effective capping response in a deep sea location were not considered; complex multiphase oil and gas flow from deep water reservoirs was omitted from the OSM; droplet size distribution (one of the most critical parameters for accrual oil transport and fate modelling) was not mentioned; the OSM report only deals with a surface oil slick and fails to predict the distribution of oil on the sea floor resulting from numerous pathways; the OSM underestimated instantaneous velocities and localisation of the Agulhas current; the Agulhas current variability was underestimated; and the reliability of the representation of mixing regimes in mesoscale resolving models was highlighted.

- These expert reports support and are supplemented by additional critical flaws in the OSM report identified by the appellant, including in relation to assumptions made regarding wellhead blowout release rates and duration (resulting in predicted oil spill volumes being significantly underpredicted), critical assumptions used relating to oil slick on surface water and oil on shoreline predictions (resulting in a failure to predict socio-economic impacts and sub-lethal ecological effect impacts), and heavy reliance on the project proponent's data and interpretation thereof without adequate validation (where validation was carried out at all) by ERM and PRDW.
14. The appellant contends that that climate change is not only a relevant consideration but a vital consideration when granting an EA that relates to the exaction of fossil fuels. To have any chance of meeting the Paris 2°C target, carbon emissions around the world need to be decreasing rapidly. Opening up and using new fossil fuel reserves or resources increases carbon emissions, in conflict with what is required under the Paris Agreement. There is no room for any new fossil fuel development and yet the FEIAR does not include a climate risk assessment for the Project and the long-term implications thereof.
 15. The appellant contends that the impact of the Project on the Marine Protected Areas and irreplaceable Critical Biodiversity Areas has been addressed in a cursory manner without a valid assessment of the impacts of the Project thereon. These areas are fundamental to the resilience of our oceans, to support the recovery and productivity of our fisheries, to

protect fragile and sensitive habitats and endangered species, to help combat climate change, and to ensure resilient and healthy oceans that can support coastal communities and a sustainable blue economy into the future.

16. The appellant contends that the baseline information for the Project Area is hopelessly inadequate. This contention is supported by expert input. The FEIR consists of too many unknown factors and bases its significance ratings on subjective assumptions.
17. The appellant contends that there is an overall inadequate assessment of the impacts including incorrect and missing information regarding the Agulhas Current, marine ecology and the ocean scenario (specifically in relation to spill response and with regard to the applicant's experience in the industry in general). The comparison to drilling in Mozambique is both disingenuous and misleading.
18. The appellant contends further that the FEIR has inadequately considered the no-go option in that it has only dealt with the potentially negative economic impacts thereof. This is a biased and one-sided approach, particularly when the no-go alternative will ensure no pollution, no catastrophic spill, no climate impact, no impact on fisheries, no socio-economic impact and no harm to the marine environment. At the very least the implications of thriving MPAs on the sustainability of the ocean and coastal fisheries should be explored.
19. The appellant contends that the applicant has failed to adequately present the need and desirability of the project in that the Project has been represented in a bias manner that deprives stakeholders and decision-makers in South Africa from understanding the full dimensions of the Project and the implications thereof.
20. Finally, the appellant contends that the applicant has failed to comply with the EIA Regulations, specifically Appendix 3.

D. THE STRUCTURE OF THIS MEMORANDUM

21. The appellants appeal against the decision on a number of grounds which are dealt with in more detail below. Before considering that detail however, it is necessary to traverse the

applicable legal principles so that the appeal grounds can be appreciated in their proper context. To that end:

- **PART E** deals with the legal framework in terms of which the decision-maker acted, and the powers of the appeal authority considering this appeal;
- **PART F** sets out the appeal grounds raised by the appellants; and
- **PART G** contains the conclusion – that is, that the appeal should be upheld and the decision set aside.

E. LEGAL FRAMEWORK

22. For ease of reference, the applicable legislation and principles are set out briefly, which includes:

- The National Environmental Management Act, 1998 (“**NEMA**”), EIA Regulations published under NEMA, and Public Participation Guidelines made in terms of NEMA;
- The Promotion of Administrative Justice Act, 2000 (“**PAJA**”); and
- The process and powers of the appeal authority considering this appeal.

E1. National Environmental Management Act

23. The National Environmental Management Act⁴ (“**NEMA**”) requires all decision-makers to secure sustainable development while promoting justifiable economic and social development, as required by section 24 of the Constitution of the Republic of South Africa (“**the Constitution**”) (environmental clause).⁵

⁴ Act 107 of 1998 (as amended).

⁵ Section 24 provides that everyone has the right:
to an environment that is not harmful to their health or well-being; and
to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-
(i) prevent pollution and ecological degradation;
(ii) promote conservation; and
(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

24. NEMA defines sustainable development as meaning “the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations”.⁶ An integrated approach requires that the decision-maker has all of the relevant facts before him or her, and can consider and balance these considerations to ensure sustainable and justified development.
25. In addition, all decision-makers are obliged to consider applications and act in accordance with *inter alia* the following relevant principles set out in section 2 of NEMA, which apply throughout the Republic to the actions of all organs of state that may significantly affect the environment:
- Development must be socially, environmentally and economically sustainable.⁷
 - Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.⁸ The “best practicable environmental option” is defined as meaning the one that “*provides the most benefit or 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.*”⁹
 - Sustainable development requires the consideration of all relevant factors, including (among other things):
 - (a) that waste is avoided, or where it cannot be altogether avoided, is minimised and remedied;¹⁰
 - (b) 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;¹¹ and

⁶ Section 1.

⁷ Section 2(3).

⁸ Section 2(4)(b) of NEMA.

⁹ Section 1 of NEMA (definition of “best practicable environmental option”).

¹⁰ Section 2(4)(a)(iv) of NEMA.

¹¹ Section 2(4)(a)(vii) of NEMA.

- (c) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.¹²
26. Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.¹³
27. The “social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment”.¹⁴
28. The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.¹⁵ Public participation in relation to the assessment of the environmental impact of any application for environmental authorisation is defined in NEMA as meaning ‘*a process by which interested and affected parties are given the opportunity to comment on, or raise issues relevant to, the application*’.
29. Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.¹⁶
30. Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must (among other things) ensure, with respect to every application for authorisation, public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of

¹² Section 2(a)(vii) of NEMA.

¹³ Section 2(4)(e) of NEMA

¹⁴ Section 2(4)(i) of NEMA.

¹⁵ Section 2(4)(f) of NEMA.

¹⁶ Section 2(4)(k) of NEMA,

the activity, with a reasonable opportunity to participate in those information and participation procedures.¹⁷

Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must (among other things) include, with respect to every application for an environmental authorisation (and where applicable) reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information.¹⁸

31. South African legislation, case law and international best practice require an EIA to be based on a consideration of scientific and technical reports. The environmental assessment practitioner is required to compile reports on the basis of expertise (and by implication, not merely on the basis of opinion). In this regard, our courts have held that:

“[30] Section 22(2) of the ECA, requires the functionary who has to decide whether the necessary environmental authorisation should be granted, to consider reports concerning the impact of the proposed activity and of alternative proposed activities on the environment”. This duty is mandatory as section 22 (2) expressly states that the authorisation “shall only be issued after” consideration of such reports.”¹⁹

32. The General Objectives of NEMA include to ensure that adequate and appropriate opportunity is provided for public participation in decisions that may affect the environment.

EIA Regulations

33. Environmental authorisation is provided for in section 24 of NEMA and is given content to in the EIA Regulations, 2014 (“**EIA Regulations**”).²⁰

¹⁷ Section 24(4)(a)(v).

¹⁸ Section 24(4)(a)(iv).

¹⁹ See *Sea Front For All and Another v the MEC: Environmental and Development Planning Western Cape Provincial Government and Others* 2011 (3) SA 55 (WCC) paragraph 30; and NEMA section 24(1). S24(1A)(f) ... Every applicant must comply with the requirements prescribed in terms of this Act in relation to... (f) the undertaking of any specialist report, where applicable.

²⁰ GNR.982 of 4 December 2014: Environmental Impact Assessment Regulations, 2014 (as amended).

34. Regulation 12(3)(b) stipulates that the EIA proponent or applicant (i.e. Eni) must provide the EAP and specialist with access to all information at the disposal of the proponent or applicant regarding the application, whether or not such information is favourable to the application.
35. General requirements for EAPs and specialists are set out in regulation 13, and regulation 13(f) stipulates that the EAP in turn must disclose to registered I&APs (and the competent authority) all material information in the possession of the EAP that reasonably has or may have the potential of influencing: any decision to be taken with respect to the application by the competent authority in terms of these Regulations; or the objectivity of any report, plan or document to be prepared by the EAP, in terms of these Regulations for submission to the competent authority; unless access to that information is protected by law (in which case it must be indicated that such protected information exists and is only provided to the competent authority).
36. Regulation 23(3) of the EIA Regulations requires that an environmental impact assessment report (“**EIA report**”) must contain all information set out in Appendix 3 to these Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice. Where the application is for an environmental authorisation for *inter alia* exploration of a petroleum resource, the EIA report must contain attachments that address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of exploration operations, made in terms of the Act.
37. Regulation 23(4) of the EIA Regulations requires that an EMPr must contain all information set out in Appendix 4 to these Regulations or must be a generic EMPr relevant to the application as identified and *gazetted* by the Minister in a government notice and, where the application for an environmental authorisation is for *inter alia* exploration of a petroleum resource, the EMPr must contain attachments that address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of exploration operations, made in terms of the Act.

38. Regulation 23(5) of the EIA Regulations requires that a specialist report must contain all information set out in Appendix 6 to these Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and *gazetted* by the Minister in a government notice.
39. A decision-maker makes the decision in terms of Regulation 24, having regard to a comprehensive suite of information placed before him or her in the EIA.
40. Regulation 40 deals with public participation, and provides (among other things) that I&APs must be afforded a period of at least 30 days to submit comments on each of the various reports required. The public participation process must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation.
41. Regulations 41 deals further with the public participation, and (among other things) requires that the person conducting a public participation process must take into account any relevant guidelines applicable to public participation.
42. In terms of Regulation 43:
 - (1) A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
 - (2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7 (2), to comment within 30 days.
43. In terms of Regulation 44, the applicant must (among other things) ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

44. In terms of Regulation 45, an application lapses, and a competent authority will deem the application as having lapsed, if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless extension has been granted in terms of Regulation 3 (7).
45. The NEMA EIA Regulations are supplemented by the NEMA Public Participation Guidelines.²¹ Among other things these guidelines state as follows:
- Public participation is one of the most important aspects of the environmental authorisation process. It is considered so important that it is the only requirement for which exemption cannot be given. This is because people have a right to be informed about potential decisions that may affect them and to be afforded an opportunity to influence those decisions.²²
 - I&APs must be provided with an opportunity to make representations on proposed applications and all written submissions made to the CA [competent authority] by the applicant or the EAP.²³
 - Draft reports must first be submitted to the CA before making it available to registered I&AP's for comment. However, in the case of final reports, registered I&APs must be afforded a reasonable opportunity to comment on the report before submission to the CA.²⁴
 - The minimum requirements for public participation outlined in the EIA Regulations will not necessarily be sufficient for all applications. This is because the circumstances of each application are different, and it may be necessary in some situations to incorporate extra steps in the public participation process. This section provides guidance for deciding on the required level of public participation.

²¹ GN807 of 10 October 2012.

²² Paragraph 2.

²³ Paragraph 4.6.

²⁴ Paragraph 4.6.

Three categories of variables need to be taken into account when deciding on the level of public participation and the process to be followed:

- the scale of anticipated impacts of the proposed project;
- the sensitivity of the affected environment and the degree of controversy of the project; and
- the characteristics of the potentially affected parties.

E2. Promotion of Administrative Justice Act

46. The Promotion of Administrative Justice Act²⁵ (PAJA) was enacted to give effect to the right to administrative action that is lawful, reasonable and procedurally fair as contemplated in section 33 of the SA Constitution.
47. Section 3 of PAJA provides that administrative action which materially and adversely affects the rights or legitimate expectations of any person must be procedurally fair. In order to give effect to the right to procedurally fair administrative action, an administrator must give that person (among other things) adequate notice of the nature and purpose of the proposed administrative action and a reasonable opportunity to make representations.
48. Section 6 of PAJA provides that any person may institute proceedings in a court for the judicial review of administrative action, and the court has the power to judicially review an administrative action if (among other things):
- (a) the administrator who took it-
 - (i) was not authorised to do so by the empowering provision;
 - (ii) acted under a delegation of power which was not authorised by the empowering provision; or
 - (iii) was biased or reasonably suspected of bias;
 - (b) a mandatory and material procedure or condition prescribed by an empowering provision was not complied with;
 - (c) the action was procedurally unfair;

²⁵ Act 3 of 2000 (as amended).

- (d) the action was materially influenced by an error of law;
- (e) the action was taken-
 - (i) for a reason not authorised by the empowering provision;
 - (ii) for an ulterior purpose or motive;
 - (iii) because irrelevant considerations were taken into account or relevant considerations were not considered;
 - (iv) because of the unauthorised or unwarranted dictates of another person or body;
 - (v) in bad faith; or
 - (vi) arbitrarily or capriciously;
- (f) the action itself-
 - (i) contravenes a law or is not authorised by the empowering provision; or
 - (ii) is not rationally connected to-
 - (aa) the purpose for which it was taken;
 - (bb) the purpose of the empowering provision;
 - (cc) the information before the administrator; or
 - (dd) the reasons given for it by the administrator;
- (g) the action concerned consists of a failure to take a decision;
- (h) the exercise of the power or the performance of the function authorised by the empowering provision, in pursuance of which the administrative action was purportedly taken, is so unreasonable that no reasonable person could have so exercised the power or performed the function; or
- (i) the action is otherwise unconstitutional or unlawful.

49. It is relevant to note that PAJA is not the only avenue to judicial review. In accordance with the Constitutional principle of legality, preliminary conduct by functionaries and/or administrators that does not qualify as administrative action is still be required to be fair in appropriate circumstances. In *Albutt*,²⁶ the Constitutional Court expanded on the principle of legality by treating procedural fairness as a requirement of rationality.

²⁶ *Albutt v Centre for the Study of Violence and Reconciliation* 2010 (3) SA 293 (CC).

E3. Appeal authority

50. The appeal authority considering this appeal does so in terms of section 43 of NEMA.
51. The appeal grounds are now set out.

F. GROUNDINGS OF APPEAL

F.1 Point in Limine

ASA role in EIA process unlawful

52. On 18 June 2004, the then Minister of Minerals and Energy designated²⁷ the South African Agency for the Promotion of Petroleum Exploration and Exploitation (Pty) Ltd, known as the Petroleum Agency South Africa (Proprietary) Limited (“PASA”) to perform the functions set out in Chapter 6 of the Minerals & Petroleum Resources Development Act (“MPRDA”).²⁸
53. Section 71 of the MPRDA sets out the functions of the designated agency, which include (among other things) that the designated agency must:
- (a) promote onshore and offshore exploration for and production of petroleum;
- and
- (i) review and make recommendations to the Minister with regard to the acceptance of environmental reports and the conditions of the environmental authorisations and amendments thereto.
54. It is pointed out that these functions do not extend to PASA making decisions regarding EIA processes, including EIA processes in terms of NEMA (applicable following the

²⁷ GN733 of 18 June 2004: *Designation of the Petroleum Agency South Africa (Proprietary) Limited for the purposes of the Petroleum Resources Development act, 2002 (Act No. 28 of 2002)*. Section 70 of the MPRDA provides that the Minister Mineral Resources may designate an organ of state or a wholly owned and controlled agency or company belonging to the State to perform the functions referred to in Chapter 6 of the MPRDA (Petroleum Exploration and Production).

²⁸ Act 28 of 2002 (as amended).

implementation of the ‘one environmental system’). This is reinforced by the MRPDA Regulations, which stipulate regarding ‘Environmental Impact Assessment’ that:

The designated agency, the Council of Geosciences and the Council for Scientific Research must be identified as interested and affected parties for the purposes of the public participation to be undertaken as part of the Environmental Impact Assessment process.²⁹

55. In terms of the NEMA Environmental Impact Assessment Regulations Listing Notice 2 of 2014, the Minister responsible for Mineral Resources is identified as the competent authority where the listed activity is or is directly related to (among other things) exploration of a petroleum resource. The listed activities subject to the environmental authorisation under appeal herein are or are directly related to exploration of a petroleum resource.
56. 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:
- (a) The Director-General of the Department of Minerals and Energy; or
 - (b) Any officer in the department of Minerals and Energy.
57. It is relevant to note that s42B does not make reference to state-owned agencies or companies, such as PASA. Unlike s42(2)(d) of NEMA, it also does not include a power to subdelegate.
58. The appellant is not aware of any written delegation by the Minister to PASA. Even if there was, such a delegation by the Minister (as well as any sub-delegation by the Director General DMR or any officer in the DMR) to PASA would be *ultra vires* the empowering statute.³⁰

²⁹ MPRDA Regulations, r86(4).

³⁰ According to available information, while these delegations must be in writing, they are not publicly available. Messrs Herbert Smith Freehills South Africa LLP write that they submitted an information request in terms of the Promotion of Access to Information Act (PAIA) requesting copies of all of the Minister of Mineral Resources’ delegations in terms of NEMA. As at 12 April 2019, the only delegation of authority granted by the Minister of Mineral Resources in terms of NEMA is reported to be dated 8 June 2015, and which empowers regional managers to approve, grant and refuse environmental authorisations, and Chief Directors: Mineral Regulations to amend environmental authorisations. See: <https://hsfnotes.com/africa/2019/04/12/decisions-by-regional-managers-may-be-unlawful/>

59. As has been mentioned above, PASA's mandatory statutory functions under the MPRDA include to promote onshore and offshore exploration for and production of petroleum, as well as to review and make recommendations to the Minister with regard to the acceptance of environmental reports and the conditions of the environmental authorisations and amendments thereto. The MPRDA Regulations also require that PASA must be identified as an I&AP for the purposes of the public participation to be undertaken as part of the Environmental Impact Assessment process.
60. Notwithstanding that NEMA does not provide for the lawful delegation of EIA decision-making functions to PASA (and that any such purported delegation would in any event be *ultra vires* the empowering provisions of NEMA or otherwise unconstitutional and unlawful), PASA has performed various functions, including competent authority decision-making functions, during the multi-stage EIA decision-making process under appeal herein. This is evidenced by the following examples (among others):
- PASA has performed the role of the competent authority in accepting the application for authorisation (including its acceptance after the EIA had lapsed due to ERM not submitting the draft EIA report within the prescribed time period), and was also the point of contact for the EIA consultant during the EIA process.
 - PASA performed the role of the competent authority with regard to the acceptance and approval of the Scoping Report. For example on 16 April 2018, PASA wrote to ERM advising that

The Petroleum Agency SA (hereafter referred to as the 'Agency') has evaluated the submitted FSR [Final Scoping Report] and Plan of Study for Environmental Impact Assessment and is satisfied that the documents comply with the minimum requirements of... [NEMA and the EIA Regulations, 2014]... The FSR is hereby accepted in terms of Regulation 22(a) of the EIA Regulations, 2014. You may therefore proceed with the environmental impact assessment...³¹

³¹ FEIR Annexure C Part 1 at p4.

- After the EIA lapsed due to ERM not submitting its draft EIA report within the time period prescribed in regulation 23(1)(a) of the NEMA EIA Regulations, PASA accepted ERM's application. On 25 September 2018 (see Annexure "A3"), ERM wrote to stakeholders by email advising (among other things) that:

A new EIA process has commenced, which was approved by PASA on 29 August 2018, successive to the approval of the Scoping Report on 16 April 2018.

- ERM meeting minutes³² dated 8 February 2018 indicate that it met with PASA to:

...discuss ERM's letter to PASA of 01 February 2019 requesting to submit a supplement to the Comments and Response Report (CRR), which formed part of ERM's EIA submission in December 2018.

The context of this meeting was that ERM had failed to include the appellant's detailed submissions on the draft EIA report in its FEIR CRR. This omission had been brought to ERM and the DMR's (c/o PASA) attention by the appellant's attorneys on 30 January 2019, and a follow up letter setting out the appellant's views of the serious legal consequence of this omission was sent on 6 February 2019 (this issue is addressed in more detail as a separate ground of appeal below headed ***Failure to take appellant's submissions into account when finalising EIR renders the public participation procedure meaningless and procedurally unfair, and results in the EIA having lapsed***). The minutes reflect that ERM briefed PASA on its view that the appellant's submission contained no new information (which the appellant disputes in this appeal), and that the FEIR would not need to change as a result of this 'oversight'. ERM state further that it had taken legal advice and offered to provide a letter from its legal representative in this regard. PASA is indicated as having 'agreed' with ERM's proposal to submit a supplementary comments and response report (SCR report). PASA is indicated further as indicating that it wanted to confirm with the DEA whether they have had any similar instances and for advice on meeting requirements. PASA was to respond formally to ERM by the following week. The appellant's attorneys were not informed of this meeting at the time, the

³² Available on ERM's project website:

https://www.erm.com/contentassets/9b249338ddb744a2bfa31f57febf7566/final-eia-report-2018/pasa-meeting-minutes_0802018.pdf

appellant was not offered an opportunity to make any representations, nor was PASA's formal response (if any) after receiving input from the DEA provided. However, a notification letter dated 22 February 2019 was subsequently emailed to I&APs by ERM advising that it would be proceeding with a SCR report, again with no reference made to this meeting with PASA or PASA's formal response thereto (if any)

- Subsequent to the closure of the EIA commenting period in November 2018, PASA commissioned a review of ERM's OSM report from the Department of Environmental Affairs: Oceans & Coast ("**DEA: O&C**"). Minutes of a meeting dated 3 May 2018 between PASA, ERM, ERM's peer review and the DEA: O&C indicate that ERM were furnished with a copy of this report by PASA, and were furthermore afforded an opportunity to meet with the author and PASA regarding this report, and were provided a further opportunity to provide written responses on this report (this issue is addressed in more detail as a separate ground of appeal below headed ***Failure to afford appellant (and other I&APs) opportunity to comment on DEA:O&C review of OSM report procedurally unfair***). In contrast, PASA did not inform the appellant about this review report, did not provide a copy to the appellant or afford it an opportunity to comment thereon (despite the appellant having taken serious issue with the subject matter of this report in its submissions on the draft EIA report, and was not informed about this meeting).
61. It is respectfully submitted that the various functions (including decision-making functions) performed by PASA during the EIA process should properly have been performed by the Minister of Mineral Resources, alternatively by the Director-General of the Department of Minerals and Energy or an officer in the department of Minerals and Energy (acting under a lawful delegation from the Minister of Mineral Resources).
 62. Given that PASA's statutory functions in terms of s71 of the MPRDA include the mandatory obligation for PASA to '*promote... offshore exploration for and production of petroleum*', it also cannot reasonably be viewed as a neutral or objective role-player.
 63. In the premises, it is submitted that:

- (a) the administrative actions and decisions undertaken by PASA during the EIA process were taken without PASA being authorised to do so by the empowering provision (NEMA);
 - (b) alternatively, should it be contended in response to this appeal that PASA acted under a written delegation of power, the administrative actions and decisions undertaken by PASA during the EIA process were taken by PASA acting under a delegation of power which was not authorised by the empowering provision (NEMA); and
 - (c) given that PASA is required by s71 of the MPRDA to (among other things) '*promote... offshore exploration for and production of petroleum*', PASA was inherently or statutorily biased, or can reasonably be suspected of such bias.
64. As a consequence, the environmental authorisation process upon which the environmental authorisation under appeal is based is fatally flawed, and fall to be set aside on review. This flaw goes to the heart of the environmental authorisation process (including critical decisions made during this process that should have been made by the competent authority and not PASA), and cannot be remedied by this appeal process or an appeal decision.
65. In the circumstances, the Minister is respectfully requested to exercise her powers in terms of section 43(6) of NEMA and set aside the environmental authorisation.
66. In the event that the Minister finds that PASA was lawfully empowered to perform the roles and make the decisions it did during the EIA process (which the appellant disputes), we set out our further grounds of appeal below.

F.2 EIA and Public Participation process procedurally unfair

67. As has been set out in more detail in section D above, public participation in an environmental authorisation process must not only meet the minimum commenting requirements set out in the EIA Regulations, but must also meet (among other things) the requirements of section 3 of PAJA, applicable provisions of the South African Constitution, and the NEMA Public Participation Guideline. I&APs must be afforded an opportunity to make meaningful representations, which also requires access to all relevant information.

68. Various shortcomings in the public participation process are set out under the sub-headings below.

Limited public participation provided in EIA materially influenced by an error of law

69. In the appellant's submission on the draft EIA report dated 30 November 2018, it was recorded that the appellant had requested a 30 day extension of time for the submission of its comments. While an extension was granted, the commenting period was only extended by 14 days by ERM.
70. ERM was referred to regulation 3(8) and 41(6)(b) of the EIA Regulations, section 2(4)(f) of NEMA and the NEMA Public Participation Guideline GN 807 of 10 October 2012.
71. Among other things it was pointed out that the 14-day extension resulted in ERM being unable to furnish responses to detailed queries submitted by the appellant's attorneys on 3 November 2018. As is discussed in more detail below, the responses were only included in the FEIR CRR which coincided with the closing of the EIA commenting period (as a consequence, the appellant was effectively blocked from reviewing these responses and developing a full understanding of ERM's reasoning, taking advice from appropriate experts in this regard, and submitting comments on the draft EIR informed by this understanding and any expert advice).
72. In its SCR report, the ERM fails to take this issue by the horns, and instead set out what they assert are the requirements for public participation in an EIA.
73. Of particular relevance, ERM states as follows:

Public participation with regards to EIA's in South Africa is determined by the principles of the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended) and elaborated upon in '**GN 657: Guideline 4: Public Participation (Department of Environmental Affairs, 2017)**', which states that: "**Public participation process in relation to the assessment of the environmental impact of any application for an environmental authorisation, is defined in terms of National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) as a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to, the application.**" ERM has complied

with the requirements set out for a fair and inclusive process as detailed (and proven) in the EIA Report.

74. This seems to be an attempt to discount the appellant's reference to the NEMA Public Participation Guideline GN 807 of 10 October 2012, which points out (among other things) that:

Public participation is one of the most important aspects of the environmental authorisation process. It is considered so important that it is the only requirement for which exemption cannot be given. This is because people have a right to be informed about potential decisions that may affect them and to be afforded an opportunity to influence those decisions. Effective public participation also facilitates informed decision-making by the competent authority and may result in better decisions as the views of all parties are considered.

75. However, the reference to 'GN 657: Guideline 4: Public Participation (Department of Environmental Affairs, 2017)' by ERM is either a (further) mistake, or is misleading. The guideline referred to by ERM in fact dates back to 2006, as is demonstrated by an (almost) identical statement in one of ERM's own documents relating to another matter:

Public participation with regards to EIAs in South Africa is determined by the principles of the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended) and elaborated upon in 'GN 657: Guideline 4: Public Participation' (Department of Environmental Affairs and Tourism, 19 May 2006), which states that: "Public participation process means a process in which potential interested and affected parties (I&APs) are given an opportunity to comment on, or raise issues relevant to, specific matters."³³

76. This Guideline 4 referred predates the Public Participation Guideline GN807 of 10 October 2012, and is used by ERM to justify the emaciated form of public participation provided to I&APs in the exploration EIA process under appeal, namely an opportunity only to comment on draft reports produced in the EIA process (such as the Draft Scoping Report and draft EIA report). Assuming that this was not done deliberately, ERM's misunderstanding of the importance of public participation as information by s2(4)(f) of NEMA and the 2012 Public Participation Guideline infects its approach to public participation.

³³<https://www.erm.com/contentassets/e0a5be1d1528420596a08ad35381ada6/feir/chapter-8---public-participation.pdf>, at p8-1.

77. Having regard to the suite of public participation inadequacies outlined in this appeal below, it is respectfully submitted that ERM (guided by PASA) was materially influenced by an error of law. As a consequence, the public participation process was fatally flawed, and the environmental authorisation falls to be set aside.

Preliminary OSM report and peer review not made available to appellant

78. On 28 May 2018, ERM by email notified I&APs that the Final Scoping Report had been approved by PASA on 16 April 2018, that several listed open house meetings would be held in June 2018 to communicate the findings of the draft EIA, and that the draft EIA was being finalised and would be released for a 30 day comment period.³⁴

79. On 4 June 2018, ERM by email notified I&APs that:

Due to unforeseen delays in the preparation of specialist studies and revisions to the draft Environmental Impact Assessment (EIA) Report, we have been obliged to postpone the release of the draft EIA report, as well as the public meetings planned for the week of 11 June 2018.³⁵

80. On 13 August 2018, ERM by email notified I&APs that:

ERM has experienced unforeseen delays in the finalising of specialist studies for the Exploration Drilling within Block ER236, which have resulted in subsequent delays in the drafting of certain chapters of the EIA Report. Consequently, ERM was not able to finalise and release the draft report for comment and comply with the stipulated 106 day timeframe in which to submit the final EIA Report by the 03 August 2018, as prescribed in Section 23(1)(a) of the NEMA EIA Regulations. As such, the current EIA Application lapsed on the 03 August 2018.³⁶

81. On 29 September 2018, ERM again wrote to stakeholders by email advising as follows:

An EIA process was commenced in January 2018 with the release of a Draft Scoping Report. The Final Scoping Report was approved by PASA on 16 April 2018. **ERM experienced unforeseen delays in the finalising of specialist studies which resulted in subsequent delays in the drafting of the EIA Report. Consequently, ERM was not able to finalise and release the draft report for comment** and comply with the stipulated 106 day timeframe in which to submit the final EIA Report

³⁴ FEIR 3b annex b part 1, at p6.

³⁵ FEIR 3b annex b part 1, at p11.

³⁶ FEIR 3b Annex b part 2, at p 7.

by the 03 August 2018, as prescribed in Section 23(1)(a) of the NEMA EIA Regulations. As such, the EIA Application lapsed on the 03 August 2018. A new EIA process has commenced, which was approved by PASA on 29 August 2018, successive to the approval of the Scoping Report on 16 April 2018.

82. On 9 October 2019, ERM hosted an open-house meeting in Durban. As was recorded in the appellant's attorneys letter email to ERM on 11 October 2018 (see Annexure "A4"), ERM staff members who had undertaken the Oil Spill Modelling (OSM) were not present at the meeting, nor were any of the specialists or peer reviewers who had provided expert reports. As a consequence, it was not possible to engage with the ERM staff members who had undertaken the OSM or ERM's peer reviewer on the methodologies, assumptions and results of the modelling and peer review report. In light of this, and also having regard to the complexity and volume of information contained in the draft EIR, the appellant requested a 30-day extension of time within which to submit its client's comments on the draft EIR.
83. Follow-up emails were sent on 18 and 23 October 2018 requesting a response to the request for an extension of time.
84. On 23 October 2018, ERM's Lindsey Bungartz responded by email advising that ERM had extended the commenting period by two weeks (to 8 November 2018). ERM attached a letter dated 18 October 2018 titled *Stakeholder Notification – Availability of isiZulu draft EIA* which (among other things) advised that the comment period had been extended to 8 November 2018.
85. On 26 October 2018, ERM's Lindsey Bungartz responded by email confirming that the oil spill modellers and peer reviewer were not present at the Durban meeting, and offering to facilitate a call between WildOceans and the oil spill modellers (and other specialists).
86. On 2 November 2018, the appellant's legal representative telephoned the ERM OSM 'independent' peer reviewer Mr. S. Luger of PRDW to seek clarification on some aspects of his peer review report. Mr S. Luger advised the appellant's legal representative to submit the queries through ERM.

87. Based on a preliminary review of the OSM report and PRDW's *Peer Review of ERM Spill Report*, it appeared that there was a previous version of the OSM spill report (as well as a peer review thereof) that did not feature in the draft EIR document set, and that the OSM had subsequently been re-run based on (among other things) new seismic data interpretation, and that various inputs into the modelling had been 'recalculated and optimized'.
88. On 3 November 2018, the appellant's legal representative wrote to ERM setting out in detail some of the appellant's queries relating to ERM's OSM report and PRDW's *Peer Review of ERM Spill Report* (see Annexure "A5"), which included the following (among others):
- 4.1. ERM indicates at p116 of its OSM report in response to PRDW Comment #2 that the 'input data for the model run are based on lithology and preliminary reservoir assessment and interpretation starting from seismic data. During the second quarter of 2018, new data interpretation were available from 2D/3D seismic data acquired by some multi-client providers in 2016 and 2018'.
- (a) Did ERM (or anyone else) run a modelling on the previous data (i.e. before the new data became available during the second quarter of 2018)? If so, please provide us with a copy of these modelling results and any previous versions of the OSM report reflecting these results.
 - (b) If a modelling on the previous data was run, did PRDW review this previous model? If so, please provide us with a copy of the Peer Review report/s of this previous modelling.
 - (c) Did ERM review the new data and independently verify its reliability?
 - (d) Did PRDW review the new data and independently verify its reliability?
 - (e) Has the previous and new seismic data been included in the EIA report or annexures? If not, please provide us with same, alternatively with your explanation for not including this data in the EIA report or annexures.
- 4.2. ERM indicates in response to PRDW Comment #2 that 'based on analysis already finalized, the reservoir and production profiles are expected to be very similar to the same available in other subsea fields developed by Eni in Africa. For this reason the PI (productivity index), porosity, hydrocarbon properties and expected flow rate have been recalculated and optimized using real data from those similar fields'.
- (a) What does 'analysis already finalised' refer to, and who conducted this analysis? Please provide us with a copy of this analysis.
 - (b) Did ERM have access to the underlying data used for this analysis? If so, what steps did ERM take to verify that the reservoir and production profiles are very similar to the same available in other subsea fields developed by Eni in Africa?
 - (c) Did PRDW have access to the underlying data used for this analysis? If so, what steps did PRDW take to verify that the reservoir and production profiles are very similar to the same available in other subsea fields developed by Eni in Africa?
 - (d) Who did the 'recalculation and optimization' of the flow rates? Please provide us with a copy of the documentation relating to the initial calculation of the

flow rates (before recalculation and optimisation) and the recalculated and optimised flowrates.

- (e) Did PRDW have sight of and verify the flow rate calculations before they were recalculated and optimised?
- (f) Did PRDW have sight of any earlier version of the OSM report based on the data before recalculation and optimisation?
- (g) Did PRDW have sight of the new underlying data relied upon to recalculate and optimise the flowrates?

89. ERM was requested to provide its and PRDW's detailed response to the above (and other) queries by close of business on 6 November 2018. This date was selected given that the (extended) time period for commenting on the draft EIR expired on 8 November 2018.

90. On 5 November 2018, ERM's Lindsey Bungartz emailed the appellant's legal representatives, confirming that the 3 November 2018 letter had been received, and that *'we are currently preparing a response to the questions'* (see Annexure "A6").

91. On 6 November 2018, ERM's Lindsey Bungartz again emailed the appellant's legal representatives (see Annexure "A7"), advising this time as follows:

Your letter dated 03 November 2018, received by ERM on Monday 05 November 2018 refers. Based on the volume and detailed nature of the questions, we require coordinated input from the relevant parties (some outside of South Africa) to appropriately address them. We have enlisted the appropriate people to contribute to a response, however, given the short timeframe, we will not be able to provide a response to your questions by COB today as requested. Responses to your questions will be provided in the comments and response report in the Final EIA Report. We welcome any additional comments on the EIA Report by 8 November 2018 and these comments will also be included in the Final EIA Report.

92. On 8 November 2018 (being the cut-off date of the extended time period), and without the benefit of any answers to the queries raised in the appellant's letter dated 3 November 2018 or the previous version of the OSM report and peer review, the appellant's submitted their detailed comments on the draft EIR.

On 9 November 2018, ERM's Lindsey Bungartz emailed the appellant's legal representatives confirming receipt of the appellant's comments, and advising that these comments *'will be included in the comments and responses report, together with a response from the project team'*

(see Annexure “A8”). On the same date, the appellant’s legal representative replied by email (see Annexure “A9”) as follows:

Thank you for your email confirming receipt of the WildOceans submission.

We look forward to receiving your detailed reply to our queries (and requests for further information) and the revised EIA report (and OSM modelling) for comment and engagement in due course. We also look forward to engagement over the selection of independent specialists to Peer Review the EIA report, OSM modelling and technical review, and other specialist studies.

Simply including WildOceans’ comments and ERM/PRDW/Eni’s responses in a final EIA report and submitting it to the relevant authority for a decision on authorisation will not meet the legal requirements for a lawful EIA public participation process, nor will it meet the requirements for procedurally fair administrative action.

93. ERM and PRDW’s responses to the queries raised in the appellant’s 3 November 2018 letter were in the end included in the ERM Comments & Responses Report (CRR). This effectively denied the appellant would an opportunity to take these responses into account when making its submissions on the draft EIR. In the CRR report, ERM also refused to provide a copy of the preliminary OSM report and related peer review. The relevant responses relating to the preliminary OSM report are set out below:

4.1 ERM had initially begun to prepare the model based on pre-defined input parameters without any corroboration to analogue geological field conditions for the area in question. A draft report was prepared on the initial data and preliminary comments were provided by the peer reviewer. Following this, further data become available and a revised report was prepared. **The draft report cannot be shared as it was preliminary and the results had not been verified.** The Oil Spill Modelling Report reflects the final verified and evaluated results (Annex D4 of the Final EIA Report). Unverified modelling results, outside of the context of an independent peer reviewed report, have not formed the basis of any conclusion drawn in the EIA Report. **Review of the draft report would therefore skew the evaluation of results, and may in fact prevent a stakeholder from reaching an accurate conclusion as to the proposed activities...**³⁷

Neither ERM nor PRDW reviewed the analogue or seismic data as they are not petroleum geologists and review of data of this nature is outside of their responsibility. ERM and PRDW relied on the expertise of the Company (Eni) for the geological assessment, which is standard international practice. The seismic data (both previous and latest) is licensed from multi-client sources and is commercially sensitive and confidential information.

Eni’s licensed seismic data relates to the prospectively of the area in question and is not relevant to evaluating the environmental impact of Eni’s proposed activities. Accordingly, Eni is not obliged to disclose this information.

³⁷ CRR, at page 27.

4.2 Eni provided the data for geological and geophysical properties, and ERM and PRDW did not have access to the underlying seismic data, for the reasons provided in the response to question 4.1.

The recalculation and optimization of PI (productivity index), porosity, hydrocarbon properties and expected flow rates have been undertaken by Eni to ensure a more robust and optimized data set, which is based on West African analogues with similar field characteristics. Calculation of such parameters through an analogue field index is an accepted practice in the industry where there are no other reference explorative wells in the area.

94. The appellant sought this preliminary OSM report and related peer review report so that various assumptions and thresholds used in the OSM report could be compared against same used in the preliminary OSM report to determine whether the results of the preliminary OSM report showed greater or lesser oil spill impacts arising from a major catastrophic blowout event when compared with the OSM report included, and so that the peer-reviewer's comments on the preliminary OSM report could also be considered and the rationale understood in light of the preliminary OSM report. This information was required so that the appellant could develop the necessary understanding and capacity to participate equitably and effectively with regard to the OSM report, which underpinned the EIA assessment of the consequences of a catastrophic oil spill arising from a wellhead blowout, as well as the subsequent impact assessments relating to (among other things) marine ecology, fisheries etc.
95. ERM's rationale that sharing the preliminary OSM report and related peer review 'would skew the evaluation of results, and may in fact prevent a stakeholder from reaching an accurate conclusion as to the proposed activities' is, with respect, an obfuscation. Failing to be open and share the preliminary OSM report and related peer review report with registered I&APs instead creates an atmosphere of suspicion regarding the content to the preliminary OSM report and related peer review, and invites an inference that the results of this preliminary OSM report may have been less favourable to the applicant.
96. ERM's refusal to be open and share the preliminary OSM report and related peer review report with registered I&APs results in the EIA failing to comply with the following requirements the NEMA environmental management principles and the EIA Regulations relating to public participation:

- In terms of s2(4)(f) of NEMA, the participation of all I&APs in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.
 - In terms of regulation 13(1)(d) and (f) of the EIA Regulations, ERM and PRDW are required to perform work relating to the EIA application in an objective manner, even if this results in views and findings that are not favourable to the application, and must disclose to registered I&APs all material information in the possession of the EAP and the specialist that reasonably has or may have the potential of influencing any decision on authorisation.
97. The EAP is not permitted to cherry-pick what information it makes available to I&APs. If the preliminary report contained information that was less favourable to the applicant for environmental authorisation, it would clearly be information in the possession of the EAP and specialist that reasonably has or may have the potential of influencing the decision on authorisation.
98. It is submitted that ERM and PRDW were legally bound to provide a copy of the preliminary OSM report and related peer review report to the appellant's, but failed to do so. This invites an inference that the EAP and its peer reviewer lacked objectivity, and reinforces the appellant's submission that the EIA process was procedurally unfair. As a consequence, the FEIR failed to place before the decision-maker all relevant information that could materially influence the decision, and this relevant consideration was not taken into account by the decision-maker when making its decision on authorisation.

Failure to respond timeously to detailed queries addressed to ERM and peer reviewer prevented adequate public participation

99. As has been set out above, ERM staff members who had undertaken the OSM were not present at the Durban meeting, nor were any of the specialists or peer reviewers who had provided expert reports. As a consequence, it was not possible to engage with these specialists or peer reviewers on the methodologies and assumptions and results of the modelling and specialist report. PRDW's S. Luger also refused to engage with the

appellant's legal representative telephonically, and referred the appellant's legal representative to direct any queries through ERM.

100. As a consequence, on 3 November 2018 the appellant's legal representative wrote to ERM setting out in detail some of the appellant's queries (these queries are not set out in detail here to avoid overburdening this appeal, and the appeal authority is referred to Annexure "A10" for details), and requested ERM to respond on or before close of business on 6 November 2018. The appellant required responses to these queries to inform its subsequent submissions on the draft EIR.
101. On 17 January 2019, ERM notified stakeholders that the CRR, which was reportedly released to the public on 14 December 2018 as part of the final EIA submission (it is unclear how this was released) had been updated to include responses to comments received in isiZulu, had been updated and uploaded onto the project website as of 17 January 2019.
102. On 30 January 2019, the appellant's legal representatives wrote to ERM regarding (among other things) ERM's stakeholder notification email dated 17 January, and recorded the following:
 - (2) We note from your stakeholder notification email dated 17 January 2019 that a Comments and Response Report (CRR) was released to the public on 14 December 2018 as part of the Final EIA submission.
 - (3) We record that no prior notification was received by our client (or by ourselves) that the CRR had been released to the public on 14 December 2018 as part of the Final EIA submission (we assume to PASA).
 - (4) We note that ERM has included responses to our letter dated 3 November 2018 in *3b. Annex B Public Participation Comments and Response Report*. We record that these responses were not available at the time when our client's submission on the Draft EIA Report was made on 8 November 2018, which precluded our client from commenting on these responses in its 8 November 2018 submission on the Draft EIA Report.
103. It is submitted that ERM's failure to respond timeously to these queries effectively precluded the appellant from commenting in an informed and meaningful manner on the subject matter of the queries. As a consequence, the opportunity to comment on the draft EIR was rendered meaningless as an opportunity to in turn influence the FEIR and the

decision on authorisation, and constitutes a fatal flaw in the EIA public participation process.

Failure to take appellant's submissions into account when finalising EIR renders the public participation procedure meaningless and procedurally unfair, and results in the EIA having lapsed.

104. The appellant's detailed submissions were omitted from the CR report forming part of the FEIR document set. This had three significant consequences on the procedural fairness and legality of the EIA process:

- (a) The appellant's submissions were overlooked or ignored by ERM when it finalised the EIR document set upon which the decision on authorisation rests, rendering the appellant's submissions meaningless in respect of affording it an opportunity to influence the FEIR, and constituting a fatal flaw in the EIA public participation process;
- (b) ERM's FEIR report failed to comply with regulation 44 of the EIA Regulations, as a consequence of which the applicant failed to meet the time-frame prescribed in regulation 23(1)(a) of the EIA Regulations, and by operation of regulation 45 the EIA lapsed; and
- (c) The decision on authorisation indicates that in making the decision, the decision-maker took into account (among other things) the '*information contained in the FEIR/EMPR dated 14 December 2018*'.³⁸ Given that the appellant's submissions were not included in the FEIR dated 14 December 2018, it follows that this item does not refer to same. No reference is made in the decision on authorisation at all relating to the appellant's submissions and ERM's responses thereto (which were contained in the SCR report). Failure to consider the appellant's submissions on the draft EIA report constitutes a fatal flaw in the decision on authorisation.

105. As mentioned earlier in this appeal, on 17 January 2019 ERM notified I&APs by email that a CR report was released to the public on 14 December 2018 as part of the Final EIA submission.

³⁸ EA, Reasons for Decision, 1.4.

106. On 30 January 2019, the appellant's attorneys wrote to ERM (and cc'd it to the DMR c/o PASA) regarding (among other things) the apparent exclusion of the appellant's comments from the CRR report (see Annexure "A11"):

6. ... our client's submissions on the Draft EIA Report (in all 62 pages) have not been included in the Final EIA document 3b Annex B Public Participation Comments and Response Report, nor have we been able to find our client's submission in any of the other Final EIA documents published on ERM's website (<https://www.erm.com/en/public-information-sites/eni-south-africa-offshore-exploration-eia/>). We assume that our report has thus also not been submitted to the competent authority.
7. In the circumstances we request that you:
 - 7.1 Point out where our client's submission (and ERM's responses thereto) have been included in the Final EIA submission document set submitted to the competent authority; or
 - 7.2 Explain why our client's submission (and ERM's responses thereto, if any) have been excluded from the Final EIA submission document set submitted to the competent authority.

107. ERM's Vicky Stevens responded by email to the appellant's attorneys, thanking them for bringing this to ERM's attention and advising that ERM was liaising with the authorities to determine the next steps on this, which ERM indicated would be communicated in due course.

108. On 6 February 2016, the appellant's attorneys wrote by email to ERM (and cc'd it to the DMR c/o PASA) (see Annexure "A12"):

- Advising that regulation 23(1)(a) of the EIA Regulations obliges the applicant, where regulation 21 (2) applies, within 106 days of the date of receipt of the application by the competent authority, to submit to the competent authority an EIA report which (among other things) must have been subjected to a public participation process of at least 30 days, and which reflects the incorporation of comments received;
- Pointing out that in terms of Regulation 45 of the EIA Regulations, an application in terms of these Regulations lapses, and a competent authority will deem the application as having lapsed, if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless extension has been granted in terms

of Regulation 3(7). Regulation 3(7) empowers the competent authority to extend relevant timeframes prior to the lapsing of the relevant prescribed timeframe in certain circumstances;

- Informing ERM that its failure to include the appellant's submission and ENI/ERM's response thereto in the Final EIA Report submitted to PASA was a fatal flaw compromising the administrative fairness of the EIA process, and its legal effect was that the applicant had failed to meet the time-frame prescribed in regulation 23(1)(a);
- Recording that no extension was granted by the competent authority prior to the lapsing of this time period, nor could an extension lawfully be granted after the fact; and
- Pointing out further that in the circumstances, ENI and ERM had failed to comply with the time-frame prescribed in Regulation 23(1)(a), and in terms of Regulation 45 the EIA application had lapsed.

109. On 26 February 2019 ERM responded by email advising that:

- ERM had incorporated the appellant's 'most recent comments' into a Supplementary CRR (SCRR) which was submitted to PASA and circulated to stakeholders on 22 February 2019; and
- Apologising for the 'unintentional omission' of the appellant's comments and the responses thereto, disagreeing that the FEIR was fatally flawed, and averring that it was substantially compliant with the EIA Regulations.

110. On 15 March 2019, the appellant's attorneys wrote to ERM (and cc'd it to DMR c/o PASA) (see Annexure "A13"). Referring to ERM's letter to stakeholders dated 22 February 2019, the appellant's attorneys noted that:

- ERM submitted the Final EIA Report to PASA for adjudication on 14 December 2018;
- It subsequently came to ERM's attention that some of the comments received were omitted from the CRR and were not responded to by ERM; and
- ERM had incorporated the comments into a supplementary CRR which was to be submitted to PASA and circulated to stakeholders on 22 February 2019.

111. It was pointed out that it was clear from the above that at the time of finalising and submitting the Final EIA Report to PASA on 14 December 2018, ERM failed to take into account or apply its mind to the appellant's submissions, that this irregularity effectively rendered the public participation process meaningless and procedurally unfair, that the appellant client was denied the opportunity to influence the Final EIA Report, and that ERM's consideration of and responses to the appellant's submissions were only made some months after the EIA Report had already been finalised and submitted to PASA

112. ERM's view contained in its 22 February 2019 letter to stakeholders was noted, namely that:

- Having carefully reviewed the omitted comments, ERM concludes that no information was presented in those comments that has not been addressed by responses to previous comments received earlier in the public participation process; and
- Because there was no new information in the omitted comments, responses to them, or the Final EIA Report, it follows that there was no legal obligation to circulate the Final EIA Report for further comment to Interested and Affected Parties... before submitting it to the decision-maker... it also follows that since I&APs had no further right to comment on the Final EIA Report and the Specialist Reports, they suffer no prejudice as a result of the circulation of the SCRR'.

113. The appellant's attorneys took issue with this view as being factually incorrect and legally flawed:

- Our client's substantive submissions included information and issues that had not been previously included in the Final EIA Report or CRR, including but not limited to flaws raised in respect of the Oil Spill Modelling (OSM) Report;
- ERM's failure to include our client's submission and ENI/ERM's response thereto in the Final EIA Report submitted to PASA is a fatal flaw compromising the administrative fairness of the EIA process, and its legal effect is that the applicant has failed to meet the time-frame prescribed in regulation 23(1)(a) of the EIA Regulations.³⁹ No extension was granted by the competent authority prior to the lapsing of this time period, nor can an extension lawfully be granted after the fact. As a consequence, ENI and ERM have failed to comply with the time-frame prescribed in Regulation 23(1)(a), and in terms of Regulation 45 the EIA application has lapsed; and
- As stated above, the Final EIA Report was finalised and submitted to PASA on 14 December 2018 without ERM taking into account or applying its mind to our client's submissions, rendering the public participation process

³⁹ GNR. 982 of 4 December 2014 (as amended).

meaningless and procedurally unfair. This constitutes significant prejudice to our client.

8. In the circumstances:

- We still look forward to receiving your communication regarding ERM/ENI's liaison with the authorities to '*determine the next steps on this; which will be communicated in due course*'. **Please furnish us with a copy of any correspondence between ERM/ENI and the authorities relating to this issue, as well as the minutes of any meetings between ERM/ENI and the authorities relating to this issue;**
- We stand by our view that the EIA application has lapsed, and should be resubmitted and subjected to a lawful and meaningful public participation process; and
- ERM's failure to take into account or apply its mind to our client's submissions when finalising the EIA Report and submitting it to PASA renders the public participation process meaningless and procedurally unfair.

114. Regulation 45 of the EIA Regulations clearly stipulates that an application in terms of these Regulations lapses if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless extension has been granted in terms of Regulation 3(7). ERM's omission of the appellant's detailed submissions on the EIR within the prescribed time-frame clearly constituted such a failure.

115. While regulation 3(7) empowers the competent authority to extend relevant timeframes prior to the lapsing of the relevant prescribed timeframe in certain circumstances, no such extension was sought by ERM or granted by the competent authority.

116. In the premises, it is submitted that ERM's failure to include the appellant's submissions (as well as submissions by other I&APs such as Groundwork) in the FEIR rendered the appellant's submissions meaningless in respect of affording it an opportunity to influence the FEIR (and thus ultimately the decision on authorisation). The legal consequence of this failure was that ERM failed to submit a compliant FEIR within the prescribed time-frame, without a prior extension having been sought or granted, which by operation of law resulted in the EIA application lapsing. This failure also in turn infected the decision on authorisation, which makes no reference at all relating to the appellant's submissions and ERM's responses thereto (which were contained in the SCR report). As a consequence, the EIA process was procedurally unfair, the EIA had lapsed by operation of the law, and the decision on authorisation fatally flawed and falls to be set aside on appeal.

Failure to afford appellant (and other I&APs) opportunity to comment on DEA:O&C review of OSM report procedurally unfair

117. In its reasons for decision (Appendix to EA), the DMR decision-maker indicates that (among other things) the following information was considered in the decision-making:

- 1.5 Supplementary comments requested by the Agency from the Department of Environmental Affairs: Oceans and Coasts on Oil Spill Modelling Report dated 27 March 2019.
- 1.6 Response report to the supplementary comments made on the Oil Spill Modelling Report dated 10 May 2019.⁴⁰

118. This reference to ‘supplementary comments’ is confusing, as it is unclear what these comments were, and what they were supplementary to. As far as the appellant is aware, the Department of Environmental Affairs (DEA) did not comment on the draft EIA report. The appellant was also unaware of the Department of Environmental Affairs: Oceans and Coasts (DEA: O&C) having commented on the draft EIA report.

119. However, light was shed on this somewhat cryptic reference ‘supplementary comments’ when the appeal authority responded by email on 27 September 2019 to the appellant’s request for an extension of time within which to submit this appeal. An email from the project proponent Eni was attached to the appeal authority’s email, and in turn included a number of attachments. Curiously, given that Eni will have an opportunity to respond to any appeals at the appropriate time, these attachments included the following two documents:

- Meeting Minutes (see Annexure “A14”) by ERM in respect of a meeting held on 3 May 2019 between representatives of PASA, the DEA: Oceans and Coast, the EIA consultant (ERM) and ERM’s independent peer reviewer (Stephen Luger of PRDW), with the subject indicated as:

ERM’s response to the Peer Review of the Oil Spill Modelling Report...
submitted as part of the Final Environmental Impact Assessment Report for the Exploration Drilling within Offshore Block ER236, KZN, South Africa.

⁴⁰ ER236 EA, at p15.

and

- ERM's written response dated 10 May 2019 (see Annexure "A15") included as Table 1 detailed:

Comments and Responses on DEA O&C Review of the Oil Spill Modelling Report.

120. Unfortunately, the originating DEA: O&C *Review of the Oil Spill Modelling Report* was not included as an attachment. However, the meeting minutes shed further light on this report. As background to the meeting, the Minutes indicate that **PASA commissioned an independent review by the DEA: O&C of ERM's OSM report, that the ERM was notified of the review and shared the comments on 12 April 2019.**
121. Let it be clear that the appellant does not take issue with a competent authority (assuming that PASA is indeed a competent authority, which is contested in this appeal) seeking comments from another government department with an interest in the subject matter under application for authorisation. Such comment could conceivably be sought both before and after the commenting period relating to the draft EIA report had expired, and should be considered by the decision-maker when making its decision on authorisation.
122. What the appellant does take issue with is that the basic tenants of procedural fairness (as informed by the Constitution, PAJA, NEMA and its Regulations and Guidelines, and the Principle of Legality) have been violated.
123. The subject matter of this independent review of ERM's OSM report and peer review, the subsequent meeting and ERM's 'Comments and Responses on DEA O&C Review of the Oil Spill Modelling Report' is highly material to the EA, with the OSM methodology and results underpinning the EIA finding that the consequences of a catastrophic oil release (blowout) rated as insignificant to moderate. The EA reasons for decision (Appendix to EA) show that the DMR decision-maker considered the DEA: O&C report and the EIA consultants (ERM) written responses thereto in the process of making its decision on authorisation.

124. It is clear that not only was the review of the ERM's OSM report commissioned by PASA (designated an I&AP for the purposes of environmental impact assessment), but ERM and ERM's peer reviewer were:

- furnished with a copy of this DEA-O&C report;
- afforded an opportunity to meet with the author and PASA to interrogate, discuss and influence the report; and
- provided with a further opportunity to provide written comments and responses to the DEA: O&C's review of ERM's OSM report.

125. The 3 May 2019 Meeting Minutes show that:

- PASA notified ERM of the review and shared the DEA: O&C 'comments' on 12 April 2019;
- ERM requested a 'clarification meeting' with PASA and the independent O&C Oil Spill Modelling reviewers; and
- The purpose of the meeting was to 'provide ERM and the ERM's peer reviewer (PRDW) with an opportunity to discuss the comments raised in the 12 April 2019 letter relating to the OSM report before providing a formal response to PASA'.

126. This process was procedurally unfair in the following respects.

127. Firstly, it is unclear on what legal basis PASA decided to notify ERM of the DEA O&C Review of the Oil Spill Modelling Report, facilitate a meeting between ERM and the author of the report, and provide ERM with a further opportunity to provide written responses and comments to this report. As the authors of the OSM report, ERM clearly have a vested interest in defending the OSM report.

128. Secondly, even it was appropriate for PASA to afford ERM this opportunity to influence, respond to and comment on the DEA O&C Review of the Oil Spill Modelling Report, PASA signally failed to afford I&APs a similar opportunity in breach of the requirements of procedural fairness and the basic tenants of *audi alteram partem*. PASA and/or ERM:

- Failed to notify the appellant or any other I&APs that PASA had commissioned and that the DEA O&C had provided a Review of the Oil Spill Modelling Report, notwithstanding that ERM's OSM report and peer review thereof underpinned the findings of the EIA (in particular in relation to the consequences of a catastrophic oil spill resulting from a worst-case scenario wellhead blowout), and notwithstanding that the appellant had raised serious criticisms of the ERM OSM report and peer review in its 8 November 2019 submissions on the draft EIA report.
 - Failed to make a copy of the DEA O&C Review of the Oil Spill Modelling Report available to the appellant and other I&APs.
 - Failed to notify the appellant or any other I&APs of the 3 May 2019 meeting, which was held behind closed doors (without the appellant or I&APs being informed), while affording ERM and its peer reviewer the opportunity to discuss and influence one of the drafters of the DEA O&C review of ERM's OSM report.
 - Failed to afford the appellant or any other I&APs an opportunity to make representations on the report, or for that matter on ERM's written response dated 10 May 2019.
129. Affording ERM and its peer reviewer (who both have a vested interest in defending the OSM report and peer review thereof) an (extended) opportunity to discuss, interrogate and influence the DEA O&C Review of the Oil Spill Modelling Report (which is new material new information introduced into the EIA decision-making process), while keeping this secret from the appellant and other I&APs, is unlawful and/or unconstitutional, and procedurally unfair. It clearly informed the way forward for the EIA process, and was clearly taken into consideration in the decision on authorisation.
130. It is submitted that as a consequence, the basic tenants of procedural fairness (as informed by the Constitution, PAJA, NEMA and its Regulations and Guidelines, and the Principle of Legality) have been violated. This procedural unfairness taints the legality of the EIA process, and constitutes a fatal flaw in the EIA.

Oil Spill Contingency Plan not included in EIA

131. In the appellant's 8 November 2018 submissions on the draft EIA report,⁴¹ it was submitted that the failure to include Eni's Oil Spill Contingency Plan (OSCP) in the draft EIR denies I&APs the opportunity to review and comment on the adequacy of the plan, and prevents I&APs from seeking independent technical expert advice thereon. It was submitted that this was in violation of s2 of NEMA and the principles contained in PAJA. It was submitted further that this failure constituted a violation of I&APs rights to participate meaningfully in the EIA process, and effectively denies I&APs an opportunity to in turn influence the decision maker. It was submitted further that this constituted a fatal flaw in the draft EIA report, and that any subsequent approval based on this report would stand to be set aside on appeal or subsequent judicial review.
132. The appellant's rationale for the above submission is set out in section 2.2 of its submissions on the Draft EIA report, pages 17-21 (see Annexure "A2"), which should be regarded as specifically incorporated into this appeal. While we do not intend to burden this appeal by repeating these submissions, we highlight and amplify some of the main issues, and then turn to ERM/Eni's response thereto.
133. The appellant's core complaint is that no site-specific OSCP has been developed for the proposed exploratory well installations authorised (such plans are distinguishable from South Africa's National Contingency Plan and Coastal Oil Spill Management Plans). A site-specific OSCP is highly relevant to the EIA given that it will set out the specific arrangements required to be in place to respond to a catastrophic oil spill arising from a worst-case scenario wellhead blowout, including but not limited to:
- specific equipment available (such as the blowout capping stack, and necessary offshore drilling equipment should a relief well need to be drilled);
 - where such equipment is located (such as only one capping stack being available in Saldanha on the West Coast for use in South Africa and Africa, while additional systems reportedly being available at unspecified locations elsewhere in the world);

⁴¹ SCR report p32 and p36.

- logistics informing actual response time etc. (such as transport or shipping requirements, implications of attempting to install a capping stack at a deep sea location in potentially adverse and challenging weather conditions, implications of having to drill a relief well should capping fail, and associated time requirements).
134. The OSCP is also a key consideration informing the OSM conducted in the EIA. For example, the duration assumptions for a catastrophic oil spill resulting from a worst-case wellhead blowout scenario are materially influenced by how long it would take to ship a capping stack to the relevant site (different times would apply depending on whether the Saldanha-based system was available at the time, or whether it would need to be sourced from elsewhere in the world), as well as how long it would take to drill a relief well (which may also have time implications for getting the appropriate drilling equipment to the blowout site, especially if such equipment was not available locally).
135. ERM respond to this issue in the SCR report,⁴² and their position can be summarised as follows:
- ERM deny that the failure to include an OSCP in the EIA report is a fatal flaw;
 - ERM state that the NEMA Regulations of 2017 do not state that an OSCP should be included in an EIA report.
 - ERM state that the specialist studies to be included in the EIA reporting were presented in the Plan of Study for the EIA Phase in the Final Scoping Report, which was approved by PASA in April 2018;
 - ERM states that it has provided sufficient information in the EIA reporting for I&APs to understand the potential impacts associated with the project and for the authorities to make an informed decision.
 - ERM state that an OSCP will be developed closer to the time of drilling once all details (exact location, time, vessel, shore base) are confirmed.
 - ERM state that it is the role the South African Maritime Safety Authority (SAMSA) to review and approve the OSCP prior to start of drilling. On approval SAMSA will issue a Pollution Safety Certificate.

⁴² SCRR p32 and p36.

- ERM state that Eni shall provide copies of the plan and the approved Pollution Safety Certificate from SAMSA to PASA, and the DEA.
- ERM state that the Plan and Pollution Safety Certificate are outside of the scope of this EIA process and are not required by PASA for the adjudication of this application for environmental authorisation.
- Section 9.8.2 of the FEIR describes the contents of the OSCP.

136. Regarding ERM's argument that ERM state that the 'NEMA Regulations of 2017' (sic) do not state that an OSCP should be included in an EIA report, we respectfully submit that ERM is misunderstanding its and the applicant's obligations.

137. In *Earthlife Africa v. Minister of Environmental Affairs*⁴³ ("the Thabametsi case"), the Department of Environmental Affairs and Thabametsi Power Company used a similar reasoning to avoid preparing a climate change impact assessment. The High Court flatly rejected the argument, stating:

The absence of express provision in the statute requiring a climate change impact assessment does not entail that there is no legal duty to consider climate change as a relevant consideration and does not answer the interpretative question of whether such a duty exists in administrative law.

The respondents' complaint that without explicit guidance in the law on climate change impact assessments, Thabametsi could not be required to conduct a climate change impact assessment, as there is no clarity on what is required, is unconvincing.⁴⁴

138. It is also relevant to note that in terms of section 24O(b) of NEMA, competent authorities when considering applications must:

- (b) take into account all relevant factors, which may include—
 - (i) any pollution, environmental impacts or environmental degradation likely to be caused if the application is approved or refused;
 - (ii) measures that may be taken—

⁴³ *Earthlife Africa Johannesburg v Minister of Environmental Affairs and others* [2017] 2 All SA 519 (GP).

⁴⁴ Paragraphs 88 and 89.

- (aa) to protect the environment from harm as a result of the activity which is the subject of the application; and
- (bb) to prevent, control, abate or mitigate any pollution, substantially detrimental environmental impacts or environmental degradation;
- (iii) the ability of the applicant to implement mitigation measures and to comply with any conditions subject to which the application may be granted.

139. In the Thabametsi case, Murphy J stated that ‘Section 24O(1) of NEMA obliges competent authorities to take account of all relevant factors in deciding on an application for environmental authorisation’.⁴⁵

140. The site-specific OSCP, as well as Eni/SASOL’s ability to implement the site-specific OSCP, are key measures to protect the environment, and are thus relevant factors that must be taken into account by the competent authority when deciding on an application for environmental authorisation. It follows that the appellant and other I&APs should have been, but were not, afforded an opportunity to make representations on the site-specific OSCP.

141. Regarding ERM’s response that it is the role the SAMSA to review and approve the OSCP prior to start of drilling, and that on approval SAMSA will issue a Pollution Safety Certificate, it is respectfully submitted that the approach taken by ERM (and the reliance thereon by the decision-maker) flies in the face of jurisprudence that confirms that functionaries with decision-making powers arising from their own respective empowering statutes are each required to discharge their respective statutory obligations, the basic principle being that the exercise of discretionary power (such as the DMR’s power to issue or refuse an offshore oil exploration EIA authorisation) rests with the authorised body and no one else. As the Constitutional Court held in *Minister of Public Works v Kyalami Ridge Environmental Association*,⁴⁶ which considered functionaries in different fields of planning and environmental authorisation, an “organ of state with decision making authority must consider the application before it from its own particular perspective”. In *Wary Holdings (Pty) Ltd v Stalwo (Pty) Ltd*⁴⁷ the Constitutional Court held that this is so because “each

⁴⁵ Paragraph 5.

⁴⁶ 2001 (3) SA 1151 (CC).

⁴⁷ 2009 (1) SA 337 (CC)

has “its own constitutional and policy considerations”. As a result of this difference in focus, authorities at different levels of government are engaged in functions which are substantially different in nature and there is no duplication.⁴⁸ In the *Fuel Retailers* case, the Constitutional Court (CC) held that the environmental authorities had misconstrued what was required of them by NEMA (the duty to consider the socio-economic impact of a proposed development, which the CC equated to need and desirability) by relying on a local authority’s town-planning decision that considered need and desirability. The CC pointed out that a proposed development may satisfy the need and desirability criteria from a town planning perspective and yet fail from an environmental perspective. The CC held that the environmental authority’s approach amounted to unlawful delegation of their duties to the local authority, that they had thus failed to comply with a mandatory and material condition for the granting of the authorisation.⁴⁹

142. It is noted also noted that the environmental authorisation includes the following specific condition relating to the OSCP:

5.5.2 The holder must, within 60 days prior to the commencement of the proposed drilling operations submit an Oil Spill Contingency Plan (OSCP). The OSCP must be developed in consultation with all relevant authorities, i.e. South African Marine Safety Authority (SAMSA), Petroleum Agency SA and the Department of Environmental Affairs: Oceans and Coast Branch.

143. This condition makes no reference to I&APs being afforded an opportunity to make representations regarding the content of this proposed OSCP.
144. In the premises, it is submitted that not only was the appellant’s right to procedural fairness violated by the failure to afford it an opportunity to make representations on a site-specific OSCP in the NEMA EIA process, but that the decision-maker also failed to take a relevant consideration into account (namely a site-specific OSCP) when making its decision. By simply requiring the project proponent to develop an OSCP in consultation with SAMSA, PASA and the DEA:O&C, the decision maker has abrogated its duty to take the OSCP into

⁴⁸ *Maccsand v City of Cape Town* 2012 (4) SA 181 (CC)..

⁴⁹ *Fuel Retailers Association of Southern Africa v Director-General Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others*, 2007 (10) BCLR 1059 (cc) at paragraphs 85 to 89.

account when making its decision on authorisation. The decision-maker's reliance on future SAMSA processes also amounts to an unlawful delegation of authority and/or an unlawful fettering of the DEA's statutory powers and obligations. The Final EIA Report and the decision on authorisation are thus fatally flawed, and the decision on authorisation falls to be set aside.

F.3 Oil Spill Modelling fatally flawed

145. In its submissions on the draft EIA report, the appellant raised a number of fatal flaws in ERM's OSM report. ERM and Eni responded to these submissions *ad seriatum* in tabular format in its SCR report.
146. Subsequent to appellant being notified of the decision on authorisation, the appellant sought the advice of international subject-matter experts regarding the adequacy of the EIA and OSM report, namely Professor Claire Paris (Paris), Professor Erik Cordes (Cordes), and Professor Annalisa Bracca (Bracca). At the request of the appellant, Paris prepared an *Independent Review of Annex D4: Oil Spill Modelling* (see Annexure "A16"), Cordes prepared an *Independent Review of Annex D1: Marine Ecology* (see Annexure "A17"), while Bracco prepared an *Independent Review of Annex D4: Oil Spill Modelling* (see Annexure "A18").
147. These expert reviews reveal a number of fatal flaws in ERM's OSM modelling, and reinforce a number of the issues raised by the appellant in its submissions on the draft EIA report (which comments were not taken into account by ERM when finalising the EIA report, and on the face of it were not considered by the decision-maker when making its decision on authorisation).
148. The following sections of this appeal provides an overview of the main flaws identified by Paris, Cordes and Bracca, before turning to the flaws raised by the appellant in its submissions on the draft EIR report. To avoid burdening this appeal unnecessarily, the appellant does not repeat its submissions verbatim here, nor does it include all of ERM and Eni's responses in this appeal document (many of which are simply repetition of what ERM stated in the Draft EIA report and draft OSM report). The appellant's submissions should

be read as if specifically incorporated into this appeal, and the appellant stands by these submissions (save where indicated to the contrary herein).

Paris Expert Review of ERM OSM

Introduction

149. In her introductory statement, Paris points out that:

- The OSM report does not mention the 87-day release of nearly 5 million barrels of oil, with a flow-rate of 50,000 to 70,000 barrels a day, from the Deep Water Horizon (DWH) oil spill, a relevant blowout frame of reference, and ignores the ‘unprecedented US counter-action of sub-sea dispersal injection (SSDI) and its effects on marine and human life’.
- The OSM report has not produced the ‘worst case’ oil spill, despite ERM’s claims that their ‘worst case’ spill modelling is unrealistic because they did not take into account emergency response, which would be days to weeks in the best case. Paris points out that the prevalent extreme sea conditions in the SE of South Africa would prevent any rapid and efficient first-response.
- Paris points out that deep-water spills have characteristics remarkably different from oil spilling in shallow water since a mixture of gas and gas-saturated oil, so-called ‘live-oil’, is released under very high hydrostatic pressure, and that it is thus important to distinguish between the thermodynamic processes occurring in the near-field, meters above the wellhead, and the hydrodynamic processes in the far-field, up to kilometres away. Paris goes on to state that the ERM OSM does not take into account any of the deep-sea blowout characteristics and thus does not provide three-dimensional (3-D) information to where the oil goes from several kilometres on the seafloor to the sea surface. The OSM also does not quantify oil concentration deposited on the seafloor or in suspension in the subsea, but only addresses the oil rising at the surface. This ignores a large part of the oil budget and thus the actual impact of the spill on the entire marine ecosystem.
- Paris points out that the exploration and exploitation in ‘ultra-deep’ ocean is happening in more extreme environments, which are new frontiers for the oil and gas industry since the 2010’s, and that blowout frequency is expected to increase as oil exploration and exploitation moves into deeper waters.

- Paris states that ERM's OSM is inaccurate on many levels, as described in more detail below.

Approach and Modelling Methodology

150. Paris points out that Eni and Sasol plan to drill six wells off the East Coast of South Africa with four wells to be located in 'ultra-deep' (i.e. $\geq 1500\text{m}$) waters, at 1500-2100 meters below the sea surface, and two other wells even deeper at 2600-3000m. Paris states that it is important to note that these depths are similar to or deeper than Macondo.
151. With regard to the oil spill model used by ERM, Paris points out since the model used by ERM was described in 1994, more than a decade of studies focused on the DWH blowout have revealed important characteristics of deep-sea blowouts that are not accounted for in models predating DWH, and which if taken into account would significantly affect the outcome of the modelling:

The oil spill model used in the report is the COSIM (<http://gemss.com/cosim.html>), a 3- dimensional (3-D) model described in the 1994 AMOP Proceedings (Kolluru et al. 1994), yet currently unavailable on any location connected to the internet. Since then, a decade of studies focused on DWH blowout revealed important characteristics of deep-sea blowouts, such as processes fundamentally linked to high pressure in the deep ocean. Such processes should be taken into account to accurately evaluate the transport and fate of gas-saturated oil and multiphase flow from deep-sea reservoirs (Aman et al. 2015; Boufadel et al. 2018; Malone et al. 2018; Pesch et al. 2018). In deep waters, the critical factors controlling the transport and fate of oil are: i) the gas-to-oil ratio in the reservoir, ii) the magnitude of flow rate and of turbulent kinetic energy (TKE) at the broken riser, and iii) the effects of extreme and variable pressure on the various conditions of the oil and gas at the blowout. Moreover, thermodynamic, fluid dynamic processes modulate the initial droplet size distribution (DSD), which in turn determine the rise velocity of petroleum hydrocarbons from deep-sea blowouts to the sea surface. These processes are not accounted for in oil spill models developed before DWH. An approach including these processes would significantly affect the outcome of the modeling (Perlin et al. 2019).

152. Paris points out that outdated analysis and terminology is evident from the ERM EIA, where the term used for deep blowout spill is "crude oil", and that offshore well blowouts are considered rare events because deep-sea exploration and exploitation is a new frontier for the oil and gas industry, but are expected to increase as these activities move into deeper waters:

The oil from deep reservoir is not crude oil but 'live oil' or gas-saturated oil, which fate and behavior are different from a crude oil spill (e.g., DeepSpill experiment,

Johansen and Rye 2003). This is particularly important because the DWH accident resulted for the most part from gas hydrate formation inside the riser pipe; hydrate formation is still a challenge for the industry. Offshore well blowouts are considered rare events because the exploration and exploitation in ‘ultra-deep’ ocean and more extreme environments is a new frontier for the oil and gas industry, yet blowout frequency is expected to increase as we move into deeper waters (Murawski et al. 2019).

153. Paris goes on to explain that:

Oil spill modeling of deep-sea oil spills is divided into the near-field and the far-field models (**Figure 1**). The near-field represents the initial stage that deals with buoyant jet of oil and gas mixture, where turbulent kinetic energy (TKE) and variations in pressure are the key processes affecting gas bubble and oil droplet size distributions (Bandara and Yapa 2011; Aman et al. 2015). The near-field modeling represents oil and gas separation, hydrate formation (and loss of buoyancy), the formation of gas bubbles and oil droplets, and the formation of multiphase plumes also called “intrusion layers”, which can be described as layers with high concentration of oil (Mingotti and Woods 2019). The intrusions can be of various types depending on the flow-rate, the stratified water column conditions, and the ambient current speed (Socolofsky and Adams 2011; Fabregat et al. 2016). The depth of the first intrusion dictates the trap-height (**Figure 2**) of the oil and gas plume above the well (or the depth at which the rising velocity of the buoyant plume vanishes). The trap-height is the starting location of the far-field modeling (Socolofsky and Adams 2005, Paris et al. 2012). At the trap-height location, the information about the oil droplet size distribution (DSD) and the trap-height is used in a three-dimensional (3-D) far-field model of oil transport and fate at scales of hundreds and thousands of kilometers.

The far-field modeling typically employs Lagrangian-based methods to advance oil droplets in horizontal and vertical direction based on environmental conditions and droplet buoyancy, using 3-D hydrodynamic models supplying ocean state input data, wave and surface wind data to support surface transport modeling. The oil fate is modeled for through individual-based algorithms of weathering processes such as biodegradation, dissolution, adsorption, sedimentation, degassing, surface evaporation, and photo-oxidation (Spaulding 2017).

...

During the DWH, field observations and lab-based experiments, as well as numerical sensitivity of parameterization ranges allowed confidence in hindcast models for surface evaporation rate and (DeGouw et al. 2010), surface oil slicks (Le Hénaff et al. 2012), sedimentation (North et al. 2015), and the formation of the deep-plume (Paris et al. 2012). In the current EMR report, while the near-field is not mentioned, the far-field model does not take into account the 3-D nature of the oil transport and fate, nor DSD as one of the critical initial conditions.

154. Paris points out that the ERM OSM was run in a stochastic mode (representing a statistical representation of randomly selected start dates of the spill for two seasons), which would presumably allow probabilistic analyses of a given oil concentration reaching all possible

locations after a given spill time (in line with the best modelling practices). However, Paris goes on to point out that:

... in 3-D oil spill modeling, where the source of the spill from the seafloor is in the deep ocean, the initial conditions and parameterization of the oil sub-model (e.g. droplet size, biodegradation, dissolution) are critically important (Perlin et al. 2019). These initial conditions of the model were either ignored or flawed as explained below.

Oil Model Configuration and Scenarios

155. Paris indicates that ERM evaluated three oil spill scenarios (a surface diesel spill; a deep-sea blowout; and a release of non-aqueous drilling fluid (NADF) during drilling). Paris' review focuses on modelling of the blowout scenarios, namely: *Scenario 2a - Crude Blowout – Hole Collapse* (N: 1,623m, 7-21 days) and *Scenario 2b - Crude Blowout – Cap Install* (S: 2,883m, 20-34 days).

Duration of the Oil Spill

156. Paris states that the DWH oil spill should be considered for simulating the 'worst case scenario'.
157. Paris goes on to state that since 2010, the oil and gas industry has made great strides in increasing the capabilities for subsea well control response based on learnings from the DWH incident:

Proposed regulations require access to Source Control and Containment Equipment (SCCE) to stop the flow of petroleum fluids into the environment (BSEE report 2016). The capping stack system is part of the SCCE, together with vessels, surface and subsurface equipment devices, etc. According to the BSEE report, the fastest that a capping stack can be deployed is estimated to be between 7-20 days.

158. Paris points out that despite the above, ERM's OSM report⁵⁰ unrealistically stipulates:

It is also important to note that, in line with international best practice, all three of the modelling scenarios have been run with the assumption that no oil spill response

⁵⁰ FEIR Annex D4, at p11.

measures would be implemented and that no mitigating actions would be taken at the point of spillage. Therefore, the results of the modelling present the ‘worst case scenario’ that could result from any particular oil spill.

159. Paris states that this statement is incorrect given the short duration of the spill scenarios and the low oil volume released (which she explains in more detail below). Paris notes that the OSM report goes on to state the following assumptions:

- A number of **assumptions** have been made in order to determine the scenario to be modelled. These include the following:
 - The event is completely uncontrolled, with no intervention for avoidance / reduction (unrealistic situation because the emergency response team and equipment, such as a blowout preventer (BOP), will be present and immediately activated). The use of spill/blow out containment or reduction systems (BOP, boom, skimmer etc.) hasn’t been included in the simulation (unrealistic situation).

160. Paris expresses the view that the above assumption is unjustified since a BOP is not enough to prevent deep-sea blowouts, and that a capping stack is now the primary subsea response:

Based on subsea capping stack availability and storage locations and capabilities, the Oil Spill response Limited (OSRL) Consortium holds a subsea capping stack in South Africa (BSEE Report 2016). This is relatively good news, but it takes no less than a week to bring the structure onsite at sea, given good sea conditions, and deploy the heavy and complex equipment over the ruptured riser pipe and BOP in order to gain control of the well. Note that such high seas operations are not trivial in very powerful currents associated with anomalous waves in the SE African coast where the swell is generally against the current. Mallory (1973) reported waves to be in excess of 18 m in this region. Autumn has the largest amplitude wave events; summer is the only season where large events are infrequent (S Corbella, D D Stretch).

161. Paris states that ERM’s proposed ‘worst case’ blowout scenarios are in fact ‘best case’ scenarios with spill duration of 7 days (the minimum time to secure a capping stack, if all prior evaluations have been properly undertaken to set the capping stack without further dives and or assessments) to a 34 days maximum (namely a 20 day spill duration, plus an additional 14 days after termination of the release when the transport and fate of the oil is tracked by the model).⁵¹

⁵¹ FEIR Annex D4, section 5.6 at p68.

Flow-Rate: Oil Volume Released per Day

162. Paris also criticises the assumptions made with regard to flow-rate. Paris points that the flow rate used in the simulation is highly unrealistic:

When considering the flow rates used for the ‘worst case’ simulations, they range from 4,717 barrels per day (b/d) at the wellhead located at 1,623 m depth, to a maximum of 6,604 b/d at 2,883 m depth. In the case of DWH, the calculated flow rate was 70,000 b/d at the beginning of the blowout and decayed to 50,000 b/d after 87 days (McNutt et al. 2012; Griffith et al. 2012), that is still more than an order of magnitude larger than the flow rate used in the Annex D4. There are differences in flow rates from reservoirs depending on their geological formation, but there is no base for considering such a weak flow-rate for ultra-deep, and ultra-high pressure oil and gas reservoirs —especially since the south well (S) is nearly twice as deep as Macondo. Ultra-deep reservoirs are often at greater risks of mud losses and well-control issues since they are at higher pressure (> 15,000 psi) and have high temperature (>82 °C) (UDAC 2013).

163. Paris advises that sensitivity analyses on the flow rate (including the maximum measured in the DWH accident) are absolutely necessary to take into account uncertainties in the volume of oil spilled.
164. No such sensitivity analysis was included in the ERM OSM report.

Criteria for Worst Case Scenario

165. Paris notes that the ERM OSM model worst-case scenarios had 3 criteria:

- (a) largest amount of sea surface area oiled (m²);
- (b) largest shoreline oiling mass (kg); and
- (c) fastest time to shoreline.

166. Paris points out that these criteria are not necessarily fitted to assess the ecological threats to the coastal and offshore benthic habitat types off the South African East Coast (SAEC), and that other cases could also be considered to be worst case depending on the local ecosystem:

These above model configurations are not acceptable: low volume of released oil and short duration of the spill is not what should be presented as ‘worst case scenario’. Moreover, strong currents, together with frequent extreme weather and wave conditions will make any

rapid response to an ultra deep-sea blowout impossible. Indeed, ideal sea conditions are required to deploy a capping stack in waters exceeding a few kilometer.

167. ERM has thus not modelled the worst case scenario.

Oil Droplet Size and Physics

168. Paris points out that one of the most critical parameters in oil transport and fate is the oil droplet size distribution (DSD) that drives the rising of the oil in the water column, and that not mentioning droplet size is a ‘flaring gap’ in the ERM model. Paris explains that:

The rise velocity of an oil droplet is an increasing function of its diameter and degree of saturation with natural gas components. For an intermediate-viscosity black oil like Louisiana sweet crude (which has been used as a proxy for DWH studies), oil droplets smaller than approximately 70 µm can be rendered neutrally buoyant due to small-scale ocean turbulence. Extending the sub-surface residence time of rising crude oil droplets allows toxic volatile organic compounds (VOC) (including BTEX compounds and other components) to dissolve into the water column prior to surfacing, thus theoretically reducing VOC exposure to responders and air-breathing wildlife. Previous modeling studies have calculated reductions in VOC exposure of up 28% with the addition of SSDI. Several iterations of comparative risk assessments (CRAs) have also concluded that SSDI is an effective and preferred response option for deep blowouts, yet without consideration of impacts to wildlife and their habitats. However, these modeling studies calculate oil droplet size distributions in the absence of SSDI that include de minimum quantities of droplets below this 70 µm threshold. Results of some droplet size experiments and models upon which the existing CRAs are based (e.g. results of V-DROP-J, ASA and SINTEF droplet size models) conflict with other experiments and models, especially those including ‘live-oil’ (gas-saturated) at ambient deep-sea pressures (~15 MPa) that show a substantial fraction of small droplets without the addition of SSDI.

Oil Spill Modelling Output/Results

169. Paris points out with regard to the OSM outputs/results, no mention is made in the ERM OSM of droplet size distribution (DSD):

As mentioned above, one of the major parameters of the oil sub-model, besides the chemical composition of the oil that determines the partitioning of the hydrocarbon fractions (dissolution) and biodegradation, is the droplet size distribution (DSD). The oil DSD drives its rise velocity and thus the distribution of oil in the seabed, the water column, and the sea surface (North et al. 2012, Paris et al. 2012, 2018). However, there is no mention of mean droplet size or DSD, which have been the major focus of the debates during the DWH spill for cleanup strategy (Schrope 2013).

170. Paris states that the resulting mass balance graphs are irrelevant, given that there is no explanation on the rise velocity of the oil, nor of the partitioning (dissolution) and biodegradation of the different fractions. Paris goes on to say that the modelling is very unclear and cannot be explicitly evaluated, and in addition the Probability and Contour Diagrams depend on the flow-rate (i.e. volume of oil spilled per day) which as per the model's initial conditions are order of magnitudes less than expected:

Therefore, all the figures and oil mass budgets are irrelevant.

171. Paris notes that all the ERM OSM figures are shown at the geographical scale of SE Africa and are not at appropriate scale of *Kwa-Zulu Natal Coast of South Africa*. As a result, Paris states that it is impossible to see the details of the model output without zooming in, and that this is misleading in terms of the magnitude of the spill.
172. With regard to the ERM OSM report Figure 5-13 Scenario 2a: 7-Day Crude Oil Blowout – Probability of smothering surface oiling ($>1.0 \mu\text{m}$) for spill at N1 and S in Summer/Autumn, Paris raises three criticisms:

Firstly, Summer and Autumn are contrasting oceanographic seasons (Corbella and Stretch 2012) and deep-sea blowouts have to be simulated with different boundary conditions and cannot be depicted on the same figure. Secondly, both N1 and S probability of surface oiling are quasi invisible at the geographical scale of the figure; the results are thus misleading. Thirdly, the output is merely about oil surfacing but blowout are 3-D and such output does not [inform] about the transport and fate of the deep plume and the subsea oil.

173. With regard to the ERM OSM report *Figure 5-32 Scenario 2b: 20-Day Crude Oil Blowout*, Paris points out that:

Black dots are oil mass at the surface but there is no scale showing the units of the oil mass. Also, the oil in the water column or in the sediment is not represented. Furthermore, there is no justification for the threshold of 100g/m^2 for shoreline oiled.

174. With regard to ERM OSM *Table 3-1*, Paris states that, surprisingly, the modelling output described in Table 3-1 from Annex D4 is restricted to quantifying surfaced and beached

oil. Paris points out that an uncontrolled oil spill in the ultra-deep sea is a three-dimensional problem and that:

...the following output should also be included to assess the full oil budget: (1) oil concentration in the water column; (2) sedimented oil mass (i.e., on the seafloor, shelf, coral reef habitat, etc.); (3) subsea oil mass of intrusion layer formation, so-called deep plumes (Socolofsky et al. 2011). Indeed, buoyant oil and gas, released at the bottom of a stratified ocean, can become trapped in layers, centered on the level of neutral buoyancy of the entrained seawater (Socolofsky et al. 2016). Again, there are no output addressing the contamination of the planktonic and benthic ecosystems.

175. Paris points out further that the output presented is not specific enough in terms of the toxic pseudo-components of the petroleum hydrocarbon (i.e. does not differentiate between total petroleum hydrocarbon (TPH) and polycyclic aromatic hydrocarbon (PAH) concentrations).

Summary of Shortcoming and Gaps

176. Paris summarises the shortcomings and gaps identified in ERM's OSM modelling as follows:

...ERM's Oil Spill Modelling (OSM) blowout configurations are not acceptable and the scenarios presented are fatally flawed based on the following:

1. While the initial conditions of flow-rate in the blowout scenarios presented are at least one order of magnitude less than expected for deep-sea blowouts, there are no sensitivity analyses on the volume of oil that could realistically be released.
2. The duration of the spill are not 'worst' case scenarios but in fact represent 'best' case scenarios, where a capping stack would be transported and deployed within a minimum time of 7-20 days.
3. 'Worst case' scenario should also consider the extreme sea conditions with anomalous waves in the SE of South Africa, which would prevent any first-response to be rapid and efficient.
4. The oil flow from deepwater reservoirs is a complex multiphase gas and oil problem, which is fully omitted in the modeling.
5. One of the most critical parameters for accurate oil transport and fate modeling is the oil droplet size distribution (DSD) that drives the rising of the oil in the water column. Not mentioning droplet size is a glaring gap in the EMR model. Other important input parameters are the ensuing highly turbulent flow structure and the multiphase nature of the system as well as the high-pressure, low-temperature conditions in the deep sea.

These issues significantly affect the set up of the oil model configuration but also the outcome presented here. They are thus the basis upon which I disagree with the conclusions of the document reviewed. Accidental oil releases have resulted in the long term damage of the marine environment and drilling in ultra-deep waters represent even more serious risks (Murawski et al. 2018). The oil modeling scenarios presented by ERM are highly unrealistic and should at minimum take into account knowledge and lessons learned from the past nine years of research post-DWH. It is clear that a correct approach would have significantly changed the outcome of the modeling.

Recommendations

177. Paris points out that modelling of large-scale oil spills from deep-sea oil spills is highly complex due to a number of bio-chemo-geophysical interactions, some of which have been discovered and studied following the DWH oil spill disaster in 2010. Paris states that modelling of the oil transport, fate, and prediction of mass-conserved petroleum hydrocarbons concentrations in 3-D is necessary to objectively generate modelling output useful for EIA:

Firstly, one of the most critical parameters in oil transport and fate is the observed log-normal oil droplet size distribution (DSD) that drives the rising of the oil in the water column (Malone et al. 2018). Secondly, model configuration with in a two-phase approach with liquid oil and methane gas should be implemented. Thirdly, pressure-dependent dissolution processes should be considered.

178. It is submitted that Paris' review reveals a number of significant flaws in the ERM OSM (as set out in detail above) which significantly affect both the set-up of the oil model configuration and the outcome presented. Paris thus disagrees with the conclusions of ERM's OSM report, stressing that accidental oil releases have resulted in the long term damage of the marine environment and that drilling in ultra-deep waters represent even more serious risks. Paris states that the modelling scenarios presented by ERM are highly unrealistic and should as minimum take into account knowledge and lessons learned from the past nine years of research post-DWH. Paris states further that it is clear that a correct approach would have significantly changed the outcome of the OSM. These significant flaws have a knock-on effect to the various impact assessments which rely on the results of the OSM report, and as a consequence the ERM OSM cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.

Cordes Expert Review relating to ERM OSM

OSM report fails to predict the distribution of oil on the sea floor resulting from numerous pathways

179. With regard to accidental events, Cordes points out as follows:

Impacts from accidental events can range widely from negligible to major, depending on the event that has occurred...

A large spill or blowout could have major consequences for the marine environment, from the shoreline to the deep sea. There is abundant literature on this subject, and much of this is summarized in the Annex. This is also the subject of the oil spill modeling report, which is evaluated elsewhere. Of significance to this EIA, there is an empirical relationship between the depth of drilling operations and the frequency of accidents during drilling operations (Muhlenbachs et al. 2013). In their analysis, there is a 40% probability of an accident occurring in any given year on a platform (as opposed to the drillship being used in the proposed drilling) in a water depth of 2000 m, with the probability increasing at deeper water depths.

Within the context of impacts to potential VMEs [vulnerable marine ecosystems] in the immediate vicinity of the well head, it should be noted that a significant component (up to 50%) of the liquid and gaseous hydrocarbons that were released during the *Deepwater Horizon* blowout remained in the deep ocean. These were either degraded rapidly before making it to the surface (primarily in the case of methane gas), dissolved into the seawater at depth, suspended as microdroplets in the large subsurface plume that formed, or were redeposited on the seafloor as oiled marine snow (the “dirty blizzard” depicted in Fig. 2). In particular, the oiled marine snow event was not something that was predicted to happen during a spill based on the knowledge prior to the *Deepwater Horizon*, and this material was most likely the biggest contributor to the impacts observed on the cold-water corals in the deep Gulf of Mexico (Fisher et al. 2016). The submitted EIA only deals with a surface oil slick and makes no predictions for the distribution of oil on the seafloor that will be a result of these numerous pathways...

Conclusions and Recommendations...

- Oil spill modelling needs to take into account multiple potential pathways of exposure to deep sea communities.

180. In summary, Cordes points out that:

- A large spill or blowout could have **major** consequences for the marine environment, from the shoreline to the deep sea;
- There is an empirical relationship between depth of drilling operations and the frequency of accidents (in other words, there is evidence showing that deep sea drilling results in more accidents than drilling at shallow levels);

- The EIA under appeal only deals with a surface oil slick, and makes no predictions for the distribution of oil on the seafloor that will be a result of numerous pathways. Cordes points out that a significant component (up to 50%) of the liquid and gaseous hydrocarbons that were released during the Deepwater Horizon blowout remained in the deep ocean and either: degraded rapidly before making it to the surface (primarily in the case of methane gas); dissolved into the seawater at depth, suspended as microdroplets in the large subsurface plume that formed; or were redeposited on the seafloor as oiled marine snow or “dirty blizzard”.

181. It is submitted that the failure to model the distribution of oil on the seafloor through multiple pathways in the event of a catastrophic oil spill resulting from a wellhead blowout is a significant flaw in the ERM OSM modelling and has a knock-on effect to the various impact assessments which rely on the results of the OSM report, and that the ERM OSM cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.

Bracca Expert Review of ERM OSM

Underestimation of instantaneous velocities and poor localisation of the Agulhas current

182. Bracca points out that the hydrodynamic model (HYCOM) used in the ERM OSM and assessment underestimates the instantaneous velocities especially in the upper 50 m of the water column in the area of interest, and places the core of the Agulhas too far off-shore when the current approaches the shore of Durban. This is due to the HYCOM resolution being insufficient to fully capture the localisation of strong boundary currents such as the Agulhas Current and its strength, and because HYCOM’s vertical coordinate system and limited number of vertical levels can generate pressure gradient errors in the presence of steep gradients in bathymetry. Bracco states that:

As a result, HYCOM (or any other model with a similar vertical coordinate system...) underestimates the instantaneous velocities especially in the upper 50 m of the water column in the region of interest, and places the core of the Agulhas Current too far off-shore when the current approaches the coast south of Durban...

183. In support of the above, Bracca refers to published literature having commented on these limitations to HYCOM in support of her critique (see Annexure “A18” for details).

184. With regard to localization aspect, Bracca notes that:

HYCOM predicts the Agulhas core to reside approximately 50 km (or 5-6 grid points) from the shore, close to the 1000 m isobath, where it approaches the shore south of Durban. This is again a consequence of limited (for the area) resolution and, likely, numerical stability. The analysis of SEVERI SST data performed by Rouault and Penven (2011), however, found that the core lies approximately 20 km from the shore at East London (32.97°S and 27.87°E). Their analysis is further supported by the fact that the moorings to the south of the Block described in VanZwieten et al. had to be restricted to the 100 m isobath due to the challenges posed by the Agulhas Current further offshore. **This model bias may impact hugely the shoreline oiling predictions contained in the report, as much more oil could reach quickly the shoreline far more quickly than predicted, if brought so much closer to it by the core of the Agulhas Current.**

185. In support of the above, Bracca refers to published literature that commented on these limitations to HYCOM (see Annexure “A18” for details).

186. It is submitted that the underestimation of instantaneous velocities and poor localisation of the Agulhas current are significant flaws in the ERM OSM modelling and has a knock-on effect to the various impact assessments which rely on the results of the OSM report, and that the ERM OSM cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.

Underestimation of the Agulhas current variability

187. Bracca also points out that HYCOM significantly under-predicts the Agulhas Current variability:

The HYCOM validation performed by VanZwieten et al. (2014) highlights “how HYCOM portrays the current to be less variable than it actually is. At 20 m depth, HYCOM under predicts the percentage of current reversals by 73%, 31% and 61% at locations 1, 2 and 3, respectively.”

188. Bracca states that the fact that HYCOM displays limited variability is evident in the OSM report, where the simulated ensembles of oil trajectories collapse on small areas around the spill locations, with some trajectories having a very high probability, and comments that:

This is in contraction not only with the VanZwieten et al. analysis (focused to the south of the Block ER 236 by necessity), but also with the analysis of satellite images of chlorophyll that includes the Block area presented by Guastalla and Roberts (2016). Their Fig. 14 (reported below) illustrates that the Block of interest is characterized by the highest chlorophyll variance in the region.

189. Bracca says that this is indirect, strong evidence of both physical and ecological variability that is not reflected in the hydrodynamical model and therefore in the scenarios contained in the assessment.

190. Bracca states that a similar conclusion can be drawn by considering the nurdle accidental spill in the Durban Harbour in October 2017:

While the spill starts much closer to shore compared to the planned drilling sites, it is worth noting that over 8 weeks the nurdles dispersion extended over 2000 km of the South African coastline (Schumann et al. 2019).

191. Bracca states further that the causes of this underprediction are not as clear as for the strength and localisation aspects (discussed above), and may depend on the atmospheric fluxes used to force the HYCOM hindcast (with wind and heat fluxes from well-known atmospheric products showing significant discrepancies among them). Bracca indicates that resolution (especially in relation to the representation of the Agulhas Plateau) may further contribute to this underprediction.

192. Bracca refers to Dr. Eric Chassignet, the scientist behind the development of HYCOM, who is on record as indicating that ‘Global high resolution models (with the exception of NEMO) exhibit an early Agulhas Retroflexion and eddies that are too regular in shape and pathways’. Bracca points out that this issue persists in the current version of the global hindcast used for the assessment, and that the underestimation of the Agulhas Current variability (or the excessive regularity of the current behaviour) is also discussed in published literature.

193. Bracca notes further that Dr. Chassignet stresses that other (regional) models such as NEMO and ROMS ‘are capable of doing a better job than HYCOM’, and that there are

models and configurations that would provide more realistic representation of the advective pathways from the drilling locations and of their variability.⁵²

194. Bracco also states that Dr. Chassignet mentions that the:

Analysis of the global HYCOM simulations suggests that the flow may be too barotropic. This may be due to an improper representation of the topographic/bottom drag.’ to the point of misrepresenting the mean velocity structure near the bottom, possibly invalidating the sensitivity tests performed in the event of a deepwater rupture. (emphasis added)

195. Making reference to published studies (see Annexure “A18” for full details), Bracco expresses the view that other model runs that are deemed more reliable in their representation of the Agulhas Current should have been considered and compared also for the representation of the near bottom circulation given this well know problem in HYCOM.

196. It is submitted that the underestimation of the Agulhas current variability is a significant flaw in the ERM OSM modelling and has a knock-on effect to the various impact assessments which rely on the results of the OSM report, and that the ERM OSM cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.

Reliability in the representation of mixing regimes in mesoscale resolving models.

197. According to Bracco:

...mixing regimes within the upper ocean mixed-layer (the layer where the wind forcing penetrates), cannot be properly simulated without accounting for circulations at scales of few hundreds of meters to few kilometers (the so-called submesoscales). This has been shown abundantly in the literature of the past 15 years (McWilliams, 2016 provides a good review) and was particularly relevant during the Macondo oil spill.

198. While Bracco does not argue that all spill projections should be done with a submesoscales resolving level model, she points out that:

⁵² Bracco, p7.

... considering the vicinity to the coast, the large density gradients in and around the area of interest, the large productivity in the region that is symptomatic of strong vertical mixing, and the variability shown in the chlorophyll variance within the Block ER 236, it is indisputable that submesoscale processes play a key role in the area and will be converging and transporting oil in the event of an accidental spill. These processes have been completely neglected in the current assessment.

199. Citing published studies, Bracco states that the region within and around the Block ER 236 is the ideal candidate for energetic cross-shore and vertical mixing, and advection controlled by a submesoscale rich flow field (see Annexure “A18” for details).

200. Bracco concludes in summary as follows:

In light of the intrinsic or configuration-related limitations of HYCOM for the region of interest, and the recognition that these biases have in and by the scientific community, my recommendation would be to estimate the potential oil spill damage under different spill scenarios using hydrodynamic fields from regional model outputs, with global products such as HYCOM used as boundary conditions.

Credible estimates will have to come from models with resolution sufficient to resolve fine scale features as well as coastal ocean and shelf sea processes given the proposed locations and the vicinity of the Agulhas Current to the shoreline to the south of the proposed drilling locations.

It could also be useful to release drifters from the sites and evaluate the actual time required to reach the coastline. The biodegradable drifters developed after the Macondo spill (Novelli et al., 2017) are cheap and use a Spot Trace GPS with an accuracy of about 7 m. Left undrogued they could provide very relevant data for a reasonable cost.

The major weaknesses identified in this review in relation to the hydrodynamic model used in the assessment pertain to an unreliable representation of strength and vertical structure, but especially localization and variability of the Agulhas Current, and an underestimation of lateral mixing and vertical advection due to the lack of submesoscale processes. **The projected damage is very likely to be strongly underestimated, especially in relation to the possibility of nearshore oiling and impacts to Marine Protected Areas and the coastal ecosystem.** (emphasis added)

201. It is submitted that the underestimation of lateral mixing and vertical advection due to the lack of submesoscale processes (which results in the projected damage being very likely to be strongly underestimated, especially in relation to the possibility of nearshore oiling and impacts to Marine Protected Areas and the coastal ecosystem), is a significant flaw in the ERM OSM modelling which has a knock-on effect to the various impact assessments which rely on the results of the OSM report, and that the ERM OSM cannot serve as a

lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.

ERM OSM report fatally flawed

202. The following sections of this appeal set out the appellant's further grounds of appeal relating to the ERM OSM report and PRDW peer review. Taken together with the flaws identified by the experts dealt with above, these grounds support the appellant's assertion that the ERM OSM report and the PRDW peer review are fatally flawed, and cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.
203. These grounds of appeal do not necessarily follow the same sequence as the headings contained in the appellant's submissions, but having regard to ERM and Eni's responses (which include repetitions) are for convenience dealt with thematically.

EA conclusion erroneous

204. In its submissions on the draft EIA report, the appellant commenced its critique of the OSM report by submitting that a catastrophic oil spill can result in significant environmental and socio-economic impacts, as clearly illustrated by the 2010 Deepwater Horizon catastrophe:

In addition to the loss of 11 lives, that single event resulted in the release of 124 million gallons of oil, which spread over 43,300 square miles of the GOM [Gulf of Mexico] and 1,300 miles of shoreline in several states. The environmental and other damages caused by the Deepwater Horizon incident were immense and have had long-lasting and widespread impacts on the Gulf and the affected states. For example, as part of a settlement between BP and Federal and state governments, BP has agreed to pay over \$8 billion for natural resource damages caused by the spill and for restoration of natural resources in the Gulf of Mexico region (GOMR). Those damages include severe adverse effects on wildlife, wetlands and other wildlife habitat, recreation and tourism, and commercial fishing... The released oil "was toxic to a wide range of organisms, including fish, invertebrates, plankton, birds, turtles and mammals... [and] caused a wide array of toxic effects, including death, disease, reduced growth, impacted reproduction, and physiological impairments that made it more difficult for organisms to survive and reproduce." In addition, state and local government

economic damage claims arising from the Deepwater Horizon incident were significant and have been settled for another \$5.9 billion.⁵³

205. ERM respond by (among other things) stating that comparisons to Deepwater Horizon cannot be made as it implies that the consequences and impacts of the worst spill disaster in recorded history should be identical despite very different physical conditions related to the oil reservoirs at this location.
206. For clarification, the appellant has not and does not seek to imply that the consequences and impacts of the Deepwater Horizon spill disaster would be identical to such consequences and impacts arising from a worst-case scenario oil spill from a wellhead blowout in the proposed ER236 exploratory well locations. The relevance of the Deepwater Horizon spill disaster has also been emphasised by Paris and Cordes (see above).
207. It is noted that ERM does not deny that a catastrophic oil spill can result in significant environmental and socio-economic impacts. It is for this reason that an EIA for offshore oil and gas exploration is a listed activity under NEMA, while a robust, accurate and objective OSM report is required in order to model (among other things) the potential ecological and socio-economic impacts of a worst-case scenario oil spill resulting from a wellhead blowout. This modelling in turn informs the various impact assessments conducted in the EIA (including but not limited to the marine ecology impact assessment, fisheries assessment and socio-economic impact assessment).
208. That a catastrophic oil spill can result in significant environmental and socio-economic impacts is a relevant consideration that should have been (but was not) taken into account by the competent authority in its decision on authorisation. As a consequence, the EA erroneously concludes with the statement that the proposed activity:

... will not result to (sic) any detrimental risks to the environment and public. The authorisation is accordingly granted.

⁵³ Federal Register Vol. 81 No.83 April 20, 2016 Part III, Department of Interior – Bureau of Safety and Environmental Enforcement, 30 CFR Part 250 – Oil and Gas and Sulfur Operations in the Outer Continental Shelf – Blowout Preventer Systems and Well Control; Final Rule, at p25890.

209. This conclusion is clearly erroneous, and ignores the inherent risk that a catastrophic oil spill into the marine environment may occur. The FEIR itself acknowledges that:

It is not possible to completely eliminate the risk of accident events occurring... The risk of an oil spill (including crude oil and diesel) into the marine environment is inherent in all offshore oil exploration and appraisal projects.⁵⁴ (emphasis added)

210. It is submitted that the decision-maker has failed to take a relevant consideration into account, namely that catastrophic oil spills can and do occur, regardless of mitigation measures employed and however ‘unlikely’. Even on ERM’s version (which is disputed given the serious flaws in the modelling identified in this appeal), an oil spill at the very least has ‘moderate’ significance. By concluding that the proposed activity will not result in any detrimental risks to the environment and the public, the decision-maker has clearly failed to take relevant considerations (including socio-economic impacts of a worst-case scenario oil spill) into account making its decision on authorisation.

Duration of Scenario 2a Crude Blowout – Hole Collapse and Scenario 2b Crude Blowout – Cap Install not adequately explained, substantiated or validated

211. For the purposes of the OSM modelling of wellhead blowout scenarios resulting in an uncontrolled oil release, ERM makes the assumption that a specified volume of oil (see section below) would be released over a period of 7 days (for the ‘hole collapse scenario’) and 20 days (‘capping system event scenario’).⁵⁵

212. It is notable that when considering the duration of a worst-case scenario blowout, ERM uses a capping scenario. The OSM makes no predictions regarding how long it would take to terminate the crude oil released from a wellhead blowout in the event that a capping stack is not successfully installed, and should it be necessary to drill a relief well.

213. In its submissions on the draft EIA report, the appellant submitted that:

⁵⁴ FEIR 1b. Eni SA Drilling Final EIA Report (Chapters 6-11), p8-3 to 8-4.

⁵⁵ OSM report (Annex D4), p12.

- Neither the draft EIA report nor the OSM report substantiate why periods of only 7 and 20 days respectively were used for the modelling, especially given that ERM concedes that it is required to model the worst-case scenario in line with best practice and for the development of the ERP and OSCP.
- By contrast, the *Deepwater Horizon* oil spill duration was 87 days (before it was finally capped).⁵⁶
- By further contrast, oil spill modelling by RPS carried out in relation to an impact assessment conducted by ERM for the *Tamirand Resources – Tui Field* in New Zealand covered a 45-day and 110-day well blowout scenario (see Annexure “A19”).⁵⁷
- The duration of a blowout is clearly a key input into an OSM modelling. An assumed low duration will necessarily lower the prediction of the amount of oil that may be spilled into the ocean, and will also lower the significance of potential environmental and socio-economic impacts arising from any catastrophic spill.
- The failure to substantiate and ensure public participation on the assumed 7-day Scenario 2a blowout duration and assumed 20-day Scenario 2b blowout duration constitutes a fatal flaw in the environmental impact assessment process. Any decision authorising the proposed project based on the draft EIA report and OSM modelling report would as a consequence also be fatally flawed, and subject to being set aside on appeal or judicial review.

214. ERM’s response to the above is detailed in the SCR report (which largely repeats the inadequate statements contained in its OSM report), and is not repeated here in full. However in response to the appellant’s submissions that neither the draft EIA report nor the OSM report substantiate why periods of only 7 and 20 days respectively were used for the modelling, especially given that ERM concedes that it is required to model the worst-case scenario in line with best practice and for the development of the ERP and OSCP, ERM responds condescendingly as follows:

⁵⁶ <https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill>

⁵⁷ Technical Review of Oil Spill Modelling - Tamarind Taranaki Ltd. Application EEZ100016, conducted by Coffey on behalf of the New Zealand Environmental Protection Authority (26 June 2018), at pages 3 – 4. Available online at <https://www.epa.govt.nz/assets/FileAPI/proposal/EEZ100016/External-advice-and-reports-EPA-reports/Coffey-technical-review-oil-spill-modelling-v3-26-06-2018-EEZ100016.pdf>

It is not the responsibility of the impact assessment report to provide an education in the mechanisms of a reservoir failure and how a hole collapse can occur to naturally plug a release, nor how capping takes place. A range of reasonable times were provided in the study to show a range of possible outcomes. One week for a hypothetical hole collapse is perfectly reasonable. It could take place within a day or two of the incident, but one week was a reasonable amount of time for a short-duration scenario.

Likewise 20 day to install a cap was determined by Eni as a feasible amount of time. Eni engineers are experts in performing spill drill exercises and planning the logistics for the installation of a capping system and estimating a reasonable feasible time to complete the task.⁵⁸

215. ERM states further that:

The availability of the necessary technology and the feasibility of delivery of such technology in various locations of the world vary from place to place, and varies for different oil companies.

Similarly, the geology of the reservoir varies from location to location – so a 20-day response may be feasible here but possibly not in other locations in the world.

The situation in New Zealand cannot be used as a point of comparison. Eni has the technology and expertise and availability of equipment in this location to say with confidence that a well can be capped in 20 days.⁵⁹

216. It is clear from ERM's responses (above and in the SCR report) that it persists in its failure to substantiate why periods of only 7 and 20 days respectively were used for the modelling, especially given that ERM concedes that it is required to model the worst-case scenario in line with best practice and for the development of the ERP and OSCP. For example, for the 20-day scenario ERM expects stakeholders (and the decision-maker) to simply accept its say-so, namely that *'20 day (sic) to install a cap was determined by Eni as a feasible amount of time. Eni engineers are experts in performing spill drill exercises and planning the logistics for the installation of a capping system and estimating a reasonable feasible time to complete the task'*. No rationale or underlying facts relied upon are provided by ERM.

217. As has been pointed out above, ERM respond further by stating that:

PRDW independently verified that the flow rates and spill durations were compared to historical blowout events and were found to fall in the median range of these events (UK Response to EC Impact Assessment on Offshore Regulation, GL

⁵⁸ SCR report, p11-12.

⁵⁹ SCR report.

Denton Report Number: AA/77-01-01/11959, November 2011). The justification for the blowout scenario is provided in Section 5.5 of the Oil Spill Modelling Report (Annex D4).⁶⁰ (emphasis added)

218. This response is problematic in several respects:

- Firstly, the response provides no explanation or justification for why the historical blowout events referred to in the Denton report are analogous to ER236's geology and lithology.
- Secondly, PRDW indicates that the ER236 assumed flow rates and duration were found to fall within the median (i.e. in the middle) of the historical blowout events used in the Denton report. Given that the stated purpose of the ERM oil spill modelling is *'to identify the worst case consequences for a range of spill scenarios and identify the probability of oil impacting the sea surface and seawater column, coastline and nearshore receptors'*⁶¹ and that *'modelling of the worst case scenario is in line with best practice and is required for the development of the Emergency Response Plan and OSCP'*,⁶² the flow rates and duration are clearly not the worst case scenario required (even assuming that the historical blowout events referred to in the Denton report can reliably be used for comparative purposes in the ER236 oil spill modelling).
- Thirdly, the 2011 Denton report was commissioned by the industry association Oil & Gas UK (OGUK), and should thus be approached with caution (i.e. it is not independent). The Denton report was commissioned after the adoption of a proposal by the European Commission (EC) for a Regulation on Offshore Safety, which was accompanied by an Impact Assessment regarding policy alternatives, their effects on risk reduction of a major offshore incident, and the costs associated with the implementation of the alternatives. This (and another similar report) were subject to technical peer reviews by the EC in 2012, chaired by an independent representative of UK Health and Safety Laboratory.⁶³ The technical peer review meeting report

⁶⁰ SCC report p5.

⁶¹ Draft EIA report, p221.

⁶² Draft EIA report, p222.

⁶³ See PEER REVIEW MEETINGS ON THE ASSESSMENT OF RISKS IN THE OFFSHORE OIL AND GAS INDUSTRY 28 MARCH 2012 & 2 MAY 2012 SUMMARY REPORT, available online at: https://ec.europa.eu/energy/sites/ener/files/20120703_summary_report_en.pdf (last accessed 14 October 2018).

(see Annexure “A20”) highlights a number of areas where the EC differed from the views expressed in the Denton report. For example:

JRC and other Commission representatives questioned if using the lower duration interval (15-50 days) is appropriate. One study indicates that once a blowout remains out of control for more than 14 days, chances are higher that it can only be controlled within 50-80 days (to allow time to drill a relief well)...⁶⁴

and

The Commission remarked that in the Maitland report of December 2011 (containing an independent review of the UK regulatory regime for offshore oil and gas), a **recommendation has been made to plan for a worst-case scenario of 90 days for a blowout**. In addition, JRC remarked that there is heightened public pressure for a "no expense spared" response to further offshore disasters and that the potential costs associated with future spills could rise as a result which should be taken into account when assessing costs. It was noted and agreed that none of the studies performed to-date had explicitly addressed these points.⁶⁵

219. It has been pointed out above that Paris is of the view that ERM have in fact modelled a ‘best case’ and not a ‘worst case’ scenario, and is of the view that the Deepwater Horizon oil spill (which had an uncontrolled release duration of 87 days) should be considered for simulating the ‘worst case scenario’. Paris also points out with regard to the proposed ER236 well locations that strong currents, together with frequent extreme weather and wave conditions will make any rapid response to an ultra deep-sea blowout impossible, and that ideal sea conditions are required to deploy a capping stack in waters exceeding a few kilometer.

⁶⁴ PEER REVIEW MEETINGS ON THE ASSESSMENT OF RISKS IN THE OFFSHORE OIL AND GAS INDUSTRY 28 MARCH 2012 & 2 MAY 2012 SUMMARY REPORT at p8, available online at: https://ec.europa.eu/energy/sites/ener/files/20120703_summary_report_en.pdf (last accessed 14 October 2018), citing *Report for Statoil ASA: Miljørisikoanalyse for letebrønn 30/6-28 Crux I Nordsjøen – App. 1 Technical note to blowout scenario analysis (DNV reference: 2011-0830 / 13GN2EA-2, Rev. 00, 2011-07-12)*.

⁶⁵ PEER REVIEW MEETINGS ON THE ASSESSMENT OF RISKS IN THE OFFSHORE OIL AND GAS INDUSTRY 28 MARCH 2012 & 2 MAY 2012 SUMMARY REPORT at p9, available online at: https://ec.europa.eu/energy/sites/ener/files/20120703_summary_report_en.pdf (last accessed 14 October 2018).

220. The appeal authority is also referred to a 2015 report by Lebreton titled *Stochastic analysis of deep sea oil in the Great Australian Bight* (hereinafter referred to as the ‘Lebreton report’) (see Annexure “**A21**”). This peer-reviewed report was commissioned by the Wilderness Society South Australia Inc. (WSSA). The report relates to a [then] proposed exploration drilling programme by British Petroleum (BP), joined by Norway’s Statoil, in the Great Australian Bight (GAB). WSSA had expressed serious concerns regarding the likely impacts on the environmental values of marine ecosystems in the GAB, including [then] recently proclaimed Marine Parks, as well as over the oil spill response capabilities in a region where the oil industry was not established and did not have significant support resources available locally like in the Gulf of Mexico. The Lebreton report presents an assessment of socio-economic and ecological impacts of deep water oil spill scenarios based on best available information and industry standard numerical modelling methods.⁶⁶
221. With regard to oil spill duration used in the GAB modelling, Lebreton points out that estimating the release duration for a deep-water oil spill associated with a loss of well control event requires calculating the minimum time for the relief equipment to arrive on site and perform the blowout kill operations. BP’s oil spill trajectory modelling study indicated two release duration scenarios: 35 days corresponding to the time required to place a capping system on the damaged well; and 158 days being the estimated time to drill a relief well. However, only the 35-day duration was used in the BP numerical modelling results as BP purported that this was the most credible worst case scenario. The choice of this duration was questioned by Australian Government officials. Lebreton indicates that the 35 day duration scenario was based on detailed logistics for the mobilisation and installation of a capping stack (see capping schedules shown in Tables 5 and 6 of Annexure “**A21**”).⁶⁷ Lebreton indicate that while best practice should be to take a conservative approach and use a release duration equivalent to the time required to drill a relief well, the 35 day and 87 day scenarios were selected to better compare with BPs modelling assessment.⁶⁸

⁶⁶ Lebreton (2015) *Stochastic analysis of deep sea oil in the Great Australian Bight*, p2.

⁶⁷ Lebreton, p20.

⁶⁸ Lebreton, p21.

222. In the premises, ERM and PRDW have signally failed to justify the selection of short blowout oil spill durations for the purposes of the OSM modelling. Available information (including Paris's expert review and the Lebreton report) supports the appellant's submission that in particular the worst-case scenario duration of 20 days is unrealistic and unsubstantiated. ERM expect the appellant (and the decision-maker) to simply accept Eni's assumption that a capping stack will be successfully installed and the release terminated within 20 days, with no logistical information provided to substantiate this claim. Without sufficient facts substantiating this claim, it cannot simply be accepted on Eni's say-so that a capping stack can be successfully installed and the release terminated within 20 days.
223. In addition, as mentioned above the OSM makes no predictions regarding how long it would take to terminate the crude oil released from a wellhead blowout in the event that a capping stack is not successfully installed, and should it be necessary to drill a relief well. This is significant given that the EC peer review meeting (relating to the Denton report) reveals that in European waters it could take up to 80 days to drill a relief well (and recommends a worst-case scenario duration of 90 days for a blowout). No information is provided in the EIA or OSM report regarding how long it would take for Eni to drill a relief well should a capping stack not be successfully installed.
224. The appellant stands by its submission on that the duration of a blowout is clearly a key input into an OSM modelling, and that an assumed short duration will necessarily lower the prediction of the amount of oil that may be spilled into the ocean, and will also lower the significance of potential environmental and socio-economic impacts arising from any catastrophic spill. The OSM also fails to makes any predictions regarding how long it would take to terminate the crude oil released from a wellhead blowout in the event that a capping stack is not successfully installed, and should it be necessary to drill a relief well.
225. In relying on the flawed OSM report, the competent authority took irrelevant considerations into account and/or failed to consider relevant considerations. The fatally flawed ERM OSM cannot serve as a lawful, reasonable and/or rational basis upon which a decision on authorisation could have been made.
226. The Minister is respectfully requested to exercise her powers under NEMA and overturn the decision on authorisation.

Volume of Scenario 2a Crude Blowout – Hole Collapse and Scenario 2b Crude

Blowout – Cap Install not adequately substantiated or validated

227. For the purposes of the OSM modelling of wellhead blowout scenarios resulting in an uncontrolled oil release, ERM makes the assumption the a 750m³/day of crude oil would be released from the north wellhead over a period of 7 days (i.e. a total of 5250m³), while 1050 m³/day of crude oil would be released from the south wellhead over a period of 7 days (i.e. a total of 7350 m³) (for the ‘hole collapse scenario’), while the same release rates were applied for the 20-day release ‘capping system event scenario’ (namely a total of 15000m³ would be released from the north wellhead and a total of 20,000m³ from the south wellhead).⁶⁹
228. In its submissions on the draft EIA report, the appellant pointed out with regard to the ERM OSM volume release rate assumptions that:

By contrast, the *Deepwater Horizon* oil spill released an estimated 134 million gallons of crude oil,⁷⁰ or approximately 507,245m³ (or 5830 m³/day over 87 days).

By further contrast, oil spill modelling by RPS conducted in relation to an impact assessment conducted by ERM for the *Tamirand Resources – Tui Field* in New Zealand estimated a total release of 56,721 m³ (or 1260 m³/day over a 45-day period) and 104,068 m³ (or 946 m³/day over a 110-day well blowout scenario).⁷¹

The volume of a blowout release is clearly a key input into an OSM modelling. An assumed low volume of release will necessarily lower the prediction of the amount of oil that may be spilled into the ocean, and will also lower the significance of potential environmental and socio-economic impacts arising from any catastrophic spill.

229. In its SCR report, ERM respond to the appellant’s above submissions (largely by repeating the inadequate statements contained in its OSM report) as follows:

⁶⁹ OSM report (Annex D4), p12.

⁷⁰ <https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill>

⁷¹ Per Technical Review of Oil Spill Modelling - Tamarind Taranaki Ltd. Application EEZ100016, conducted by Coffey on behalf of the New Zealand Environmental Protection Authority (26 June 2018), at pages 3–4. Available online at:

<https://www.epa.govt.nz/assets/FileAPI/proposal/EEZ100016/External-advice-and-reports-EPA-reports/Coffey-technical-review-oil-spill-modelling-v3-26-06-2018-EEZ100016.pdf>

- With regard to its volume release rate assumptions, ERM states that:

In particular the results of the seismic interpretation carried out with the 3D seismic data confirmed Eni's analysis, allowing to ensure a more robust data set and to advocate the use of the West African analogue based on similar field characteristics, thus the computation of the field productivity index (PI), pore pressure prediction computation and the consequent flowrate to be used in the oil spill modelling. This is a normal industry practice to determine the model input parameters and the drilling of the first well will confirm the geological interpretation. The use of the same rate for the 7-day and 20-day scenarios is a conservative estimate, since the rates would likely decrease over time.

It is apparent from the above that seismic interpretation carried out with the 3D seismic data is relied upon to confirm Eni's analysis, and was used to 'advocate' the use of the West African analogue based on similar field characteristics. This seismic interpretation was not disclosed in the FEIR or the SCR report, expecting the appellant and the EA decision-maker to simply rely on the project proponent's say-so. Given that Eni has a vested interest in the project being authorised, such interpretation and analysis should be approached with caution, and should have been (but were not) validated by ERM and PRDW.

- In responding to the appellant's comment that by contrast the *Deepwater Horizon* oil spill released approximately 5830 m³/day over 87 days, ERM contend that this high flowrate occurred due to the Miocene turbidite sands being different geology to the ER236 geological formation being 'thought to be' slopebasin floor fans, which Eni says it has extensive experience with in similar lithology in Est Africa. Again, the factual basis underpinning this assertion is not disclosed or shared in the response, and this speculative response has not been validated by ERM or PRDW.
- In responding to the appellant's comment that by further contrast oil spill modelling by RPS conducted in relation to an impact assessment conducted by ERM for the *Tamirand Resources – Tui Field* in New Zealand estimated a volume release rate assumptions of 1260 m³/day (over a 45-day period) and 946 m³/day (over a 110-day well blowout scenario), ERM state that:

The availability of the necessary technology and the feasibility of delivery of such technology in various locations of the world vary from place to place, and varies for different oil companies. Similarly, the geology of the reservoir varies from location to location – so a 20-day response may be feasible here but possibly not in other locations in the world.

The situation in New Zealand cannot be used as a point of comparison. Eni has the technology and expertise and availability of equipment in this location to say with confidence that a well can be capped in 20 days.

This response clearly speaks to duration and not volume.

- In responding to the appellant's comment that the volume of a blowout release is clearly a key input into an OSM, and that an assumed low volume will necessarily lower the prediction of the amount of oil that may be released into the ocean (and as a consequence will lower the significance of any potential environmental and socio-economic impacts arising from a catastrophic oil spill), ERM refer to the methodology used in the OSM report, and admit that the underlying data used by Eni was not validated as part of the review.

ERM seek to justify this omission by claiming that the flow rates were compared to historical blowout events contained in the Denton report and were found to 'fall in the median range' of these events. ERM state that PRDW independently verified that this was the case, but no rational or other information is offered to back this statement.

An analysis of the Denton Report (Annexure "A22") raises a serious question regarding ERM's response and the purported validation by PRDW. The report states regarding flow rates that a survey by United Kingdom Continental Shelf (UKCS) well operators carried out in 2011 showed that of the [then] current oil production wells, only 54% flow naturally and only 22% flow naturally at a rate of more than 1000 barrels of oil per day (bopd), i.e. 2% of the Deepwater Horizon flow rate.⁷² Denton thus respond to the proposed EC Impact on Offshore Regulation by stating that:

⁷² Denton Report, pii, p3 and p5.

Given that only 22% of UKCS wells flow naturally and produce more than 1000 bopd, an event resulting in a spillage of 88,000 bopd is considered completely unrepresentative of production well blowouts in the UKCS.⁷³

In a footnote regarding the above, Denton say that it is recognised that the production rate is only indicative of the blowout release rate. No specific reference to historical blowout events could be found in the Denton Report, and in any event it is unclear how UKCS historical production flowrates (where 46% cannot even flow naturally) can be an appropriate point of comparison with the planned deep water exploration wells proposed for Block ER236. It is submitted that ERM are being disingenuous in its representation of the Denton Report.

Furthermore, it is highly relevant to note that Denton goes on to state that Oil & Gas UK (the industry association that commissioned the Denton report):

... are also currently developing estimates for oil spill costs for significant blowouts on the UKCS... This includes detailed modelling of a number of blowout scenarios and calculation of the likely costs, including compensation. The release rates used for the modelling range from a minimum of 9,200 bopd up to approximately 58,000 bopd.⁷⁴ (emphasis added)

9200 barrels of oil per day (BOPD) converts to 1462 m³ per day, while 58000 bopd converts to 9221 m³, compared with ERM's OSM assumption that 750m³/day of crude oil would be released from the north wellhead and 1050 m³/day of crude oil would be released from the south wellhead. It is submitted that even the Denton report, relied upon by ERM and purportedly validated by PRDW, disproves ERM's assertion that its flow rate assumptions 'fall in the median range'. It is clear that ERM's flow rate assumptions are far too low, and that the ERM OSM report (and the specialist impact assessment reports that rely thereon) is fatally flawed, cannot by any stretch of the imagination be relied up for a rational and reasonable decision on authorisation, and in doing so the EA decision-maker clearly took irrelevant considerations into account.

⁷³ Denton Report, p5.

⁷⁴ Denton Report, p5-6.

230. With regard to flow rates during a loss of well control event (blowout) used in the GAB modelling (introduced above in relation to oil spill duration), Lebreton points out that BP did not provide the flow rate used for its numerical modelling study of deep water oil spill scenarios (claiming commercial confidentiality). For the purposes of its study, Lebreton indicates that it estimated the flow rate associated with a loss of well control from previous reported discharge flow rates, including the 2010 Deepwater Horizon blowout flow rate and the 2009 Montara blowout (which occurred in the shallow waters of the Timor Sea in North West Australia) flow rate. Lebreton states further that:

Only about 10 wells have been drilled in the eastern part of the Bight Basin at water depths between 70 m and 260 m and the GAB remains a frontier region with offshore areas largely unexplored. Considering the lack of information in regards to pressure reservoir in the GAB, we investigate two flow rate scenarios for this study, optimistic and pessimistic flow rates similar to the release durations. For the worst case scenario, we decided to use a flow rate below the volume estimated during the DWH spill to take into account potential response operations in the event of deep water well failure.

- Flow rate A: 5,000 bbl/day, optimistic
- Flow rate B: 50,000 bbl/day, pessimistic

231. The optimistic flow rate equates to 795 m³ per day, while the pessimistic (or worst case) scenario flow rate equates to 7949 m³ per day. Lebreton's flow rate assumptions demonstrate clearly that the ERM OSM report flow rate assumptions of 750m³/day (of crude oil would be released from the north wellhead) and 1050 m³/day (of crude oil would be released from the south wellhead) are best case rather than worst case flow rate assumptions, especially for the proposed deep sea wells proposed for Block ER236.

232. Lebreton combines the two flow rate scenarios described to compare the four BP GAP discharge scenarios with historical data on oil events worldwide, and presents the following table:⁷⁵

⁷⁵ Lebreton, p21.

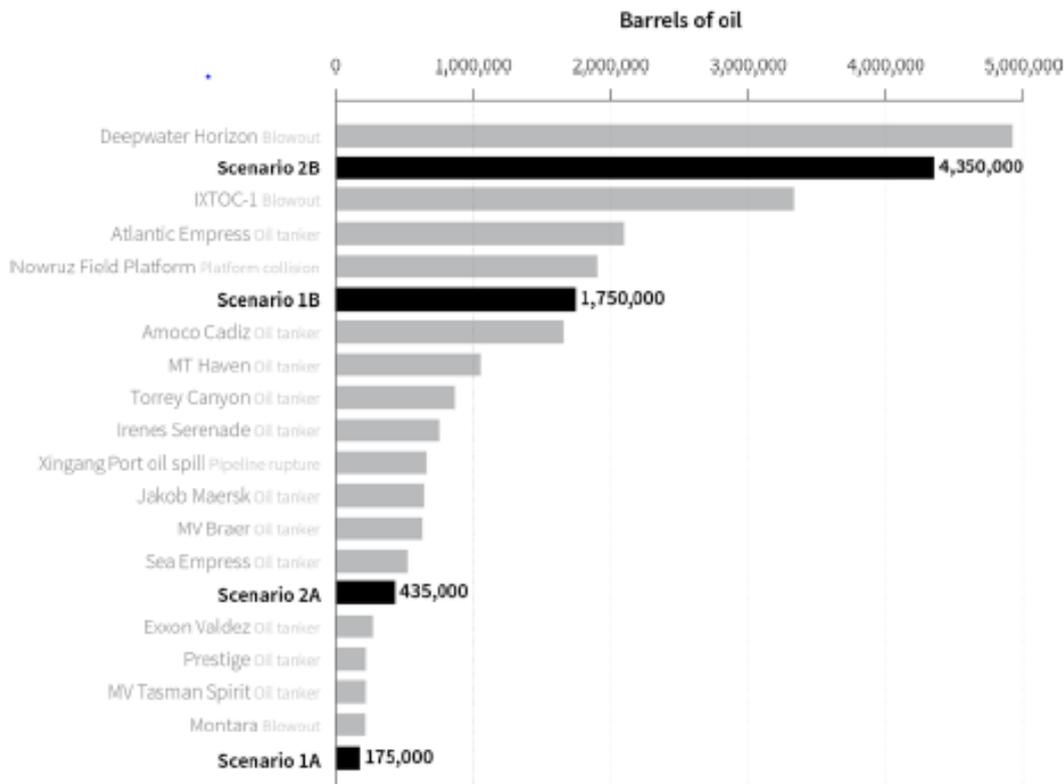


Figure 8: Comparison of the modelled volume scenarios (1A, 1B, 2A and 2B) and major historical oil spill events worldwide. Volumes are expressed in barrels. (McNutt et al., 2011, Etkin, 1999, MCI, 2010, ITOPFL, 2013)

233. By combining the oil spill duration assumptions with the oil spill volume (release rate) assumptions used by ERM for its modelled crude blowout scenarios reveals, the total assumed volume of crude oil released during the ERM crude blowout models are revealed:

Scenario & Description	Flowrate	Duration	Total volume released
Scenario 2a			
Crude Blowout – Hole Collapse	N1: 4717 bpd	7days	33,019 bpd
Crude Blowout – Hole Collapse	N1: 4717 bpd	20 days	94,340 bpd
Scenario 2b			
Crude Blowout – Cap Install	S: 6604 bpd	7 days	46,228 bpd
Crude Blowout – Cap Install	S: 6604 bpd	20 days	132,280 bpd

234. Comparing the ERM total volume release rates with the table provided by Lebreton, it is evident that based on the oil spill duration and flowrate assumptions used by ERM (and peer reviewed by PRDW), all of the ERM modelled blowout scenarios are below the

‘optimistic’ Lebreton BP GAP Scenario 1A modelled volume scenario of 175,000 bpd, and as a consequence all are also below the lowest major historical oil spill event worldwide (the Montara blowout). This again confirms that ERM have modelled ‘best-case’ rather than ‘worst-case’ scenarios, despite their assertions to the contrary.

235. In the premises, it is submitted that the information presented above clearly shows that ERM’s OSM report blowout oil spill flow rate assumptions are far too low, and that even the Denton report relied upon by ERM and purportedly validated by PRDW disproves the suitability of these assumptions. Combining the ERM blowout oil spill scenario duration and flow rate assumptions show that the total volumes released based on these assumptions are woefully understated, and predict the lowest total volumes released when compared against major historical blowout oil spills worldwide. ERM is left with Eni’s seismic 3D data interpretation, which was used to ‘advocate’ the use of the West African analogue based on similar field characteristics with regard to assumed blowout oil spill flow rates. This seismic interpretation was not disclosed in the FEIR or the SCR report, nor was any information or data provided to justify the use of this ‘West African analogue’. ERM expect the appellant and the EA decision-maker to simply rely on the project proponent’s say-so. Given that Eni has a vested interest in the project being authorised, such interpretation and analysis should be approached with caution, and should have been (but was not) validated by ERM and PRDW. As a consequence, ERM OSM report (and the specialist impact assessment reports that rely thereon) is fatally flawed, cannot by any stretch of the imagination be relied upon for a rational and reasonable decision on authorisation, and in doing so the EA decision-maker clearly relied on misleading information, and took irrelevant considerations into account.
236. If the ERM OSM falls, and fall it does, so do the various impact assessments that rely on the results of the OSM report. It is submitted that the EA is fatally and incurably flawed, and must be overturned and set aside by the Minister.

Critical threshold assumptions used for significant slick thickness and significant shoreline mass flux inadequate

237. In its submissions on the draft EIA report, the appellant made detailed submissions regarding the critical threshold assumptions used by ERM in the design of the model and

interpretations of results, which should be read as specifically incorporated into this appeal. ERM and Eni's responses to these submissions are contained in the SCR report.

(i) ***Significant oil slick thickness***

238. With regard to the critical assumption threshold used for significant oil slick thickness (oil on the ocean surface), ERM cite certain studies suggesting that oil slicks less than 1.0 μm are not harmful to seabirds, and that visible oil between 0.1 μm and 1.0 μm was chosen as the low risk exposure thickness range. It was pointed out that this is important, as ERM indicate that '*[m]odel output of the surface oiling and arrival time is filtered to remove oil thinner than 1 μm* '.⁷⁶ This means that visible oil in the 0.1 μm and 1.0 μm range has been filtered out, and are not reflected in the oil spill models and diagrams.
239. In its OSM report, ERM indicates that the 'first clearly visible oil appears as a silvery sheen at thickness between 0.04 μm to 0.3 μm based on values cataloged (sic) in the 2006 Bonn Agreement Oil Appearance Code (BAOAC)(Lewis, 2007)... A minimum threshold thickness value was defined as 0.1 μm . Oil at this thickness may be visible and potentially wash upon the shore as a silver sheen, but is not expected to cause physical injury (e.g., oiling, smothering) to wildlife contacting it.... Model output of the surface oiling and arrival time is filtered to remove oil thinner than 1 μm '.⁷⁷
240. In its submissions on the draft EIA, the appellant pointed out that in contrast, a recent (26 June 2018) technical review of an oil spill modelling commissioned by the New Zealand EPA⁷⁸ (in respect of an oil spill modelling conducted by RPS in relation to an impact assessment conducted by ERM for the *Tamarind Resources – Tui Field* in New Zealand, hereinafter referred to as the 'New Zealand EPA Tamarind Technical Review') criticised a lower minimum thickness for tracking of 0.5 μm used in the stochastic methods model settings:

⁷⁶ Draft EIA report, p225.

⁷⁷ OSM report, p18-19.

⁷⁸ Technical Review of Oil Spill Modelling - Tamarind Taranaki Ltd. Application EEZ100016, conducted by Coffey on behalf of the New Zealand Environmental Protection Authority (26 June 2018), at pages 3–4. Available online at <https://www.epa.govt.nz/assets/FileAPI/proposal/EEZ100016/External-advice-and-reports-EPA-reports/Coffey-technical-review-oil-spill-modelling-v3-26-06-2018-EEZ100016.pdf>

For comparison purpose, the same company, RPS ASA, conducted similar spill modelling in the North Atlantic in 2014 (RPS ASA 2014a) in support of the Shelburne Basin Exploration Drilling Programme. Blowout and surface spills were simulated. **Ocean conditions as well as depth of discharge are different. Nonetheless, the method stays the same and can be used here for comparison.**

The minimum thickness for tracking considered in the RPS APASA Tamarind report was 0.5 µm for oil on surface (RPS Section 6.2.1). That is, once a part of the slick became less than 0.5 µm, that part of the slick was omitted from the results. **This thickness is still significant. Based on RPS APASA Tamarind Table 6, the omission of any thickness less than 0.5 µm means that the RPS APASA Tamarind report did not consider a sheen on surface for exposure calculation.** The RPS ASA (2014a) report considered **0.04 µm for cut-off in surface oil thickness, with the rationale that this would be the minimum thickness to determine impact on socioeconomic resources.**⁷⁹ (emphasis added)

241. The New Zealand EPA Tamarind Technical Review thus:

- Indicates that the methodology for simulating blowouts and surface spills remains the same and can be used for comparison despite different ocean conditions and well depths (namely in respect of the North Atlantic Shelburne Exploration Drilling Programme and the New Zealand Tui Field);
- Criticises the omission of slicks less than 0.5 µm from the modelling results and exposure calculation, remarking that surface oil at this thickness is still significant; and
- Points out that in the Shelburne North Atlantic modelling a surface oil thickness of 0.04 µm was used because this would be the minimum thickness to determine impact on socio-economic resources.

242. ERM's filtering has effectively excluded results from its modelling that are necessary for exposure calculation and in order to determine socio-economic impacts. **The exclusion by ERM of surface oil thickness of below 1.0 µm thus grossly underrepresents the nature and extent of a surface oil slick.** ERM's modelling report relies upon this inappropriate threshold to claim in respect of Spill Scenario 2A that *'[i]t is highly likely that such a spill at either of the two spill locations (N1 and S) with thickness greater than the minimum smothering thickness (1.0 µm) would remain out to sea before weathering away into a thin sheen. In the absence of response efforts, the smothering slick of oil is able to travel almost*

⁷⁹ New Zealand EPA Tamarind Technical Review, at p 9.

*50 km and 150 km from the release points N1 and S respectively before weathering away into a thinner sheen*⁸⁰ and in respect of Spill Scenario 2B that *'[i]t is highly likely that such a spill at either of the two spill locations (N1 and S) with thickness greater than the minimum smothering thickness (1.0 µm) would remain out to sea before weathering away into a thin sheen. In the absence of response efforts, the smothering slick of oil is able to travel almost 100 km and 250 km from the release points N1 and S respectively before weathering away into a thinner sheen'*.⁸¹

243. The use of inappropriate critical thresholds in the OSM modelling in turn impacts on reliability and accuracy of the risk significance description set out in ERM's draft EIA report. This point is again demonstrated in the New Zealand EPA Tamarind Technical Review (which used much stricter thresholds than were used in the ER236 draft EIA report and OSM report):

...Thresholds. The potential discrepancy of using a higher threshold to assess exposure and produce maps of oil presence can have a significant impact. Other similar studies considered a threshold ten times lower, which could significantly change the amount of oil reported to reach shore, as well as the exposure on the surface and in the water column. The impact on decision-making is high because of the potential for 'hiding' results with thresholds, and the discrepancy with similar studies.⁸² (emphasis added)

244. The ER236 OSM modelling uses a critical threshold for 'oil on surface' that is double the threshold used in the Tamarind Tui Field modelling, and 25 times higher than was used in the Shelburne North Atlantic modelling. This clearly has the effect of 'hiding results', and would significantly impact significantly on the ERM OSM modelling and subsequent significance assessment.

245. ERM respond to these submissions by (among other things) asserting that:

- The comparison to criticisms of the New Zealand case is not relevant since the purpose of the thickness cut-off in ERM's report is to delineate impacts to birds and wildlife; and

⁸⁰ OSM report, p53.

⁸¹ OSM report, p68.

⁸² New Zealand EPA Tamarind Technical Review, at p11.

- This New Zealand EPA technical review criticism is an outlier. ERM has seen hundreds of similar studies using 1.0 μm as a minimum threshold accepted by regulatory agencies around the world.
246. The appellant disputes that the comparison to criticisms of the New Zealand case is not relevant. While the purpose of the thickness cut-off in ERM's report is to delineate impacts to birds and wildlife, this statement confirms that ERM has not taken into account in its modelling that oil slick thickness of less than 1.0 μm has potential socio-economic impacts.
247. In addition, regarding wildlife (air breathing vertebrates), French Mackay (2009) states with regard to the threshold thickness for lethal dose that '*when confined to oil, 1 g/m² is 100% lethal to birds oiled by such a slick*'. Selecting 1.0 μm may be appropriate as a critical threshold assumption at which all (100%) of birds oiled by such a slick will die, but is inappropriate for predicting other impacts, including (among other things): sub-lethal acute effects on such wildlife; sublethal effects of chronic contamination; behavioural changes resulting in reduced growth, survival or reproductive success; indirect effects via reduction in food supply, habitat or other changes in the ecosystem; and population level impacts caused by sublethal effects. These are some of the impacts of oil that French-McCay (2009) indicates a biological effects model should include evaluation of.⁸³
248. ERM's filtering of the modelling results and use of an inappropriate critical threshold results in the OSM report not predicting the extent of a surface oil slick that has potentially significant socio-economic impacts as well as sub-lethal (and related) impacts on wildlife.

(ii) Significant shoreline mass flux

249. With regard to the 'significant shoreline mass flux' critical threshold, ERM cite French-McCay (2009) as recommending a threshold of 100 g/m² as a reasonable value to indicate when a sufficient amount of oil mass per area unit may cause an impact to shorebirds and wildlife on or along the shore.⁸⁴

⁸³ French-McCay (2009) *State-of-the-Art and Research Needs for Oil Spill Impact Assessment Modelling*.

⁸⁴ Draft EIA report, p225; OSM report, p20.

250. In its submissions on the draft EIA report, the appellant pointed out that in contrast, the June 2018 New Zealand EPA Tamarind Technical Review criticised the setting of a 10 g/m² as the minimum concentration of oil on the shoreline for tracking:

... the minimum concentration of oil on the shoreline for tracking was set to 10 g/m² in the RPS APASA Tamarind Modelling, whereas a minimum concentration of 1 g/m² was considered in RPS ASA report (2014a). **A minimum concentration of 1 g/m² would trigger shoreline clean-up on amenity beaches, however the 10 g/m² would be a conservative number for impact on shoreline habitat.** In other words, the 1 g/m² represents a threshold for socioeconomic impact, whereas the 10 g/m² represents the threshold for ecological impact.⁸⁵ (emphasis added)

251. The New Zealand EPA Tamarind Technical Review thus indicates that:

- A minimum concentration of 1 g/m² would trigger shoreline clean-up on amenity beaches, and represents a threshold for socioeconomic impact; and
- The 10 g/m² threshold would be a conservative number for impact on shoreline habitat, and represents the threshold for ecological impact.

252. ERM respond by explaining as follows:

French-McCay (2009) mentions a value of 10 g/m² as potentially providing a lethal dose. However, further reading of the entire publication explains the value of 100 g/m² is a more reasonable value when considering the necessary exposure index of a given bird or wildlife to the shoreline oiling. As French-McCay describes in an example, “A value of 35% is assumed in the model [sic] and applied when oil on shorelines exceeds 100 g/m². At this oil thickness, a bird would need to move along a path 35 m long and 10 cm wide to obtain a lethal dose of 350 ml. Thus, the assumed threshold thickness is reasonable, as more scattered oil on a shoreline would require proportionately longer distances where birds would be in contact with oil.” She goes on to state, “The probability of exposure is related to behaviour: i.e., the habitats used and percentage of the time spent in those habitats on the surface of the water. For shorebirds and other wildlife on or along the shore, an exposure index is length of shoreline oiled by > 100 g/m². Areas of exposure above these thresholds have been used in environmental risk assessment studies (French McCay et al., 2003a, 2004, 2005a,b,c).”

⁸⁵ New Zealand EPA Tamarind Technical Review, at p 9-10.

253. It is submitted that, as always, the devil is in the detail. French-McCay (2009) states the following:

The exposure index we have used for seabirds and other offshore wildlife is the water area swept by more than 10- μ m thick ($> 10 \text{ g/m}^2$) oil, which is sufficient to provide a lethal dose as discussed above. The probability of exposure is related to behaviour: i.e., the habitats used and percentage of time spent in those habitats on the surface of the water. For seabirds and other wildlife on or along the shore, an exposure index is length of shoreline oiled by $> 100 \text{ g/m}^2$.⁸⁶

254. The New Zealand EPA Tamarind Technical Review indicates that a 10 g/m^2 threshold would be a conservative number for impact on shoreline habitat, and represents the threshold for ecological impact. It does not claim that exposure at this threshold would provide a lethal dose to intersecting wildlife. Ecological impacts (including sub-lethal and related effects) can and do occur below the $> 100 \text{ g/m}^2$ critical threshold for shoreline oil mass flux used by ERM in its modelling.

255. In addition, the New Zealand EPA Tamarind Technical Review indicates that a minimum concentration of 1 g/m^2 would trigger shoreline clean-up on amenity beaches, and represents a threshold for socio-economic impact. As has been pointed out above, the ERM OSM report fails to predict socio-economic impacts, in this case in respect of oil thickness reaching the shoreline.

256. In the circumstances, the appellant stands by its submission that the use of a threshold of 100 g/m^2 in the ERM OSM report is inappropriate as a threshold for socio-economic impacts (e.g. for triggering clean-up on amenity beaches) and for ecological impacts (e.g. impacts on shoreline habitat and sub-lethal impacts). It is illustrative to note that oil at the 100 g/m^2 is indicated as representing between 50,000 to 60,000 tarballs per acre of coastline.⁸⁷

⁸⁶ French-McCay (2009) *State-of-the-Art and Research Needs for Oil Spill Impact Assessment Modelling*.

⁸⁷ Lebreton, Table 11 at p30 (see Annexure “A21” to this appeal). It is relevant to note that ERM state at section 5.5.2 of their OSM report that ‘Over time, as the oil weathers, the crude oil on the surface slick may form tar balls and arrive on shorelines in a heavily weathered state where most of the soluble and volatile toxic components such as the aromatics are absent. Modelling of tar ball formation and transport was not included in this exercise’.

257. The use of inappropriate critical thresholds in the OSM modelling in turn impacts on reliability and accuracy of the risk significance description set out in ERM's draft EIA report. This point is again demonstrated in the New Zealand EPA Tamarind Technical Review (which used much stricter thresholds than were used in the ER236 draft EIA report and OSM report):

...Thresholds. The potential discrepancy of using a higher threshold to assess exposure and produce maps of oil presence can have a significant impact. Other similar studies considered a threshold ten times lower, which could significantly change the amount of oil reported to reach shore, as well as the exposure on the surface and in the water column. The impact on decision-making is high because of the potential for 'hiding' results with thresholds, and the discrepancy with similar studies.⁸⁸

258. The ER236 OSM modelling uses a critical threshold for shoreline mass flux that is 10 times higher than was used in the Tamarind Tui Field modelling, and 100 times higher than was used in the Shelburne North Atlantic modelling. This clearly has the effect of 'hiding results', and would significantly impact significantly on the ERM OSM modelling and subsequent significance assessment.

259. This approach is misleading and highly questionable, and shows that the modelling needs to be re-run with appropriate critical threshold assumptions, and must be subject to robust independent validation (by suitably qualified experts not forming part of ERM's EIA team, chosen by the competent authority in consultation with I&APs).

260. Any decision authorising the proposed project based on the draft EIA report and OSM modelling report would as a consequence be fatally flawed, and subject to being set aside on appeal or judicial review.

Dissolved Aromatic Hydrocarbons

261. In its submissions on the draft EIA report, the appellant pointed out that despite including Dissolved Aromatic Hydrocarbons (DAH) as one of the 3 critical thresholds that relates directly to ecological effects and selecting a level of 5 ppb,⁸⁹ the OSM report did not

⁸⁸ New Zealand EPA Tamarind Technical Review, at p11.

⁸⁹ Draft EIA report, p224.

include modelling results for DAH. This was raised in the PRDW report (major comment 3.2), and ERM's response follows **Comment #5 – Address impacts associated with dissolved aromatic hydrocarbons** in ERM's OSM report *A1 Addendum: Response to Technical Review*.

262. In its SCR report, ERM respond by stating that it 'provided an assessment of the dissolved aromatics in the addendum'.⁹⁰
263. ERM is correct insofar as the Addendum to the OSM report contained in the draft EIA report includes modelling of the DAH plume above the 5ppb threshold for *Scenario 2a: 7 day Crude Oil Blowout (summer/autumn and winter/spring)*. However, no modelling of the DAH plume was included in respect of the *Scenario 2b: 20 day Crude Oil Blowout*.
264. This addendum does not appear in the OSM report (Annex D4) to the FEIR, but the modelling of the DAH plume above the 5ppb threshold for Scenario 2a: 7 day Crude Oil Blowout (summer/autumn and winter/spring) appears in section 5.8 (p100 to 105). Again, no modelling of the DAH plume was included in respect of the *Scenario 2b: 20 day Crude Oil Blowout*. Interestingly, in section 5.6.1 of the final OSM report (Annex D4) includes in section 5.6.1 *Figure 5-31 Scenario 2b: 20-Day Crude Oil blowout – Dissolved Aromatic Hydrocarbons from N1 and S in Summer/Autumn* (at p81). However, the figure does not illustrate modelling of a DAH plume, but speaks to the worst-case shortest time of oil to contact the shoreline.
265. In the premises, it is submitted that the OSM report fails to provide modelling results for DAH relating to the appellant persists with its assertion that that the OSM report failed to model *Scenario 2b: 20 day Crude Oil Blowout*.

OSM relies on EIA Applicant's data and interpretation thereof without validation

266. As has been mentioned in other sections above, the ERM OSM report relies heavily on Eni's data and interpretation thereof, without such data and interpretation having been validated by ERM or PRDW. This unquestioning reliance on the EIA applicant's expertise

⁹⁰ ERM SCR report, p27.

(and interpretation of data) falls short of the independence and rigour required for EIA reports upon which decisions on authorisation can reliably depend.

267. For example:

- In its OSM report,⁹¹ ERM indicate in their response to PRDW Comment #2 that the *'input data for the model run are based on lithology and preliminary reservoir assessment and interpretation starting from seismic data. During the second quarter of 2018, new data interpretation were available from 2D/3D seismic data acquired by some multi-client providers in 2016 and 2018'.*

In its letter to ERM dated 3 November 2018, the appellant queried whether ERM or PRDW had reviewed and independently verified the new seismic data referred to in the OSM report, and also requested clarity on whether the previous and new seismic data referred to in the OSM report had been included in the draft EIR, alternatively an explanation for not including this data.

ERM respond in the CRR report (4.1) by admitting that:

Neither ERM nor PRDW reviewed the analogue or seismic data as they are not petroleum geologists and review of the data was outside of their responsibility. ERM and PRDW relied on the expertise of the Company (Eni) for the geological assessment, which is standard international practice. The seismic data (both previous and latest) is from multi-client sources and is commercially sensitive and confidential information. Eni's licensed seismic data relates to the prospectively (sic) of the area in question and is not relevant to evaluation the environmental impact of Eni's proposed activities. Accordingly, Eni is not obliged to disclose this information.⁹²

In addition to admitting that neither ERM nor PRDW reviewed the analogue or seismic data and that they relied on the expertise of Eni for the geological assessment, it is relevant to note that ERM's claim that the previous and new seismic data is not relevant to the evaluation of the proposed exploration activity contradicts the statement it made in the ERM OSM report (quoted above) that input data for the model run included seismic data.

⁹¹ Page 116.

⁹² Page 27 of CRR.

- In its OSM report,⁹³ ERM indicate further in their response to PRDW Comment #2 that:

Based on analysis already finalized, the reservoir and production profiles are expected to be very similar to the same available in other subsea fields developed by Eni in Africa. For this reason the PI (productivity index), porosity, hydrocarbon properties and expected flow rate have been recalculated and optimized using real data from those similar fields.

- In its letter to ERM dated 3 November 2018, the appellant queried:
 - who conducted the analysis referred to;
 - whether ERM or PRDW had access to the underlying data used for this analysis (and if so what steps were taken to verify that the reservoir and production profiles are ‘*very similar to the same available in other subsea fields developed by Eni in Africa*’);
 - who did the recalculation and ‘optimization’ of the low rates;
 - whether PRDW had sight of and verified the flow rates before recalculation and optimisation; and
 - whether PRDW had sight of the new underlying data relied upon to recalculate and optimise flow rates.

In the CRR report, ERM confirms that a model based on pre-defined input parameters without any corroboration to analogue geological field conditions for the area in question had initially been prepared, and that a preliminary report was prepared on this initial data and preliminary comments were received from ERM’s peer reviewer. Further data became available and a revised report prepared. ERM refused the appellant’s request for a copy of the initial modelling results and draft OSM report, and in the CRR seeks to justify this by stating that the report was preliminary and the results not verified, and that:

Unverified modelling results, outside of the context of an independent peer reviewed report, have not formed the basis for any conclusion drawn in the EIA Report. **Review of the draft report would therefore skew the**

⁹³ Page 116.

evaluation of results, and may prevent a stakeholder from reaching an accurate conclusion on the proposed activities.⁹⁴

ERM respond in the CRR report (4.2) by admitting that the EIA applicant provided the data for geological and geophysical properties, and that neither ERM or PRDW had access to the underlying seismic data '*for the reasons provided in response to question 4.1.*' ERM responds further by stating that:

The recalculation and optimization of PI (productivity index), porosity, hydrocarbon properties and expected flow rates have been undertaken by Eni to ensure a more robust and optimized data set, which is based on West African analogues with similar field characteristics. Calculation of such parameters through an analogue field index is an accepted practice in the industry where there are no other reference explorative wells in the area.

This again demonstrates that both ERM and PRDW relied on the EIA applicant's expertise, and failed to independently verify this information.

- In its OSM report, ERM indicate further in their response to PRDW Comment #2 that '*the pore pressure prediction is computed using a sophisticated technology from the velocity analysis coming from the recent (2016) 3D seismic volume.*'

In its letter to ERM dated 3 November 2018, the appellant queried (among other things) who computed the pore pressure predictions.

ERM respond in the CRR report (4.3) by admitting that it:

[U]sed the results of Eni's pore pressure prediction calculations in terms of the hydrocarbon properties and expected flow rates that were input into the model. **Eni provided the pore pressure computations.** The pore pressure prediction computation was performed on the 2016 3D seismic data available at the time. The 2018 seismic data was not available at the time the calculation was undertaken, however the latest 3D interpretation confirms the pore pressure computations used. These calculations have not been provided due to their confidential nature.

⁹⁴ Page 27 CRR.

This again demonstrates that ERM and PRDW relied unquestioningly on data for its model predictions that were provided by the EIA applicant, without independent verification.

- In its OSM report, ERM indicate further in their response to PRDW Comment #2 that ‘for all the wells drilled in similar deepwater environment, an analogue approach was utilised for preparing the casing design and mud density, to keep the well under control while drilling’.

In its letter to ERM dated 3 November 2018, the appellant queried (among other things) what was meant by an ‘analogue approach’, who conducted this approach (and if Eni, what steps were taken by ERM and PRDW to verify the suitability and reliability of this analogue approach, and requested a copy of any documentation or report in which this analogue approach was recorded.

ERM respond in the CRR (4.4) by explaining that an analogue approach is an example used for comparison, that:

Eni conducted the comparison and provided ERM and PRDW with the dataset. ERM and PRDW did not have access to the underlying data, for the reasons provided indicated in the response to question 4.1... The seismic data (both previous and latest) is licensed from multi-client sources and is commercially sensitive and confidential information. **Eni’s Multiclient seismic data relates to the viability of the area in question for prospecting and is not relevant to evaluating the environmental impact of Eni’s proposed activities.** Accordingly, Eni is not obliged to disclose this information.’

This again demonstrates that ERM and PRDW relied unquestioningly on data provided by the EIA applicant, without independent verification.

- In its OSM report, ERM indicate further in their response to PRDW Comment #2 that ‘in the recent development of some African deepwater field, Eni has confirmed that those estimation (sic) has been confirmed during the subsequent drilling of the wells’.

In its letter to ERM dated 3 November 2018, the appellant requested ERM to indicate what steps it and PRDW had taken to verify the accuracy of these estimations indicated by Eni.

ERM respond in the CRR report (4.5) by stating that:

The **flow rates and spill durations were compared by PRDW to historical blowout events and were found to fall in the median range** of the events reported in the UK Response to EC Impact Assessment on Offshore Regulation Report (GL Denton Report Number: AA/77-01-01/11959, November 2011) to verify the flow rates.

The purported validation by PRDW of the flow rates and spill durations having been found to fall within the median range has been critiqued and addressed in detail above, and is not repeated here.

- In its OSM report, ERM indicate further in their response to PRDW Comment #2 that:

during Macondo/Deepwater Horizon blowout, a very high flowrate from the reservoir occurred for different reasons: different geology (Macondo target Miocene turbidite sands as compared to the geological formation at ER236 South Africa where the reservoir rocks from the Upper Cretaceous age **are thought to be** slope-basin floor fans) and pore pressure, different well construction and different profile. For these reasons, the Macondo well and reservoir couldn't be used as a reference for Block ER236, as opposed to ENI's experience in similar lithology in West Africa, which has allowed for optimizing the flow rate and PI parameters that, in the unrealistic situation that no mitigation (e.g. no BOP closure) will be applied, should provide a better estimation of flow rates. (emphasis added)

In its letter to ERM dated 3 November 2018, the appellant queried (among other things) who made the assumption that the '*geological formation at ER236 South Africa where the reservoir rocks from the Upper Cretaceous age are thought to be slope-basin floor fans*', what steps had been taken by ERM to verify the accuracy of this statement if the EIA applicant was the source, whether ERM and PRDW in relying on the EIA applicant's '*experience in similar lithology in West Africa*' had access to the underlying data and what steps ERM and PRDW took to verify this

data, and asked ERM to explain the level of uncertainty associated with the word 'should' when referring to the flow rates and PI parameters being optimised.

ERM respond in the CRR report (4.6) by admitting that:

ERM relied on Eni's estimations and this statement was provided by Eni based on their interpretation of the seismic data. It is accepted practice to rely on the geo-scientific expertise of the operator. As stated above, neither ERM nor PRDW reviewed the analogue or seismic data as they are not petroleum geologists and are therefore not responsible for reviewing these data. They relied on the expertise of Eni for the geological assessment and seismic interpretation. Based on Eni's extensive experience and confirmed by the interpretation carried out on the 2016 and 2018 seismic data, Eni's degree of uncertainty in the selection of the analogue field is low. ERM and PRDW are not reservoir specialists and therefore could not be the source of such studies.

This again demonstrates that ERM and PRDW relied unquestioningly on the EIA applicant for the geological assessment and seismic interpretation, without independent verification.

ERM's response that it relied on Eni's estimations and '*this statement was provided by Eni based on their interpretation of the seismic data*' also contradicts other responses by ERM stating that '*Eni's licensed seismic data relates to the prospectively (sic) of the area in question and is not relevant to evaluation the environmental impact of Eni's proposed activities*' and '*Eni's Multiclient seismic data relates to the viability of the area in question for prospecting and is not relevant to evaluating the environmental impact of Eni's proposed activities*' (see above).

268. It is evident from the above examples that Eni has failed to provide ERM and/or PRDW with access to all information at its disposal relating to the EIA application, and as a consequence this information has in turn not been disclosed to the appellant and other I&APs (or to the competent authority where the disclosure of such information is protected by law). As a consequence, Eni has failed to comply with its mandatory obligations in terms of Regulation 12(3)(b) of the NEMA EIA Regulations,⁹⁵ and ERM has failed to

⁹⁵ Regulation 12(3)(b) stipulates that the proponent or applicant (i.e. Eni) must provide the EAP and specialist with access to all information at the disposal of the proponent or applicant regarding the application, whether or not such information is favourable to the application.

comply with its mandatory obligations in terms of Regulation 13(f) of the NEMA EIA Regulations.⁹⁶

269. It is submitted that ERM and PRDW's reliance on Eni's expertise, data and interpretation thereof, without validation of the accuracy and reliability of this information, falls short of the independence and rigour required for EIA reports upon which decisions on authorisation can rationally and reasonably be made.

Other

270. ERM's OSM report for Scenario 2A and 2B indicate that the model was run 120 times to simulate releases on different starting days from January 2013 through October 2017.⁹⁷ The sufficiency of these simulations needs to be subjected to a robust independent validation.
271. The magnitude and direction of currents used in the sub-surface spill modelling need to be subjected to a robust independent validation, including a validation of any information provided on how the oil reaches the surface, whether any jet and plume has been simulated accurately (or at all), and whether sufficient information is provided (e.g. the diameter of the pipe from which the oil escapes to enable calculation of oil exit velocity).
272. The draft EIA report indicates that 'Eni is anticipating the oil viscosity to be light for this project',⁹⁸ making the point that such oils are 'less persistent and tend to disappear rapidly from the sea surface', while in contrast 'high viscosity oils... are more persistent, usually requiring a clean-up response (e.g. heavy crude oil).' No underlying data has been provided

⁹⁶ Regulation 13(f) stipulates that the EAP in turn must disclose to registered I&APs (and the competent authority) all material information in the possession of the EAP that reasonably has or may have the potential of influencing: any decision to be taken with respect to the application by the competent authority in terms of these Regulations; or the objectivity of any report, plan or document to be prepared by the EAP, in terms of these Regulations for submission to the competent authority; unless access to that information is protected by law (in which case it must be indicated that such protected information exists and is only provided to the competent authority).

⁹⁷ OSM report, pages 52 and 67.

⁹⁸ Draft EIA report, p234.

to substantiate Eni's claim that the ER236 oil is anticipated to have light viscosity. This claim also needs to be subjected to a robust independent validation.

F.4 No Climate Impact Assessment

273. Anthropogenic⁹⁹ climate change is real and poses serious risk for the wellbeing of humans and our society.¹⁰⁰ Recognising this risk, governments of the world have agreed to limit warming to 1.5-2°C under the Paris Agreement. South Africa is signatory to this Agreement.
274. The most robust approach to meet the temperature goal is the carbon budget approach, based on the well-proven relationship between the cumulative anthropogenic emissions of GHGs and the increase in global average surface temperature. The budget needs to be in line with what is scientifically required to keep global warming and thus climate change “tolerable.”¹⁰¹

⁹⁹ The IPCC, in its recent IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels, found: “Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (high confidence)...Estimated anthropogenic global warming is currently increasing at 0.2°C (likely between 0.1°C and 0.3°C) per decade due to past and ongoing emissions (high confidence).” IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, et al (eds.)]. World Meteorological Organization, Geneva, Switzerland, p 6.

¹⁰⁰ Global average surface temperature is not the only feature of the climate system that is changing. Other features of the climate system that are changing include changes in the basic circulation patterns of the atmosphere and the ocean; increasing intensity and frequency of many extreme weather events; increasing acidity of the oceans; rising sea levels and consequent increases in coastal flooding; and intensification of the hydrological cycle. (National Oceanic and Atmospheric Administration, USA (NOAA) (2018), Global Climate Report – Annual 2017). The IPCC (2013), the most authoritative assessment body on the science of climate change, states that the impacts of climate change are already being felt around the world. Some of the most important impacts are: a) Warmer and/or fewer cold days and nights over most land areas, b) Warmer and/or more frequent hot days and nights over most land areas, c) Increases in the frequency and/or duration of heat waves in many regions. d) Increase in the frequency, intensity and/or amount of heavy precipitation (more land areas with increases than with decreases, e) Increases in intensity and/or duration of drought in many regions since 1970, f) Increases in intense tropical cyclone activity in the North Atlantic since 1970, g) Increased incidence and/or magnitude of extreme high sea levels. The evidence for the influence of climate change on worsening extreme weather includes: a) The fact that all extreme weather events are now occurring in an atmosphere that is warmer and wetter than it was 70 years ago; b) Long-term data records show observed changes in the nature of extreme weather; and c) Climate models run with and without the additional greenhouse gases in the atmosphere from human emissions show the increase in likelihood that a specific extreme weather event would have occurred because of climate change.

¹⁰¹http://awsassets.wwf.org.za/downloads/understanding_carbon_budgets_final_nov_2014.pdf

275. Professor Steffen¹⁰² in his expert report in the Rocky Hill Mining case, New South Wales, Australia¹⁰³ stated that in order to meet a 2°C carbon budget, a very rapid phase-out of all fossil fuel usage is required. To quote:

No new fossil fuel development is consistent with meeting the Paris accord climate targets. That is, paragraphs 47-50 above demonstrate clearly that to meet the Paris accord, emissions must be reduced rapidly and deeply .. and to do this requires the rapid phase-out of existing fossil fuel mines/wells. It is an obvious conclusion that no new fossil fuel developments can therefore be allowed.¹⁰⁴

The clear message from any carbon budget analysis, under any reasonable set of assumptions regarding probabilities of actually meeting the budget and the sensitivity of the climate system to the level of greenhouse gases in the atmosphere, is that fossil fuel combustion must be phased out quickly....¹⁰⁵

276. There is no doubt that Southern Africa is already feeling the effects of the climate crisis. Floods in Durban on 20 March 2019 left 70 dead and, further down the coast at Port St Johns, devastation was caused by flooding, with hundreds of people having to be evacuated. Media showed footage of raging rivers, collapsed roads and houses and tons of plastic debris that has washed up onto the beaches and into Durban Harbour. During 2016 and 2017, KwaZulu-Natal suffered through an extreme drought that led to dams dropping to 32% and in 2018 Cape Town was nearly the first South African city to run out of water.
277. Intense Tropical Cyclone Kenneth was the strongest [tropical cyclone](#) to make landfall in [Mozambique](#) since modern records began, hitting northern Mozambique with a windspeed 220km/h (140mph) on 25 April 2019, flattening thousands of homes flooding low-lying areas. It may be the strongest storm to ever hit Africa's East Coast. This occurred just 5 weeks after Cyclone Idai killed over 1000 people in Mozambique, Zimbabwe and Malawi. The UN World Meteorological Organization projects the disaster could be among the worst weather-related disasters in the southern hemisphere with the destruction of more than 360,000 hectares (900,000 acres) of crops, damage to at least 17,000 houses, and

¹⁰² Emeritus Professor, The Australian National University, Senior Fellow, Stockholm Resilience Centre.

¹⁰³ Gloucester Resources Limited v Minister for Planning [2019] NSWLEC 7 (Preston CJ), 8 February 2019.

¹⁰⁴ Steffen report, p51.

¹⁰⁵ Ibid p49

affecting nearly 2 million people.¹⁰⁶ The UN's Economic Commission for Africa estimates that Mozambique, Zimbabwe, and Malawi, may have lost \$1 billion worth of infrastructure in the cyclone.¹⁰⁷

278. Climate litigation taking place around the world is testing whether fossil-fuel companies and governments (for example, Juliana v United States¹⁰⁸) can be made to pay for the costs of climate change. Since 2017, eight United States cities, including New York and San Francisco, six counties, one state and the West Coast's largest association of fishermen have brought suit against a host of corporations — Exxon Mobil, Royal Dutch Shell, BP, Chevron, Peabody Energy, among others — for selling products that caused the world to warm while misleading the public about the damage they knew would result. These are claims for compensation for a variety of expenses: sea walls and infrastructure to cope with rising waters; the costs of combating wildfires, floods, pine beetle infestations, agricultural losses and heat waves.

279. In our comments on the draft FEIR we stated that:¹⁰⁹

A climate change risk assessment has not been done to assess the risks of further reliance on fossil fuels. In the Thabametsi case (Case number: 65662/16)82, the court considered the quality and form of climate change impact assessment required when a competent authority assesses an application for environmental authorisation in South Africa. Notwithstanding the lack of an express legal obligation to conduct a focused climate change impact assessment, the court ruled that climate change is a relevant consideration when granting an environmental authorisation, and a formal expert report on climate change impacts is the best evidentiary means to consider climate change impacts in their multifaceted dimensions.

280. In the Supplementary Comments and Responses Report, the Applicant responds with the following:

The proposed project will have limited impact on climate change, due to the temporary nature of the activities. Climate change impacts from the proposed drilling activities have been assessed in Chapter 7 of the EIA Report as Negligible. The magnitude of the impact on climate change due to GHG emissions from the project activities during the drilling phase is assessed to be Negligible as CO2 emissions generated by the

¹⁰⁶ <https://www.nature.com/articles/d41586-019-00981-6>

¹⁰⁷ <https://blogs.nasa.gov/hurricanes/tag/idai-2019/>

¹⁰⁸ <https://www.ourchildrenstrust.org/juliana-v-us>

¹⁰⁹ p40

project equate to only 0.0003 percent of the total CO₂ emissions for South Africa. The client has committed to the following inbuilt compliance.¹¹⁰

281. The validity of this counter-argument rests on the assumption that the Applicant would stop its activities at the exploration phase. However, a production phase that exploits the deep water Durban Basin offshore reserve that the Applicant is exploring, is a reasonably foreseeable future activity that the Applicant hopes to engage in. Therefore, it is necessary for stakeholders and decision-makers to understand the climate impacts of the production phase **prior** to granting permission for the exploration phase. Failure to do so would allow Applicant to argue that, since it has already invested large sums of money for exploration, then it should be allowed to engage in production regardless of the costs of the climate impacts.

282. The amount of CO₂ emissions associated with the production phase of the project depends on the size of the reserve and the rate of its exploitation. The values for the size of the reserve and the rate of its exploitation are unclear since the only information presently available regarding the reserve is based on 2D reconnaissance seismic data obtained in 2014 and 3D seismic data acquired in 2016 and 2018. However, information provided in the Oil Spill Modelling Report presented as part of the EIR allows inferences regarding the size of the reserve and the rate of its exploitation.

283. In the Oil Spill Modelling Report, the following blowout scenarios are presented:

Scenario 2: In the blowout scenarios, crude oil was assumed to be released from the wellhead over a period of 7 days in Scenario 2a and 20 days in Scenario 2b. Blowouts from the northern well (N1) are assumed to release at a rate of 750 m³/d, while blowouts from the southern well (S) was simulated to release at 1,050 m³/d.

284. In the document titled “Peer Review of ERM Oil Spill Report”, the Applicant explains that these blowout scenarios are based on seismic information it has about the reserves it wishes to exploit:

¹¹⁰ p62

Scenario 2: The crude oil release rates of 4,717 bpd and 6,604 bpd for the two blowout scenarios require a thorough justification. These seem low compared to previous studies off the west coast of South Africa and Namibia undertaken for international oil companies where the modelled oil release rates for blowouts ranged between 10,000 and 80,000 bpd. For reference, the Macondo/Deepwater Horizon blowout in the Gulf of Mexico released 4.9 million bbl over for 87 days giving an average of 56,300 bpd.¹¹¹

285. In response to this review comment, the Applicant provided the following reasons for the flow rates for Scenario 2:

The input data provided for the model run are based on lithology and preliminary reservoir assessment and interpretation starting from seismic data. During the 2Q of 2018, new data interpretation was available from 2D/3D seismic data acquired by some multi-client providers in 2016 and 2018. Based on the analysis already finalized, the reservoir and production profiles are expected to be very similar to the same available in other subsea fields developed by Eni in Africa. For this reason the PI (productivity index), porosity, hydrocarbon properties and expected flow rate have been re-calculated and optimized using real data from those similar fields. The confirmation of those assumption will be provided after the drilling of first explorative well.

286. Dr. Mark Chernaik's¹¹² assessment of this is that the crude oil release rates of 4,717 bpd and 6,604 bpd for the two blowout scenarios are therefore also very conservative measures of the production rates of the Northern and Southern portions of Block ER236, a combined rate of 11,321 bpd, or 4.1 million barrels per year. The average CO₂ emissions from production and eventual combustion of crude oil (including its refined products) is estimated at 0.43 metric tons CO₂/barrel.¹¹³ This implies that CO₂ emissions of 1.77 million metric tons per year is a very conservative estimate of the climate impact of the foreseeable production phase of the project. Actual production of oil from Block ER236 might attain rates an order of magnitude higher than anticipated blowout scenarios.

287. The Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) has published estimates of the social cost of CO₂ emissions to allow agencies to incorporate

¹¹¹ p2

¹¹² E-Law in-house scientist in email correspondence with the Applicant.

¹¹³ Greenhouse Gases Equivalencies Calculator - Calculations and References:
<https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>

the social benefits of reducing CO₂ emissions into cost-benefit analyses of regulatory actions. In the methods adopted by IWG, the social cost of carbon is defined as:

[T]he monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.¹¹⁴

288. The most recent estimates of the social cost of CO₂ emissions is presented in the following table:

Table ES-1: Social Cost of CO₂, 2010 – 2050 (in 2007 dollars per metric ton of CO₂)

Year	5% Average	3% Average	2.5% Average	High Impact (95 th Pct at 3%)
2010	10	31	50	86
2015	11	36	56	105
2020	12	42	62	123
2025	14	46	68	138
2030	16	50	73	152
2035	18	55	78	168
2040	21	60	84	183
2045	23	64	89	197
2050	26	69	95	212

289. As noted above, from 2025 to 2029, indirect CO₂ emissions of the Block ER236 offshore oil project would be at least 1.77 MtCO₂eq per year. Applying the most recent Central Value (3% discount rate),¹¹⁵ and converting 2007 dollars to 2018 dollars, then estimates of the social cost of CO₂ emissions of the Block ER236 offshore oil project would be **\$496 million** for the years 2025-2029 inclusive.¹¹⁶

290. It is reiterated that to have any chance of meeting the Paris 2°C target, carbon emissions around the world need to be **decreasing** rapidly. Opening up and using new fossil fuel

¹¹⁴ IWG (August 2016) Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866

¹¹⁵ <https://www.usinflationcalculator.com/>

¹¹⁶ \$46/tCO₂eq x 1.77 million tCO₂eq/year x 5 years x 1.22

reserves or resources **increases** carbon emissions, in conflict with what is required under the Paris Agreement. There is no room for any new fossil fuel development.

291. South Africa's own Climate Change Report in 2016¹¹⁷ confirmed that:

Urgent and appropriate climate action offers South Africa and other countries in the region, and globally, a clear pathway towards the shared aim of attaining a more prosperous, inclusive, equitable and secure future, in which national priorities of eradicating poverty and reducing inequality are addressed. Therefore, taking immediate action to curb emissions as close as possible to the 2°C compatible emissions pathways, while building climate resilience to the current and near-term impacts of climate change, is vital to avoid costly mitigation and adaptation actions in the future.

292. Section 24(b) of the Constitution entitles everyone 'to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- prevent ... ecological degradation;
- promote conservation; and
- secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development.

293. An important legislative measure enacted pursuant to s 24(2) of the Constitution is the National Environmental Management Act 107 of 1998 (NEMA). Section 2(1) of NEMA decrees that the principles contained in that section apply throughout South Africa to the actions of all organs of state that may significantly affect the environment and that they inter alia (a) serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of a statutory provision concerning the protection of the environment; and (b) guide the interpretation, administration and implementation of laws concerned with the protection and management of the environment.

294. The principles contained in s 2 of NEMA include the following:

¹¹⁷ Department of Environmental Affairs, 2017. South Africa's 2nd Annual Climate Change Report. Pretoria: Department of Environmental Affairs

- Environmental management must place people and their needs at the forefront of its concern (para (2)).
- Development must be socially, environmentally and economically sustainable (para (3)).
- Sustainable development requires the consideration of all relevant factors (para (4)(a)), including:
 - that the development, use and exploitation of renewable resources do not exceed the level beyond which their integrity is jeopardised (para (vi));
 - 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 (para (vii));
 - that negative impacts on the environment and on people's environmental rights must be anticipated and prevented and, when that is not possible, minimised and remedied (para (viii)).
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment (para (4)(i)).
- Decisions must be taken in an open and transparent manner (para (4)(k)).
- Global and international responsibilities relating to the environment must be discharged in the national interest (s 2(4)(n)).
- The environment is held in public trust for the people; the beneficial use of environmental resources must serve the public interest; and the environment must be protected as the people's common heritage (s 2(4)(o)).

295. Section 2 of the Marine Living Resource Act, 1998 (MLRA) decrees that the Minister and any organ of state shall, in exercising any power under the Act, have regard to the objectives and principles stated in the section. These objective and principles, which are consistent with, and in part overlap with, the Constitution and NEMA, include:

- The need to achieve optimum utilisation and ecologically sustainable development of marine living resources (para (a));
- The need to conserve marine living resources for both present and future generations (para (b));

- the need to apply precautionary approaches in respect of the management and development of marine living resources (para (c)); and
- employment creation and a sound ecological balance consistent with the development objective of the national government (para (d)).

296. Section 2 of the National Environmental Management: Biodiversity Act, 2004 provides for:-

- the management and conservation of biological diversity within the Republic and of the components of such biological diversity (para (a)(i));
- the need to protect the ecosystem as a whole, including species which are not targeted for exploitation (para (a)(iA);
- the use of indigenous biological resources in a sustainable manner (para (a)(ii)); and
- the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources (para (a)(iii));
- to give effect to ratified international agreements relating to biodiversity which are binding on the Republic (para (b); and
- to provide for co-operative governance in biodiversity management and conservation (para (d)).

297. Conservation and sustainable development, which are placed to the fore by section 24 of the Constitution, ss 2(3) and 2(4)(a) of NEMA, and various paragraphs of section 2 of the MLRA, are important because people in the past, the present and the future have depended, do depend or will depend on exploiting renewable resources for their economic well-being.

298. The need to preserve environmental resources for the benefit of future generations, often referred to as ‘intergenerational equity’, is an important element of sustainable development.¹¹⁸

299. This principle should not be viewed as applicable only to first world countries. Courts in developing nations have also invoked it. For example, in State of Himachal Pradesh v Ganesh Wood Products 314 AIR 1996 SC 149 the Supreme Court of India quashed an

¹¹⁸ Sands. P (QC): Principles of International Environmental Law 2 ed at 253, 2003. (Principle 3 of the Rio Declaration).

administrative decision relating to the felling of khair trees inter alia on grounds of intergenerational equity: ‘After all, the present generation has no right to deplete all the existing forests and leave nothing for the next and future generations.’¹¹⁹

300. The precautionary principle features widely in environmental legislation around the world. It entails that where there is a threat of serious or irreversible damage to a resource, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation¹²⁰. In AP Pollution Control Board v Prof. M V Nayudu AIR 1999 SC 812, the Supreme Court of India reviewed the development of the precautionary principle internationally. The court identified inadequacies of science as the real basis that has led to its emergence. It is ‘based on the theory that it is better to err on the side of caution and prevent environmental harm which may become irreversible’.

301. Honourable Judge Rogers in *WWF versus Minister of Agriculture, Forestry and Fisheries*, 2018 at para [104] states:

“There is a detailed treatment of the subject in the Australian case of *Telstra Corporation Limited v Hornsby Shire Council*, 228.121 The court said that the principle finds application where two conditions are satisfied, namely that the proposed activity poses a ‘threat of serious or irreversible environmental damage’ and the ‘existence of scientific uncertainty as to the environmental damage’. If these conditions are met, the principle is activated and there is a ‘shifting of an evidentiary burden of showing that this threat does not, in fact, exist or is negligible’. Furthermore, prudence suggests that ‘some margin for error should be retained’ until all consequences of the activity are known. Potential errors are ‘weighted in favour of environmental protection’, the object being ‘to safeguard the ecological space or environmental room for manoeuvre’.”

302. If the risk-averse and cautious approach is applied, the limits of current knowledge about the consequences of decisions and actions, as well ensuring that global and international responsibilities relating to the environment are discharged in the national interest, must be

¹¹⁹ This and other cases are discussed in B J Preston "The Role of the Judiciary in Promoting Sustainable Development: The Experience of Asia and the Pacific" (2005) 9(2-3) *Asia Pacific Journal of Environmental Law* 109.

¹²⁰ Jan Glazewski *Environmental Law in South Africa* 19-20; cf *Space Securitisation (Pty) Ltd v Trans Caledon Tunnel Authority & others* [2013] 4 All SA 624 (GSJ) paras 45-48.

¹²¹ 228 [2006] NSWLEC 133.

taken into consideration. The International Seabed Authority¹²² discussion paper on Implementation of the Precautionary Approach by the International Authority¹²³ finds that three dimensions should be involved in the implementation of the precautionary approach: the procedural, the institutional and the taking of protective measures. Importantly, procedural dimensions encompass assessments of the environmental risks and impacts, including cumulative and long-term impacts. It also includes assessment of the effectiveness and proportionality of potential protective measures as well as any potential counter-effects of these measures.

303. This international policy has not been adequately considered in the draft EIA report or the subsequent FEIR. The Applicant's response to this is¹²⁴:

“The application of the precautionary principle (in terms of a risk-averse approach) is triggered by two conditions namely:

- a threat of serious or irreversible environmental damage; and
- scientific uncertainty as to the nature and scope of the threat of environmental damage.

Since these conditions are both not met, there is no basis upon which the precautionary principle can operate.“

304. Our argument is the opposite to that of the Appellant in that:

- the operations of the Appellant trigger a threat of serious or irreversible damage; and
- there is scientific uncertainty caused by the extent and scope of the threat of environmental damage and the long-lasting consequences thereof (and the lack of a climate impact assessment, baseline information and appropriate oil-spill modelling in the EAIR); and
- the cumulative and long-term impacts are severe.

¹²² The International Seabed Authority is an autonomous international organisation established under the 1982 United Nations [Convention on the Law of the Sea](#) and the [1994 Agreement](#) relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea. The Authority is the organisation through which States Parties to the Convention shall, in accordance with the regime for the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area) established in Part XI and the Agreement, organise and control activities in the Area, particularly with a view to administering the resources of the Area. South Africa is a member state and became a party to the agreement on 23 December 1997. See: <https://www.isa.org.jm/authority>

¹²³ <https://www.isa.org.jm/files/documents/EN/Pubs/DPs/DP5.pdf>

¹²⁴ Supplementary Comments and Response Report p69

305. This is elaborated on in more detail in the further grounds of appeal below and support the need for the Minister to rely on the precautionary principle in deciding this Appeal. It is better to err on the side of caution and prevent environmental harm which may become irreversible, than allow an activity to go ahead that will contribute directly to the climate crisis and ultimately cost South Africa billions. As stated by UN Secretary-General António Guterres in a message to mark the International Day for Disaster Risk Reduction on 13 October:¹²⁵

Climate resilience and disaster risk reduction must be central to the trillions of dollars that will be invested in new housing, schools, hospitals and infrastructure over the coming decade.

As well as being the “right thing to do”, because it can ease and prevent human misery, investing in climate resilience has a positive economic effect... it creates jobs, saves money and, for every dollar invested, six dollars can be saved.

306. Mr. Guterres called for greater focus on urgent climate action and for disaster risk reduction to be at the heart of the “Decade of Action”, leading up to the deadline for the UN’s 2030 Agenda for Sustainable Development.

307. As held in the *Thabametsi case*, climate change is a relevant consideration when granting an environmental authorisation, and a formal expert report on climate change impacts is the best evidentiary means to consider climate change impacts in their multifaceted dimensions. Evidence based decision-making, based on best available scientific information is vital in applications such as the one subject to this Appeal.

308. There is no doubt that this Appeal must succeed on the basis that the FEIR failed to include a climate risk assessment for the Project and the resultant activities that will follow therefrom. It would be irresponsible to do otherwise.

¹²⁵ <https://news.un.org/en/story/2019/10/1049151>

F.5 Failure to consider Marine Protected Areas (MPAs), Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

309. In February 2016 the Minister of Environmental Affairs published the intention to declare a representative network of 21 new, expanded MPAs. In accordance with the objectives of Operation Phakisa, these areas were identified as important to:-

- support fisheries recovery and productivity,
- protect fragile and sensitive habitats and endangered species,
- help combat climate change, and
- ensure resilient and healthy oceans that can support coastal communities and a sustainable blue economy into the future.

310. On 24 October 2018, Cabinet approved this network for implementation and In August 2019, twenty MPAs were proclaimed along with regulations for the management of them. In spite of the overlap of the approval and declaration of the MPAs with the submission of the FEIR and subsequent EA thereof, the FEIR fails to adequately assess the potential impact of the proposed operations on these critical areas.

311. In responding to our concerns regarding the impact of the operations on the MPAs the Applicant states:

It is acknowledged that MPAs are important for the protection of marine resources, however, it must be noted that while Block ER236 overlaps with some MPAs (as shown in Chapter 4 of the EIA Report), the drilling areas of interest where Eni intend to drill does not overlap with any of the existing and recently approved MPAs.

312. For the sake of clarity, Block ER236 overlaps with the iSimangaliso MPA, and Protea Banks MPAs (see map below). Although drilling in sections of the original Block ER236 are not with the MPAs, the proximity of the drilling to these areas and potential impact on them (particularly in the case of a spill) has not been addressed in the FEIR.

315. The FEIR confirms¹²⁶ that:

The objectives of the KwaZulu-Natal Coastal and Marine Biodiversity Plan (previously referred to as the SeaPLAN project) were to 1) provide a systematic framework for assessment of the status of biodiversity protection in KZN, and 2) enable planning for marine biodiversity protection by identifying spatial priorities for ongoing and future marine conservation efforts...

The final spatial product of the Plan was a map of Focus Areas for additional marine biodiversity protection (Harris et al. 2012). These were made up of Critical Biodiversity Areas (CBAs) that are considered either “irreplaceable” or “optimal”... Irreplaceable CBAs representing areas of significantly high biodiversity value and in some cases the areas are the only localities for which the conservation targets for one or more of the biodiversity features can be achieved i.e. there are few, or no, alternative sites available. Optimal CBAs are areas representing the best option, out of a potentially larger selection of options, of a selection of planning units that meet biodiversity targets. The optimal CBAs equate to the “Best solution” output minus the irreplaceable CBAs described above (Harris et al. 2012). The key drivers determining the selection of each focus area are provided in Table 10. **Block ER236 overlaps with three CBAs, namely iSimangaliso Wetland Park extension, and Offshore Areas 20 and 21.** Of these the iSimangaliso Wetland Park extension, and Offshore Area 20 have **irreplaceable CBAs, which fall within Block ER236. The southern area of interest for well drilling falls within the irreplaceable portion of Offshore Area 20.**¹²⁷

See map below:

¹²⁶ p72-73

¹²⁷ Our emphasis

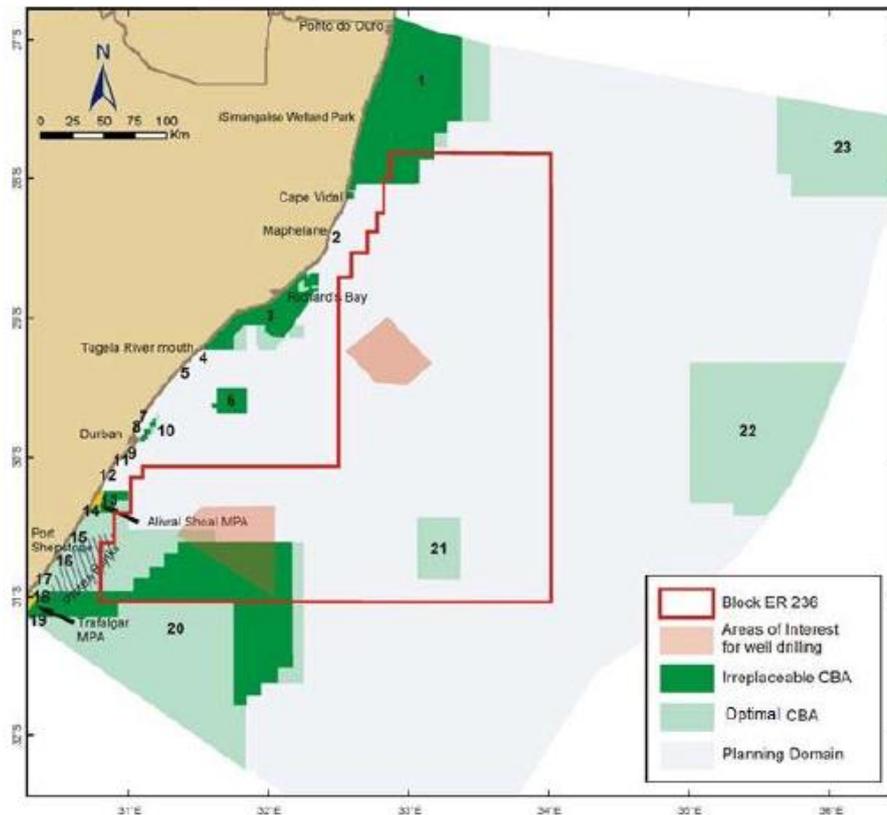


Figure 27: Critical Biodiversity Areas (CBAs) within the Exclusive Economic Zone off the KwaZulu-Natal coast in relation to Block ER236 and the areas of interest for well drilling. The numbers represent the various biodiversity focus areas provided in Table 10.

316. The southern area of the Project Area 20 clearly falls within the irreplaceable CBA.

317. The FEIR further notes that¹²⁸:

Three Ecologically or Biologically Significant Areas (EBSA) have been proposed and inscribed for the East Coast under the Convention of Biological Diversity (CBD) (CBD 2013), namely Protea Banks and the Sardine Route, the Natal Bight and the Delagoa Shelf Edge. In meeting the EBSA criteria various endemic and rare chondrichthian and teleost species were listed for the Natal Bight and Tugela Bank, and IUCN listed species and threatened habitat types identified. The Protea Banks area includes submarine canyons, an area of steep shelf edge and a unique deep-reef system, all of which may support fragile habitat-forming cold-water coral species. This area also includes a major component of the migration path for several species undertaking the ‘sardine run’. The Delagoa Shelf Edge, Canyons and Slope is a transboundary EBSA that includes the iSimangaliso Wetland Park, a Ramsar and World Heritage Site in South Africa, and Ponta do Ouro Partial Marine Reserve in Mozambique. This EBSA supports a variety of fish, sharks, turtles, whales and other marine mammals by including their migratory routes, nursery areas,

spawning/breeding areas, and foraging areas, and notably provides nesting habitat for Loggerhead and Leatherback turtles. Many of the species in the EBSA are threatened, such as: coelacanths, Seventy-Four seabream, marine mammals, turtles, and sharks. Potential VMEs include numerous submarine canyons, paleo-shorelines, deep reefs, and hard shelf edge, with reef-building cold-water corals also recovered at depths of more than 900 m.

318. In spite of this (and probably because) the FEIR fails to consider the impact of the Project on the above areas), an EA is granted.
319. As previously mentioned, CBAs are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. As CBAs are required to meet biodiversity targets (% of marine ecosystem that needs to be preserved) and Block ER236 overlaps with three irreplaceable CBAs, namely iSimangaliso Wetland Park extension, and Offshore Areas 20 and 21 and the Areas of Interest (for actual drilling) overlap with Offshore Area 2,¹²⁹ the Project would cause the target to be affected.
320. This activity, according to the definitions in the EIA regulations,¹³⁰ should therefore automatically be classified as a **significant impact** in the FEIR.
321. Dr. Erik Cordes, in his expert review of Annex D1 (attached hereto marked “A?”), confirms that the southern area of interest for drilling intersects two “irreplaceable Critical Biodiversity Areas” (CBAs). Irreplaceable CBAs represent an area where one or more of the targets for conservation (species or habitat types) are exclusively found and no alternative locations exist and no alternative locations exist for capturing this biodiversity.¹³¹

¹²⁹ Annexure D1, p74

¹³⁰ “Significant impact” means an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

¹³¹ Dr. Cordes, Full Professor and Vice Chair of the Department of Biology of Temple University in Philadelphia, USA, reviewed Annexure D1 at the request of the Appellant. Dr. Cordes has worked on the ecology of deep-sea ecosystems for 25 years and has published over 70 peer-reviewed papers on the subject. He is the lead of the Oil and Gas Working Group of the Deep Ocean Stewardship Initiative and was instrumental in the Natural Resources Damage Assessment for deep benthic communities following the Deepwater Horizon blowout and oil spill in the Gulf of Mexico in 2010. His research focusses on deep-sea

322. Cordes states further that in the depth range of the planned operations, a number of ecologically or biologically significant areas (EBSAs) and vulnerable marine ecosystems (VMEs) are defined by the Convention on Biological Diversity (CBD). There are submarine canyons and the cold-water corals in the area.
323. The fact that the Project overlaps with irreplaceable CBAs is only mentioned in passing and has not been incorporated into the actual assessment of impacts in any of the different phases of the activity and very importantly in the potential cumulative impact of the activities on the combination of CBAs.
324. Similarly, the proximity to and the locations of the MPAs, although mentioned, are not included in the assessment of impacts.
325. The FEIR fails to allocate impact ratings to the effects of the operations on such areas in spite of the proximity to four significant MPAs, these being iSimangaliso, uThukela, Aliwal Shoal and Protea Banks.
326. The value and importance of the these MPAs is set out below:
- The uThukela Banks MPA is located between the Mlalazi and Seteni estuaries. The purpose of this MPA is to protect coastal habitats including sandy beaches, rocky shores and estuaries as well as offshore habitats including the soft sediment and reef systems, submarine canyons, the shelf edge and slope ecosystems¹³². It is a CBA and is required for the protection of threatened habitats (muds and gravels), processes (fresh water input) and species. It is a key area for linefish recovery, small scale fisheries, prawns and migrating whales as well as a spawning and nursery area for overexploited species such as squaretail kob. The area supports bycatch management in the crustacean trawl fishery and protects hammerhead sharks in their nursery area. Although not included in the MPA, there are large submarine canyons in the vicinity

corals and natural hydrocarbon seeps, using a variety of molecular, bioinformatic, experimental, ecological, and field sampling tools to understand these communities.

¹³² p 72 of Annexure D1 and as per Government Gazette 39646, 2016

of the this MPA that should be included in any assessments of impacts in the nearby area.

- The Protea Banks Marine Protected Area is an offshore area in the 20m to 3,000m depth range with the southern portion lying adjacent to the existing Trafalgar Marine Protected Area. The purpose of this MPA is to conserve and protect submarine canyons, deep reefs, cold water coral reefs and other habitats of the shelf edge and slope.¹³³ It is an important ecotourism area with the sardine run occurring annually and seven shark species occurring in this area.
- The Aliwal Shoal MPA is situated on the south coast between Umkomaas and Ocean View. It is an important eco-tourism area and brings new tourism development with its scuba operations, Blue Flag beaches and educational sites. It is needed for spawning aggregations and is a key area for geelbek and dusky kob.
- The iSimangaliso MPA stretches 150 km from the Mozambique boundary to approximately 1 km south of Cape Vidal.¹³⁴ The MPA protects a large number of turtle nesting sites; the migration of whales, dolphins and whale-sharks offshore; coelacanths in the submarine canyons; and a considerable number of waterfowl associated with the iSimangaliso Wetland Park, including large breeding colonies of pelicans, storks, herons and terns. It is in alignment with World Heritage Site boundaries and supports prawn trawl bycatch management, and slinger and rockcod aggregations to deliver fisheries benefits.

327. Authorising the Project to take place within CBAs and EBSAs undermines ecological thresholds and leads to unsustainable development, particularly in the ocean context, eroding the very reason for which the areas were given such status.

328. Without a reliable oil-spill modelling report, the potential impact of the activities on the MPAs, particularly a blow-out, has not been considered or assessed.

329. Dismissing this Appeal would set a dangerous precedent in allowing exploration in areas of Critical Biodiversity, in close proximity to MPAS and without a SEA in place.

¹³³ Ibid

¹³⁴ P 71 Annexure D1.

330. The Appeal should be upheld on this basis alone.

F.6 No baseline assessment

331. One of the objectives of an EIR¹³⁵ is to identify the location of the development footprint within the approved site as contemplated in the accepted scoping report. This is based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment.

332. The baseline for the Project was, as confirmed in the FEIR, determined through “a review of existing information”¹³⁶ a collation of “existing information and data from scientific literature, internal reports and the Generic EMPR compiled for oil and gas exploration in South Africa”¹³⁷ that are outdated and not peer-reviewed.

333. In a letter to the Minister from the Deep-Ocean Stewardship Initiative (DOSI) and co-signed by 45 international experts in their fields (see Annexure “**A23**”):

A robust EIA considers the most recent and relevant of the peer-reviewed scientific literature from the area under consideration. Very little peer-reviewed literature is available from the deep-sea habitats along the east coast of South Africa, which makes it difficult to accomplish this task. Importantly, there is a significant body of new knowledge following the Deepwater Horizon (DWH) spill, which occurred in 2010 at the same depths as the proposed drilling locations but has not been considered in the EIA.

334. Later in the FEIR it is stated that:¹³⁸

Chapter 4 of the Final EIA Report presents the baseline conditions in the Project Area. This chapter is substantial and details the most pertinent information related to the environmental and socio-economic baseline of the affected areas. The specialist studies (Annex D) were undertaken by local experts based on scientifically available information. In ERM’s professional opinion there is sufficient information provide for

¹³⁵ EIA Regulations, Appendix 3

¹³⁶ p 4-1

¹³⁷ Supplementary comments and response report p 54 and p64

¹³⁸ Ibid p 68

I&APs and Authorities to understand the baseline and the Competent Authority to make a decision.

335. However, Cordes, in his expert review of Annex D1 states that the information to establish a baseline environmental assessment within the proposed drilling areas is “sparse and generally insufficient.”

336. The DOSI letter confirms:

There is a paucity of environmental baseline data for the deep-water and seabed area in question, including physical and chemical parameters, as well as the distribution and importance of habitats and inhabiting communities, including those that constitute Vulnerable Marine Ecosystems (VMEs).

337. The EIA is a fundamental input into the EMP, which becomes the main tool for managing environmental impacts. It is important that the Applicant integrates biodiversity information into the three broad requirements for the EIA and development of the EMP¹³⁹:

- Establish baseline information on the affected environment to determine protection, remedial measures and environmental management objectives.
- Investigate, assess and evaluate the impact of mining on the environment, socio-economic conditions and national heritage.
- Describe how actions/activities/ processes which cause pollution or environmental degradation and migration of pollutants are to be mitigated (modified, remedied, controlled or stopped).

338. Baseline information must be sufficient to enable the reliable identification of biodiversity priority areas, as described above, that might be impacted during the Project life cycle. Baseline information records the ‘pre-drilling’ environmental condition. In order to assess and evaluate the potential significance of impacts on biodiversity and ecosystem services, it is also important to consider any background trends that may be affecting their conservation status or integrity. In some areas, such as in marine ecosystems, extensive baseline information is not available. Biodiversity specialists will play an important role in

¹³⁹ Section 39(3) Mineral and Petroleum Resources Development Act

these cases and the cumulative impacts of drilling may be highly significant when viewed against these trends.

339. Outcomes of a baseline survey of the area must form part of the FEIR and EMPr and made available for public comment. This is a vital aspect of any FEIR in order to properly assess the potential impact of the operations. In this instance it is particularly important given that the marine ecology assessment does not adequately cover the Project Area and therefore the impact cannot be properly assessed.
340. Once again we re-iterate that NEMA requires a risk-averse and cautious approach be applied, which must consider the limits of current knowledge about the consequences of decisions and actions, as well ensuring that global and international responsibilities relating to the environment are discharged in the national interest. It is a legal requirement that the EIA process must effectively identify the nature, significance and extent of the impacts, which the current process has failed to do.
341. In terms of Section 2(f) of Appendix 3,¹⁴⁰ it is also an objective of the EIA process to identify the ideal location for the activity as contemplated in the accepted scoping report ‘based on the lowest level of environmental sensitivity identified in the assessment’.
342. The FEIR consists of too many unknown factors and bases its significance ratings on subjective assumptions. There is a lack of knowledge on South Africa’s deep water ocean ecosystems and as a result, it is imperative that baseline information is obtained. This has not been done.
343. This concern was raised in our comments submitted in November 2018 but given that none of our comments were included in the FEIR submitted to the Department, this issue was not addressed. In an attempt to rectify the ‘oversight’ the consultants submitted a Supplementary Comments and Responses Report in February 2019 in which they state:

“The Marine Ecology Study (Annexure D1 of the EIA Report) has been updated to include relevant 2016 publications. These references have added additional data and therefore value in updating the baseline chapter of the EIA Report (Chapter 4)

¹⁴⁰ EIA Regulations

however, these additional data sources have not changed the outcome of the impact assessment.”¹⁴¹

344. However, the Marine Ecology Study (Annex D1) still admits that it is a ‘desktop’ study and there is limited available information on the ecology and biological communities of the region, particularly at the depth range of the proposed activity.

345. Dr. Cordes’ review of Annex D1 highlights the following concerns:

- There is very little existing literature on the ecology of the area and most of this information is derived from a few studies of nearby areas in shallower waters;
- There are no existing surveys of the habitats within the depth range of the proposal (1500 to 3000 m water depth);
- The information to establish a baseline environmental assessment within the proposed drilling areas is sparse and generally insufficient;
- Even in well studied areas, there is a general lack of knowledge of the baseline status of deep-sea habitats¹⁴². Significant effort is required to survey the area of interest in order to establish the current state of the ecosystem that is subject to this proposal;
- Although only briefly mentioned in Annex D1, during the description of the Protea Banks Marine Protected Area and the discussion of the various EBSAs and the VMEs in the region¹⁴³, there are indications that cold-water corals may be present and possibly even common within the area. There are submarine canyons that cut through the lease block and extend to 3000 m water depth, which contain hard substrata and tallus accumulations at the basal fans of these features. These types of settings are highly suitable for the development of deep-water coral gardens and reefs. They are all slow growing and long-lived species, with some individual antipatharian (black coral) colonies reaching thousands of years in age, and large cold-water coral mounds accumulating over hundreds of thousands of years. These are among the most prominent examples of VMEs in the context of off-shore drilling EIAs and have been the focus of conservation efforts worldwide;

¹⁴¹ Supplementary Comments and Responses Report p41.

¹⁴² Cordes et al, 2016 Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies.

¹⁴³ Section 3.2.10 of Annex D1

- Another potential habitat type that is not mentioned in Annex D1 is natural hydrocarbon steps. These are common features in offshore oil provinces around the world. Although these have not yet been discovered in the area, this may be due to their absence or the lack of deep-water surveys in the region;
- Species that are not included but which may well inhabit the region include long-lived organisms with some age estimates of tubeworm species at similar depths (1500 – 3000m) in the Gulf of Mexico exceeding 500 years. Therefore, recovery times for these species would be measured in centuries, making them Vulnerable Marine Ecosystems;
- A significant effort is required to obtain the data necessary to determine where VMEs may be located within the area of interest. The first step is a careful examination of available or newly acquired bathymetric and/or 3D seismic data to determine the presence of high-relief areas in the bathymetry and the presence of hard grounds as indicated by high surface reflectivity in the 3D seismic surveys. This should be followed by a series of ROV surveys to ground truth these data. Annexure D1 states that ROV surveys will be conducted¹⁴⁴ at the specific sites where drilling is to take place prior to any seafloor activity. However, the design of these surveys and the use of experts for review of the videos is not indicated;
- ROV surveys should extend beyond 500m, particularly where bathymetric or 3D seismic data suggest the presence of hard grounds in the area. These video data need to be provided to the Department for archiving and independent evaluation of the surveys for the presence of VME indicator species.

346. Based on the above concerns, the following conclusions are made by Dr. Cordes:

- The lack of bathymetry and ecological data within the lease block introduces significant uncertainty in the apriori assessment of the severity of potential impacts;
- Survey data, including high resolution ship-based multibeam surveys, 3D seismic data (particularly surface reflectivity) and visual surveys from ROVs must be made available to the Department and to independent experts for review;

¹⁴⁴ p101

- Vulnerable marine ecosystems, including deep-sea coral and sponge habitats and possibly chemosynthetic cold-seep ecosystems are likely to be present in or near the proposed areas of interest; and
- Where it is assumed that any hard grounds in the survey could provide suitable substrate for cold-water corals or natural hydrocarbon seep fauna, a set-back distance of at least 1km from any hard ground apparent in bathymetric or 3D surveys must be instituted for any installations of seafloor infrastructure.

347. We therefore bring to the Minister's attention that our concerns raised in response to the draft EIA report have not been adequately addressed by the FEIR for the Project Area.
348. There remains little or no knowledge of the seabed communities and ecology at the depth of the proposed activity. There is little or no knowledge of the geological and physical components surrounding the well area.
349. Given that deep-sea ecosystems are "particularly vulnerable to human impacts given that the majority of species have a slow growth, low recruitment and recovery rates and take a relatively longer time to reproduce in comparison to species from other marine ecosystems"¹⁴⁵, the Appellant requested that the marine ecology report be revisited by local experts and further baseline data obtained. Thereafter the Appellant requested that a further draft EIA be released for public comment. Instead, the Appellant's comments were not taken into consideration at all in the preparation of the FEIR that was submitted to the Department for decision.
350. Baseline surveys should be carried out first at regional level and prior to any industrial activity, comprehensive surveys should be carried out with the planned area of focus and in a comparable reference area outside of the influence of typical impacts.
351. An EA should not have been granted without an adequate baseline assessment of the proposed specific drilling site areas and surrounds of at least a radius of 2km. The Appeal should accordingly be upheld.

¹⁴⁵ Gustavo Vaz de Mello Baez Almada, Angelo Fraga Bernardino: Conservation of deep-sea ecosystems within offshore oil fields on the Brazilian margin, SW Atlantic. 2016

F.7 Incorrect assessment of the impacts

Agulhas current

352. The Peer Review of the oil spill modelling portrays a single image of the Agulhas current direction. It is not stated how this particular image was chosen **but it does not, however, represent a typical picture of the velocity and direction of the Agulhas current.** Rather it represents the current during the passage of an infrequent mesoscale eddy and therefore misrepresents the general strength, location and coherence of the current in the area between Richards Bay and the KZN South Coast.
353. According to an expert review by Dr. Annalisa Bracco¹⁴⁶ (see Annexure “A18”), HYCOM underestimates the instantaneous velocities especially in the upper 50 m of the water column in the region of interest, and places the core of the Agulhas Current too far off-shore when the current approaches the coast south of Durban.
354. Further to this, ‘HYCOM significantly under-predicts the Agulhas Current variability. The HYCOM validation performed by VanZwieten et al. (2014) highlights “how HYCOM portrays the current to be less variable than it actually is.”
355. Dr. Bracco also finds flaw in that mixing regimes within the upper ocean mixed-layer (the layer where the wind forcing penetrates), cannot be properly simulated without accounting for circulations at scales of few hundreds of meters to few kilometres (the so-called submesoscales).
356. Her review of the report confirms that:
- Limited variability displayed by the HYCOM is evident in the report,

¹⁴⁶ Physical oceanographer with 20 years’ experience in fluid dynamics and ocean modelling whose research program focuses on the mechanisms and implications of transport and mixing in the ocean School of Earth and Atmospheric Sciences, Georgia Institute of Technology CLIVAR SSG Co-Chair

- The simulated ensembles of oil trajectories collapse on small areas around the spill locations, with some trajectories having a very high probability.
- This is in contraction not only with the VanZwieten et al. analysis (focused to the south of the Block ER 236 by necessity), but also with the analysis of satellite images of chlorophyll that includes the Block area presented by Guastalla and Roberts. Their Fig. 14 (reported below) illustrates that the Block of interest is characterized by the highest chlorophyll variance in the region.
- This is an indirect, strong evidence of both physical and ecological variability that is not reflected in the hydrodynamical model and therefore in the scenarios contained in the assessment.

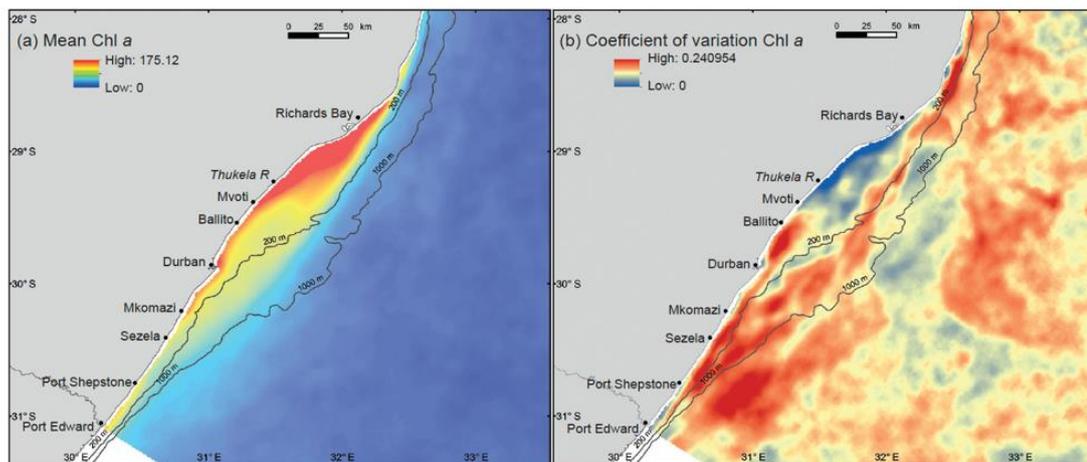


Figure 14: Merged MODIS satellite imagery (from Livingstone et al. [unpublished data]) showing (a) mean chlorophyll a and (b) coefficient of variation of chlorophyll a off the KZN coast from January 2001 to December 2004. SeaWiFS chlorophyll a data representing the best single-day image per month was obtained from the NOAA website. Data interpolation of missing pixels due to cloud presence was performed using ordinary Kriging, and 51 SeaWiFS chlorophyll a images were used for the final analysis

357. A similar conclusion can be drawn by considering the nurdle accidental spill (Annexure “A24”) in Durban Harbour, South Africa, in October 2017. While the spill starts much closer to shore compared to the Project Area, it is worth noting that over 8 weeks the nurdles dispersion extended over 2000 km of the South African coastline.¹⁴⁷

358. Dr Bracco concludes:

¹⁴⁷ Schumann EH, MacKay CF, Strydom NA. Nurdle drifters around South Africa as indicators of ocean structures and dispersion. *S Afr J Sci.* 2019 p115(5/6).

The major weaknesses identified in this review in relation to the hydrodynamic model used in the assessment pertain to an unreliable representation of strength and vertical structure, but especially localization and variability of the Agulhas Current, and an underestimation of lateral mixing and vertical advection due to the lack of submesoscale processes. The projected damage is very likely to be strongly underestimated, especially in relation to the possibility of nearshore oiling and impacts to Marine Protected Areas and the coastal ecosystem.

359. A separate assessment of the Agulhas Current undertaken in 2017¹⁴⁸ and which incorporates substantially more detail than the FEIR, notes:

- While the flow of the Agulhas Current is known to be fairly stable (Lutjeharms, 2006a & b) there are occasional, irregular perturbations that can alter the flow.
- One such feature is the Natal Pulse, which is associated with a meander in the Agulhas Current. This feature develops off the KZN Bight (north of Durban) and grows in amplitude (offshore extent) as it passes south of Durban, sometimes extending as far as 200km offshore of East London. The implications of this are if a blow-out happened during a Natal Pulse of this nature, the oil would behave completely differently to the oil spill modelling report. It would not disperse quickly but would stay within the Project Area. It could then be entrained and pushed inshore once the Agulhas current moves closer to shore again.
- Rouault & Penven (2011) calculated that on average 1.6 Natal Pulses per year reach Port Elizabeth, however previous estimates had put the number of Natal Pulses at 4 to 6 per annum.
- The Natal Pulse migrates south-westward down the coast at a speed of approximately 10-20 km/day, although propagation speeds of 23 km/day have been reported, and has a total lifespan of some 50 to 70 days.
- A cyclonic circulation and cold core develops and they are characterised by a decrease in current speed and current reversals (i.e. north to north-eastward flowing currents). This would put the MPAs at risk and further create increased risk to the Isimangaliso World Heritage Site.
- Semi-permanent cyclonic (clockwise) eddies develop on the inshore region of the southward-flowing Agulhas Current in the lee of large coastal offsets along the coastline.

¹⁴⁸ Oceanographic Assessment: Agulhas Current for Mad Swimmer proposed 100km, June 2017

- One such eddy is the Durban Eddy, a semipermanent cyclonic eddy circulation that exists off the south coast of KZN in the lee of the southern end of the KZN Bight between approximately Durban in the north and Sezela in the south.
 - The eddy is approximately 40-50 km wide and 60-90 km long and the clockwise rotation causes north-eastward currents near the coast, opposite to the main south-westward Agulhas Current flow further offshore.
 - The eddy occurs approximately 55% of the time in the area between Durban and Sezela and is a major contributing factor to the frequent current reversals inshore, landward of the core of the Agulhas Current. The eddy is highly variable in occurrence, strength and downstream propagation speeds. The average lifespan is 8.6 days, with a range of 3 to 19 days and an average time between eddy events of 7.7 days.
 - The Durban Eddy detaches from the Durban area and flattens against the coast as it and migrates southwards in the shoreward boundary of the Agulhas Current, eventually dissipating as a lateral wave.
 - A further semi-permanent cyclonic eddy exists to the south between Waterfall Bluff and Port St Johns, known as the Port St Johns Eddy. This is a smaller feature than the Durban Eddy, with a maximum length of 50 km, but plays an important role in facilitating whether sardines make it northward during the annual sardine run.
360. The incorrect and missing information regarding the Agulhas Current affects the entire FEIR making it wholly misleading, particularly with regard to the oil spill modelling and the impact assessment. The baseline assessment should be conducted over two years to assess the Project Areas in variety of different ocean conditions over all seasons and cycles.

The Ocean Scenario in general

361. It is repeatedly stated throughout the Comments and Responses Report that “Eni has drilled 14 deep and ultra-deep exploration wells in Mozambique with similar water depth and current conditions, equating to 800 days of continuous drilling without any incidents taking place. It is not improper to use Eni’s track record of safe and reliable operations in equally challenging environments to demonstrate Eni’s experience in deep and ultradeep offshore environments and its commitment to safety, with no incidents of oil spill in exploration operations to date”.

362. However, comparing the drilling conditions in northern Mozambique with drilling off the east coast of South Africa is not appropriate. As mentioned above, the Agulhas Current is the strongest western boundary current in the world, and combined with the deep, extremely rough sea conditions of the South African east coast (abnormal wave size),¹⁴⁹ comparing it to drilling in the relatively sheltered Mozambique channel is illogical.
363. The three key points to make with regards comparing the northern Mozambique locations and the South African location are:
- (a) They are not comparable from an ecosystem or biological perspective, as they fall into 2 different REALMS (Spalding et al 2007 report¹⁵⁰) are in different Marine Provinces, and in very different Ecoregions within those provinces¹⁵¹:
 - Northern Mozambique is in the “Western Indo-Pacific Province” Realm in the “Western Indian Ocean” Province, in the “East African Coral Coast” Ecoregion.
 - The drill sites in South Africa are south of Cape Vidal in the “Temperate Southern African” Realm, in the “Agulhas” Province, in the “Natal” Ecoregion.
 - (b) Although this is a coastal and shelf classification (i.e. shallower habitats to about 250m), and the deeper habitats will be somewhat distinct from them, this is significant as the hydrographic features and distinctive abiotic features define the difference between provinces, with distinct biotas. It cannot be assumed that these different hydrographic features (such as currents, disturbance from storms) are not having an influence in the offshore deeper area; and

¹⁴⁹ <https://pdfs.semanticscholar.org/4a6d/72097d83e8100d8c0a4bf0c6fe8c6412d54e.pdf>

¹⁵⁰ Spalding et al 2007: Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas

¹⁵¹ p578

- (c) The two areas have significantly different meteorological regimes that affect the wind speeds, current speed and frequency and the swell conditions.¹⁵² There are therefore significant differences in:

Current

- Northern Mozambique – currents occasionally up to 4 knots between October and February.
- KwaZulu-Natal – rates of about 5 knots have been recorded in all months of the year between Cape St Lucia and East London.

Winds

- Northern Mozambique -see wind roses attached hereto marked “A?” 1.165 (Lumbo) and 1.166 (Pemba) – less than 1 day a year with gales. The maximum frequency of calm conditions 32% and there are very low incidences of >Force 7 winds¹⁵³.
- KwaZulu-Natal – see 1.161 (St Lucia) and 1.162 (A”) (Durban) – days with gales 8 a year off Cape St Lucia. Frequency of calm conditions is at maximum 16% and there is notable incidence of Force 7 and Force 8-12¹⁵⁴
- Northern Mozambique – Only 2 months of the year have any winds of Force 6, with no winds of Force 7 or greater. (See summary of WindGuru Archive Data annexed hereto marked “A?”).
- KwaZulu- Natal – all months had winds of Force 6, with 4 months having winds greater than Force 7. (See summary of WindGuru Archive Data annexed hereto marked “A?”).

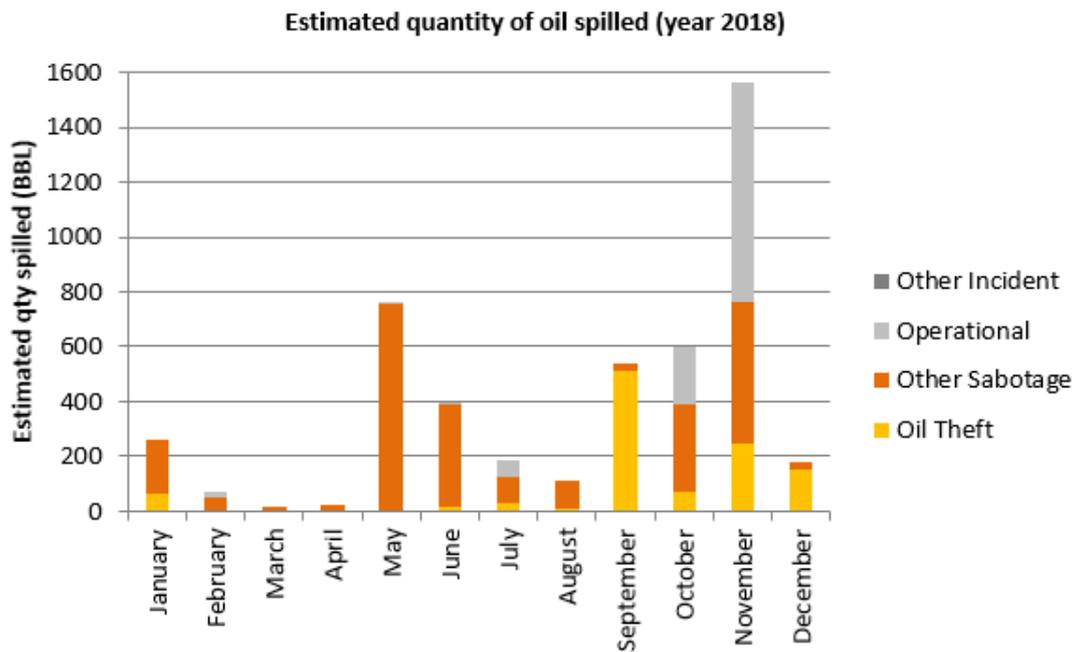
This equates to significantly more current and wind (which brings more swell) at the Project Area, with extreme conditions occurring every year, compared with Mozambique which is protected by Madagascar and subject to the weaker Mozambique current.

¹⁵² Admiralty Sailing Directions – Africa Pilot Volume 3, 17th Edition. 2016. Hydrographic Office, United Kingdom

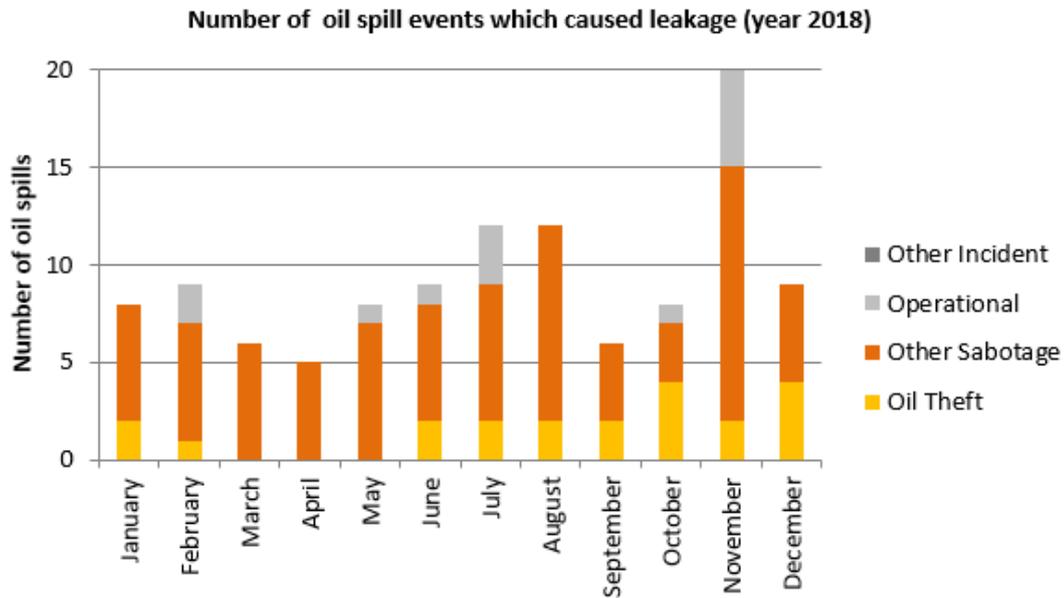
¹⁵³ Admiralty Sailing Directions – Africa Pilot Volume 3, 17th Edition. 2016. Hydrographic Office, United Kingdom

¹⁵⁴ Ibid

364. Re: “No incidents of oil spill in exploration operations to date”. This statement is a clear indication of green washing. The Applicant’s operations result in oil spills on a monthly basis around the world. For example, on the Applicant’s website they state that in 2018, the number of barrels spilled in **operational oil** spills was **2665**. In 2018 in Nigeria alone the statistics are as follows:¹⁵⁵



¹⁵⁵https://www.eni.com/en_NG/sustainability/environment/response-to-oil-spills/spill-incident-statistics/spill-incident-statistics.shtml



365. It will take too much of this Appeal to detail the spills that take place around the world every year as a result of the Applicant's operations, or to assess which apply to off-shore operations, however is submitted that some of these can be found at:

- https://www.eni.com/en_NG/sustainability/environment/response-to-oil-spills/spill-incident-data/spill-incident-data.shtml
- <https://mg.co.za/article/2011-12-24-offshore-nigeria-spill-came-amid-tankerloadingWhile>
- <https://unearthed.greenpeace.org/2016/02/22/arctic-oil-eni-nigeria-spills/>

366. In Dr. Cordes' review he states:

There is an empirical relationship between the depth of the drilling operations and the frequency of accidents during drilling operations. There is a 40% probability of an accident occurring in any given year on a platform (as opposed to a drillship being used in the proposed drilling) in a water depth of 2000m, with the probability increasing at deeper water depths.

367. It is submitted that the FEIR fails to adequately consider the combination of depth, fierce current, steep continental shelf and exposure that comes with drilling off the east coast of South Africa and the comparison to Mozambique is misleading and illogical. This, combined with the suggestions that the Applicant's operations are reliable and incident

free, it is submitted that the nature and extent of the Project and the risks associated therewith, have not been properly considered and have been under-represented.

368. Based on the above, the assessment of the potential impact of the operations cannot be adequately assessed as the risk has not been correctly assessed.

Marine Ecology

369. With reference to the expert review by Cordes, the following impacts were incorrectly assessed:

- Water-based muds (WBM) and drilling fluids are highly preferred to oil-based or synthetic fluids however the release of the full volume of WBM into the environment is not included in the Cuttings Modelling Annex of the EIA report. The preferred alternative is the complete treatment of the WBM and drill cuttings and disposal in proper facilities on shore.
- Oil spill modelling fails to take into account multiple potential pathways of exposure to deep-sea communities.
- Recovery times from physical disturbance of hardgrounds would be very long considering the longevity of some organisms (over 1000 years for many deep-sea black corals). Therefore, the impact for physical disturbance of the seabed sediments should be moderate, not minor.
- The accumulation of residual cement would induce burial that would persist for long periods of time, and would turn a soft-sediment habitat into hardgrounds. This type of impact would also be highly localised to the area immediately around the well head but could persist for longer periods of time than the disturbance of sediments. Therefore, for both categories of habitat, the impact of accumulation of residual cement of the seabed would be moderate, not minor.
- The impacts of the accumulation of disposed drill cuttings and associated fluids would come from the smothering and burial of fauna along with potential toxicity of the residual drilling fluids that were discharged with the cuttings. Significant community shifts arising from the burial of soft sediment fauna along with the effects of barite deposition would be anticipated over 200-300 m around the well head and would persist for months to a few years for WBM. For NADF, these

impacts could extend to a few kilometres and persist for years to decades. Therefore the magnitude of these impacts on the soft sediment benthos would be considered minor for WBM and major for NADF. Because of the recovery time for hard-substrate VMEs, the impacts would be moderate to major.

- Within the context of impacts to potential VMEs in the immediate vicinity of the well head, it should be noted that significant component (up to 50%) of the liquid and gaseous hydrocarbons that were released during the Deepwater Horizon blowout remained in the deep ocean. These were either degraded (primarily in the case of methane gas), dissolved into the seawater at depth, suspended as microdroplets in the large subsurface plume that formed, or were redeposited on the seafloor as oiled marine snow (the “dirty blizzard”). In particular, the oiled marine snow event was not something that was predicted to happen during a spill based on the knowledge prior to the Deepwater Horizon, and this material was the most likely the biggest contributor to the impacts observed on the cold-water corals in the deep Gulf of Mexico. The FEIR only deals with a surface oil slick and makes no predictions for the distribution of oil on the seafloor.

370. Further to Cordes’ findings, in terms of the NEMA EIA regulations “significant impact” means an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with **accepted environmental quality standards, thresholds or targets** and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence. [Our emphasis].

371. Instead, the FEIR refers to international studies to:

“provide an indication of possible impacts to benthic habitats that might be expected in future petroleum production activities off the East Coast. The identified environmental aspects and the related potential impacts are discussed and assessed below using information from the international literature”.

372. In a recent study entitled: “Persistent and substantial impacts of the Deep-Water Horizon oil spill on deep-sea megafauna”,¹⁵⁶ 2019, it states that:

“The impact on deep-sea benthos were severe. Much of the oil spill remained at depth. Oil released at 1511 m, plume dynamics, and the 2.9 million litres of dispersant injected directly into the source led to 35% of the hydrocarbons being trapped and transported in deep-sea plumes. These deep, subsurface plumes consisted of a mixture of hydrocarbons. Weathering, burning and application of dispersant to sea surface oil also returned additional hydrocarbons to the deep-sea floor as oiled marine snow. Toxic hydrocarbons, dispersants and heavy metals released in association with drilling and well control created chronically and acutely toxic conditions in its vicinity. Parts of the deep Gulf sea floor became a ‘toxic waste....Further information about how deep-sea biodiversity is recovering is urgently needed given the linkage between deep-sea biodiversity and multiple ecosystem functions and services, such as carbon sequestration, nutrient regeneration, microbial-based detoxification and deep-sea fish stocks. Moreover, there is a great need to understand the resilience and recovery of deep-sea ecosystems in the face of predicted increases in deep-water exploration and extraction worldwide...”

373. As mentioned by Cordes’ report, the FEIR only deals with a surface oil slick and makes no predictions for the distribution of oil on the seafloor. As already set out in detail in section II of this Appeal, the exclusion of surface oil thickness of below 1.0 µm also grossly underrepresents the nature and extent of a surface oil slick and therefore the impact of oil on the marine ecology.

374. The FEIR further fails to understand the deep-sea ecosystem in any suitable way that could form baseline information for this type of activity. Accordingly, those impacts that have been identified cannot properly be assessed.

375. In Dr. Paris’¹⁵⁷ review (“the Paris review”) of the Oil Spill Modelling Report (Annex D4) she states:

Surprisingly, the modeling output described in Table 3-1 from Annex D4 (reproduced below) is restricted to quantifying surfaced and beached oil. However, an uncontrolled oil spill in the ultra-deep sea is a three-dimensional problem and the following output should also be included to assess the full oil budget: (1) oil concentration in the water column; (2) sedimented oil mass (i.e., on the seafloor, shelf, coral reef habitat, etc.);

¹⁵⁶ McClain CR, Nunnally C, Benfield MC. 2019 Persistent and substantial impacts of the Deepwater Horizon oil spill on deep-sea megafauna. R. Soc. open sci. 6: 191164. <http://dx.doi.org/10.1098/rsos.191164>

¹⁵⁷ Biological oceanographer and Full Professor of Ocean Sciences at the University of Miami’s Rosenstiel School of Marine and Atmospheric Sciences, Miami, Florida, USA.

(3) subsea oil mass of intrusion layer formation, so-called deep plumes (Socolofsky et al. 2011). Indeed, buoyant oil and gas, released at the bottom of a stratified ocean, can become trapped in layers, centered on the level of neutral buoyancy of the entrained seawater (Socolofsky et al. 2016). Again, there are no output addressing the contamination of the planktonic and benthic ecosystems. Moreover, the output presented is not specific enough in terms of the toxic pseudo-components of the petroleum hydrocarbon, i.e., does not differentiate between total petroleum hydrocarbon (TPH) and polycyclic aromatic hydrocarbon (PAH) concentrations.

376. The knock-on effects of the inaccurate oil spill modelling are evident in the Fisheries Study and Marine Ecology (Annex D1) assessments. The Fisheries Study's conclusion is based on the 3 scenarios in Annex D4 which have been determined as 'highly unrealistic' by Dr.Paris-Limouzy. The conclusion in Annex D4 that "*the results of the modelling indicates that no significant shoreline oiling would occur, it is unlikely that unplanned release of hydrocarbons would affect the operations of nearby fisheries*"¹⁵⁸ is based on unrealistic modelling meaning that the impacts of realistic modelling on nearby fisheries was not adequately assessed, if at all.

377. A brief review of the EAIR by Deborah French-McCay, Director, Research and Model Development¹⁵⁹ she raised the following concerns:

- The Applicant show maps of the extent of the plume > 5ppb, and give large areas affected in the text but does not appear to explain the depth over which these areas are impacted, or the time duration.
- However, they conclude on p159: "For a sub-surface slick, the risk significance is considered to be MINOR for benthic invertebrates, plankton, pelagic fish and larvae, seabirds and for marine mammals and turtles."
- If the plume is that large, there would be an impact. It seems the Applicant just opined the risk significance and did no real analysis.

378. There is no information in the FEIR regarding the observer data of whales, dolphins and seabirds that should have been collected during the seismic surveys. This information (required as per seismic survey permit conditions that a Marine Mammal Observer be

¹⁵⁸ p77

¹⁵⁹ In email correspondence with the Appellant on 17 October 2019.

onboard all seismic survey vessels) should be used to verify what species occur in the proposed project area, and should be made available in the FEIR as raw data sheets and a summary. The failure to include this information in the FEIR is not understood by the Appellants. All observer data should form part of a post seismic survey report that informs the EAIR in so far as the actual occurrence of the marine mammals in the survey area.

379. Without this information there is no accurate baseline data and it is accordingly impossible to accurately assess the impact.
380. In assessing the effects of the Deep Water Horizon spill, the Center for Biological Diversity, USA¹⁶⁰ used multiplication factors from leading scientists to estimate how many more animals are killed than are actually observed or collected. In their report they found that the spill likely harmed or killed about 82,000 birds of 102 species; about 6,165 sea turtles; as many as 25,900 marine mammals; and a vast (but unknown) number of fish.



381. According to NOAA Fisheries,¹⁶¹ about 450 living, oiled sea turtles were rescued, brought into rehabilitation, cleaned, and released back into the wild. 95% of released sea turtles were [loggerhead sea turtles](#). More than 600 turtles were found dead during the oil spill

¹⁶⁰https://www.biologicaldiversity.org/programs/public_land/energy/dirty_energy_development/oil_and_gas/gulf_oil_spill/a_deadly_toll.html

¹⁶¹<https://www.fisheries.noaa.gov/national/marine-life-distress/deepwater-horizon-oil-spill-2010-sea-turtles-dolphins-and-whales>

response, of which 18 were visibly oiled and about 75 percent of these were [Kemp's ridley turtles](#).



382. More than 150 dolphins and whales were found dead during the oil spill response, of which nine were visibly oiled and more than 90% were [bottlenose dolphins](#).

383. According to a December 2013 study of the Deepwater Horizon spill's potential effects on dolphins, bottlenose dolphins in Louisiana's Barataria Bay have [lung damage and adrenal hormone abnormalities](#) not previously seen in other dolphin populations.



384. The FEIR conveniently refers to old data and states:¹⁶²

The effects of oil pollution on marine mammals is poorly understood (White et al. 2001), with the most likely immediate impact of an oil spill on cetaceans being the risk of inhalation of volatile, toxic benzene fractions when the oil slick is fresh and unweathered (Geraci & St Aubin 1990, cited in Scholz et al. 1992).

And

Being highly toxic, oil from a 'blow-out', a riser disconnection or marine diesel released during an operational spill would negatively affect any marine fauna it comes into contact with. The drilling activities would be located in the offshore marine environment, ~100 km offshore, and removed from most sensitive coastal receptors (e.g. bird colonies, coral reefs) or MPAs. However, due the proposed well(s) being situated within the influence of the strong Agulhas Current, spilled hydrocarbons would be rapidly transported considerable distances, both within the water column and on the surface, with visible surface slicks potentially reaching the shore to the southwest of the proposed well locations. Depending on the nature of the spill, sensitive coastal receptors and MPAs could thus likely be affected to a greater or lesser degree by surface oil.

385. This is not a clear or legitimate evaluation of the potential impacts. The Cordes Review confirms that:

A large spill or blowout could have major consequences for the marine environment, from the shoreline to the deep sea.

386. At this point we draw the Minister's attention to research done in 2018 by a team led by marine biologist Chris Wilkinson, technical manager for the Mammal Research Institute at the University of Pretoria. The team sampled the number of humpback [whales in one population](#) (C1) by counting them as they swam past Cape Vidal, on South Africa's east coast. The whales migrate each year from feeding grounds in Antarctic waters to breeding areas near Mozambique. From their survey data, researchers extrapolated to estimate a population of more than 30,000 humpbacks in the entire western Indian Ocean. This increase of whales is seen to be a direct result of the 1979 ban against commercial whaling. About a decade after the ban, Ken Findlay, a whale biologist at Cape Peninsula University of Technology, began to survey the humpbacks that migrate past Cape Vidal to monitor

¹⁶² Annex D1, p139

their recovery. Focusing on the C1 group he observed an estimated 360 whales during his initial field season in 1988.¹⁶³

387. This C1 population of humpback whales moves along the South African coastline, with peaks in July and October (but activity June to November) and has been steadily increasing in number since then. From just 208 whales in 1988 to more than 30 000 whales in 2018 is a conservation success story. Should a blow-out occur as a result of the Project, there is a high risk that the C1 population will be severely impacted, setting back their recovery dramatically.

388. This impact would catastrophic and is not included in the FEIR.

389. In the following section of the Appeal, the inability to manage a spill will be dealt with. This section will show that Annex D1 is fundamentally flawed by the inaccurate oil spill modelling and the inability of the Applicant to quickly manage a deep-sea blowout in a timeframe that would prevent any impact on the marine ecology. There is absolutely no doubt that a deep-sea blowout would have catastrophic effects on the marine and coastal environments. As per the Paris Report:

“low volume of released oil and short duration of the spill is not what should be presented as ‘worst case scenario’. Moreover, strong currents, together with frequent extreme weather and wave conditions will make any rapid response to an ultra deep-water blowout impossible. Indeed, ideal sea conditions are required to deploy a capping stack in waters exceeding a few kilometres.”

390. The failure to adequately assess the impacts of the Project on marine benthic communities, the ecology, marine mammals and fisheries in South Africa’s Exclusive Economic Zone (EEZ) is a fatal oversight. The Appeal must succeed on this basis alone.

¹⁶³ <https://www.nationalgeographic.com/animals/2019/07/humpback-whales-recovery-south-africa/>

F.8 Inadequate consideration of the no-go alternative

391. The FEIR has failed adequately consider the no-go option in that it has only dealt with the potentially negative *economic* impacts thereof. This is a biased and one-sided approach to no-go option assessment.
392. According to the FEIR, the assessment of potential “No-Go” impact is based solely on:
- “No positive, local, economic impact in term of procurement (direct and indirect), taxes (royalties and other taxes) and salary paid to direct employees and suppliers employees.
 - No potential to diversify the South African energy mix or consider the possibilities that may be realised if the project proceeded (and a viable hydrocarbon source was discovered).
 - Sustained (or even increased) reliability on importation from other countries depending on the growing demand”.
393. According to Guideline 5,¹⁶⁴ the no-go option assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. The ‘no-go’ alternative is also regarded as a type of alternative, but is described separately to emphasise its importance in EIA.
394. In a situation where negative environmental impacts have high significance, the ‘no-go’ alternative takes on particular importance. In some cases, the ‘no-go’ alternative may be the only realistic alternative and then it has a critical role to play.
395. The FEIR fails to consider the no-go alternative as the only realistic alternative, which the Applicant submits it is. The implications are that the no-go alternative will ensure no pollution, no catastrophic spill, no climate impact, no impact on fisheries, no socio-economic impact and no harm to the marine environment. At the *very least* the implications

¹⁶⁴ DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

of thriving MPAs on the sustainability of the ocean and coastal fisheries should be explored.

396. We will deal with this further in the need and desirability section below.

F.9 Inadequate Assessment of the Need and Desirability

397. In spite of the FEIR stating that the Guideline on Need and Desirability,¹⁶⁵ was used to guide the report and that need and desirability must be considered together with the content of IDPs, SDFs, EMFs and other relevant plans, frameworks and strategies when considering each application, the FEIR report fails to show how this was done.

398. Regulation 18 of the EIA Regulations requires that, when considering an application the competent authority must have regard to section 24O and 24(4) of the Act, the need for and desirability of the undertaking of the proposed activity, the requirements of these Regulations, any protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice or any relevant guideline published in terms of section 24J of the Act.

399. Section 24O of NEMA mandates that any guidelines, departmental policies, and environmental management instruments that have been adopted in the prescribed manner by the Minister and any other information in the possession of the competent authority that are relevant to the application; and any information and maps compiled in terms of section 24(3), including any prescribed environmental management frameworks, to the extent that such information, maps and frameworks are relevant to the application **must** be taken into account when considering applications.

400. A Strategic Environmental Assessment (SEA)¹⁶⁶ of proposed offshore oil & gas development that encompasses both exploration and development phases is recognised as

¹⁶⁵ Department of Environmental Affairs (DEA), Pretoria, South Africa (2017)

¹⁶⁶ CSIR (2007) Strategic Environmental Assessment (SEA) Resource Document: Introduction to the Process, Principles and Application of SEA:
http://fred.csir.co.za/project/csir_course_material/Final_Resource%20Document.pdf DEAT (2004) Strategic Environmental Assessment, Integrated Environmental Management, Information Series Department of Environmental Affairs and Tourism (DEAT), Pretoria

a best practice tool for informing stakeholders and decision-makers about the full dimensions of individual projects.¹⁶⁷

401. There are a number of examples where assessment of individual offshore oil & gas projects has been preceded by an SEA of oil and gas development. For example: The Strategic Environmental and Social Assessment of Oil and Gas Development in Mauritania¹⁶⁸.

402. The Government of South Africa has issued several guideline documents regarding the application of SEA as best practice, including the "Strategic Environmental Assessment in South Africa"¹⁶⁹ which states that NEMA makes provision for the development of assessment procedures that aim to ensure that the environmental consequences of policies, plans and programmes are considered. This provision indicates a need, within legislation, for the use of SEA.

403. The scope of the project being assessed in the FEIR is very narrow; that being the drilling of a limited number of exploration wells. Section 3.4 of the FEIR states:

"The Drilling Program and Time Schedule proposed by Eni is to drill at least one exploration well within the northern or southern areas of interest between November 2019 and March 2020"

and

"If the first exploration well shows a hydrocarbon discovery, the Eni Drilling Program and Project Schedule will be updated to include the drilling of up to two exploration drilling wells at different locations and up to three appraisal wells. Unlike the

https://www.environment.gov.za/sites/default/files/docs/series10_strategic_environmental_assessment.pdf

¹⁶⁷ See, for example: Doelle, M., Bankes, N., & Porta, L. (2013). Using Strategic Environmental Assessments to Guide Oil and Gas Exploration Decisions: Applying Lessons Learned from Atlantic Canada to the Beaufort Sea. *Review of European, Comparative & International Environmental Law*, 22(1), 103-116.

<https://prism.ucalgary.ca/bitstream/handle/1880/49278/StrategicEAsOP39.pdf>

Lamorgese, L., Geneletti, D., & Partidario, M. R. (2015). Reviewing strategic environmental assessment practice in the oil and gas sector. *Journal of Environmental Assessment Policy and Management*, 17(02), 1550017.

Barker, A., & Jones, C. (2013). A critique of the performance of EIA within the offshore oil and gas sector. *Environmental Impact Assessment Review*, 43, 31-39.

¹⁶⁸<http://documents.worldbank.org/curated/en/770661468283141036/pdf/704840ESW0P1210arts0A0and0B0June029.pdf>

¹⁶⁹DEAT

(February

2000)

http://www.commissierner.nl/docs/os/sea/casestudies/various_south_africa_6_cases_00_csir.pdf

exploration wells, the appraisal wells will be tested and this is described further in this chapter. At the end of operations both kind of wells will be plugged and abandoned (“decommissioned”).

"The drilling of the exploration and/or appraisal wells will be undertaken as separate campaigns. In the event the exploration and appraisal wells identify a commercial interest for future field development, a further Schedule and Programme for the Development and Production phases will be prepared in a separate EIA process and therefore is not included in this EIA Report."

404. With respect to the issue of produced water disposal:

"The impacts assessed as part of this project have been limited to the proposed exploration drilling activities as this is the full ambit of the scope of this proposed project. Impacts related to production, such as produced water, will be assessed as part of a separate EIA process, should a viable source of hydrocarbons be found during the proposed exploration drilling activities¹⁷⁰.

405. It is very advantageous for the Applicant to narrow the scope of the project to encompass only the drilling of exploration wells. This excludes from the scope of the assessment **all of the impacts associated with production wells**, such as the generation and disposal of produced water and other major impacts, including climate impacts of indirect CO₂ emissions from the combustion of oil & gas that would be recovered from Block ER236. This very narrow scope of the Project deprives stakeholders and decision-makers in South Africa from understanding the full dimensions of the Project, considering that oil development is a reasonably foreseeable future action hoped for by the project proponent.

406. Given that the project is so narrowly defined in the scope, and that no SEA for oil & gas development off the East Coast of South Africa preceded the FEIR for the project to inform stakeholders and decision-makers about the full dimensions of the project, it is submitted that the need and desirability criteria cannot be properly presented in the FEIR.

407. The granting of this authorisation opens the door to an onslaught of applications throughout the entire EEZ without the necessary baseline assessments and knowledge that is required to properly understand the potential impacts of oil exploration off our volatile coastline. It is effectively telling the world that we are ‘open for business’ without taking into

¹⁷⁰ Supplementary Comments and Responses Report p51

consideration the long-term ramifications of doing so. The FEIR has failed to consider the need and desirability associated with the no-go option other than only dealing with the potentially negative *economic* consequences thereof. This is a biased and one-sided approach to both the need and desirability requirement and the no-go option assessment.

408. The Minutes of the Ordinary Shareholders Meeting of “E.n.i s.p.A” held on 14 May 2019 and available on the Eni website¹⁷¹ are self-explanatory, however a series of issues are raised from p84 onwards that bring the need and desirability of the Project (in light of the Applicant’s operations around the world) into doubt.

409. In an effort to prevent this Appeal becoming too voluminous we only paraphrase from a few excerpts from presentations at the shareholders meeting by way of example:

We believe that this must be the place where not only are Eni’s industrial strategies and financial results made available to the shareholders, but also the place where the shareholders can listen to the voices of those who live in areas adjacent to extraction and petrochemical centres, to heed what Eni’s activity can produce not only in terms of dividends but also in terms of social mobilisations, public complaints, environmental contamination, health risks, bribery for jobs and undermining of the territory’s traditional economic system.

A point that we feel we need to highlight here is the clear contradiction, in our opinion, between the green image ascribed to the declared commitment to decarbonisation and to the circular economy, in which Eni is making massive investments, and the business plans that essentially envisage a steady increase in oil and gas extraction over the next few years.

In his opening remarks, the CEO underscored the peaceful coexistence between the amount extracted and the respect for – even the exceeding of – the emission reduction targets necessary to combat climate change.

Eni’s business model explicitly recognises in its corporate records that “the main challenge for the sector is access to energy resources in a way that is efficient and sustainable for everyone, combating climate change”.

In the 2017 fact book, Eni states that in 2017 it achieved a production record of 1.82 million barrels of oil equivalent per day, an increase of 3.2% on the previous year. What is more, in the 2019-2022 strategic plan the production of hydrocarbons is expected to grow by a further 3.5% per year, also thanks, and I quote, “to the large number of new licenses in high-potential basins” where it aims to achieve “2.5 billion barrels of new resources by drilling 140 exploration wells in 4 years”.

¹⁷¹https://www.eni.com/docs/en_IT/enicom/company/governance/shareholders-meeting/2019/Minutes-of-the-Ordinary-Shareholders-Meeting-held-on-May-14-2019.pdf

Of the €33 billion of investment announced in the four-year plan for 2019- 2022, as we have heard several times during the reports given this morning, €3 billion, or rather less than 10%, are allocated to the decarbonisation process.

That said, is it really possible and credible to state, as Eni does, that “decarbonisation is structurally present in all corporate strategy and is predominant in ambitions for the future” when the company is still in thirtieth place among firms producing fossil fuels that emit more CO₂ at global level, according to the authoritative Carbon Majors Report and was alone responsible for 0.6% of the total industrial climate-altering gas emissions released into the atmosphere globally between 1988 and 2015 and intends to progressively further increase the amount of extraction in the years to come?

and

... Over the years, Eni’s extraction model in Gela has been unsustainable from every point of view: economic, environmental, social and cultural, and it runs counter to the very idea of Enrico Mattei when he wanted very strongly to complete the old petrochemical plant in Gela in the late 1950s.¹⁷² Eni is a company that has had a huge impact on the life of the city.

Given the short time available, I will not even address the data on land reclamation and the data on pollution because the responsibilities are surely shared there, but the territory certainly needs a change of gear.

If today we were to do one of those cost-benefit analyses that are so popular lately, perhaps we would find that Eni has been profitable, that it has taken from the territory more than it has given, then perhaps the time has come to balance the accounts.

and

... my remarks are mainly aimed at clarifying the data on the 2017 spill that occurred in Val d’Agri... Energy Valley project, even with its 200 jobs, seems really insufficient to compensate for the indirect damage that, unfortunately, this mining activity has had on the territory. Please keep in mind that the Val d’Agri is at the centre of a national park and that it was considered a valuable agricultural area.¹⁷³

and

In particular, I refer to the mining activities carried out by Eni in the last 25 years in Basilicata, in the Val d’Agri facility located in the Municipality of Viggiano, in the province of Potenza, called in short the “COVA. Arguments in criminal proceeding no. 1753 of 2017 are currently under way before the Criminal Court of Potenza, referred to as the “Petrolgate” trial¹⁷⁴ ... The crimes that are alleged in this case concern the trafficking and illegal disposal of hazardous waste from mining activities. Both the judicial investigations and the ongoing trial in which I found myself forced to participate, as a civil party through two associations that I represent, have uncovered that in the re-injection well located in a place called Montemurro, near Viggiano, and next to the Pertusillo reservoir, some 854,101 tonnes of wastewater were stored in a single year taken as a point of reference, from September 2013 to September 2014, while at Tecnoparco, of which I spoke earlier, some 594,671 tonnes of wastewater were stored. Before formulating specific questions to Eni’s top

¹⁷² p96

¹⁷³ p102

¹⁷⁴ p113

management, it cannot go unstated that the seriousness of the Basilicata question can no longer be overlooked. There was a further epilogue in 2019 of an issue that arose in 2017, which consisted of the leak of semi-processed crude oil stored in the tanks of the COVA's Viggiano facility, which is pumped twice a week to the Taranto refinery.

This leak may have irreversibly polluted the aquifer of the Municipality of Viggiano and perhaps that of the neighbouring Municipality of Grumento Nova as well, because there are underwater pumps that are operating even as we speak in both municipalities.

410. Given the Applicant's repeated assertions of its "track record of safe and reliable operations" in the Comments and Responses Report, these Minutes are an important consideration in the assessment of the need and desirability of the Project versus the need and desirability of the protection of the ecosystem as a whole, of the sustained and ongoing protection of our ocean, that is shared by all South Africans.

F.10 Failure to comply with the EIA Regulations

411. A FEIR must contain the information set out in Appendix 3 or comply with a protocol or minimum information requirements relevant to the application as identified and *gazetted* by the Minister in a government notice, and, where the application for an environmental authorisation is for prospecting, exploration, or extraction of a mineral or petroleum resource, including primary processing, or activities directly related thereto, the basic assessment report must address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations, made in terms of the Act.
412. The FEIR failed to comply with the regulations in that the Applicants failed to *inter alia*:
- Adequately identify the nature, significance, consequence, extent, duration and probability of the impacts particularly with regard to baseline information and a thorough understanding of the area of interest and oil spill modelling (section 3(1)(h)(v)) and (section 3(1)(i)) and (j);¹⁷⁵
 - Identify the manner in which impacts, particularly from a spill or blowout, could be reversed (section 3(1)(h)(v)(aa) and section 3(1)(j));

¹⁷⁵ GNR 982 of 2014, Appendix 3.

<https://www.researchgate.net/publication/288468395> The environmental and social impact of petroleum and natural gas exploitation in Nigeria

- Detail the irreplaceable loss of resources in the event of the impact, particularly a spill or blowout (section 3(1)(h)(v)(bb) and section 3(1)(j));
- Provide details of financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impact and, more importantly, the financial security for clean-up in the event of a large spill or blow-out particularly the ability of insurance being adequate enough to indemnify the South African taxpayer from having to cover the costs of clean-up (section 3(1)(t));
- Address the concerns raised during the public participation process in that the Appellants comments were not incorporated into the FEIR that was put before the decision maker in December 2018 (section 3(1)(h)(iii));
- Provide necessary information to inform the public participation process rather than simply stating that it will be provided 'prior to start of drilling operations', such as the Oil Spill Contingency Plan (section 3(1)(h)(v) and section 3(1)(m));
- Set out adequate spill response methods and technology effective for the correct predicted volumes and show that the necessary infrastructure is in place for timely spill response especially given that the infrastructure is on the opposite coastline and the ferocious nature of the coastline was not considered (section 3(h));
- Ensure protection of marine and coastal wildlife populations (particularly endangered, threatened, vulnerable and protected species) given that observer data of marine mammals was excluded and the impact on them could not be adequately assessed (section 3(1)(h)(v));
- Show that oil and gas activities will not result in harm to the marine life and, sensitive and marine protected areas in and around the east coast of South Africa in the event of a spill or blow-out, particularly given the lack of baseline data and the incorrect oil spill modelling (section 3(1)(h)(v));
- Analyse how the project may interact with baseline conditions in order to define, predict and evaluate the likely extent and significance of environmental, social and health impacts that may be caused by the project (section 3(1)(h)(vii)); and
- Inadequate consideration of the no-go alternative and the need and desirability of the Project (section 3(1)(f)).

Constitutionality, NEMA and Specific Environmental Management Acts

413. The Minister of Environment, Forestry and Fisheries is responsible for the implementation of environmental protection laws in South Africa, including the National Environmental

Management Act 10 of 1998 (NEMA), the National Environmental Management: Protected Areas Act 57 of 2003 (NEMPAA) and the National Environment: Integrated Coastal Management Act 24 of 2008 (NEMCA). The Environmental Minister is also responsible for the implementation of the Marine Living Resources Act 18 of 1998.

414. The DMR and the DEAFF are 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.

G. CONCLUSION

415. The decision on authorisation was unlawful because it failed to comply with *inter alia* the SA Constitution, NEMA and PAJA as set out in the grounds of appeal above.
416. The appeal should be upheld.

Adrian Pole¹⁷⁶ and Kirsten Youens¹⁷⁷

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Date: 21 October 2019

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¹⁷⁶ Appeal Sections F.1 to F.3.

¹⁷⁷ Appeal Sections F.4 to F10.

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COPY TO: **THE DEPARTMENT OF MINERAL RESOURCES**
Legal Services Directorate
Attention: The Director of Legal Services
Private Bag x 59
Arcadia
0007

Per email: Pieter.Alberts@dmr.gov.za

Per facsimile: 086 710 0877

AND TO: **THE PETROLEUM AGENCY SA**
Attention: The Chief Executive Officer
Private Bag x 5111
Tygervalley
7536

Per e-mail: eappeals@petroleumagency.com

AND TO: **Eni**
Attention: Ms. Nicole Lomborg
Eni South Africa B.V.
1st Floor Icon Building
Corner CubeWS
Corner Lower Long & Hans Strijdom Road

Per e-mail: nicole.lomborg@eni.com